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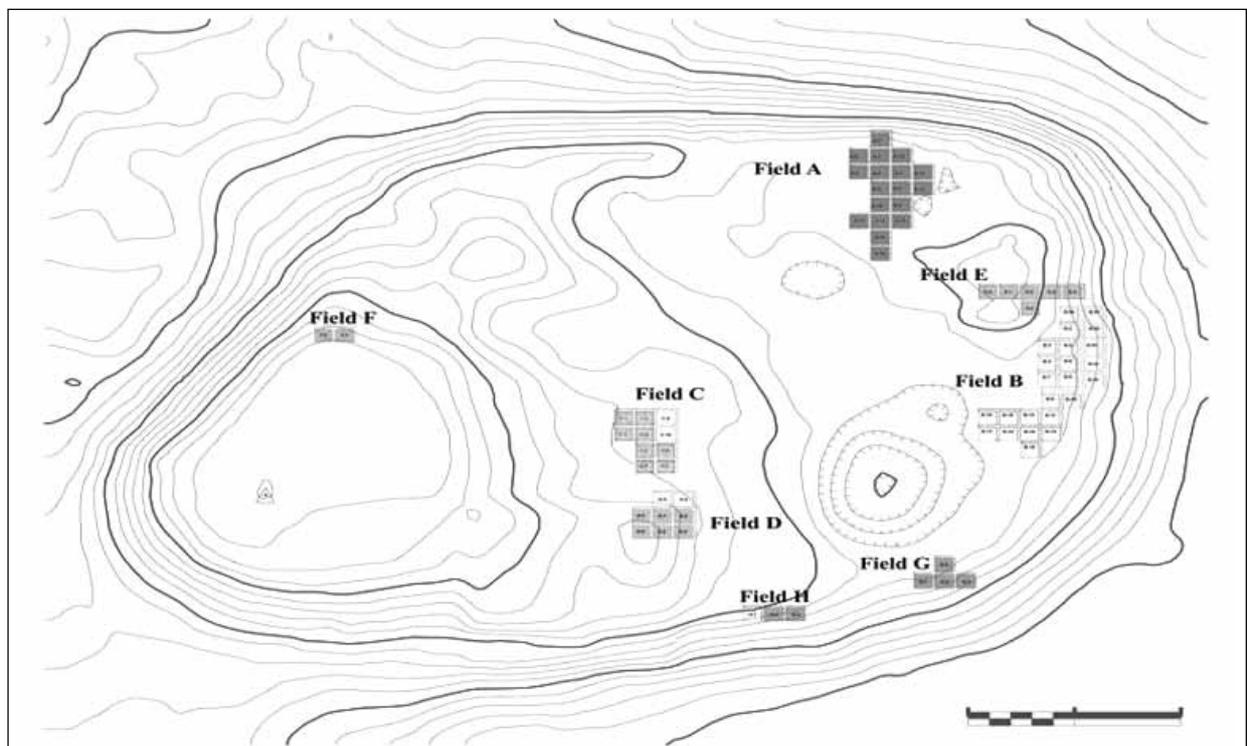
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A TRIPARTITE PILLARED BUILDING IN TRANSJORDAN

Paul Z. Gregor

During the first, 1992, season of excavation at Tall Jalūl, located approximately 5km north-east of Mādabā in Jordan (Younker *et al.* 1993, 1996, 1997, 2000 and 2007), a wall was revealed in Field A, Square 2, which was dated to the 8th century BC. Since this Field is located on the north-eastern ridge of the tall (see **Fig. 1**), this wall was expected to be a part of the city's defense system. However, after the first season, its thickness, length and exact function were still uncertain, since only the northern face of the wall had been exposed, with the rest left unexcavated in the southern balk. During the following season, in 1994, new squares were laid

out on the other (south) side of the wall in order to reveal its true nature and function. Soon after the second season, it was evident that there was another wall dating to the 7th century BC, which was built just inside the 8th century BC wall found during the previous season. During the course of excavation, upper portions of rectangular pillars emerged. The pillars were in parallel lines and appeared in two squares. It was immediately obvious that they represented the architectural form of a pillared building. During the following season, in 1996, the entire building was excavated, exposing all of its structural features. It was evident that it was actually a



1. Topographical map of Tall Jalūl.

typical tripartite pillared building with two parallel rows of pillars located inside the structure. These are well-known in Cisjordan.

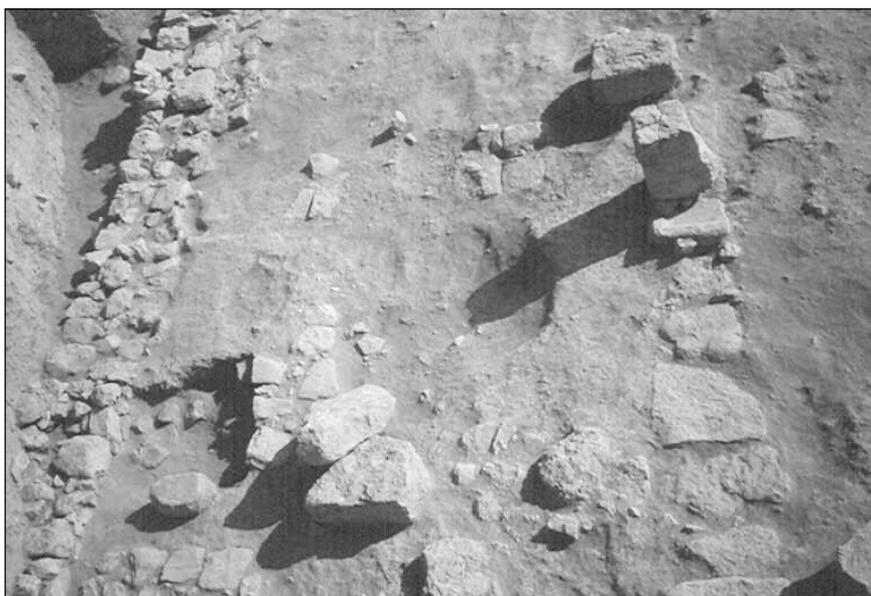
The building was 17m long and 10.2m wide, aligned just a few degrees off the north-south axis. Most of the upper portions of the walls were missing, owing to the fact that the floor of the building was just 1m below the ground surface. During the 19th century AD, this area was extensively used as a burial ground for slaves and servants of nearby villagers. In addition to the digging of the last couple of centuries, which greatly disrupted the ancient walls and floors of the building, some of the wall stones were undoubtedly robbed in antiquity and later times for other structures. The majority of the robbed stones were probably reused in constructing the Islamic village to the south of the tell. The western wall of the building, however, was well-preserved over its entire length and was visible above the floor level of the structure. Although most of the wall was preserved to a height of just 10 to 20cm above the floor, in some places it survived up to 1 meter. In addition to the western wall, only half of the northern wall survived at the north-western corner of the building. Apart from a few foundation stones, the eastern part of the northern wall and the entire southern and eastern walls were missing. Most of the pillars and pavement stones from the interior of the building were also missing.

From the remaining walls, however, it is ob-

vious that the building was well-constructed. Walls were 1m thick in most places. The lower courses of the walls consisted of larger, roughly hewn stones (50-70cm in diameter). Some of the stones were clearly reused from earlier structures. In one instance, the builders reused a large stone that once served as door socket, probably as part of a door of a larger building or even a city gate. In addition, a large stone basin which was 50cm in diameter was reused as a foundation stone in the southern wall. The majority of the stones used for the walls were roughly hewn and most were small (20-40cm) and medium (40-60cm) sized.

As noted above, from the remains of the structure it was evident that the roof of the building was supported by two parallel rows of pillars, of which a few were found *in situ* (see **Fig. 2**). The distance between the exterior walls and the pillars, and the distance between the two rows of pillars was 2.5m. Pillars in both rows were equidistant from each other, standing about 2m apart. Some of the pillars were buried in the ground, while others were standing on a supporting foundation, or stylobate. In some places only the foundation stones were found and some were missing altogether. Among those pillars still standing, the tallest one stood 1m above the floor.

The floor between the pillars was made of beaten earth, but the floor between the walls and pillars was covered with flagstones of various



2. 7th century BC Pillar Building.

sizes. The entrance to the building was probably located on its southern side, which opens on to the inner city. Since the entire southern wall is missing, apart from few foundation stones, the precise shape and size of the entrance remains unknown.

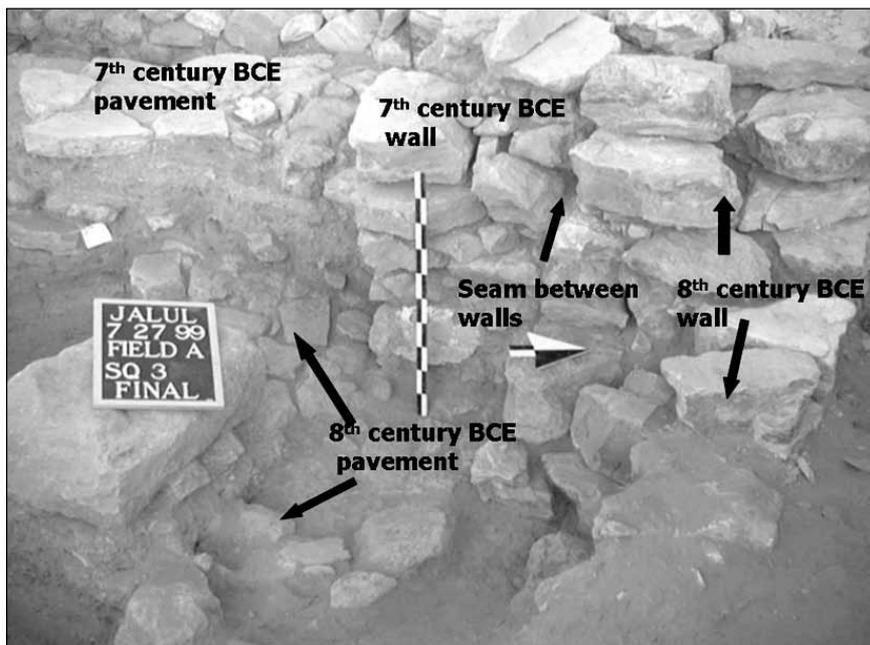
Owing to the fact that the structure was poorly preserved, a decision was reluctantly made to penetrate the floor of the building and to examine its possible foundation trenches in an attempt to determine its exact date. According to the pottery excavated under the sealed floor, it was evident that the structure was erected during the 7th century BC. After excavating the debris under the floor, the excavators were impressed to discover how the ancient architects had negotiated the uneven terrain by stabilizing the foundation of the building and ensuring that the structure was secure and safe.

The structure was erected on the remains of an earlier building dating to the 8th century BC (see **Fig. 3**). Ancient architects cleared most of the material deriving from this earlier structure. Apart from the remnants of the western wall found during the first season of excavation and sporadic flagstones, all other stones were recycled into the tripartite pillar building. In spite of the fact that northern wall of the earlier building (8th century BC) was in decent shape, for some reason the builders decided to construct a new

wall immediately next to it.

During the course of excavation, no foundation trenches for any of the existing walls were found. Obviously ancient architects had come to the conclusion that the ground was stable enough to support the weight of the structure, so they laid the first course of walls right on the existing surface. This was also true for one row of pillars running along the western side of the building. However, the east row of pillars was constructed in entirely different way. For some reason the architects thought that the surface upon which this row of pillars was to be placed would not support their weight, and that as result the building would not be stable. This was probably due to the fact that the terrain where the eastern column of pillars was to be placed was sloping slightly down to the east, meaning that this surface was more that 50cm lower than its western side. In addition, the excavation revealed that the texture of the soil on that side of the building consisted of soft, ashy material unsuitable for any kind of structural support. To avoid digging deep trenches, the engineers constructed a stylobate (1m wide and 60cm high) consisting of small stones (10-30cm in diameter) in order to provide a solid foundation for the eastern row of pillars (see **Fig. 4**).

Later, when the stylobate for the eastern row of pillars was in place and walls were construct-



3. 7th and 8th century BC structures.



4. 7th century BC stylobite.

ed, the builders leveled the surface of the building floor. They filled the entire building with debris consisting of a thick layer (40-60cm) of soil mixed with small stones in order to stabilize the structure. The new surface between the walls and columns of pillars was evenly paved with flagstones of various sizes. Some of the floor stones were 50cm across, while others were much smaller; most were about 20 to 30cm thick. The floor was leveled by placing lime mortar into the space between flagstones, which provided a firm and smooth surface. The area between the columns of pillars, however, was not paved but rather covered with a layer of beaten earth, 4 to 5cm thick.

Many of the flagstones on the floor and stones from the walls were removed in later periods. However, enough sealed floor surfaces remained to establish the date when this structure was originally erected. Pottery excavated from these sealed loci indicated that the building was constructed sometime early in the 7th century BC. Pottery found on the floor suggests that the building went out of use sometimes near the end of the 7th century BC. The angle of some of the surviving pillars indicates that the building collapsed toward its northern end, but this probably did not occur until after the building survived its second phase of use.

Owing to the heavy activities of stone robbers

and grave diggers during the past few centuries, the second phase of the building was evident only in one place. It seems that the floor of the building was resurfaced once again, and at that time, the building was redesigned by placing an additional wall within the building. The wall was built on the previous floor and only a few stones remained intact. The wall was located on the western side of the building and ran perpendicular from the existing wall towards the inside of the structure. One of the stones served as a door socket, with its socket of 25-30cm in diameter indicating a presence of a larger door. Apart from this, nothing else remained that would shed light on this final phase of use.

It seems that the second phase of the building ended towards the end of 7th century BC. Careful removal of the debris above the floor indicates that the building was not destroyed by natural disasters (e.g. earthquake), human activity or an accidental fire. There was no burnt material of any kind present among the debris found on floor of the building. Also, the floor was devoid of any pots, whole or otherwise, indicating that the structure collapsed as a result of abandonment.

This tripartite pillar building found at Tall Jalūl is very similar to those already discovered on both sides of the Jordan River. It is rectangular in shape and is divided into three long rooms

by two rows of pillars. Like most similar buildings, two side rooms were paved with flagstones while the center room was surfaced with beaten earth. The fact that the eastern row of pillars was supported by a stylobate is unique, apart from one pillar building excavated at 'Ein Gev where stylobates are also present as an additional support for the pillars (Kochavi and Tsukimoto 2008: 1924). Throughout the course of the excavation, neither mangers nor basins were found in or around the building to indicate its possible function as stable or industrial facility. Therefore, it is probable that this building most likely served as a store-room, market or perhaps both at different times.

A Short Note on the Discovery of Pillared Buildings

The first recorded pillared building was discovered at Tall al-Hesi; its existence was reported in 1894 and 1898 by Frederick Bliss (1898: 90-98). The excavators discovered a complex of three pillared buildings, but the pillars were not parallel with the outer walls of the building. A decade later, Sellin unearthed few standing monoliths at Ta'anach, which he interpreted to be some kind of ritual pillared street (1904: 104). Not surprisingly, this structure was later recognized as a pillared building (Borowski 1987: 81).

A team from the University of Chicago excavated Megiddo from 1925 to 1939, which resulted in several preliminary reports and a two volume publication. In the second preliminary report, published in 1931, the excavators indicated the existence of several pillared buildings among the ruins of ancient Megiddo (Guy 1931: 37-48). The existence of tripartite pillared buildings was confirmed by two later reports (Lamon and Shipton 1939; Loud 1948). During several seasons of excavations the team discovered a complex of five pillared buildings. Later, in 1998, Tel Aviv University renewed excavations at Megiddo and continued until 2002. They discovered another complex of 12 pillared buildings clustered around an open cobbled courtyard (Finkelstein, Ussishkin and Halpern 2006a and 2006b).

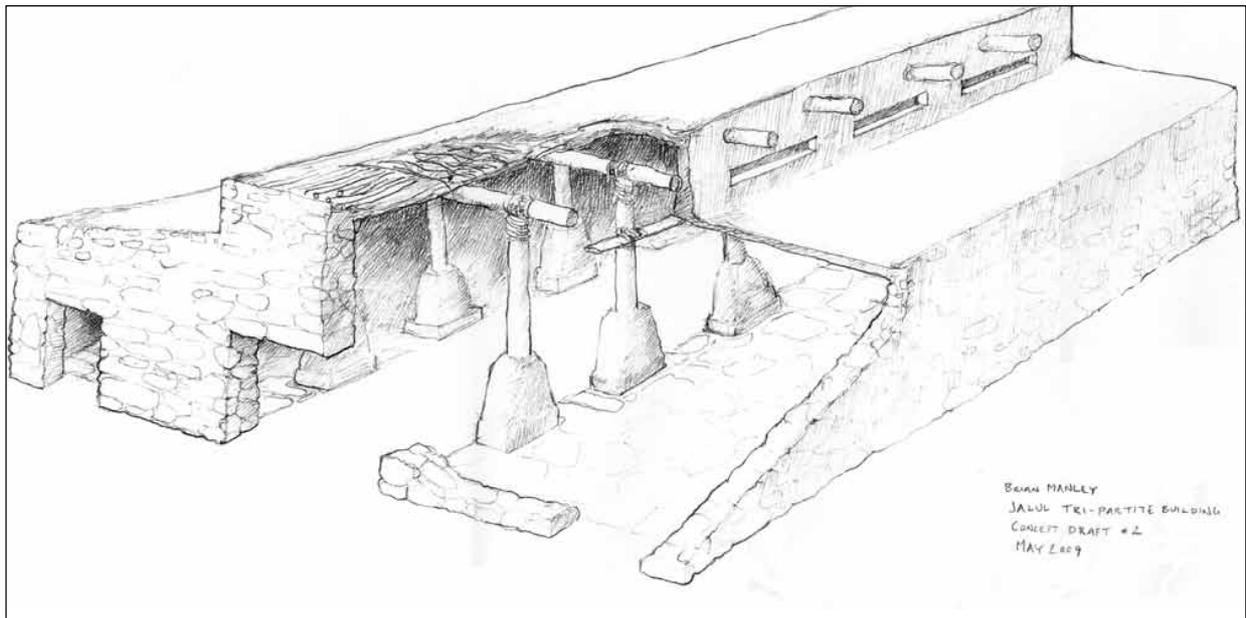
At about the same time as the University of Chicago excavations were underway at Megiddo, Grant started his excavations at Beth Shem-

esh. The excavation lasted only four years, starting in 1928 and finishing in 1931 (Grant 1931; Grant and Wright 1939). The excavators reported the discovery of a large building and at first suggested that it was a temple. However, the building was never completely excavated and it lacked any evidence to indicate that it was used for cultic purposes. Finally, it was suggested that this building may have been some kind of governmental residency (Grant and Wright 1939: 69). It was later identified as a pillared building (Bunimowitz and Lederman 2008: 1646).

In 1935 Hamilton reported his findings from the excavation at Tall Abu Hawam. In spite of the fact that the stratigraphy of the building was not clear, he proposed several phases for its construction. Dimensions of the building were 10.7 by 7.5m, making it one of the smallest pillared buildings recorded (Hamilton 1935: 8-10). Two years later, another publication came out, indicating the presence of a pillared building at Lachish (Starkey 1937: 237). Later, this report was confirmed in the final publications on the Lachish excavations (Tufnell 1953a and 1953b). When Tel Aviv University recommenced excavations between 1973 and 1994, the existence of several pillared buildings was again confirmed (Ussishkin 2004).

During the mid twentieth century another possible pillared building was discovered at Tall Qasile, which was excavated between 1948 and 1950 by Benjamin Mazar (Mazar 1986: 70-71). A few years later Yadin excavated Hazor and reported the discovery of a pillared building. However, a row of ten pillars were excavated and reported by Garstang, who had excavated at the site a few decades earlier (in 1928), but never recognized them to be part of a pillared building. He indicated in his report that he found an enclosure "which he called the camp area" (Yadin 1993: 595). Yadin excavated a pillared building in 1955 and 1956, which continued in use through Strata VIII-VII. The building measured 14 by 24m; the central room was 3.6m wide while side rooms were about 2.5m wide (Yadin 1958: 11-14; 1960: 6-9; 1972: 167-169).

At Tall Miqne (ancient Ekron), Naveh reported the existence of a building near the city gates (Naveh 1958: 87-94). Later, Yadin and Ussishkin indicated that rows of pillars with tethering holes closely resembling the tripartite buildings



5. Pillared building reconstruction.

at Megiddo and Beer Sheba had been found (Yadin 1975: 61, n. 23; 1976a: 22, n. 20; Ussishkin 2004: 831). Another possible pillared building was discovered at ancient Gibeon. The site was excavated in 1956 by Pritchard (1964: 35-37) and the building was extremely fragmentary, but later it was recognized as a possible pillared building (Herzog 1973: 26; Herr 1988: 50).

During three seasons of excavations conducted between 1967 and 1971, a tripartite pillared building measuring 7 by 18m was discovered at Tall Malhata (Kochavi 1993b: 935). Later, when the site was excavated again between 1990 and 2000, several other pillared buildings were discovered, which preceded and co-existed with the one discovered earlier (Beit-Arieh 2008b: 1917).

Another significant complex of pillared buildings was discovered and reported in 1973 by Aharoni, who excavated Beer-Sheba between 1969 and 1971 (Aharoni 1973: 13-18). Three pillar structures were found with similar features, in terms of construction and size. On average the buildings were 18m long and 15m wide. They closely resembled the tripartite pillared buildings found at Megiddo.

A few years later (between 1972 and 1975), Tel Aviv University carried out several seasons of excavations at Tall Masos under the directorship of Yohanan Aharoni. After three seasons

of excavations, the remains of a building were discovered that resembled a pillared building (Kempinski and Fritz 1977: 136-148). In spite of the fact that Fritz was certain that this was a tripartite pillared building, others challenged this conclusion (Herr 1988: 50; Kempinski and Fritz 1977: 140). Since the building is dated to Iron Age I, it may be plausible to suggest that it was some kind of prototype for a typical tripartite pillared building, which would become very common in later periods.

Ancient Timnah (Tall Batash) was excavated between 1977 and 1989. After twelve seasons of excavations it was reported that Area E contained a cluster of four typical pillared buildings. Pillars that divided each building into three sections, or rooms, were described as “monolithic stone pillars” (Mazar and Kelm 1993: 155). All excavated pillars were square (0.4 by 0.4m) and ranged in height from 0.84 to 1.24m. Pillars were not uniformly distant from each other (1.84 to 2.45m) and it seems that the complex collapsed as a result of abandonment, as the floors were virtually empty of finds (Mazar 1997: 218-219).

Between 1982 and 1985, a German team led by Fritz excavated Tall Chinnereth and reported the existence of a pillared building (Fritz 1993: 300). Later, Fritz identified the building as a tripartite pillared building (1995: 85). Another complex of pillared buildings was discovered at

‘Ein-Gev by a Japanese team between 1990 and 1991. The buildings share exterior walls and are located on top of a hill near a massive casemate wall. The complex covers an area of about 20 by 36m. Stone pillars are present in every building and are supported by stylobates. The side rooms are paved with stones while the floors in the middle rooms are made of packed earth (Kochavi 1993a: 411-412; Kochavi and Tsukimoto 2008: 1724-1726).

Tall Hadar was excavated between 1987 and 1997 by Tel Aviv University under the directorship of Yadin and Kochavi. They found two tripartite pillared buildings dating to the end of the 11th century BC (Yadin and Kochavi 2008: 1756). Most of the pillars that divide the buildings into three parts were preserved up to 2m in height. This may be one of the earliest tripartite buildings in existence (Kochavi 1993c: 551).

Three pillared buildings were discovered at Tall Hadid between 1995 and 1997 during salvage excavations. The buildings were 8 to 9m long and were divided into three sections by two rows of pillars (Beit-Arieh 2008a: 1757-1758). Another discovery was made in Transjordan, where two pillared buildings were reported in 2006 (following the one found at Jalūl in 2004 — see below). They were discovered in Khirbat al-Mudayna. The buildings were divided into three rooms by standing pillars. Between each pair of pillars was a stone basin. The floor of the side rooms was bedrock, while the central room was also bedrock but was plastered with beaten earth (Daviau 2006: 14-30).

Different Functions of Pillared Buildings

The tripartite pillared building discovered at Tall Jalūl during 1994 is, the best of our knowledge, the first one found in Transjordan. Apart from the one discovered at Khirbat al-Mudayna, all other tripartite pillared buildings found during the last 100 years have been located west of the River Jordan. All of them follow the same basic structural design: they are large, elongated rectangular buildings divided into three long rooms by two parallel rows of pillars that create one central room flanked by two long side rooms. Even though all are structurally rectangular in shape, they vary in length from 11 to 28m, while their width ranges between 7.5 and 10.7m. Side rooms are between 1.9 and 2.8m

wide (2.3m on average). The distance between pillars varies between 0.7 and 1.53m, with managers, rubble or platform fillings between them (Currid 1992a: 52-54).

Scholars have debated the function of these buildings for decades, suggesting different functions. Their arguments will not be repeated here, except to offer a brief summary of their ideas (Albright 1943: 22-24; Pritchard 1970; Yadin 1975, 1976a and 1976b; Conrad 1977; Volkmar 1977; Wightman 1984; Davies 1988; Herr 1988; Kroll 1989; Currid 1992a and 1992b; Herzog 1992; Holladay 1992; Kochavi 1998). Based on the shapes and forms of the pillars, the sizes of the rooms and the artifacts found on the floors of the tripartite pillared buildings, different interpretations regarding their function(s) were offered. It was first suggested by Bliss (1898: 95-96) that pillared buildings served as bazaars or market places. This same idea was supported by Herr (1988: 57-61) and Kochavi (1998: 475) who identified them as “shopping malls” or emporia (1999: 45). However, Bliss was not certain that the building he excavated was indeed a bazaar, and he also proposed that it might have served as barracks for soldiers (1989: 96). This idea was supported by Pritchard (1970: 274) and Fritz (1977: 42). However, one pillared building (at Beth Shemesh) was identified as a possible temple (Grant and Wright 1939: 69). Nevertheless, due to insufficient cultic artifacts found in and around the building, this idea did not receive much acceptance within the scholarly world.

It was also suggested that pillared buildings might have been used as ancient slave prisons (Tvedtnes 1992: 68), customs houses (Linsay 1992: 68), tax collection centers (Herzog 1973: 30; Wise 1999: 10), or simply as a place for shearing sheep (Bartels 1977: 48). Franklin suggested that the courtyard at Megiddo served as a fairground where people from the countryside brought different products to display and sell, while live animals were kept inside the pillared buildings (Shanks 2003: 53). In spite of the fact that these latter suggestions might sound appealing, they did not receive much scholarly support since they are not based on evidence revealed through the excavated material. Another suggestion came from Aharoni, who proposed that pillared houses might have been used for domestic purposes during times of distress as

refugee centers. He based this suggestion on the fact that at a pillared building in Beer Sheba, a sizeable assemblage of domestic pottery was discovered on the building's floor, which represents the final phase of occupation before its destruction (Aharoni 1973).

In addition to the above-mentioned possible functions of pillared buildings, Daviau offered a new interpretation, at least for those she excavated in ancient Moab. Based on artifacts found among fallen debris, she suggested that the two pillared buildings discovered at Khirbat al-Mudayna served as industrial facilities for weaving and dying textiles (Daviau 2006: 20).

During the first half of 20th century, Megiddo was excavated and a tripartite pillared building interpreted as a horse stable (Guy 1931: 37; Lamon and Shipton 1939: 32-47; Yadin 1975, 1976a and 1976b; Davis 1988: 32). Later, tripartite pillared buildings found at Lachish (Ussishkin 2004: 831) and Beer Sheba (Yadin 1976b; Holladay 1986) were also interpreted as stables. This interpretation of pillared buildings was challenged later, and it was suggested that they were nothing more than storehouses (Pritchard 1970: 268-276). Even at present, archaeologists are divided in their interpretations of the function(s) of these structures in general, and those at Megiddo in particular. Apart from the questionable pillared buildings found at Megiddo, scholars generally agree that they served mostly as storehouses or granaries. This is certainly true for Beer Sheba (Aharoni 1973: 14-15; Herzog 1973, 1992), Hazor (Yadin 1972), Beth Shemesh (Bunimovitz and Lederman 2008) and Lachish.

In spite of the fact that the function of tripartite pillared buildings is disputed, all archaeologists agree that they were some kind of public buildings. As such, it would be hard to accept that they served only one purpose. Some might have been specially constructed for one function, but it should not be ruled out that during their existence, they might have served different purposes at different times. This idea was first suggested by Yadin (1976b: 249), but was emphasized by Wright, who offered a wide range of possible usages for such buildings (1985: 307). He was followed by Mazar, who suggested that the same architectural features could have served different functions as dictated by

local and immediate needs (1990: 476-478).

The discovery of pillared buildings clearly demonstrates several things. First, this type of structure is not only common in the Iron Age II period; it is now evident that they were used in earlier periods, i.e. Iron Age I, as well. The first pillared buildings that may be recognized as possible prototypes were in existence even earlier, during the 12th century BC (Tall Masos) and 11th century BC (Tall Hadar). Second, tripartite pillared buildings were not restricted to the West Bank, but were also known and used in Transjordan (Tall Jalul and Khirbat al-Mudayna) as well. Third, tripartite pillared buildings were not popular within only one ethnic group (Israelites) but were also used by other ethnic groups such as the Philistines (Tall Qasile, and possibly Tall Abu Hawam), Ammonites (Tall Jalul) and Moabites (Khirbat al-Mudayna). Fourth, although similar in structure, tripartite pillared buildings were used for different purposes and served different needs such as stables, storehouses, industrial facilities and market places. Fifth, it is also possible that within as little as a year or as much as a decade, one building might have been used for variety of purposes to accommodate the immediate needs of different inhabitants.

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P. Z. Gregor: A Tripartite Pillared Building In Transjordan

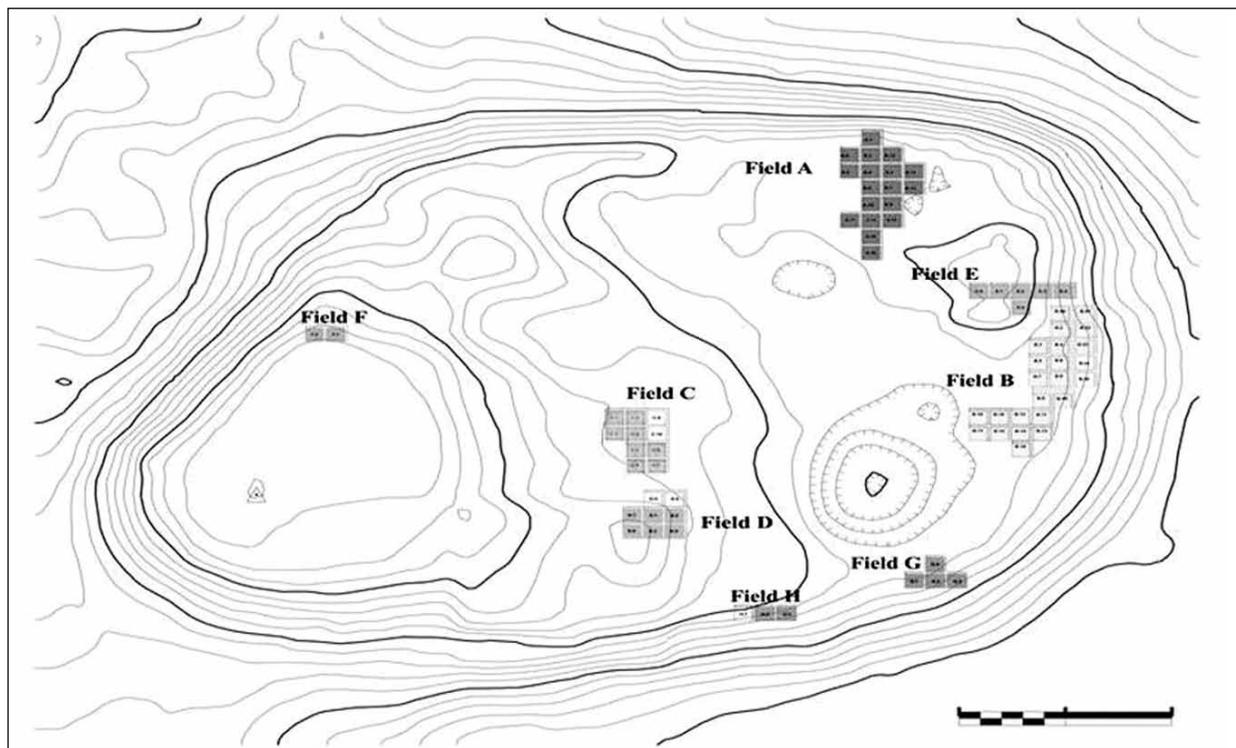
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PRELIMINARY REPORT ON THE TALL JALŪL 2007 SEASON: FIELD A¹

Paul and Helena Gregor

The primary goal in opening Field A on the north-eastern ridge of the tall (see **Fig. 1**) was to expose a possible city wall defensive system. During the previous seasons of excavation (1992, 1994 and 1996), Field A revealed seventh and eighth century BC architectural remains but

not city walls. Most likely, exterior building walls served as city defensive walls during these periods. During the 1999 season, a decision was made to excavate the layers under the remains of seventh and eighth century BC buildings in hope of finding earlier structures. Notwithstand-



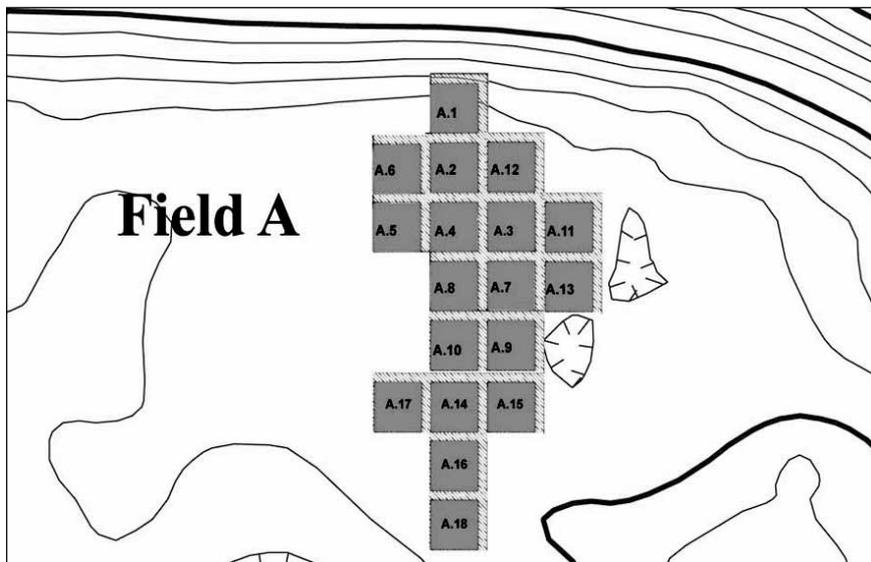
1. Topographical map of Tall Jalul.

1. The authors of this report would like to express their gratitude to volunteers and staff members who participated in this Field. Further, our gratitude is extended to our major sponsoring institutions: Andrews University, Northern Caribbean University and Cincinnati Christian University. Also, we would like to thank the Director General of Antiquities, Dr Fawwaz al-Khraysh, for the support the Department of Antiquities of Jordan provided this season. The overall project directors were Randall W. Younker and Constance E. Gane; as-

sociate directors were Paul Z. Gregor (Field A), Jennifer Groves (Field D), Robert Bates (Field E) and Mark Ziese (Fields G and H). Associate Field A supervisor was Helena R. Gregor; square supervisors were Vassel Kerr (A14), Helen Dixon (A16 and A18), Mr Bassem Nail al-Mohamed (A17). Rodrigo de Silva, Eva Katarina Glazer, Stanley Maxwell, Roxanne Maxwell, Nigel Maxwell, Phemie Maxwell and Yvette Remfort were volunteers.

ing the excavation of Squares A3, A4, A7 and A8, which are clustered together (see **Fig. 2**), the excavations of 1999 and 2005 did not bring desirable results. During those two seasons of excavations, the layers below the buildings were carefully removed. In spite of the fact that in some places excavation extended more than 3m below the eighth century BC building, no architectural remains of any kind were discovered. However, at the end of the 2005 season, a sig-

nificant discovery was made with respect to the position of the lowest excavated layers. These layers seemed to be sloping, indicating that the ridge of the tall, with its Iron Age I and possibly earlier city wall defenses, was probably located more inward of the tall (see **Fig. 3**). Following this rationale, four new squares (A14, A16, A17 and A18) were opened during the last season of excavation in 2007. Squares A14, A16, and A18 are aligned on a north-south axis, while A17²



2. Field A.



3. Square A3 sloping layers with Iron I pottery.

2. Because of a lack of manpower, Square A17 was not excavated deep enough to produce any material cul-

ture, except for a phase of abandonment after the Persian period.

was located west of A14 (see **Fig. 2**). The reason to open Square A17 west of A14 was guided by the fact that on the surface was evidence of a possible wall, which turned out to belong to some kind of structure from later periods (possibly an Islamic period animal enclosure). The dating of this wall was difficult owing to the fact that only two courses of stones survived, very close to the ground surface, which has been heavily disturbed over the past two centuries by the digging of graves for servants or slaves of the local tribe. During the 2007 season, Field A with its four squares revealed two phases of occupation (Phase 1: seventh century BC; Phase 3: Persian period), each followed by a phase of abandonment (Phases 2 and 4).

Phase 1

Architectural evidence of this phase surfaced in all three squares (A14, A16 and A18) of Field A. Square A14 revealed remains of a structure of an undetermined nature. Owing to the twin facts that this square was covered with graves dug during the last few centuries, and that the remains of a seventh century BC building were just 2 to 3 feet under the surface, only a few stones of this structure remained intact. In spite of this disturbance, preliminary pottery readings indicate that the building was erected and used during the seventh century BC. It is likely that the remaining stones represent the first course of the wall (Locus 11) since smaller sized stones were placed next to the wall stones to stabilize and to strengthen their position in the ground (see **Fig. 4**). The wall is composed of small to medium sized, roughly hewn field stones. It runs from the south-east corner of the square in a north-westerly direction, and ends abruptly in the middle of the square, possibly representing the corner of a building (see **Fig. 4**). The direction of the wall is more or less parallel with the western wall of the pillared building excavated in previous seasons; this wall comes from the same time period.

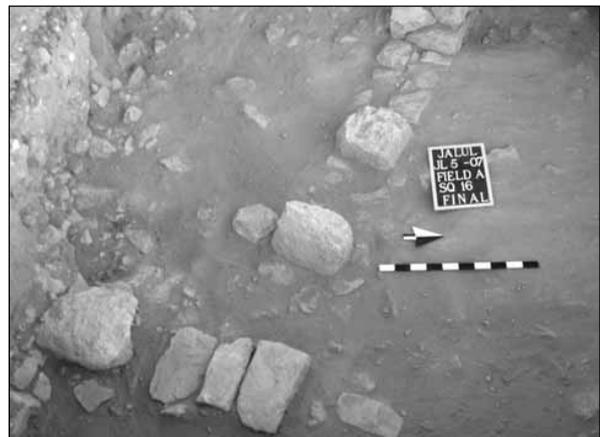
The same phase is also represented in Square A16 with a similar wall (Locus 10). It is made of slightly better quality stones than those used in Wall 11 in Square A14, but both run parallel to each other. It clearly represents the north-eastern corner of a structure. Its remains come from the middle of the western balk and run toward the



4. Square A14 seventh century BC building.

south-eastern corner of the square, but it ends before the eastern side of the square and turns toward the southern balk at a 90 degree angle. It is not yet clear if the stones represent the first course of its foundation or upper courses, but it is evident that there was a door or entrance in the north-eastern corner of the structure (see **Fig. 5**). The wall was made of small to medium sized, roughly hewn stones. Both walls (10 and 11) were at approximately the same level and preliminary pottery readings indicate that they date to the same period, the seventh century BC.

While Phase 1, dating to the seventh century BC, is represented by Wall 11 in Square A14 and Wall 10 in Square A16, the same phase is represented in Square A18 with a wall (Locus 18) and two floors (Loci 10 and 16), indicating that this phase had two Sub-phases, 1A and 1B. Wall 18 is only partially visible since most of it is in the northern balk, but it is evident that it runs parallel to walls 10 and 11. A possible



5. Square A16 seventh century BC building.

door or entrance to the structure is also present (see Fig. 6). The structure represented by Wall 18 was occupied in both sub-phases, 1A and 1B, since both floors were attached to it. When Wall 18 was built, the floor was placed on its southern side. The floor was constructed of heavily beaten earth packed with pottery sherds, which had been carefully placed to strengthen the surface (see Fig. 7). After some time, another floor (see Fig. 8) of a similar nature was constructed about 20 to 30cm above the first floor (see Fig. 9). The material between the floors was densely packed with a large quantity of pottery sherds. Unfortunately, Square A18, along with Squares A14 and A16, was honeycombed during the last two centuries by grave digging, since the whole area was used as a burial ground. However, it was possible to isolate a few undisturbed square feet of both floors which represented sealed loci and enabled the floors to be properly dated. Pottery sherds collected above the upper floor



6. Square A18 seventh century BC structure.



7. Square A18 seventh century BC lower floor.



8. Square A18 seventh century BC upper floor.



9. Square A18 seventh century BC floor both phases.

(Locus 10) represented sub-phase 1B. Pottery collected between the two floors, and pottery collected from under the lower floor (Locus 18) represented Sub-phase 1A and was virtually the same, indicating that the time between these two sub-phases was very short. Preliminary pottery readings indicate that Wall 18, with its two floors 10 and 16, was in use during the latter part of the Iron Age II period, or the seventh century BC.

Some of the pottery assemblage found in association with these walls (Wall 11 in Square A14, Wall 10 in Square A16, and Wall 18 in Square A 18), together with floors 10 and 16 in Square A 18, consisted primarily of kitchen ware, represented by bowls of various sizes, plates, small jars, jugs etc., along with a small number of storage jars. Some of the bowls were highly burnished with a red, yellow or black slip, all of which were traditionally used in the region during the last part of the Iron Age II period.

Bones found in the layers associated with this

period, i.e. the seventh century BC, were mainly of sheep and goats. In addition to occasional remains of bird, a few small mammal bones were also found. Cow and donkey bones were occasionally present, but there were not as many as sheep and goat bones. The predominance of sheep and goats suggests that there was a heavy pastoral component in the animal economies of the site during the seventh century BC. However, the presence of cattle suggests that the inhabitants of the site were also engaged in some kind of sedentary agriculture, at least for part of the year.

Phase 2

Phase 2 is an abandonment phase in Field A that is represented in all three squares. The layers representing the abandonment of the site at this time are between 30cm (Squares A14 and A18) and 60cm (Square A16) thick. The lack of burned material around the walls and the absence of objects on the floor clearly indicate that the site was abandoned for not more than one century.

Phase 3

This phase is represented in Squares A14 and A18, but not in Square A16. A pavement constructed of small to medium sized flagstones was discovered in Square A14, and covered one quarter of the northern part of the square (Locus 4). It was found only 20 to 30cm under the ground surface, and was damaged by grave-

digging in the 18th and 19th centuries (see **Fig. 10**). Only a small section of the pavement was undisturbed; most of it was removed in ancient and more recent times when stones were robbed for use in other structures in the vicinity of Tall Jalūl. Furthermore, the flagstones in this pavement themselves most probably derive from earlier periods, since the size and shape of the pavers were very similar to those found in the floor of the seventh century BC pillared building.

In addition to the pavement in Square A14, a wall was found in Square A18 just 5 to 10 cm under the surface (Locus 11). The wall was approximately 40cm wide and was constructed primarily of small field stones, of which only two courses survived (see **Fig. 11**). The wall



10. Square A14 Persian pavement.



11. Square A18 Persian wall.

ADAJ 53 (2009)

belonged to a structure, the purpose of which remains unknown as so little of it survived in Square A18. It runs from the north-eastern corner of the square, just south of and almost parallel with the northern balk. The wall is about 3m long and ends abruptly. It is probable that the missing portion was removed by grave digging activities.

Pottery found in and around the base of Wall 11 in Square A18, and under pavement 4 in Square A14, indicates that both were constructed and occupied during the very latest parts of the Iron Age II and Persian periods. The animal bone

from these layers is very similar to that of Phase 1, or the seventh century BC, indicating very similar subsistence patterns during Phases 1 and 3, most probably of a semi-nomadic character.

Phase 4

Similar to Phase 2, Phase 4 is also a non-occupational phase, the debris of which accumulated after the Persian period. It is represented in all squares in Field A.

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PRELIMINARY REPORT ON THE 2009 SEASON OF THE MADABA PLAINS PROJECT: TALL JALŪL EXCAVATIONS 2009

Randall Younker, Constance Gane, Paul Gregor, Jennifer Groves and Paul Ray

Introduction

During the 2009 season, Andrews University continued excavations at Tall Jalūl and the Islamic village. The excavations on the tall were directed by Randall Younker and Constance Gane, of the Institute of Archaeology at Andrews University. The excavation in the Islamic village was directed by Reem al-Shqour¹. Over 50 faculty, students and volunteers joined more than 20 Jordanian workers in the excavations this season.

For background information on the site and the history of its exploration see the 2008 report submitted to the Department of Antiquities. In 2009, excavations on the tall were conducted in only three areas: Fields C, D and G.

Results of the 2009 Season at Tall Jalūl

Field C

The 2009 season of excavations in Field C

1. Reem al-Shqour, Research Associate for Archaeology at the Institute of Archaeology at Andrews University, will present a separate report for the 2009 season at the Islamic village. We wish to thank Dr Fawwaz al-Khrayshah for his support of the project this season. We would also like to thank the American Center of Oriental Research (ACOR) for their support, through the good work of Barbara Porter and Chris Tuttle, in launching the project this season. Finally, we appreciate the services of Mr Basem al-Mahamid and Mr Hussam Hjazin who served as representatives of the Department of Antiquities of Jordan.

Staff for the 2009 season included director Randall W. Younker and co-directors Constance E. Gane and Reem al-Shqour. Paul Z. Gregor and Paul Ray were associate directors. Sabal Zaben served as field archaeologist and facilitated the excavations of the Islamic village. The Field Supervisors this year were Paul Gregor (G), Paul Ray (C) and Jennifer Groves (D). Paul Ray served as the objects registrar and architect and Jody Washburn was the pottery registrar. Karen Borstad and Theodore Bergh conducted the GPS survey of Jalūl village, while Paul Ray, Zach Ray and Owen Chestnut oversaw the GPS readings on the tall and the Islamic village. Basem al-Mahamid did the architectural drawings for Field G.

brought clarification on the nature of the Late Iron II/Persian walls that had initially been exposed in previous seasons. In 2009, two rectangular buildings were identified in the southern part of Field C (which included Squares C5, C6, C7 and C8). The larger building is located on the west side of the field and occupied most of this season's excavation area. At least three building phases were detected for the western building (**Fig. 1**).

To the north of the large western building was an alley that separated it from the Late Iron II/Persian period pillared house found in earlier seasons (**Fig. 2**). This pillared house was initially constructed in the seventh century BC and continued to be used throughout the Iron II/Persian period. It was the building in which a cave, containing skeletons representing some 20 individuals, was found below the open courtyard floor. Based on the ceramics found in associa-

Paul Ray did the drawings for Fields C and D. Magalie Anna Dartus did the architectural drawings for the Islamic village. Zach Ray served as the objects artist. Square supervisors for Field C included Christie Chadwick, Chris Chadwick, Sarah Gane, Roy Gane, Jenny Shrestha and Audrey Shaffer. Square supervisors for Field D were Sean Porras, L. Scott Baker, Owen Chestnut and Jasmine Saunders. Square supervisors for Field G included Micah Johnson, Jeff Hudon, Chad Washburn, Michelle Berglin and Justin Singleton. Square supervisors for the Jalūl Islamic village included Magalie Dartus, Thomas Pieters, Ehren Lichtenwalter and Christine Chitwood.

Volunteers included Gary Achenbach, Stephen Allock, Abigail Arkusinski, Andy Arkusinsky, Ryan Atkins, Arnie Baker, Einra Baker, Lora Baker, Stefani Clouzet, David Cox, Kristina Cress, Denis Fortin, Erika Fortin, Rebekah Gauthier, David Glazer, Eva Glazer, Sasa Glazer, Chelsea Grimstad, Madeliz Gutierrez, John Heczko, Young Kim, Suzanne LaRue, Amanda J. McGuire, David Merling, Jeremy Merling, Kohl Merling, Timothy Paulson, Nadine Plummer, Vern Porras, Daniel Regal, Zenaida Salazar, Douglas Simmons, Victor Tenorio, Tine Vekemans, Frances Watkinson, Bob Wilkins and Florie Yang,



1. Iron Age II/Persian period building in Field C (middle and lower walls) and the alley way (in between upper wall where people are standing, and middle wall).



2. The alley or street in Square C6; the wall to the left (south) is the northern wall of the large western building that dates to the Iron Age II/Persian period.

tion with the skeletons, the bodies date from the seventh century BC.

The second building in Field C was found in the south-east part of the field; only the north-west corner of this building was exposed. A room in the north-west part of the building was paved with small stone cobbles. This north wall of this south-east building was robbed out in antiquity.

Suggested phasing for the results of the 2009 excavations in Field C can be summarized as follows:

Phase 1: Last street or alley phase (C5.37b=C6.8) and pavement in north-west corner of C5 (C5.22).

Phase 2: Iron Age IIC/Persian ‘buttress’ which strengthened the northern wall of the western building, and also serves as the southern boundary of the street or alley (C7.42 tumble or stone

fall=post-occupational phase of the building).

Phase 3: Iron Age IIC/Persian expansion of ‘western building’ to west. This expansion includes wall C8.17b=C11.11, C8.26=C5.21, C5.13, the thickening or widening of the center wall or pylon C8.16=C7.12, and the pavement C8.20=28 = 31 = C5.25. The middle pavement of the street or alley is part of this phase (C5.39 = C6.11).

Phase 4: Iron Age IIC/Persian ‘western building’: walls C8.17, C7.14, C8.16 = C7.12 (the center wall or pylon) and C6.21 = C5.8; pavement C5.29; wall C6.19 = C5.44 (also serving as the northern boundary of the street or alley) and pavement C5.42 (the street or alley).

Phase 5: An Iron Age IIC/Persian period building (C7.35 and 36); the north-west corner of this building includes a cobble pavement (C7.38 = C8.25).

Phase 6: An Iron Age II building (seventh century BC); the pillared building and cave (C1. 28) in Squares C1 to 4, found in previous seasons, continues.

Phase 7: What appears to be an Iron Age I wall (C4.29) found in Square C4.

Field D

Excavations in Field D on the tall continued to clear the rooms of the large Iron II/Persian period building that was found in earlier seasons (**Fig. 3**). In the course of clearing the rooms, large amounts of broken pottery continued to be found as was the case in previous seasons. This season’s finds included a piece of Attic



3. Iron Age II/Persian building from east; courtyard is in the foreground; rooms along the south (left) and west (top) sides are visible; fallen stones are from stone pillars.

ware -- typical of the Persian period. A number of small objects were also found, including a limestone cosmetic palette, at least four beads (one of which was made of glass and another of amber), parts of two horse figurines, the head of an Egyptian-style female figurine, and a plaque fertility female figurine (**Fig. 4**). An unbaked clay loom weight from D1 (actually the second such weight from the same room) and a couple of fragmentary stone loom weights, again from D1, were also found. In addition to the aforementioned objects, fragments of a couple of rhytons (small ceramic drinking vessels) were recovered; one of these was in the shape of a camel's head.

As well as the architecture and small finds, a broken seal and a *bullā* (piece of clay stamped by a seal) were found (**Fig. 5**). The inscriptions were Ammonite and date to about the seventh century BC. Thus, they were in use prior to the last use of the Iron II/Persian period building, showing that the building has an earlier history in the Late Iron II period -- around the seventh century BC.

The phasing in Field D is basically restricted to the Iron Age IIC/Persian period and its post-occupational/abandonment phase. However, there were several sub-phases of the Iron

Age IIC/Persian period building. The suggested phasing for Field D after the 2009 season is as follows:

Phase 1: Post-Iron Age IIC/Persian occupation (an abandonment phase).

Phase 2: Iron Age IIC/Persian late phase walls (D3.14 upper phase); D3.21.

Phase 3: Iron Age IIC/Persian wall D3.34; pillars 27 a, b and c.

Phase 4: Iron Age IIC/Persian walls D3.28, D4.18 and D1.44.

Phase 5: Iron Age IIC/Persian walls D3.33, 25 and 48.

The discovery of Persian period remains at Jalūl in Fields C and D (as well as in A and B during earlier seasons) is significant in view of the fact that material from this period has hitherto been rather rare. However, more recent archaeological work in Transjordan has been slowly altering that picture. Stern (2001: 454-59) has compiled a convenient list of those sites in Jordan for which the excavators have reported possible Persian period remains. In the Ammon region these include Ḥisbān, Tall al-'Umayrī, Tall Ṣāfūt, Khirbat al-Ḥajjār, Tall al-Durayjāt (excavated by the author), Umm Uthaynah, Abū Nuṣayr and tombs at Muqablayn, Khildā. To these sites Tall Jalūl can now be added².

2. See E. Stern *Archaeology of the Land of the Bible Vol. II: The Assyrian, Babylonian, and Persian Periods*

(732-332 B.C.E.), New York, 2001.

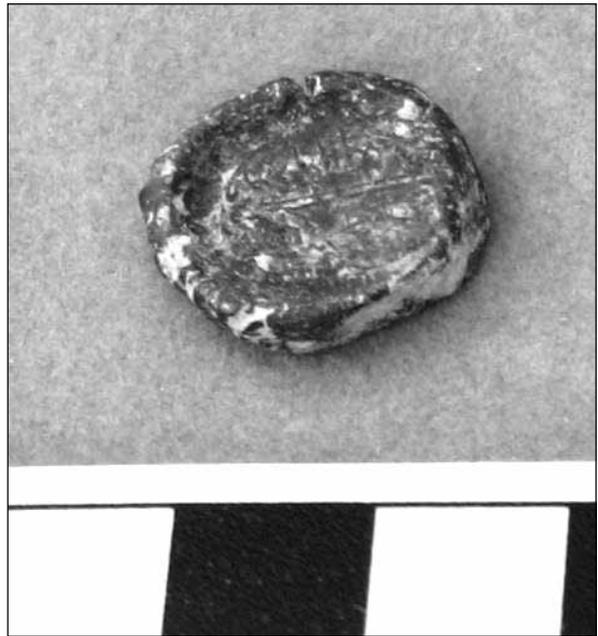


4. Iron Age II plaque fertility figurine from Field D.

Field G

The 2009 season in Field G continued to expose a city wall first found during the 2007 season (Figs. 6 and 7). This season, the city wall was traced across four 5m squares, meaning that at least 20m of the wall was exposed. The wall runs in a north-west, south-east direction and dates to the ninth century BC.

To the north of the ninth century city wall, in the eastern part of Field G, the south portion of a large Iron II (eighth and seventh centuries BC) building was exposed. This south portion contained a couple of small rooms that were located at the back of the building. One of these small rooms contained a considerable amount of smashed pottery that dated to the Iron II pe-



5. Iron Age II bullae from Field G.

riod (seventh century BC). The forms included cooking pots, decanters, oil lamps, bowls, storage jars, etc.

One of the most intriguing finds in Field G was a late Iron II/Persian period (seventh century BC) water channel that ran from a large reservoir located at the south-east part of the tell. The water channel cut across the earlier Iron II building and exited through the early Iron II wall. The water channel apparently drained the overflow from the water reservoir to a number of smaller reservoirs located outside the city wall to the east and south-east. It would therefore seem that Jalūl had an abundant water supply during the Iron Age.

Besides the architectural remains of Field G, a number of small objects were found, including arrow heads, bone tools and ceramic figurines, amongst them a number of female heads -- possibly of Ammonite fertility goddesses.

Phases for Field G after the 2009 season appear as follows:

Phase 1: Islamic period walls (G8.3; G9.2) (based on stratigraphic position).

Phase 2: Post-seventh century BC abandonment phase (G2.53-60; G4.19, 25; G5.1-8, 10; G8.1).

Phase 3: seventh century BC occupation: wall G4.36; water channel walls G2.38 = G5.9.

Phase 4: Post-eighth century BC abandonment: fills G1.8-14, 18 and 19; G4.26-32, 35, 38, 41



6. Final photo of Field G from west. Left shows rooms of 8th century BC building; center shows 7th century BC water channel that runs from water reservoir to outside the city wall; wall on right side of photo (south) shows 9th century BC city wall.

and 43; G5.11-16; G7.1-11, 13 and 14; G8.4-8.
Phase 5: eighth century BC occupation: plaster G1.15; walls G4.13, 15, 16, 17 and 33; G4.37; G4.40; G5.17, 18 and 19; G7.18; G8.12; G9.3-4.

Phase 6: Post-ninth century abandonment phase, including fills G1.16; G2.39-52; G2.61-64; G2.68-69; G4.44; G7.12, 15-17; G8.9-11.

Phase 7: ninth century BC occupation: the City Wall, including walls G1.17; G2.5 and 67; G4.34; G7.4 and 19; G8.2 and 13.

Mapping of the Islamic Village (Karen Borstad and Theodore Burgh)

The mapping of the Islamic village was conducted by Dr Karen Borstad and Dr Theodore Burgh. 22 structures were recorded during this initial season, including four houses complete to their roof-lines. Within the more ruined structures, special features such as doors, large lintel stones and arches were mapped separately (**Fig. 8**). A built wall amongst the ruined buildings, running up to a cave entrance, indicated a possible habitation cave. Several complete houses within 'old Jalūl' are currently occupied and their locations will be recorded in future seasons. Using GIS, the structures mapped in 2009 will be displayed on a geo-referenced aerial photo of the Islamic village site. Analysis of occupation and use patterning through time will

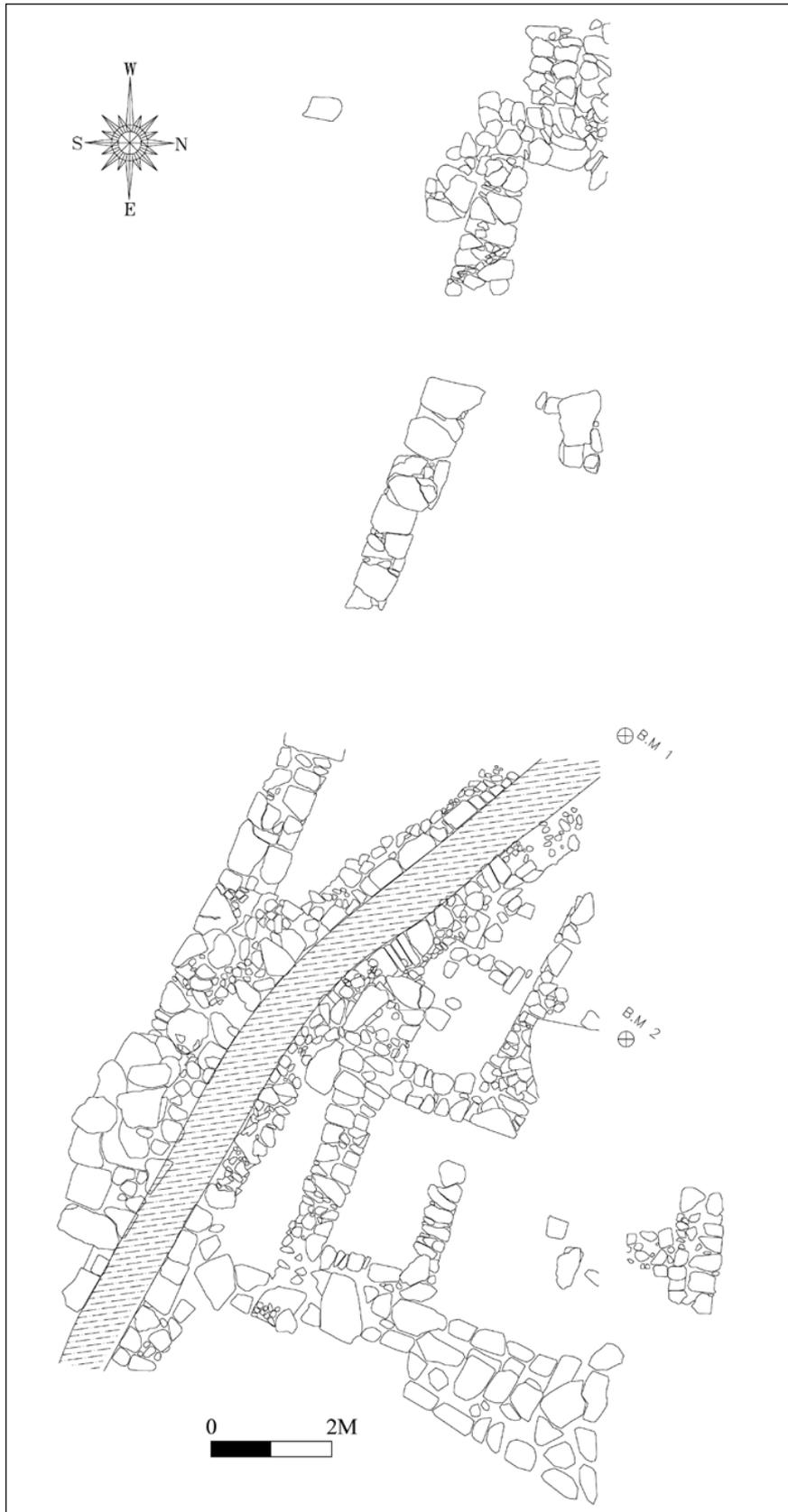
be possible through 3D modeling that is a part of the planned excavation and documentation project.

Mapping of Cisterns and Water Catchments

The water systems study was prompted by the discovery of five ground-level cistern openings along the ancient built road, found in 2007, that passes from north-west to south-east along the western side of Tall Jalūl (cf. Munjazat 2007: 74-75). In addition, two cisterns at the north foot of the tall were known, as was a large unexcavated cistern on top of the tall. Pottery sherds collected from the ancient road in 2007 indicated use of the road from Iron Age to Byzantine times, and possibly into the Islamic period as well.

The current mapping project led to a discovery of 25 cisterns within 500 meters of the tall, predominantly on the north and south sides. Due to time constraints only half of the north side area, devoid of houses or plantings, was surveyed thoroughly. An olive grove and private home occupies the area east of the tall, and new homes of the current Jalūl village occupy the immediate west side of the tall. The team conducted a cursory look in both areas. Following are brief descriptions of the types of cisterns found during the survey:

- 13 are a constructed hole in the ground, often



7. Topographic map of Field G
(by Basem Mohamid).



8. Islamic Village arch in Building 9.

difficult to see from more than 5-10m away. There were no noticeable markings near or around them (Fig. 9).

- Five are capped. The cap is a cement square structure, less than 1m high, often with a metal cover over the opening. Three of these had one or more external basins (Fig. 10).



9. Cistern along south end of ancient road.



10. Capped cistern south of the tall.

- Seven are collapsed (Fig. 11).

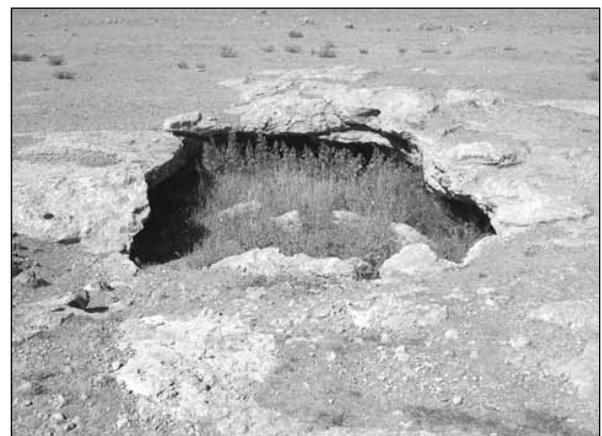
During the mapping of the cisterns, it became apparent that the natural topography south-east and north of the tall formed natural basins and terraces. The appearance of these areas was striking in view of their distinct shapes, the depth of the basins, and the variety and color of vegetation, especially on the south side of the tall. Sheep herds were observed in the spring-time drinking the standing water in the south terraces. On the north side of the tall, a striking feature is the high concentration of evenly spaced, uniformly-sized rocks concentrated at the lowest point of the basins. The mapping team estimated at least four of these natural basins on the north side of the tall and, on the south side, two prominent terraces and three basins. Owing to time and equipment constraints, the existence of these areas was simply noted; more detailed terrain mapping will be conducted next season.

Cisterns with Water Management Features

Four cisterns on the north side of the tall, and one on the south side, displayed seemingly man-made raised earth structures, reinforced with rock that formed a steep drain-like area with the cistern opening at the lowest point. They would appear to funnel flowing surface water or rain-water into the cistern. The team mapped these raised structures for future hydrographical analysis and 3D visualization.

Conclusions

The 2009 mapping project revealed what appears to be a significant concentration of cisterns



11. Collapsed cistern south of tall.

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and other water management systems around the tall and Islamic village at Jalūl. The high proportion of cisterns constructed at ground level is a unique feature that suggests long term collection of rainwater or, possibly, more plentiful surface water flow in the past. These cisterns are however difficult to date; the capped cisterns suggest current use and at least one ground-level cistern contained deep water in June. Preliminary comparative research suggests that sites with similar concentrations of cisterns are in remote areas and *caravanserai* closer to the desert fringe. Cisterns ring the ruins of the Islamic village and residents today buy water from three wells in the immediate area. Despite the fact that

Jalūl has no visible surface spring, the extensive water collection/storage system documented in this preliminary survey shows intensive use of Jalūl's natural landscape and geology, from ancient occupation of the tall and Islamic village up to the present day.

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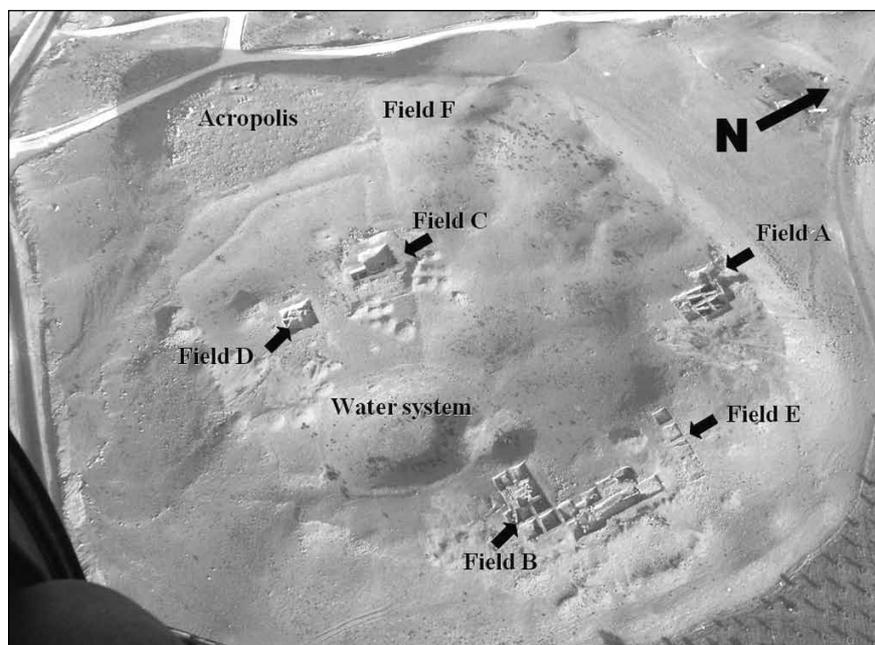
2008 EXCAVATIONS AT THE ISLAMIC VILLAGE AT TALL JALŪL¹

Reem al-Shqour

During the 2008 season, Andrews University conducted excavations at Tall Jalūl and initiated excavations at the Islamic village located immediately south of Tall Jalūl and 5km west of Mādabā, Jordan. The excavations on the tall were directed by Randall Younker and supervised by Jennifer Groves. The excavations at the Islamic village were directed by Reem al-Shqour, Research Associate at the Institute of Archaeology of Andrews University and doctoral student in Islamic archaeology at Ghent University, Belgium. Dr Paul Ray served as field archaeologist and assisted with the planning.

Site Location

Tall Jalūl, at 18 acres, is the largest tall site on the central Jordan plateau (**Fig. 1**). It also occupies the highest point in the immediate vicinity of Mādabā, making it an imposing feature on the western side of the Mādabā plain. It is located 5km due east of the town of Mādabā and due west of Queen ‘Alia International Airport. The site is almost square in plan with a high, flat acropolis occupying the south-west quadrant. A number of rocky hills on the tall are suggestive of badly eroded ruins of ancient buildings. Two broad depressions in the south-east quadrant of



1. Aerial image of Tall Jalūl from the east.

1. The staff this season consisted of Randall W. Younker (director of the Tall Jalūl excavations), Reem al-Shqour (director of the Jalūl Islamic village excavations), Paul Ray (field archaeologist), Jennifer Groves (supervisor of Field D), Sabal Zaben (field archaeologist) and

Owen Chestnut (GPS). Scottie Baker, Micah Johnson, Jody Washburn, Leo Abraham, Ledezma Sierra and Carrie Applebury served as square supervisors. Issa Syrianni was the Department of Antiquities representative.

the tall indicate the presence of ancient water systems. The occupation on the tall is dominated by Bronze and Iron Age ruins, although there is also some evidence of Islamic activity as indicated by both sherds and vaulted chambers on the acropolis.

In addition to the ruins on top of the tall, there is an extensive area of ruins on its southern slopes that date from the Roman, Byzantine and early, middle and late Islamic periods, with a considerable density of material from the Mamluk period. The ancient village to the south of the tall covers a surface area of about 30,000 square meters.

Site Identification

One of the challenges that scholars studying Jalūl continue to face concerns the actual identity of Jalūl in antiquity. Biblical scholars have suggested several possibilities for the identity of Jalūl during Bronze and Iron Age times. These suggestions have included Besor (Josh 20:8), Jahaz and even Heshbon (Nu 21). Unfortunately, no archaeological evidence has been produced to help settle this matter.

Zabn² suggested that the name Jalūl comes from the Arabic word *jaljul* which means luck. He also suggests that in Aramaic *jaljul* means the high slope. Unfortunately, he provides no supporting evidence for this suggestion.

Early Explorers of Jalūl

One of the earliest western travelers to mention Jalūl was the Swiss explorer Johann Burckhardt, who rode past the site in 1812³. He wrote (1822: 365):

“In order to see Medaba, I left the great road at Hesban, and proceeded in a more eastern direction. At six hours and three quarters, about one hour distant from the road, I saw the ruins of Djeloul, at a short distance to the east of which, are the ruined places called El Samek, El Mersouh, and Om el Aamed”.

Henry Baker Tristram visited the site in 1872, referring to it by the name Jeljul⁴. After visiting Azizah, Tristram rode west until he came to a site which he described as a “small ruin appar-

ently of a fort and a village”. He referred to the site as Jeljul and noted that it had previously been visited by Burckhardt and, later, by Irby and Mangles.

“Five minutes west of this was a small ruin, apparently of a fort and a village, which we visited, called Jeljul (Djellgood of Irby and Mangles, or Djeldjoun of Burckhardt)”.

Tristram’s reference to Burckhardt’s name for the site as Djeldjoun is puzzling because, as noted above, Burckhardt clearly transliterates the site as Djeloul, and his Arabic spelling is identical to the modern Arabic name for the site today. Irby and Mangles’ reference to Djellgood is found on p. 371 of their book⁵.

The next explorer to mention the site was the English traveler, Charles Montagu Doughty, who passed by the site in 1886. Doughty lists the names of some of the ruins he passed by including one called Jaljul⁶.

“The plots of khurbets are mostly small as hamlets; their rude dry building is fallen down in few heaps of the common stones. I was so idle as to write the names of some of them, Khurbet Enjahsah, Mehnwwara, el-Hahlih, Me-haineih, Meddain, Negaes, Libbun, Jeljul, Nelnockh, Mehrud, Howihih, Gamereyn (of the two moons), Harfa (where a Mohammedan shrine and mosque; anciently it was a church)”.

Unfortunately, Doughty does not provide any specific information about Jalūl proper.

William Foxwell Albright visited Jalūl during his Transjordan tour of 1933⁷. Albright (1933: 28) wrote the following:

“The large mound of Jalul, east of Madeba, with an estimated length of about 200 meters, yielded numerous sherds of Middle Bronze, Late Bronze, Early Iron I-II, Byzantine and early medieval Arabic. The Middle Bronze is particularly well represented on the slopes of the hill. The top is partly occupied by an Arab cemetery. The ancient name is unknown. It will be seen that the Middle Bronze occupation in the extreme east of Palestine was surprisingly dense”.

Nelson Glueck visited the site in 1933 and not only mentioned the importance of the tall in the Late Bronze and Iron Ages, but also de-

2. (Zabn 2000: 74-75).

3. (Burckhardt 1822: 365).

4. (Tristram 1873: 118).

5. (Irby and Mangles 1823).

6. (Doughty 1888: 22).

7. (Albright 1933: 23-31).

scribed the later Byzantine and Islamic village to the south⁸ (1934: 5):

“At Jalul, five kilometers east of Madeba, is a large mound commanding the surrounding plains and visible for considerable distances around. On the top surface and slopes of the mound, particularly on the northwestern and western sides, quantities of sherds were found belonging for the most part to EI I-II, although some dated from MB and LB. Several Nabatean sherds were found, one large piece of sigillata ware, and numerous sherds belonging to the Byzantine and mediaeval Arabic periods. To the south of the mound lies the modern Arabic village, built over previous Byzantine and early Arabic settlements. An interesting stone molding was found built into the western wall of a large modern building in the village. On it were carved an altar, a rosette, and a wreath. The latter two are much like similar decorations which we found at Kh. Barzah and at Fiq. On the southern slope of the mound, inside a small ruined stone building, two fragments of a large stone plaque were found on which a worn floral design was visible”.

Robert Ibach surveyed Jalūl in 1976 for the Hesban survey⁹ (1987: 3, 13-14). He describes the site as:

“... a major site ... on the plain east of Madaba, covering about 17 acres. The mound is oblong, measuring about 300 meters east-west and 240 meters north-south. On the south and south-east sides of the tell, just off the lower slopes, is abundant ruined architecture including walls preserved above the door lintels and arches still intact. Fragments of mud brick may be found on the surface of the tell; three fragments of human figurines were found by the survey team”.

Excavations at Jalūl Village

While this was the first excavation in the Islamic village conducted by Andrews University, there have been at least two previous projects undertaken by the Department of Antiquities. The first was a survey and excavation directed by Ibrahim Zabn in 2002.

In his survey of the Islamic village, Zabn reported a number of old structures dating to the beginning of the last century. Several of the

buildings had large arches that supported a roof made of mud, wood and hay -- a technique that was commonly used throughout Jordan during the 19th century. The people often constructed these houses by reusing ancient stones from archaeological sites, making it difficult to understand the plans and functions of the buildings.

Zabn also reported the presence of a mosque made of well dressed stones, which also dated to the beginning of the last century, located on the south side of the village. Zabn described a *mihṛāb* built in the south wall, facing Mecca; the roof and floor were made of concrete, and an external staircase in the north corner was used by the *imām* for the call to prayer.

Zabn described what he thought to be a Roman mausoleum on the north-east side of the village, being a square structure built of large ashlar.

The remains of what was thought to be an older mosque, located just south-east of the Roman mausoleum, was also described. Zabn noted the presence of a semi-circular curve in the south wall, which made him think that this structure might be a mosque. The remains of the compound included walls between 0.9 and 1m wide; the length of the north and south walls was about 17.5m, that of the east wall about 9.1m, and that of the west wall about 9m.

Finally, Zabn reported the remains of a Byzantine church located east of the mosque.

The Zabn Excavation in 2002

The excavations of the 2002 season were concentrated on the north-west side of the village. They were divided into Areas A, B, C and D, in which 40 squares were opened. Excavations were conducted between first September and 30th December 2002.

The Results

Zabn was able to clarify the layout of two residential units. The first consists of six rooms of different sizes and shapes. Each room had a door, and the floors were made of compact soil or bedrock. Some floors also served as a ceiling for lower chambers, creating two storey structures. The lower levels sometimes consisted of natural caves or vaulted rooms. The author dated

8. (Glueck 1934: 1-115).

9. (Ibach 1987).

the upper rooms of the first residential unit to the Ayyubid/Mamluk period and the lower levels to the early Islamic or Byzantine periods.

The second residential unit, located east of the first, also consisted of six rooms of different sizes and shapes. The doorways were made of well dressed stone; the floors were of compacted soil and sometimes *ḥuwwar* or bedrock. This unit consists of one storey, at the same level as the upper part of the first unit. A roadway or path along the south side of the residential units separated them from other residential units on the opposite side. The roadway was made of compacted soil. The town plan suggests that the government in that period had the power to organize and establish a well planned city. Indeed, Jalūl in the Ayyubid/Mamluk period was probably more important than Mādabā.

The Excavations of 2004¹⁰

A second season of excavation was conducted by Ali Khayyat, director of the Mādabā office of the Department of Antiquities. The aim the 2004 season was to clarify the nature of the structure described by Ibrahim Zabn in his survey as a mosque, located on the east side of the village with dimensions of about 17.5 x 9m.

Four squares were opened along the east wall, as were four squares along the west side, two squares by the south wall (to clarify the nature of the possible *miḥrāb*), and two squares on the north side where one might expect to find the *ṣaḥn* or nave of the mosque. During the excavation a lot of walls appeared inside the structure, forming many rooms. Khayyat concluded that if this structure had ever been a mosque it must have been reused in later periods as residential building. Further excavations revealed the presence of natural caves below several of the interior rooms. Some of these rooms had a hole in the floor leading to the caves below. The excavations led Khayyat to change his opinion about the function of the structure; he suspected that it may have been a *khān*¹¹, with the upper rooms being used for accommodation and the lower caves being used for storage or livestock. Khayyat thought that the presence of the *khān* suggested that Jalūl may have been one of the stations on the pilgrimage routes. The pottery

sherds collected above the floors of the rooms were typical Ayyubid/Mamluk, mixed with a few sherds from the earlier Roman, Byzantine and early Islamic periods.

Results of the 2008 Season

The goals of the 2008 season were modest, in view of the fact that the team had only a couple of weeks to conduct excavations. As noted above, Ali Khayyat had suggested that there may have been a *khān* located immediately east of the oldest free-standing square building in the center of the east quadrant of the site (it has been suggested that the freestanding building dates to the Roman or Byzantine periods, although no definitive archaeological evidence has been produced to confirm the actual date). It was therefore decided to open a couple of squares across what appeared, at least from the surface, to be a couple of vaulted rooms that opened into an open area to the west (**Fig. 2**). The architectural layout was suggestive of a *khān*. The south-west corner of Square A1 was located by GPS at N125134.00 E 231292.00. The south-west corner of Square A2 was located by GPS at N 125126.00 E231292.00. Each square measured approximately 5 x 10m, although excavation was concentrated on the inside of the two rooms. The north room was the largest at 7.5 x 4m. The doorway was 0.75m wide. It was not possible to measure the length of the southern room, but it was nearly 3m wide; the door was approximately 0.75m wide.

The excavations in the two squares (A1 and A2) exposed parts of two vaulted rooms (**Fig. 2**) – the ‘north room’ and the ‘south room’. The team only managed to reach bedrock in the north room. The fill of the north room consisted of roof collapse.

Phase 1 - Initial Construction

The north room was built on bedrock in most places, as far as can presently be discerned. The walls from this phase include the west (L.40, L.22) and east walls (L.24, L.35) of the north room (**Fig. 2**). These walls are all about 1.20m thick and are built mostly of relatively large shaped stones. The size and shaping of the stones represents a considerable investment by

10. (Al-Khayyat 2004)

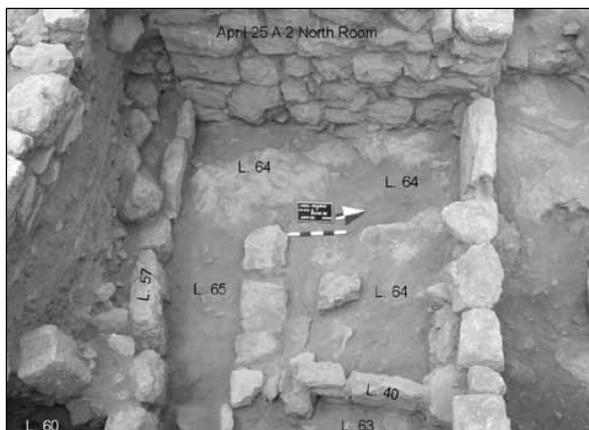
11. (Al-Khayyat 2004: 52).



2. North and south vaulted rooms of the Mamluk khān in the Islamic village of Jalūl.

the constructors and is indicative of the importance of Jalūl at the time that this and adjacent buildings were constructed. While there were early Islamic sherds in cracks in the bedrock, most of the sherds in the north room fills were Mamluk, suggesting that this was the predominant period of use.

Only the southern part of the north room was excavated this season. In this southern section, a number of wall lines were revealed, founded upon bedrock and creating at least three small rooms (Rooms 63, 64, 65) (Fig. 3). It is uncertain at this point whether these wall lines were established during the initial construction or represent a later addition or sub-phase. Some of the smaller wall lines seem to create stone bins, possibly mangers. Indeed, these and the presence of small rooms with low walls suggest that animals may have been kept in the southern part of the north room.



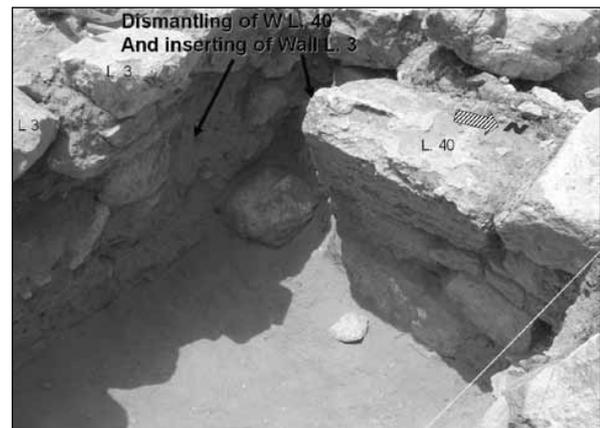
3. South half of the north vaulted room (A2), from east to west.

Phase 2 - Dismantling and Destruction of North and South Rooms

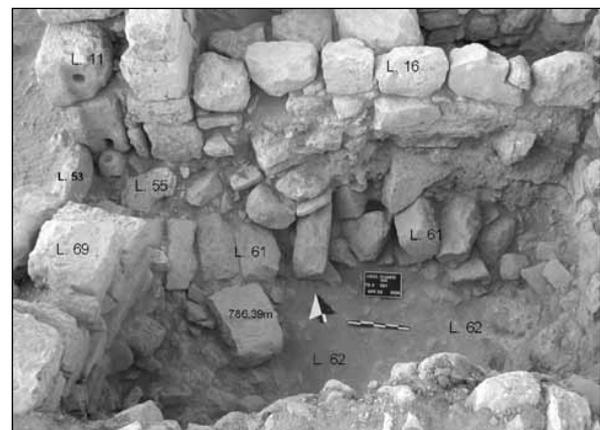
At some point during the Mamluk period, the southern half of the north room was systematically dismantled (Fig. 4), apparently to facilitate the reconstruction of the south room, which for some reason, had been completely destroyed. Nicely shaped stones from the destruction of the south room were seen covering its floor (L.61) (Fig. 5). The destruction in the south room proper looks more random and haphazard, but the original south end of the north room was clearly taken apart carefully by hand.

Phase 3 - Remodeling

South Room: During the remodeling phase, a new partition wall (L.3) was constructed to separate the north room from the south room (Fig. 6). Wall L.3 is not as substantial as the external walls (L.40, L.22) of the north room. Rather, L.3 was built with a narrower width. While the



4. Point where south wall of the north room (A2 L.40) was dismantled and a later wall inserted.



5. South room (A1) looking north towards its north wall; note fallen stones on the floor.



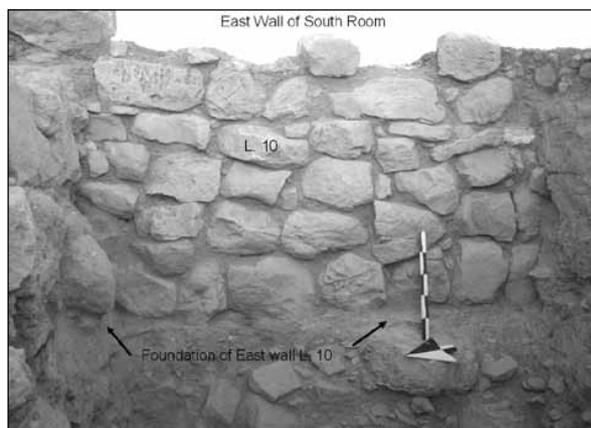
6. South room (A1) and north room (A2) after excavation, from south to north.

height of partition wall L.3 is uncertain, it does not seem to have been founded on bedrock like the exterior walls. This can be surmised from the fact that in the south balk of the north room, there is a pile of collapsed rock below wall L.3 that protrudes from the balk and seems to run under wall L.3. Also, the view of wall L.3 inside the bin (L.16) seems to indicate that the base of wall L.3 had been reached (however, this is not 100 % certain and must be checked next season).

The east wall (L.10) of the south room was also built at this time; likewise, it was not founded on bedrock (Fig. 7). In summary, it would seem that walls L.11, L.3 and L.10 of the south

room were built as a unit at the same time. The original floor of this room was made of hard packed *nari* (L.51). It runs right up to the base of the east wall L.10 (Fig. 8).

North Room: That the bin and wall lines were part of the remodeling and not part of the original architectural layout is supported by the fact that the bin in the north room cuts into the area where the wall was cut. The silo was not founded on bedrock; rather, it seems to have been established at about the same level as the walls in the south room. Its floor (L.45) was hard packed *nari* (Fig. 9). Under the *nari*, the silo was built of smaller stones. This probably does not represent an earlier phase of the silo; rather, it is the foundation for the silo above L.45.



7. East wall of south room (A1).

Phase 4 - South Room Remodeling

At this point, there was an additional phase of remodeling that seems limited to the south room. A bin (L.16) was constructed along the north partition wall (Fig. 6). The base of the bin and, indeed, the floor of the south room are at a higher level, suggesting some time had gone by since the original remodeling. The precise date is impossible to determine at present; most of the ceramics are Mamluk, although it is possible that this room continued in use into Ottoman times. It is also possible that the north room also remained in use during this time (e.g. the silo



8. Original nari floor of south room (A1 L.51), from south to north.

etc). Some pits were dug into earlier levels during this period, e.g. in the south-west corner of the south room.



9. Fragment of nari floor at base of silo in south-east corner of north room (A2).

Phase 5 - Destruction and Abandonment

Eventually, both the north and south rooms fell out of use. Both rooms were later filled with fallen stones and earth up to the ground surface, but whether from sudden destruction or gradual abandonment is hard to say at this point. In the north balk of the north room, there is a layer of ash below the layer of fallen stones, which suggests that there was a fire in part of the north room. However, the fire does not seem to have spread throughout the entire room (e.g. there is no evidence for this in the south part of the north room) and was probably localized. Rather, it seems the final collapse was part of a gradual period of abandonment (see **Fig. 11**).

Significant Finds

Significant small finds included two Arabic *ostraca*, numerous pieces of glass, glass bracelet fragments, an iron 'spoon', a metal ring, a faience bead, jar stoppers and worked bone.

Another important find was a limestone slab, measuring 72 by 40cm, which displayed a cross within a circle, with Greek letters both inside and below the circle. The 'Greek Cross', which is basically a 'plus' sign in a circle, displays in the first quarter to the left a Greek letter Δ. Below the circle is one line of letters: "Λ π Ι Δ Ι θ". Below the Greek letters the stone is bisected by a line.

The team also sherded the eastern part of the site, around the free standing building and *khān*. The surface sherds indicate activity during the Roman/Nabatean, Byzantine, Umayyad, Fatimid, Mamluk and possible Ottoman periods.

Summary

While more work is necessary to fully understand the date and function of the north and south rooms in the eastern sector of Jalūl, everything found during the 2008 season is consistent with a residential unit or even a *khān*. Not only were there pens and bins, tethering ‘holes’ for animals, and facilities for grain storage, but also ceramics representing the full range of functions associated with a residential unit, e.g. food preparation and consumption (plates, cups, kraters, storage jars, cooking pots, imported wares etc). In addition, there were ground stone tools associated with food preparation, such as millstones, grinding stones, pounders etc, plus some possible weaving tools (loom weights, bone awl). There were also a couple of Arabic *ostraca*, again, something more likely associated with a residential area. As for the question of the ‘mosque’, time did not permit excavation of the so-called *mihṛāb*, but a visual inspection did not reveal anything indicative of such a structure. Dr Ghazi Bishah, who visited the site during the season, came to a similar conclusion following a visual assessment of the feature. Thus, the structures in the eastern sector of the

Jalūl village seem unlikely to have served as a mosque, but are not incompatible with those of a *khān*. Further work will hopefully shed more light on the issue.

Field D on the Tall

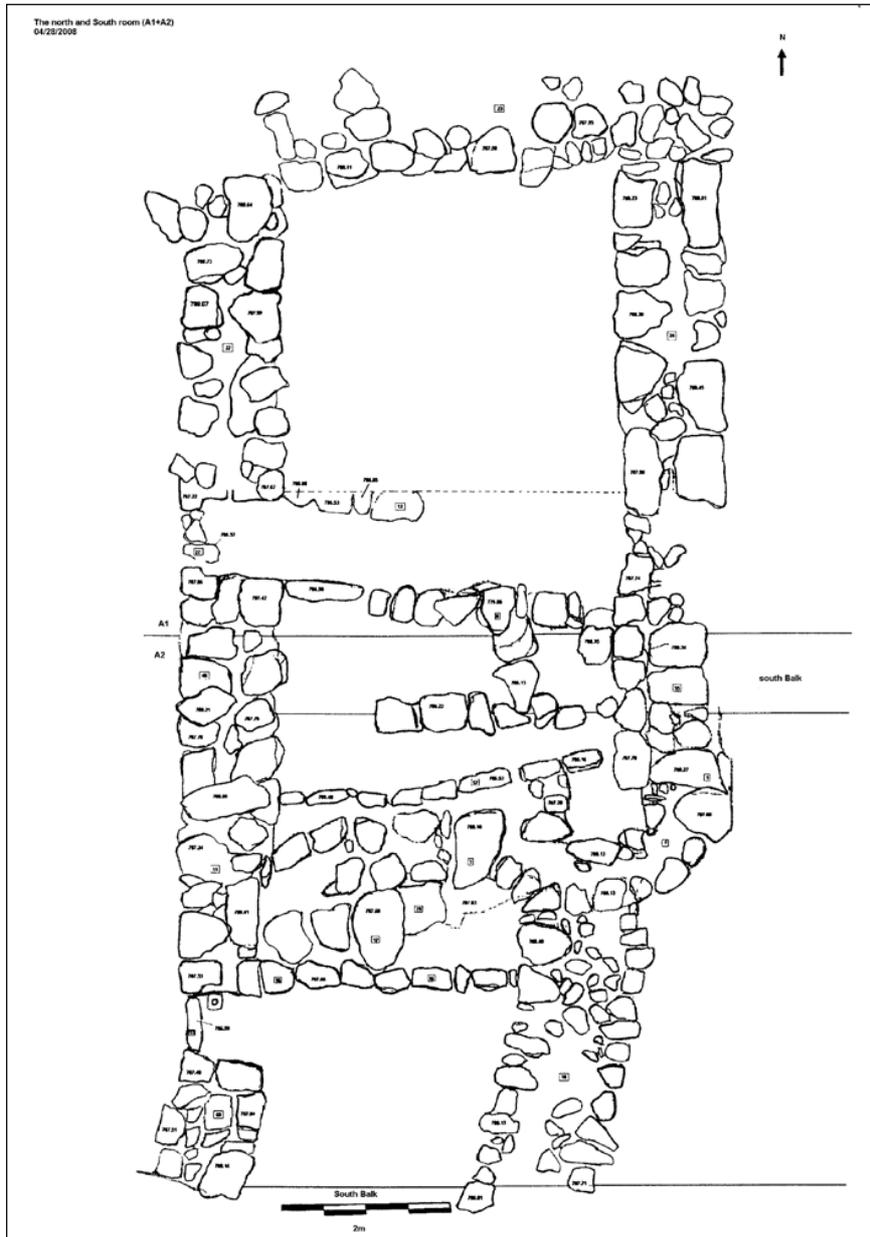
Excavations in Field D on the tall concentrated on two rooms in squares D1 and D2 (Fig. 10). The objective of this work was to date the walls of these rooms. The excavation team succeeded in reaching the base of the walls and established that the building was founded in the Late Iron II period (seventh to sixth centuries BC) and continued in use into the Late Iron II/Persian period (fifth and possibly fourth centuries BC). Of interest was the fact that in the south-eastern room, walls were found below the Late Iron II walls. The earlier walls were built on a different axis and plan. While no firm dates could be established for these earlier wall lines, pottery from the Late Bronze IIB/Iron I transition was recovered -- including a carinated bowl and a jar with a slightly everted rim.

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10. Two rooms in the south-west corner of the Persian period building in Field D at Tall Jalūl.



1. Plan of rooms A1 and A2 of the Mamluk khān at Jalūl Islamic village.

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THE MEGALITHIC LANDSCAPE AT TALL AR-RĀS IN WĀDĪ AR-RAYYĀN: THE 2007 SEASON OF THE NORTH JORDAN TOMB PROJECT ¹

James A. Fraser, Benjamin G. Anderson, Anne-Marie Beavis and Lena Beccar ²

Introduction

This report presents some preliminary results of a season of fieldwork investigating megalithic monuments in Wādī ar-Rayyān (formerly Wādī al-Yābis). The wadi, which runs from the 'Ajlūn highlands to the Jordan Valley, has been known for its extensive dolmen fields ever since the area was first visited by explorers such as Schumacher (Steuernagel 1924) and Glueck (1951: 210-211). More recent surveys, however, have shown that the dolmens exist alongside other, less-obvious megalithic structures including rubble rujm cairns, standing stones, stone circles and alignments (Palumbo 1992: 52; Lovell *et al.* 2005: 192; Scheltema 2008: 69-70). Together, these monuments constitute a complex megalithic landscape that probably spans a considerable period. In order to investigate this landscape in detail, a team of ten archaeologists from the University of Sydney and Department of Antiquities spent six weeks in late 2007 surveying and excavating a field of megaliths on Tall ar-Rās, a ridgeline near the village of Kufr Abil, mid-way up Wādī ar-Rayyān (**Fig. 1**)³. This fieldwork forms part of the North Jordan Tomb Project (NJTP), which is an ongoing field-project developed by the principal author (JAF) as part of his postgradu-

ate study of prehistoric megalithic monuments in the southern Levant.

Previous Research

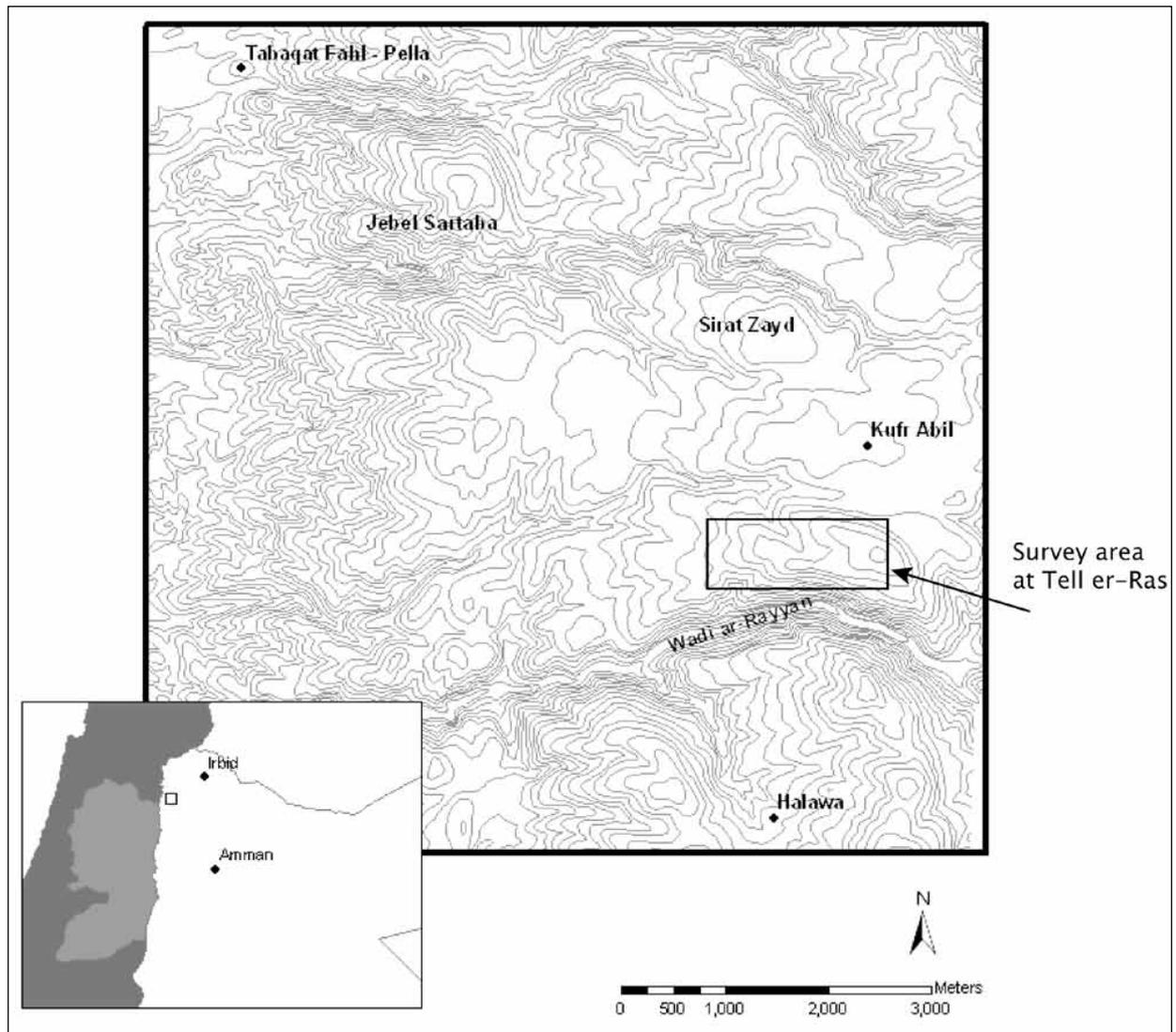
Wādī ar-Rayyān was first systematically investigated by the Wādī al-Yābis Survey between 1987 and 1992 (Mabry and Palumbo 1988; Palumbo, Mabry and Kuijt 1990; Palumbo *et al.* 1993). Although the survey noted hundreds of dolmens throughout the wadi system, Gaetano Palumbo, in a special dolmen survey completed as part of the 1989 season, documented a particularly dense cluster of dolmens and cairns between the villages of Kufr Abil and Ḥalāwah (Palumbo, Mabry and Kuijt 1990: 111-113; Palumbo 1992)⁴. The Tall ar-Rās ridge, on the northern side of the wadi, contained the highest density of megaliths in this concentration, and was selected for re-survey by the current project as it provides a representative sample of monuments found throughout the wadi system⁵. In addition, Lovell re-visited some of the dolmen fields on the south side of the wadi near Ḥalāwah as part of her survey of the Chalcolithic and Bronze Age site of al-Khawārij (Lovell *et al.* 2005).

Environmental Setting

The headwaters of Wādī ar-Rayyān receive

1. We thank Dr Fuwwaz al-Khraysheh, Director-General of the Department of Antiquities, and his staff in the Irbid and al-Kūra Offices for their assistance during our time in the field. The fieldwork was funded by the Carlyle Greenwell Bequest and the Leonie Crawford Travel Grant (Near Eastern Archaeology Foundation), both of the University of Sydney.
2. Fraser, Anderson and Beavis: The University of Sydney; Beccar: Conservator, Dār as-Sarāyah Museum, Department of Antiquities, Irbid.
3. James Fraser (Director), Lena Beccar (Department of Antiquities Representative), Ben Anderson (Surveyor/

GIS), Anne-Marie Beavis (Archaeologist), Adam Carr (Photographer), Amanda Dusing (Archaeologist), Kerrie Grant (Archaeologist), Kristen Mann (Archaeologist) and Tamara Treffiletti (Bio-Archaeologist).
4. These monuments are concentrated in several clusters that Palumbo recorded as dolmen or tumulus fields WY27, WY118, WY121, WY 133, WY134 and WY169.
5. We are grateful to Gaetano Palumbo for allowing us to continue work on the megalithic monuments in this area.



1. Map of Tall ar-Rās in Wādī ar-Rayyān.

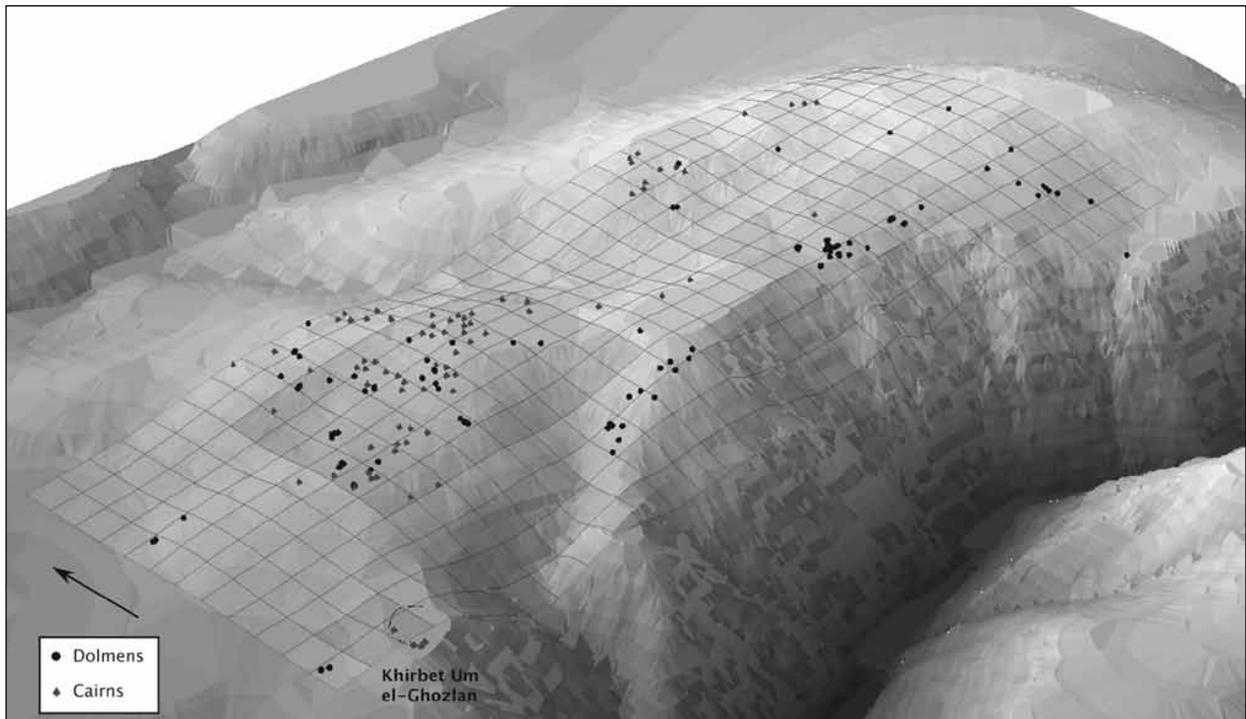
some of the highest rainfall in Jordan, which is why the name of the wadi was changed from *yabis* (“dry”) to *rayyan* (“well-watered”). The visually striking, natural ridgeline of Tall ar-Rās is found mid-way up the wadi, rising from around 350m.a.s.l. at its western end to 500m.a.s.l. at its eastern ‘head’ (Fig. 1). The ridge is part of the ‘Ammān Silicified Limestone Formation and contains beds of fine, brown chert.

This area of Wādī ar-Rayyān lies within a *Mediterranean maquis* zone of open oak and scrub forest (Palumbo, Mabry and Kuijt 1990: 95). Low scrub and exposed bedrock cover the south side of the ridge, which drops sharply into the wadi. A small strip of deeper soil on the

northern, gentler side of the ridge is cultivated with olive groves and fields of onion and *fūl* beans. A network of ancient field walls suggests that this area has been used for agricultural production since Classical antiquity at least.

Methodology

As shown in Fig. 2, the area surveyed on Tall ar-Rās extended 1.55km east-west and 0.60km north-south, the north-west corner of which was at UTM 749000E 3589050N. The survey thus covered most of the ridge-line and all the dolmen and cairn fields Palumbo identified between Kufr Abil and Wādī ar-Rayyān. The survey area was divided into 372 squares (50 x 50m), which



2. 3D image of Tall ar-Rās showing the distribution of dolmens and cairns.

were walked in 10m transects. Surface artefacts were collected in 82 squares that contained the highest densities of monuments. Over 350 features were found on the ridge using the general categories of dolmen, cairn, standing stone, wall-line and rock-cut feature (**Table 1**). Each feature was mapped using a differential GPS system, recorded on a detailed feature sheet and photographed. Select examples were drawn and, upon completion of the survey, one dolmen and six cairns were excavated.

General list of features found on Tall ar-Ras, 2007	
Dolmens:	106
Dolmen quarry sites:	15
Cairns:	
Featureless rock piles	154
Cairns with architectural features	77
Standing Stones:	3
Rock-Cut Features:	
Basins	18
Cup-Hole Sites	43
Wine-Presses	5
Gaming Boards	5
Walls	58

Dolmens

106 dolmens were recorded in the survey area and, as shown in **Fig. 2**, these clustered in three groups: on the immediate ridge-top, on the upper reaches of a spur running into the wadi, and on the upper slope of the western descent of the ridge. Most of the dolmens therefore had a clear line-of-sight to the wadi.

Typology

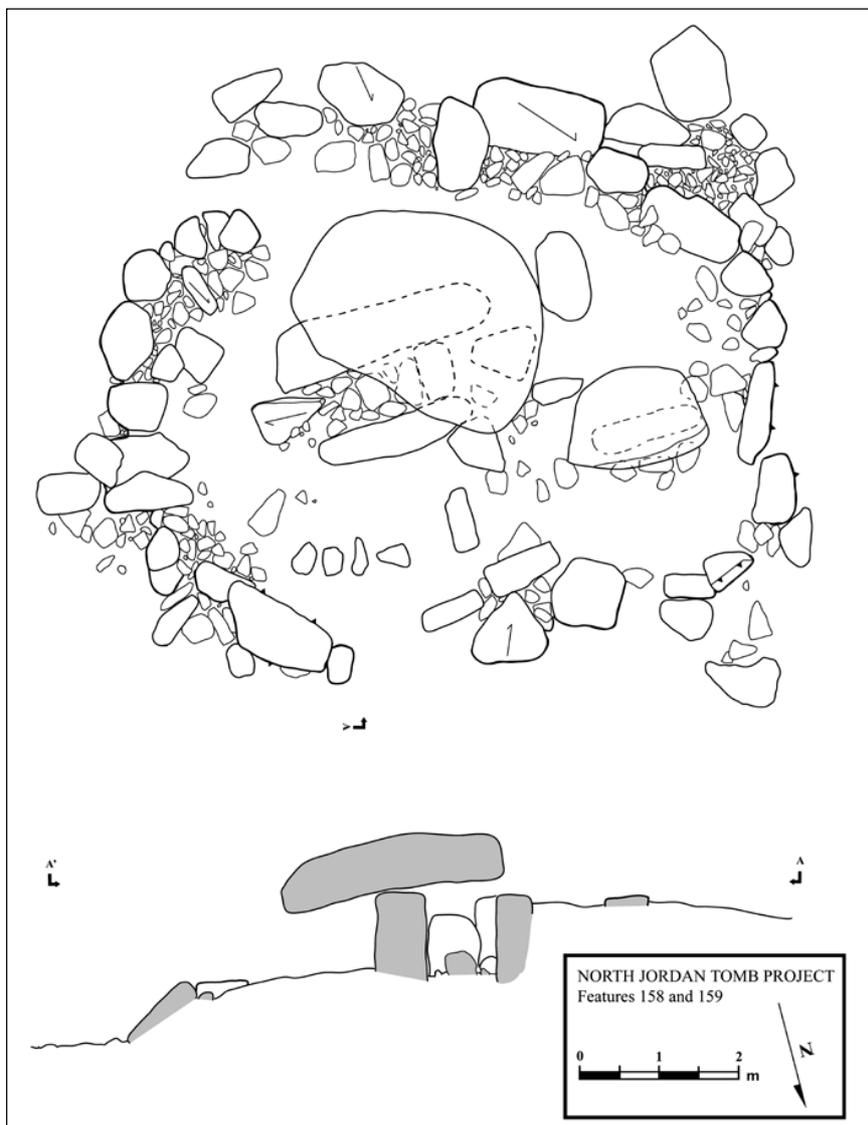
A typical dolmen at Tall ar-Rās stands 1.5m high with a roof-slab between 2 and 3m in diameter. As Palumbo has described in detail (Palumbo 1992: 46-47), all the dolmens are of the simple “trilithon” type defined by Epstein (1985), which is Type A in Zohar’s revised typology (1992). Accordingly, two vertical limestone slabs were erected ca. 75cm apart, either embedded in the soil or resting on bedrock, and a larger roof-slab was placed on top to create a rectangular chamber. Smaller vertical slabs usually enclosed the chamber at one or both ends, and the base of the chamber was either lined by several rough, flat stones, or incorporated the bedrock itself.

While all the Tall ar-Rās dolmens can be classified as “trilithons”, this typology focuses

upon the immediate architectural construction of each monument and fails to account for the tremendous variety of architectural features associated with most dolmens. While several dolmens were free-standing, others, for example, were surrounded by a low ring-wall, often recessed into the slope to create distinct platforms on which the dolmens stood. Ring-walls usually contained two or three dolmens, although a few enclosed four or even five (Fig. 3). Occasionally a rubble tumulus covered the platforms to the level of the roof-stones. While it has been suggested that all dolmens were once covered by tumuli that have subsequently been eroded (Ilan 2002), it is unlikely that the few tumulus-covered dolmens on Tall ar-Rās represent the

only surviving examples. The lack of dispersed rubble around the other dolmens, combined with good preservation of large rubble cairns in the area, suggests that the few dolmens distinct for their tumulus today were equally distinct in antiquity.

These additional architectural features reflect deliberate choices made by the dolmen-builders, although their significance remains elusive. As Thuesen suggests for the Jadidah dolmen field in the Mount Nebo region, the inclusion of several monuments within the same ring-wall or tumulus may reflect lineage or kinship structures (Thuesen 2004: 114), which may be more broadly represented in the general clustering of dolmens in groups across the ridge.



3. Plan of two dolmens within a ring-wall.

Orientation

The orientation of the chamber itself also varies between dolmens. Palumbo noted that most chambers faced between 90 and 160 degrees, and related this to the rising sun in autumn and late winter (Palumbo 1992: 58). Astronomical theories recur in discussions of dolmen orientation, and owe their currency to the orientation of nawamis in Sinai, which have been shown to relate to the setting sun during certain times of the year (Bar-Yosef *et al.* 1983). However, while nawamis have a very precise orientation, the dolmens at Tall ar-Rās span over 70 degrees and it is equally possible that they were built to align with the dominant topographic feature in the landscape, the wadi. Certainly this would account for such a broad axis, as the orientation of the dolmens gradually changes relative to the wadi across the ridge. Intriguingly, 11 dolmens — more than 10 % of the sample — were orientated between 20 and 40 degrees, perpendicular to the rest of the monuments. This marked difference emphasises the potential significance orientation may have had, and suggests that neither astronomical nor topographic explanations are definitive.

Construction

All dolmens were hewn from the local limestone, and the undersides of the roof-stones and interior sides of the orthostats were fashioned smooth. At least 15 ‘quarries’ were found in exposed bedrock outcrops (Fig. 4). These features

were vertical scars left in the bedrock and were of roughly the same proportions as the roof-slabs used in the dolmens themselves. They were all found slightly upslope of one or several dolmens, suggesting that the dolmen-builders manoeuvred the quarried slabs downslope into position.

One semi-complete example provides a window into this process, in which a roof-stone, partially hewn from the bedrock, was found abandoned during manufacture (Fig. 5). Two fractures in the bedrock had been enlarged into channels with vertical, tooled sides, and the base of the slab rested on a seam of chert, presumably targeted as another plane of weakness. The chert, more brittle than the surrounding micritic limestone, had been broken and partially removed, so that the middle of the slab was completely



5. Photograph of a partially quarried dolmen slab. Note the two grooved channels over natural fractures in the bedrock.



4. Photograph of a dolmen ‘quarry-site’. Note the seam of flint at the base.

undercut, before, for whatever reason, the task was abandoned. If completed, the enlarged, vertical fracture-lines and the removed seam of chert would have allowed the dolmen-builders to cleave the limestone slab from the bedrock. Interestingly, as shown in **Fig. 4**, several quarry-scars also show flint seams at their base, suggesting that these seams were deliberately targeted. An analysis of these features will hopefully give us a better understanding of the techniques involved in building the dolmens, and so provide a window into the social contexts surrounding their construction, such as the amount of time taken to carve and erect the monuments, and the number of people involved.

Excavation and Dating

All the dolmens had been robbed out, most, no doubt, in antiquity. Dolmen 88, however, was targeted for excavation as only the top 30cm of the orthostats were visible above the ground and, like an unrobbed dolmen excavated at Tall al-‘Umayri (Dubis and Dabrowski 2002), its capstone had been removed making it less visible than most other dolmens. A small sounding was opened in the chamber, which yielded several human hand and foot bones, although no ceramics or worked stone were recovered. Given the presence of phalanges with both fused and unfused epiphyses, we can infer that at least one adult and one juvenile had been interred⁶.

The extensive robbing makes it difficult to date the dolmens with any precision. Similarly, transect walking in the surrounding area failed to yield any significant surface material, despite the good ground visibility in autumn. Given the proximity of two late prehistoric sites, Jilmit ash-Shāriyah near the base of the wadi, and al-Khawārij⁷ on the opposite slope, Palumbo suggested that the dolmens date to the late Chalcolithic-EBI period (Palumbo 1992: 59), a suggestion supported by the EBI pottery found inside the unrobbed dolmen at Tall al-‘Umayri.

The paucity of surface artefacts is surprising, as it is reasonable to assume that robbers would have discarded unwanted broken vessels and

human remains around the dolmens they were robbing. The absence of sherds may be no more than a function of geomorphological processes on the ridge. It is interesting to note, however, a comment made by Gajus Scheltema who, after visiting several dozen dolmen fields in Jordan, observed that while some fields contained ample surface material, others yielded almost none (Scheltema 2008: 46). As Scheltema suggests, the difference may be cultural, which raises the possibility that some dolmen fields were used as cemeteries more frequently than others, or were not even built as cemeteries at all.

Cairns

Distribution and Typology

In his dolmen survey, Palumbo also observed an extensive cairn field on the west slope of Tall ar-Rās (site WY133), which he identified as possible tomb monuments (Palumbo 1992: 9) similar to cairn-tombs elsewhere in the region (e.g. Bradbury 2009; Fujii 2004; Greenburg 2000; Haiman 1992; Paz 2005). There are important methodological issues in defining a “cairn-monument”, however, as a rubble tumulus concealing a burial may look no different than rubble piled up by a farmer to clear his fields. For our purposes, a “cairn-monument” was defined as a pile of rocks in which any sort of architectural structure was visible, such as a kerbed edge or inner wall-line. Of the 231 cairns recorded by the survey, only 77 met this criterion. While many of the remaining 154 featureless rock piles may actually be deliberately constructed monuments, their general proximity to the modern and ancient field-walls in the north of the area suggests that this distinction was, at least broadly, correct. As shown in **Fig. 2**, most of the 77 “cairn-monuments” were clustered on the uncultivated western slopes of the ridge, as Palumbo had originally noted. Without a rigorous program of excavations, it is impossible to establish the chronological relationship of all these structures, let alone determine how many cairns were actually tombs. Nevertheless, the cairns do fall into a series of basic types.

6. We thank Tamara Treffiletti, of the Australian National University, for her analysis of the human remains.

7. A sounding at Jilmit ash-Shāriyah revealed a late Chalcolithic-early EBA sequence (Palumbo, Mabry and

Kuijt 1990: 109-111), while extensive excavations at al-Khawārij have exposed significant Chalcolithic occupation (Lovell *et al.* 2006, 2007).

Kerbed Cairns (Fig. 6)

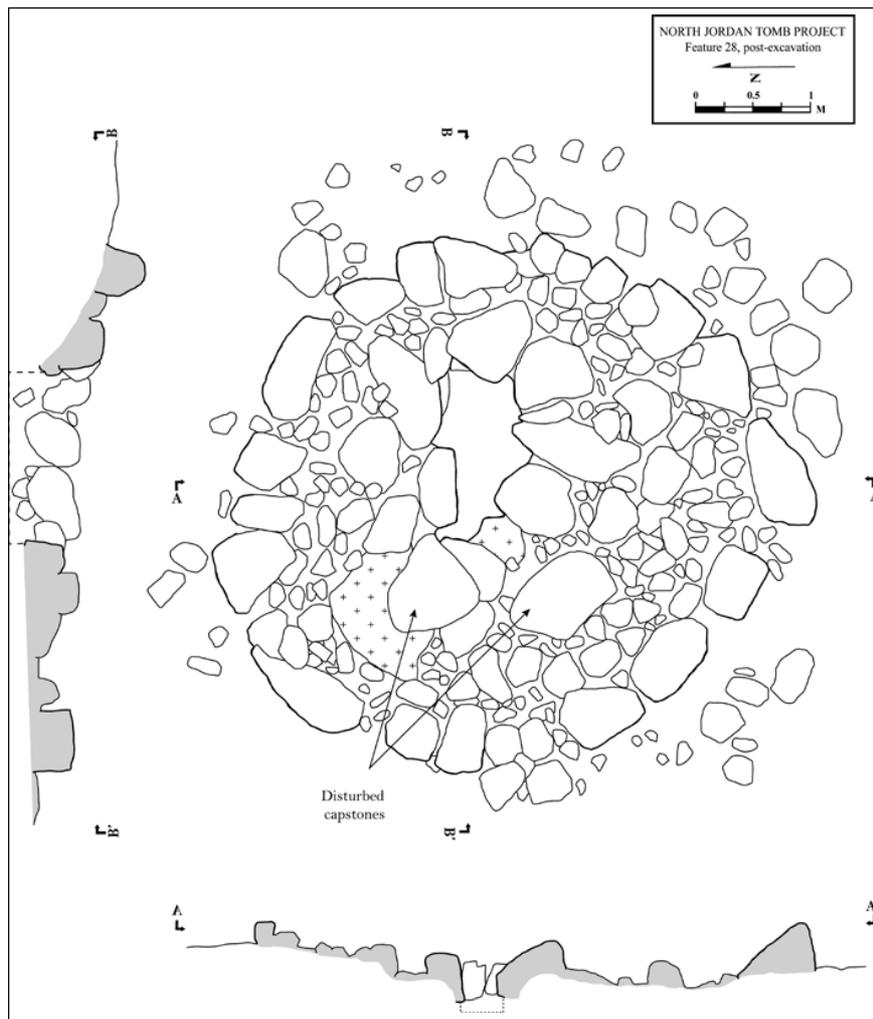
Kerbed cairns are small, circular rubble spreads around 5m in diameter and less than 0.5m high. Their defining characteristic is a ring of large boulders containing a tumulus of small and medium rocks. Few kerbed cairns were found on the Tall ar-Rās ridge, although several examples are known from the Pella hinterlands (P. Watson, pers. comm.). The best parallels for these features are found in the cairn field at Ramat Hanadiv, on the southern tip of the Carmel range, which dates to the EBII - III period based on the few artefacts recovered (Greenberg 2000).

The rubble tumulus from one kerbed cairn, Cairn 28, was removed to fully expose a ring-wall of flint and limestone blocks resting on a reasonably level pavement of medium rocks and bedrock (Fig. 6). Several large limestone and

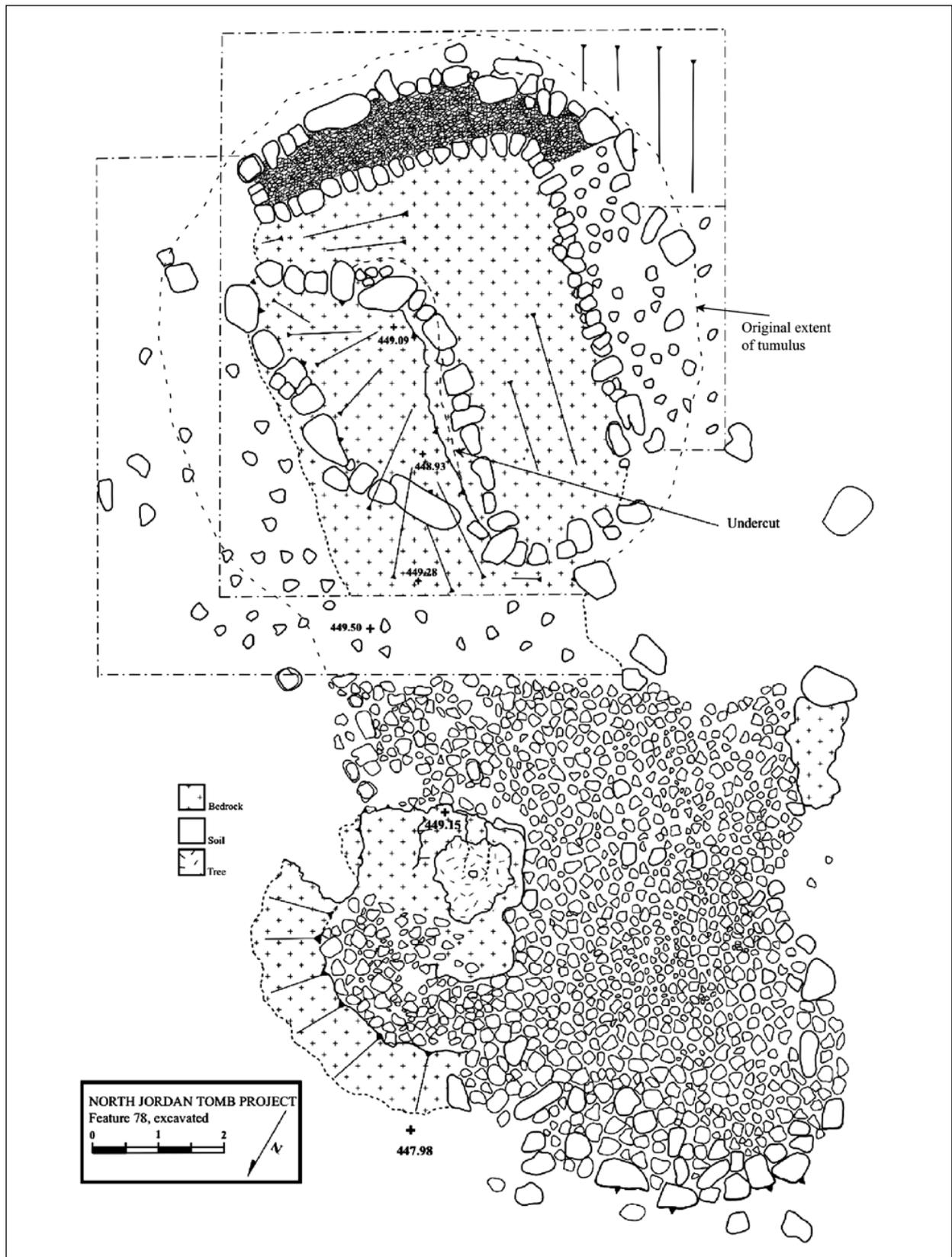
flint rocks were set into the centre of the pavement to create a roughly rectangular chamber orientated east-west, the east end of which was marked by two upright blocks. Although several large, flat slabs once covered the chamber, these had been disturbed and so were removed when the tumulus was cleared. No base slabs or paving stones were found to mark the bottom of the chamber.

Rubble Cairns (Figs. 7 - 11)

The vast majority of cairns surveyed on the ridge fall into the “rubble cairn” category. These are large, amoeba-like rubble piles of small and medium rocks. While significantly larger and higher than the kerbed cairns, their size and shape vary: some are low, circular piles, but most are ovoid and can be up to 15m long, 10m wide and 2m high. Their tumuli conceal archi-



6. Plan of Kerbed Cairn 28.



7. Plan of Rubble Cairn 78.

tectural structures such as wall-lines, kerbing and cells built of medium and large limestone and flint blocks. Often a low wall, two or three courses high, defines part of the edge of these features, particularly the upper edge if the cairn was constructed on a slope. Excavations were conducted in three rubble cairns: Cairns 78, 45 and 85.

Cairn 78 (Figs. 7 and 8): The rubble spread of Cairn 78 ran 14m down a gentle slope, measured 7m across at its widest point, and stood ca 0.75m high. A vague line of rocks could be seen curving around the southern, upslope end of the feature, while an L-shaped wall was visible within the tumulus itself. The removal of the upslope half of the tumulus, however, revealed a more intricate network of wall-lines. A second L-shaped wall was exposed a metre inside the curved boundary wall, referencing the inner L-shaped wall that had been visible within the tumulus and thereby creating a passage of empty space.

Curiously, the inner L-shaped wall lined the edge of a small cave that lay directly beneath the centre of the upper tumulus, and a lower, linear wall enclosed this cave on a third side, like the hypotenuse of a triangle (**Fig. 8**). Flat-lying flint blocks lined the base of the cave, although these may have been natural. No artefacts or human remains were retrieved from the cave or from the tumulus itself, and there are no obvious par-

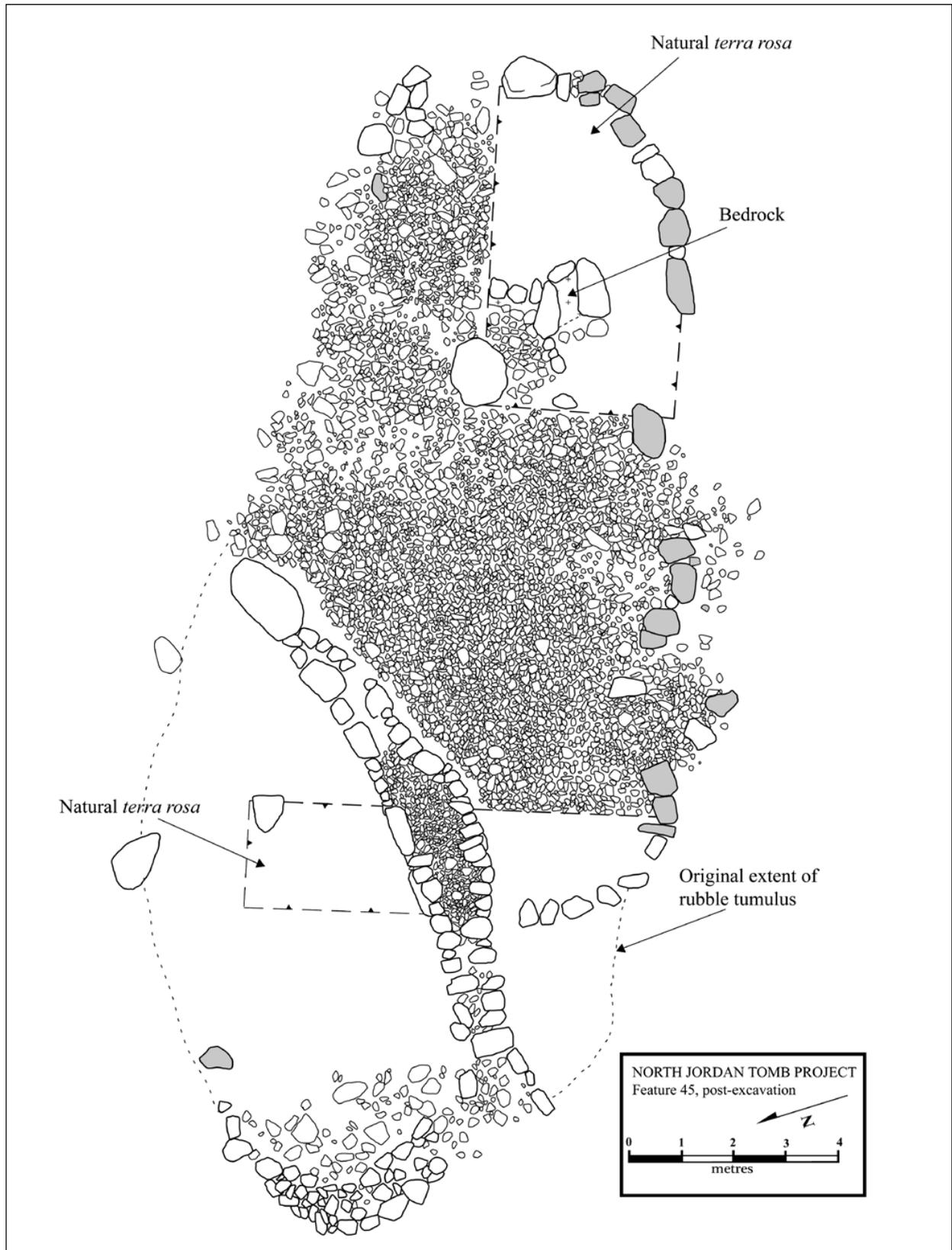
allels. The feature does, however, recall a description of a cairn at Ramat Hanadiv, in which the excavator noted “an L-shaped ‘construction’ of large stones” that “was cleared and found to be filled with smaller stones and apparently virgin soil” (Greenberg 2000: 605).

Cairn 45 (Fig. 9) Cairn 45 was a similar rubble spread that ran 22m downslope, measured 9m across at its widest point, and stood ca. 0.50m high. A series of curved walls visible in the tumulus suggested a series of cells extending down the slope, possibly accreted on to each other over time, and a larger wall was visible in the tumulus still further downslope (**Fig. 9**). Given the size of the monument, it was excavated in two areas. Limited excavations in the upper, eastern end exposed an outer kerb of large limestone and flint rocks that enclosed a curved chamber. The chamber was paved with small stones set into the natural *terra rossa* soil, and was partially covered by a large boulder. In addition, a small chasm or fracture in a raised area of adjacent bedrock was joined to the chamber by a small wall.

A larger area was cleared in the lower third of the cairn, exposing a curved, double-rowed wall running against the slope. A boulder marked one end of the wall, which returned in a curve at the other. While it is unclear how the wall relates to the upper chamber, both areas were covered by the same tumulus. The wall may have defined a



8. Photograph of inner walls and cave beneath the tumulus of Cairn 78. Facing west.



9. Plan of Rubble Cairn 45.

ritual area used in the funerary process, although neither area yielded any artefacts to support this theory.

Cairn 85 (Figs. 10 and 11): With a diameter of 10m and a height over 2m, Cairn 85 was the most visually impressive cairn to be excavated (Fig. 10). A rough ring-wall was visible within the tumulus. Removal of the tumulus exposed no more architectural features; instead, the ring-wall contained an area of raised bedrock notable for three natural, basin-like cavities. A depression in the upper rubble tumulus directly over one cavity yielded several dozen sherds from a single Galilean grooved-lip cook pot, suggesting that the cairn was re-used in the early Roman period. As shown in Fig. 11, three slabs had been deliberately placed over another of the cavities at the level of the bedrock under the tumulus. While no human remains were found beneath these ‘capstones’, the cavity contained over 50 sherds with a coarse, pale-buff gritty fabric that may date to the late prehistoric period. Unfortunately, no diagnostic pieces were recovered, and a definitive date awaits scientific analysis.

Retaining Cairns

These semi-circular or square features, less than 5m in size, are defined by a retaining wall, several courses high, on one or more sides of the structure. Often these cairns were built against a raised bedrock outcrop, which was incorporated as an additional side. The retaining



11. Photograph of capstones over a bedrock cavity beneath the tumulus of Cairn 85.

walls were usually well-built and well-faced, although the orange patina on some examples, coupled with their proximity to ploughed or terraced areas, suggests that these features may be nothing more than elaborate field cairns. The removal of the tumulus from one example, Cairn



10. Photograph of Cairn 85 before excavation.

248, showed that the walls bottomed out within the topsoil, suggesting that the cairn was nothing more than field-clearance piled between the bedrock and an off-set retaining wall. Palumbo sounded a similar cairn with the same result (Palumbo 1992: 56).

Ringed Features

Given their lack of rubble tumuli, these features are not really “cairns” at all. Rather, they consist of a small, circular wall of medium and large rocks. Few such features were found on the Tall ar-Rās ridge and only one, Feature 86, was excavated. It was constructed of a ring of upright, white limestone slabs that formed three-quarters of a circle against an exposed seam of bedrock. A rubble spread on the immediate downslope side of the feature suggests that it may have once been covered by a tumulus, in which case the feature would have resembled a kerbed cairn discussed above. The inner soil was removed to bedrock, upon which a flat layer of medium stones had been laid. Once again, no finds were recovered.

Standing Stones (Fig. 12)

Given the well-known spatial relationship between standing stones and other megalithic monuments (Scheltema 2008: 53-58), it was surprising that only three standing stones were recorded in the survey area. The largest of these stood over 1.5m high and 2m long (Fig. 12). Unlike the white limestone slabs used to construct

the dolmens, this standing-stone was hewn from a band of brown chert, an interesting contrast as the stone had been erected on the very edge of the ridge next to one of the densest clusters of dolmens in the south-eastern third of the survey area. Like the dolmens, the standing stone is roughly parallel with the wadi.

Wall-Lines

In addition to several modern field-walls, 58 wall-lines were recorded across the ridge, falling into two distinct types. The first type comprised roughly faced linear walls built of two rows of large fieldstones filled in with small and medium rocks. All walls of this type were found on the gentler, northern side of the ridge, and many define large areas that are no longer ploughed but which probably reflect ancient field systems. Given the correspondence between these areas and a peak in the Roman-Byzantine material collected during the surface survey, it is likely that these walls represent field-walls built during the Classical period.

The second type of wall consists of single, unfaced lines of boulders and large rocks. These walls do not appear to enclose parcels of land, but were instead usually associated with dolmens and cairns, and may have served some symbolic function defining ritual or sacred spaces in the cemeteries.

Rock-Cut Features

The survey recorded 110 features cut into ex-



12. Standing-stone (with Charlotte Whiting as scale).

posed areas of bedrock, most of which probably served agricultural purposes. These features were concentrated on the northern side of the ridge, in the same area as the ancient field-walls, and fell into several sub-categories.

Winepresses (Fig. 13)

Of the five winepresses recorded, four consisted of a small, rectangular upper basin or treading floor, and a lower oval collection vat. A channel or hole in the base of the upper basin allowed the juice to flow into the vat from the treading floor. This type of press shares several parallels with the Type 1 winepress defined by Watson on the basis of her survey in the Pella hinterlands (Watson 2004: 487).

A single example of a far more complex type of winepress was also recorded, namely Feature 170 which had a square, flat treading floor, 4.1 by 4.1m, with traces of plaster around the lipped edges (Fig. 13). An oval depression, 0.4 by 0.5m, in the centre of the floor probably received the upright pole of a wooden screw press (see Watson 2004: 493). A small channel through the wall of the treading floor allowed the juice to collect in a lower, rectangular vat, although the vat has since been deepened to create a water collection tank. This press corresponds to Watson's Type 4 winepress (Watson 2004: 492-494), a common type in north Jordan (El-Khoury 2008: 82-84).

A particularly good example sits on top of the Jesus Cave (*Kahf as-Sayyid al-Masih*) at Bayt Idis, in which a large oil press is also found 8. The size and complexity of the Type 4 press at Tall ar-Rās suggests that ancient wine-production in Wādī ar-Rayyān had developed into a sophisticated industry by the late Roman and Byzantine periods.

Cup-Holes

The 43 cup-hole 'sites' recorded on the ridge probably related to this industry. Most cup-holes are circular, about 20cm in diameter and depth, often with several cup-holes clustered together on the same patch of bedrock as a single cup-hole 'site'. Nearly all these sites were located on the northern side of the ridge, where all winepresses and most ancient field-walls were found; many cup-holes are adjacent to the presses themselves. Although it has been suggested that cup-holes may have served a ritual purpose associated with dolmens (Scheltema 2008: 24-25), it is more likely that the cup-holes at Tall ar-Rās functioned more practically as supports for posts or jars used during wine production (see Ahlstrom 1978: 44; Watson 2004: 487).

Basins

Fifteen broad, shallow circular depressions, about 40cm in diameter, were recorded as "ba-



13. Winepress Feature 170.

8. The oil and wine presses at the Jesus Cave are currently undergoing conservation and restoration by Amjad Ba-

tayneh, Inspector of the al-Kūra Antiquities Office. We thank Mr Batayneh for drawing the site to our attention.

sins” although some of these features may have been natural. In contrast, three other “basins” were cut rectangular features with fashioned vertical sides, 1.0 by 0.8m and at least 0.8m deep. It is difficult to identify the function of these features, although the proximity of one example to the large winepress suggests that they served a similar agricultural purpose, possibly relating to storage. Today, these basins collect water used by flocks grazing along the ridge, and they may have had a similar function in antiquity.

Gaming Boards (Fig. 14)

Five gaming boards were recorded in two areas. As shown in **Fig. 14**, four were inscribed into the capstone of a dolmen, although they probably post-date the dolmen itself. Three of these boards were “mangella” boards, each containing two rows of seven small holes, although a separate board with a medium hole surrounded by a circle of nine smaller holes was also present. A single mangella board was carved into a bedrock outcrop elsewhere on the site.

The Monumental Site of Khirbat Umm al-Ghuzlān

In addition to the off-site features and monuments discussed above, the survey area contained one large site: Khirbat Umm al-Ghuzlān (**Fig. 2**). This monumental complex of large curved walls, rubble rings and cairns was originally recorded as site WY28 by the Wādī al-Yābis Survey and dated to the EBIV period and the second /third centuries AD on the basis of its surface pottery (Palumbo 1992: 48). The site was briefly revisited by the NJTP survey as it fell within the south-west corner of the survey



14. Gaming boards engraved in the capstone of a dolmen.

area, although we returned in 2009 to map the site in detail. The results of this more recent field-work are discussed in depth elsewhere (Fraser and Batayneh, this volume).

Khirbat Umm al-Ghuzlān sits on the top of a knoll that protrudes from the base of the Tall ar-Rās ridge into the steep drop of Wādī ar-Rayyān (**Fig. 2**). A series of curved walls, built from large and megalithic field stones, surround the base of the knoll to form a discontinuous oval enclosure 100 by 50m. Two rubble rings, each 30m in diameter, sit inside the enclosure and are connected to the outer perimeter wall by smaller, radial wall-lines. Several rubble cairns, some with visible internal structures, sit between these rings and the outer enclosure wall, and one of the largest dolmens seen anyway in the area (Palumbo 1992: 48) is found at the base of the western side of the knoll.

The lack of regular architectural remains within the enclosure wall suggests that the site was never a permanently occupied settlement, although its function can only be clarified through excavation. Regardless, the monumentality of the enclosure walls, enhanced by the site’s distinct location, adds a new dimension to the megalithic landscape at Tall ar-Rās (see Fraser and Batayneh this volume for an extended discussion).

Discussion

The Tall ar-Rās ridge consists of two very different cultural landscapes. During the Classical period the ridge was exploited for its agricultural potential, evidenced by the ancient field-walls, winepresses and cup-holes concentrated along the flatter, northern side of the ridge-top. The earlier, megalithic landscape of Tall ar-Rās is more difficult to understand. The following discussion raises some preliminary ideas and points towards avenues for further research.

Firstly, the way the dolmens are distributed across the ridge appears to reinforce group affinities, a suggestion made by Thuesen concerning the Jadidah dolmen field (Thuesen 2004). Not only do the dolmens cluster in three areas, but certain monuments within these areas are grouped within the same ring-wall, platform or tumulus. Patterns in the relationship between the dolmens, their additional architectural features, and other characteristics such as orientation and

size may reflect social structures such as kin-groups, or, as Thuesen suggests of the Jadidah dolmens, their “lay-out in the landscape may symbolise family trees” (Thuesen 2004: 114).

The processes involved in constructing dolmens also have significant socio-economic implications, although these processes are rarely considered. The partially quarried capstone and the residual scars of other quarries allow us to explore these processes in detail, including issues concerning the technologies available to the dolmen builders, the time it took to construct a monument, and the resources and labour required. The cairns present us with more methodological problems. Critically, there is, as yet, no definitive way to tell a “cairn monument” from a pile of field-clearance. While this survey identified only those rock-piles with visible architecture as “monuments”, some of these features, such as the retaining cairns, proved upon excavation to be field-clearance. Conversely, we cannot be certain how many piles of “field-clearance” contain built structures beneath their tumuli, although the general relationship between these features and cultivated areas suggests that most are modern.

The more intriguing issue concerns the function of the “cairn monuments” themselves. Some structures are clearly tombs. Kerbed Cairn 28, for example, contained disturbed capstones and a built chamber, and there are good architectural parallels with tombs from Ramat Hanadiv. Other structures, like the rubble cairns, are more ambiguous, even though they are deliberately conceived and constructed monuments. Cairn 78, for example, was clearly built with a specific purpose in mind, evidenced by its intricate network of wall-lines enclosing a small cave. This purpose is unlikely to have been funerary as the cairn did not contain any human remains or cultural artefacts, even though robbers had not disturbed its tumulus and wall-lines. Similarly, although the tumulus of Cairn 85 overlay a ring-wall enclosing three bedrock cavities, one sealed by *in situ* capstones, this feature also failed to yield human remains. Consequently, we must be wary of generalised descriptions of cairns as late prehistoric burial structures, as their function remains just as elusive as their date.

Given the paucity of artefacts both on the surface of the ridge and inside the monuments

themselves, it is impossible to identify with certainty the societies that constructed the megaliths at Tall ar-Rās. Arguments attributing dolmens to nomadic or semi-nomadic pastoralists are well known (Prag 1995; Zohar 1992), and the spatial and visual relationship between the dolmens and Wādī ar-Rayyān may have reinforced lines of movement between highland and lowland pastures. Palumbo, however, associates the dolmens at Tall ar-Rās with the pastoral components of nearby Chalcolithic and EBI village communities at Jilmit ash-Shāriyah and al-Khawārij (Palumbo 1992: 58). It may therefore be fruitful to consider the Tall ar-Rās dolmens from the perspective of “rural economies” (Palumbo 1992: 58; also Prag 1995), and their significance may relate to the negotiation of land between various components of these hinterland populations.

This suggestion tallies with Philip’s argument that megalithic monuments legitimised corporate claims to resources, the symbolic capital of which derived from their significance as prominent burial markers (Philip 2003: 118-120). In this respect, not only does the location of the monuments on a prominent ridge-line underscore the importance of visibility, it also emphasises the significance of ‘place’. The Tall ar-Rās ridge contains a variety of monuments built over a considerable period, at least from the EBI, to judge from the dolmens, to the EBIV, to judge from the enclosure of Khirbat Umm al-Ghuzlān. It is easy to envisage such a landscape becoming self-referencing, in which later monuments were built with respect to earlier ones. As such, we must consider that the monuments were significant just as much for where they were as for what they were.

The cairns are, perhaps, best understood from this perspective. While their function remains elusive, the three excavated examples were all built over splits or chasms in the bedrock, including a cave (Cairn 75), three basin-like depressions (Cairn 85), and a raised bedrock fracture (Cairn 45). Possibly coincidental, we must nonetheless consider the implication of the situation of these monuments within an enduring and visible dolmen cemetery that may have charged the ridge with a spiritual significance, such as an association with the ancestors (but cf. Whitley 2002). The enclosure of bedrock

fractures and then the burial of these fractures beneath a rubble tumulus may have been a way of engaging with or managing the ancestors in a landscape already charged with meaning.

This suggestion is, inevitably, highly hypothetical. Articulating patterns in the way monuments relate to each other in spatial terms will hopefully illuminate some of the meaning embedded within the megalithic landscape at Tall ar-Rās. We must nevertheless be aware that the landscape itself has been significantly altered by later activity. Just as Palumbo noted the destruction of hundreds of monuments originally observed by Schumacher and Glueck, the current survey can attest that several monuments recorded by Palumbo have since been destroyed by encroaching development and cultivation. As stated by H.R.H. Prince El Hassan bin Talal in his forward to *Megalithic Jordan* (Scheltema 2008), “the challenge for us today is to manage our demographic and economic growth, without destroying what our ancestors have left behind”.

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2006

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A SURVEY AT THE EBIV SITE OF KHIRBAT UMM AL-GHUZLĀN

*James A. Fraser and Amjad Batayneh*¹

From ninth to 16th of March 2009, a small team from the University of Sydney and the Department of Antiquities² surveyed and mapped the site of Khirbat Umm al-Ghuzlān near the village of Kufr Abil in Wādī ar-Rayyān, formerly Wādī al-Yābis (**Fig. 1**). The site was originally recorded as site WY28 by Jonathan Mabry and Gaetano Palumbo during their Wādī al-Yābis Survey (Mabry and Palumbo 1988) and, based on its surface pottery, Palumbo dated the site to the EBIV period and second to third centuries AD (Mabry and Palumbo 1988: Fig.1; Palumbo 1992: 48). In 2007, the North Jordan Tomb Project (hereafter NJTP) revisited Khirbat Umm al-Ghuzlān while surveying an extensive field of dolmens and cairns scattered along the adjacent ridgeline of Tall ar-Rās and around the site itself (Fraser *et al.*, this volume). Given the site's proximity to these megalithic structures, as well as its monumental walls and Bronze Age date, Khirbat Umm al-Ghuzlān may have been incorporated within the striking megalithic landscape of Tall ar-Rās. Consequently, the NJTP returned in 2009 to survey the site in detail, the results of which are presented here³.

Location

Khirbat Umm al-Ghuzlān is located mid-way up Wādī ar-Rayyān at UTM 749725E 3588460N at an elevation of 390 m.a.s.l.. The site sits on a small knoll that protrudes from the base of the Tall ar-Rās ridge into Wādī ar-Rayyān (**Figs. 1 and 2**), and has commanding views up the wadi to the 'Ajlūn highlands and down to the Jordan

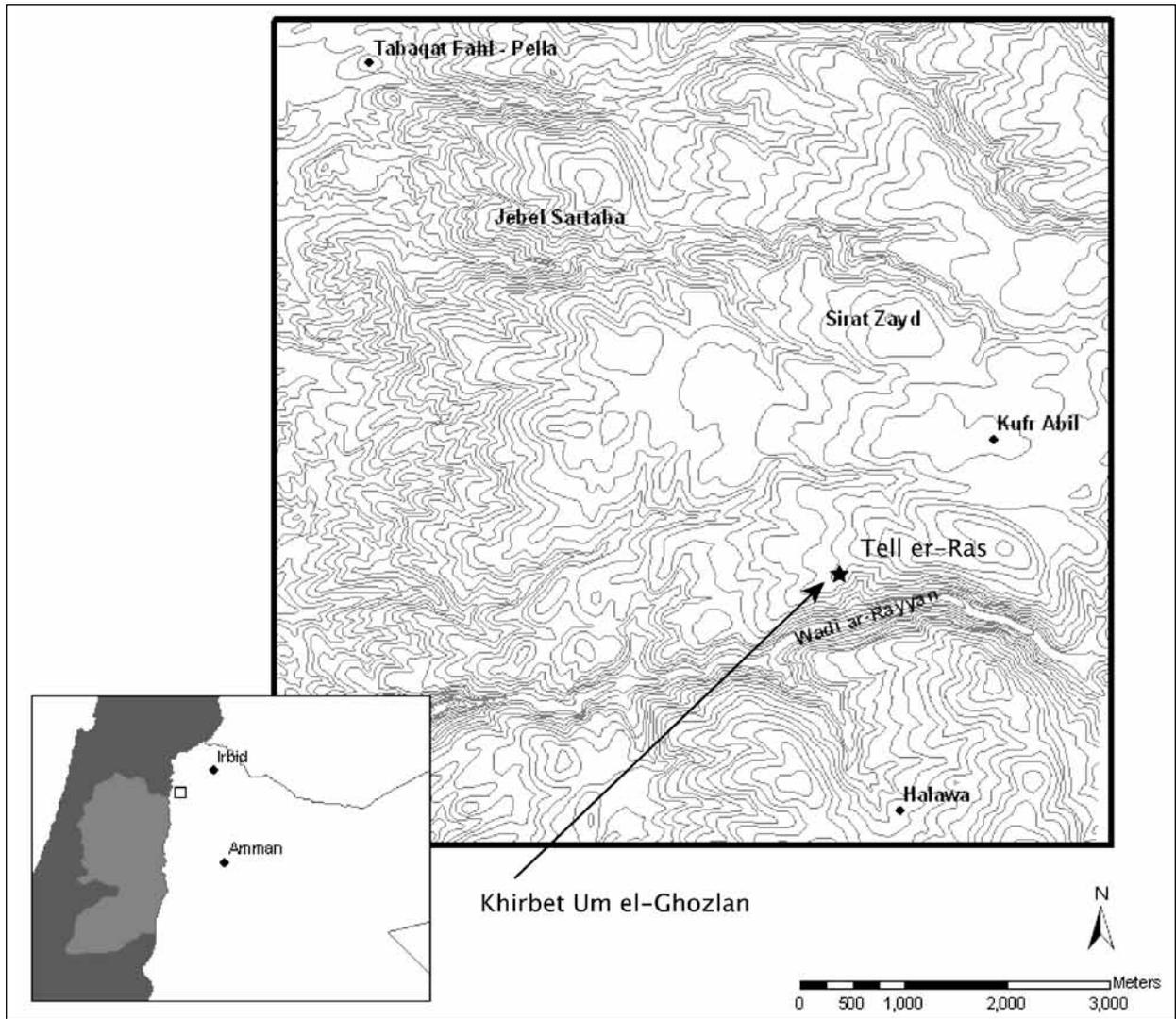
Valley. Several large, curved walls around the base of the knoll create an oval enclosure measuring approximately 100m north-south by 50m east-west (**Fig. 3**). Two rubble circles sit in the centre of the site, and several large, rubble piles fill the areas between these rings and the enclosure wall. In addition, two dolmens are found at the base of the knoll, immediately north-west of the site; one of these is the largest dolmen recorded in the area by either the NJTP or the Wādī al-Yābis Survey (Palumbo 1992: 48).

Survey Methods

The primary aim of the fieldwork was to record all visible features at Khirbat Umm al-Ghuzlān in order to place the site within its immediate context in the Tall ar-Rās dolmen and cairn fields, and to produce a map of the site that would enable architectural comparisons between Khirbat Umm al-Ghuzlān and similar sites elsewhere in the Levant. The site was walked in 10m transects, then re-walked in transects at 45 degrees, during which architectural features were flagged and artifacts counted and retained. Although many sherds were recovered, few were diagnostic: this may be because of the soft, friable, sandy fabric of the EBIV pottery, which easily weathers and loses any clear edges or form; it may also be explained by pick-ups made by previous surveys. It is because of these earlier surveys and the pottery they published that Khirbat Umm al-Ghuzlān can be identified as an EBIV site (Mabry and Palumbo 1988: Figs. 7.34, 8.47; Palumbo 1992: 48).

1. James Fraser, PhD Candidate, The University of Sydney. Amjad Batayneh, Inspector, al-Kūra office, The Department of Antiquities.
2. James Fraser (Director), Amjad Batayneh (Representative of the Department of Antiquities), Guy Hazell

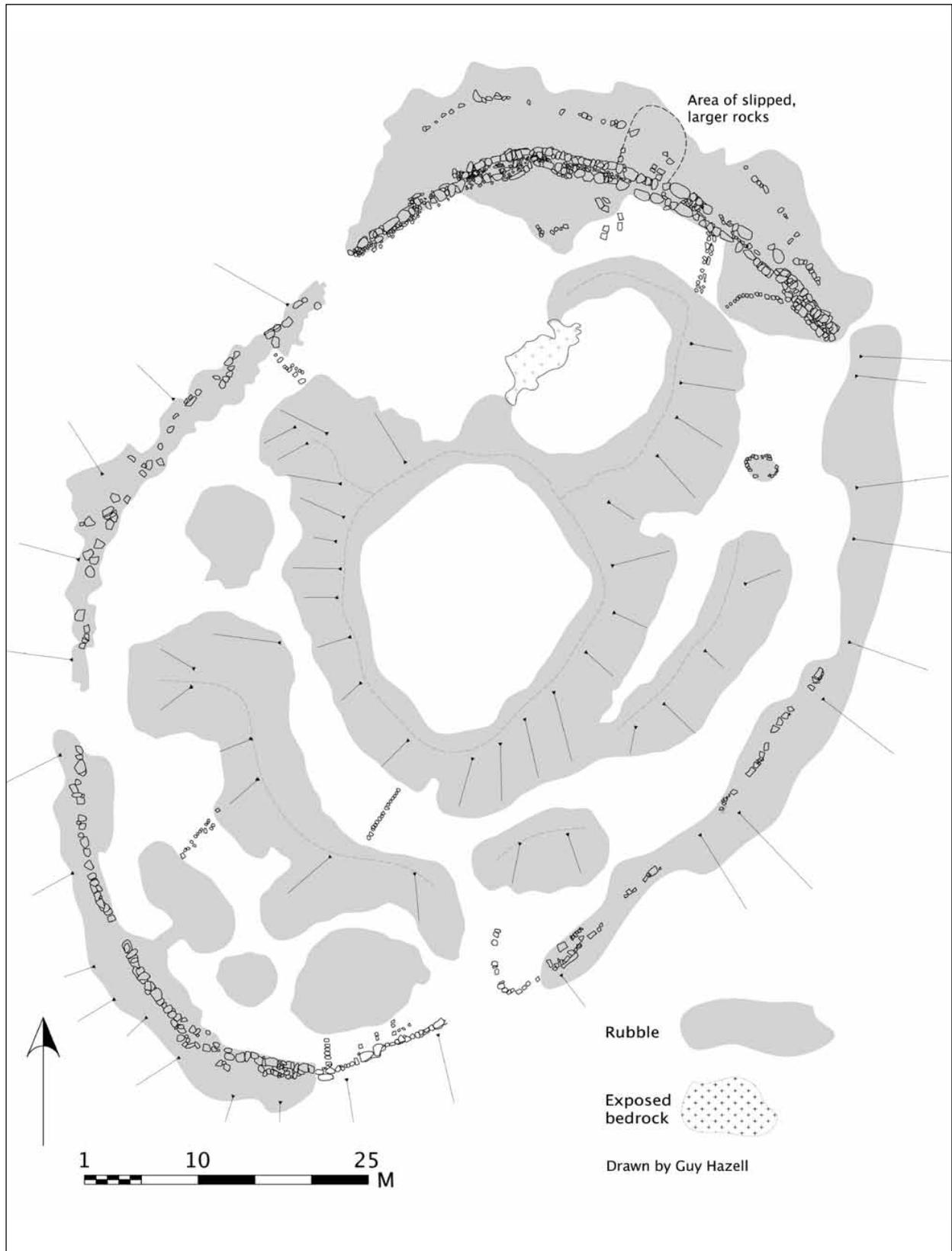
(Surveyor), Bobby Callard (Archaeologist).
3. The 2009 season of the NJTP focused on the excavation of a field of large, rubble, rujum cairn monuments on Jabal Sartaba near Pella (Ṭabaqat Faḥl). The results of these excavations will be published in a later report.



1. Map of Khirbat Umm al-Ghuzlān in Wādī ar-Rayyān.



2. View of Khirbat Umm al-Ghuzlān from the Tall ar-Rās ridge (looking southwest).



3. Site plan of Khirbat Umm al-Ghuzlān.

Standing Architecture

The outer wall

As shown in **Fig. 3**, the perimeter of the site is defined by a series of discontinuous wall-lines that together form an oval enclosure referred to here as the “outer wall”. The northern wall-line in the outer wall is the most substantially constructed, longest and best-preserved wall in the entire site. It runs for 30m in two rows across the flat, northern end of the site then, in a single row, follows the contour of the knoll for another 12m to the south-west (**Figs. 4 and 5**). The wall is built of large and megalithic fieldstones of the local limestone and flint, some of which measure over 1.5 by 1.0 by 0.8m in size. Although the wall stands up to four courses high, dispersed medium and large rocks on either side of it suggest that it once stood significantly higher.

By spanning the entire northern side of the



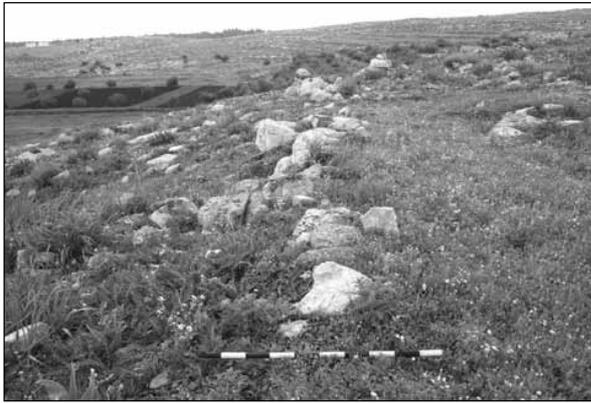
4. North wall (looking south-west).



5. North wall (looking east).

site, this monumental wall emphasises the topographic distinction between the knoll on which Khirbat Umm al-Ghuzlān sits and the low saddle that connects it to the Tall ar-Rās ridge. This saddle serves as the main route into the site, and the scattered rubble suggests that the entrance was more substantial in antiquity than today. As shown in **Fig. 3**, a small wall runs parallel to the exterior face of the larger north wall and there may be more such walls beneath the dispersed rubble. In addition, a dense concentration of large slabs appears to have slipped or fallen in rough alignment from the outer wall (**Fig. 3**), suggesting that an adjacent structure, or even a large superstructure such as a gate-way, existed at this point. This ‘gate-way’ area corresponds with several megalithic slabs that are lower and flatter than any other in the outer wall, and which may have acted as steps or pavers associated with an entrance-way into the site. These hypotheses can, of course, only be demonstrated through excavation.

The rest of the outer wall is not as substantial as the northern wall. On the western side of the knoll, the outer wall can be traced as an alignment of large slabs that are only one row wide and, at most, two courses high (**Fig. 6**). However, piles of stone cleared from adjacent fields obscure parts of this wall-line. In contrast, the southern end of the site has, in places, a double row of large rocks similar to the north wall, although the rocks are not as large with fewer extant courses (**Fig. 7**). The wall continues around



6. West wall (looking north-east).



7. South wall (looking south-east).

the sharper, eastern side of the knoll, but here it is built of smaller rocks and even incorporates patches of exposed bedrock.

It is unlikely that the entire knoll was once enclosed by a monumental wall of which only the northern wall-line remains. The lowest courses of the eastern and western walls are much smaller than the large slabs on which the northern wall is built, implying that these walls

were never meant to be as high or as substantial as the northern wall. Moreover, there is significantly more rubble around the north wall than around any other stretch of wall on the site. The northern wall was therefore probably the largest and most impressive wall-line on the site in antiquity, just as it is today. Consequently, it is unlikely that the outer wall was part of a fortification system: the eastern, western and southern wall-lines define the boundary of the site, but they would not have been substantial enough to defend it. The monumental architecture of the northern wall may have instead emphasised the site's location on the knoll as distinct from the Tall ar-Rās ridge, from which the wall is visible.

The Inner Rings and Tumuli

Two rubble circles sit on the highest point of the knoll within the outer enclosure (**Fig. 3**). The larger of the circles, located in the centre of the site, encloses an area ca 22 by 24m; the smaller circle sits between this central ring and the northern outer wall, enclosing an area ca. 16 by 11m, although it incorporates bedrock on its western side (**Fig. 8**). Both rings are built of medium and large field stones piled up to 70cm high. There are traces of wall-lines with deliberate coursing within these circular piles, although these are un-faced and, if continuous, are now obscured by the rubble (**Fig. 9**). Both rings enclose flat ground covered by shallow soil and exposed bedrock, and the lack of any visible architectural remains suggests that these areas were also empty in antiquity.

Several large, rubble mounds are found between the central ring and the outer wall. Some of the smaller examples contain deliberately placed kerbing stones, while depressions in others suggest they have been robbed (**Fig. 10**). These features are similar to the rujm cairn 'tombs' found along the Tall ar-Rās ridge (Fraser *et al.*, this volume). The larger mounds show no architectural structure and, given their size and irregular shape, may have been created to emphasise the rubble rings on the top of the knoll, or are simply piles of field-clearance. Several small, linear walls link the inner rubble rings and tumuli to the outer wall, like spokes on a wheel (**Fig. 3**). These radial walls stand only one course high, and many are only one row wide (**Fig. 11**).



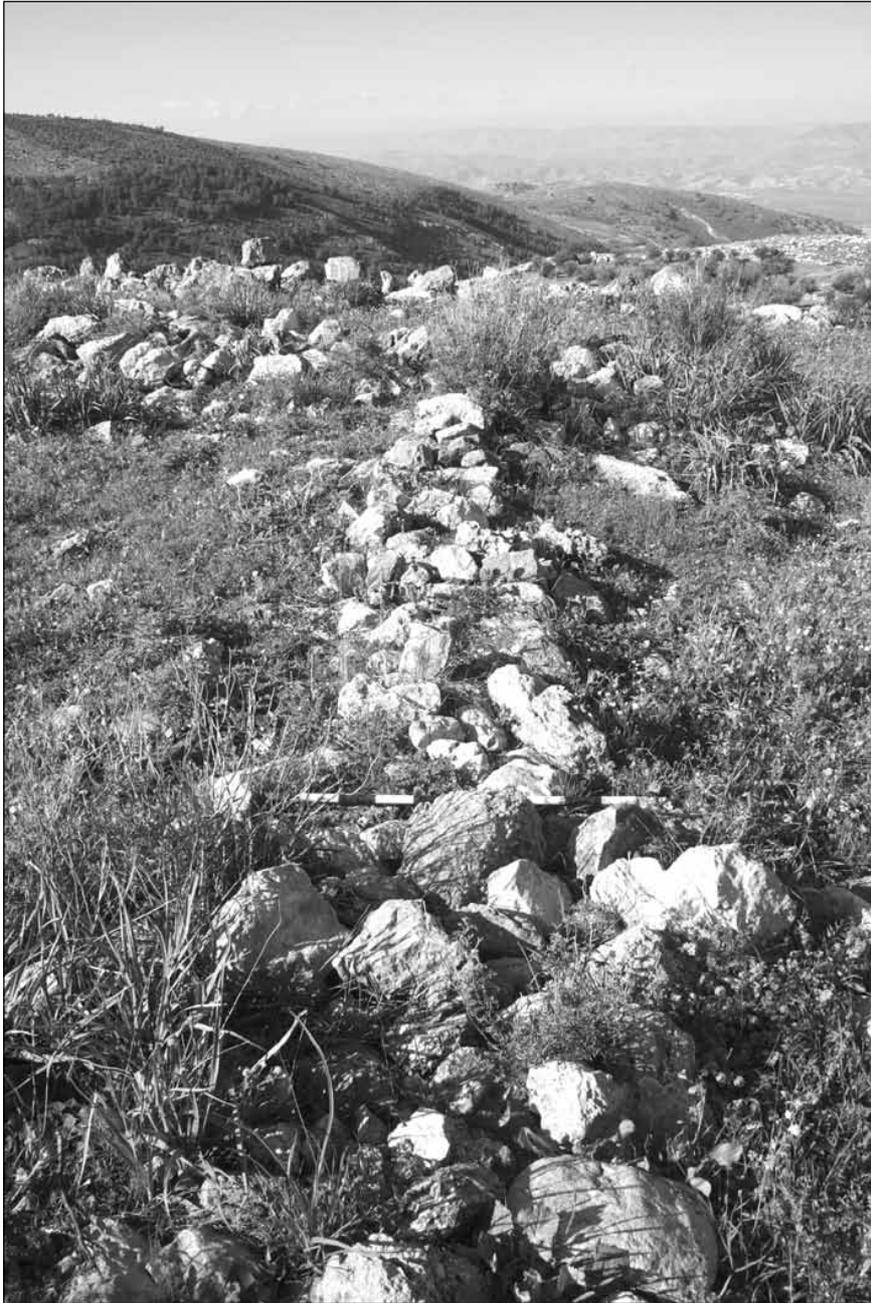
8. Northern stone circle (looking south-west).



9. Coursed stones in the northern stone circle (looking north-east).



10. Small cairn 'tomb' (looking south-east).



11. Radial wall between tumuli (looking south-west).

Chronology

As Palumbo identified both EBIV and second to third century AD surface pottery (Palumbo 1992: 48), it is possible that the different architectural components of the site represent different phases of use. We must bear in mind, however, that Classical-period pottery was found in almost every transect of every square surveyed on the Tall ar-Rās ridge during the 2007 NJTP season (Fraser *et al.*, this volume);

its presence on Khirbat Umm al-Ghuzlān does not necessarily signal Classical occupation. In contrast, the site yielded the only EBIV pottery found in the entire survey area and, although most sherds were undiagnostic, they testify that the site was a focus of activity in the late Early Bronze Age. Nevertheless, without excavation the chronological relationship between the well-constructed outer wall and the inner rubble rings remains elusive.

It is reasonable to assume, however, that the outer wall was built during the EBIV period. Its monumental architecture and limestone slabs are more consistent with the nearby Bronze Age dolmens and megalithic wall alignments than with the regular, Classical field-walls found on the adjacent ridge. The rubble rings are more ambiguous. Although stone circles are often associated with dolmen and cairn fields elsewhere in Jordan (Scheltema 2008: 21-23), the later pottery at Khirbat Umm al-Ghuzlān suggests that they may be corrals or field-markers built during the Classical period when the area was exploited for its agricultural potential (Fraser *et al.*, this volume). The problem with this suggestion is that the central circle has no entranceway for animals to access the corral and, if the rings defined circular fields, the amount of rubble cleared from these small areas seems excessive. Occasional traces of coursed walling beneath the rubble suggest that the rings may have been originally constructed at the same time as the outer wall, but were obscured by rubble cleared during later agricultural activity. These issues can only be resolved through a programme of targeted excavations.

The significance of Khirbat Umm al-Ghuzlān

Based on the present survey, we can assume that the knoll at Khirbat Umm al-Ghuzlān was enclosed by an oval structure sometime in the EBIV period. We can also infer that a monumental wall defined the northern end of the site, where the knoll could be seen and accessed from the Tall ar-Rās ridge. It is unclear, however, why this enclosure was built. Despite the shallow depth of deposit, evidenced by the patches of exposed bedrock, there are no smaller wall-lines visible within the enclosure to suggest that the knoll was occupied by a settlement if, indeed, the site was built to be occupied at all. If the tumuli and rubble rings post-date the outer wall, the enclosure may have contained empty space, so the purpose of the enclosure may have been to define the knoll itself. If the rubble circles were contemporary with the outer wall, then the site presents us with an example of a complex network of curved structures and tumuli reminiscent of other monumental sites such as Condor's Circle (Thuesen 2004) and Rujum al-Hir (Mizrachi *et al.* 1996).

Regardless of which scenario is closer to the truth, we must consider Khirbat Umm al-Ghuzlān from the perspective of the topographic and cultural contexts in which it is located. The distinct knoll on which the site sits is emphasised by the walls that enclose it, particularly the northern wall that demarcates the knoll from the adjacent saddle and ridge. Furthermore, the monumentality of the north wall may have referenced the other megalithic monuments scattered along the ridge, from which the wall can be seen. These visual references suggest that the site was integrated within the megalithic landscape at Tall ar-Rās, even if we do not know the role it played.

In this respect, the similar site of Condor's Circle may be germane. Although built during the EBII period (Thuesen 2004: 113), Condor's Circle is also a monumental, circular site that sits atop a knoll on a wadi-edge and is overlooked by an extensive field of dolmens, cairns and other megalithic structures (Thuesen 2004). Thuesen argues that the site was integrated within a complex mosaic of megalithic monuments, settlements and topography that together may reflect "some basic socio-ideological structures of the society" (Thuesen 2004: 114). Similarly, the concentric circles at Rujum al-Hir in the Jaulan are reminiscent of the rubble rings found inside Khirbat Umm al-Ghuzlān, albeit on a more complex scale; this site is also surrounded by an extensive field of dolmens and cairns (Mizrachi *et al.* 1996). Like Condor's Circle and Rujum al-Hir, Khirbat Umm al-Ghuzlān may also have derived significance from its location within a striking, megalithic landscape, although the chronology and function of the site must be established before its role in this landscape can be assessed.

Conclusion

We are becoming increasingly aware of the number and importance of megalithic landscapes in Bronze Age Jordan. Although small, the site of Khirbat Umm al-Ghuzlān adds an important dimension to our knowledge of the megalithic landscapes in Wādī ar-Rayyān during a critical period of change in the southern Levant. Without excavation, the chronology, re-use and purpose of the site suggested here will remain hypothetical. This is urgent work,

as the site's survival is precarious. When Palumbo surveyed the area over 20 years ago he noted a "rapid pace of destruction" (Palumbo, Mabry and Kuijt 1990: 111); several dolmens and cairns have since been bulldozed to make way for encroaching agricultural development. Areas close to the site are newly ploughed and, critically, recent bulldozer activity has cut into olive groves on the immediate western side of the site. It is hoped that the small survey presented here will contribute to our understanding of this intriguing but threatened site.

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MUGHR AL-ḤAMĀMAH: A PREHISTORIC CAVE SITE IN THE WESTERN ‘AJLŪN DISTRICT REPORT ON THE INITIAL SURVEY SEASON

Tobias Richter, Aaron Stutz, Liv Nilsson Stutz and Mohammed al-Balawneh

Introduction

From July 7 to July 11 2008, a small team of archaeologists from Emory University, University College London and the Department of Antiquities carried out topographic and surface collection surveys of Mughr al-Ḥamāmah, a recently identified prehistoric cave site situated between Wādī Rājib and Wādī Kufrinja, in the western portion of the ‘Ajlun Governate. The aim of the survey was to evaluate the potential of the site for future excavations, with a focus on the possible preservation of *in situ* Palaeolithic deposits. Excavating a potentially stratified Palaeolithic site in the eastern Jordan Valley would likely yield significant insights into the Palaeolithic sequence in Jordan and beyond.

Background

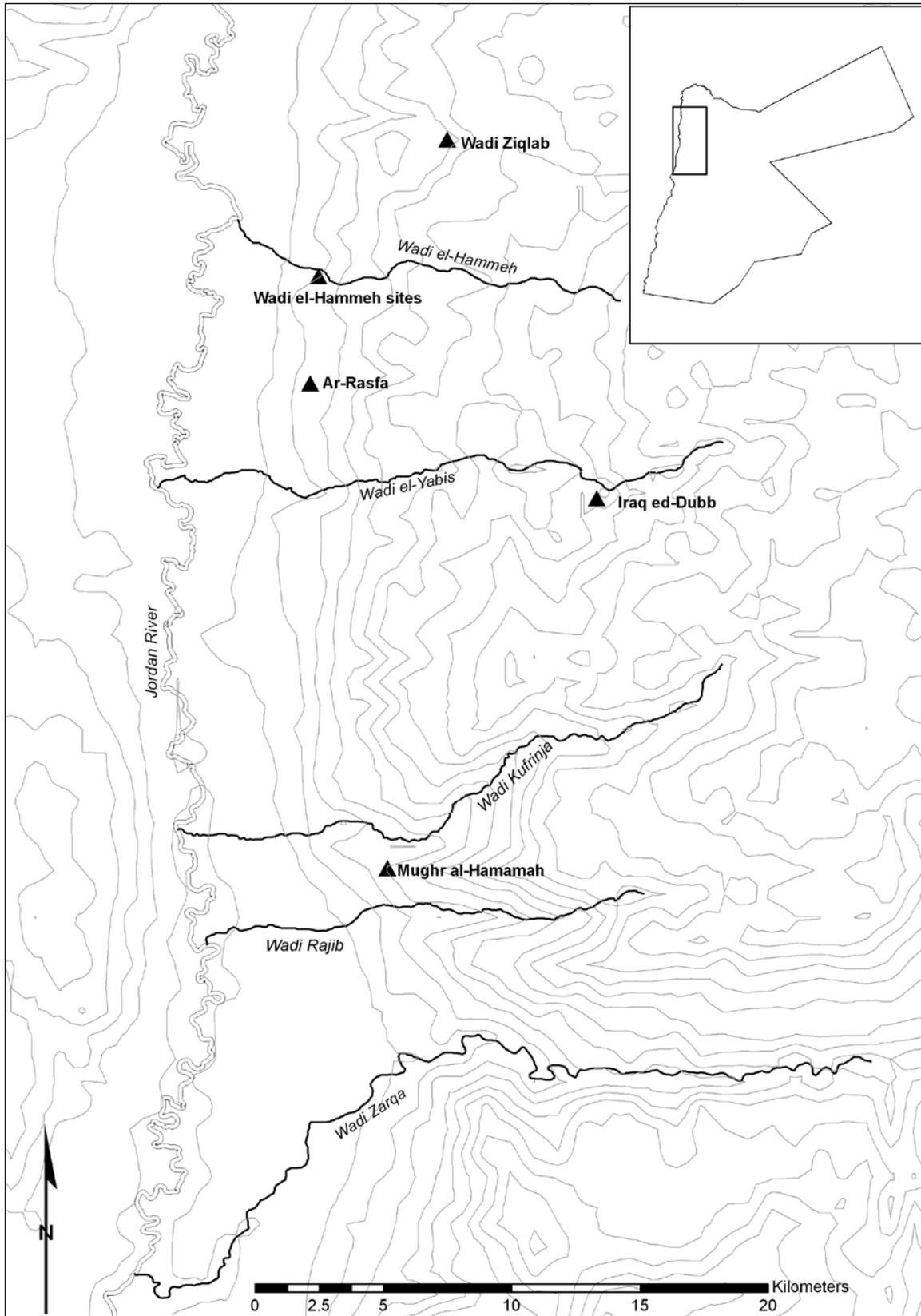
Mughr al-Ḥamāmah appears to have first been reported as an archaeological site in 2006, when members of the Ritual Landscape Project (RLP), directed by Dr Jaimie Lovell (Council for British Research in the Levant), visited the site and produced a short description and sketch-plan of the caves and terraces. Unsystematic surface collection yielded a number of Paleolithic flint artefacts, including an undiagnostic blade blank, a Levallois point and a single platform bladelet core (J. Lovell pers. comm. 2007). These preliminary finds suggested that the caves may have been used by humans during multiple periods in the later Middle or Upper Pleistocene (*ca.* 200,000 - 10,000 BC).

Although previous projects have documented numerous early prehistoric sites in the eastern Jordan valley foothills, as yet only a handful of the localities have been thoroughly investigated (Banning 1992; Banning *et al.* 1992; Edwards 1987, 1991, 2001; Edwards *et al.* 1996; Kuijt

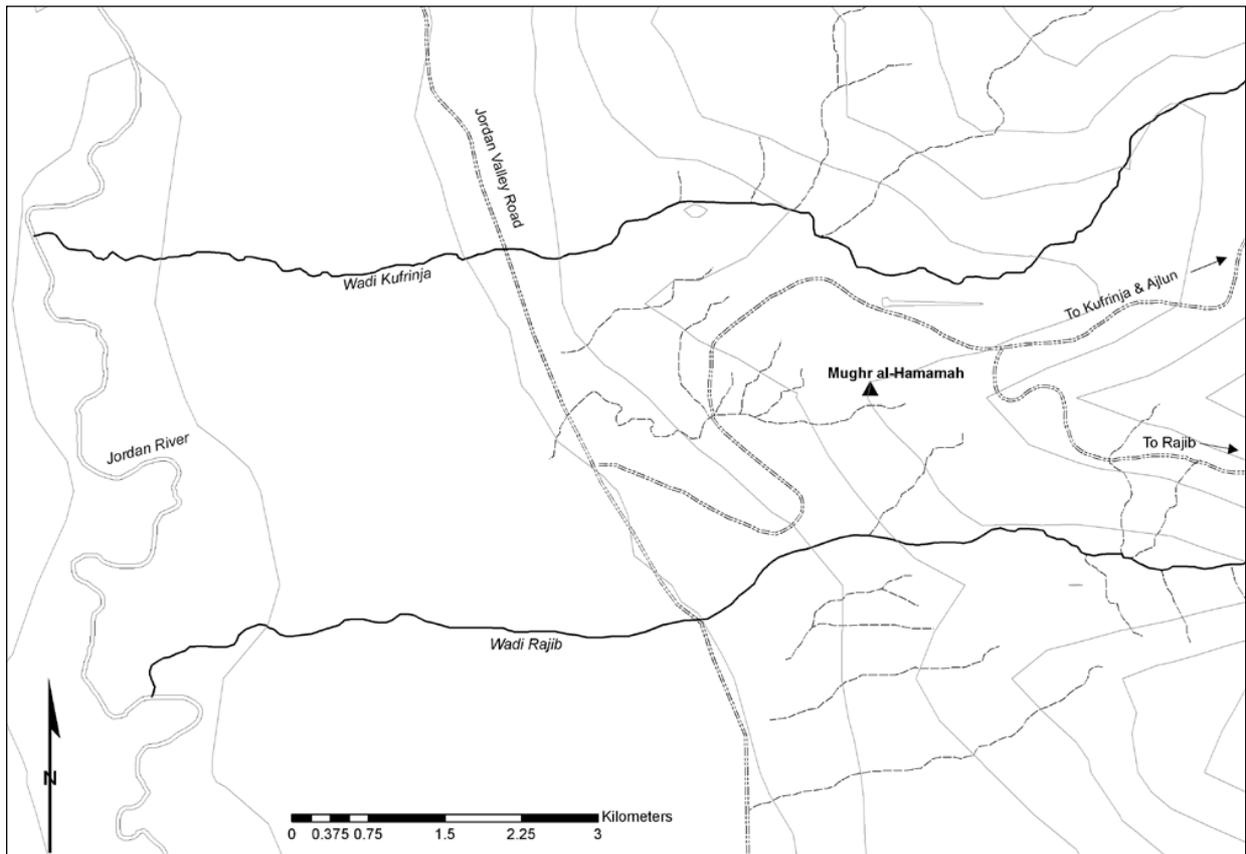
2002; Kuijt *et al.* 1991; Mabry and Palumbo 1988, 1992; Macumber *et al.* 1997; Maher 2007; Maher *et al.* 2002; Muheisen 1988; Shea 1998, 1999; Shea and Crawford 2003). The majority of sites that have been excavated date to the Epipalaeolithic period (*ca.* 22,000 - 10,000 BC). Many other prehistoric localities that have been previously charted in this region are unfortunately deflated, eroded or otherwise disturbed, or of limited size. Moreover, no multi-period stratified Pleistocene-age cave site has yet been excavated in north-western Jordan. The lack of data from such a site is particularly relevant with respect to the number of Palaeolithic caves and rockshelters excavated in the western Levant. To date, we lack a stratigraphic sequence that could be chronometrically dated and compared to similar long-term cave sequences in the western, central or northern Levant (Bar-Yosef 1994, 1998). In general, caves would have been long-term sources of shelter in Paleolithic hunter-gatherer landscapes and, just as importantly, are often traps for sediment that may bury and preserve archaeological material. Initial surface collections suggested that Mughr al-Ḥamāmah might preserve *in situ* stratified occupation deposits, and systematic excavation could potentially yield important new insights into Palaeolithic settlement in the area.

Ecological Setting

Geographical considerations alone predict that the western ‘Ajlūn District should have a rich Pleistocene archaeological record. Mughr al-Ḥamāmah is situated in the low foothills just above the upper terrace of the Jordan Valley bottom (**Figs. 1 and 2**). While little is known about the geology of the earlier Pleistocene palaeolakes in this section of the Jordan Valley, Mughr



1. Mughr al-Ḥamāmah in the geographic context of north-western Jordan.



2. Mughr al-Ḥamāmah in local context. The site is located at 80m. asl. The contour lines are drawn at 100m. intervals; the al-Ḥamāmah Caves are shown in their location near the 100m. asl contour. Due west of the caves, the Jordan River flows at ca. -350m. asl.

al-Ḥamāmah would have been only 3-5km away from and 300-400m above the shores of Lake Lisan (which occupied the basin from the Holocene Sea of Galilee and Dead Sea, from ca. 70 ka to 13 ka) (Stein 2001). The portion of the lake immediately downstream from Mughr al-Ḥamāmah would have contained fresh water. Mughr al-Ḥamāmah would have faced Lake Lisan just south of its narrowest point. While the lake would have limited Upper Pleistocene human movement across the Jordan Valley, its maximum east - west width opposite Ḥamāmah during Lisan's highest stand (ca. 26 ka) would have been only 5km. Thus, Ḥamāmah's location may have favored some contact directly across the Jordan Valley, at least in later Paleolithic periods.

Ḥamāmah is also strikingly well situated between the valley bottom and the Transjordanian plateau. The 'Ajlūn Mountains (900-1100m. asl) are located only 15km away as the crow

flies, via the Wādī Kufrinja. The hills of the Dībḥḥ Forest (700-900m. asl) are directly accessible 12km away, via the Wādī Rājib. Fresh water would likely have been available in perennial wadi streams and springs throughout both valleys. Within one-day or overnight trips from al-Ḥamāmah, foragers would have been able to traverse valley-bottom wetland and gallery forest, lower-elevation grassland and open oak forest terrain, and rich, denser oak forest zones that would have prevailed at higher elevations along the wedge-shaped ridge between the Kufrinja and Rājib valleys. Overall, the 'Ajlūn area — extending from the Transjordanian Plateau in the east to the palaeolake margin in the west — would have probably offered a diverse spectrum of big game, small game, nuts, pulses, fruits, grains and possibly tubers within a one-day foraging radius. While flint outcrops have not been systematically mapped in the region, abundant flint nodules and tablets occur in the limestone

bedrock outcrops and wadi bottoms throughout the 'Ajlūn district.

Previous Paleolithic Investigations in the 'Ajlūn District

While the potential of north-western Jordan's Paleolithic archaeological record is well acknowledged (Muheisen 1988), the central and southern portions of the 'Ajlūn district have not been systematically investigated. To our knowledge, Shea and Crawford (2003) have conducted the only survey in these areas specifically focused on identifying Paleolithic sites. They worked in the Wādī Kufrinja, visiting and inspecting numerous caves and rockshelters, mostly in the upper reaches of the valley. While some sites had Middle, Upper or Epipaleolithic artefacts eroding out on the surface, almost all of the caves were very small or had been extensively disturbed by erosion or historic and recent human activities. Lovell's RLP survey, while focusing on Chalcolithic and Bronze Age ritual use of caves in Jordan, has incidentally confirmed Shea and Crawford's results, with Mughr al-Ḥamāmah representing a relatively rare exception of substantial surface finds, indicating potential buried stratified deposits (J. Lovell pers. comm. 2007). In this context, we note that survey for Paleolithic-age open air sites in either the Wādī Kufrinja or Wādī Rājib has not yet been conducted. This raises an additional reason to investigate Mughr al-Ḥamāmah. If stratified

deposits are indeed preserved there, we would have a local cave sequence with which to anchor the chronological placement of nearby open air deposits.

The Site

Mughr al-Ḥamāmah (Caves of the Doves) are located approximately at N32°15'23.5" / E035°38'04.1" and situated at roughly 80m. asl (see **Figs. 1 and 2**). Based on visual inspection, we report the approximate Google Earth coordinates as N32°15'26.79" / E35°38'4.05". The site consists of a series of five distinct caves and rockshelters, whose south-facing mouths are exposed in a 10-15m thick limestone outcrop that defines the upper slope of the right bank of a small, only seasonally flowing wadi, which dissects the ridge between the mouths of the Wādī Rājib and Wādī Kufrinja (see **Figs. 2 and 3**). The caves are fronted by a relatively narrow, rubble-strewn terrace, which gives way to quite a steep 25°-30° slope down to the wadi bed. As seen in **Fig. 3**, this slope appears to preserve remnant agricultural terraces. Sparsely distributed ceramic sherds are visible along the entire slope, suggesting a likely Roman - Byzantine date for the terracing. We have numbered the caves from 1 to 5, oriented from west to east. Our surveying efforts focused on total station mapping of the cliff face, cave wall contours and major cave terrace features (**Figs. 3-6**). Here, we briefly describe the five caves and their terraces.



3. View of Mughr al-Ḥamāmah from the south. The five main chambers are numbered from west to east.



4. View of Maghārat al-Ḥamāmah 3 during site mapping. Note in foreground that the exposed bedrock is ancient breccia that likely dramatically predates the Middle and Upper Pleistocene formation of the archaeological deposits. In the middle distance a shepherd wall is visible. Cave 3 and Cave 4 (the latter is off-picture to right) appear to be the remnants of a largely collapsed chamber that may preserve intact Pleistocene deposits under more recent roof fall.



5. Mughr al-Ḥamāmah 2 looking east, with rockfall-strewn terrace in the foreground. Massive roof collapse indicates a former outer chamber, which is now collapsed.

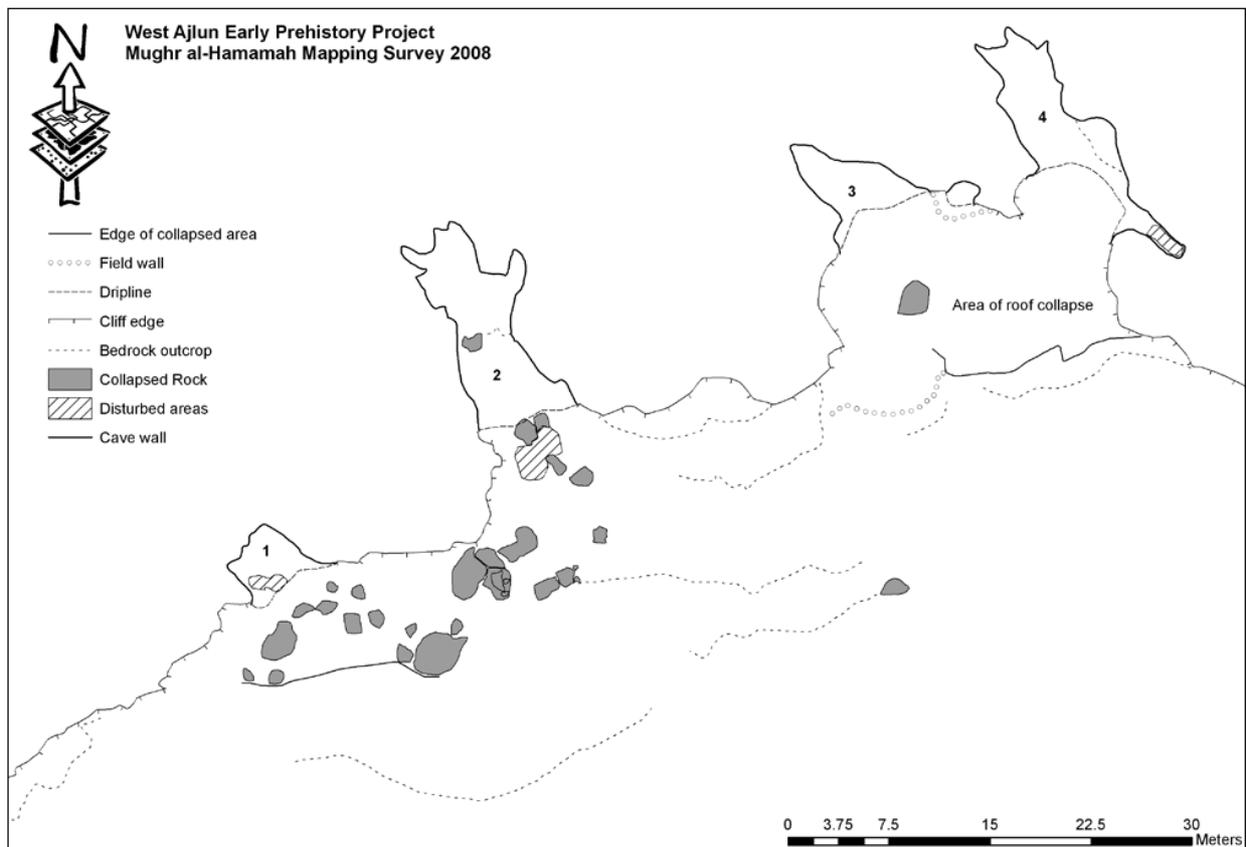
Al-Ḥamāmah 1

This chamber is small — approximately 4 by 4 meters in plan with a maximum entrance height of *ca.* 4m. Little in the way of sediment is preserved and much of the floor of the cave is defined by a relatively flat bedrock shelf. However, a fairly large hole (likely dug by shepherds to store hay, other supplies or trash) intrudes into sediment that had filled in a crack in the limestone shelf. Toward the dripline, the hole was dug out to a depth of about 150cm, under a large slab of rockfall lying flat and extending onto the terrace. Thus, sediments on the terrace are preserved and may be fairly deep. Unsystematic surface collection around Cave 1 revealed most-

ly Upper or Epipaleolithic diagnostic artefacts, including several blade / bladelet cores. These surface finds may have been thrown up during excavation of the hole. If so, the bulk of the deposits on the terrace are protected by rather massive rockfall. Currently, they are inaccessible, but limited clearance could allow sufficient test excavation in the future.

Al-Ḥamāmah 2

This cave consists of two moderately sized, successive chambers (**Fig. 5**). The back chamber lacks a chimney and is strewn with roof and wall fall fragments. It appears unlikely to contain archaeological deposits; patterns of wall



6. Plan view of Mughr al-Ḥamāmah 1-4. Surface collection results suggest that al-Ḥamāmah 1 Terrace and al-Ḥamāmah 2 Cave and Terrace have the most potential for preserving stratified prehistoric deposits. al-Ḥamāmah 3 Terrace may also preserve Pleistocene-age deposits. Cave 5 is located approximately 75m to the east and contains no intact deposits. The exposure of successive bedrock sills illustrate that the cave terraces are relatively narrow, with erosion having created a rubble-strewn talus slope down to the wadi floor, almost 50 meters below.

fall suggest that it had been at least partially sealed off from the front chamber for much of the cave's Pleistocene history. The front chamber is more regularly shaped, with a triangular entrance roughly 8m wide at the base and 9m high at the apex. While also lacking a chimney, its walls meet the current sediment surface diving virtually vertically down. Moreover, the surface is largely free of fallen rock. Preserved sediment is visible underlying the one major block of wall fall (likely from the collapsed entrance to the back chamber). This sediment resembles phosphatized Pleistocene cave deposits from sites in Cis-Jordan, including Hayonim and Kebara (**Fig. 6**). Thus, the outer chamber has the best observed potential to preserve buried intact cave deposits.

Cave 2 is also fronted by a relatively extensive terrace on which several large boulders and bedrock outcrops are exposed, suggesting

that one or more larger chambers have long ago collapsed. Indeed, it is notable that somewhat weathered cemented (probably calcified) terrace sediment includes visible flint and bone artefacts. Cave 2's outer chamber and terrace appear to provide the best potential for excavation. Surface artefacts found mainly on the terrace include diagnostic Middle Paleolithic (Levallois) material and Upper-Epipaleolithic (a carinated scraper, cores and bladelet debitage) flint pieces.

Al-Ḥamāmah 3 and 4

These two caves appear unlikely to hold archaeological deposits (**Fig. 4**). However, the terrace is strewn with relatively unweathered large roof and wall collapse boulders, suggesting that a large outerchamber collapsed relatively recently. No surface artefacts were found here, but the terrace of Cave 3, in particular, is relatively free of

roof fall and may preserve intact buried Pleistocene sediments. A number of low dry-stone walls have been constructed in the area, one of which encloses the entrance of a small, low rock shelter between Mughr al-Ḥamāmah 3 and 4. These reflect shepherd activity and use of the caves to pen animals. Further traces of similar constructions were observed on some of the terraces in front of the caves, often utilizing existing rock outcrops to facilitate wall construction.

Al-Ḥamāmah 5

Located approximately 25m east of Cave 4, the fifth cave is an irregularly shaped chamber with little sediment and an eroded, steep terrace. No surface artefacts were recovered and Cave 5 seems unlikely to preserve Pleistocene deposits. A low dry-stone wall seals off the entrance to the cave and was likely built by recent shepherds to pen animals inside the cave.

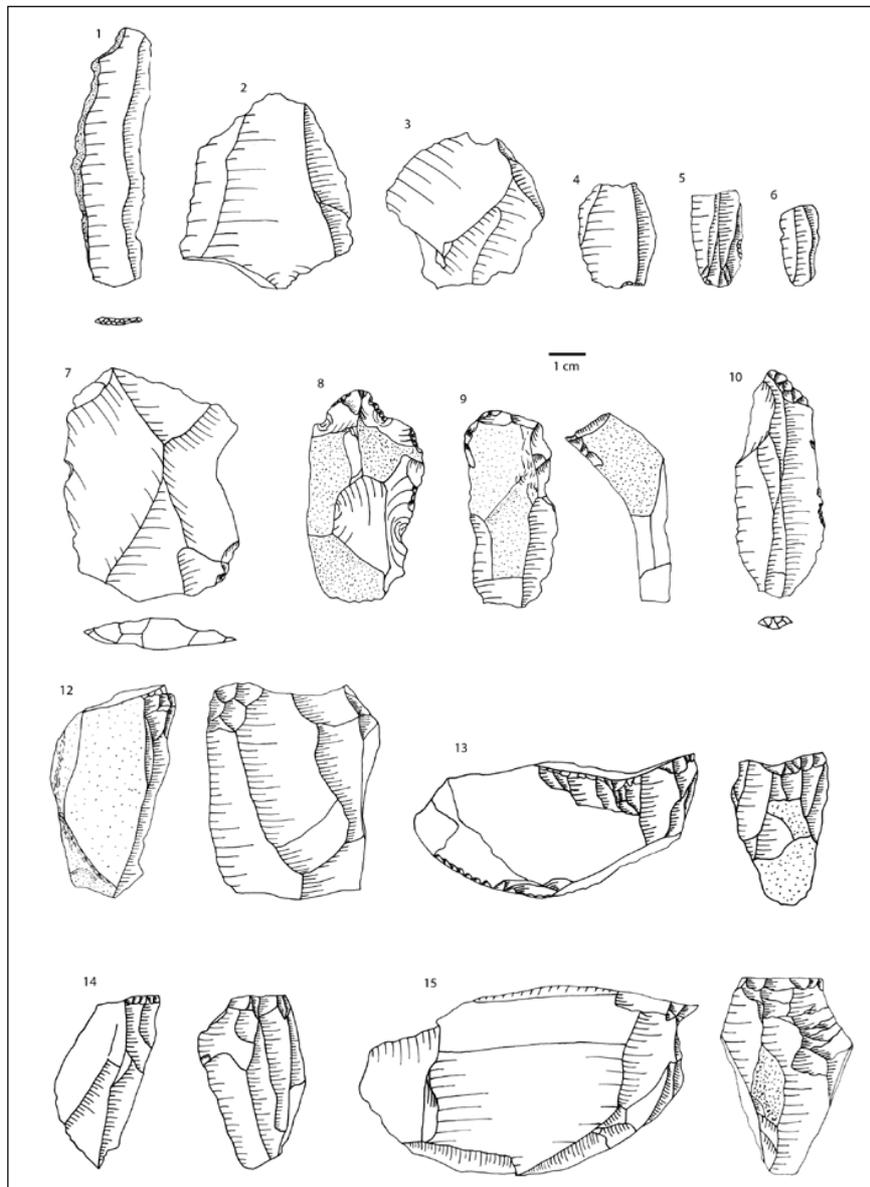
Finds

With a short field season, we conducted an unsystematic surface collection, resulting in the retrieval of 48 flint artefacts, one groundstone artefact fragment and two likely Pleistocene-age ungulate bone fragments. Pottery sherds dating to the Byzantine and later periods were also noted on the cave terraces and slope below, but were not collected. We note that RLP workers conducted two previous unsystematic surface collections. Here, we report only on the July 2008 surface collection. Many of the flint artefacts are broadly diagnostic to either the Middle (200,000-48,000 BC) or Upper / Epipaleolithic (48,000-10,000 BC) periods (**Fig. 8**). The Middle Paleolithic diagnostic pieces include four Levallois flakes, a small retouched Levallois point, one narrow Levallois blade and one bifacial artefact that appears to be a Levallois core with its dorsal surface reworked and battered. The Levallois pieces show mainly unidirectional dorsal scar patterns. We note also that the previous RLP survey carried out by Lovell and Wasse retrieved a unidirectional convergent Levallois flake. Most of the Middle Paleolithic diagnostic material was recovered from the Maghārat al-Ḥamāmah 2 outer chamber and terrace. Much of the Upper / Epipaleolithic material was recovered from al-Ḥamāmah 1. The Upper / Epipaleolithic artefacts include debitage (bladelets), three tools (various

kinds of endscraper) and 5 blade / bladelet cores (for examples, see **Fig. 7**). Two of the cores have a narrow-faced preparation, suggestive of Early or Middle Epipaleolithic. However, our sample remains too small — especially without more diagnostic tools having been recovered — to provide more precise results. We also note that a moderately thick retouched blade, with its bidirectional dorsal scar pattern and faceted platform, may be either Middle or Upper Paleolithic in age. We offer the same conclusion about two notched pieces made on thick flakes. The surface collection results confirm the presence of Middle and Upper / Epipaleolithic components at Mughr al-Ḥamāmah. Moreover, the majority of the flint artefacts recovered during this season, as well as the material recovered by Lovell's RLP team, are



7. View of exposed phosphatized sediments in Maghārat al-Ḥamāmah 2. Underlying cave wall fall (which may be very recent), these sediments are marked by phosphate inclusions, resembling diagenetically altered deposits from well-studied Middle and Upper Pleistocene cave sites in the western Levant. Thus, we expect the deposits in al-Ḥamāmah 2 to date at least broadly to the Middle - Upper Pleistocene. In such chemically altered cave sediments, bone will not be preserved, but the matrix is friable and relatively easy to excavate, while preserving flint artefacts datable by thermoluminescence. We note that bone preservation appears to be more promising on the terrace of al-Ḥamāmah 2.



8. Selected cores, debitage and tools recovered from the surface of Mughr al-Ḥamāmah 1 and 2. Middle Paleolithic diagnostic pieces include a Levallois blade (1) and flakes (2-4, 7). Upper or Epipaleolithic artefacts include bladelet fragments (5-6); a notched endscraper (7); a carinated endscraper on a thick cortical blade (8); and bladelet cores (13-15). A relatively thick re-touched flake (8) is consistent with Upper Paleolithic occupation, but we cannot rule out its association with a Middle Paleolithic occupation (Bar-Yosef and Kuhn 1999).

unpatinated and have fresh edges. This strongly suggests that the recovered material was exposed only relatively recently. This underscores the potential for finding well-preserved Middle or Upper Pleistocene archaeological deposits at the site.

Conclusions

The mapping survey, surface collection and geological observations indicate that Middle and Upper / Epipaleolithic archaeological deposits are most likely to be preserved in the outer chamber and terrace of Maghārat al-Ḥamāmah 2. Upper or Epipaleolithic deposits appear to be pre-

served under rockfall on the terrace of Maghārat al-Ḥamāmah 1. No surface artefacts were recovered from the terrace of Maghārat al-Ḥamāmah 3, but intact Palaeolithic deposits may be preserved underlying historical deposits and cave collapse. Our tentative conclusion is that Mughr al-Ḥamāmah is likely to preserve a later Pleistocene archaeological sequence, ranging from the Middle — and Upper — to Epipalaeolithic. Confirmation of this conclusion can only be achieved through future excavations at the site.

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ENDURING ENIGMAS: LATE PREHISTORIC PASTORALIST RITUAL STRUCTURES IN WĀDĪ RAMM

Gary O. Rollefson and Kerry J. Pine

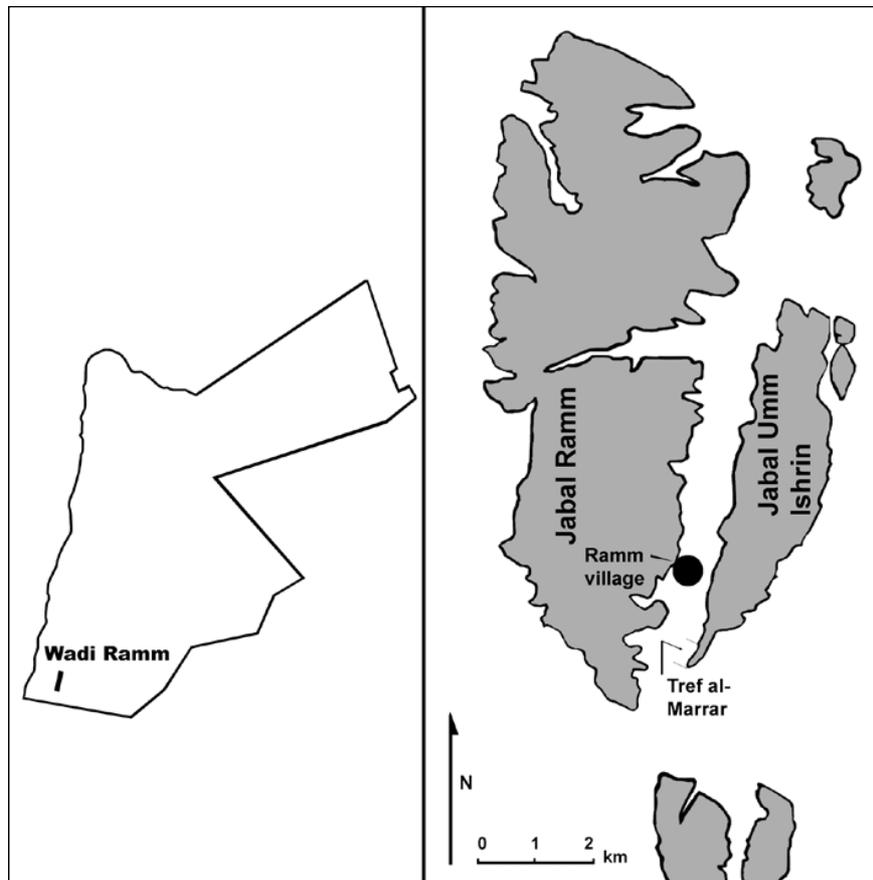
Introduction

As our final contribution to the Wādī Ramm French - Jordanian Archaeological Project directed by Dr Saba Farès - Drappeau, the authors undertook a four week season of mapping and sand clearance to finish the work begun in 2007 (Rollefson and Matlock 2007). Along with our Department of Antiquities representative, Abdullah Rawashdeh, we spent four weeks (9 June to 4 July 2008) revisiting some of the 45 stone alignments that were mapped in 2007, in ad-

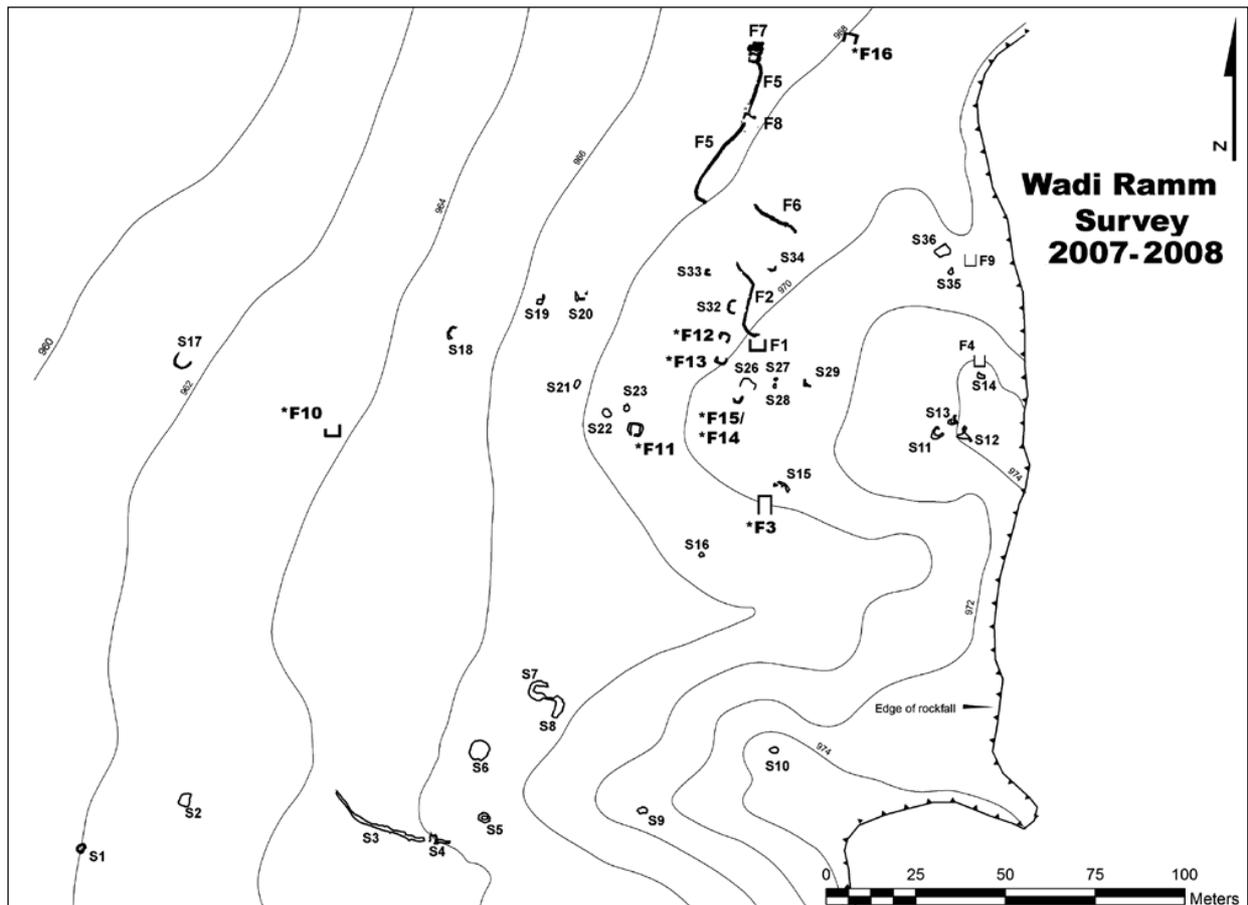
dition to locating three more in the same area (Figs. 1 and 2).

Methodology

Although indications of construction were clear, details were obscured by the movement and deposition of sediment, which necessitated clearance of drift sand. Using brushes and trowels, the drift sand was removed to expose selected features as completely as possible, down to the base of stones that constituted the various



1. Location of the *Turayf al-Marāgh* area in Wādī Ramm.



2. The distribution of mapped structures (beginning with 'S') and features (beginning with 'F'). The newly investigated features are marked with an asterisk (*) before the 'F' (Map by T. Richter, W. Matlock and G. Rollefson).

features. In some cases this entailed the removal of up to 15-20cm of sand. Since *in situ* artifacts had been totally absent in the 2007 season (as they also seemed to be in the 2008 campaign), we took soil samples from beneath stones of seven of the features in order to obtain Optically Stimulated Luminescence (OSL) dates for the construction of the structures. All exposed features were re-covered with sand at the end of the season.

Results

Owing to the persistent winds in the canyon, movement of sand since the 2007 season had exposed three new structures, *viz.* Features F10, F15, and F16 (Fig. 2), in addition to the 45 stone alignments mapped in 2007. These three structures, in addition to structures S24, S25, S30, S31 and F3 which had been mapped in 2007, were cleared of drift sand and drawn. Descriptions of the features are provided below.

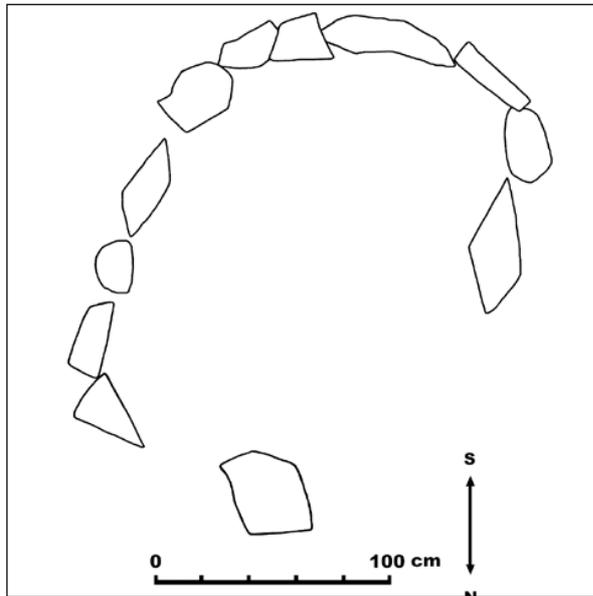
Newly Discovered Structures

F10

Feature F10 was a small, asymmetrically u-shaped alignment of sandstone slabs and rocks set on edge or on end (Figs. 3 and 4). The axis of the building was oriented to 200° (somewhat west of due south). The eastern wall was dis-



3. Photo of F10; view to south.



4. Plan of F10; north to bottom of drawing.

proportionately long compared to the western wall: approximately two meters long compared to only one meter. The width of the alignment just before the apse-like south wall began to arc from one side to the other was about 1.20m.

In the south-western corner of the structure, several small triangular sandstone pavers about 1.5cm thick were placed between two stones set on edge, forming a small paved chamber-like arrangement of unknown function. The position of these stones, 5-10cm above the base of the structure walls, may represent secondary use of the feature after a period of time during which sand filled in much of the floor. The south-east corner of the feature also had several pavers, but their orientation indicates some post-depositional disturbance. Near the middle of the eastern wall we recovered a single Nabataean sherd about 15cm below the modern surface and at the same general level as the disturbed pavers in the south-east corner.

Although it cannot be demonstrated securely in stratigraphic terms, a striking element of the F10 ensemble is a lone standing stone at the northern end of the alignment. This is a sizeable rock set on end, nearly 40cm wide and 45cm high. It recalls a similar standing stone just to the north of the cobble-paved 'apron' of F7 (Rollefson and Matlock 2007) and thus might have served the same purpose, whatever that might have been. Attempts to align the center of

this standing stone and any of the on-edge slabs in the southern wall with terrain landmarks on the horizon were unproductive.

The remarkable aspect of F10 is a low, broad (60cm wide) sandstone slab set on edge. About 30cm below the top of this slab is an area in the center with more than 50 minute pits intentionally pecked into the sandstone. No regularity in design was detectable, but there are clear indications that this alteration of the stone's surface was the result of Nabataean masons (see below).

F15

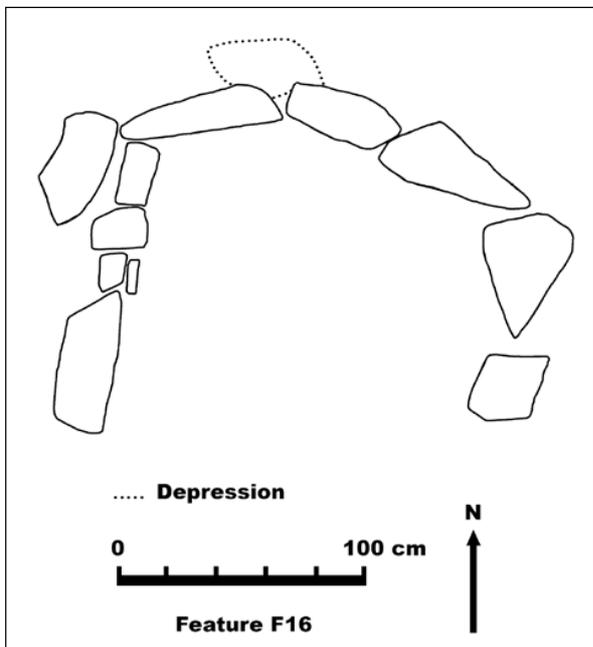
In 2007 we noticed an area near a stone alignment (S24 in Rollefson and Matlock 2007: Fig. 2) that was marked by several thin sandstone slabs, similar to the pavers so common in the Ṭurayf al-Marāgh area, barely emerging through the drift sand surface. At the time there was no apparent pattern to these narrow slabs poking through the sand, so we did not map them as a feature at the time. In the interval since the end of the 2007 season, more sand had been driven by winds to expose additional on-edge pavers, which appeared to form small enclosures less than a half meter in maximum dimension. We spent some time exposing this cluster of 'chambers', but will postpone description and discussion until dealing with Feature F14 = S24 below.

F16

F16 was, despite its late number in the sequence, the first feature we worked on in the 2008 season. It is the northernmost feature in the Ṭurayf al-Marāgh area, and once again was noted only because of deflation by winds since the end of the 2007 season (Figs. 5 and 6). The axis of orientation is 20° east of north. As is the case with most of the structures at Ṭurayf al-Marāgh, the dimensions are relatively small: the western wall is about 1.40m long, the eastern wall about 90cm and the northern cross-wall 1.75m. The only notable feature of this structure is a relatively deep depression just outside the center of the northern wall. Although filled with drift sand, the difference in texture between the original depression and the loose fill was readily apparent. Removal of the drift sand revealed a 'socket' that measured 34cm by 30cm across



5. Photo of F16; north arrow is 35cm long.



6. Plan of F16; the depression that apparently once contained a standing stone is marked with dots.

and 11cm deep. This appears to have been the location of a standing stone that was later ‘robbed’ for some other purpose. Although the ‘axis of symmetry’ of the structure itself is oriented east of north, the midpoint of the space between the southern ends of the eastern and western walls forms an alignment with the ‘vacant’ standing stone that is directed towards true north.

Re-investigation of Structures Mapped in 2007

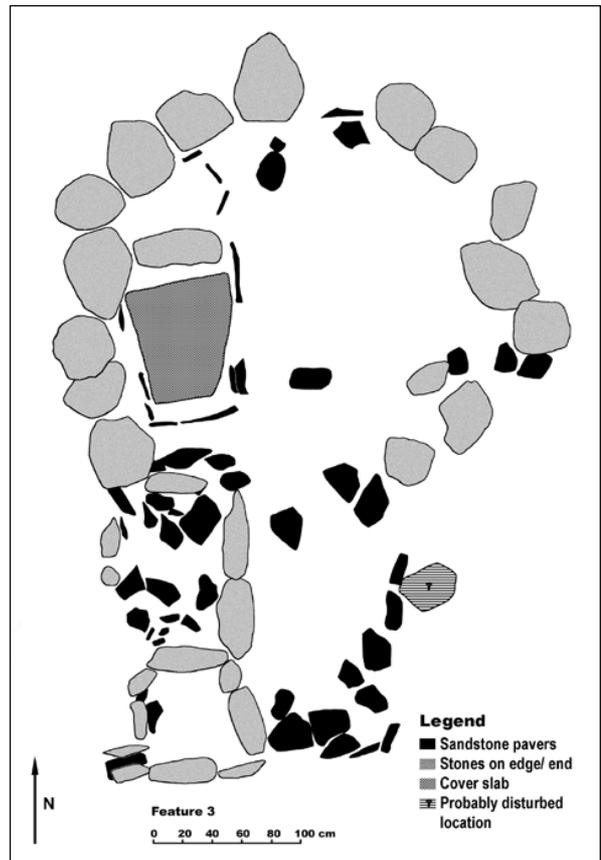
The 2007 season was very short, so many of the objectives we would normally have pursued had to be postponed until the 2008 season. In 2008, we therefore took the opportunity to take

a closer look at some of the stone alignments we had mapped in 2007.

F3

Feature 3 was one of the two most intriguing structures we uncovered in 2007. Aside from the serpentine meanders of Features F2, F6, and F7 (Fig. 2), this circular arrangement of stones set on end was not matched anywhere in the Ṭurayf al-Marāgh sector, and the addition of two sizeable rectilinear ‘chambers’ at the south-western rim of the circle added to its mystique. But perhaps the most attractive aspect of this architectural *tableau* was the large sandstone slab set off by upended pavers inside the circle (Fig. 7; cf. Rollefson and Matlock 2007: 211).

Because we had so little time in the 2007 season, and since we found no diagnostic artifacts directly associated with the features in 2007, in 2008 we determined to resolve the dating of at least some of the structures by taking sediment samples from which to obtain OSL dates that



7. Plan of F3 before the sandstone pavers were exposed (from Rollefson and Matlock 2007).

would give us a clear (albeit ‘ballpark figure’) time frame for the construction of the different kinds of features. This aspect of the 2008 season is treated more directly below, but its implementation led to some surprises concerning the architecture of Feature F3.

The large slab in the western side of F3 had a very magnetic effect on our imagination. Kirkbride had excavated small rectangular features at Rizqeh, for example, and found important dating and ritual evidence that tied the site to the Chalcolithic period (Kirkbride 1969: 191). Was this the case for F3 as well? In order to obtain soil samples from beneath the sandstone slab for dating purposes, it was of course necessary to

dig beneath the slab. On the way we encountered a major surprise: the interior of the circular part of F3 was, in fact, covered with thin sandstone pavers, a circumstance we were not aware of in 2007 (**Fig. 8**). In contrast to most of the features we investigated in both the 2007 and 2008 seasons, this was the only structure that was completely paved, and this added to the curiosity we felt.

We probed the sandy sediments beneath the sandstone slab and, once this was accomplished, decided to lift the slab (**Fig. 9**) and investigate the material that it might have ‘protected’. Unfortunately, sectioning the sandy sediments beneath the slab to a depth of 35cm (well beneath



8. Photo of the sandstone pavers in F3.



9. Photo of ‘bins’ and the large sandstone slab before investigation of the sand beneath it in Structure F3 (view to east); north arrow is 35cm long.

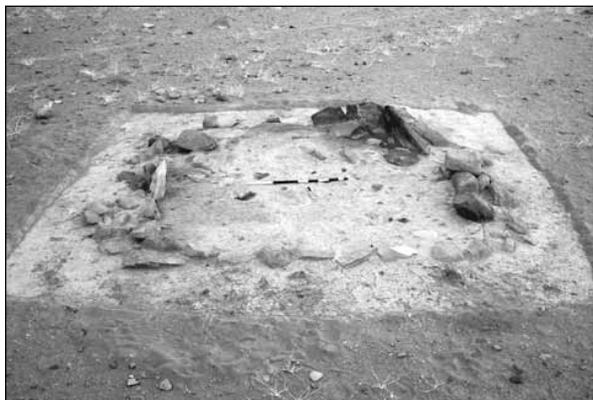
the floor of the feature itself) in a trench 25cm wide showed no indication of inclusions or of any incidents of burial or retrieval of objects. What the purpose of the slab may have been, it apparently had nothing to do with the soil beneath it.

After we had cleared the pavers, it was clear that the floor of F3 was not horizontal. Instead, the northern edge of the paved area was 6-7cm higher than the southern edge (a *ca* 3 % slope over two meters). This suggests this F3 may not have been a residential structure.

F11 = S24

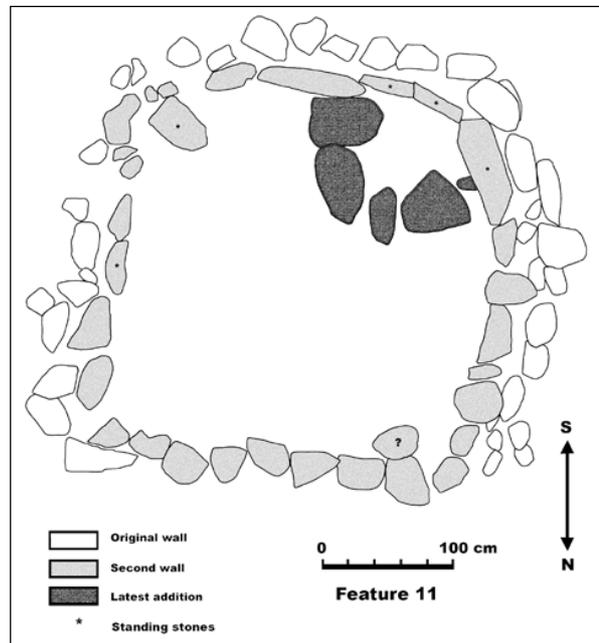
In the 2008 season we wanted to sample the variety of sizes, orientations and configurations of the structures we had mapped in the 2007 season. Among this sample was S24, which was re-designated as Feature F11 (Figs. 10-12). It was among the largest of the structures we had found (the only larger one was F7) and was attractive because there appeared to be at least two (probably three) phases in its construction and function (not counting its recent use as a windbreak for making tea by 20th century shepherd groups, the traces of which were abundant in the upper portion of drift sand).

As Fig. 11 clearly indicates, there are two walls associated with F11 = S24 (hereafter, F11). From the stratigraphic evidence (or lack thereof, in view of the nature of sandy soil accumulation), we suggest that the original structure consisted of the outer perimeter stones, even though the base of the stone in both walls was at approximately the same absolute elevation. The outer perimeter walls are very large in comparison with all of the other rectilinear structures we



10. Photo of F11 to south.

investigated, but this should not impress us with any special meaning, since the efforts involved



11. Plan of F11.



12. Photo of the three standing stones in the south-west corner of F11; view to south-west.

in construction are not beyond the physical capabilities of even one individual. The orientation of the structure along the axis of symmetry is 190° (slightly west of south).

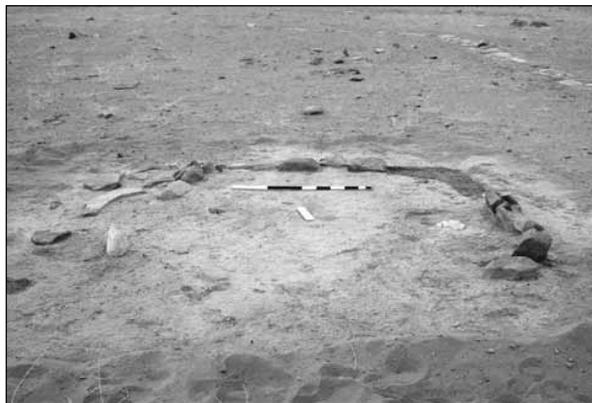
The outer arrangement of stones is not remarkable beyond the general rectilinear shape: the constituent stones are not particularly distinctive in terms of dimensions. The inner arrangement, however, shows some major departures from the outer stones. First, the interior of the u-shape of the earlier structure was replaced with a rectilinear enclosure, which is not echoed

anywhere else in the Ṭurayf al-Marāgh area of Wādī Ramm. Second, the south-eastern corner of the structure takes on special focus, since here there are sandstone slabs set on edge that are 56-66cm higher than any other stones in the other walls, and these stones appear to be from a later re-use and re-orientation of the structure. It might be mentioned that an axis from the north-eastern corner of the secondary wall aligns at an angle of 223° (i.e., virtually south-west) with a transect through the central standing stone of the south-western triad of standing stones to intersect on the horizon with a mountain peak called Jabal Redihi (**Fig. 12**). There are also two standing stones in the eastern wall: one (37cm high) in the center and another (51cm high) in the south-eastern corner; the latter had tumbled completely while the former was leaning at an angle of roughly 70°, both casualties of post-abandonment disturbance.

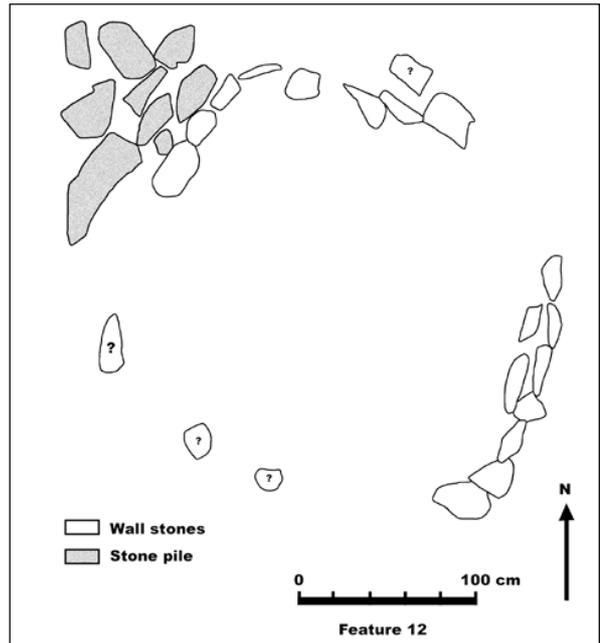
The other stones that filled in the south-western corner of F11 (dark grey in **Fig. 11**) are certainly later than both the original outer wall and the interior rectilinear rearrangement of the structure. The upper sandy deposits clearly indicate the use of this corner in very recent times, owing to the presence of the plastic store-bought containers of yoghurt-eating shepherds.

F12 = S31

Feature F12 is an incomplete structure, in the sense that some of the stones in the alignment appear to have been removed and, perhaps, discarded just outside the north-west perimeter of the structure (**Figs. 13 and 14**). The orientation along the axis of symmetry is about 28.5° east of north. It seems to have been a hasty construc-



13. Photo of F12; view to north. Serpentine F2 is at upper right corner.



14. Plan of F12.

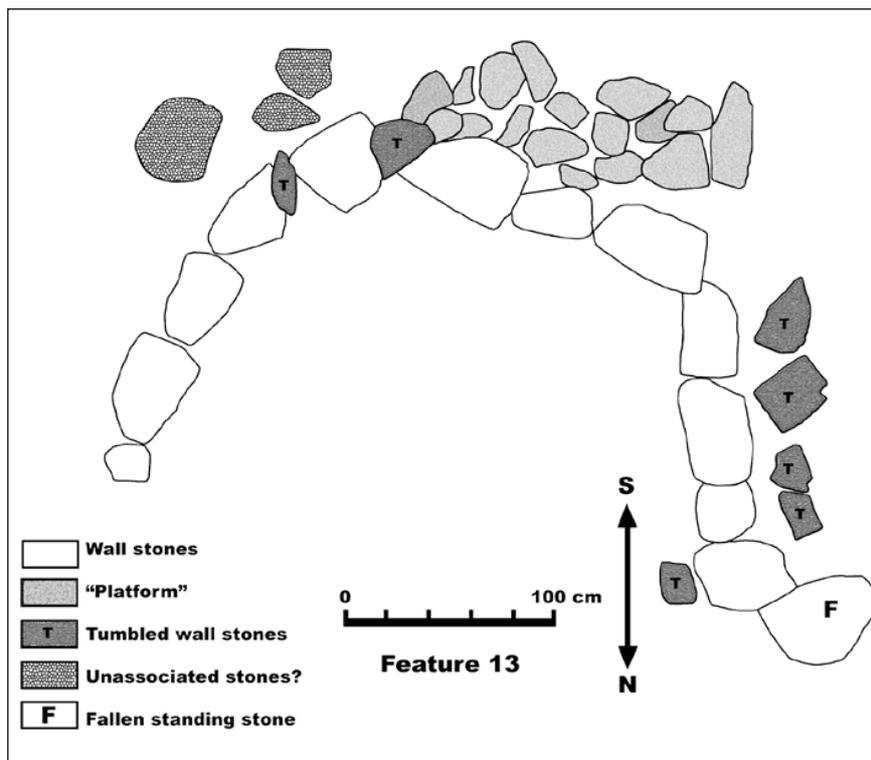
tion to begin with, measuring only 2.4m east-west and 2.0m north-south; none of the stones was very large.

F13 = S30

Just 15 m south of F12 is the former Structure S30, now renamed F13 (**Figs. 15 and 16**). The massive stones (up to 80cm high) are aligned in a rough u-shape, oriented along the axis of symmetry at an angle of 199° (south of south-west). The feature measures 2.8m east-west and 2.0m north-south. The feature appears to have experienced two or three separate episodes of use: a secondary use of the alignment is indicated by the presence of light-colored sandstone cobbles and pavers inside the u-shaped structure (**Fig.**



15. Photo of F13; view to south.



16. Plan of F13.

16). Included within the sandy fill, among the pavers and cobbles of this use, were four undecorated ribbed Nabataean potsherds. A tertiary use is represented by a scatter of very coarse sandstone boulders (from the Salib Arkose Bedded Sandstone formation about a hundred meters to the south) that may originally have been stacked atop the stone blocks in the original alignment but, if so, these evidently tumbled after the structure was eventually abandoned.

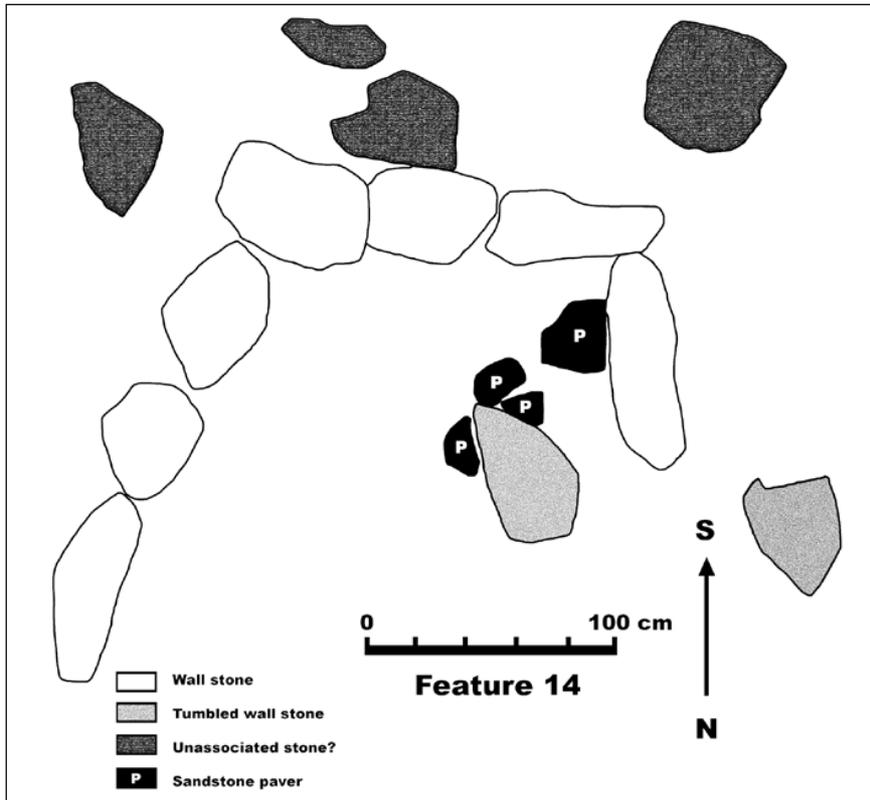
Outside the northern wall of F13 was a 'platform' of sandstone slabs and cobbles tucked up against the wall at the south-eastern corner of the feature (Fig. 16). The function of the 'platform' is not known, nor can it be definitely associated with any particular phase of the use of the feature. A possible utilized flint flake was found between the platform stones and, in view of the fact that flint sources are found only along the edge of the Ma'an Plateau about 50km to the north (Henry *et al.* 2003: 16), the artifact represents a valuable resource. However, it is also not impossible that the flake was picked up by someone visiting the abandoned MPPNB site of 'Ayn Abū Nukhayla just a couple of kilometers west across the Wādī Ramm from Ṭurayf al-Marāgh.

F14 = S25 and F15

The u-shaped stone alignment designated F14 (recorded as S24 in 2007) is comprised of large sandstone boulders oriented along an axis of symmetry facing due-south (180°). Four large sandstone boulders to the north of the alignment do not appear to be directly related to the feature, and two sandstone boulders near the northern end of the western wall appear to have been dislodged from the alignment sometime after F14 went out of use (Fig. 17). One of the tumbled stones ("T" in Fig. 18) lay atop the edges



17. Photo of F14; view to south. Southernmost part of F15 is visible at lower left corner.



18. Plan of F14.

of three sandstone pavers, indicating that at one time the feature may have had a paved floor, as was the case with F3 (many dislodged sandstone pavers were found in the hollow area of F14, indicating disturbance after abandonment).

As we followed the eastern wall, making certain that the end of it was not buried beneath drift sand, we came across some slabs of light-

colored Disi sandstone that, when exposed more extensively, constituted a narrow arrangement that was orthogonal to the eastern wall of F14. Continued clearance of drift sand eventually exposed an extensive layout of horizontal slabs and small 'enclosures' set apart by sandstone slabs set on edge (Fig. 19). We designated the southern cluster of horizontal slabs and edged



19. Photo of F15; view to south.

'bins' as F15 since it was not absolutely certain that it was a part of F14, although it is likely the two features were in use at the same time. The east-west oriented pavers of F15 appear to follow a slight slope, decreasing in absolute elevation to the west. The center of the pavers in F15 is 13cm higher than the westernmost paver, and the westernmost paver is 8cm higher than the *in situ* pavers in F14. **Fig. 20** shows the plan of both features, displaying the relationship between them.

The 'bins' in F15 recall similar arrangements of on-edge sandstone pavers at the western side of F3, located about 25m to the south-south-east. In neither feature were the floors of the 'bins' paved with sandstone, but F3 and F15 are very different in terms of orientation and symmetry.

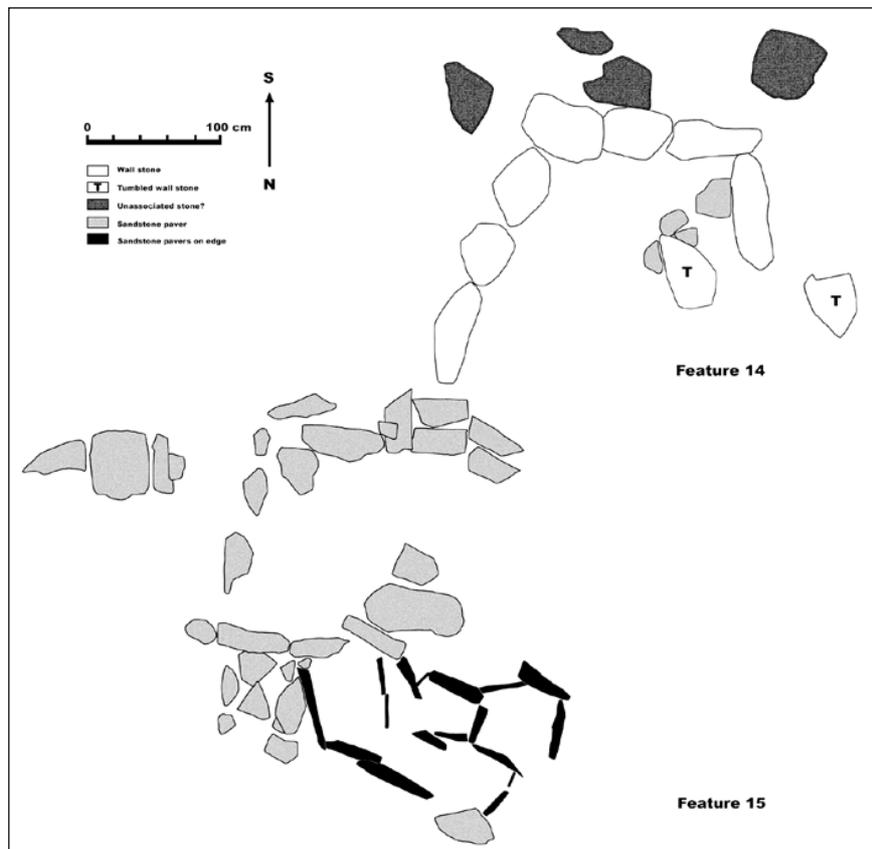
OSL Samples

Because artifacts were absolutely rare and in all but one case in suspicious relationship to features that could be used to assign dates to the structures, we took sediment samples from beneath stones that made up the alignments in

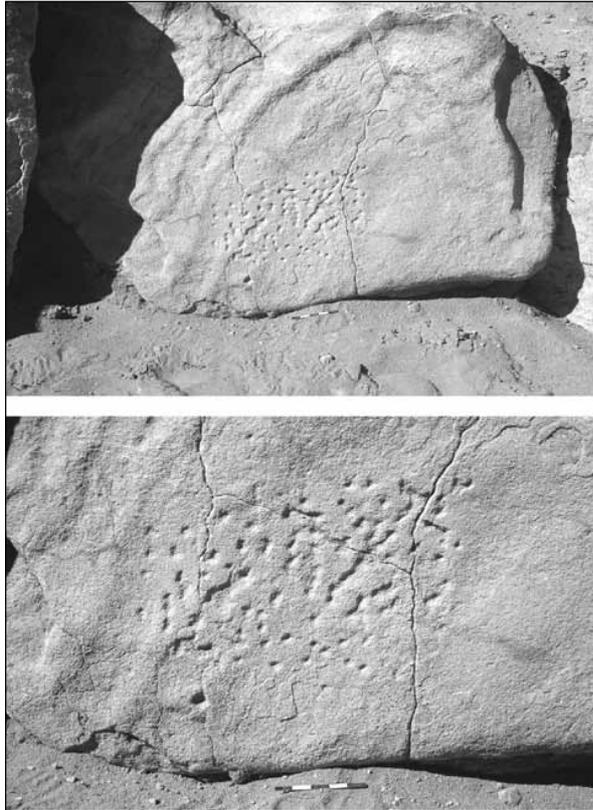
seven of the features. These samples of sandy soil would reveal by OSL how long the quartz crystals in the sand had been shielded from the energy of direct insolation by the sun. Sample #1 was taken from beneath one of the stones in the sinuous 'pathway' of F5 (Rollefson and Matlock 2007: 215). Sample #2 came from another pathway, F6, and Sample #3 from the sinuous pathway F2. Sample #4 was extracted from one of the standing stones that formed the southern wall of F7 (Rollefson and Matlock 2007: 217-218), while Sample #5 came from beneath the large sandstone slab at the western edge of the circular part of F3. Sample # 6 was obtained from under the broad standing stone at the southern wall of F9 (Rollefson and Matlock 2007: 216) and, finally, Sample #7 originated from beneath a standing stone in the south-western corner of F10. It will take some time for the results of the analyses of these samples to be produced.

Discussion

The features in the Ṭurayf al-Marāgh area of Wādī Ramm remain enigmatic in terms of their



20. Combined plan of F14 and F15; south to top of drawing.



21. Pitted stone in the center of F10.

purpose and age. The orientation of the structures virtually spans the compass, although several are aligned to the Pole Star or to the exact opposite azimuth reading. The axis of the north-western corner of F11 with its south-western corner intersects a prominent mountain on the south-western part of the horizon, and while this might conform to Nabataean use of the inner renovation of the structure, it doesn't provide much clarity as to the age of the original u-shaped structure.

Ribbed potsherds of typical Nabataean manufacture occur dispersed across the surface of Turayf al-Marāgh, although they are not abundant and appear to originate from a prominent tumulus (S12 in Fig. 12) uphill from all of the structures we recorded. Such sherds were found in five of the structures we cleared (F3, F10, F12, F13 and F15), but they only appeared in numbers of one to five sherds per structure, never indicating a pot-break for example. Small glass fragments with opalized patina are also very rare. The co-occurrence of a couple of the potsherds with, in one case, small numbers of

mammal bones indicates that these particular examples are probably associated with animal burrows (jackal burrows being numerous in the region today) and animal disturbance to the *in situ* sediments. In no case was the ceramic evidence associated with a floor surface, occurring instead in fill above floors or in association with the disturbance of pavers on the original floors. Based on these observations, then, the appearance of Nabataean pottery does not provide secure dating for the original construction and use of any of the features (e.g., F11).

In only one case is there strong support for Nabataean construction of a u-shaped structure: the intentionally pitted sandstone slab set on edge in the center of the southern wall of F10 (Fig. 21). While it is likely that Nabataean pastoralists noticed and possibly re-used standing structures from earlier times, F10 is a case where they could also imitate earlier efforts at erecting u-shaped structures.

Acknowledgements

We would like to express our gratitude to the Department of Antiquities for the permit to continue our research in the 2008 season and to Dr Saba Farès - Drappeau for the opportunity to work on her project. We also thank Dr Barbara Porter (Director) and Dr Chris Tuttle (Associate Director) of the American Center of Oriental Research in Amman for their generous assistance prior to, during and after the field season. The research was also greatly assisted by donations from Dr Joan Kedziora, the Forney Family Foundation and John and Ana Maria Ashahara. We are also grateful to the Natural Resources Authority for the use of their facilities in Rashidiyya.

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THE INTERNATIONAL WĀDĪ FARASA PROJECT (IWFP): PRELIMINARY REPORT ON THE 2007 SEASON

Stephan G. Schmid

Introduction and Acknowledgments

The 2007 field season of the International Wādī Farasa Project (IWFP) lasted from 12th August to sixth September. IWFP 2007 was part of the French project, “From Petra to Wādī Rum”, directed by Dr Christian Augé (CNRS, IFPO ‘Ammān). IWFP 2007 was conducted by the Association for the Understanding of Ancient Cultures (AUAC;), based in Basel, Switzerland, and was generously sponsored by the French Ministry of Foreign Affairs, the French National Centre for Scientific Research (CNRS) and Paul Valéry University, Montpellier III, France. We would like to thank the Director General of the Department of Antiquities, Dr Fawwaz al-Khraysheh, for his support and for granting the work permit, in addition to Dr Christian Augé (‘Ammān), Dr Fawzi Zayadine (‘Ammān), Prof. David F. Graf (Miami) and Dr Bernhard Kolb (Basel) for their continuous interest in the project. We would also like to thank IFPO ‘Ammān, especially its director Dr Jean-François Salles, for accommodating the team during its stay at ‘Ammān and Suleiman Farajat, director of the Petra Park Authority, for logistical support.

The following persons participated in IWFP 2007: archaeologists Stephan G. Schmid (director), André Barmasse (Basel), Laurent Gorgérat (Basel), Bénédicte Renoult (Montpellier), Corinne Gosset (Montpellier) and Aurélie Guet (Montpellier). The Department of Antiquities representative was Abduraheem Hazeem, whose help and advice were very much appreciated. Ten workmen and one teawoman from the B’dul and Saydine tribes were employed. During the teams sojourn at Nazzal’s Camp, Shaher Mohammed al-Bdool was a very efficient and helpful camp manager.

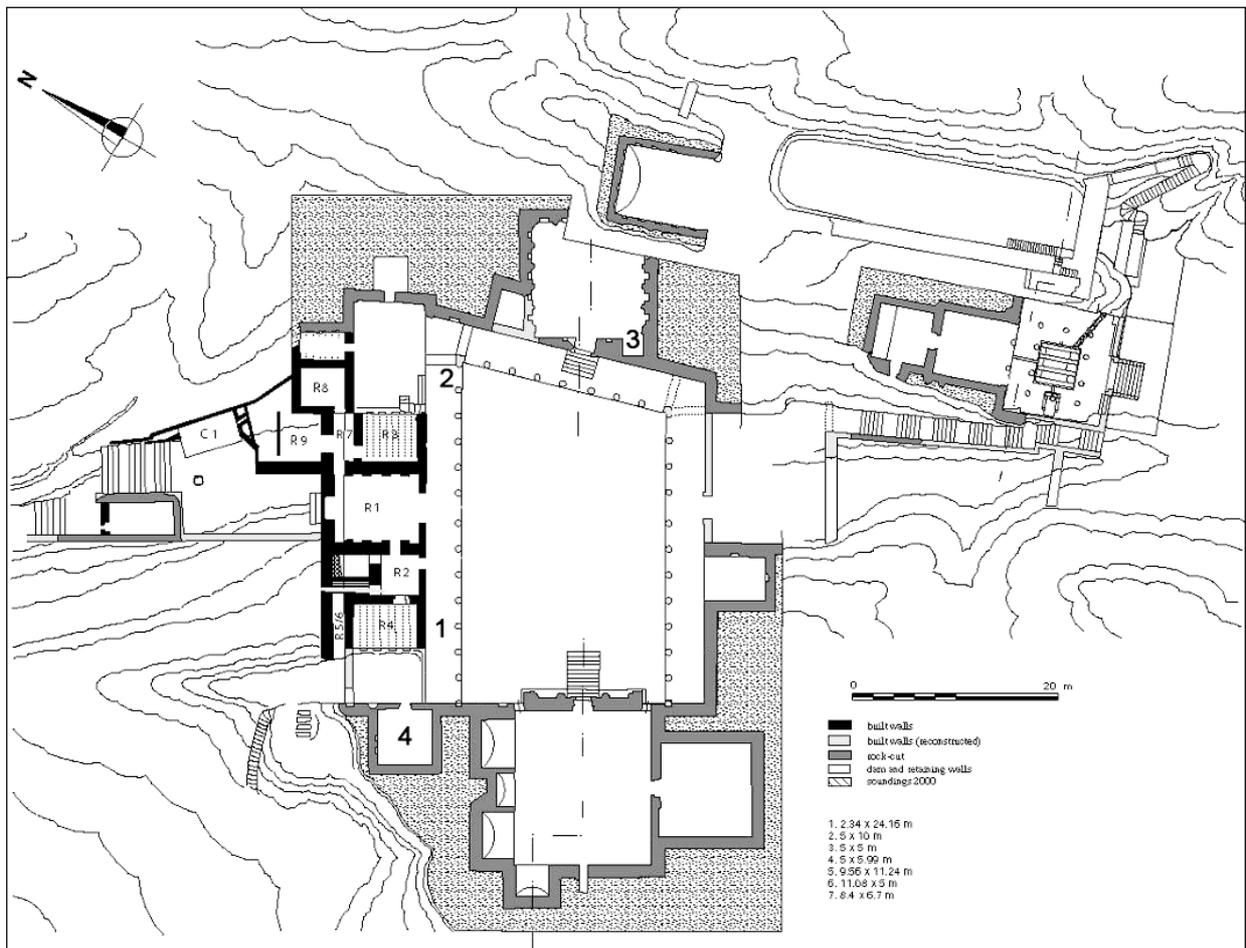
In view of the results of previous seasons

(Schmid 2007b), the following trenches and soundings were opened (**Fig. 1**).

At the emplacement of the northern portico a square was opened in order to connect the previously excavated part of the central portico with the first sounding excavated in 2000 at its south-west corner (**Fig. 1, no. 1**). Underneath the rocky plateau at the north-east side of the complex, the Mediaeval structures we began to expose in 2006 were again the objectives of several trenches (**Fig. 1, no. 2**). A small sounding was excavated within the southern-most entrance to the huge *triclinium* of the complex (**Fig. 1, no. 3**). Finally, the rock-cut room associated with the rocky outcrop at the south-west side of the complex was cleaned, as was the rocky surface in front of it (**Fig. 1, no. 4**).

Northern Portico

Towards the western corner of the northern portico, a trench was opened to continue exposure of the colonnade. Since the trench is situated immediately adjacent to Room 4 (**Fig. 1, no. 1**), it was hoped to obtain some additional information about the water management of the complex (see Schmid 2008). As discussed in previous reports, Room 4 and the neighbouring Room 2 were not constructed during the main building phase of the complex in the second half of the first century AD, but slightly later in the early second century AD. When Room 4 was constructed, an underground channel of Nabataean date was blocked, first by the construction of the substantial northern wall of Room 4, and again by the fill upon which the floor of Room 4 was subsequently built. This caused massive disturbance to the water management of the entire complex. The water channel underneath Room 4 was actually used to drain water from

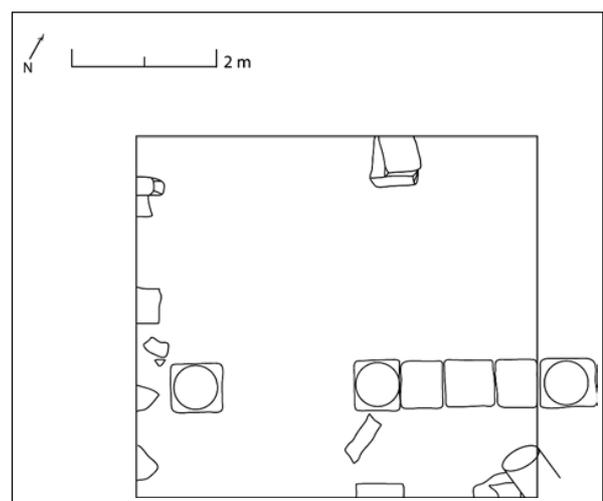


1. Wādi Farasa East, general plan of the Soldier Tomb's complex (A. Barmasse after Bachmann, Watzinger and Wiegand 1921).

the entire wadi, a necessary measure in order to have a stable area for construction. In the Nabataean period, following the construction of the courtyard and porticoes, this water channel ran underneath these installations but must have remained in use. It was only with the construction of Room 4 that it was cut. This led to a series of problems: since the water could no longer be evacuated from the complex, it must have begun to flood other rooms in the northern area. As a result, the water channel north of Room 2 was constructed (excavated in 2001, see Schmid 2002). The water must also have penetrated under Room 4, causing major stability problems.

Therefore, one of the goals of the 2007 season was to confirm the exact position and operation of the water channel under the northern portico, in addition to excavation of the colonnade itself. Since the area under exploration is limited on its northern side by the southern wall

of Room 4, the remains of at least two columns were found in collapse debris (**Figs. 2 and 3**). So far, 12 column drums have been recorded



2. Wādi Farasa East, sounding within northern portico (L. Gorgerat).

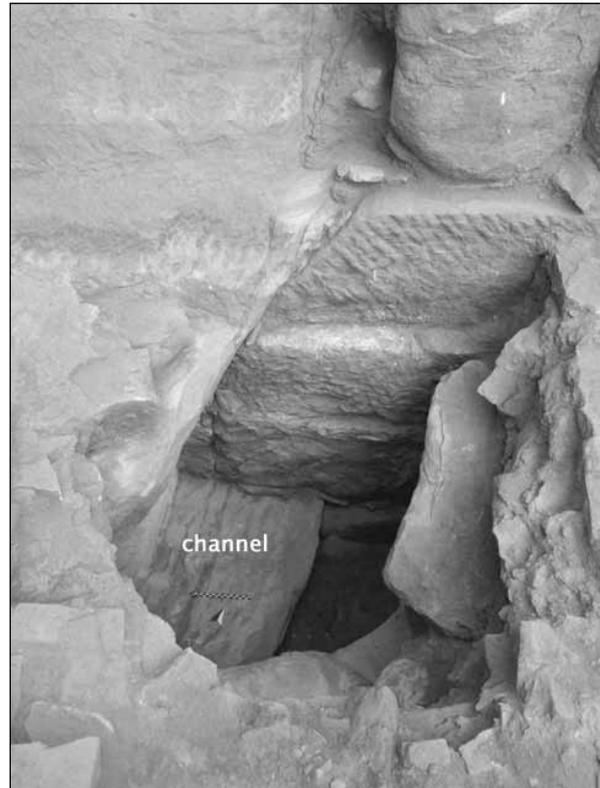


3. *Wādī Farasa East, sounding within northern portico with collapsed columns (S. Schmid).*

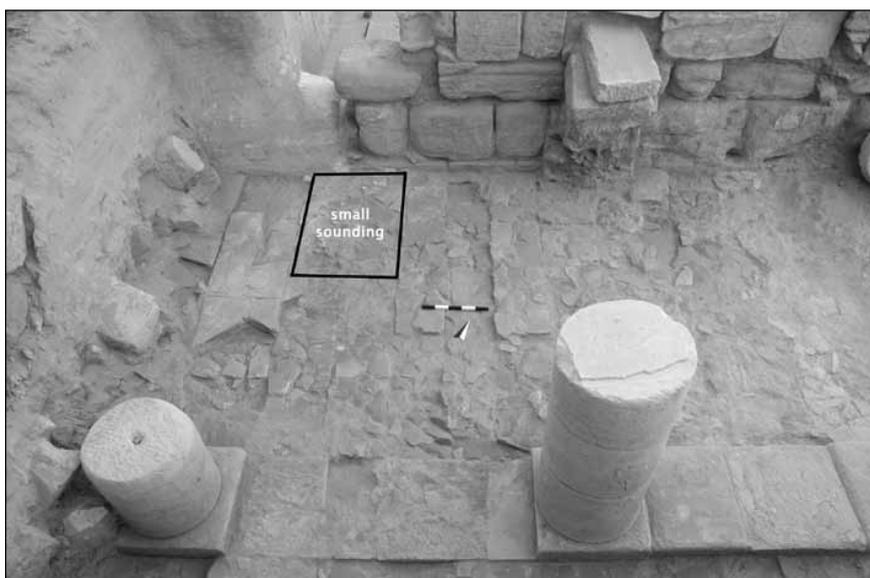
from this area, but no capital. Presumably the capitals fell further into the courtyard when the colonnade collapsed. On top of the debris created by the architectural components of the colonnade, a Mediaeval occupation comprising an ashy layer with significant quantities of 11th to 13th century AD pottery was identified. As in previous seasons, it was observed that most of the primary floor slabs were missing by the time the colonnade collapsed, but the foundations for these slabs, consisting of smaller, flat stones and clay with earth, not only remained *in situ* but also clearly indicated the outline of the slabs themselves (**Fig. 4**).

To our surprise, and in contrast to the scenario outlined above, a small sounding excavated below the portico floor slabs immediately south

of the southern wall of Room 4 yielded conflicting evidence for the chronology and operation of the water management system. The sounding was opened where we expected to find the continuation of the above-mentioned water channel and, indeed, it was at this very spot that the water channel was actually found (**Fig. 5**). However,



5. *Wādī Farasa East, small sounding in northern portico (S. Schmid).*



4. *Wādī Farasa East, sounding within northern portico after cleaning (S. Schmid).*

contrary to our expectations, it was clear that the channel had already been cut when the Soldier's Tomb complex was first constructed. In Figure 5 one can clearly see that it was the construction of the southern wall of Room 4 (Fig. 5, top) that cut the channel. In order to provide better support for that wall, a part of the channel was even chiselled away. Thus, what we originally believed to be a major system of drainage and canalisation was already defunct by the time the main complex was first constructed in the second half of the first century AD. Therefore, the question of precisely how water was diverted from the complex remains open for the time being, as a number of other potential solutions have already been ruled out (*supra* and Schmid 2007b: 144-145, Schmid 2008).

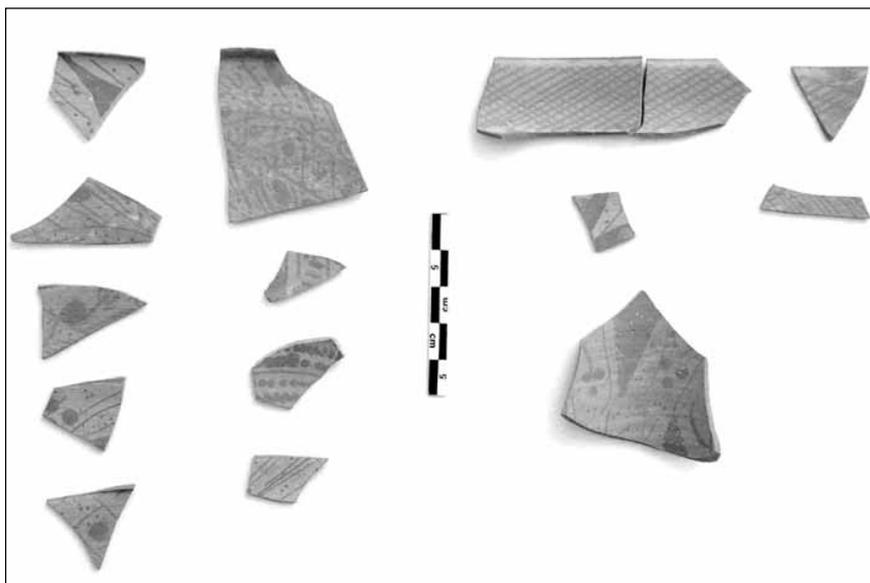
Regarding the chronology of the complex, the new sounding at the northern portico confirmed the results of similar soundings excavated in previous seasons. A significant number of small pottery fragments were recovered from under the foundations of the colonnade floor slabs. Except for a few coarse-ware sherds, most of the fragments are of Nabataean fine ware, especially painted cups (Fig. 6). Since all the painted sherds can be attributed to Nabataean painted fine ware Phase 3a (c.f. Schmid 2000), this gives us a reliable *terminus post quem* or, at best, a *terminus ad quem* of the third quarter of the first century AD for the construction of the complex.

North-East Corner of the Complex and Triclinium Entrance

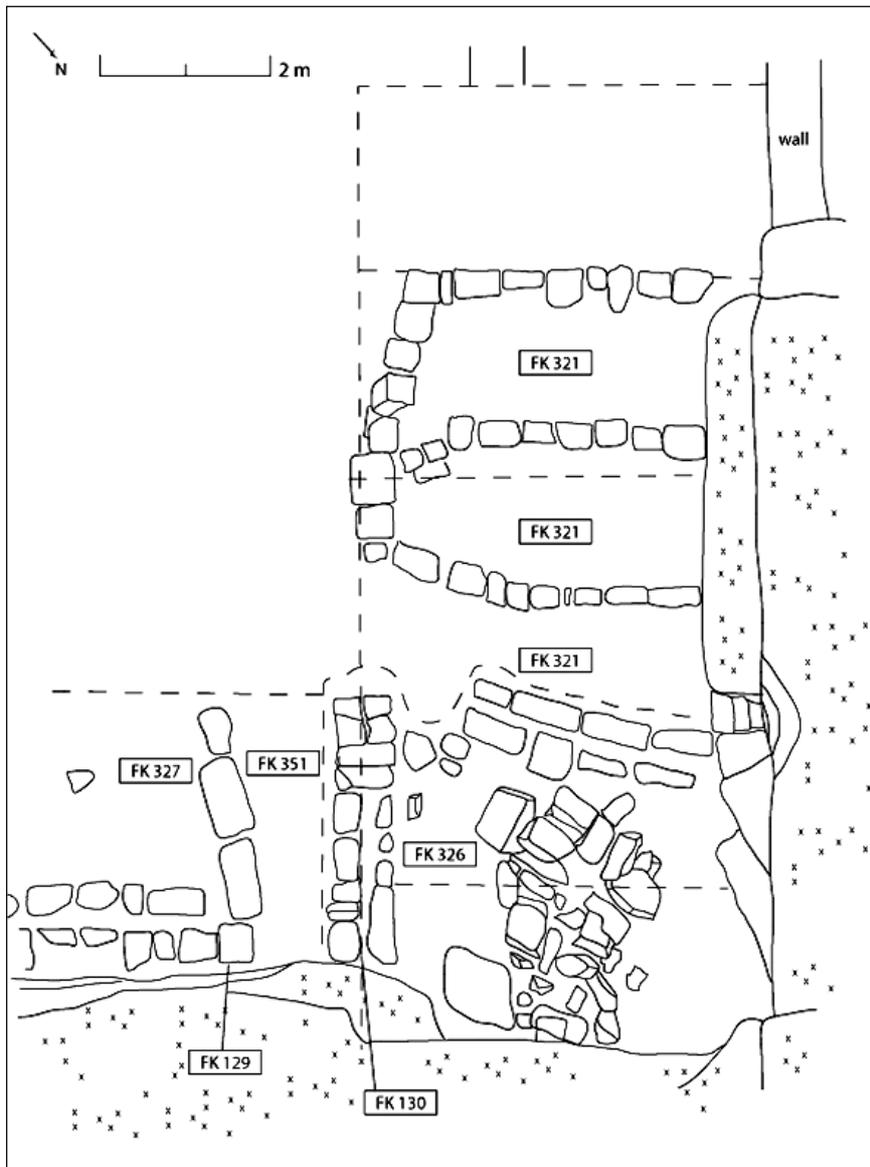
During the 2006 season, a series of apparently Mediaeval rooms began to appear in the north-east corner of the former portico and in front of the huge triclinium of the Soldier's Tomb complex (Fig. 1, no. 1), forming two rooms and a kind of corridor (Figs. 7 and 8). This year, an adjacent room was exposed, directly facing the rock on its north and east sides (Fig. 8, top left; Fig. 9, left). As clearly indicated by the collapse and two remaining arch supports, the room was originally spanned by an east-west arch.

The haphazard building technique in reused stone (Fig. 11) and significant quantity of so-called Ayyubid-Mamluk pottery of the 11th to 13th centuries AD indicate a Mediaeval date for these structures. This, together with the results of previous seasons (Schmid 2007b: 141-144, Schmid and Barmasse 2006: 217-219, Schmid 2005: 75f.), demonstrates that the Soldier's Tomb complex was reused during the period of Crusader presence at Petra, probably as a small fortification (see Schmid 2006a). This hypothesis of a military aspect to the Mediaeval occupation of the area is supported by the presence of a significant number of round stones in various sizes, that could be interpreted as *ballistae*, i.e. ammunition for slingshots and small catapults (Fig. 12).

East of the abovementioned structures, other walls of the same phase of construction continue



6. Pottery from small sounding in northern portico (S. Schmid).



7. Wādī Farasa East, Mediaeval rooms at north-east corner of complex (A. Barmasse and L. Gorgerat).

in direction of the huge *triclinium* of the Soldier's Tomb complex (**Fig. 7**, left). At least one additional room was exposed, and it seems that the same row of structures once continued all the way in front of the *triclinium*. As the main, central entrance of the *triclinium* was completely cleared in the 1930s by the then Department of Antiquities of Transjordan (Horsfield 1938: 40, notes 5 and 7, Horsfield 1939: 93), no additional information would be forthcoming from that spot. It was therefore decided to excavate a small sounding in the area of the southernmost lateral entrance of the *triclinium* (**Figs. 13 and 14**).

Although rather small and not completely finished, the sounding revealed a succession of phases within its narrow extent. A series of steps leading from the *triclinium* down towards the courtyard (**Fig. 13**, right; **Fig. 14**, right) ought to belong to the earliest phase of the Soldier's Tomb complex. This makes sense, as the courtyard floor (including floor slabs) is at an elevation of 930.61m. asl, the central part of the *triclinium* floor is at 931.58m. asl and the first step to be excavated this year at 931.89m. asl. Therefore, the difference in height of 1.28m. had to be descended by these steps. At this period, the southern side door must have been impressively



8. Wādi Farasa East, Mediaeval rooms at north-east corner of complex (S. Schmid).

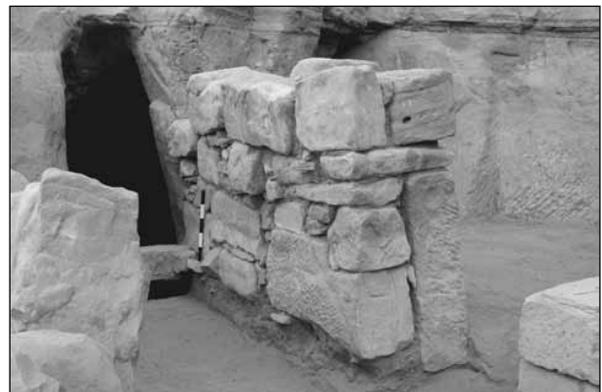


9. Wādi Farasa East, Mediaeval rooms at north-east corner of complex (S. Schmid).

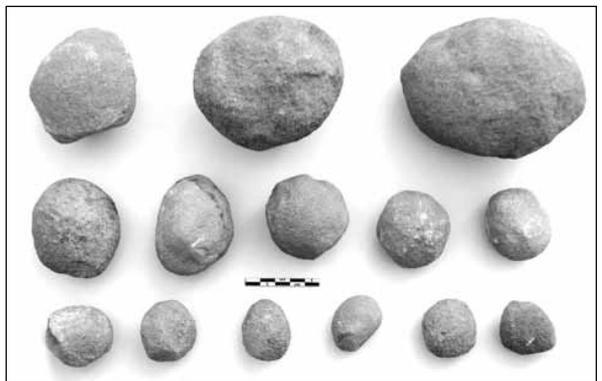
high; in a subsequent phase it was partially filled in and the threshold raised by almost one meter. When this was done has not, so far, been established; similarly, the reason for the alteration remains uncertain. Maybe these changes were aimed at diverting winter flood-water, which would suggest that the water management systems of Wādi Farasa East were not working properly as early as late Antiquity. Later, the area immediately in front of the southern side door was occupied by an important structure, perhaps a podium or something similar. This



10. Wādi Farasa East, Mediaeval rooms at north-east corner of complex (S. Schmid).



11. Wādi Farasa East, Mediaeval wall (S. Schmid).



12. Wādi Farasa East, rounded stones, possibly Mediaeval ballistae (S. Schmid).

was constructed of large stones positioned on a level of clearly reused smaller stones, some of which retained traces of wall plaster (**Fig. 13**, centre; **Fig. 14** centre). This podium-like structure seems to have covered the whole space in front of the *triclinium* (c.f. above), which could be indicative of a Mediaeval date. In fact, all the rock-cut structures so far explored on the lower and upper terrace clearly show that the Mediae-



13. *Wādi Farasa East, small sounding in southern doorway of large triclinium (S. Schmid).*



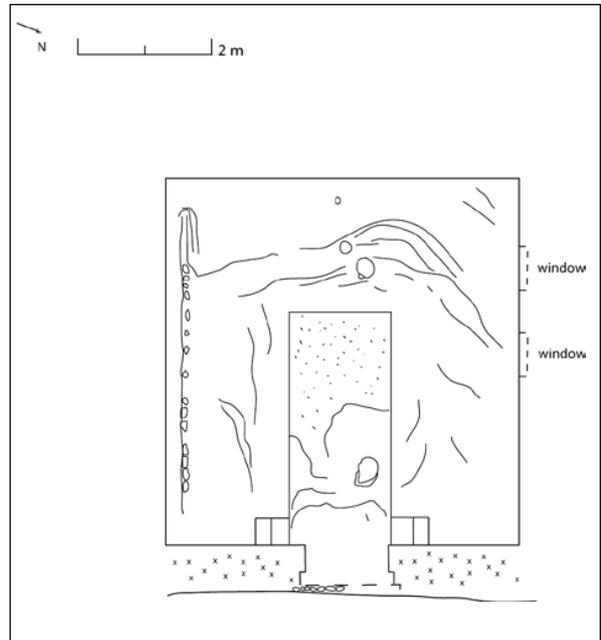
14. *Wādi Farasa East, small sounding in southern doorway of large triclinium (S. Schmid).*

val — probably Crusader — occupation of Wādi Farasa East had a strong defensive character; for instance, the entrances of the Soldier's Tomb on the lower terrace and the Garden House on the upper terrace were all blocked.

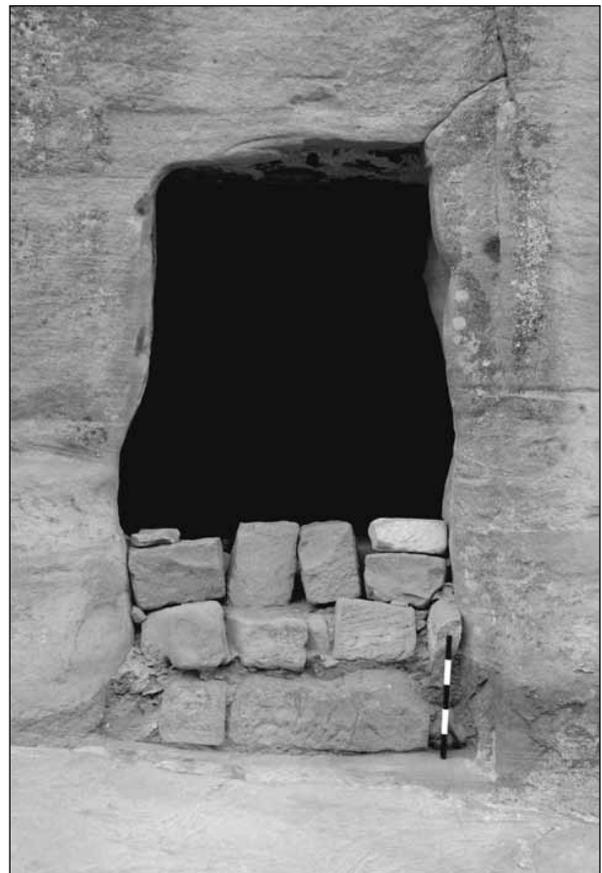
Rock-Cut Room at the Western Corner of the Complex

Ever since the first Western travellers visited and described the remains of Wādi Farasa East, the exact function of this room (**Fig. 1, no. 4; Fig. 15; Brünnow and Domaszweski 1904: no. 238**) has remained unclear, mainly because it was completely filled by animal dung and other remnants of secondary use, and its doorway was blocked by a series of stones (**Fig. 16**).

Even when clearing the surface of the inner room, it was apparent that there were rock-cut platforms along three sides or the four sides. Removal of an upper layer of greyish ash, which contained the abovementioned evidence of secondary use, exposed a layer of reddish



15. *Wādi Farasa East, rock-cut triclinium at south-west corner of complex (S. Schmid and L. Gorgerat).*



16. *Wādi Farasa East, entrance to rock-cut triclinium at south-west corner of complex (S. Schmid).*

sand lying immediately over the floor in the centre of the room. Removal of this layer began to expose the shape of the room (**Figs. 15 and 17**) which was, without doubt, that of a small *triclinium* or banqueting hall. The room was accessed by a row of three small steps on either side of the entrance. Further proof of its function was provided by finds from inside and also outside the room. The abovementioned, lowermost layer of reddish sand inside the room was 5 to 10cm. thick and contained a significant amount of pottery, which appeared on preliminary inspection to be of the second century AD. The most striking observation was an apparent absence of fine wares, specifically painted drinking cups — an astonishing situation in the case of a banqueting hall. On the other hand, large numbers of fragmented cooking pots (**Fig. 18.1**) and amphorae for storing and transporting liquids clearly reinforce its interpretation as a *triclinium*. The same observations also applied to the upper layer, viz. significant presence of cooking wares and *amphorae*, and absence of fine drinking cups. The upper layer also contained some sherds of Mediaeval pottery, indicating that the room was also used during that period. As for the absence of fine ware in general and drinking cups in particular, we can put forward three hypotheses:

1. Drinking cups may have been personal possessions and were therefore taken away by *triclinium* users on departure;
2. The people using the Soldier's Tomb complex would almost certainly have belonged to the Nabataean upper classes, regardless of exactly who they were. As Strabo, writing in



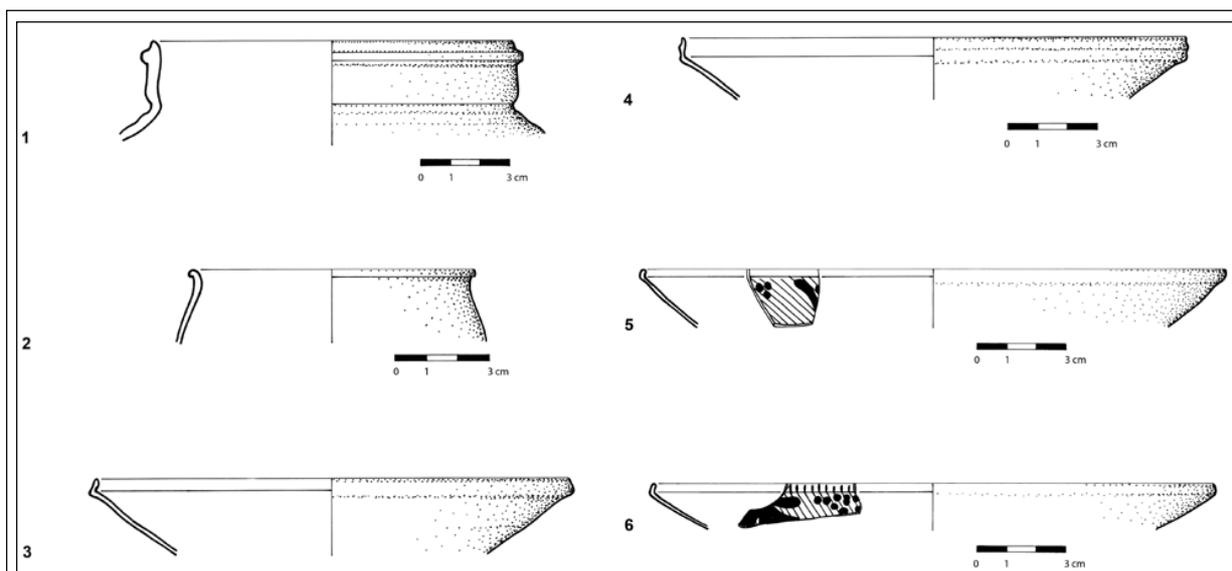
17. Wādi Farasa East, rock-cut *triclinium* at south-west corner of complex after cleaning (S. Schmid).

the late first century BC, informs us that the Nabataean aristocracy used golden drinking cups (Strabo, Geogr. 16, 4, 26: c.f. Schmid 2000), there may have been no need for pottery drinking cups in this specific instance;

3. Finally, and most probably, a large number of pottery fragments were recovered from the bedrock surface outside and in front of the *triclinium* itself (**Fig. 19**). The types of cooking pots and *amphorae* match those from inside the *triclinium*, with the addition of several sherds of fine ware, including painted drinking cups (**Fig. 18.2-6**) belonging mostly to the late first century AD.

In respect of the third hypothesis put forward above, that is to link the pottery found just outside the small rock-cut *triclinium* with the banqueting activities that took place within it, a number of other finds may be of interest. The main retaining wall of the lower terrace had been exposed as early as 2001 (Schmid 2002: 260-262). At its southern end, where it blocks the water channel discussed above in connection with the northern portico and Room 4 (c.f. Schmid 2002: 262, 266, fig. 16), a significant quantity of Nabataean fine ware pottery was found inside and beside the water channel. At that time it was difficult to account for the presence of this pottery, as there was no apparent association with any of the structures that had been excavated to date. However, this location is immediately below the rocky terrace that gives access to the small rock-cut *triclinium*. As we have good evidence that pottery was cleared out of the *triclinium* on at least several occasions, it is possible that some of it may have fallen into and around the water channel below.

As can be seen in Figure 20, the rocky interior surface of the *triclinium* was not always of the quality needed to provide a perfectly level surface; consequently small packing stones were placed in some areas. However, one can hardly imagine that such a rough surface was designed to be visible in Antiquity and, therefore, we propose that the floor was once paved with slabs. The same probably is true of the floor outside the *triclinium*. In some places, rock-cut bedding for floor slabs can even be seen (**Fig. 19**) and, indeed, a few broken floor slabs were found in the debris outside the small *triclinium* (**Fig. 21**).



Catalogue of Pottery Illustrated in Figure 18 (Colours Follow Munsell Soil Color Chart)

Nr. 1

Nabataean / Roman cooking pot from inside the triclinium

Clay: 5YR reddish yellow 6/6

Inner surface: 5YR reddish yellow 6/6

Outer surface: 7.5YR gray - brown 5/1.5

Parallels: Gerber 1997: 409, fig 4B (second half first century AD and later)

side the triclinium

Clay: 5YR reddish yellow 6.5/8

Inner surface: 5YR reddish yellow 6/6

Outer surface: 5YR reddish yellow 6.5/8

Parallels: Schmid 2000: 9, 25, figs. 54-56 (20 to 100AD)

Nr. 2

Nabataean plain fine cup / beaker from outside the triclinium

Clay: 5YR reddish yellow 6.5/8

Inner surface: 2.5YR red 6/7

Outer surface: 5YR reddish yellow 6.5/8

Parallels: Schmid 2000: 61, figs 224-225 (late first to second century AD)

Nr. 5

Nabataean painted fine ware bowl from outside the triclinium

Clay: 5YR reddish yellow 6.5/8

Inner surface: 5YR reddish yellow 6.5/8

Outer surface: 5YR reddish yellow 6.5/8

Painting: 2.5YR dark red 4/6

Parallels: Schmid 2000: 28-29, 38, figs 90-92, 378-379, colour plate 5: 7-10 (70 to 100AD)

Nr. 3

Nabataean plain fine ware plate from outside the triclinium

Clay: 5YR reddish yellow 6/6

Inner surface: 5YR reddish yellow 6/8

Outer surface: 5YR reddish yellow 6/8

Parallels: Schmid 2000: 9, 25, figs 52-53 (this specific form: late first to second AD)

Nr. 6

Nabataean painted fine ware bowl from outside the triclinium

Clay: 2.5YR red 6/8

Inner surface: 5YR reddish yellow 6.5/8

Outer surface: 5YR reddish yellow 6.5/8

Painting: 2.5YR dark red 4/6

Parallels: Schmid 2000: 28-29, 38, figs 90-92, 378, 379, colour plate 5: 7-10 (70 to 100AD)

Nr. 4

Nabataean plain fine ware plate from out-

18. *Wādī Farasa East*, pottery from inside and outside the rock-cut triclinium at south-west corner of complex (S. Schmid).

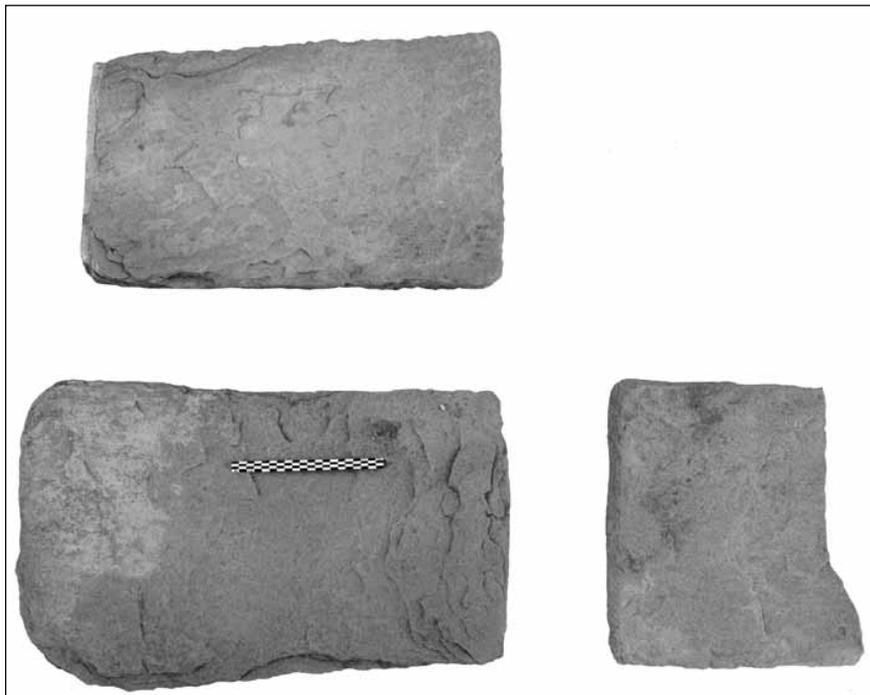


19. *Wādī Farasa East, area in front of the rock-cut triclinium at south-west corner of complex (S. Schmid).*

Although total exposure of the northern colonnade was not achieved during the 2007 season of the International Wādī Farasa Project, the results obtained are highly encouraging. On the one hand, our understanding of the Soldier's Tomb complex — which clearly reflects the high-status architecture of the Hellenistic and Roman upper classes in the wider Mediterranean area — has become increasingly clear. In future years its chronology will undoubtedly be refined, especially for its later, Roman phases of use (for the wider chronological context see Schmid 2006b; 2007a; 2009). On the other hand, this season's results have demonstrated



20. *Wādī Farasa East, rock-cut triclinium at south-west corner of complex after cleaning: detail (S. Schmid).*



21. *Wādī Farasa East, fragmented floor slabs from area in front of rock-cut triclinium at south-west corner of complex (S. Schmid).*

that the Mediaeval occupation of the site is even more important than we previously been led to believe (c.f. Schmid 2006a).

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EVIDENCE OF NABATAEAN OCCUPATION AT QAŞR AṬ-ṬILĀḤ IN THE NORTHERN ‘ARABAH VALLEY FROM EXPOSURES IN WĀDĪ AṬ-ṬILĀḤ

Tina M. Niemi and John D. Rucker

Introduction

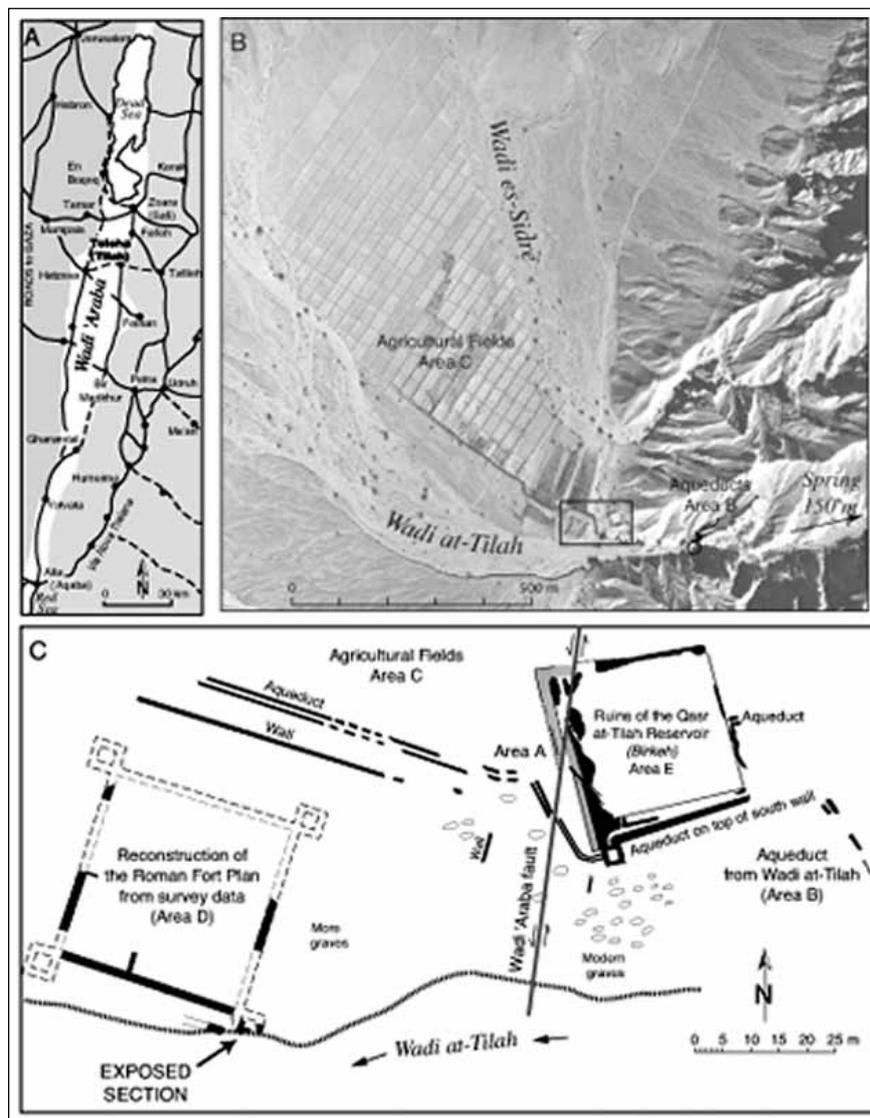
The Qaşr aṭ-Ṭilāḥ archaeological site is located in the northern Wādi ‘Arabāh valley about 8km south of the escarpment to the Dead Sea Ghawr. The site is built on mid-Holocene alluvial fan sediments that were deposited from Wādi aṭ-Ṭilāḥ approximately 6,500 years ago (Zhang 1998; Klinger *et al.* 2000a; Niemi *et al.* 2001). The site contains a fort (caravanserai), a water reservoir with aqueducts leading to it from the adjacent Wādi aṭ-Ṭilāḥ, and aqueducts leading from the reservoir or *birkah* (Fig. 1). Another prominent feature of the site is the associated agricultural field system with its regular orthogonal plan.

The age of the ruins at Qaşr aṭ-Ṭilāḥ was estimated to be predominantly Nabataean-Roman, with minor Late Byzantine occupation, on the basis of the surface scatter of potsherds (MacDonald 1992). However, charcoal collected from the mortar of the interior of the south wall and upper wall, above a repair, reveals that the extant water reservoir at this site was built in the late sixth or early seventh centuries (Niemi 2000; Klinger *et al.* 2000b), indicating its use in the Late Byzantine to Umayyad period. This is in agreement with the nearby *khirbat*, or village, of Late Byzantine age (MacDonald 1992). Abundant Nabataean surface pottery clearly indicates occupation at this site in the first century AD. The fort at the site is also identified as *Toloha*, which is recorded in the fourth century *Notitia Dignitatum* as a base for a Late Roman cavalry unit (*Ala Constantiana*). *Toloha* is also recorded in the Beersheva edict (Kennedy 2004: 214).

The Wādi ‘Arabāh Earthquake Project (WAEP) has conducted research at the Qaşr aṭ-Ṭilāḥ archaeological site over the course of

five field seasons (1999, 2001, 2002, 2003 and 2007), each lasting between one and three weeks in duration (Niemi 2000, 2002 and 2004). The main object of WAEP is to document the geological and cultural history of earthquakes along the southern Dead Sea fault in Jordan. WAEP uses geological and geophysical field methods, as well as archaeological excavations, to map and date the evidence of past earthquakes from faulting and from seismically-induced damage to ancient structures. Through this research, we seek to resolve major seismic hazard parameters such as the epicenter location, rupture length, fault slip, seismic intensity and magnitude of the large, historical (yet often textually undocumented) earthquakes that have had a profound effect on the cultural history of the region.

Archaeological sites that are built over active faults are unique because of their potential to yield the precise date and magnitude of individual historical earthquakes. The Qaşr aṭ-Ṭilāḥ archaeological site is built across the seismically active Wādi ‘Arabāh fault. Our research efforts have largely concentrated on mapping the *birkah* and aqueduct that are left-laterally offset by coseismic slip across the northern Wādi ‘Arabāh fault (Haynes 2005; Haynes *et al.* 2006; Niemi 2007). The site plan map of Qaşr aṭ-Ṭilāḥ shows the relationship of the structures to the fault (Fig. 1C). Two aqueducts that originate in the adjacent Wādi aṭ-Ṭilāḥ feed the *birkah* at the south-east corner and in the middle of the east wall. The south wall has a channel along the top that exits into a settling pool located at the south-west corner of the *birkah*. A short, NW-trending aqueduct connects the settling pool at the base of the *birkah* with a W-trending aqueduct that appears to extend to the field system. The NW-trending aqueduct has been ruptured



1. Location and site maps. (A) Map of some the Roman and Byzantine period roads and paths connecting forts and towns along and across Wādī 'Arabah. The figure is modified from that Parker (2000: 368). (B) 1978 aerial photograph showing the Qasr at-Tilāh site and surrounding physiographic features (Royal Geographic Center of Jordan). Note the ancient agricultural fields represented as a grid on the mid-Holocene alluvial fan surface. Wādī at-Tilāh, which flows from the spring east of the image, has eroded the south side of the archaeological site. The box shows the area detailed in Fig. 1C. (C) Site plan map of some of the structures at the Qasr at-Tilāh site. The Wādī 'Arabah fault, the main seismically active structure of the Dead Sea fault system, trends NNE across the site. The location of the incised section shown in Figs. 2 and 3 is marked in Wādī at-Tilāh.

by earthquake faulting (Fig. 1). Using paleoseismic and archaeological evidence collected from trenches excavated across this aqueduct and fault zone (Area A), we identified evidence for four ground-rupturing earthquakes. Radiocarbon dating from key stratigraphic horizons and relative dating using potsherds brackets the dates of the four earthquakes to some time between the sixth and 19th centuries. Individual earthquakes most likely occurred in the seventh, ninth and 11th centuries. Evidence for pre-seventh century earthquakes are likely at the site, but can not be deciphered from the extant aqueduct and birkah system as these date to the Late Byzantine and Early Umayyad periods.

Owing to our research priorities, our excava-

tions at this complex multi-component site have been limited to those areas of the site that directly relate to the fault. In previous field seasons of the WAEP, archaeological excavation focused mainly on the area around the birkah at Qasr at-Tilāh (Area A). However, in order to understand the context of the birkah and aqueducts, several surveys were conducted in the environs of Qasr at-Tilāh to determine the relationships between the various water transport features and to understand the phases and types of occupation at the site. This included mapping the aqueducts within Wādī at-Tilāh (designated Area B), surveying the agricultural fields to the west (Area C), investigating the south-east corner tower of the fort exposed in the incision of the wadi (Area

D), and mapping the *birkah* (Area E). In this paper, we describe evidence for the earlier periods of occupation of the archaeological site of Qaṣr aṭ-Ṭilāḥ from exposures in Wādī aṭ-Ṭilāḥ.

Cutback Exposure of the Fort and Earlier Structures

As part of our surveying for the site plan map of the Qaṣr aṭ-Ṭilāḥ site, we collected data points on the Roman fort. Although its wall alignments are not completely visible, the structure is a small *quadriburgium* with internal dimensions of 34m square and external dimensions of 38m square (Fig. 1C). The southern wall is well preserved, where a 2m-wide wall thickness is measured. The exact relationship of the corner towers to the curtain walls is not clear. The corner towers appear to protrude ca. 4-5m from the curtain wall, and the corner tower walls seem to align with the perimeter walls of the fort (see reconstruction of corner towers in Fig. 1C).

A stratigraphic section through the south-east corner tower of the fort and underlying structures was created by erosion in the incised bed of Wādī aṭ-Ṭilāḥ. We took advantage of this fortuitous exposure to document the stratigraphic relationship of structures in Area D. As we cleared away loose rubble and vegetation, it became apparent that the structure visible in the incised section, while underlying the fort, was in fact an earlier structure on a slightly different alignment. Fig. 2 shows a photograph of the section and our drawn interpretation of the exposed stratigraphy.

The structures visible in the wadi section consist of four lower walls labeled Walls 1 to 4, and upper walls and rubble from the Roman fort. In the lower section, two walls (2 and 4) are exposed predominantly in cross section and two walls (1 and 3) are exposed in longitudinal section. Between walls 1 and 2 there is an apparent floor or activity surface capped by soil layers composed mainly of decayed mud mortar and ash. Above these lower structures are the walls and collapse rubble of the fort. Two walls that are probably part of the south-east corner tower are exposed in the section.

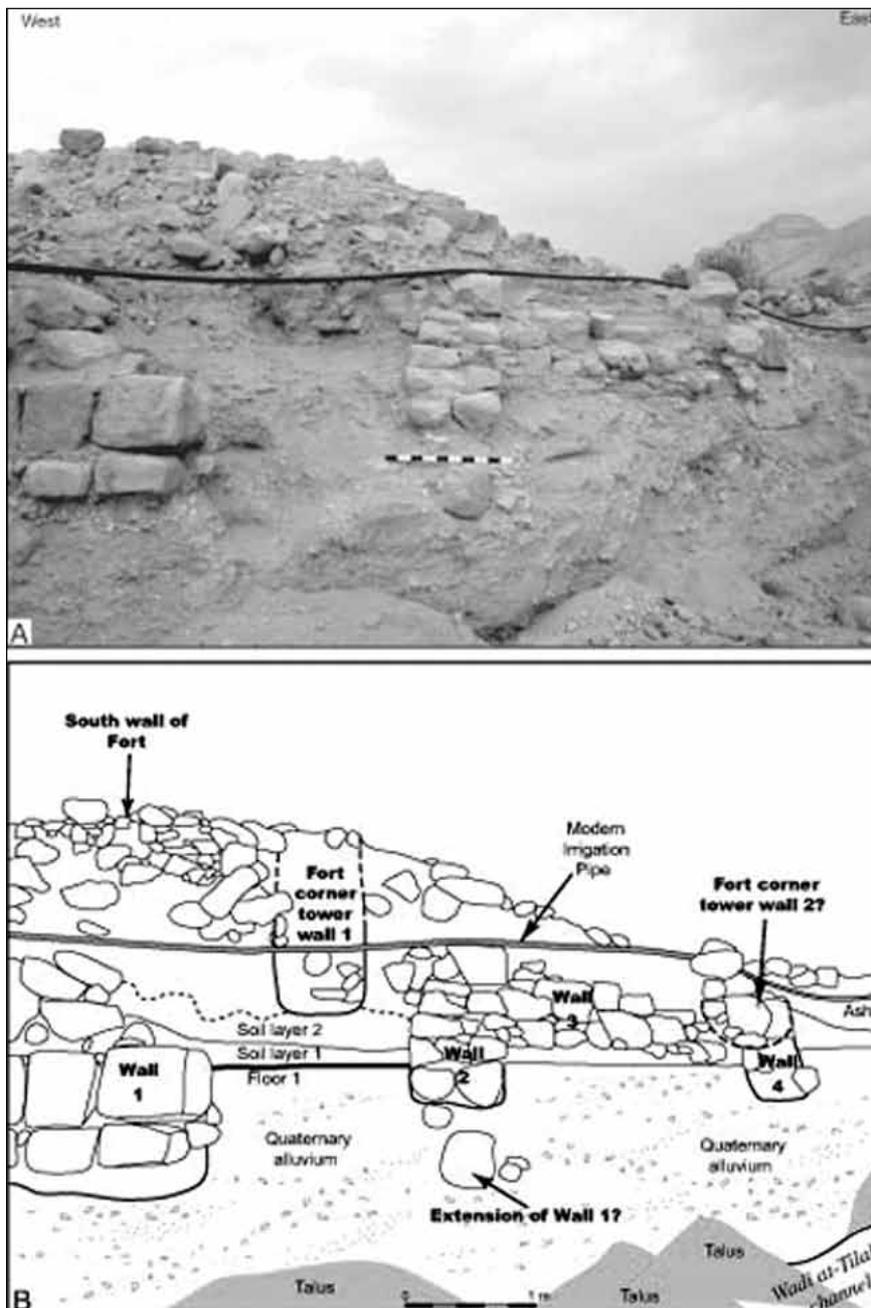
Exposed both longitudinally and in section, Wall 1 consists of very large, hewn ashlar blocks, some as long as 80cm, with mud mortar and small chink stones in between. Wall 1 can

be traced along the ground surface for 8m. It is clear that the wall was originally constructed within the alluvial fan deposits and not along a wadi exposure. Thus, the wadi has meandered to the north and cut through this structure. Wall 1 is preserved four courses high with the lower course apparently stepped outward. It is not entirely clear that this is the original configuration due to potential shifting in the exposure. Wall 1 is founded in a substantial foundation trench that was excavated 85cm into the gravel alluvium. The width of Wall 1 is 90-100cm. A boulder approximately 1.5m to the east in the exposure may represent the original extension of Wall 1 (Fig. 2). When a large boulder fell from the exposure (Fig. 2C), it was apparent that this rock was not part of Wall 2 as alluvial gravel is located between them. The relationship between Walls 1 and 2 therefore remains unclear. Wall 1 appears to be founded to a deeper level than Wall 2. The 90cm-wide Wall 2 is composed of two faces, one course wide and with a rubble core. The stones of the wall faces are square hewn on their outer sides. Wall 2 may have abutted Wall 1 or was added in a later phase.

Floor 1 located between Walls 1 and 2 is an ashy plaster surface that is approximately 2cm thick. Floor 1 apparently abuts both Walls 1 and 2. Overlying Floor 1 is a 15cm-thick soil layer (Layer 1) consisting primarily of decayed mud mortar. Abundant pottery sherds and near-complete vessels, including a Nabataean bowl dating from 20-70AD (S.T. Parker, pers. comm.) were found in association with the floor and soil layer. Layer 2 is a soil layer with abundant ash up to 30cm thick overlying soil Layer 1. It contains abundant pottery dating to the first-second centuries AD (S.T. Parker, pers. comm.).

Wall 3 is exposed in a longitudinal section and runs between Walls 2 and 4. It abuts Wall 2, but stops approximately 60cm short of Wall 4. Several long flat stones apparently more or less *in situ* across the thickness of the wall tentatively suggest that Wall 3 is part of a staircase. Wall 3 seems to be founded on two courses of small closely laid stones set in mud mortar, which themselves rest on the Quaternary alluvial surface. The original width of this wall/staircase is unclear due to lack of exposure of its north side.

Wall 4 is exposed in cross section and has a similar construction to Wall 2. It is constructed

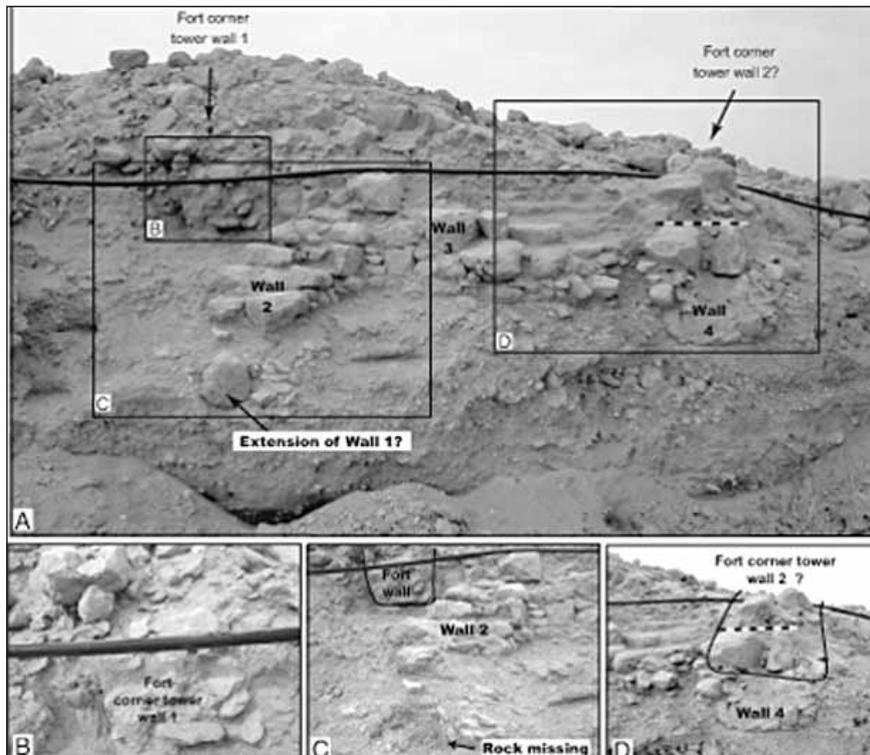


2. Photograph and section drawing of the cutback exposure across the south-east corner tower of the fort and underlying structures (facing NNE).

of two courses of facing stones, square-hewn on their outer faces, with a rubble core. Wall 4 is approximately 110cm wide and is founded in a foundation trench filled with mud mortar and cobble chinking. The foundation trench was excavated 50cm into the gravel alluvium. One of the stones from this wall displays typically Nabataean diagonal dressing. The upper courses of Wall 4 appear to be oriented on a different alignment and are associated with the later fort construction.

The relationship between the ruins of the fort

and the lower structures can be seen through close examination of the upper strata exposed in the incised section (Fig. 3). The upper exposure is covered with slope wash and is more difficult to interpret. It seems that the foundations of the south wall of the fort lie above Wall 1 and about 2.5m above the channel of Wādī at-Ṭilāḥ. The section exposes what appears to be the south-east corner tower of the fort. Fort corner tower wall 1 is founded on ashy soil layer 2 (Fig. 3B) and lies above Wall 2. It is about a meter



3. (A) Photograph of the exposure in Wādī aṭ-Ṭilāḥ showing location of detailed images below (facing north-north-west). (B) Close-up photograph of the fort corner tower wall 1. (C) Photograph showing the relationship of the fort wall with underlying Wall 2. (D) The fort corner wall 2 appears to be built on Wall 4.

in width and constructed of undressed limestone boulders. Approximately 4m to the east along the exposure, a second wall alignment that we interpret as the fort corner tower wall 2 is exposed. Fort corner tower wall 2 is founded on top of the underlying Wall 4. A thick ash layer abuts and extends to the east of the corner tower wall 2. Pottery sherds from the upper layers indicate that the ceramics are mixed, ranging from Early Roman-Nabataean to Early and Late Byzantine (S.T. Parker, pers. comm.).

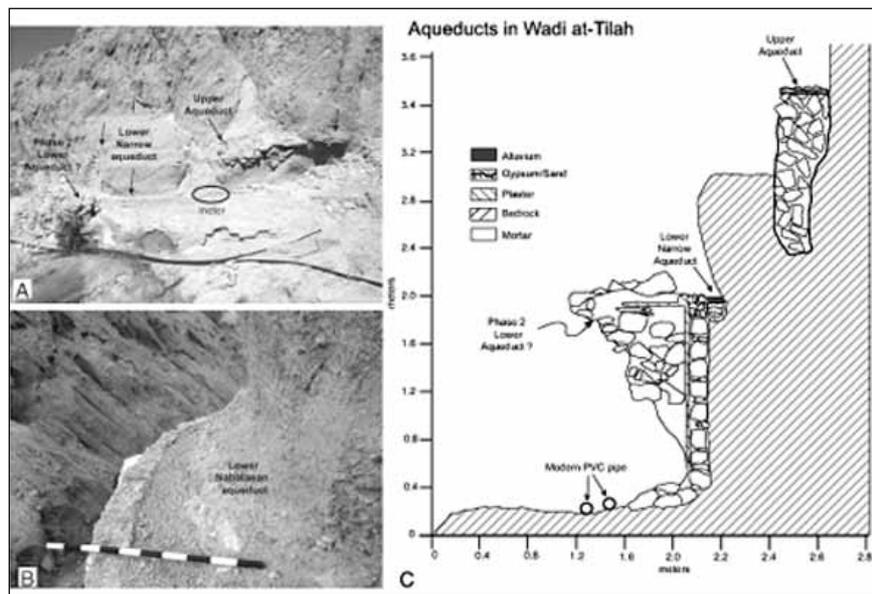
Exposures of the Aqueduct System in Wādī aṭ-Ṭilāḥ

Several aqueducts of various constructions and elevations lie parallel to the course of Wādī aṭ-Ṭilāḥ. These aqueducts were studied collectively as Area B. Two prominent aqueducts were traced along the northern bank of Wādī aṭ-Ṭilāḥ for a distance of 0.3km east of the Qaşr aṭ-Ṭilāḥ *birkah*. These aqueducts were fairly continuous except across several tributary drainages where the aqueducts have been completely eroded away. The last evidence of what may be an aqueduct was noted approximately 0.6km to the east. The spring in Wādī aṭ-Ṭilāḥ is about 0.75km from the site. In the region where

fluvial terraces lie parallel to Wādī aṭ-Ṭilāḥ (between 0.3-0.6km), an ancient aqueduct may have been excavated into the alluvial sediment making it easily buried by subsequent colluvial processes. This is also the case near the Qaşr aṭ-Ṭilāḥ reservoir (*birkah*) that is built in part on the Quaternary alluvial fan sediments. Here, only the upper aqueduct is evident. The lower aqueduct located in the alluvial fan sediments may have been buried at this location, or was eroded away, or may have had a significantly different trend.

At a point approximately 0.3km east of the *birkah* (designated Area B.5), the bedrock walls of the Wādī aṭ-Ṭilāḥ canyon narrow to a width of about 2.3m at the elevation of the channel. It is at this location that three phases of aqueduct construction are preserved on the northern bedrock ledge, starting about 2m above the wadi channel floor (Fig. 4). Mortar from each of the aqueduct wall phases contains lime with charcoal and gravel aggregates. Ceramics and other artifacts were extremely scarce.

The lower aqueduct is a channel that is 20cm in width and about 20cm in depth. In places the lower aqueduct is cut into the bedrock along the north wall and along the small channel bot-



4. (A) Photograph showing three phases of aqueduct construction along the north bedrock bank of Wādī at-Ṭilāḥ (facing north-west). The location of site is shown on Figure 1B. (B) Detailed photograph of the lower 20cm-wide aqueduct that was cut into the conglomerate bedrock. The construction style is suggestive of Nabataean engineering. (C) Drawing showing the relationship between the lower, narrow aqueduct, a lower Phase 2 aqueduct, and the upper aqueduct.

tom. Both the channel and the bedrock wall are coated with a layer of plaster. The south wall is constructed of a narrow, 20cm-wide wall that in one location stands 1.8m in height. The exterior of the wall is plastered (Fig. 4). The width of the channel and the bedrock construction is suggestive of Nabataean technology. The small channel was filled with sand and gypsum, and capped by a thin layer of alluvium.

An apparent second phase of construction appears to be a widening of the lower aqueduct at the same elevation. Evidence for this phase is found only at the B.5 location, where the wadi narrows dramatically. The interpretation of this construction as a new phase is very uncertain as it is not corroborated elsewhere. It is possible that most of the evidence for this lower Phase 2 aqueduct is either completely eroded or completely buried. Alternatively, the structures preserved at this elevation may have been built to provide additional support for the upper aqueduct at this location. Radiocarbon dating of charcoal within the mortar of the lower wall yielded an age of 1380 ± 40 yrs BP (CAMS #100535). This corresponds to a two-sigma calendar age of AD 582-694.

The upper aqueduct leads into the standing *birkah* at the Qaṣr at-Ṭilāḥ site (Fig. 1). It is approximately 1.9m above the lower aqueduct channel floor. The construction of the upper aqueduct was also studied at other locations along Wādī at-Ṭilāḥ where erosion has pro-

vided a complete cross section of the feature (Fig. 5). The upper aqueduct channel is constructed of two walls with a 65cm-wide channel in between, tapering slightly over its depth. The width of each wall is approximately 80cm, resulting in a total aqueduct width of approximately 2.3m. Each wall is two courses wide and stands at least four courses high. Large roughly hewn and undressed boulders of local limestone have been used in the wall construction. In between the boulders, mortar and cobbles are used as chinking blocks. The channel is about 70cm in depth. The channel is lined with 8cm of plaster flooring, which extends up the sides of the channel. Beneath the channel plaster floor is a 60cm-thick layer of mortared rock rubble that supports the base of the channel. Many of the characteristics of the upper aqueduct were also



5. Photograph of a cross section through the upper aqueduct, as exposed in a tributary wadi of Wādī at-Ṭilāḥ. The aqueduct leads into the Late Byzantine-Early Umayyad period *birkah* at the Qaṣr at-Ṭilāḥ site.

observed where it was exposed in Area A in trenches west of the *birkah* (Haynes *et al.* 2007).

Along Wādī aṭ-Ṭilāḥ where the upper aqueduct is preserved, the central channel has been completely filled with sediment. Immediately above the floor plaster is an approximately 2-2.5cm thick layer of travertine. This is overlain by 20cm of alluvial gravel. The upper 30cm of fill is gravelly silt deposited as slope-derived colluvium. This indicates that water continued to flow in the aqueduct for a period of time when it was not being maintained since sediment filled the lower part of the channel. The aqueduct then ceased to carry water and it filled with slope wash deposits.

Conclusions

Numerous 20th century visitors to the site of Qaṣr aṭ-Ṭilāḥ have noted the abundance of Nabataean sherds scattered on the surface. Glueck interpreted them thus: “In places, as in other sites in the ‘Arabah which were occupied by Roman garrisons after the collapse of the Nabataean kingdom, Nabataean potters continued to furnish all or much of whatever pottery was necessary” (Glueck 1935: 13). We now recognize that there have been various phases of occupation at the site that are separated by periods of abandonment. Furthermore, illicit grave robbing and looters’ pits at the site have brought sherds from lower stratigraphic levels to the surface.

Our data show that in the first century there was a significant Nabataean presence at the Qaṣr aṭ-Ṭilāḥ archaeological site. Structures exposed in the incised Wādī aṭ-Ṭilāḥ section suggest that there was major architecture, probably representing at least a large farmstead, on the site in the first to second centuries. Typology of the narrow aqueduct excavated into the north bedrock canyon wall of Wādī aṭ-Ṭilāḥ further indicates that the water structures at the site were first engineered by the Nabataeans. Whether or not the extant field wall system at Qaṣr aṭ-Ṭilāḥ is Nabataean remains uncertain.

Identification of the site as *Toloha* seems straightforward given the linguistic similarity between the names of aṭ-Ṭilāḥ and *Toloha*, and its geographic relationship with other identified ancient sites in the region. In the *Notitia Dignitatum*, the site of *Toloha* is clearly associated with a Roman military presence around 400AD.

However, the effects, if any, of the devastating earthquakes that occurred on 18 and 19 May 363AD are unclear at this site. It is possible that the site experienced severe damage in the 363AD earthquakes. Epitaphs recovered from Safī demonstrate that the earthquake destroyed structures with fatal results (Meimaris *et al.* 2005). Whether or not the fort at this site sustained damage and remained viable after 363AD is a question for future research.

Our previous research (Haynes 2005; Haynes *et al.* 2006; Niemi 2007) showed that the extant structures at Qaṣr aṭ-Ṭilāḥ are predominantly late sixth to early seventh century in age. Radiocarbon dating of the aqueduct system in Wādī aṭ-Ṭilāḥ confirms this interpretation. The site history between the Nabataean-Roman and Late Byzantine periods is at present poorly understood. Further excavations would help resolve many questions regarding occupation at the site and the history of earthquakes that have affected it during the Nabataean, Roman, and Byzantine periods.

Acknowledgments

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EXCAVATIONS AT THE PPNA SITE OF WF16: A REPORT ON THE 2008 SEASON

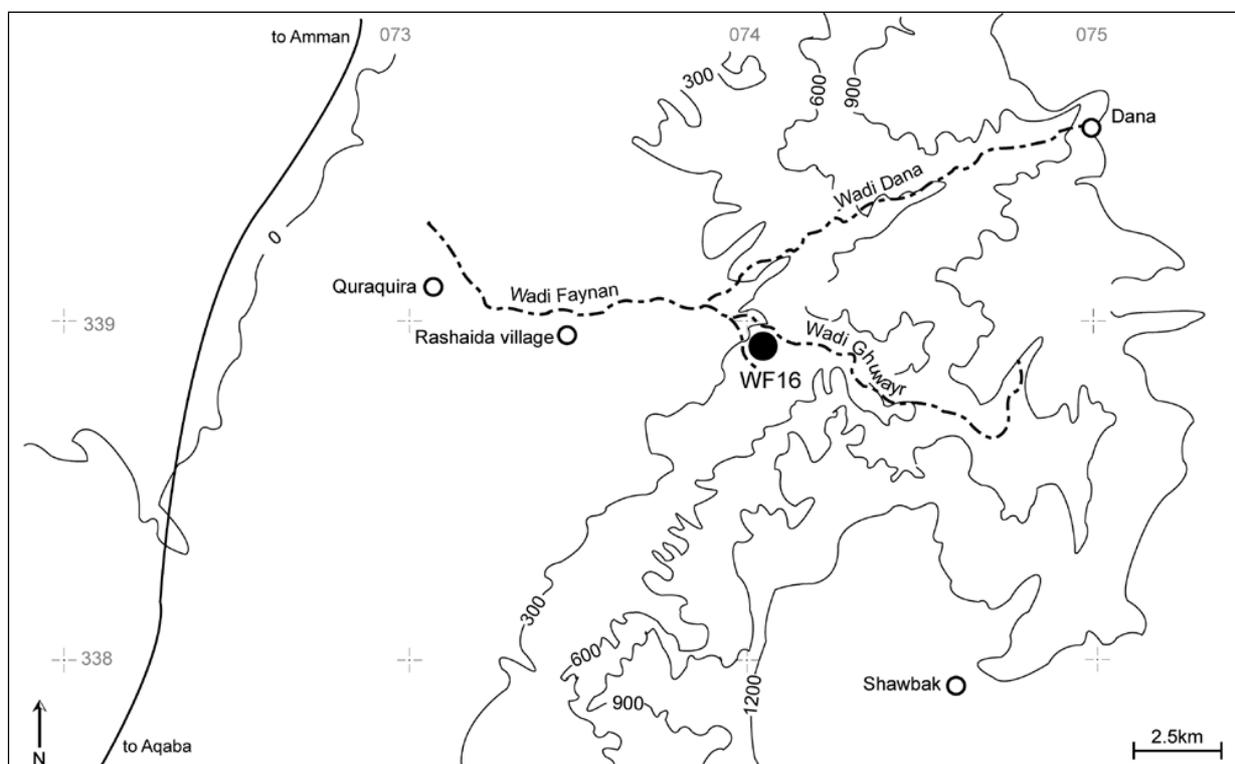
S. Mithen, B. Finlayson, M. Najjar, E. Jenkins, S. Smith, S. Hemsley, D. Maricevic, N. Pankhurst, L. Yeomans and H. al-Amarat

Introduction

The excavations at the Pre-Pottery Neolithic A (PPNA) site of WF16 in Wādī Faynān, southern Jordan (36R 3390442N 0739824E) (**Fig. 1**) have been designed to address core issues related to the transition from hunting and gathering societies to farming, principally concerning the extent to which wild plants were cultivated and animals managed, whether communities were mobile or sedentary, and the nature of key cultural developments. Previous work at WF16 (Finlayson and Mithen 2007) had demonstrated the importance of the site in terms of its potential to address these research questions, but had

confirmed the need to open a large area of the site. This is essential to ensure sufficiently large samples of artefacts, faunal remains and botanical material are recovered to address these issues, and in order to be able to investigate spatial and chronological patterning within the site.

With funding from the Arts and Humanities Research Council UK, a three year programme of excavation has been designed with field seasons in 2008, 2009 and 2010, followed by a separate conservation season. The project is co-directed by Finlayson, Mithen and Najjar, and employs Smith as Project Manager and Jenkins as Data Manager. Four professional archae-



1. Location of WF16 in relation to modern settlements.

ologists are employed as area supervisors, Sam Hemsley, Darko Maricevic, Nick Pankhurst and Lisa Yeomans. The project will focus on excavating a single trench, 15 by 40m., that covers the central area of the PPNA settlement as identified by the evaluation project (Finlayson and Mithen 2007). This report summarises the preliminary field results of our first field season during which Haroun al-Amarat acted as the Department of Antiquities (DoA) representative.

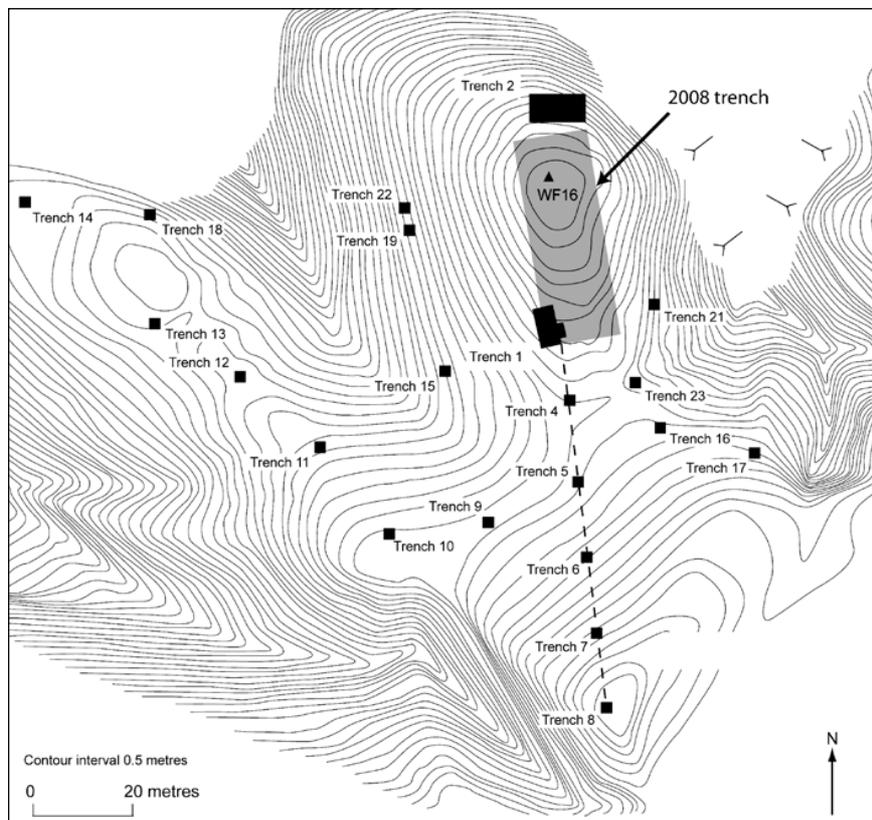
Methodology

The first field season at WF16 took place between 10th March and 19th April 2008. In total, 30 archaeologists and six volunteers worked on the excavation. In addition to the four area supervisors, six professional archaeologists were employed as site assistants, along with a surveyor, finds processor, environmental sampling supervisor, nine students and 20 local *bedouin* workmen.

A single trench measuring 15m x 40m was opened up at the beginning of the season (Fig. 2). An initial overburden of loose, mixed material ~ 0.1m thickness was removed using mat-

tocks, shovels and trowels. The trench was divided into four areas for excavation and a 5m x 5m grid laid out for sampling. The overburden was very rich in PPNA artefacts, suggesting that it represents deflated PPNA occupation material. In general, the overburden was thickest to the west and east of the trench and was thinnest on top of the knoll.

A single context recording method was used during the excavation, as developed in the 1970s by Museum of London Archaeological Services (MOLAS). The basic unit of record in this system is a *context* which can be either positive (for example, a wall or a deposit) or negative (for example, a cut). In this report context numbers are given in brackets and prefixed by a 'C'. Each context was given a unique number, recorded using a context sheet, planned at 1:20 and recorded with a digital camera. A Harris Matrix is employed to aid in understanding how these contexts are related (c.f. Harris *et al.* 1993). Contexts are then grouped into features, for example, a burial will consist of a cut, at least one matrix fill and the skeletal elements, all of which will be individual contexts. A single running list



2. Plan of the WF16 knoll showing 2008 trench in relation to evaluation trenches.

of features was created, for convenience different prefixes are used to refer to the numbers, 'S' for structure, 'B' for burial, 'H' for hearth and 'M' for midden.

A database designed specifically to manage complex stratified deposits and their associated finds, the Integrated Archaeological Database (IADB), was used to record all site records. The IADB has forms which replicate the context and sample sheets used on site; each day the supervisors entered their records. Plans were scanned and digitised into the IADB; finds were also recorded directly into the IADB. At the end of the season all information generated from the 2008 field season had been digitally recorded. In addition to the single context planning, the whole trench was planned at 1:20 at the end of the season.

A comprehensive sampling strategy was used at the site. Where possible, a 30 litre flotation sample was taken from each context and processed using a flotation machine. If the context was less than 30 litres an archive sample was taken (see below) and the rest of the context was sampled for flotation. If the context was large or if it contained potential botanical remains a greater quantity of sample or multiple samples were taken. In total, 420 flotation samples (6825 litres) were processed during the 2008 season. Two flotation machines were needed to keep up with the number of samples generated. Each machine consisted of a 55 gallon oil drum and two settling tanks. Due to water shortage problems in the region, water was recycled using filters and the barrels cleaned every day, with the whole system fully cleaned every week and refilled with fresh water. A 300 μm mesh was placed inside the barrel to catch the heavy residue; mesh bags with chiffon sides and a base made of 0.25 μm mesh were used to catch the light fraction. Both the light fraction and the heavy residue were dried in a specially designed drying tent out of direct sunlight. After drying the light fraction was re-bagged, entered into the IADB and crated for storage. The heavy residue was sieved into 4mm, 2mm and 1mm fractions and sorted for finds by local workmen. The 4mm fraction was 100 % sorted, while the smaller fractions were sub-sampled according to overall size of sample. These finds were then entered into the IADB, bagged and crated for storage.

Archive samples of approximately 2 litres were taken from each context so that future chemical analysis can be conducted if necessary. Brown paper bags were used to store the 296 archive samples collected in the 2008 season. Any sediment not taken for flotation or for archive samples was dry sieved on site by the workmen through a 2mm mesh, resulting in a total of 35,263 sieved litres. The amount of sediment sieved was recorded using calibrated buckets. This material was then sorted off site by workmen looking for finds. Information about the finds was then entered into the IADB, before they were bagged and crated for storage. 70 phytolith samples were taken from selected contexts only. Burial fills were always sampled, while other contexts such as hearths, pits and intact floors were chosen at the supervisor's discretion. 4 gm samples were taken from within a context and a clean trowel was used to collect the sediment. A micromorphology sample was taken from Structure S11 (C125).

Similar abbreviations to those used for features were created for finds, with 'SF' denoting special find (a find that was of sufficient enough interest to be recorded and bagged separately) and 'BF' bulk find (finds such as chipped stone, or unworked animal bone which were bagged together according to context and sample number). In total, 3,410 bags of bulk finds and 564 bags of small finds were collected.

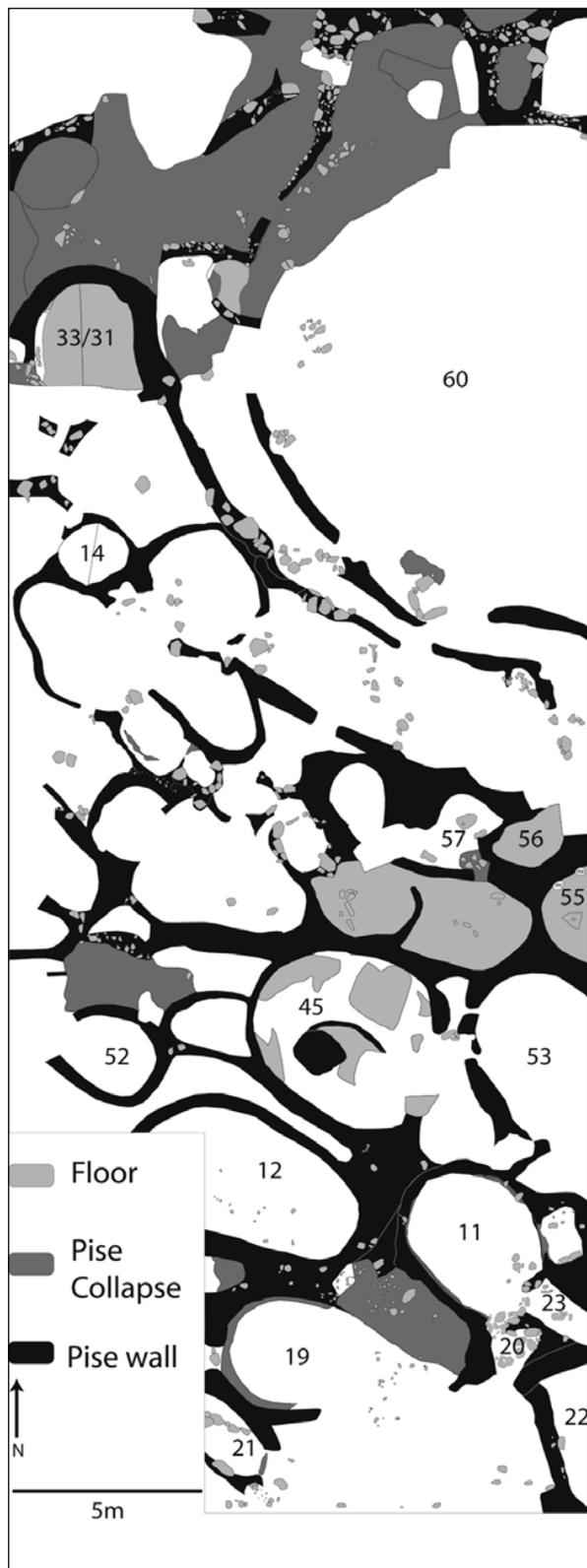
Overview of Excavation

Figure 3 shows a general view of the trench and Figure 4 a multi-context plan of the trench at the end of the 2008 season.

The following section provides a brief over-



3. The 2008 trench looking north.



4. Simplified multi-context plan of WF16 at the end of 2008 field season, showing structural remains; numbers refer to structure numbers.

view of the PPNA archaeology uncovered during 2008. Several features were identified in the overburden. These were mostly stone features. At the southern end of the trench, two cup-hole mortars (SF1 and SF31) were discovered immediately below the surface. These later proved to be central to structures (S10) and (S11) respectively. One robber pit (C3) was identified on the surface of the site, apparently targeting a partially exposed archaeological structure (not excavated in 2008), the stony element of which was visible on the surface. Further to the north were a series of stony features, with particularly dense concentrations of stones in the easternmost squares (C184, C185, C63), which may have been robbed out graves (although no human bone survived) or natural accumulations of stones in shallow hollows. The fills of cut features were difficult to identify in the loose upper sediments. The lack of post-PPNA artefacts is remarkable given the rich archaeological history of the Wādi Faynān region.

After the overburden had been removed, the outlines of several sub-circular, yellowish-brown arcs of pise walling were apparent across the trench, most clearly seen in the south (Fig. 5). These arcs were similar to the PPNA pise walls discovered in Evaluation Trench 1 (Finlayson and Mithen 2007). Deposits of possible pise collapse, midden material, and stone / rubble dumps were also visible at this level, mostly located towards the north of the trench. The removal of these during the season began to expose further pise and stone arcs in this area. A further notable feature was the presence of many small cuts, which were of a size and shape suggestive of burials; these were concentrated towards the central area of the trench. It was often unclear if cuts had been cut from this level, or had been cut through overlying, deflated levels.

Several of the arcs of pise formed recognisable and coherent sub-circular outlines, which we interpreted as probable PPNA structures. These were assigned structure numbers (Fig. 4). In total, 16 such structures were identified during 2008. As is clear from Figure 4, it is very likely that many other structures are present within the trench, but as further excavation is required to define their outlines, they were not assigned structure numbers during the 2008 field season.

A range of excavation techniques were em-



5. Detail of southern portion of trench, showing excavation of structures (looking north).

ployed in order to investigate the identified structures. The contexts within structures were removed in stratigraphic order, in some cases in single context levels from the whole interior, whilst in other cases internal deposits were removed in quadrants, to provide a higher degree of spatial resolution and to examine vertical sections. In one case a quadrant was removed more rapidly, in order to determine the depth of surviving walls. We have, as yet, a very limited understanding of the stratigraphic relationships between structures and, given the uneven deflation at the site, the degree to which these structures may be contemporary or not remains unclear at present. Moreover, the limited excavation of most of these structures leaves many questions regarding the construction techniques, life histories and function of the structures unanswered. Understanding stratigraphic relationships is also hampered by the facts that structures appear to have been rebuilt and remodelled during their lives, and that walls are shared between structures.

The following sections will provide more detail on the results of the 2008 season, focusing on structures, burials and a possible community rubbish dump. The type and quantity of finds recovered during 2008 will also be discussed.

PPNA Structures

There was considerable variability in the archaeology initially exposed in the northern, cen-

tral and southern parts of the trench. Although deflation has affected the entire trench, structures in the upper levels are better preserved in the south than in the centre, which, as the highest part of the knoll, may have been most affected by deflation. Towards the south of the trench the arcs of pisé were clearly identifiable as a series of juxtaposed structures. From the surface, these structures appear relatively similar: they are all relatively large ~4m in diameter, sub-circular structures large defined by yellowish brown pisé walls around 0.3m thick. In this area, at least eight such structures, along with several other structures, were identified. In the northern half of the trench, structural remains were originally less clear. In the central part of the trench this is partly because of deposits of pisé collapse which obscured underlying structures, partly because the small pits - including several which proved to be burials — were at their highest density in this area, and partly because the pisé structures exposed appeared to be more complicated, multi-cellular structures. The remains in the north were different again, resolving into a number of pisé and stone structures, several of which had been truncated by the excavation of a large midden pit (S60).

Even in the south, stratigraphic relationships between structures remain unclear at present. However, the nature and detail of pisé walling allied to some initial stratigraphic interpretation, suggest that the latest phase of well-preserved

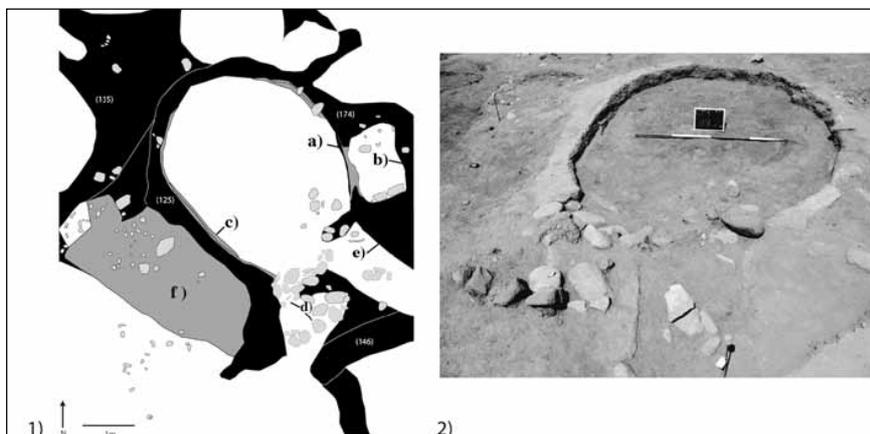
structural activity appears to be represented by structures S11 and S53 (Fig. 4). These share a connecting wall (C56) and are constructed of a similar colour pisé (paler than other structures); their interior walls appear to have been lined with a white mud plaster. At present it is not clear how these structures relate to most of the other structures (S55, S56, S57, S45 and S52), although in the very south of the trench it seems likely that structure S11 post-dates the construction of adjacent structures S12 and S19. Because structure S11 appears to represent a rebuild of an earlier structure on the same footprint (see below), it is possible that structures S12 and S19 may have been contemporary with the earlier phase of S11. A shared rubble buttress (C133) which fills the gaps between these structures supports this interpretation.

An example of the complexity of the PPNA structural archaeology at the site can be gleaned from more detailed examination of structure S11, which indicates a complex history of use and remodelling (Fig. 6).

The pale yellowish brown pisé wall (C125) of structure S11 was clearly revealed very high in the sequence, appearing to define a sub-circular structure approximately 4m in diameter. During removal of overburden, SF31 a cup-hole mortar, was identified and appears to have been set upon patch of floor surface (C130), central to the structure. This provides clear evidence that deflation has removed upper levels of PPNA occupation in this part of the site. In order to detect the presence of other possible ephemeral floor surfaces within the fill of the structure, we removed the remaining infill in quadrants, allowing examination of deposits in section.

The upper contexts initially appeared to be homogenous mid grey brown sandy silts. However, examination of sections revealed more variability within these contexts, which included occasional lenses of patchy laminated sediment together with small lumps of pisé. The presence of successive laminations suggests a relatively slow filling of the structure. Lower in the sequence, context C181 contained a large concentration of burned stone and partially articulated bird bone, perhaps several raptor carcasses (formal identification pending). Below this context and a layer of silt (C466), we discovered a more substantial floor surface (C462). This was a firm but patchy pisé floor apparently worn away towards the centre of the structure. Below this, a further series of laminated floor surfaces were noted at the southern edge of the structure. It is probable that that these floors relate to an earlier structure on roughly the same footprint as S11 as, at the same level as these floors, a band of pisé (possibly denoting an earlier wall alignment) was noted protruding 0.05m out from the western internal wall face of wall (C125).

The internal face of wall (C125) appears to have been coated with a white plaster material. This may represent a deliberate whitewashing or plastering of the walls but, in the absence of specialist analysis, it remains possible that this was a post-depositional phenomenon. Elsewhere in structure S11, a patch of dark, potentially burned pisé (C473) was found adhering to the inner face of the wall, overlying the white-wash. The remodelling effected by the addition of (C473) appears to have served to reduce the floor area of the structure and may be associated with a phase of remodelling, during which a se-



6. Structure 11: (1) Plan showing features discussed in text - (a) blocking, (b) cell or annex, (c) pisé step/wall line, (d) stone structures/blocking, (e) corridor / (?) entrance and (f) buttress; (2) Photograph of structure 11 during excavation, looking north-west.

ries of small stone structures (S20) were built to the south of the S11, possibly blocking an earlier entrance. The function of these small stone structures is unclear, but the presence of ashy silt amongst the stones may suggest that these structures served as ovens or hearths associated with S11. Perhaps also associated with this phase of activity is structure S22, which may represent a new entrance way or corridor into S11. In addition, to the north-west of S11 and apparently of the same build was a sub-rectangular wall (C174), which may represent a small cell or annexe of S11. This preliminary interpretation of the history of S11 underscores the stratigraphic complexity of the site.

Structure S45 is also located in the southern area of the trench and is the biggest so far identified. It is a ~5m diameter, almost circular structure defined by pisé walls (C245). In the centre of the structure, a well-preserved hearth (C248) was formed of moulded pisé. Structure S45 is cut by a probable Byzantine grave [C262], the section of which showed a sequence of PPNA archaeological deposits at least 1.5m in depth.

In the centre of the trench, work was slowed by the need to painstakingly excavate numerous burials. Consequently, the structures in this area remain largely undefined and take the form of a rather complex series of pisé arcs, some of which may define a number of juxtaposed small structures (diameter <2 m). These may be the remains of larger, multi-celled structures. A feature of note in this area is structure S14, which is significantly smaller and has a lining of thick yellowish mud plaster, perhaps suggesting that this may have served as a storage pit.

Further north, following the removal of overburden, a number of walls sections were identified. These appear to represent the deflated remains of later PPNA structures overlying better preserved PPNA deposits. We excavated the north-west quadrant of a structural sequence (S31 / 33) to some depth (**Fig. 7**). Very close to the surface were the remains of a burial (B3), lying within the upper fill (C67) of the structure (S31) defined by curved pisé wall (C381). Below this fill was a small area of a mud plastered floor comprised of thin laminations (C94). Wall C381 is clearly part of an earlier structure (S33). Sealed by the floor surface (C94) was another burial (B7). The remaining deep fill, compris-



7. Structure 33 at end of 2008 season, looking east.

ing blocks of pisé or mudbricks, was excavated down to another floor level (C380) constructed of light grey silty clay with a number of finds on its surface. These included a long polished stone implement, two hammerstones and a bone point. The floor surface lipped up over the edges of the pisé wall to the north, and over the edge of a group of stones in the western corner of the quadrant, which may represent the blocking of an entrance, suggesting that the layout of the structure was altered. The clean fill appears to represent a deliberate levelling of the interior.

Near S31 / 33 are further structures, incorporating more stone than those to the south. These have not yet been fully excavated and interpretation is hampered by the fact that several of the walls in the eastern half of the trench appear to have been truncated by a cut (C379) which defines the edge of the large midden S60.

A Community Rubbish Dump?

An important feature uncovered in 2008 was a rubbish dump or midden (S60) which dominates the north-eastern area of the trench. The area within the trench is a large semicircle ~20m diameter, which continues under the eastern baulk. It was not always possible to excavate the individual dumps within the midden and where individual contexts could not be identified, it was excavated in spits within the 5m divisions of the grid, thereby providing some spatial control and chronological subdivision.

To the north, the midden had accumulated within a large cut (C379) truncating an earlier structure to the west. Further south, it is currently unclear whether the midden is filling a cut through pisé walls, or whether the midden is

bounded by a free-standing pisé wall. The midden extended up to the northern limit of excavation where it was deposited over structures in the north-western corner of the trench.

The midden has so far been excavated to a depth of ~0.5m, producing a substantial quantity of finds including chipped stone and animal bone. Also present were numerous beads, fragments of worked bone, marine shells, ground stone and incised stone fragments. The majority of the midden sediments were dark grey brown loose silts with various internal features including a number of dumps of stones (e.g. C194), most of which were fire-cracked and are probably hearth waste, with one large mound of larger stones which may represent building material. These stone dumps seem to have accumulated in the midden as it was building up, rather than as single events. The midden was not just a waste dump, but also an activity area. Along its edge, where the earlier structures had been truncated, the deposits had been scorched. Crushed, burned snail shells also indicate *in situ* burning and trampling within the midden. The midden also contained human remains and more structured features such as hearths. Under the stones forming context (C116) and under midden layer (C100), the bones of an articulated human foot (C120) were found. A few other bones were present but not articulated. There was no sign of a cut and the bones probably represent part of a disturbed burial that was subsequently dumped into the midden.

At the base of the lowest spit of midden removed in 2008, a hearth (H16) consisting of a circle of stones measuring 0.35m x 0.32m was discovered. Stones used in the hearth included angular pieces of porphyry and smaller quantities of flint and granite; all of the stones showed heat damage from use of the hearth. Half-sectioning the hearth exposed a single fill of 90 % charcoal. Since the charcoal had not turned to ash, the fire in the hearth may have been extinguished rather than left to go out. Immediately to the east of the hearth was a burial (B17). The adult skeleton was lying on its right side in a crouched position with the head facing to the west.

Positioning this large rubbish dump in the centre of the settlement, and cutting through the existing hard pisé walls to set it there, suggests

a major investment in time and energy; perhaps the construction of this feature represents a community level planned activity.

Burials

In total, 27 burials were found as well as two possible robbed out burials and numerous finds of disarticulated human remains that were not associated with burial cuts. At least two of the graves were later intrusions, Burials B25 and B63, which are thought to be Roman / Byzantine. In the majority of cases the top part of the burial had been removed by deflation so that the top of the burial cut was lost. This makes it difficult to be absolutely certain as to their date, but, based on the positioning of the skeletons and the general character of the burials most compare well with burials from other PPNA sites. Most of the graves contained single inhumations but at least two were multiple burials. Many of them had been modified and rearranged after the primary burial, sometimes with secondary skeletal remains added. Burials were closely associated with structures and were often cut through the walls or under the floors. In this preliminary report we focus on three burials that were found during the 2008 excavation season which have particularly interesting characteristics.

Burial B32 was the first excavated and it contains the greatest number of individuals. This burial was initially identified as a deposit of ten large cranial fragments (C25 - 29 and C31 - 35). The top crania (C25 - 29) appear to have been carefully stacked. It is not known if any of these crania belong to the individual in the primary burial below (C20), *viz.* a crouched adult inhumation in a north-south orientated rectangular burial pit (C12) which cut the interior edge of a pisé wall (C278). The pit had been recut and the primary skeleton rearranged when further skeletal remains were added. The primary skeleton lay on its right side with the right leg remaining *in situ* flexed towards the chest so that the knee met the right elbow. The position of the right hand suggests that the right hand might originally have been placed underneath where the skull would have been if still articulated. Only the upper portion of the left arm survives *in situ* and the position of the lower arm or hand is unknown. The position of the left leg was presumably in a flexed position because there is

no place within the cut for any other articulated arrangement. Several objects were found in the burial, including a bird bone (SF106) and a flint core (SF114), but it is unclear if these were part of the primary inhumation. Our current interpretation of events is that the skull and mandible were removed from the primary skeleton, with the long bones of the left leg and the tibia of the right leg being moved from their original position and crossed over each other in the region where the skull would have been.

Burial B39 started as a smallish rectangular burial pit (C304) which may have contained a primary burial, but a recut (C293) truncates it through the middle and no articulated human remains were found within the fills of the primary cut. The bones of a skeleton (C271) were placed in a semi-articulated state in the recut burial pit. Before the bones were placed, a lump of gypsum was positioned against the eastern edge of the new pit (C293). The lump (C296) measured 0.21 x 0.12 x 0.10m and was capped with some orangey sandy material (C295). The lowest bones present were in the western part of the recut and included hand and finger bones, a femoral head and a tibia fragment. The west corner contained the remains of the radius and ulna, perhaps with the hand and finger bones placed under the skull. This is not entirely clear as large parts of the overlying remains had to be lifted as a block. A fine flint blade and three other chipped flint pieces (SF333, SF334, SF336) came from this part of the back-fill. The skull and mandible were positioned above, next to the gypsum lump (C296). The skull faced northwards and the front teeth rested against the pelvis. There were some traces of possible gypsum coating on the pelvis. Next to the pelvis was a femur with its head disarticulated and also possibly coated in gypsum. The shaft of the femur together with some other bones were coated in a more substantial gypsum substance, which had clear impressions of basketry on its outer face (Fig. 8, right). This suggests that the gypsum paste was applied either onto the bones or, more probably, onto the inside of a basket or a wrap which then held the bones. The whole arrangement was partially back-filled at which point a cloth or a bag containing gypsum paste was placed against the back of the skull.

Burial B7 was cut (C102) through the floor



8. Burial B39 showing possible basketry impressions in plaster.

(C94) of structure S31. This structure was one of a number of heavily eroded structures that had burials cut through the floor. The skeletons are presumably preserved because they would have been lower than the structures they relate to. B7 was a single undisturbed PPNA burial and contained an adult buried in a crouched position (C82), lying on its left side with the head to the north. The cut for the burial was a clear sub-circular pit through the fill sequence of the building below (Structure S33).

Finds

No specialist analyses have yet been made of the artefacts, but it is possible to provide a general overview of finds from the 2008 season based upon field observations.

Almost all the finds appear to be PPNA. Very few clearly later / earlier finds were recovered. Most of these came from the later burials B63 and B25 and overburden contexts. The PPNA

material cultural assemblage is very rich and supports the analyses of the previous evaluation (Finlayson and Mithen 2007).

Chipped Stone

A large (>100,000 pieces) chipped stone assemblage has been recovered. This appears to be a bladelet based industry dominated by diagnostic PPNA tool types, including El Khiam points and perforators. There are some indications that the assemblage from the midden — which was very dense — contains fewer pointed artefacts than other areas and is dominated by larger flake based tools and chunky debitage. Specialist analysis of the chipped stone assemblage will begin during 2009.

Ground Stone

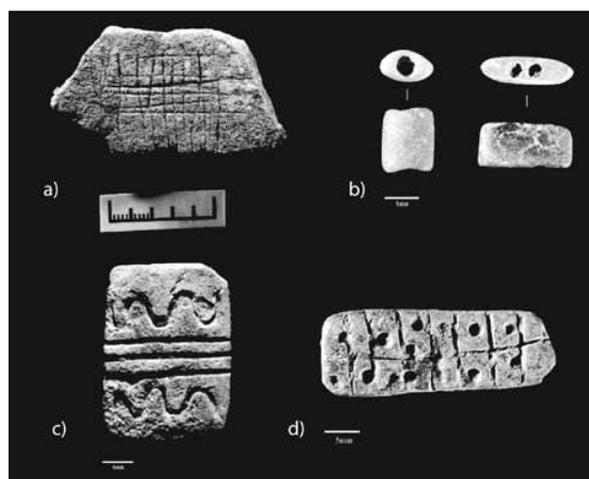
A large range and quantity of groundstone was recovered. This included many classic PPNA types such as cup-hole mortars. Additionally, many platters, vessel fragments and pestles were recovered. Some of the groundstone is of a very high quality, showing signs of delicate and intensive polishing. The midden (C60) contained a particularly high concentration of groundstone and also yielded evidence for on-site manufacture of groundstone, in the form of roughouts, and manufacturing debitage.

Beads

A significant number of beads (>100) and pendants were recovered during 2008. These include pieces made on greenstone (malachite) and shell. Bead types include small spacers together with larger beads with both single and double perforated forms (Fig. 9b). Significantly, many unworked shells as well as unworked / partially worked pieces of greenstone were also recovered, indicating that beads may have been manufactured on site.

Incised and Decorated Objects

A total of 45 decorated or incised stone objects were recovered during 2008. These ranged from elaborately decorated pieces to objects with a single (possibly natural?) incision. Of special note are SF332 (Fig. 9d), a domino-like decorated small plaque, and SF82 (Fig. 9c), a small greenstone plaque with an interesting motif that is strongly reminiscent of a similar arte-



9. Artefacts from 2008 excavations at WF16 - (a) incised stone (SF264), (b) beads (SF496 and SF193), (c) and (d) decorated plaques (SF 82 and SF332).

fact found at PPNA Netiv Hagdud (Bar Yosef and Gopher 1997). SF238 (Fig. 10) is a small limestone sculpture depicting a human face. On the reverse of the piece is another human face, this time in an upside down position. To our knowledge this is the only double-faced human head yet discovered from the PPNA, although small stone sculptures depicting single human faces have been found at several large PPNA sites such as Mureybet (Cauvin 1977), Jericho (Kenyon and Holland 1981) and Jurf al-Aḥmar (Stordeur 1997).

Other Artefacts

A range of typical PPNA material culture was recovered from the site. This included worked bone items, including several needles or pins, unworked marine shell and a range of perforated stones and several 'shaft straighteners'.



10. Three views of sculpted (?) limestone head (SF 238), showing both human faces.

Faunal Remains

A large assemblage of animal bone was also recovered, comprising more than 1,000 bulk find bags. The assemblage includes both large and micro fauna. The majority of this material was recovered from the midden.

Archaeobotanical Remains

407 archaeobotanical samples were generated from the flotation process, 402 from the light residue and 5 from the heavy residue. In addition, 12 further samples were collected from the dry sieve. These remains unsorted, but based on the material found in the evaluation, they are likely to contain charcoal, seeds and other macrobotanical remains.

Summary and Future Plans

This first season of excavation at WF16 has been highly rewarding, confirming the inferences regarding the quality of preservation and richness of the material culture made during the evaluation project (Finlayson and Mithen 2008). It is however the case that the architecture has proved to be more substantial and well preserved than had been anticipated. The number of burials and large extent of the midden exceeded our expectations and further demonstrate the overall significance of WF16 for understanding the origins of the Neolithic. The value of excavating a PPNA settlement at this scale is readily apparent.

It is clear from the depth of stratigraphy, especially as revealed by the sections of later burials cut through the PPNA deposits, that the site has a long history, the extent of which will hopefully be established during the 2009 and 2010 excavation seasons. While the contemporaneity of the exposed structures has yet to be established, our initial impression is that the settlement displays a considerable degree of planning. The extent of the midden suggests that it served numerous households and also acted as a centralised area for artefact production and other tasks. We suspect that this midden was deliberately created during a later phase of the settlement, and testing this will be a key objective of the 2009 season. That season will also continue to excavate the relatively well-preserved structures at the southern end of the trench, further burials in the central area of the trench, and the smaller

structures below these.

During the 2009 season, we anticipate acquiring at least as many artefacts and faunal remains as in the first season, which have already been very substantial for a site of this age. The number of symbolic objects is unparalleled for a PPNA site in the southern Levant, which may be a reflection of the scale of the excavation. We feel confident that following completion of the excavation in 2010 and the programme of post-excavation studies that will begin in 2011, WF16 will make a significant contribution to our understanding of the origins of sedentism, farming and the Neolithic in the Levant.

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ḤISBĀN OSTRACON A1: NEW COLLATION AND NEW READINGS

Matthieu Richelle and Michael Weigl

Introduction

A correct understanding of an ancient inscription usually stems from several successive studies made by different epigraphists in order to gradually improve the *editio princeps*. It is all the more striking that in the case of the Ḥisbān ostrakon A1 (see **Figs. 8, 9**), apart from a short study of E. Puech (1985), virtually no detailed epigraphic work on this inscription was published after the initial article of F.M. Cross (1975). As a result, most of the subsequent publications follow the latter without change, which seems to be the sole detailed study based on a direct examination of the original object.

The present article is the result of a new collation of the ostrakon at the ‘Ammān Citadel Museum, which has led the authors to several significant new readings and interpretations of some personal names and commodities mentioned in the text.

The object

Excavation number: H73.1657

Cross numbers: IV, A1

Present location: Amman Citadel Museum

Museum registration number: J.15366

Date of discovery: 31 July 1973

Excavators: Siegfried H. Horn (director), James A. Sauer (supervisor of Area B)

Archaeological context: Area B, Square 1, Locus 143; Iron Age II / Persian (according to the excavator, but see Cross 1973: 1)

Description: Pithos with very large inclusions of calcite

1. Former studies

In the *editio princeps*, Cross (1975: 2) read and translated the text of the ostrakon as follows:

- 1) [L]MLK. ’KL 20+10+5 (?)
- 2) WŠ’N 8 vacat
- 3) WLNDB’L BN N ’M’L M[
- 4) LZ[]M’LT NK’T 2 10+’K[
- 5) L[] NK’T 2 ’RH BT 2 W[
- 6) LB ’Š [’] KSP 20+20 ’Š NTN L[
- 7) YN 20+2 WŠ’N 10 LBBT [
- 8) YN 8 W’KL 6
- 9) LYT B DŠ’ ’KL 20+4 (?)
- 10) Š’N 9
- 11) ’RH BT 3

- 1) To the king: 35 (jars) of grain [
- 2) and 8 small cattle, vacat
- 3) and to Nadab’el son of Na‘amēl from[
- 4) To Z[] from ’Elath: 12 (measures) of gum; (x jars) of g[rain
- 5) To [] 2 (measures) of gum; a two year old cow and [
- 6) To Ba ’š [a’]: 40 (pieces) of silver which he gave to [
- 7) 22 (bottles) of wine; and 10 small cattle; (x measures) of wheat germ[
- 8) 8 (bottles) of wine; and 6 (jars) of grain.
- 9) To Yatib: hay; 24 (jars) of grain;
- 10) 9 small cattle
- 11) a three-year-old cow.

This great epigraphist was followed without modification by Aufrecht (1989: 214-215) and Jackson (1983: 51-52), while Aḥituv (2008: 371-372) only changed a number (reading 50 instead 40 at line 6).

Apparently on the basis on photographs, Puech (1985: 13-14, 16 fig. V) proposed his own reading:

- 1) [L]MLK. ’KL 20+8[
- 2) WŠ’N 9

- 3) WLNDB'L BN N 'M'L.K[SP
- 4) LZ'B BN(?)'LT.NK'T W/ZRH B[T
- 5) LY'[Š.]NK'T W/ZRH BT 2 W[
- 6) LB 'Š' [.]KSP 20+20 WŠ NTN L[
- 7) YN 20+2 [+2/3] WŠ'N 10 W/LBBT [
- 8) YN 8 W'KL 6
- 9) LYTB DŠ' 'KL 20+4
- 10) WYN 9 -(?)
- 11) W/ZRH BT 3

Puech's reading differs on several points from the *editio princeps*. The most important modifications are the following:

Correcting some readings: in lines 4, 5 and 11, the presence of the word "cow" is implicitly dismissed because Puech reads W/ZRH instead of 'RH; likewise, at the end of line 7, the word "wheat germ" (LBBT) becomes uncertain, because the first letter can also be read W. Moreover, in line 10, Puech reads WYN ("and wine") and not Š'N ("small cattle"). Furthermore, in line 6, the spelling of the relative pronoun is 'Š according to Cross, but Š according to Puech.

Filling some gaps: at the beginning of lines 4 and 5, Puech reads two personal names (Z'B and Y'[Š.] respectively) and in line 4 he proposes that the following word is BN ("son of").

However, because the focus of his article was on palaeography, the French scholar did not try to give a new interpretation of the text; he eliminated some words without providing any explanation for his own readings. Cross was not convinced by the latter's propositions and, in a new synthesis on the Ḥisbān Ostraca (2003: 71-79), he reproduced his own former reading without change.

2. New collation

Thanks to the courtesy of the Department of Antiquities of Jordan and the Director of the Amman Citadel Museum, we had the opportunity to examine the original ostrakon afresh, to make drawings and take new photographs. This study led us to some significant improvements in the reading as well as to the re-interpretation of several words of this text.

2.1 Reading and Translation

- 1) [L]MLK. 'KL 20+8[
- 2) WŠ'N 9
- 3) WLNDB'L BN NQM'L K[SP

- 4) LZ'-[B]N 'LTMK BT 10+2 'K[L
- 5) LY'[]KP'T.WRHBT 2 W[
- 6) LB 'Š'[.]KSP 20+20 WŠ NTN-[
- 7) YN 20+2 WŠ'N 10 WBBT[
- 8) YN 8 W'KL 6
- 9) LYTB DŠ' 'KL 20+4
- 10) WYN 9-
- 11) WRHBT 3

- 1) To MLK, grain: 28
- 2) and small cattle: 9
- 3) and to NDB'L son of NQM'L sil[ver
- 4) To Z'-[so]n of 'LTMK, bath: 12, gr[ain
- 5) To Y' [] and jars: 2 and [
- 6) To B 'Š'[], silver: 40 and what he gave [
- 7) wine: 22 and small cattle: 10 and merchandise [
- 8) wine: 8 and grain: 6
- 9) To YTB hay, grain: 24
- 10) and wine: 9-
- 11) and jars: 3

2.2. Epigraphic and Philological Notes

Our comments will mostly concern new readings and new interpretations, line by line.

Line 1: [L]MLK. 'KL 20+8[
MLK

Cross is probably right in considering as virtually certain the reconstruction [L]MLK, because there is only space for one letter and because the text uses the form : preposition L + personal name + commodity + quantity several times.

We nonetheless prefer a cautious approach, i.e. not to conclude immediately that MLK is a title here, designating the king of the land. Indeed, MLK could also be a simple personal name, as is attested in Biblical Hebrew (e.g. 1 Chr 8:35, 9:41; see *HALOT*, 592), perhaps on a Palaeo-Hebrew bulla (WSS 400), in Phoenician (Benz 1972: 138, 344-345), in Palmyrenian (Stark 1971: 95), as well as in Safaitic, Lihyanite and Thammudic (Harding 1971: 564-565).

'KL

This word probably means "grain" (cf. Hab 3:17: "and the fields yield no grain", as pointed out by Ahituv 2008: 353), though "flour" and "bread" are also possible senses. In addition to the Ugaritic occurrences and to the instance on

a cuneiform tablet from Ta'anakh that Cross has pointed out (2003: 72-73), one can mention at least two examples nearer to the Ammonite realm, since 'KL appears:

In Aramaic on an economic clay tablet approximately dated to the middle of the seventh century BC. (Lemaire 2001: 33-41: "nourriture, grain");

In Edomite on an ostrakon from Ḥorvat 'Uza dated to the end of the 7th century or to the beginning of the 6th century BC (Beit-Arieh and Cresson 1985: 96-97; Beit-Arieh 2007: 134; Ahituv 2008: 351-353).

Line 2: WS'N 9

The reading as well as the interpretation are clear.

Line 3: WLNDB'L BN NQM'L K[SP NDB'L

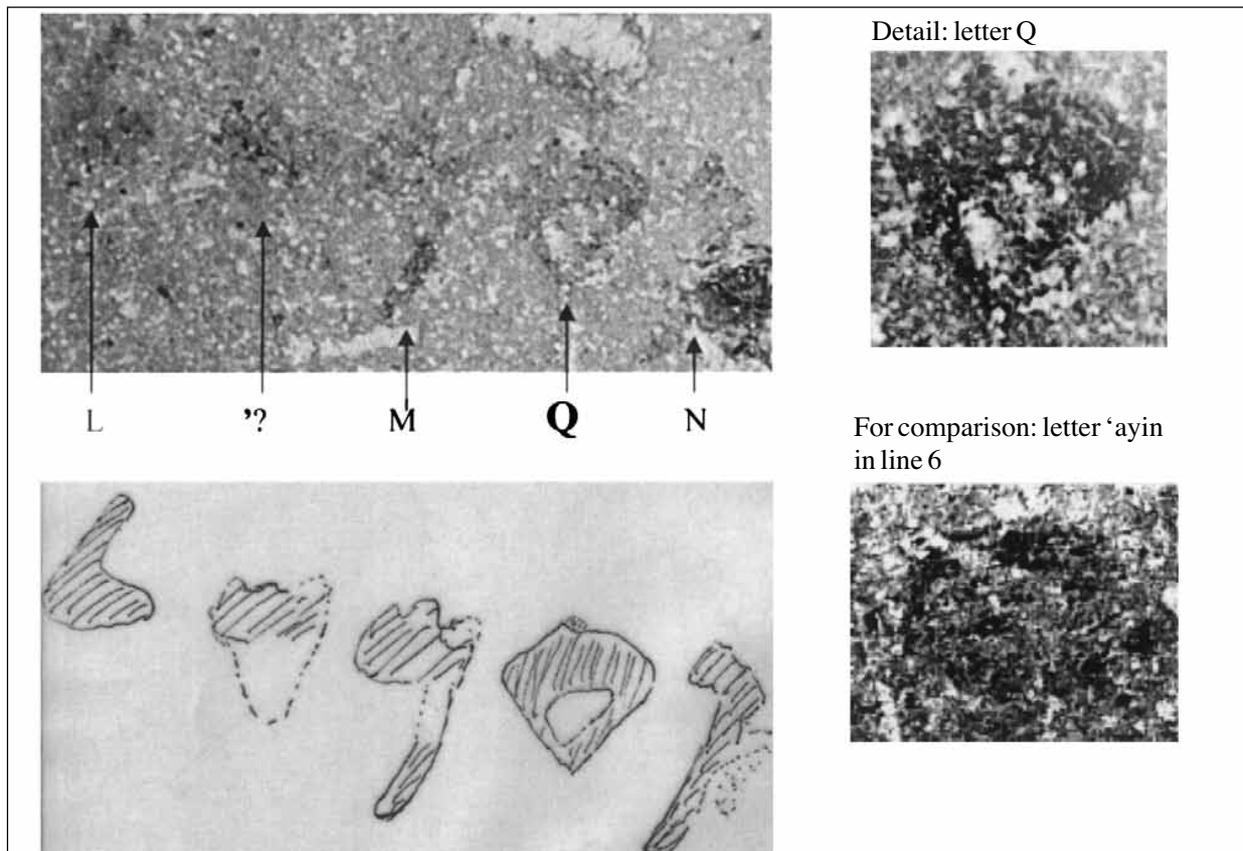
Before the second L in the line, there is a large white spot that clearly stems from the production process of the vessel and therefore pre-

dates the writing. Again, the shape of the letter remains unclear, but the reading fits the traces of ink and provides a name common in the Ammonite onomasticon.

NQM'L

After the two N in the middle of the line, the letter that both Cross and Puech have read ' is undoubtedly a Q (Fig. 1). It is formed by two vertical and symmetrical curved strokes, giving an ellipsoidal shape to the letter, and is clearly different to the occurrence of ' in line 6.

As a result, we here encounter the personal name NQM'L, which also appears for the first time in the Ammonite corpus. It is attested in Phoenician (Benz 1972: 363) and possibly in Palaeo-Hebrew on an inscription on a jar handle from Tall an-Naṣbah, which can be read either NQM'[L] or NQMY[HW] (Dobbs-Allsopp *et al.* 2005: 387). Names of the form NQM+DN are known in Amorite (Huffmon 1965: 241-243) and Ugaritic (Gröndhal 1967: 168). NQM appears probably as hypocoristicon in Palaeo-



1. The sequence NQM'L in the second half of line 3.

Hebrew on a jar handle from Jerusalem (Dobbs-Allsopp *et al.* 2005: 218-219), while in Sabaeen (Ryckmans 1934-35: 144) and in Safaitic (Harding 1971: 598) it is rather interpreted as *Nāqim* “avenger” (cf. also NQMT in Safaitic; Ryckmans 1934-35: 144). Other names derived from the same root are NQWM and NQMW that appear on the Aramaic ostraca of Idumea (Lemaire 2002: 166, 274). The root NQM (“to avenge”) is possibly attested in the Ammonite onomasticon as component of YQM[']L on the El-Mazar Ostrakon VII (line 9), but this PN can also be analyzed in a different way (from the root QWM: see Aufrecht 1989: 342).

K[SP

At the end of the line, it seems to us that the head of the last letter, which is compact and enlarges on the left, pertains to a K (as proposed by Puech) rather than to an M (as proposed by Cross). Puech’s restitution of K[SP] stems from the occurrences of this word at lines 1 and 6, and seems reasonable. KSP is widely attested in West Semitic inscriptions (Hoftijzer / Jongeling 1995: 524-526).

Line 4: LZ' -[B]N 'LTMK BT 10+2 'K[L

This line is more difficult to read because the ink has faded.

LZ' -[B]N

The second letter can be read W or Z; after the initial L which is probably a preposition, it is difficult to take the W for the beginning of a word, so the reading Z has to be preferred. After Z, Puech reads a ' that was merely conjectured by Cross, and then two successive B. The direct examination of the shard shows that the surface is abraded by scratches and that the ink has faded. There are traces of ink from three letters: the first ones are *compatible* with the presence of a '. As for the two following letters, no reading stemming from the traces can be proposed. It is likely that L was followed by a personal name Z' -, for instance Z' B as Puech implicitly suggests; it is attested in the Bible (Judg 7:25, 8:3). At the end of this area of uncertainty, i.e. immediately before the next legible letter (the ' of 'LTMK), there is a trace of ink at the bottom of the line (on the left part of a small depression that was created before the writing was applied):

it pertains to the tail of K/M/N/T. Cross takes it for an M and reads the preposition “from”, preceding a toponym 'LT. The latter interpretation is very unlikely, as we will soon see. Although every proposition remains guesswork, we suggest reading a N belonging to [B]N “son of”, which would be expected between two personal names: Z[] and 'LTMK, as in line 3. It should however be noted that there are several examples in West Semitic epigraphy where BN is omitted between a name and patronym. Consequently, even if it were lacking here, it would not be problematic.

'LTMK

The next legible sign is the head of a ', followed by a L. From the next letter, there remains mainly the lowest part of a tail, whose orientation indicates a reading K/M/N/T. Moreover, although there is not sufficient space on the left for the presence of a head, there is a trace of ink on the right, which can only pertain to a T. Then there is an M, and the last letter clearly is a K.

With regard to the complete sequence, Cross reads 'LT “Elath” (preceded by M, “from”) and NK'T “gum”; in addition, Puech sees a separator between these two words. These propositions prove to be problematic. From an epigraphic point of view, there are several severe improbabilities for this hypothetical reading: our own examination convinced us that the shape of the letter they read as N more likely points to a M (as was already apparent from the drawing of Puech) and that there is no separator between T and N. As for the sense, other difficulties arise. Cross’ identification of “Elath” with the port and city on the Gulf of 'Aqaba is questionable (2003: 73); moreover, it would be the sole example of such precision in the text after a personal name. Furthermore, the presence of “gum” would, to say the least, be astonishing in this context.

On the contrary, the epigraphic data lead us to read 'LTMK, which is a personal name attested in Ammonite inscriptions on the Nimrud ostrakon (CAI 47, l. 14) and on a seal (CAI 62). The equivalent name TMK'L is well known in Ammonite on seals (CAI 1, 3, 14, 26, 84, 86, 113, 132; WSS 886) and on another Ḥisbān Ostrakon (A4, see *infra*); its hypocoristicon TMK' appears on two seals (CAI 85 and WSS 981). Both TMK'L and TMK' are attested in Phoeni-

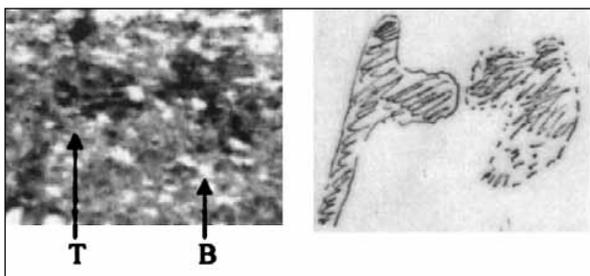
cian (Benz 1972: 429), while the former appears on an Aramaic seal (WSS 853).

BT 10+2

After 'LTMK, both Cross and Puech read 'T (end of the word NK'T). But this reading was influenced by the presence of the same word (NK'T) in the following line. A close examination of the shard indicates that, from a strict epigraphic point of view, we must correct the reading ' into B (Fig. 2). Note that the head of this B is slightly erased on the left part, exactly like the B in line 3.

After BT, Cross reads 10+2'K[whereas Puech deciphers W/ZRH B[T. Here again, Puech seems to seek a reading of a sequence of letters that appears in line 5. In addition, he was probably misguided by the presence of an incrustation under the penultimate letter that gives it the appearance of a Ḥ on some photos. As a matter of fact, the material traces, indicating numerals, were more correctly read by Cross. Since the ink of the last letter is very faded, its reading remains uncertain; it could be a K as suggested by Cross, which reasonably leads to the reconstruction 'K[L.

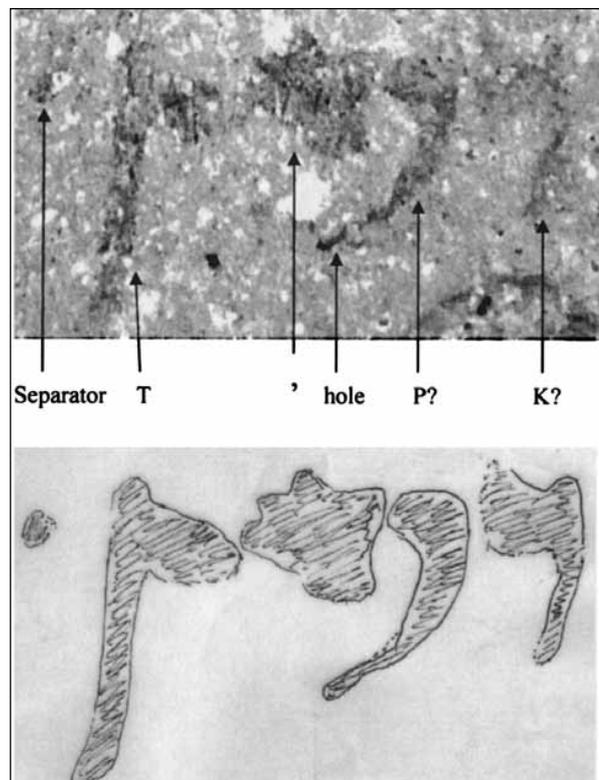
BT designates a measure of capacity (*bath*) well known in the Bible (e.g. 1 Kgs 7:26) as well as in Epigraphic Palaeo-Hebrew, on jars (Aḥituv 2008: 240-242) and on ostraca from Arad (e.g. Aḥituv 2008: 92-94). These ostraca use the abbreviation b followed by a numeral. Here, two *bath*-measures are reported in the account. Biblical data, as well as archeological data, seem to indicate that the Israelite pre-exilic bath measured about 24 liters (Powell 1992: 902; Dobbs-Allsopp *et al.* 2005: 343). However, there is no reason to assume that the same range was used in Ammon; in Ekron, one *bath*-measure contained 32 liters (Aḥituv 2008: 241, 345).



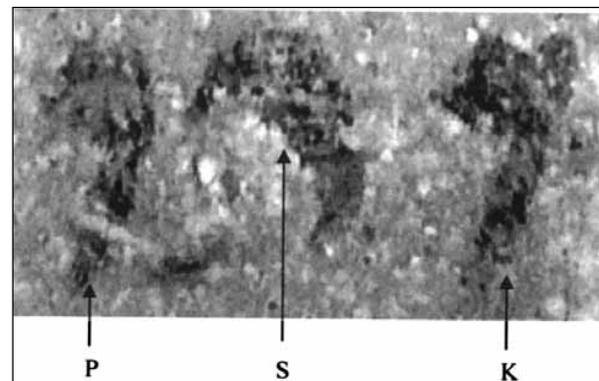
2. The sequence BT 10 + 2 in line 4.

Line 5: LY' '[]KP'T.WRHBT 2 W[
LY' '[]KP'T

In the first half of the line, the ink is faded and there are several holes in the surface of the sherd. Before the gap, Puech is correct in reading two more letters than Cross: Y'. After the gap, both scholars read NK'T. Our own examination leads us to the conclusion that the first letter cannot be an N as the head is too wide (Fig. 3), but could be a K (compare the K in line 6; Fig. 4). Likewise, the second letter is undoubtedly not a K (compare, again, the K in line 6; Fig. 4); its head clearly does fit this reading.



3. The sequence KP'T in line 5.



4. The sequence KSP in line 6.

On the other hand, it could be a P (compare the P in line 6; Fig. 4), although it remains uncertain. Note that what seems to be the end of a very long and curved tail for this letter is in reality a hole at the surface of the shard (Fig. 5).

As a result, we read *KP'T*. However, owing to the gap before these letters, the complete sequence of letters remain unknown, so it is difficult to decide if *KP'T* is a substantive or, if part of it, belongs to a former word or name.

At least, two conclusions can be drawn:

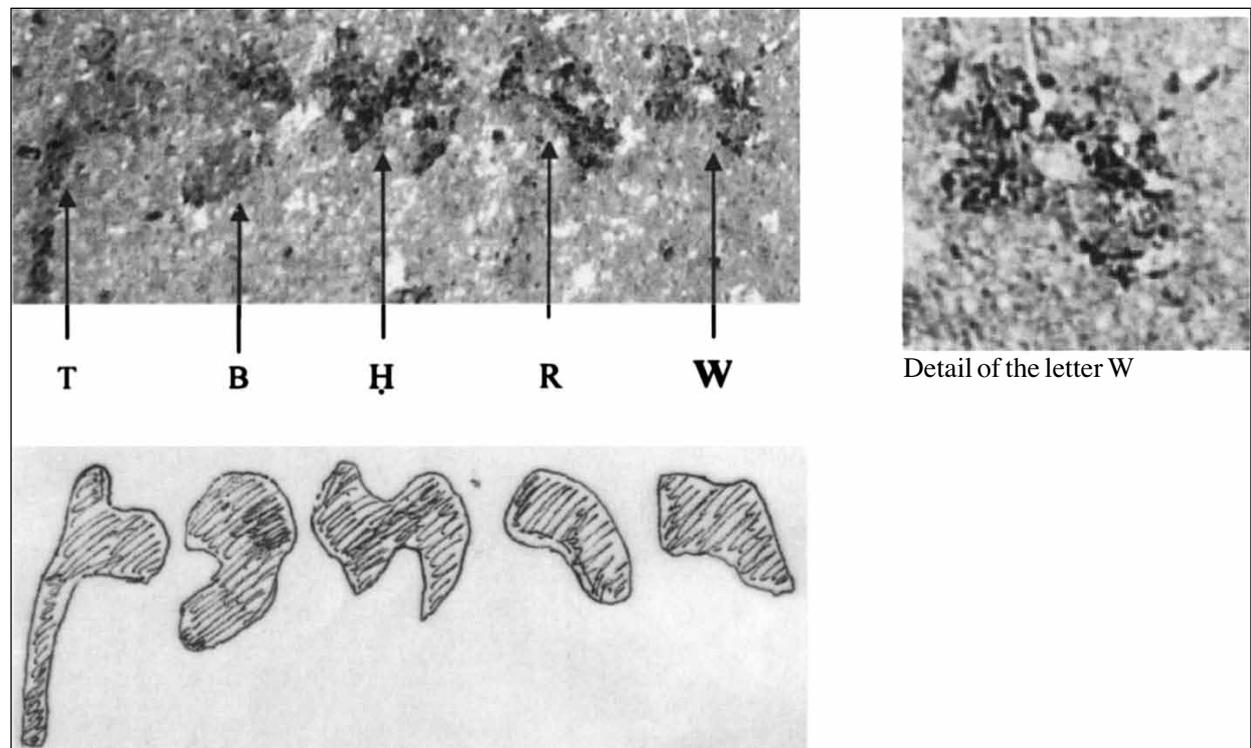
- First, one can reasonably assume that the initial L is followed by a personal name Y'[]]. Examples of such anthroponyms are Y'S (WSS 442, 512, 513, 799), Y'WŠ, Y'ZN, Y'ḤŠ and Y'R (Dobbs-Allsopp *et al.* 2005: 599-600).
- Second, there is a separator after T (not noticed by Cross or Puech), and the next word (designating goods of some sort, see *infra*) is introduced by the conjunction W: it implies that the last word before the separator ([]KP'T ?) designates a commodity.

RḤBT

Cross reads 2'RḤ BT 2, whereas Puech pro-

poses W/ZRH B[T. In fact, reading 2' proves to be simply impossible; there is only one sign before R. In addition to the epigraphic problem, Cross' interpretation was highly conjectural: a "two year old cow" would be a very unusual designation for a commodity in an economic ostrakon. Moreover, our own examination allows us to come to a decision with regard to the letter: it is clearly a W, not a ' (Fig. 5).

As a result, we read the word RḤBT after the conjunction W. In the Bible, it appears as a toponym (Gen 10:11; see also Gen 26:22). This is a personal name in Safaitic (Ryckmans 1934-35: 123) and Sabaean (Harding 1971: 272), more precisely a feminine one that Sholan (1999: 143) proposes to vocalise *Raḥbat* or *Ruḥabat*, which can be linked to *Ru-uh-bat-um* in Amorite (Gelb 1980: 342). RḤB is a personal name in Lihyanite, Safaitic, Minoan and Sabaean (Harding 1971: 272). Nevertheless, since all the anthroponyms of the text are preceded by the preposition L, which is lacking here, and since RḤBT is followed by a numeral, one should rather assume that it designates a commodity. In Ugaritic RḤBT means "amphora, jar"; this word notably appears in the syntagm RḤBT YN (Del Olmo



5. The sequence WRḤBT in line 5.

Lete / Sanmartin 2003: 737). Del Olmo Lete / Sanmartin relate it with Akkadian *ribu* (cf. CAD, vol. 14, 321).

Line 6: LB 'Š[']KSP 20+20 WŠNTN-[
LB'Š [']

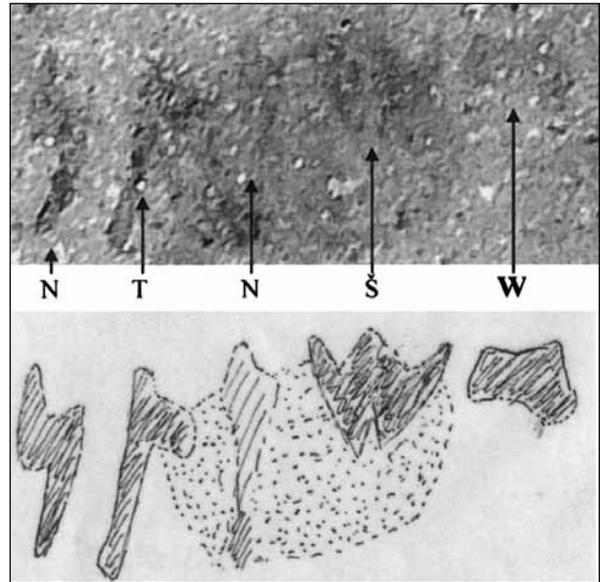
Before K, there is a large fissure on the shard, probably caused after the process of writing. We recognize a trace of ink forming part of the tail of the final ' before the damaged area. The name B 'Š' is well known and was perhaps the name of an Ammonite king, but this is debated (see Cross 2003: 74 n. 26).

WŠ NTN

Preceding Š, Cross reads a ' , but Puech a W. It follows from close examination that the latter reading is correct. This epigraphic question has an important grammatical consequence: the sole attestation of the Ammonite relative pronoun is in the form Š and not 'Š (Fig. 6). In this respect, two important studies on dialectology (Garr 1985: 85 and Yun 2005: 751) must be updated.

Line 7: YN 20+2 WŠ'N 10 WBBT [
BBT

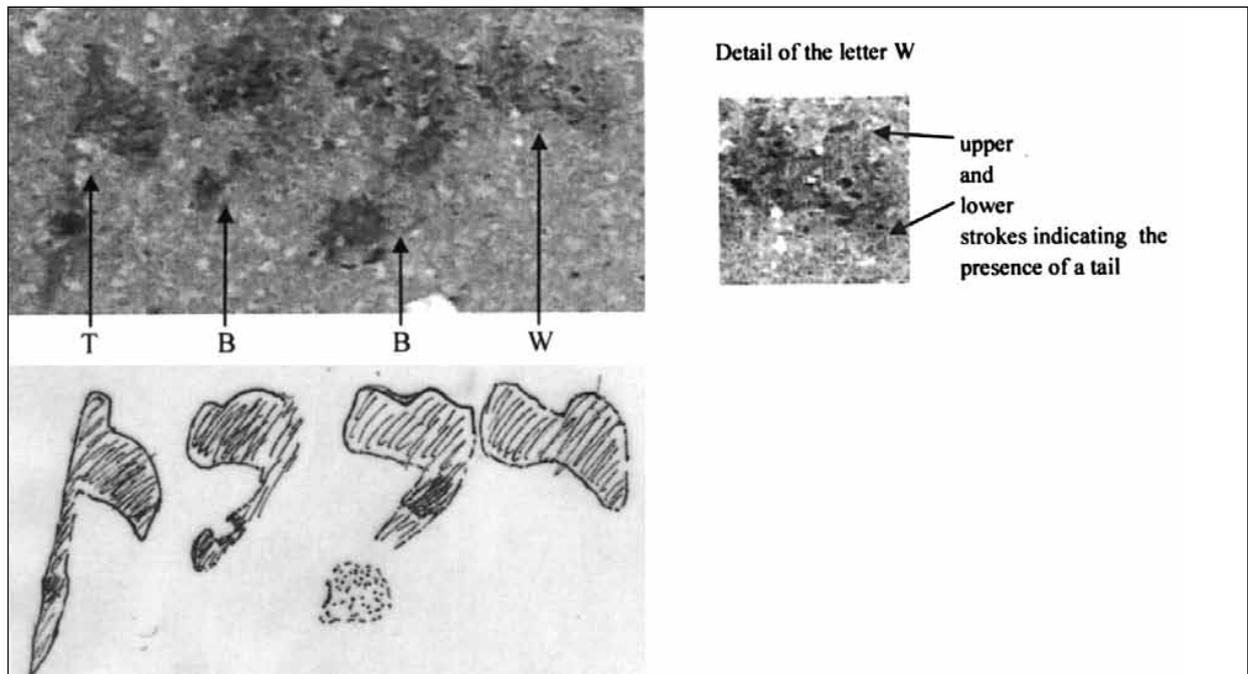
Ahead of the two successive B, Cross reads an L and interprets LBBT as "wheat germ"



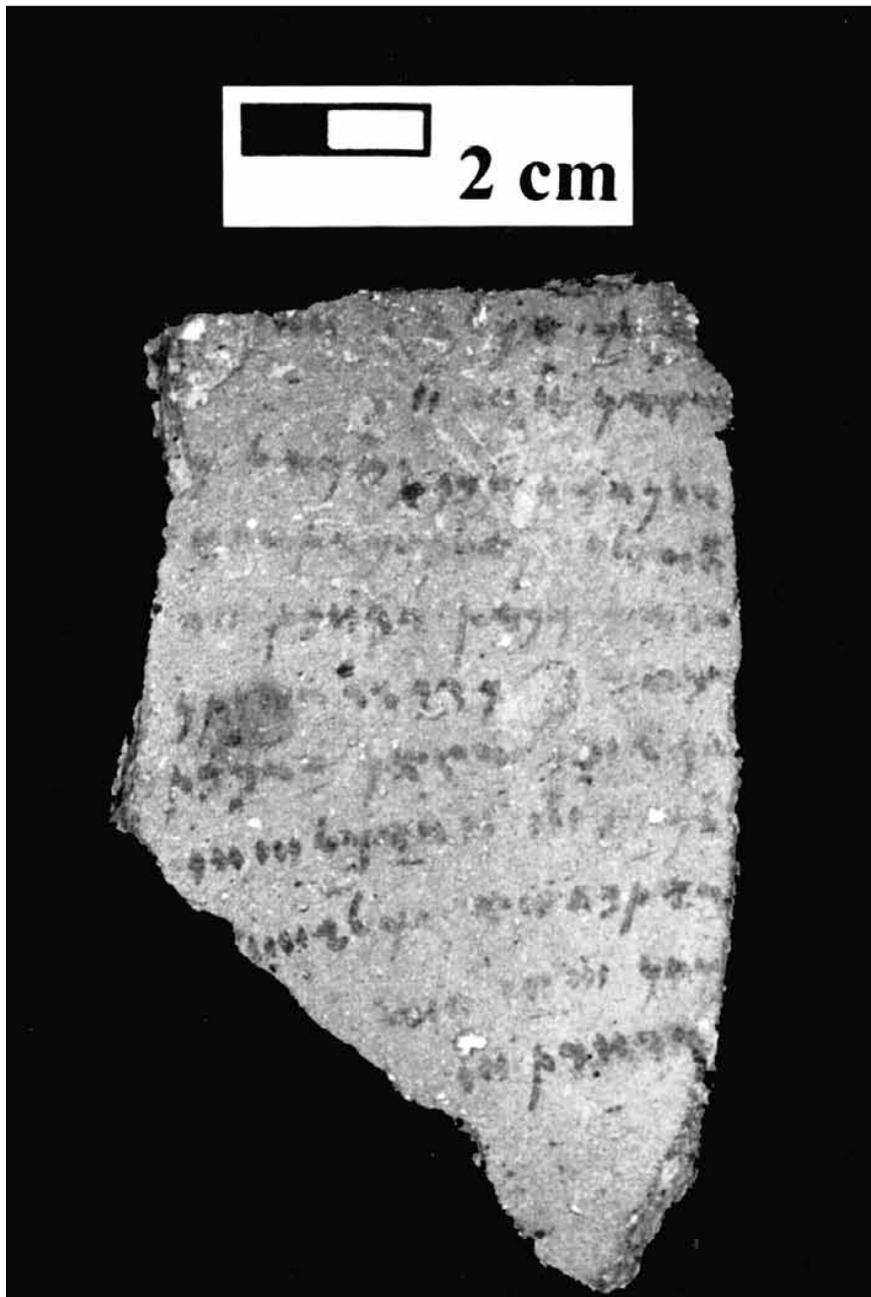
6. The sequence W□NTN in line 6.

(2003: 72). Puech hesitates between L and W. In fact, the reading W is absolutely certain, as a good photograph as well as direct examination of the sherd clearly shows that the letter has no upper stance above its main part, and on the right there is a small tail, so that the shape points to a W (Fig. 7).

Consequently, Cross' interpretation must be rejected and after the conjunction W, we need



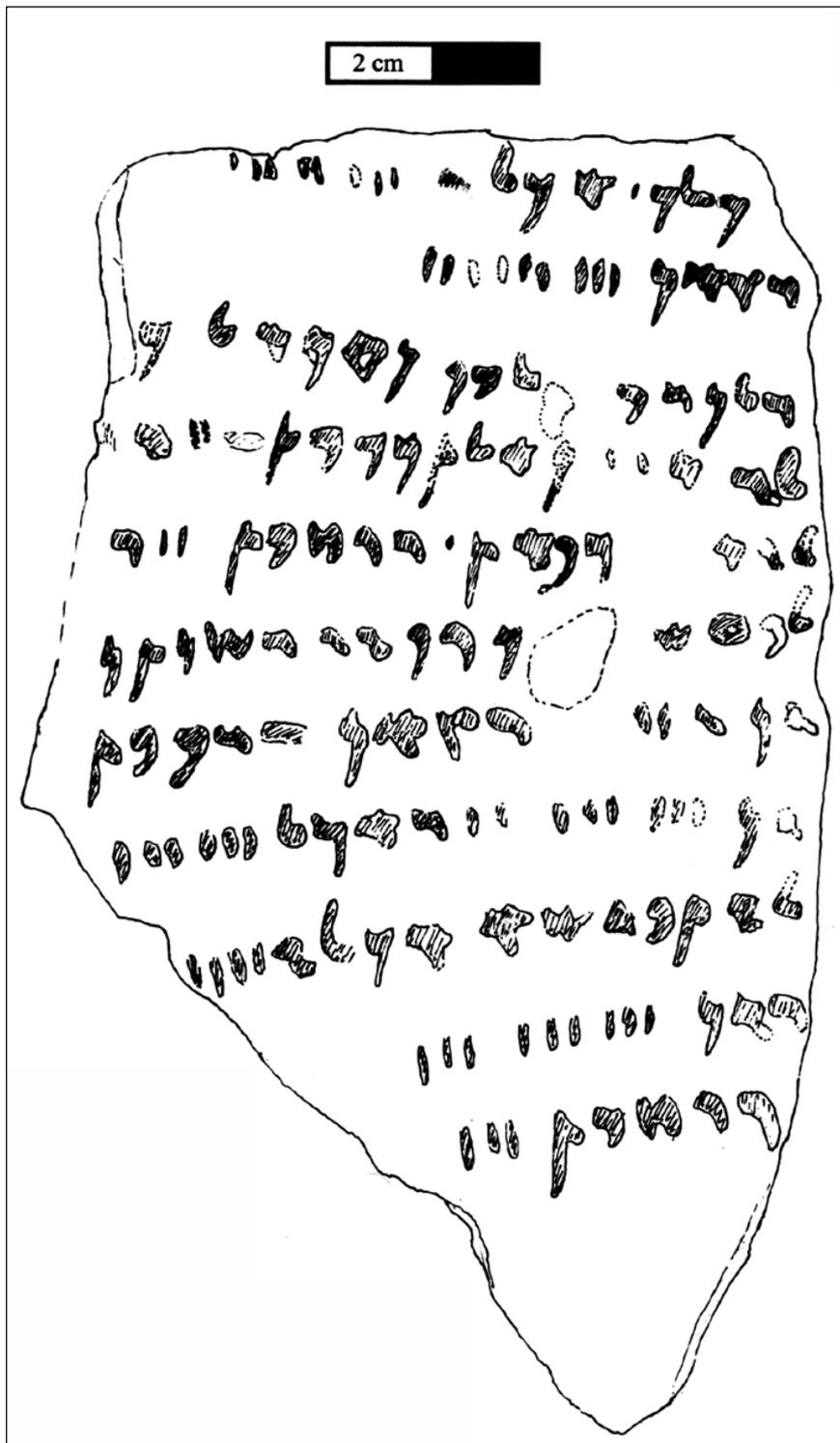
7. The sequence WBBT in line 7.



8. The ostracon A1.

to explain the reading BBT. Admittedly, it is attested as a personal name in Sabaean (Harding 1971: 91; Sholan 1999: 106) and Palmyrenian (Stark 1971: 8, 74), and was perhaps a hypocoristic for the feminine name 'LBBT (Sholan 1999: 95, 106). However, since the preposition L is absent before it, BBT more likely designates merchandise. At the present state of knowledge, it seems virtually impossible to find such a substantive in the West Semitic languages. However, in Akkadian, *babtu* designates a commodity

(“Handelsgut”, *AHW*, vol. 1, 95), perhaps more precisely “an amount of staples, finished goods or merchandise outstanding (i.e., not at hand at the time of accounting but whose delivery or payment is expected with certainty in the near future” (*CAD*, vol. 2, 10-13). For example, *CAD* translates: 5 MA.NA *kaspum* 148 ŠE.GUR *našpakum* 40 ŠE.GUR *ba-ab-tum nikkassī šu ša maḥar Šamaš ipušu* as follows: “Five minas of silver, 148 gur of barley in storage (and) forty gur of barley deliveries outstanding, (are) the



9. Drawing of ostrakon A1

possessions for which he accounted to Šamaš” (CAD, vol. 2, 13).

Thus, it seems reasonable to understand BBT as a designation for a particular commodity, which perfectly fits our economic text, perhaps

with a nuance near to the Akkadian semantics.

Line 8: YN 8 W'KL 6

Although the ink has faded at the beginning of the line, the reading and the interpretation are

virtually certain.

Line 9: LYTB DŠ' 'KL 20+4

In this line we agree with Cross' and Puech's readings (which are the same).

YTB

This is a personal name in Safaitic and Thamudic (Harding 1971: 657).

DŠ'

Cross recognizes the word meaning "grass" and interprets it as "hay". This is possible, albeit slightly surprising; note also that there is no number after this word, so that no indication of quantity is provided for this merchandise. It is hard to suggest a better interpretation. The only other solution would be taking DŠ' for a personal name. In this case, there wouldn't be the usual link BN between the name YTB and its patronym but, as has already been noted, it sometimes occurs in West Semitic epigraphy. However, it seems difficult to find any attestation of DŠ' in West Semitic onomasticon. Taking into consideration the development T>Š (Lipiński 1997: 118-122; for Ammonite see Garr 1985: 29), we could perhaps link DŠ' with the Minoan personal name DT' (Harding 1971: 234). This is obviously hypothetical, and we mention it only in order to explore the possibilities.

Line 10: WYN 9-

The sole problem concerns the numeral: after 9, there are traces of ink which are difficult to read.

Line 11: WRḤBT 3

Here we encounter exactly the same situation as in line 5.

2.3. Conclusion

This new examination of the inscription has led us to propose several significant changes to former readings. The main results are the following:

- Four words were, in our opinion, mistakenly read in this text: there seem to be no references to the commodities "two year old cow", "gum" and "wheat germ", nor to the toponym 'LT.

- On the contrary, we discovered here the presence of:

- two personal names: NQM'L (for the first time in Ammonite) and 'LTMK;
- a measure of capacity (BT), already known in pre-exilic inscriptions from Judah, in biblical texts and in Ekron, but not in Ammon;
- two designations for commodities: RḤBT ("jars") and BBT, that were previously merely known in Akkadian.

Moreover, we are in a position to confirm Puech's reading of the Ammonite relative pronoun in the form Š; it has been mistakenly read 'Š by many, and this inaccuracy has in turn impacted on quite a few grammatical treatises.

3. Remarks on the Ḥisbān Ostrakon A4

Rollston has recently proposed a few improvements to Cross' reading of ostrakon A4. Cross' reading (2003: 85-86) is:

- 1) []
- 2) SKT PD[N'
- 3) TMK'L[
- 4) BNY GBL'
- 5) []

Instead of TMK'L in line 3, Rollston (2008: 88) reads GMR'L. He argues that T and K of line 3 (according to Cross) have a different morphology and stance than T and K in line 2, and proposes parallels with G and R (respectively) in line 3.

We doubt Rollston's proposition. Firstly, he does not compare the letter he reads as G in line 3 with the G of line 4. There is a striking difference in morphology between them: the orientation of the strokes is clearly different as well as their angle. Therefore, it seems problematic to read G at the beginning of line 3. On the contrary, by comparing the first letter of line 3 with the T of line 2, it appears that the orientation of the strokes and their angles are approximately the same. Indeed, the main difference is the thickness of the letters of the letters of line 2 in comparison to the letters of line 3. Nevertheless, there are inscriptions where the thickness varies from line to line. This is not a result of ink fading, but of the manner of writing. In this respect, a striking example is provided by the (incised) "barley ostrakon" from Samaria (C 1011, cf.

Ahituv 2008: 310-311). Compare the letters of line 1 with those of lines 2 and 3. Consequently, this difference is not an obstacle to reading T in line 2, as Cross proposed.

Similarly, apart from the thickness, there is no conclusive difference between the third letter of line 3 and the K of line 2. As a result, we consider Cross' reading adequate. Incidentally, the personal name TMK'L that is also attested on ostrakon A1 appears here for a second time.

Acknowledgements

Our research has been made possible by the generosity of Dr Fawwaz al-Khaysheh, Director General of the Department of Antiquities of Jordan, himself an epigrapher. We are also deeply indebted to Dr Aida Naghawi, Director of the 'Amman Citadel Museum, as well to the many helping hands who provided us with the epigraphic material at the museum. Last but not least, we wish to express our special thanks to Dr Rafe Harahsha and Mrs Catreena Hamarneh who organized our research in a most competent and efficient way. We also wish to express our gratitude to Prof. André Lemaire (Université de Paris Sorbonne) for pointing us in the direction of some of these new readings in personal communications.

Abbreviations

- AHw *Akkadisches Handwörterbuch* [von Soden 1965]
 CAD *Chicago Assyrian Dictionary* [Oppenheim (ed.) 1956-]
 CAI *Corpus of Ammonite Inscriptions* [Aufrecht 1989]
 HALOT *The Hebrew and Aramaic Lexicon of the Old Testament* [Koehler/Baumgartner 1994]
 WSS *Corpus of West Semitic Stamp Seals* [Avigad/Sass 1997]

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SWEDISH JORDAN EXPEDITION: PRELIMINARY REPORT ON THE ELEVENTH SEASON OF EXCAVATION AT TALL ABŪ AL-KHARAZ, 2008

*Peter M. Fischer and Rainer Feldbacher
With Contributions by M. Rinner, M. Schmidl and C. Wenger*

Introduction

The eleventh season of excavation at Tall Abū al-Kharaz was carried out with the kind support of the Department of Antiquities of Jordan between 1 September and 3 October 2008, after a break of seven years. This break saw the publication of comprehensive reports on the Middle and Late Bronze Ages of Tall Abū al-Kharaz (Fischer 2006a), the chronology of the Jordan Valley during the Middle and Late Bronze Ages based on results from Pella, Tall Abū al-Kharaz and Tall Dayr ‘Allā (Fischer ed. 2006b) and the Early Bronze Age of Tall Abū al-Kharaz (Fischer 2008). The excavations were resumed in order to refine our understanding of the stratigraphy and collect new material and additional radiocarbon dates for the next volume, namely, that on the Iron Age (Fischer forthcoming).

One of the main objectives of the 2008 season was to further investigate Area 7, the area which had hitherto yielded the best-preserved Iron Age remains (evidence from the 1993, 1994, 1997 and 1998 seasons partly published in Fischer 1995, 1996 and 1998), in order to further study the occupational sequence of the Iron Age and to provide first-class samples from a sequence of occupational phases for the Iron Age radiocarbon dating project, run in co-operation with the VE-RA-laboratory at the University of Vienna.

The 2008 team consisted of Peter M. Fischer (director), Rainer Feldbacher (field director), Hikmat Ta’ani (foreman, trench supervisor), Mu-

wafaq al-Bataineh (surveyor, draughtsperson), Michaela Rinner, Martina Schmidl and Christine Wenger (trench supervisors). The Department of Antiquities representative was Ismaeel Melhem, who supported the field work in many ways for which our team is most grateful. Further support was provided by *Salim Suleiman Musa* (transport), *Khalid Mohammad Dheeb* (cook) and two other students who participated part-time in the initial stages of the excavations. Twelve local workers were employed on the excavations.

Results

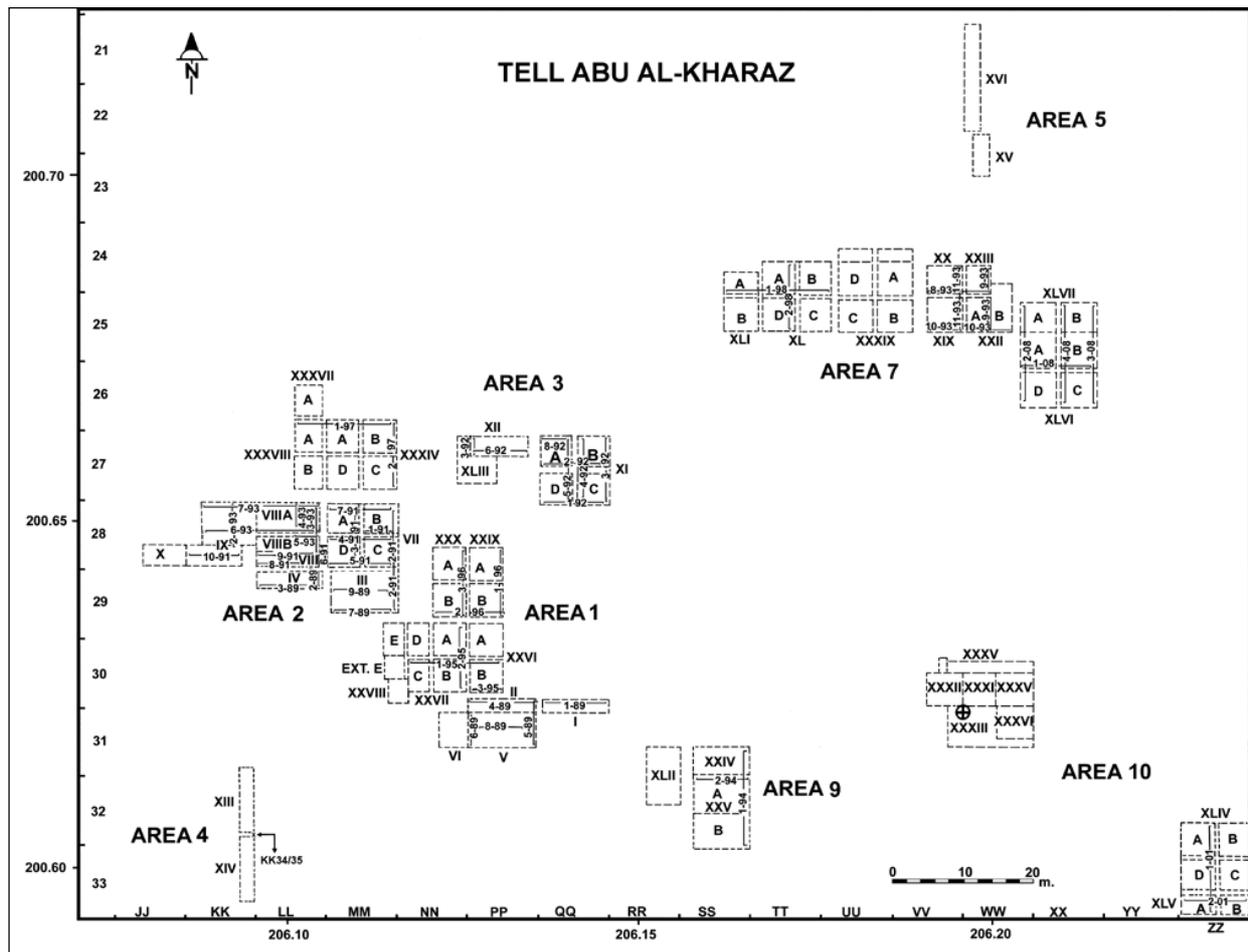
Two trenches, consisting of six sub-trenches, were opened to the east of Trench XXII at the easternmost part of Area 7, which lies in the north-eastern part of the tall just below its summit (**Fig. 1**). These new trenches, located in Grids WW/XX 25/26 (see Fischer 2008: 21, fig. 9), were Trench XLVIA-D (10m x 10m in size) and Trench XLVIA-B (4m x 10m in size). The area of the excavations in 2008 is almost flat in the east-west direction (10m wide), but slopes down from south to north by 4.9m on its eastern edge and by 2.5m on its western edge (14m long). The occupational phasing is only applicable to the present area of excavation but parallels with earlier excavations in Area 7 and its general phasing will be referred to.

Stratum 1A¹

The most recent occupational phase can be

1. “Stratum” should only be considered as a term of convenience for use during field work and in preliminary reports (see Fischer 2006: 26). It is used to designate a level of occupation regardless of area, and is allocated a number as it is excavated. From 1989 to 1994 consecutive numbering of the strata was used in the preliminary reports submitted to *ADAJ*. Nevertheless, after the 1995

season it was decided that Stratum 1 A, B etc. should designate the phases from the Islamic period back to the Iron Age. Stratum 2, with sub-divisions, is reserved for the Late and Middle Bronze Ages, and Stratum 3, with sub-divisions, for the Early Bronze Age. All these divisions and sub-divisions relate only to the preliminary reports. The final phasing for the Early, Middle and



1. Location of Trenches XLVI and XLVII in Area 7.

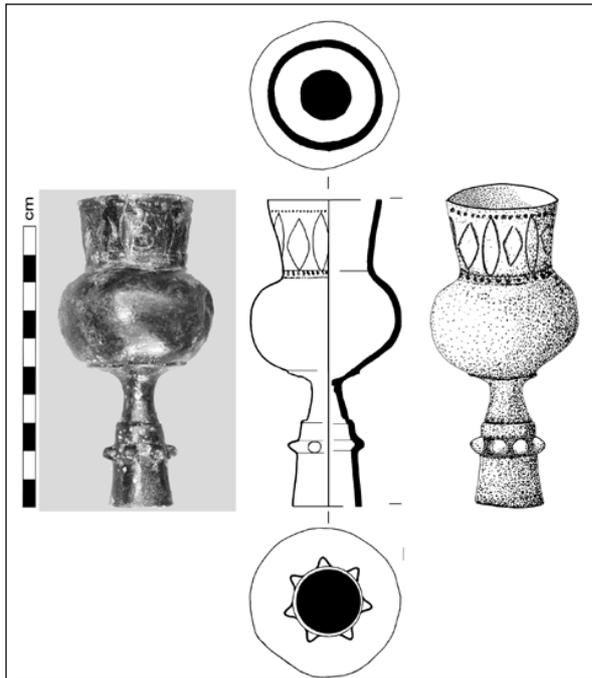
attributed to the Abbasid period. The architectural remains from this period, which were located just below or within the colluvial soil, are much better preserved than those, which were exposed in Area 7 during earlier excavations. The Islamic city wall (W548/569) in the present area of excavation corresponds from east to west with the following walls, which were exposed during earlier excavations: Walls 232, 167, 155, 446 and 486. This gives the exposed Abbasid city wall in Area 7 a total length of approx. 55m. It is approx. 0.85m wide and only a stone foundation of one to two courses is preserved. There are two rooms, which were built against the city wall: one to the west and another to the east. They are approximately 3.5m

wide (their lengths parallel to the city wall are so far unknown). Between these two rooms is an open area with a refuse pit which disturbed the earlier strata down to Stratum 1C. Another partly preserved wall and additional pits are to the south-west.

In addition to typical Abbasid pottery of the ninth century AD (see the pottery from the 1993 excavations described by Walmsley 1995: 107, 116-7), an unusual find should be mentioned: a bronze object, perhaps partly gilded, with neatly incised geometric patterns which resemble the symbols of playing cards (**Fig. 2**). The function of this object is not clear, but a possible interpretation is a table or hanging lamp (pers. comm. A. Walmsley). There is a well-preserved, 48.5cm

Late Bronze Ages is in Fischer 2006a, 2006b and 2008. There are six sub-phases for the Early Bronze Age (IA and B, IIA and B, IIIA and B), two sub-phases for the

Middle Bronze Age (IV/1 and 2) and four sub-phases for the Late Bronze Age (V to VIII). The final phasing of the Iron Age will consequently start with Phase IX.



2. Abbasid lamp of (gilded?) bronze.

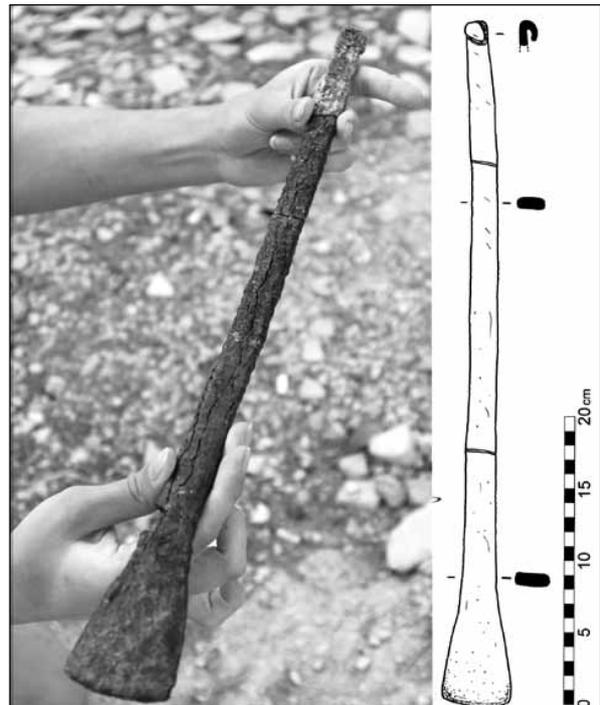
long iron object which was found in the south-western part of the excavated area at the lowest Islamic level (**Fig. 3**)²: it is axe- or most likely adze-shaped with a long shaft and the tang bent over to hold the tool more securely to a handle, presumably made of wood. It seems to have been used for woodworking.

Stratum 1B

This stratum is only preserved in the north-western part of the excavated area. There is a stone-paved space of the same size as the western room described above (W548, 555 and 550). The architectural remains from preceding Iron Age period seem to have been — at least partly — reused in Stratum 1B. This stratum is also dated to the Abbasid period.

Stratum 1C (Figs. 4a and b)

This stratum corresponds to the most recent and best preserved phase of late Iron Age occupation (Iron Age IIC in conventional terms). It is contemporaneous with “Strata 1 and 2” in the previously excavated part of Area 7 (see preliminary report on the 1993 excavations in Fischer 1995: 101). The exposed compound is limited to the north by the stone foundations of a 1.6m



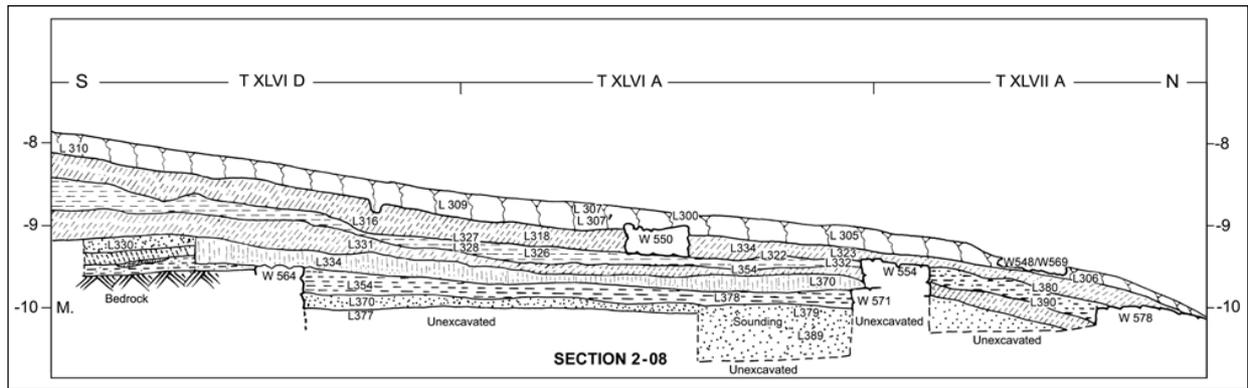
3. Iron adze.

wide wall (W574/575). The date of this wall and the perpendicular W573 is problematic: it was certainly used during this period and earlier Iron Age phases, but W574/575 at least might date back to the Late Bronze Age as part of the casemate system previously excavated in various areas (e.g. Fischer 2006: 211, fig. 251). The ceramic evidence strengthens this hypothesis: although late Iron Age sherds dominate, there are also sherds from an earlier phase of the Iron Age and the Late Bronze Age.

W562/576 represents the southern limit of the casemate walls and functions as the northern edge of a building complex. There are two roofed spaces in the western part of the excavated area. One is a room to the north-west which is bordered by W578, 576, 557 and 554. It is 7.5m x 3.5m in size and was full of complete pottery vessels and various tools related to textile production (see Appendix 2 of this report). There is a *ṭābūn* built against W554 to the south-west. The latter wall separates this room from another one to the south-west. The latter room is 7.5m x 5m in size (reconstructed) and surrounded, as excavated, by W554, 560 and 564. It contains a large stone structure, approximately 1m square,

2. This object could equally belong to the fill deposits

above the most recent Iron Age occupation.



4b. Western section of the excavated area (Section 2 of four).

close to its north-eastern corner. This structure might have functioned as a working table or, less likely, a roof support and might represent part of an earlier wall. To the east of these two rooms is a partly excavated area, which was roofed in its northern part. It is limited by W558, 557, 562 and contains a small mudbrick dividing wall (W561). The southern limits of this space are not clear but it seems that it was limited by walls (there are the remains of two walls: W566 and 576).

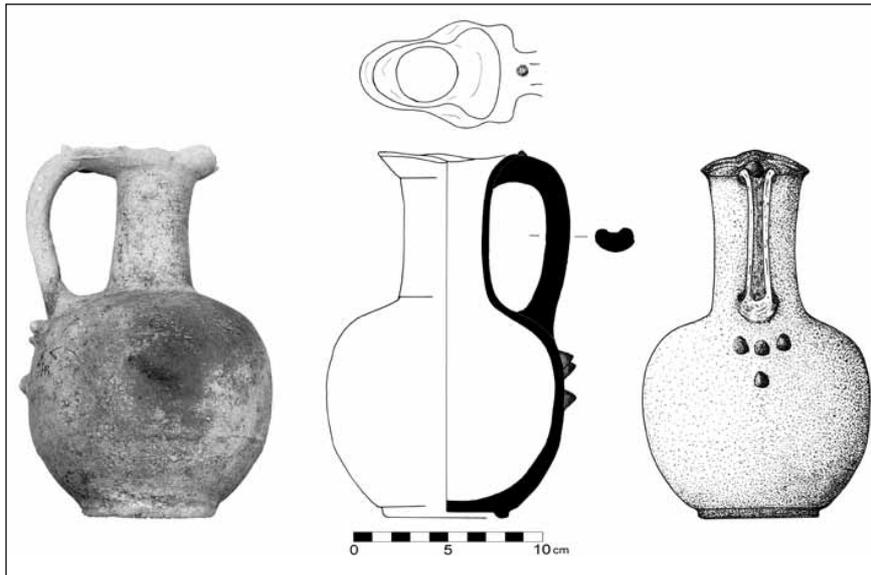
The south-eastern corner of the exposed area (Trench XLVIC) is interpreted as an open-air workshop for the production of iron and bronze tools on account of thick layers of ash, and pits containing numerous arrowheads of iron and some items of bronze (L329, L332, L336, L344 and L350). The majority of these loci consist of yellowish-red to reddish-brown loose soil intermixed with substantial layers of ash and slag. Pieces of hard-fired mudbrick were also present. Finds from these loci include a number of iron arrowheads (N1177, N1180, N1181 and N1185), a bronze dagger (N1178) and, among other iron objects, an iron sickle (N1168). There is also an accumulation of many arrowheads bundled up together (N1179) in L344 (see Appendix 3).

We are working with the hypothesis that the area once contained a furnace, which was destroyed or dismantled. This theory is supported by finds of parts of a possible tuyère of fired clay / sherds leading to a small pit surrounded by pebbles. In addition, there is another partly excavated small pit with pebbles (L374), which unfortunately continues into the southern section. It contains loose, ashy, material, with a hard

bottom of a greyish-white material; this might have been used as a small casting installation. It is somewhat surprising to find evidence of textile production, in the shape of spindle whorls and loom weights, in such close proximity to a metal workshop (see Appendix 2). However, the workshop is separated from the domestic area to the north and west by a small wall (W567), now all but destroyed. The location of the workshop at the north-eastern corner of the settled plateau is well-chosen because at Tall Abū al-Kharaz the wind, today at least, blows mainly from west and south. Therefore, the population would have been less affected by the smoke and smell of the workshop.

How were our metal objects produced? The simplest form of casting is in an open mould of stone, loam or clay. Metal wastage barely occurs if the metal is cast in crucibles and moulds of stone or sand, which are smeared with sheep fat or flour (cf. Reiter 1997: 458 ff.). Unfortunately, evidence for all this is missing except for the remains of fired mudbrick.

Amongst the typical late Iron Age pottery from this phase are imports from Cyprus (Red-on-Black pottery from the Cypro-Geometric III period), Phoenicia and Assyria. The Phoenician juglet, with its inwardly folded rim, double handle and plastic decoration above and below the handle is unique to Tall Abū al-Kharaz (Fig. 5). The import from Assyria is a red-painted Neo-Assyrian cylinder seal of steatite / enstatite with the representation of a bearded male, wearing a full-length decorated dress and aiming a bow and arrow at an ungulate heading towards a tree (Figs. 6 and 7). There are two symbols above the animal: one is a double-wedge, which resembles



5. Phoenician juglet from Stratum 1C.



6. Red-painted Neo-Assyrian cylinder seal from Stratum 1C.



7. Seal impression (see Fig. 6).

the Greek letter “pi”³ and the other a half-moon (see Appendix 1). We also discovered an ostrakon of a storage jar (Fig. 8). The partly preserved inscription is in a Transjordanian dialect or old

Hebrew. There are three letters “r”, “q” and most likely “p”. The interpretation is speculative but it could be read as “only”, placed directly before a name (pers. comm. K. Jaros).

To sum up, the Stratum 1C complex located east of the four-room house exposed in the 1993 and 1994 excavations is tentatively identified as a workshop for the production of metal tools. The compound includes the workshop itself and accommodation for the craftsmen.

Earlier Phases

A number of limited soundings were carried out in Trenches XLVIB and C, and XLVIIB. The pottery confirms the presence of earlier Iron Age, Late and Middle Bronze Age, and Early Bronze Age occupation. It seems, however, that these phases were disturbed to a considerable extent by the extensive and intensive building

3. There is some resemblance between these double wedges and incised and raised potmarks from Early Bronze Age Tall Abū al-Kharaz Phase I (Feldbacher and Fischer 2008: 395, 35), Phase II (idem: 396, 26)

and “unstratified” (idem 397, 17). These finds are dated to around 3000 BC (see chronological discussion in Fischer 2008: 371-382).



8. Ostracon from Stratum 1C.

activities of Stratum 1C, *viz.* the Iron Age IIC. At some spots in the southern part of the exposed area, bedrock was reached upon which mainly Early Bronze Age pottery was found.

Future Objectives

The 2008 season is the first of at least three seasons intended to continue investigation of the Iron Age sequence at Tall Abū al-Kharaz.

Appendix 1: A Neo-Assyrian cylinder seal from Tall Abū al-Kharaz (M. Schmidl)

The Cylinder Seal and the Context

A cylinder seal (N1161, **Figs. 6 and 7**) was discovered in the most recent Iron Age phase in Trench XLVIB, Area 7. The seal is of a yellowish-white material with a 'greasy' surface and dark brown core, probably enstatite. Its 2.9cm long, slightly convex body has a diameter that varies from 1.0 to 1.1cm. It has a centred drilling throughout its length, measuring 0.3mm in diameter; its weight is 5.2g. The seal is engraved with fairly deep, hand-cut lines. Brownish-red stains on its surface are most likely the remains of paint.

The Engraved Scene

Between two collars there is one scene covering the entire surface. It shows an anthropomorphic figure and an ungulate. Other motifs are a crescent moon, a pair of wedge-shaped elements and a tree-like element, narrowing towards its top, which is split in several directions above half of the total height of the seal.

The human figure, which fills the entire space between the two collars, is depicted in profile, facing left. Only one foot is slightly in-

dicated. This hunter can be identified as male on the basis of his clothing, a belted, full-length skirt, seemingly worn in a wraparound fashion (according to the various sloping, horizontal and vertical lines across its surface) leaving the upper part of the body naked, and his high, pronged headdress and apparent beard. His right arm is stretched away from the body; the left one is raised up to his face with the elbow at the level of the shoulder in order to aim and draw a bow which is nearly two-thirds as long as its owner. Although the string has not been cut, the arrow is clearly visible with its elaborate arrowhead pointing at an ungulate whose head is turned away from the aggressor. Its four legs consist only of angular lines, but nevertheless show details such as joints and hooves. Its horn is emphasized, with an ear protruding from the head right next to it. In addition, a mane and tail are depicted, with the tail — which ends in tassel — dropping down to the floor and crossing one of the hind legs. Lines across its body seem to indicate a harness. The animal is facing the tree-like element. The two remaining filling motifs, the crescent moon and two adjoining wedges, cover the space between the bow and the animal's head and neck.

Interpretation and Parallels

This seal is certainly an import. It depicts the well-known motif of archer and prey, with the prey being attacked from behind. The relatively common feature of a stylized tree or plant might denote a sacred tree which needs to be defended by the archer (Porada 1948: 73). The style of cutting, namely linear with the depicted elements consisting for the most part of contours with few details, is convenient considering the soft material and the fact that only hand-held tools were used for the cutting. This 'linear style' is typical of Neo-Assyrian seals, usually dated to the ninth and eighth centuries BC (Collon 2001: 2-3). There can be variants in the posture of the archer (e.g. standing or kneeling), the kind of animal (which might turn its head to look at its attacker or be replaced by winged human-headed animals or monsters) and the repertoire of filling motifs. Normally, this style is not as deeply cut as in our example (Teissier 1984: 34; Brentjes 1983: 153). This style continues into the seventh to sixth centuries BC (Teissier 1984:

34). Matthews (1990: 90-91) has proposed an even earlier date for the appearance of this type of seal, a hypothesis based on Middle-Assyrian cylinder seals. Nevertheless, this plausible theory is not particularly consistent with Porada's view (1948: 73), *viz.* the distinction between early and late seals according to their size, with the earlier ones being taller than those of later centuries. In addition, Porada (1948: 72) favours a connection between the Kassites and the evolution of the linear style in Neo-Assyrian times, due to the non-realistic but ornamental or decorative way of depicting scenes. Teissier (1984: 34) refrains from a definite pronouncement on the origin of the style but also mentions Kassite or Elamite glyptics (13th century BC), referring to Middle Assyrian seals cut in linear style only in a footnote.

Herbordt (1992: *passim*) and Collon (2001: *passim*) prefer to categorize on the basis of motif, rather than style and technique as suggested by Porada (1948: *passim*). Designs like the one shown here might, according to Collon (2001: 3, 35-41), be influenced from the west. It remains to be added — especially considering the standing archer — that this motif is found mainly on faience seals (Collon 2001: 3). This can be seen as a consequence of the general correlation between hand-cutting techniques and soft materials. These facts seem to support the supposition that this cylinder seal is of enstatite, although empirical proof has yet to be found.

The most striking parallel was published by Collon (2001: 29; see also Collon 1987: no. 337, originally published in Wiseman 1959: pl. 51). The individual elements are almost exactly the same: we see an archer pointing his bow towards a winged bull facing him. Additional motifs are (again) a tree, though less stylized, a crescent moon and two wedges, in this case separated from each other. The last three motifs are placed above the bull. An interesting correlation concerning the posture and garment of the standing archer is depicted by Parker (1962: pl. XI, 3), notwithstanding the fact that it is damaged. Other seals show at least some parallel elements, demonstrating that a certain repertoire of forms and figures were in use and were combined with this type of motif and style of cutting during the period in question. The stylized tree, for example, is depicted in a very similar manner on a

stamp seal impression on a tablet from Nimrud (Herbordt 1992: pl. 16, 5; cf. Parker 1955: 121, fig. 21, pl. 28, 1).

Crescent and wedges as filling motifs are very common within this group of seals, e.g. crescent and wedge (Collon 2001: no. 19), two vertical wedges (Collon 2001: no. 27), one wedge (Collon 2001: no. 28) and standing archer, crescent and two wedges (Collon 2001: no. 31). Collon 2001: no. 24 and 25 are interesting because they show animals that might be intended to represent bulls, but actually resemble horses; the latter could be case in our scene. The interchangeability of horse and bull is even more clearly demonstrated in Kist (2003: no. 338), where a bull has been re-modelled as a horse. Another example is Doumet (1992: nos. 137, 138), which shows an archer aiming at a horned quadruped and wearing a robe of very similar design to ours. In Doumet no. 137, the ungulate's body is depicted with linear details which hint at the presence of a harness. There are many more parallels, including Keel-Leu and Teissier (2004: nos. 168 and 170) and Porada (1948: no. 617) which use three joined wedges as filling motif, while another one (Porada 1948: no. 621) shows them placed separately. Similar pieces can be found in Teissier (1984: no. 163, 167, 168).

There seem to be no exact parallels to our cylinder seal in Jordan. The closest one in period and motif was found in Khirbat an-Nuḥās (Eggler and Keel 2006: 127, 1), which has a standing archer and procumbent ungulate. However, it is very simple in style and, moreover, a stamp seal in the form of a scarab. Nevertheless, its date seems close to the abovementioned group of seals and motifs, *viz.* 1075-900 BC (Eggler and Keel 2006: 126). It may be added that depictions of standing archers seem to be few in number in Jordan as a whole. Eggler and Keel (2006: 267, 14) present only one further example, from Saḥāb, on a cone made of limestone. While different in style, the motif is similar to ours, although the extremely schematic prey is cut above its assailant and rotated 90°. Another archer is engraved on the side of the cone. This piece is dated to 1250 / 1200-1000 BC. An example in Kühne and Salje (1996: 103f Nr. 52) shows one of the rare depictions of an archer, this time from Kāmid el-Loz, but according to the authors it was roughly carved with a cutting-

wheel and left unfinished. Still, it is dated to the early Iron Age on the basis of its stratum, without ruling out a possibly earlier date. The example in Keel *et al.* (1990: 389, 98) is another possible parallel, but the composition cannot be unambiguously determined with regard to motif. Scarabs in Keel (1997: 560f, 85-89) originate from Akko and show standing archers, but not a comparable scene. An equivalent in date and scene, but not style can be found in Keel (1997: 575, 123) and is dated 1150-900 BC. An ungulate turning its head towards its assailant is illustrated in Keel (1997: 591, 172A) but differs conspicuously in style. A standing archer, hunting a probable dog, can be seen in Keel (1997: 599, 191) and has been dated between the 12th and 10th centuries BC. An Iron Age IIA-B stamp seal from Ashdod might show a warrior with lance and bow. Archers aiming at lions are a recurring motif, see for example Keel (1997: 613, 233 or 699, 25). A depiction of a horse, which resembles our ungulate — especially its legs and tail — in posture, from Aseka is in Keel (1997: 737, 5) and is dated to the middle or end of the 8th century BC.

There may even be a similar scene from Tall Abū al-Kharaz itself: an impression on a handle from Area 2, Trench XXXIVC, in a pottery context dated to Iron Age IIC. There seems to be a figure behind a quadruped, but owing to its state of preservation no detail can be deciphered (Fischer 1998: 214, fig. 2; cf. comments by Egger and Keel 2006: 279, 3).

Summary

The seal in question, which depicts an archer and prey, is certainly imported from Assyria on the basis of related seals and its exclusively Mesopotamian design elements. The comparable, but unfortunately extensively damaged, example in Parker (1962: pl. XI, 3) could hint at an origin from Nimrud, but this remains highly speculative. The motif and style of our seal point to a ninth or eighth century BC date. While such seals are not uncommon in areas closer to the main Assyrian sphere of influence, its occurrence in Jordan seems to be unique, with no convincing parallel published so far. With regard to the identification of the prey, I prefer to consider it a horse or ungulate other than a bull, owing to its mane, harness and the parallels discussed

above. Concerning the seal itself, its supposed painting seems odd, as its form does not hint at its use as an amulet. If a painted stone seal were to be used on clay, its colour would have to be constantly renewed.

Appendix 2: The Loom Weights from the 2008 Season at Tall Abū al-Kharaz (M. Rinner)

Introduction

The objective of this study is to investigate loom weights from Iron Age II C contexts at Tall Abū al-Kharaz which were discovered in 2008 (Fig. 9).

Loom weights are unpretentious artefacts which help to reveal the characteristics of textiles that were produced in ancient times (Friend 1998: 11). Two types of looms, warp-weighted and horizontal looms, were used for the production of fabric (Boertien 2004: 308). Loom weights are only necessary for the warp-weighted loom. This type of loom consists of two vertical side beams supporting the cloth beam, to which warps and loom weights were attached. The function of the loom weights is to stretch the warp threads. The weights ensure the necessary tension of the warps and keep the threads parallel (Crowfoot 1951: 18, fig.3). In order to facilitate the weaving process, the tension must be sufficient to hold one set of threads, the warp, parallel so that another set of threads, the weft, can be interlaced with the warp. The actual weight of the loom weights varies depending on the width and the type of fabric.

Some of the oldest findings of warp-weighted looms and complete sets of weights derive from Early Bronze Age II contexts, dated to around 3000 BC, at Tall Abū al-Kharaz (Fischer



9. Collection of sun-dried loom weights from Stratum IC.

2008: 50-54, 352-354; Fischer 2006: 350-357). The warp-weighted loom underwent continuous development in the Levant (Barber 1991: 81, 83-84) and spread westwards, reaching Greece, northern Italy and even Scandinavia, where it was used from the Early Pottery Neolithic onwards (Hoffmann 1974: 17). The use of warp-weighted looms in northern Europe has even been documented as late as the middle of the 2th century (Hoffmann 1974: 17; Barber 1991: 81, 301). In addition to making it possible to weave fabric of considerable lengths, other advantages of the warp-weighted loom are that it can easily be dismantled and stored away when not actually in use, or moved to another place.

Boertien (2004: 314) divided the perforated loom weights from Iron Age contexts at Tall Dayr ‘Allā into two groups: the horizontally – and vertically-pierced loom weights. The conical, spherical or doughnut-shaped loom weights from Tall Abū al-Kharaz all belong to the vertically-pierced group. Boertien also claims that conical loom weights often appear in small numbers within larger groups of other loom weights and that the doughnut form was the most popular shape in Iron Age Palestine. It is difficult to form a spherical shape from dry clay, but wet clay gives a smooth round ball with an intended shape that is difficult to maintain during the drying process (Boertien 2004: 316).

The vast majority of loom weights from the 2008 season derive from the most recent Iron Age IIC phase. They are all of unfired, sun-dried clay and have counterparts in the hundreds of unfired loom weights from earlier excavated Iron Age contexts at Tall Abū al-Kharaz. The 2008 season yielded 64 loom weights. Of these, 35 (55 %) were complete and pierced. Five (8 %) weights were not pierced, which shows that they were made on the spot. Twelve (19 %) were incomplete but pierced; in seven cases (11 %) no hole could be observed but markings suggest that they once were pierced. Five loom weights (8 %) were not sufficiently well-preserved to give unambiguous measurements of weight and diameter.

As shown in **Table 1**, variation in weight is considerable, as also noted by Boertien (2004: 312) at Tall Dayr ‘Allā. It is likely that the number of threads tied to each weight was not always the same and it was thus not necessary to make each example identical in terms of weight (Shamir 1996: 143; Broudy 1979: 26; Hoffmann 1974: 314). Boertien (2004: 313) claims that at least ten loom weights would be required to weave a cloth wide enough to be of any practical use.

From experiments with loom weights recovered from various sites, it is known that about 20 warp threads were tied to a cord in the loom

Table 1: The Iron Age loom weights from 2008 by type and weight.

	<i>n</i>	<i>weight (g)</i>	<i>hole (cm)</i>	<i>diameter (cm)</i>	<i>height (cm)</i>
Complete, pierced	8	189 - 272	0.6 - 1.2	6.0 - 7.9	4.6 - 5.2
	8	305 - 388	1.2 - 1.4	7.9 - 8.4	5.3 - 6.0
	19	413 - 640	1.4 - 1.8	8.4 - 9.6	6.1 - 8.1
Complete, not pierced	5	381 - 465	n/a	8.1 - 9.1	2.0 - 7.0
Incomplete, pierced	6	138 - 297	1.0 - 1.6	5.7 - 8.0	4.4 - 5.4
	6	310 - 544	1.7 - 2.1	8.4 - 9.7	5.7 - 7.2
Incomplete, hole missing	7	180 - 429	n/a	6.4 - 8.5	4.8 - 6.3
Indefinable	5	291 - 512.7	n/a	8 - 9	5.5 - 6.7
Total	64				

weight (Shamir 1996: 144; Kelm and Mazar 1995: 163; Shamir 1994: 282; Broudy 1979: 26; Hoffmann 1974: 314). In this way, weaving would have been possible without disordering the warp to the extent that holes would have appeared in the cloth. Ten loom weights would have resulted in a piece of cloth about 20cm wide (Sheffer and Tidhar 1991: 5-19). In general, lighter loom weights were used for finer textiles and heavier weights for coarser textiles.

In order to understand this ancient craft, analyses of loom weights will be very important in future research. The evaluation of these weights gives us an insight into daily life, the tools used and the products manufactured (Friend 1998: 11).

Concluding Remarks

Two major areas of Iron Age II textile production have been listed by Sheffer (1981: 81-83) and Browning (1988): one around Beisan and the central Jordan Valley, and the other in the Shephelah region. Tall Abū al-Kharaz must now be added to the list of textile-producing sites in the former region because of the large number of Bronze and Iron Age loom weights found at the site.

The more elaborate loom weights from the Early Bronze Age at Tall Abū al-Kharaz were usually made of doughnut-shaped basalt or, more rarely, limestone discs (Fischer 2008: 50-54, 352-354). Their weight did not exceed 100 grams. Middle and Late Bronze Age contexts at Tall Abū al-Kharaz also produced light loom weights of stone or fired clay which were most often conical or dome-shaped (Fischer 2006: 350-357). During the Iron Age, certain tools related to textile production changed and loom weights became much heavier, made mainly of unfired clay in sphere, doughnut or other shapes. A possible explanation (Friend 1998: 9) for this change in production methods is that the conical and dome-shaped forms tended to break more frequently at the narrow end, near the perforation, and a cheaper material — unfired clay — was used instead. At Tall Dayr ‘Allā, the ball-shaped type often occurs in large groups (Boertien 2004: 316) which correlates well with our findings at Tall Abū al-Kharaz.

The Iron Age loom weights from Jerusalem are notably lighter than our loom weights (Ariel

1996: 139). These weights, which are all of unfired clay, range from 160.7 to 187.1 grams. In our material, there seem to be three size groups: light from 189 to 272 grams, medium from 305 to 388 grams and, most frequently, heavy from 413 to 640 grams. It is clear that heavier loom weights can only be used for the production of heavy textiles like rugs, wall hangings, blankets or storage bags (Friend 1998: 10). Crowfoot (1951: 29) suggested that there may be a correlation between loom weight form and function but this cannot be demonstrated on the basis of the Iron Age assemblage from Tall Dayr ‘Allā. Here, the type of loom weight does not enable us to establish what sort of textile was being produced (see also Boertien 2004: 323). It seems likely that only eight of our complete pierced weights could have been used in the production of light- or medium-weight textiles, e.g. for garments or household textiles.

The relatively high number of loom weights discovered in Iron Age contexts at Tall Abū al-Kharaz is suggestive of substantial textile production at the site at this time. This assumption is further supported by the recovery of nine spindle whorls from the limited exposures excavated in 2008.

Appendix 3: A Note on the Arrowheads (C. Wenger)

During the 2008 excavations at Tall Abū al-Kharaz, at least 22 iron arrowheads dating to the most recent Iron Age occupation (Iron Age IIC) were discovered in Trench XLVI C (Fig. 10). The arrowheads were in various stages of corrosion: some consisted mainly of calciferous layers and others were fairly intact. There was also a conglomerate (38.7 x 16.5 x 22cm) of no



10. Collection of iron arrowheads from Stratum 1C.

Table 2: The best preserved arrowheads from the 2008 season of excavation.

<i>Description</i>	<i>Length (cm)</i>	<i>Width (cm)</i>	<i>Thickness (cm)</i>
Corroded but almost complete	5.3	0.6 (tongue)	1.2
Corroded but complete	7.8	2.0 (max)	1.4
Corroded but complete	7.0	1.9 (max)	1.0
Complete but broken	9.3	1.7	0.7

less than 12 arrowheads on which x-ray investigation was carried out. The majority of the arrowheads are pointed and their shape resembles a stretched rhombus. There are, however, two arrowheads with rounded tips which are most likely the result of corrosion. The best preserved arrowheads have a flat or oval cross-section. On three of them, a midrib could be discerned. Their lengths vary between 5.3 and 9.3 cm.; the average width is just under 2cm and the average thickness around 1 cm. (see **Table 2**). A deformed bronze dagger was found close to the arrowheads. Its shape is irregular and its size 12.7 x. 4.5 x 0.7 - 1.4cm (thickness) as preserved.

There are no iron ore deposits in the vicinity of Tall Abū al-Kharaz. The closest iron ores are in the eastern foothills of the Jordan Valley, leading up to the Jordanian plateau. Therefore, iron and / or iron ore must have been brought to Tall Abū al-Kharaz where it was used in local workshops for the production of weaponry, armour and other iron objects for daily use (see also main report).

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QANAT FIR'ŪN – DOCUMENTATION OF THE 100 KILOMETRES AQUEDUCT TUNNEL IN NORTHERN JORDAN

Mathias Doering

Summary

Since 2004, the author of this report has been engaged in measuring and documenting a Roman tunnel system in Jordan. The tunnel system is larger than any found previously and extends as an overland aqueduct well into Syria. The region, climate, geology, land use and settlement history have been detailed previously (Döring 2004, 2008, 2009), permitting this report to concentrate on the findings of the excavation.

These indicate that the underground-channel was constructed to supply the Decapolis cities of Abila, Gadara and, probably, Dar'a. Radio-carbon dating has revealed that the main building period was between 90 and 150 AD. The total length of the aqueduct is over 170km, according to current research. There are four tunnels of 1, 11, 34 and 60km respectively and an overland section of 64km. Thus, the aqueduct appears to be the most elaborately constructed long distance pipeline of the Roman period; the underground section of 106km is the longest of Antiquity discovered to date.

Previous Work

In 2004 the author was called in to assess a tunnel beneath the settlement of az-Zayraqūn. The tunnel had been discovered during archaeological work carried out by Tuebingen (Ibrahim and Mittmann 2000) and Wuppertal Universities (Mittmann and Vieweger 2000: 7ff) at the Bronze Age settlement of az-Zayraqūn. The site is located on a tributary of the Yarmouk river, the Wādī ash-Ashallālah (**Fig. 1**), and had hitherto received little attention. Closer investigation quickly revealed that the tunnel was not of Bronze Age date, as had previously been assumed, but was likely to be much more recent. This assumption was based partly on the fact

that the tools needed to cut away this amount of hard limestone were not available in the third millennium BC. It was also clear from plaster and sinter traces that a large volume of water had passed through the tunnel for long periods, indicating that it was unlikely to have been a channel for simply local water supply. The tunnel appeared to be part of a larger and hitherto undiscovered aqueduct system (Kerner 2004).

In order to locate the system, a survey of the surrounding area was carried out. Further tunnel sections were discovered which had, to judge from the chisel marks, been dug out using sloping construction shafts in both directions. The shafts, some of which were up to 70m deep, were equipped with steps and mainly blocked up, making them unidentifiable from the surface.

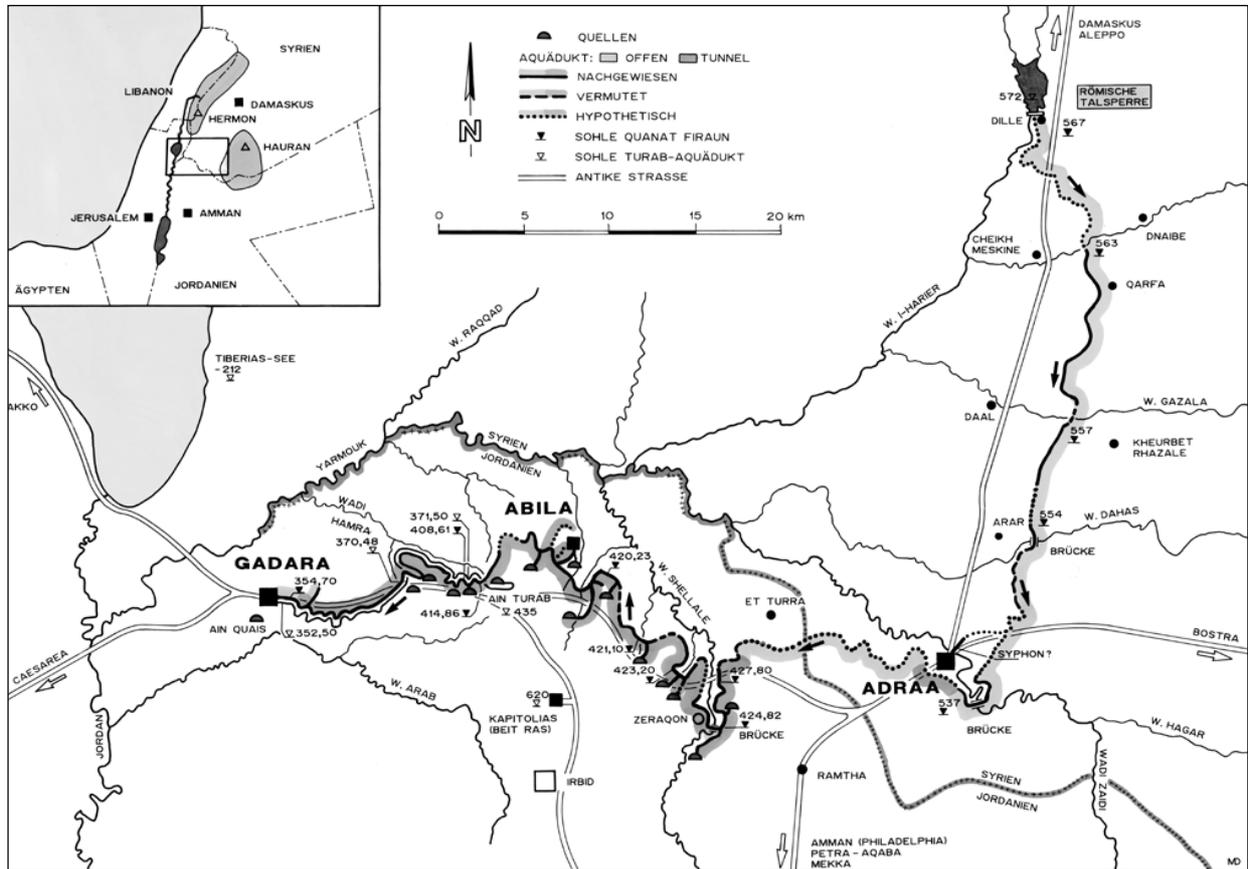
Levels revealed that all tunnel sections lay at the same height. They had been built using the same construction method and appeared to belong together, thus indicating a unified and supra-regional plan. Given that Antique cities which could have used such a water supply were absent in the surrounding area, plus the fact that the origin of the tunnel had not been located, its interpretation as a long-distance pipeline seemed reasonable.

This hypothesis led to the establishment of a project supported by the German Research Foundation (Deutsche Forschungsgemeinschaft, or DFG).

In order to determine the course of the tunnel, the author used topographic maps to plot a possible route in both directions, taking Antique construction techniques into account. This began at Wādī ash-Ashallālah and, with the decline of 1 % which was customary in Roman construction and a maximum depth of 70m, confirmed

its interpretation as a long-distance pipeline. The route passed directly by the Decapolis cities of Abila (20km) and Dar'a (40km), ending after 60km at Gadara (Fig. 1).

The author and his students made a systematic investigation of the 400 km² area between Wādi ash-Ashallālah and Gadara along the predicted tunnel route (Fig. 2), and were surpris-



1. Project area in northern Jordan and southern Syria. The tunnel system in Jordan is more than 100km long; ca. 90 % of this was located and surveyed. Sections marked with ●●● were either blocked or flooded.



2. Landscape at al-Mughayyir. The tunnel goes through the top third of the right hand slope at a depth of 20-40m (86.5km).

ingly quick to obtain results.

During the second season, over 30 construction shafts were discovered within a few weeks (Figs. 3 and 4). These were the only access points to the tunnel. By the end of the third, 2006, season over 100 open shafts, over 200 blocked shafts and three tunnel sections had been found. Although the tunnel sections did not allow continuous passage from end to end, their total length added up to *ca.* 106km.

The first aim of the 3½ week season in 2007 was to locate the remaining gaps in the tunnel route. This was followed by the survey and measurement of the entire Jordanian section, including taking levels on the tunnel floor. Reference pegs had already been used to mark the openings of significant construction shafts during the 2005 and 2006 seasons.

The length of the aqueduct meant that its survey was only possible using satellite technology (GPS), which also enabled centimetre precision in the measurements. This was necessary because the height of the channel floor at the beginning and end of the tunnel section had an average gradient of only 0.75 % (75cm per km). Therefore, the utmost accuracy was required when measuring the elevation of the tunnel.

Local estimates were then used to tie in the overland reference points with the tunnel floor. Optical measurements proved difficult owing to changes in gradient and curves in the shafts, which sloped at an angle of 45 to 55°. Neither was it possible to position the instrument above the shaft or to change the instrument within the shaft. A manometer with tube was therefore used, which in some cases delivered more accurate results than a frequently re-positioned tachymeter. Check measurements revealed dif-



3. Typical construction shaft with steps.

ferences of only a few centimetres between the two.

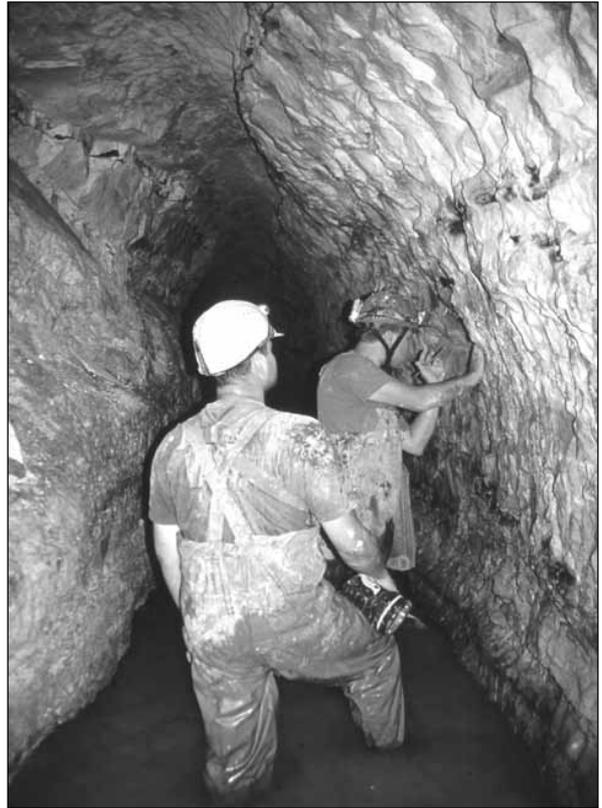
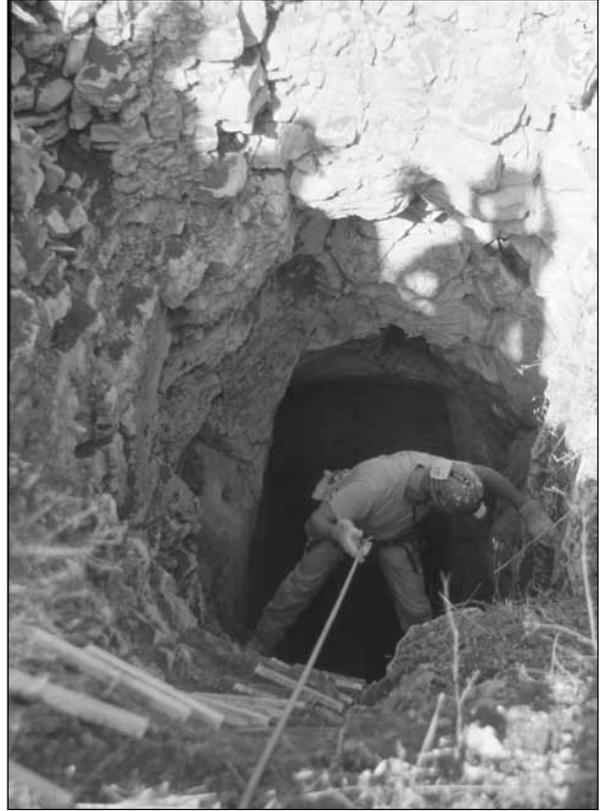
Position measurements had greater tolerance of discrepancies, which did not have such a negative effect on results. Depending on the local setting, a tachymeter or a cross laser with horizontal reference circle were used, whilst a compass was used to check and confirm the results. A constant comparison of measurements revealed differences of only 2-3 % over several hundred metres.

The tunnel was spacious and lined with screed and plaster. Sections of several hundred metres and, in one case, 2 km. permitted unobstructed passage (Fig. 5). Occasionally, the previous water level was indicated by sintering. In other sections, where the hewn rock had not been plastered over, construction appeared unfinished. Passage through the tunnel was frequently obstructed by earth that had accumulated below collapsed shafts. This blocked the cross-section of the tunnel, causing rain water to gather behind it. However, hardly any later fissures were discovered. It was not possible to carry out further investigation in the vicinity of the Syrian - Jordanian border and the course of the aqueduct along two short sections at Abila and the spring of 'Ayn Turab remains unclear (Fig. 1).

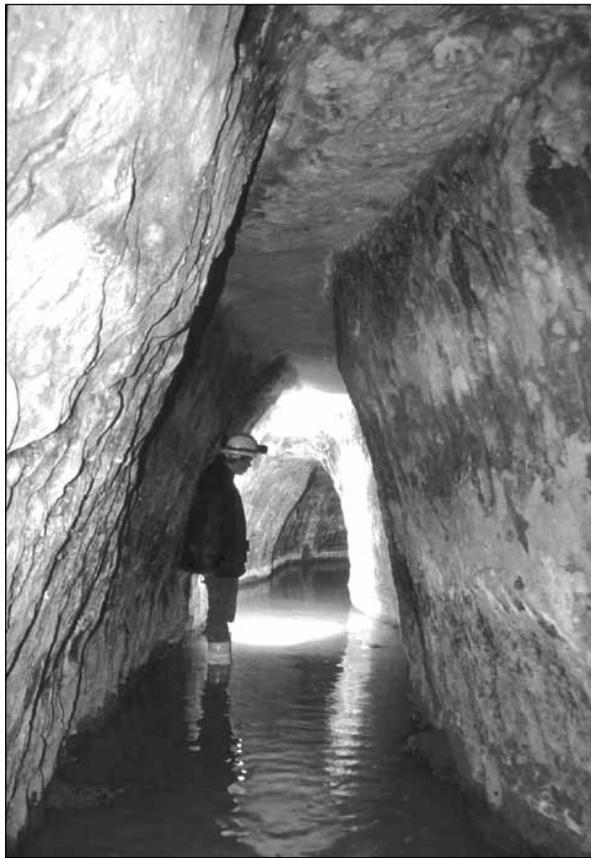
Aqueduct Route

Nineteenth century reports referred to fragments of an Antique aqueduct near the Dar'a - Damascus road, which began at Dille (565m. asl, km. 0) and ended at Dar'a. Remains of this aqueduct are to be found between Dâal, Syria and Dar'a, as well as in the southern part of this town (Buckingham 1825: 167; Wetzstein 1860: 123-125; Schumacher 1889: 49f; 1890: 78f, 162-166; 1897: 125-128; 1915: 136f; Rindfleisch 1898: 13-14, Table 1; Steuernagel 1926: 497f.). Further hypothetical details, deduced from the upper of the two tunnel systems beneath the acropolis at Gadara are provided by Bienert (2004) and Häser (2004).

Only in a later phase does the aqueduct appear to have been extended towards the west. This branch began shortly before Dar'a and crossed the Wadi Zaidi south of the city. Construction became technically more demanding around ash-Shajara (440m asl, 64km from



4. Results of exploratory work.

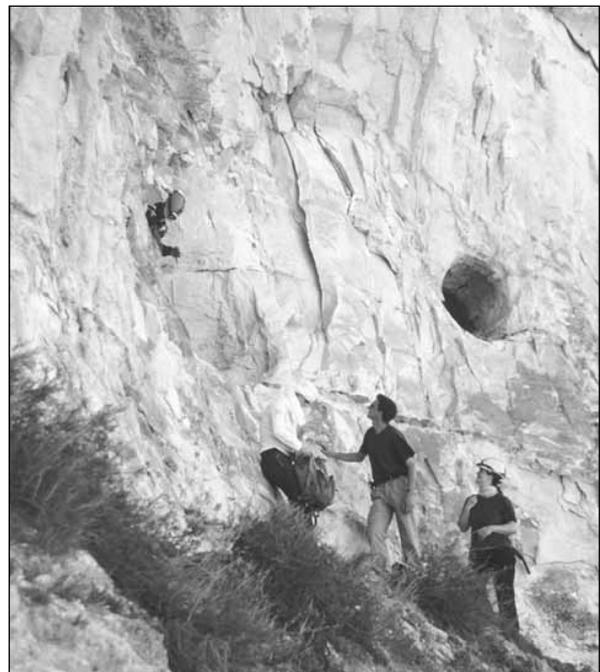


5. Tunnel: unfinished (left, 149km) and plastered (right, 109.5km).

Dille). The Wādī ash-Shallālah is almost 200m deep and had to be bypassed near its headwater, as was the norm in Antique aqueducts.

Here the aqueduct entered the first tunnel, one of 11km. After a complicated line through mountain precipices (**Fig. 6**) the spring of ‘Ayn Guren (75km) was incorporated and, after another 1km length of tunnel, the valley was traversed with a 20m high and 100m long bridge (424m asl, 76km), now ruined (Döring 2004).

The third tunnel began on the far side of the valley, and continued for 94km as far as Gadara. This headed north along the western side of the Wādī ash-Shallālah, meaning that 40km of tunnelling was required to cross a valley only 800m wide. Abila (122km) was reached after further valleys, in which several springs were utilised as water sources (Fuller 1985: 271, 523ff; Fuller 1987: 250-252, 523-525; Mare 1982; 1986: 129). Further circumventions of valleys (Schumacher 1897: 181 ff) followed until the aqueduct switched to the south side of the Gadara plateau, at 159km, 401m asl below



6. On the eastern bank of Wādī ash-Shallālah the aqueduct passes through rock walls for an extended distance. The picture shows two construction shafts (72.5km).

the watershed between the Yarmouk and Wādi al-‘Arab. The aqueduct ended at Gadara (335m asl), approximately 170km from Dille.

Tunnel Construction

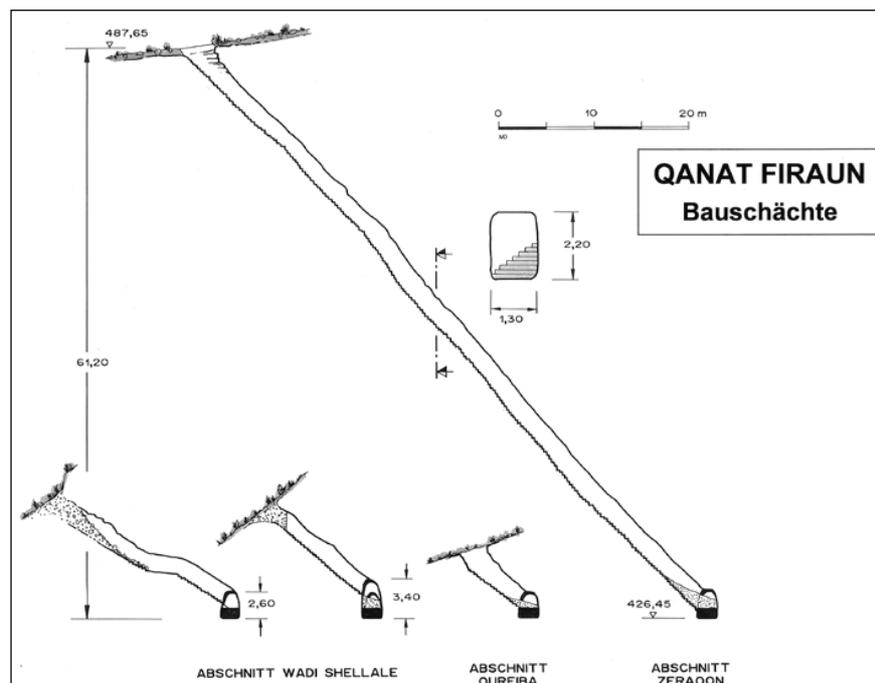
The entire tunnel system was dug out of the limestone bedrock using mining techniques, viz. hammer and chisel. The rock is frequently permeated by horizontal flint layers, which occasionally form the tunnel roof. Above-ground measurements and staking out the route were followed by excavation of construction tunnels and shafts. These were spaced at 20 to 50m intervals, with a depth of up to 70m and a width of 1.30m. They were between 1.60 and 2.20m high and usually had a gradient in excess of 45° (Fig. 7). Chisel marks (Fig. 8) show that tunnelling was carried out from the foot of the shafts in both directions, so that tunnelling teams worked towards one another. It is estimated that the number of construction shafts that were sunk totalled around 2900.

Between 80km and 130 it became clear that the Antique tunnel builders had diverged from the concept that they had initially followed. Rather than constructing the tunnel along valleys that bypass the mountains, the course cut a straight line across plateaus which are several kilometres wide. This required particularly deep

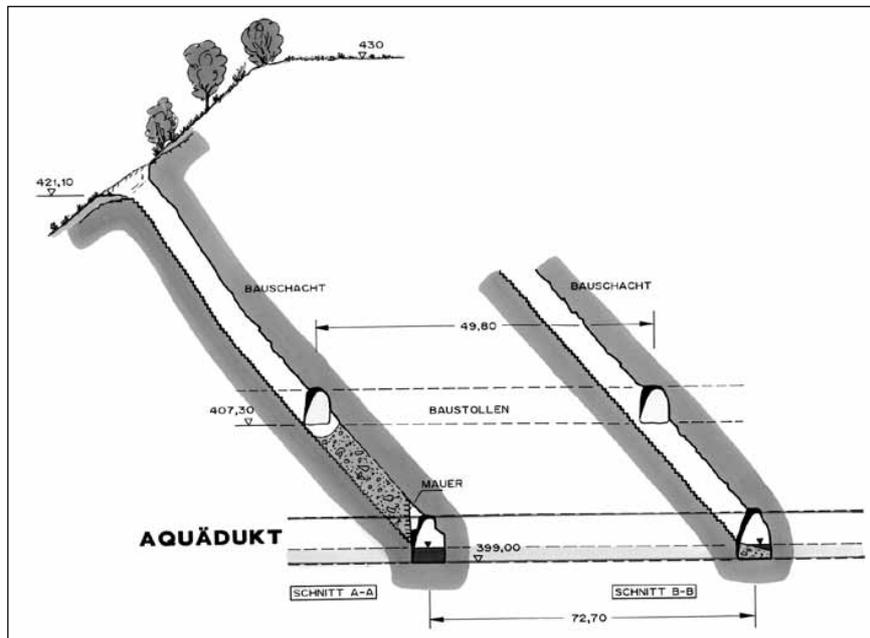


8. Construction shafts with construction tunnels at Al‘āl (99km). The lower part of construction shaft A-A is filled with rubble; shaft B-B is thoroughly blocked below the ground surface. Today, access to the aqueduct is provided by shaft A, the pilot tunnel and then shaft B (Section S, Fig. 7).

and, in some cases, multi-level construction shafts (Figs. 9 and 10) in which the first sloping construction shaft was followed by a horizontal tunnel and then a second sloping shaft down into the aqueduct. This restricted ventilation of the tunnel, meaning that gas detectors (for O₂, CO₂, H₂S, methane etc.) had to be used during the 2007 survey. When limestone comes into contact with carbon dioxide in air and water it reacts and becomes permeable. Therefore the 1.80 to 5m high and 1.20 to 2.50m wide tun-



7. Construction shafts.



9. The tunnel was excavated using hammer and chisel. This picture shows the marks left by a quadratic single-point threading tool with a diameter of ca. 1cm.

nel here had to be coated with waterproof plaster and supplemented with screed (Figs. 5 and 11). In order to make the plaster waterproof, 'hydraulic' material was incorporated into the mortar. This was usually ground tuff or *pozzolana*, a volcanic ash from Puteoli near Naples. If no such 'hydraulic' materials were available, ground charcoal, which has similar properties, could be used instead.

Because orientation was difficult underground, workers began with pilot tunnels set into the tunnel roof. These often curved further into the mountain (Fig. 12), which should have led to a breakthrough when the construction tunnels being dug from opposite ends met in the middle. That this was not always the case is reflected in numerous examples (see below). Following the breakthrough between the two tunnels, the full width of the cross section was dug out, differences in direction and height of tunnel were corrected, and the tunnel floor was finished off. As an example of the water level in the tunnel, in a section at Abila the upper traces of sinter are clearly defined and reflect a level of 50 to 80cm. This corresponds to a flow of 500-700 l.s. (40,000-60,000m³ per day). The main water source was the now dry dam 60km away at Dille, Syria. At least ten springs fed into the aqueduct during its course and represented an additional source of water.

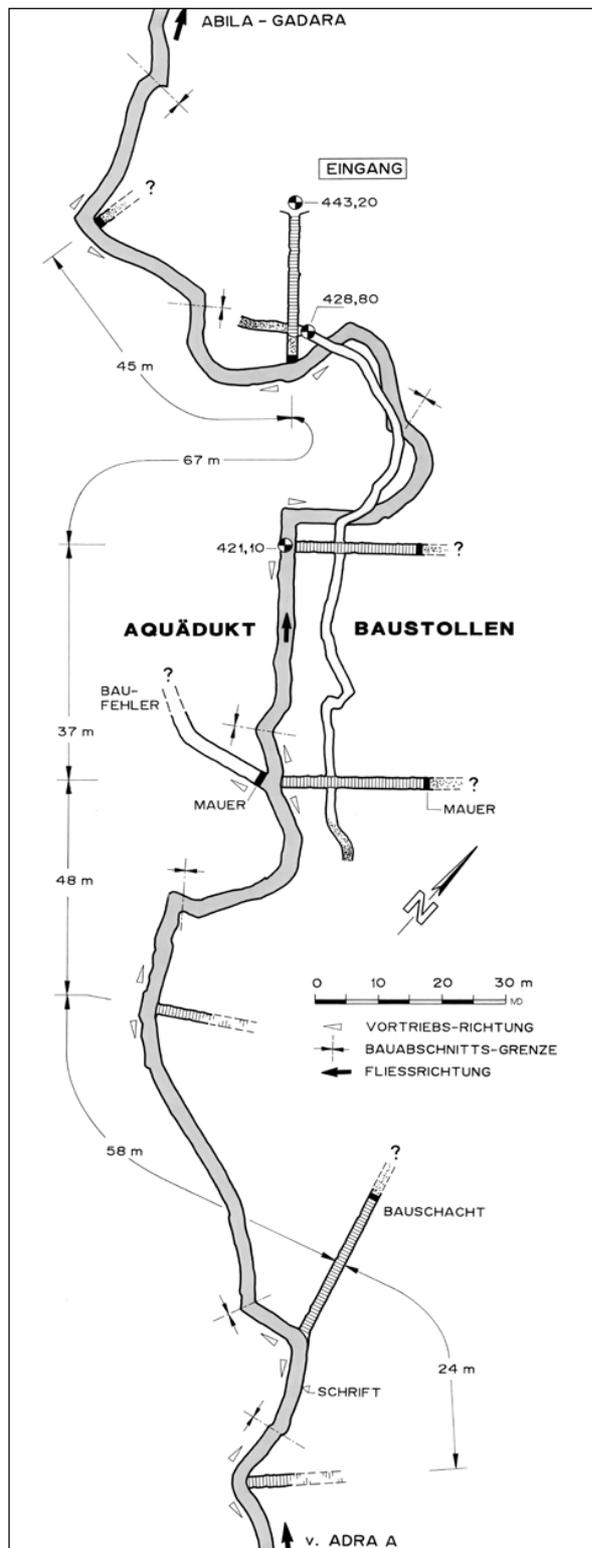
Ancient Measuring and Route Pegging

Specialists who worked all over the Roman Empire would be requisitioned for the general planning and main pegging of the larger aqueducts. The construction would be carried out by local workers and, frequently, military forces. In order to peg out the angle the *dioptre*, an instrument similar to the theodolite, was used. A *chorobates*, or water level gauge made about 6 m long, and water level gauge made from goat intestines were used for levelling. Horizontal monitoring was carried out using iron sights, with a plumb-line being used for vertical monitoring.

The landscape between Dille and Shajara was level and without large obstacles (Fig. 1), meaning that routing cannot have presented many difficulties. Thus, the pegging out methods normally used for Roman aqueducts could have been applied without complications. The same can be said for the tunnel section running from the watershed of Wādī Ḥamra - Wādī al-'Arab to Gadara, which is not obstructed by valleys.

The section between Wādī ash-Shallālah and the watershed would have been more difficult. Although no reports of the method used are available, topography permits the following hypothetical reconstruction.

The north Jordanian plateau runs steeply down to the Yarmouk, incised by steep valleys.



10. The irregular course of the tunnel course shows how difficult underground orientation must have been. In the middle of the tunnel section, a failed attempt is indicated by (?). This could not be investigated owing to lack of oxygen.

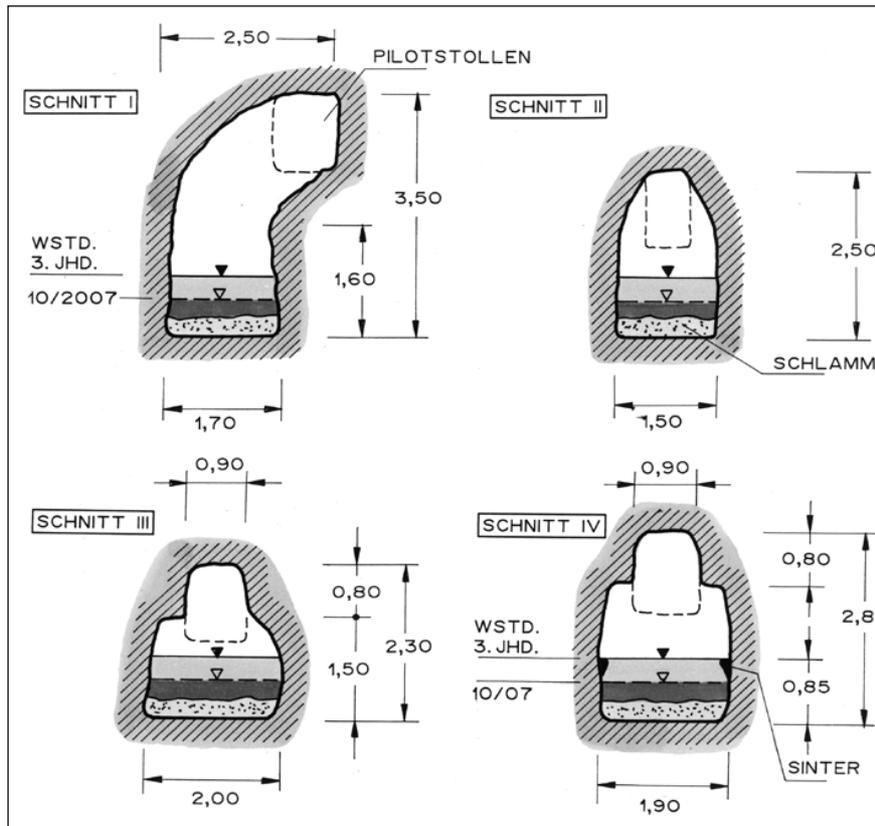
The ‘table mountains’ to which this has given rise are almost all at elevations of around 400m. asl. The line of sight between mountains is uninterrupted and the distance between them is never more than one kilometre. It is therefore likely that levelling was carried out using two batter boards mounted horizontally, using a *chorobates* or a water level gauge, in relation to fixed points on the opposite mountain ridge. This would have made it possible to work forward from mountain to mountain. The eastern side of Wādi ash-Shallālah lies 40m higher than the western ‘table mountains’. With the 1 % decline common in such constructions, circumvention of the valley would require a pipeline of 40km.

Following this, fixed points would have been used to establish the main levelling datum and project it forward into the tributary valleys. The elevation of the route could then be offset from the ‘table mountains’ at around 400m. asl, although the additional lengths needed to circumvent valleys had to be taken into consideration. If the start points for the construction tunnels were marked with stakes, the tunnel base could be extended into the mountain using water level gauge and plumb-line (Fig. 13).

The gradient of the decline is extremely low; averaging just 0.3 %. In the eastern, ca. 60 km tunnel section it is 0.1 to 0.9 %, or 10 to 90cm per km. In the middle section the decline is 1.4 to 1.6 % and in the western section ca. 2.6 %. Anyone with experience of tunnel construction will know how difficult it is to maintain such a low gradient, even over much shorter distances and with the benefit of modern techniques. However advantageous the sloping construction shafts may have been for spoil removal, they must also have presented an obstacle to the accurate projection of direction and elevation from surface to underground operations. How this was carried out with such precision has yet to be fully explained.

Position Errors

Although frequent checks against the staked route must have been carried out, position errors did occur. Despite the pilot tunnel technique and the limitation of intervals between construction shafts to a maximum of 120m in almost every instance, divergence from the correct route was common. This was partly because the ‘curved’



11. Cross-section of the tunnel.

tunnelling technique was not consistently applied or could only be applied with difficulty as, for example, when the route itself curved. As long as the tunnelling teams from opposite sides met at some point, errors could be corrected without great difficulty. When the tunnelling teams passed by one another, completely missing the point of intersection, the situation became more difficult. A more exact measurement usually made connection in the right direction possible. However, at one place in the Wādī Ḥamra a cross cut was made in the wrong direction and had to be corrected by bringing the whole pipeline back into the right direction.

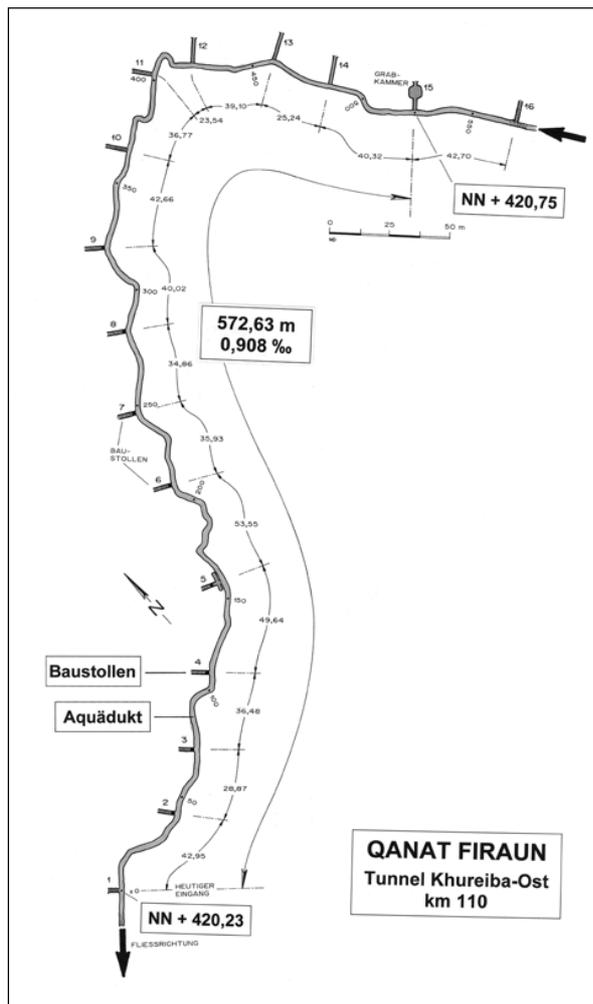
Occasionally, as in the case of az-Zayraqūn (76km, Fig. 14), the tunnelling operation had progressed too far for a straightforward solution. In such cases the two sections were connected, not with a right-angled bend, but with an s-bend, probably in an effort to avoid turbulent water flow which could cause an increased build-up of sinter. At the same location, the route had initially been laid too close to the precipitous ground surface. This caused fissures in the rock, which was less stable here. Similar cases were

found on the east side of Wādī ash-Shallālah, where the tunnel had been routed too close to the rock face, thus causing entire mountain sides to collapse (Fig. 15). These problems were subsequently avoided by setting the tunnel further into the mountain.

Near the 'Ayn Turab spring, a 130° curve was needed to circumvent a valley in which construction shafts could not be dug for an extended distance. A serious error in measurement appears to have arisen here (149km), meaning that the intersection point had to be located by means of a winding 200m 'search' tunnel.

Height Differences

When minor height discrepancies, appearing as offsets of up to 2m in the tunnel roof, arose, the floor of the tunnel could be corrected without difficulty, so that no 'sediment fall' developed and an even water flow was guaranteed. However, in some cases reworking of the tunnel floor was not attempted, for unknown reasons. An example of this, in the form of a 60cm step against the water flow, was found near the 'Ayn Guren spring (74km, Fig. 1).



12. In order to minimise the risk of the two tunnelling teams missing one another at the intersection point, the course of the tunnel curved into the mountain as shown by construction tunnels 6 and 9.

In some cases, greater differences in height made new construction necessary. This is the case at 70km, where one long tunnel section was replaced by another section set 1.50m higher. Another example is found at Wādī Ḥamra, where the tunnel was excavated with a slope ascending against the water flow for an extended stretch, meaning correction could not be carried out by simply lowering the tunnel floor. Therefore, when the doubled tunnel height had been reached, a second tunnel with the corrected gradient was constructed beneath the first (Fig. 16).

Date and Use

The first, approximate attempt to date the

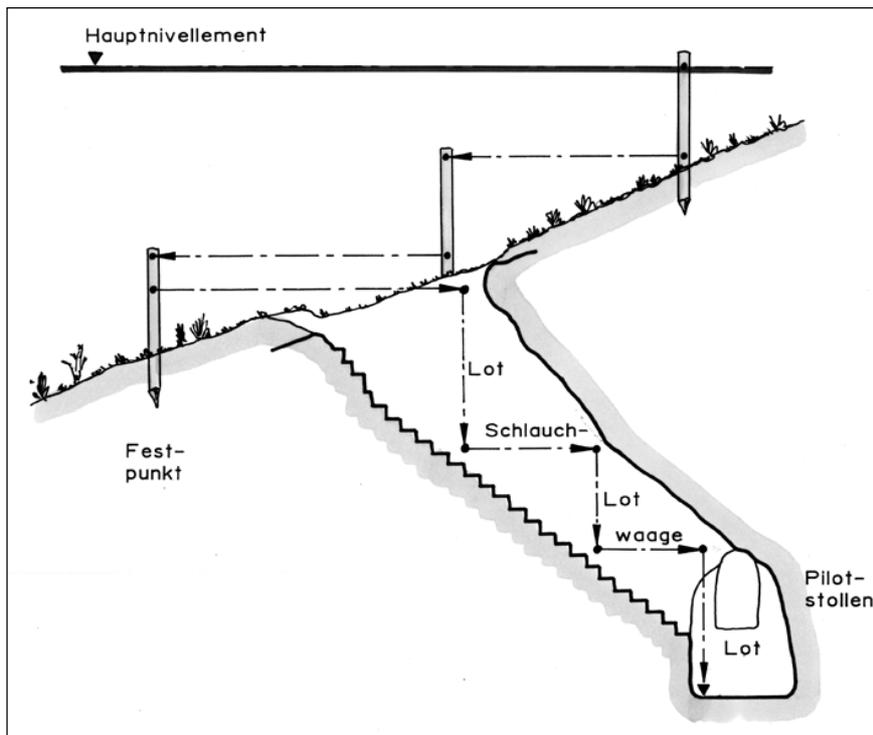
aqueduct was based on sherds found in an incomplete tunnel section in Wādī Ḥamra, which were indicative of the Roman period (63BC. to 5th century AD). A more accurate effort was subsequently made using radiocarbon analysis (¹⁴C) of charcoal in the aqueduct waterproofing between Wādī ash-Shallālah and Wādī Ḥamra. This suggested that construction occurred some time between 90 and 210AD, a period when the Decapolis cities enjoyed great prosperity. Sintering between the Wādī ash-Shallālah (75km) and a point west of Abila (116km) indicates that the aqueduct was in use for several centuries. This is agreement with ¹⁴C dating that suggests that the plaster at 77km was repaired around 380AD.

The aqueduct's regular operation may have come to an end with the collapse of Byzantine rule in 636AD, or the catastrophic earthquake of the 8th century (Hoffmann 2002). This is suggested by inscriptions found in the tunnel (Fig. 17). The route of the pipeline, its cross-section and degree of completion suggest that construction was carried out in the following chronological order:

1. Dille - Dar'a (44km),
2. 'Ayn Rahub spring - Abila (33km),
3. 'Ayn Guren spring - 'Ayn Rahub (12km),
4. Dar'a - 'Ayn Guren spring (32km),
5. Abila - 'Ayn Turab (23km),
6. Watershed - Gadara (12km, unfinished),
7. 'Ayn Turab - watershed (14km, unfinished).

The first sections to be built were clearly — though not necessarily simultaneously — sections 1 and 2, followed by sections 3 and 4 as an extension of section 2, and then section 5. The numerous construction errors in section 6 are likely to be responsible for the fact that this was abandoned before being finished, without plaster or screed coating. Thus, section 7, which was finished before section 6, was not able to hold water and ended up as something of a 'white elephant'.

A few hundred metres west of 'Ayn Turab spring, Qanāt Fir'ūn is higher than the older aqueduct that led from there to Gadara (Weber 1991, 2002: 35; Zens 2006). At this point, which was previously inaccessible, water could have been redirected into the lower pipeline and been carried to the city through this channel.



13. Pegging out the height in a construction tunnel (hypothetical).

Photography credits

All sketches and photos are by the author, unless otherwise indicated.

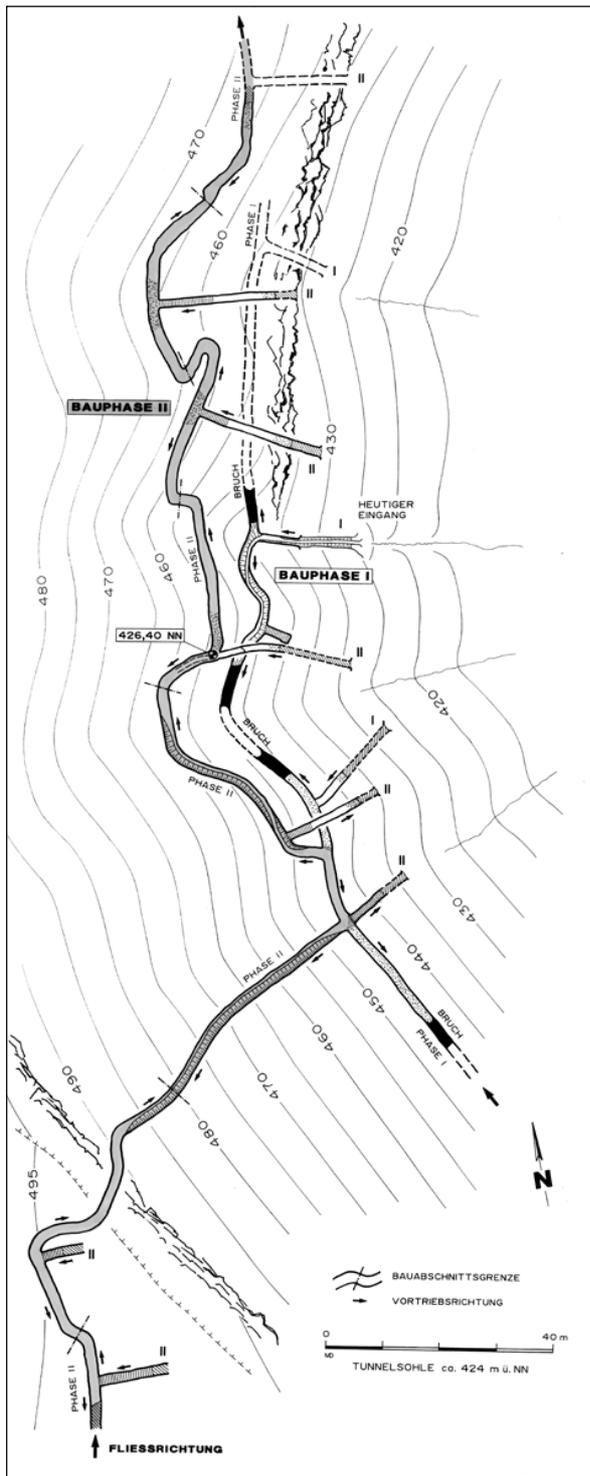
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14. Tunnel system with construction errors at az-Zayraqūn in Wādī ash-Shallālah.

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15. A landslide caused by tunnel construction exposed the route in Wādī ash-Shallālah.

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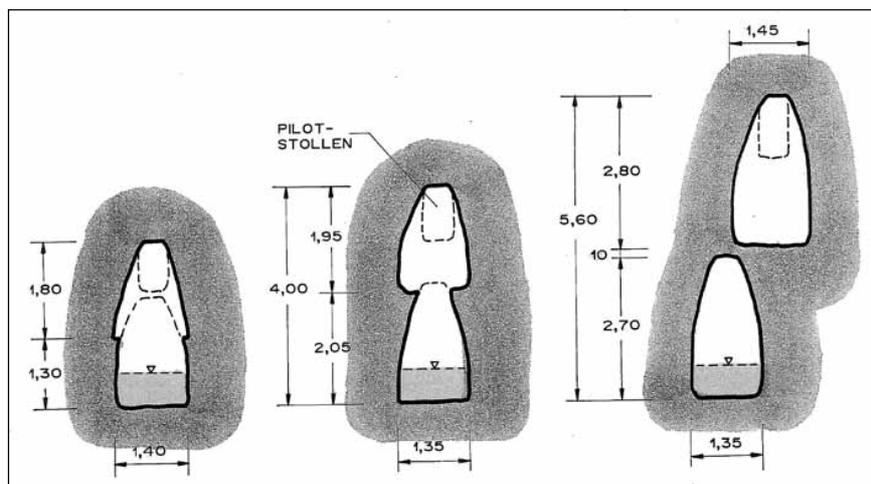
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17. Fragments of Greek writing from the tunnel, probably 7th century (Photo: P. Keilholz).



16. A two-level tunnel in Wādī Ḥamra to correct a difference in height.

KHIRBAT AS-SAMRĀ ANCIENT CEMETERY: PRELIMINARY DISCUSSION OF SITE C

A. J. Nabulsi, Aktham Abbadi, Ahmad Shami and Hussain Askar

Introduction

During the summer of 2008, excavations at Site C in the ancient cemetery of Khirbat as-Samrā were completed. It was the fourth season after the 1997, 1998 and 2007 campaigns. This has provided a timely opportunity to present an outline of the archaeological observations made at the site. Some features have already been discussed in previous reports (Nabulsi *et al.* 2007, 2008).

Field Observations at Site C

This site represents the south-western corner of the cemetery. The area was divided into a 5 x 5m grid of rows (A to G) and columns (1 to 9) (Fig. 1). The cemetery's expansion to the south was restricted by an irregular rise in the level of the basalt bedrock layer that almost reached the ground surface in squares C3 and D8. From Column 9, the cemetery boundary turns at E9 in the direction of G6. There are no tombs in the area beyond this line. This was the result of a 25m trench dug by Humbert (1993). To the west, the cemetery ends at Row G. The tomb at the end of Square G3, XX2, is an unfinished grave that is 50cm deep; it is similar to XX1 in Square B7.

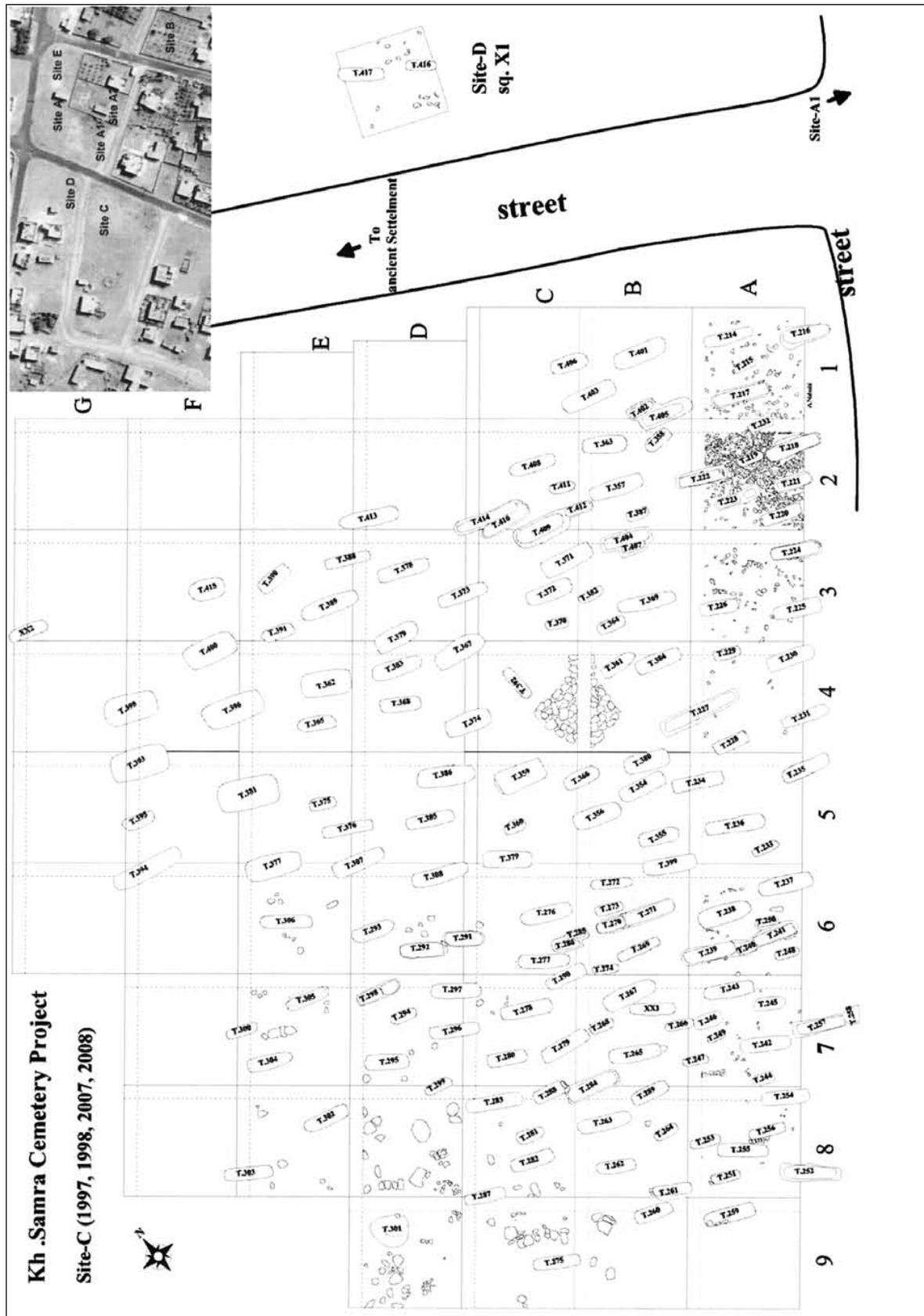
Contrary to our predictions, no tombs were found north of a line extending from Square G3 to the upper part of Square C1, though some of the 'empty' squares were dug much deeper than the standard 20-30cm. Site A1 is located on the opposite side of the road and extends further northwards. Since the cemetery was expected to expand northwards beyond Site C, a 4 x 4m square (D-X1) was excavated at Site D. This site is located north of Site C, on the opposite side of the modern road leading to the ancient town. Two tombs were found and excavated in that square (Fig. 1). This confirms the cemetery's extension

to the north. The empty space between Sites C and D could be part of an old road or pathway from the ancient settlement that may have run through the cemetery itself. This suspected road ended either in the cemetery, somewhere before reaching the area of Site A1, or it turned to the north. The recent growth of the modern village prevents this hypothesis from being tested.

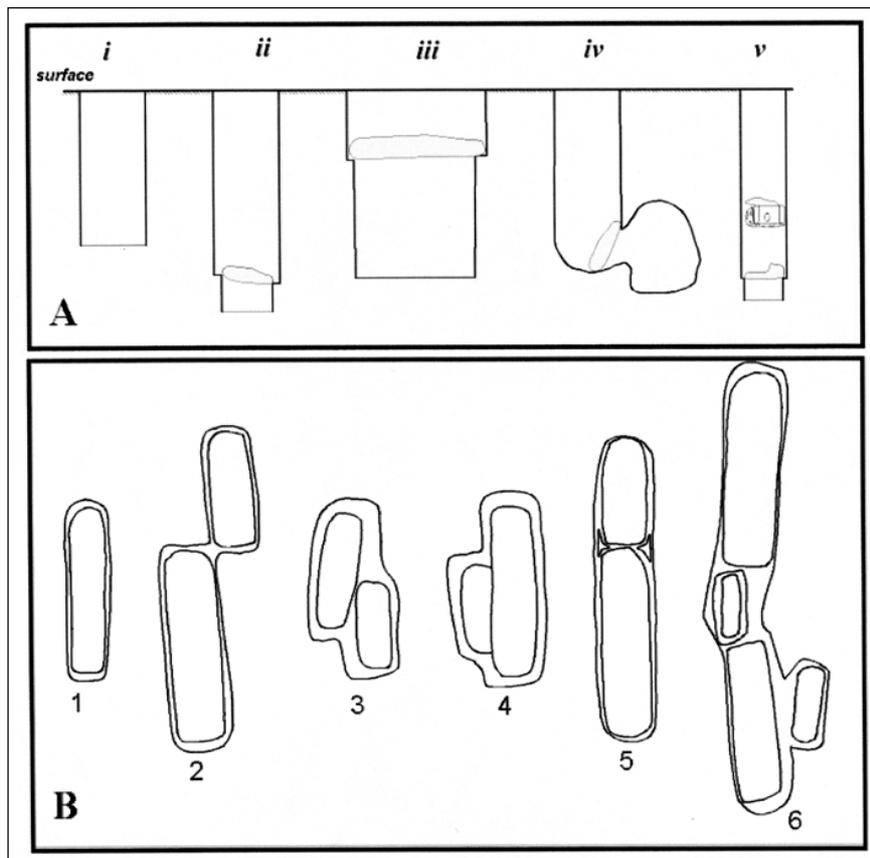
The site reflects the cemetery's general organization of parallel lines of tombs orientated east-west. Tomb 392, with its north-south axis is an exception. Further division in 'family' areas has already been suggested (Nabulsi *et al.* 2008). The deceased were buried on their backs, with variations in the positioning of the head and limbs. At the surface, tombstones were positioned at either end to mark the graves. Three tombs revealed small, shallow pits contiguous with their shafts: Tombs 277 and 359 to the west, and Tomb 265 to the east. It is probable that these were sockets for the tombstones. The west tombstone of Tomb 280 was found *in situ*; its engraved side had a cross and Greek inscription, and faced eastwards.

All excavated tombs in the cemetery were shaft-tombs with variations in the burial chamber. At Site C, five types of tomb were differentiated (Fig. 2A):

- i. Shallow pit tomb with no 'shoulders'.
- ii. Cist-tomb with 'shoulders' and stone covering slabs; burial chamber less than 60cm wide.
- iii. Large cist-tombs similar to Type (ii), but with broad (> 75cm), relatively high burial chamber covered by huge stone slabs.
- iv. Burial cist hollowed out of either of the broad sides, and closed with diagonally placed slabs.
- v. Two 'storey' cist-tombs, with two distinct



1. The complete excavated area of Site C; the top corner of the satellite picture of the modern village shows the excavation sites within the ancient cemetery (source Google Maps).



2. Tomb variation at Site C (details in the text).

A. Variation in burial chamber.

B. Variation in tomb arrangement.

burial chambers at different levels.

Type (iii) is restricted to specific areas of Site C. The other types were found in various parts of this site, and at other sites in the cemetery. Type (ii) is the standard form. Types (i), (iv) and (v) were documented in ten, three and one tombs respectively.

Tombs were situated at varying distances from their neighbours. In some cases, two or more tombs were dug so close to each other that they shared – partially or completely – at least one side, thereby forming a long or broad shaft. These tomb arrangements were classified in 6 types (**Fig. 2B**; also **Fig. 1** for examples):

1. Single: the standard tomb with a distinct shaft.
2. In-line: the tombs, often two, are joined at one of the narrow sides.
3. Corner-linked: two adjacent tombs with shared corners.
4. Partly parallel: two tombs partly open to one another along the broad side.
5. Parallel: two completely parallel tombs sharing one open broad side.
6. Complex: a cluster of three or more tombs re-

vealing variable combinations of Types 2-5.

A total of 157 tombs were excavated at the site, 53 of which were intact. Most tombs were single burials, but graves with multiple (two to three) burials were relatively common. Fragmentary human bones were found in the fill of some intact tombs. In Tomb 290, a cranium was placed in the lower south corner, on the stone slabs, while the postcranial remains were piled at the eastern end in the burial cist. These observations suggest extensive re-use of tombs. It was estimated that at least 40 % of the tombs were re-used, either by means of multiple insertions, or by discard and re-interment. This observation is presently valid for Site C only.

Objects and Tomb Offerings

Some of the objects found at Site C have been discussed in previous reports and many are still under study. Only a generalized inventory of objects is presented here (**Table 1**).

Objects were recovered from 89 (or 57 %) of the 157 tombs, as well as from topsoil. Two-thirds of objects can be considered jewellery, including

Table 1: Objects recovered at Site C of the Khirbat as-Samrā ancient cemetery during the 1997, 1998, 2007 and 2008 excavations.

Object	n	Material	Found in
Bracelet and anklet	45	8 Brz, 30 Fer, 1 Glass, 4 Os, 2 Wood	31 tombs
Beads ^(A)	109 (521)	2 Brz, 54 Glass, 11 Os, 25 Shell, 17 Stone	38 tombs
Buckle	2	1 Brz, 1 Fer	2 tombs
Chain	7	6 Fer, 1 Brz	7 tombs
Cloth	4	Linen (shroud)	4 tombs
Coin	3	2 Brz, 1 Silver	3 tombs
Earring	26	15 Gold, 7 Silver, 1 Brz, 3 Glass	10 tombs
Gems and seals	5	2 Scarabs, 3 Gemstones	5 tombs
Ceramics	4	2 Juglets, 2 Lamps	Topsoil and 3 tombs
Leather	4	Fragments of belt and sandals?	4 tombs
Nail	10	10 Fer, single and multiple occurrences	8 tombs
Necklace	2	1 Brz, 1 Brz / Fer	2 tombs
Pendant	13	2 Brz, 2 Shell, 1 Fer, 3 Glass, 4 Os, 1 Stone	10 tombs
Pin	13	All Ivory hairpins	4 tombs
Plant	6	1 Fruit, 5 Seed	6 tombs
Ring	12	5 Brz, 7 Fer	10 tombs
Spatula	7	5 Brz, 1 Fer, 1 Os	5 tombs
Tombstone	8	5 Engraved with cross, 4 inscribed	Topsoil and 2 tombs
Vessels	12	11 Glass Vase, 1 Alabaster	6 tombs
Wood	10	9 Wood, 1 Charcoal pieces	Topsoil and 5 tombs
Others ^(B)	14	10 Fer, 3 Brz, 1 Cer, 4 Os, 3 Stone	Topsoil and 17 tombs
Total	316		Topsoil and 89 tombs

Key: brz = bronze, fer = iron, os = bone, cer = ceramic.
^(a) = sum of types found in each tomb, total number in brackets.
^(b) = includes cleats, a stone axe and other fragmentary and indefinable objects.

rings and earrings, anklets and bracelets, various beads, pendants and necklaces, as well as gemstones. These were made of various materials, particularly iron, bronze and glass. They also include 15 gold and seven silver earrings. Together with cosmetic items (e.g. spatulae, hairpins and associated glass vessels), 75 % of objects can tentatively be considered female-related.

Tomb 292 is a special case. The intact burial of a 14 to 15 year-old girl included more than 50 items, i.e. 20 % of the 316 objects found at the site. Jewellery objects were concentrated on and around the upper body. The girl was buried wearing bracelets on the upper and lower arms. Below her feet, three glass vases and one alabaster pot, containing a fossilized mammalian

bone fragment, were placed. Other material, including iron nails, wood and linen cloth fragments, could be associated with funerary rites. It is highly probable that the deceased was buried wrapped in a linen shroud, or laid on a wooden stretcher -- if not in a wooden coffin. Other objects, such as iron cleats and large nails, found in other tombs indicate that cloth and occasionally wooden coffins were used in burial practices.

Discussion and Conclusions

The significance of Site C as part of the systematic excavations in the Khirbat as-Samrā ancient cemetery can best be comprehended in comparison with Site B, which was excavated in 1996.

Site C had greater variation in tomb types and arrangements, relatively frequent multiple burials and no religious objects, except for two tombstones with engraved crosses. Site B yielded twice as many objects as Site C, many of which are suggestive of a 'Christian' background (Nabulsi 2007). Objects date Site B to the seventh and eighth centuries AD, whereas C is probably earlier. The 53 intact tombs at Site C (cf. 4 out of 130 at Site B) are extremely significant, as is the relatively better state of preservation of the human bone. Whereas most of the individuals buried at Site B were sub-adults (Nabulsi 1998), the majority of tombs in Site C contained adult burials. It was observed that secondarily-used tombstones, serving as covering slabs, were placed with the engraved side looking into the burial cist at Site C, whereas Site B revealed the opposite (see pictures in Humbert 1998: 268-269).

The diversity so far revealed at this cemetery is a reflection of the systematic nature of the work carried out. Subsequent archaeological and biological studies will probably provide more definitive results and interpretations. Comparison with other cemeteries, particularly those with archaeological or geographical parallels, e.g. Umm al-Jimal (Brashler 1995), will yield essential comparative data and information on the history and structure of local populations.

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Addendum

In the 2008 report (Nabulsi *et al.* 2008), it was suggested that a basalt stone (represented by fragments KS-1331 and KS-1332) with an engraved North Arabic / Safaitic inscription had probably been intentionally damaged with a chisel. Another fragment (KS-1382) was found on the last day of the 2007 season. Later, in 2008, it was recognized to be the lower part of the inscribed stone. One can clearly observe the continuation of the upper frame (**Fig. 3**). The chisel marks continued on to the non-inscribed part of the stone, and were not restricted to the area of text. The damage to the inscription was thus circumstantial and not intentional, as we first suggested. The stone was probably erected as a tombstone.

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3. Fragments KS-1331, KS-1332 and KS-1382 of the North Arabic / Safaitic inscribed tombstone.

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WĀDĪ ABŪ ṬULAYḤA: A PRELIMINARY REPORT ON THE SUMMER 2008 FINAL FIELD SEASON OF THE JAFR BASIN PREHISTORIC PROJECT, PHASE 2

Sumio Fujii

Introduction

The primary purpose of the Jafr Basin Prehistoric Project is to trace the process of pastoral nomadization in the area on the basis of specific archaeological evidence and, in so doing, shed new light on far-reaching socio-economic reorganization in the later prehistory of the southern Levant. For this purpose, we have continuously investigated a dozen archaeological sites since 1997, focusing on the four millennia spanning from the Pre-Pottery Neolithic B (PPNB) to the beginning of the Early Bronze Age (EBA).

The site of Wādī Abū Ṭulayḥa, or JF-0155 in our site registration code, has undergone continuous excavation since the first field season in the spring of 2005. The previous five investigation seasons revealed some sixty semi-subterranean masonry structures at an elongated settlement *ca.* 100m in total length (Fujii 2006a, 2007a, 2008a), in addition to a series of water catchment facilities along a tributary wadi flowing across the southern edge of the site (Fujii 2007b, 2007c). Available evidence suggests that they were combined to form a Middle-Late PPNB agro-pastoral outpost probably derived from contemporary farming communities to the west, and that it was based on a risk-diversifying, mixed economy consisting of hunting mainly of gazelles, short-range transhumance bringing along a limited number of domestic sheep and goats, and small-scale basin-irrigated agriculture within the flooded area of a large stone-built barrage (Barrage 1).

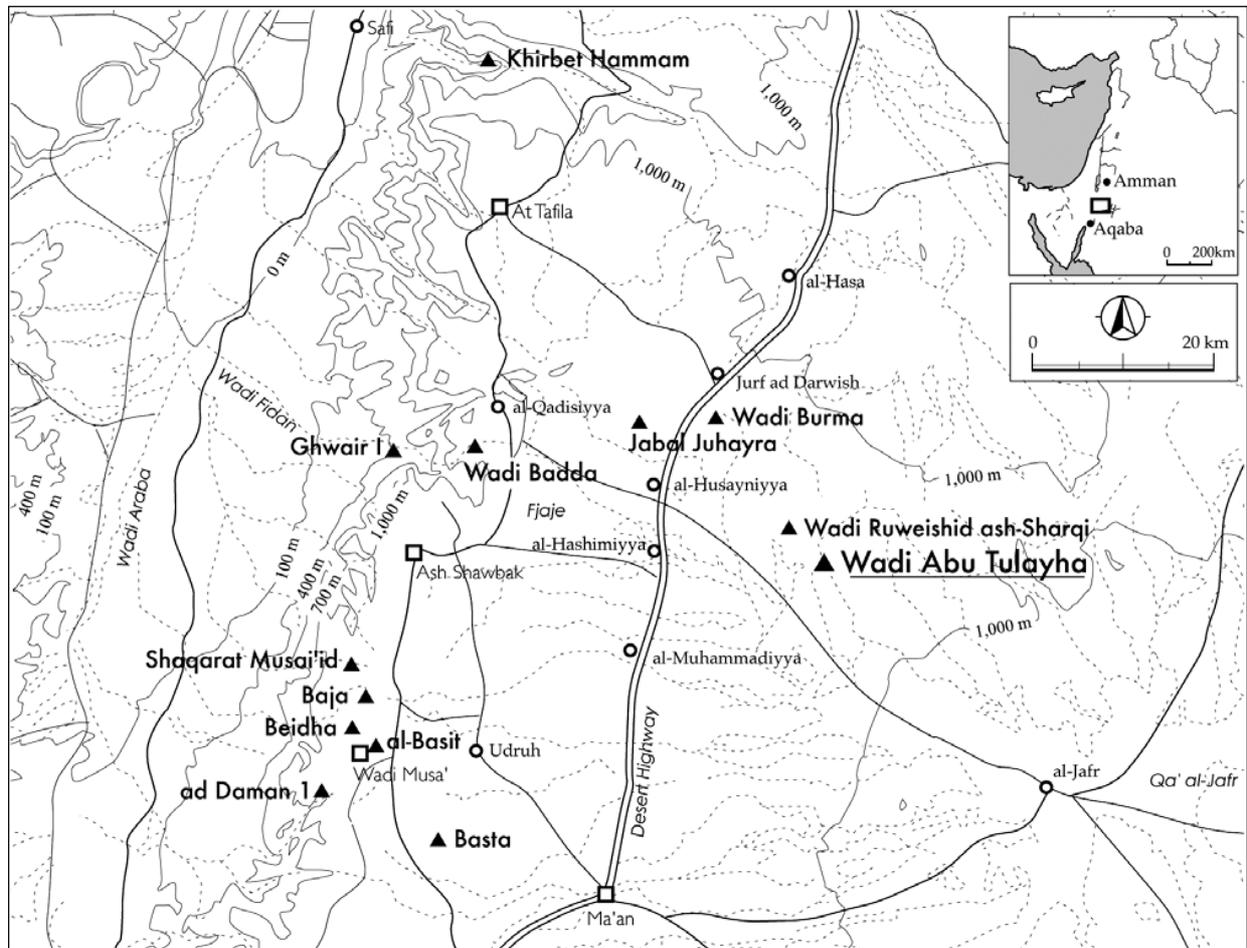
The sixth and final field season took place between August 2 and September 18 2008, focusing on the following three major issues: (1) the date and material culture of the initial occupational phases of the outpost, (2) the identification of pens for livestock whose existence was

suggested through our faunal analysis and (3) the function, date, and archaeological implications of a cistern-like feature that first came to light in the previous season. Although no clear evidence for animal pens was confirmed, the investigations have shown that the outpost began with a tripartite structural complex dated to the Middle PPNB, and that the unique feature was used as a cistern to supply drinking water to the neighboring outpost. This report briefly outlines the investigation results of the sixth and final field season at the site of Wādī Abū Ṭulayḥa.

The Site and Research History

The site of Wādī Abū Ṭulayḥa, situated in the north-western part of the Jafr Basin, was first discovered during our 2001-2002 winter season survey (Fujii 2002b; Fujii and Abe 2008) (**Fig. 1**). Topographically, it occupies flat terrain on the north bank of the tributary wadi that flows eastwards across the southern edge of the site to merge into the main stream of Wādī Abū Ṭulayḥa. Lying in the middle of a flint pavement desert (al-Ḥamād in Arabic) with an average annual precipitation of less than 50-100mm, the site is currently completely isolated from farming communities to the west. This is not to say, however, that it occupied a similar setting in the Neolithic period. The occurrence of various wild animal bones and the existence of water catchment facilities both suggest that the Jafr Basin received a certain amount of rainfall during the Neolithic.

To date, five seasons of investigation have been carried out. A general area survey and limited soundings, both conducted in the first field season in the spring of 2005 (Fujii 2006a), showed that the site covered an area of *ca.* 1.5ha and consisted of the following three major com-

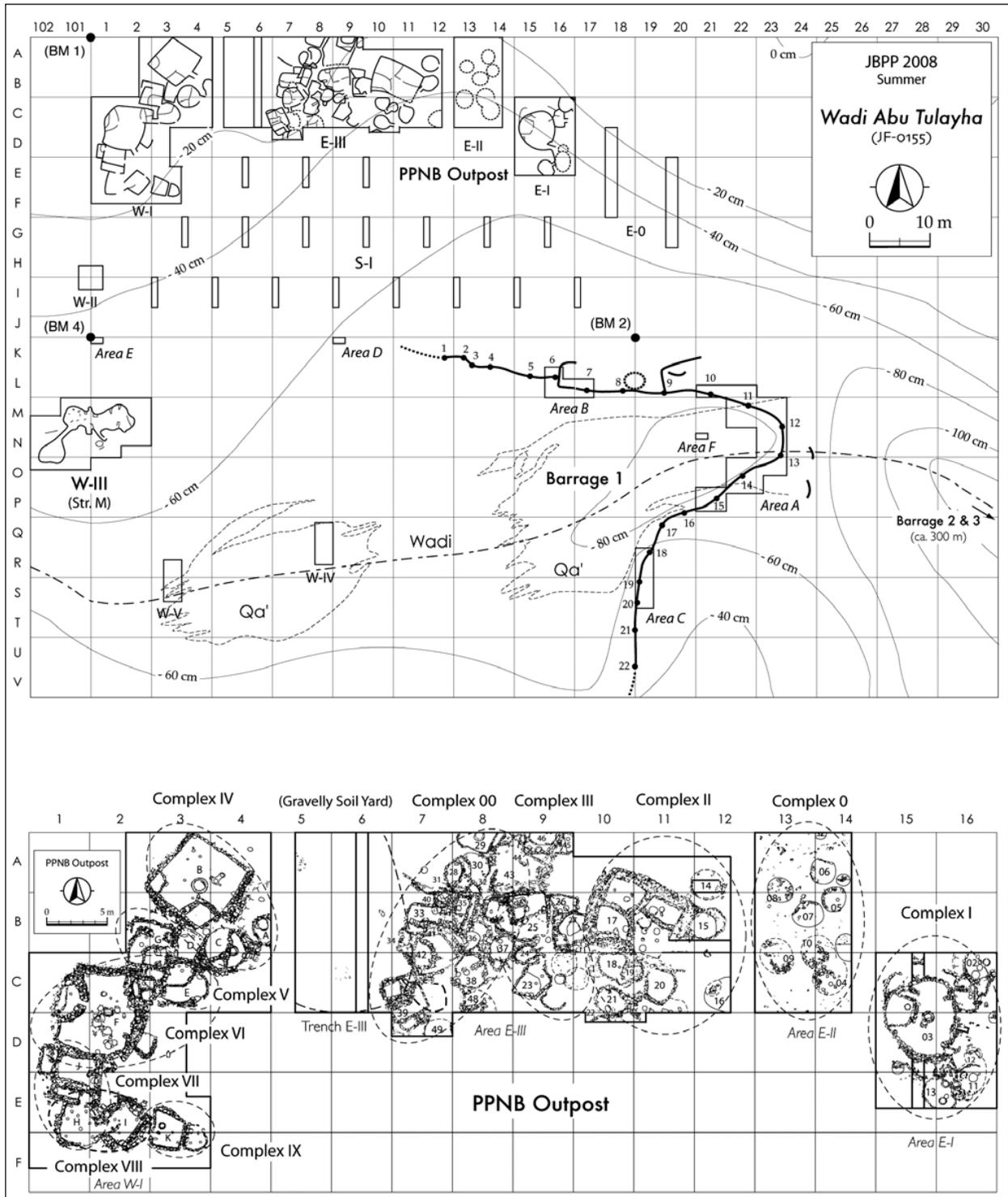


1. Wādī Abū Ṭulayḥa and PPNB sites around the Jafr Basin.

ponents: (1) a small settlement occupying the north-western corner, (2) a pair of EBA burial cairns overlying the settlement and (3) an elongated, V-shaped freestanding wall built across the tributary wadi (Fig. 2). The second field season in the summer of the same year fully excavated the western half of the settlement (Fujii op. cit.). Evidence suggested that it served as a Middle-Late PPNB agro-pastoral outpost, probably derived from the contemporary farming society to the west. The third season conducted in the spring of 2006 was focused on the V-shaped freestanding wall, which turned out to be a basin-irrigation facility (Barrage 1) used by the neighboring Middle-Late PPNB outpost (Fujii 2007b, 2007c). The season also investigated two smaller barrages or wadi barriers newly found in the lower course of the same wadi. The fourth season in the summer of the same year returned to the main body of the outpost and excavated its

eastern half extensively (Fujii 2007a). The fifth season in the summer of 2007 was devoted to excavation in the eastern half of the outpost and revealed Complex 00, probably the first residential quarter of the site (Fujii 2008a). The season also located a cistern-like feature (Structure M) at Area W-III.

The sixth and final field season, our main concern, was focused on the three major issues described above, that is to say, the continued excavation of Complex 00, the identification of animal pens, and further scrutiny of the cistern-like feature. In addition, a few supplementary operations were conducted for a more comprehensive understanding of the site. The area and volume of soil excavated this season totaled *ca.* 200 square meters and *ca.* 100 cubic meters respectively. Excavated soil from fill layers was not routinely sieved; a total of *ca.* 500 liters of hearth contents and floor deposits was wet sieved.



2. Wādī Abū Ṭulayḥa: site plan (above) and the outpost (below).

Continued Excavation in Area E-III (Complex 00)

The last field season revealed a total of 19 semi-subterranean masonry structures in the

western half of Area E-III; two of them (Units 39 and 42) were not fully excavated owing to time constraints (Figs. 3 to 5). This season started with the continued excavation of these two



3. Complex 00: general view (looking N).



4. Complex 00: general view (looking NE).

units. In the course of this operation, three new features (Units 47, 48 and 49) were also identified and excavated. Thus, the structural remains investigated in this season totaled five (six if a forecourt-like space between Units 48 and 49 is also counted). In combination with a few abutting units, they constitute the southern half of Complex 00. Stratigraphical evidence suggests that they fall into the following three phases (**Fig. 6**).

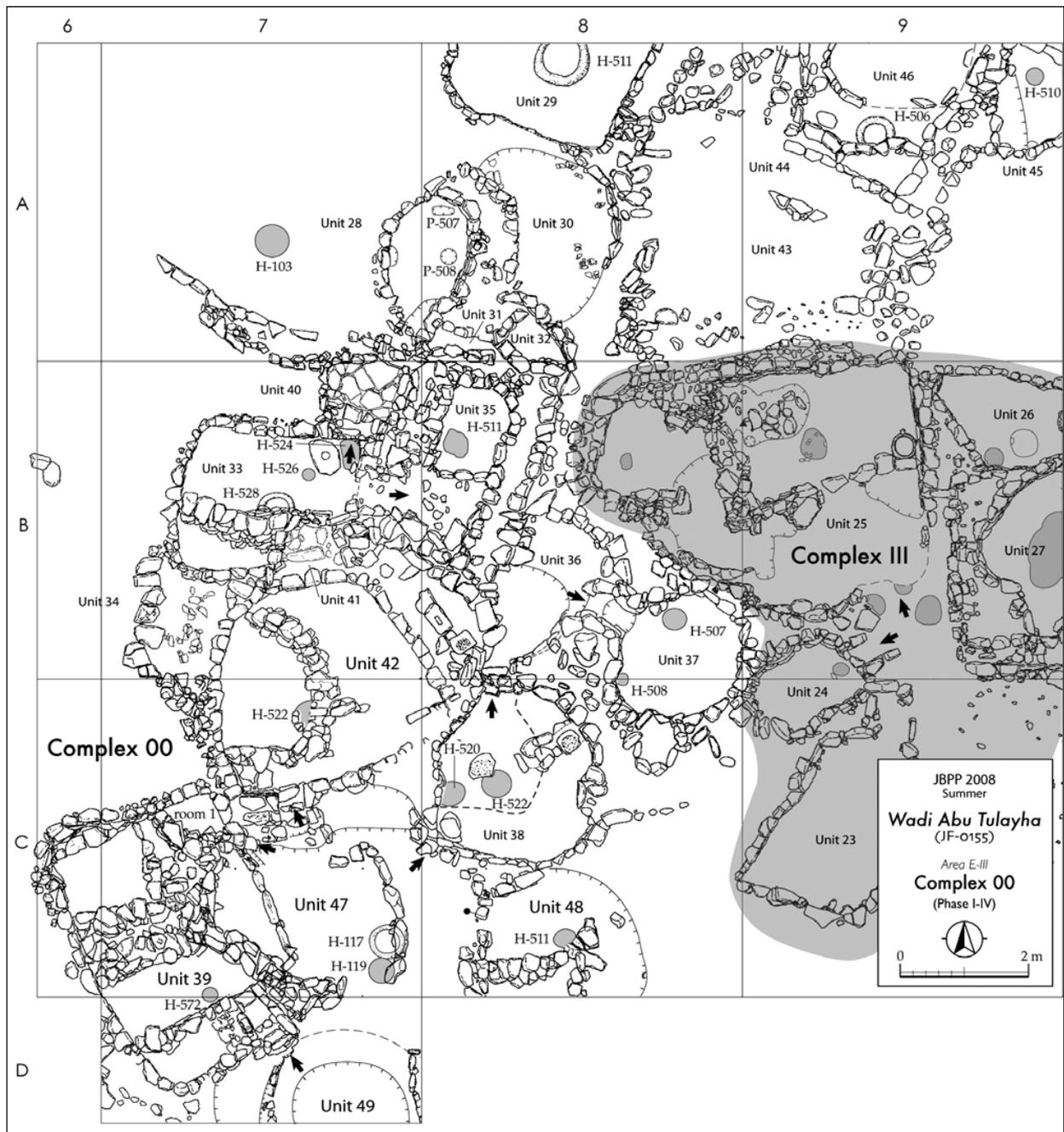
Phase I

Phase I consisted of three small architectural components centred on the southern corner of

Complex 00: Unit 48, Unit 49 and a forecourt-like space between the two. Interestingly, all of them were situated within a large semi-quad-rangular pit *ca.* 7m across and *ca.* 0.7m deep. This semi-tripartite complex represents the initial phase of the occupational sequence of the outpost.

Unit 49

Unit 49 was discovered in Square D7, at the south-western corner of Area E-III (**Fig. 7**). It was a round, semi-subterranean structure nested in the large pit, measuring *ca.* 2m in diameter and *ca.* 0.9m in total depth (or *ca.* 0.2m below

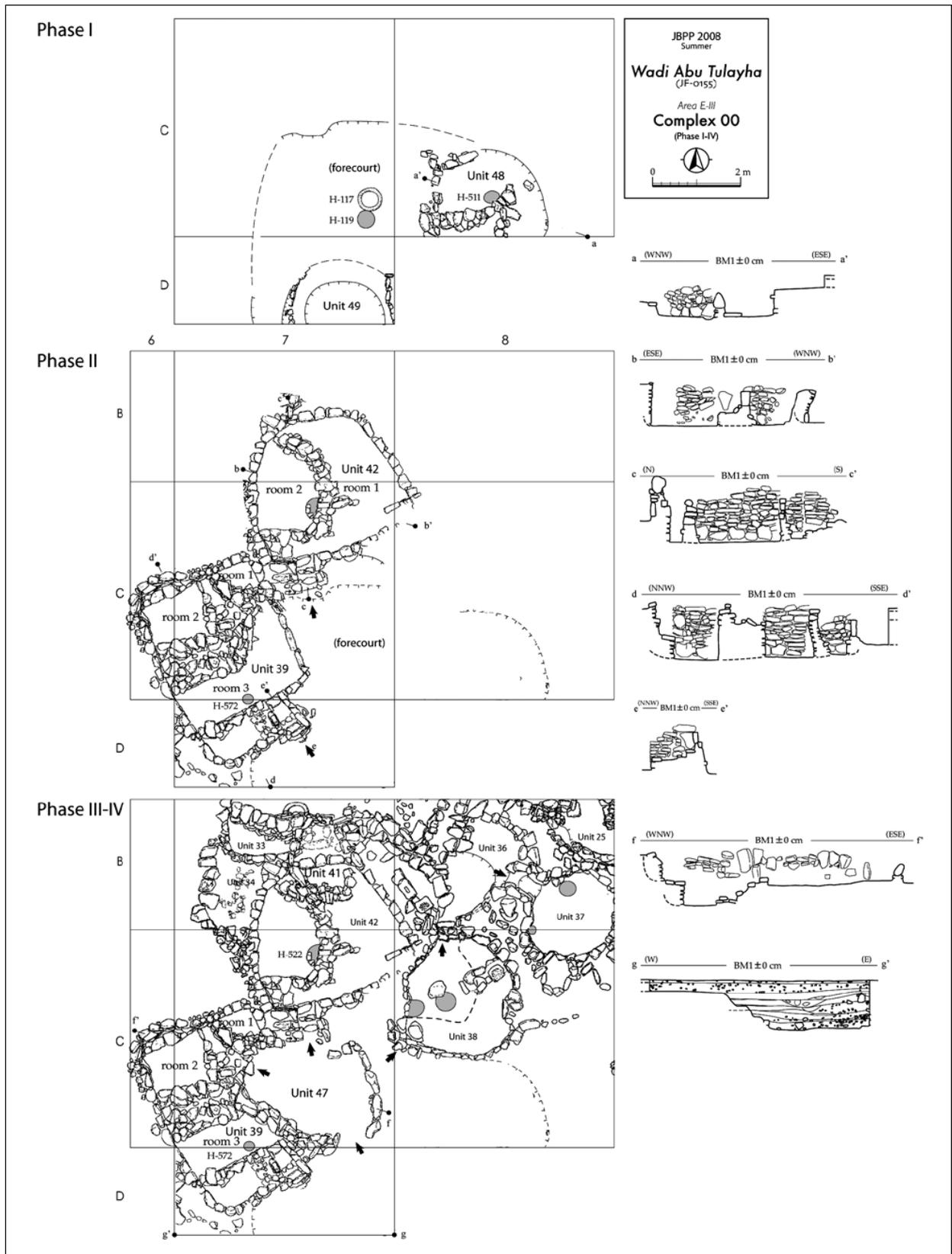


5. Complex 00: general plan.

the base of the pit). Unfortunately, it was barely preserved at its foundation course owing to the poor standard of construction. No remarkable features were found on its original floor, but the existence of a few hearths on ashy fill layers suggested that it was repeatedly reused as a semi-open kitchen or as a dumping pit for surrounding, later structures.

This unit, though poor in material culture,

provides a key with which to trace a technological development of the outpost's structures. Noticeable are a stepped, less steep foundation pit, and rubble and clay fill compacted behind masonry walls, both of which contrast with subsequent features characterized by nearly perpendicular pit sides and pebble fill (Fujii 2006a, 2007a). Presumably, those who were involved in the construction of Phase I features



6. Complex 00: reconstruction of the occupational sequence.



7. Unit 49: general view (looking SW).

had yet to become fully familiar with the construction of semi-subterranean masonry walls. In this context, it is understandable that the masonry walls were founded not on the floor but on a lower step of the foundation pit (it is important to note that the same technique was used in Structure M referred to below). The same is true of the combined use of smaller slabs and larger upright cobbles as foundation stones. Such technological inconsistency highlights the immature nature of this unit.

Unit 48

This round structure, *ca.* 2.5m in diameter and *ca.* 0.7m deep, occupied the north-eastern corner of the large pit (Fig. 8). It had much in common with Unit 49 in terms of technology. Neverthe-

less, it was different in typology, being equipped with a partition wall bent at a right angle in the southern half, and a narrow entrance flanked with a pair of upright stones at the western corner. A small hearth (H-511) was found beside the partition. This unit yielded a stone figurine (see Fig. 20: 1, Fig. 21) and two unique clay objects from a middle fill layer (see Fig. 20: 7-8).

Forecourt

A *ca.* 3m by *ca.* 4m empty space occupied the north-western quarter of the large pit (Fig. 9). It was cut by Unit 39 (belonging to Phase II-III) at its western edge, and was partly disturbed by Unit 42 (Phase II-III) at its northern periphery. A clay-lined hearth *ca.* 0.6m in diameter (H-117) and a simple hearth (H-119) *ca.* 0.4m in diameter were found roughly in the middle of the floor. Their existence, coupled with ashy deposits around them, suggests that this space served as a communal forecourt for the abutting two units nested in the same pit.

Phase II

Phase II included Units 39 and 42 as two major components (Figs. 3 to 5). Both features partly cut the large pit containing the three Phase I features, and were in turn partly disturbed by Unit 47 of Phase III. In addition, the forecourt of Phase I continued to be used in combination with these two new units. In this sense, the



8. Unit 48 and its surrounding features: general view (looking WSW).



9. Forecourt between Unit 48 and 49: general view (looking N).

Phase II features can be defined as a later version of the semi-tripartite complex of Phase I.

Unit 39

Unit 39 was located at the south-western corner of Complex 00. Continued excavation this season showed that it was a rectangular, semi-subterranean structure *ca.* 3-3.5m across and up to *ca.* 1.2m deep, and that it was equipped with a narrow stepped entrance at both the north-eastern and south-eastern corners. This unit underwent repeated reconstruction, which allowed us to divide its occupational history into the following three sub-phases.

Sub-phase 1 is represented by four masonry retaining walls and the stepped entrance opening to the south. It follows that Unit 39 was originally a single-room structure. The walls were constructed with relatively small yet standardized limestone slabs, preserved up to a height of a dozen courses. Overall, the masonry technique was superior, forming a marked contrast with other features that were reconstructed or newly added in subsequent sub-phases. Of interest is the southernmost wall, which partly collapsed and was converted to a support in order to protect a newly added wall from strong lateral soil pressure. A similar technique was observed in Unit 03 of Complex I (Fujii 2007a). Seeing that the new wall also stood on the original floor, the chronological gap between the two is thought to have been small. A small hearth (H-572) was

found beside the southern wall.

Sub-phase 2 witnessed the collapse and reconstruction of a wall segment at the north-western corner (**Fig. 10**). This episode is evidenced by a remarkable difference in masonry technique in both vertical and horizontal directions. While the upper two-thirds of the wall were irregular in construction, the lower third still retained its original condition. Interestingly, the lower part was fully covered with clay mortar *ca.* 7-8cm thick and the upper part was crudely reconstructed, overhanging it (**Fig. 11**). The contrast in the horizontal direction, on the other hand, means that while the western two-thirds of the wall underwent the patchwork reconstruction described above, the eastern third still remained intact. This probably means that a curvilinear partition wall (*loc.* 507. bwl),



10. Unit 39: Room 1 and 2 (looking NW).



11. Unit 39: northern wall of Room 2 (looking NW).

newly added to the interface between the two wall segments, also doubled as a buttress. It was founded on an upper floor *ca.* 20cm higher than the original one, clearly indicating that this episode post-dated Sub-phase 1. The same is more or less true of another partition wall (*loc.* 506. wll) attached to the middle of the western wall. A pair of clay-lined hearths (H-562 and H-564) was found beside the southern wall of Room 2.

Sub-phase 3 saw an episode in which another stepped entrance was newly opened at the north-eastern corner. Given that it leads down from the original floor of neighboring Unit 47 (Phase III), the northern half of Unit 39 may have been remodeled as a rear room or storage bin for Unit 47. If this is the case, it follows that Sub-phase 3 of Unit 39 is equivalent to Phase III of the general occupational sequence of Complex 00. A few hearths were found beside the southern and eastern walls of Room 2.

Unit 42

The continuation of last season's excavations showed that Unit 42 was a relatively large trapezoidal structure with a floor area of *ca.* 3m by *ca.* 3m, and a floor depth of *ca.* 0.9-1m (**Fig. 12**). It partly cut the large pit of Phase I and, in turn, had its southern and south-eastern corners partly disturbed by Unit 47 (Phase III) and Unit 38 (Phase IV) respectively. Both observations, coupled with overall technological affinities to the abutting Unit 39, enable us to assign it to Phase II.

This structure also underwent reconstruction, falling into the following two sub-phases. Sub-phase 1 was represented by the original floor and a series of masonry retaining walls founded on it. There is little doubt that, like the abutting



12. Unit 42: general view (looking E).

Unit 39, this unit was originally a single-room structure. A narrow stepped entrance flanked with a pair of side walls was at the south-western corner. In addition, a small hearth (H-522) was found roughly in the center of the floor, underneath a later partition wall (see below). Sub-phase 2 contained upper floors and a semi-circular partition wall (*loc.* 510. wll) attached to the western wall and probably doubling as a buttress. It is conceivable that Sub-phase 2 of Unit 39 was equivalent to neighboring Unit 47 and therefore falls within Phase III of the general occupational sequence of Complex 00, along with Sub-phase 3 of Unit 38.

Forecourt

In light of the orientation of the two entrances belonging to this phase, there is little doubt that the north-western quarter of the large pit, though in a half-buried condition, continued to be used as a communal forecourt for the neighboring two units. It therefore follows that, as in the case of Phase I, Phase II was characterized by a tripartite complex consisting of an open forecourt and two roofed features. What differentiates the two in technological terms is that the Phase II features were much larger and constructed separately in an individual pit, rather than being nested within the same pit. Typologically, the shift to a rectangular or trapezoidal plan is noticeable. Such techno-typological innovations suggest that the Phase II structures were constructed against a background of some bitter experiences in Phase I.

Phase III

Phase III consisted of the three components:

Unit 47, newly built as a semi-roofed communal forecourt or anterior chamber, and Units 39 and 42, both reused as its rear rooms. It is important to note that the tripartite layout is common to the three phases representing the initial stage of the outpost.

Unit 47

Unit 47 was a small, semi-subterranean structure *ca.* 3m by *ca.* 2m in floor area, the construction of which partly disturbed the two abutting units of Phase II. Unlike surrounding features, it was shallow at *ca.* 0.3m depth and surrounded with a single course of upright slabs (**Fig. 13**). It is also noteworthy that it overlay the forecourts of preceding Phases I and II. Both observations strongly suggest that it served as a semi-roofed anterior chamber for the abutting two units. An upright limestone slab, probably a remnant of an entrance, was found *in situ* at the southern corner.

The occupational sequence of this unit falls into the following two sub-phases. Sub-phase 1 consists of the original floor and the eastern wall founded on it. As noted above, this sub-phase witnessed the opening of a passage leading down to Room 1 of Unit 39. In this context, it is understandable that the entrance of Unit 42, another pre-existing feature, was incorporated into the northern wall of Unit 47. Two hearths (H-117 and H-119) and several concentrations of fire-cracked limestone pebbles were found on the original floor, indicating that this unit

was used as a communal kitchen for the abutting two units. Sub-phase 2, on the other hand, is characterized by the reconstruction of the southwestern wall on an upper floor *ca.* 0.3m higher than the original floor. A few hearths and stone concentrations still existed in this sub-phase, indicating that the unit continued to be used for domestic affairs.

Phase IV

Although beyond the scope of the sixth field season under discussion here, a few comments should be made about Phase IV, reviewing the results of last season's excavations. This phase includes at least two units: Unit 38 which cut the south-eastern corner of Unit 42 (**Figs. 3 to 5**), and Unit 41 which was built over the top of the northern edge of the same Unit 42 (**Fig. 14**). Both of these can be defined as Phase IV features in the sense that they forced Unit 42 (Phases II-III) into a state of dysfunction. It therefore follows that Unit 36 and 37, both connected to Unit 38 through a narrow passage, also fall within Phase IV. In light of its general layout and contents, it appears that Unit 38 served as a roofed communal anterior chamber for the two rear rooms. Thus Phase IV is characterized by the appearance of a full-fledged tripartite complex. On the other hand, Unit 41 disturbed the south-eastern corner of Unit 33 as well as the northern edge of Unit 42. This probably means that the tripartite



13. Unit 47: general view (looking N).



14. Unit 41: general view (looking N).

complex consisting of Units 33, 35 and 40 belongs to Phase III. This seems likely, seeing that Unit 33 has much in common with Unit 39 and 42 in terms of both technology and typology.

Considered in this light, it seems reasonable to conclude that Complex 00 gradually developed from the nested-in-one-pit, semi-tripartite complex of Phase I, through the independently-constructed semi-tripartite complex of Phase II and the proto-tripartite complex of Phase III, into the full-fledged tripartite complex of Phase IV. A series of C-14 dates suggest a date of the end of the Middle PPNB for the features of Phases III and IV (see **Table. 1**). Thus, the features of Phases I and II may date back to the middle part of the Middle PPNB. Results of the radiometric dating now in progress are eagerly awaited.

Supplementary Operation 1: Trench E-III

The last field season revealed an area of gravelly soil at the western edge of Area E-III. On the basis of its location and contents, it was tentatively identified as a dumping site for excavated soil from neighboring semi-subterranean structures, especially those of Complex IV (Fujii 2008a). In order to test this hypothesis, we set up a 1m by 15m trench (Trench E-III) running north-south across the area in order to examine the stratigraphy (**Fig. 2**). It turned out that the gravelly soil was stratigraphically sandwiched between Layer 2 (on which the EBA burial cairn was constructed) and Layer 4 (into which the PPNB semi-subterranean structures were dug) (see **Fig. 26**). Close scrutiny also showed that pebble components of the gravelly soil have much in common with those of the underlying stony layers, especially Layers 5 and 6. Both

observations confirmed our initial perspectives.

The Finds

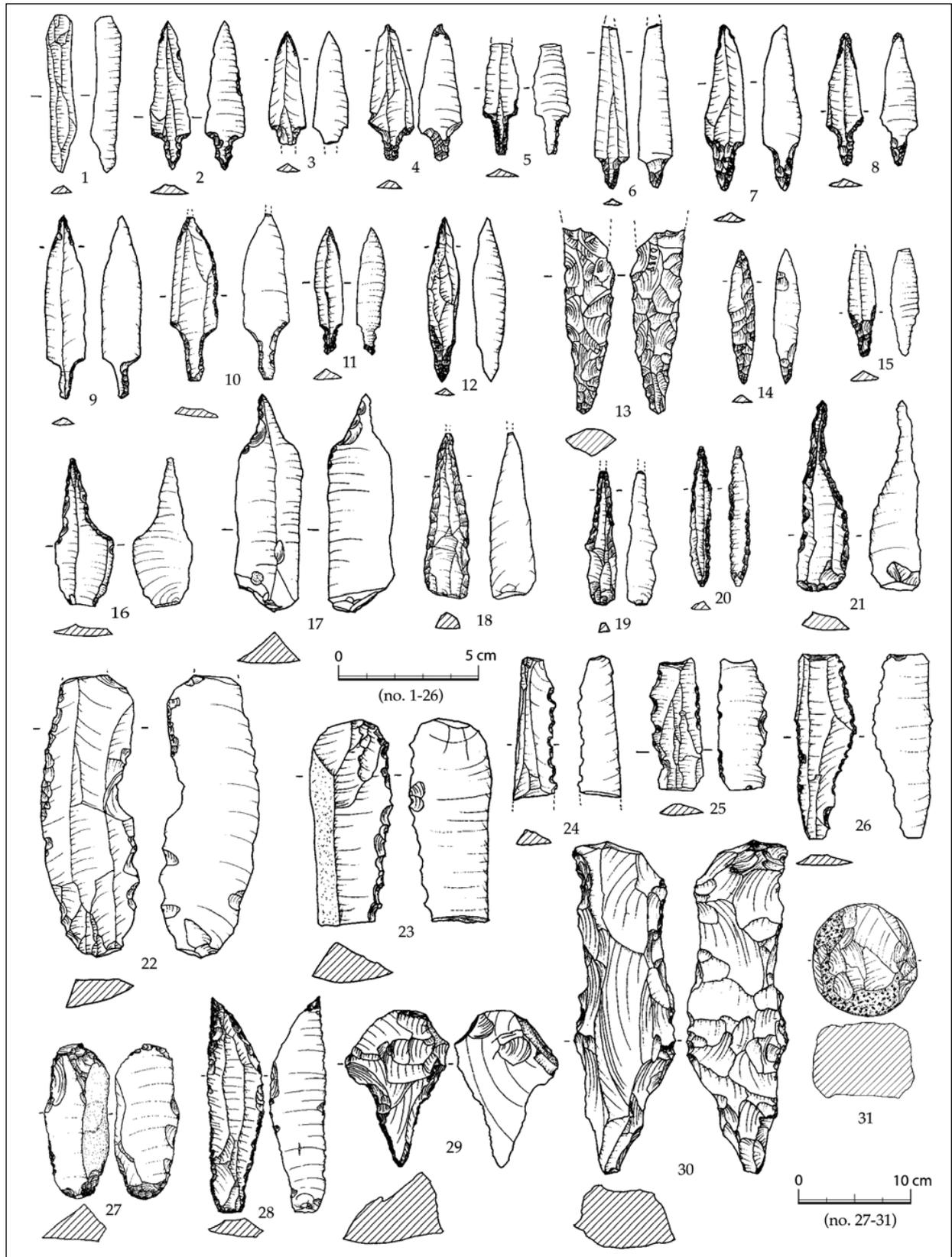
The Phase I-III features of Complex 00 produced various artifacts, mainly stone, including chipped flint artifacts, grinding implements, stone vessels, gaming boards, diagonally truncated stone bars, palettes, stone weights, pillar bases, and other miscellaneous objects. The finds also included small clay objects, bone tools, and adornments. In addition, faunal and botanical remains also occurred in some contexts. As detailed analyses of these finds are now in progress, we will give just a brief overview of each category.

Chipped Stone Artifacts

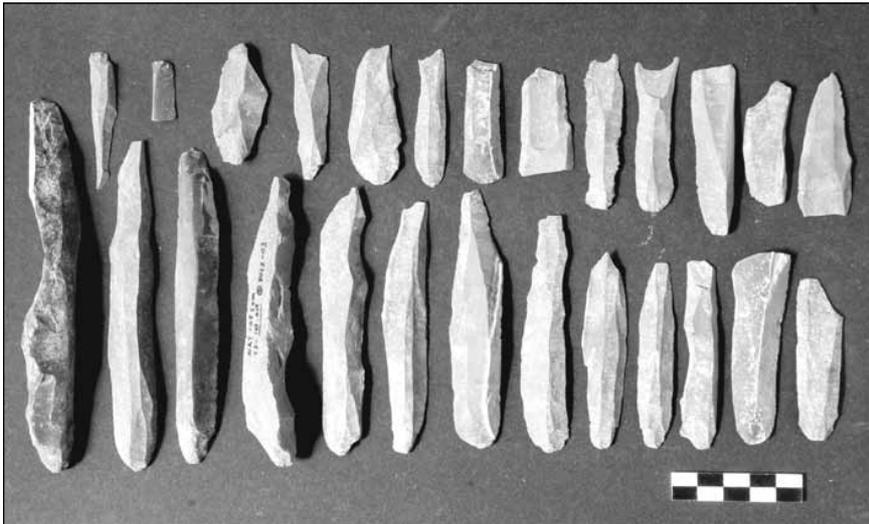
The chipped stone assemblage included a large number of cores and debitage, most of which were produced by the naviform core-reduction technique (**Fig. 15: 1**). Their presence, coupled with that of hammerstones made of cortical flint pebbles (**Fig. 15: 31**), clearly indicates that the flint production took place within the outpost. Of interest is a blade cache found *in situ* on an upper floor of Unit 47 (*loc. C7-107. art*), which contained a total of 26 blade blanks including three crested blades (**Fig. 16**). The tool kit, on the other hand, was dominated by projectile points (**Fig. 15: 2-15**) and drills / perforators (**Fig. 15: 16-21**), followed by less frequent artifact classes such as notches/denticulates (**Fig. 15: 22-24**), serrated blades (**Fig. 15: 26**), retouched blades (**Fig. 15: 25**), end- or side-scrapers (**Fig. 15: 27**), and a large pointed tool (**Fig. 15: 28**). The projectile points included a certain number of Jericho points (**Fig. 15: 2-6**), as well as Byblos (**Fig. 15: 7-11**) and Amuq (**Fig. 15: 12**) points. In addition, heavy digging tools also occurred in small quantities (**Fig. 15: 29-30**). They were probably used for digging the deep foundation pits of the semi-subterranean structures.

Grinding Implements

Grinding implements from the Phase I-III features were relatively infrequent, consisting of several flat querns (**Fig. 17: 1-3**) and a dozen round to oval grinding slabs (**Fig. 17: 4-9**). Neither oblong nor rectangular grinding slabs were recovered. The querns were made exclusively of limestone and flint, whereas the grinding slabs



15. Finds from Complex 00: chipped flint artifacts.



16. Finds from Complex 00: blade cache from an upper floor of Unit 47.

were made of a variety of materials, including basalt, granite, tuff, scoria and sandstone, as well as limestone and flint.

Stone Vessels

Three stone vessels were found in Units 39 and 42. One of them was a medium-sized shallow bowl made of limestone (**Fig. 17: 12**) and the other two were unusual bowllets made of a cortical flint slab with a natural depression or pitted hole on their upper surface (**Fig. 17: 10-11**). One of the two bowllets was a half-finished or failure product, suggesting on-site production of these unique artifacts. Similar examples have been reported from Baṣṭa (Nissen *et al.* 1991; Gebel 1999), al-Ḥimmah (Makarewicz and Goodale 2004) and ‘Ayn Jammām (Rollefson 2005). In view of their unique form and limited distribution, flint bowllets may help to define the Middle-Late PPNB cultural entity in southern Jordan.

Gaming Boards

Five gaming boards were found, again from Units 39 and 42 (**Fig. 17: 13-17, Fig. 18**). In total, the site has yielded a total of twenty-five gaming boards, including nineteen examples found in previous seasons. All of them were made of limestone and had relatively large, well-defined, semi-spherical depressions and a pair of shallow grooves connecting them in a lateral direction. The number of preserved depressions varied from two to six, but the existence of interrupted grooves suggested that they

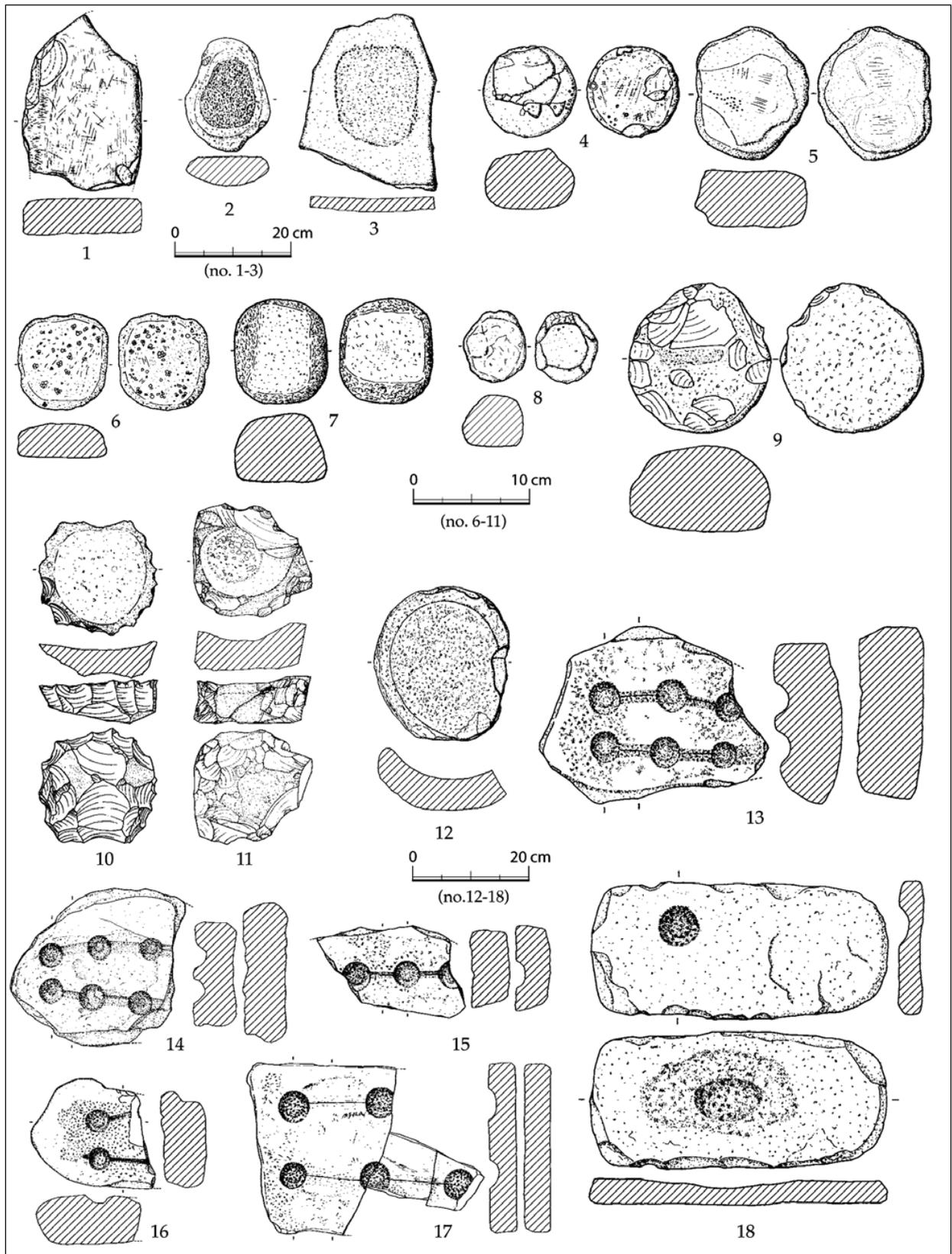
were at least four to eight. The collection also included a half-finished product that reused the reverse side of an exhausted quern (**Fig. 17: 18**).

Diagonally Truncated Stone Bars

Diagonally truncated stone bars are unique to the site; nine examples occurred this season. They were made of hard, fine-textured limestone and were abruptly truncated, usually at both ends (**Fig. 19: 1**). The exceptions to this were a few examples with a relatively pointed end, which were truncated only at the other end (**Fig. 19: 2-3**). Interestingly, they were standardized to a length of *ca.* 20-25cm and a weight of *ca.* 3-4kg. In light of their weight and remarkable edge damage, they were probably used for digging through or, more precisely, pecking off the limestone layers during excavation of the semi-subterranean structures. Noticeable is the fact that this season’s nine examples all came from a relatively small area of excavation. This is probably because ‘deep floor’-type features were concentrated there.

Palettes

This season yielded three small palettes made of limestone or flint, two of which were found in the fill layers of Unit 42 (**Fig. 19: 4-6**). They were irregular in form, being roughly trimmed at their peripheral edges only. It is reasonable to assume, therefore, that their production and use were *ad hoc* in nature. It is probably for this reason that traces of red pigments were usually limited to a small part of their working surface.



17. Finds from Complex 00: groundstone artifacts.



18. Finds from Complex 00: game board from Unit 42 (Reg. no. WAT-8243).

Grooved Stone Weights

Grooved stone weights are important in that they help to date the nearby barrage system (Fujii 2007b, 2007c, 2009). Three specimens were found, again from Units 39 and 42 (**Fig. 19: 7-9**). They were made of limestone and had with a shallow groove on both surfaces and/or a pair of small notches at both lateral edges. Traces of friction, probably from rope, were recognized in these areas. Importantly, these weights were standardized to a length of *ca.* 25-30cm and a weight of *ca.* 5-6kg. There is little doubt that they were used for tying something (possibly roof material) down in combination with rope.

Pillar Bases

Two large pillar bases made of limestone were recovered from upper fill layers of Units 42 and 47 (**Fig. 19: 10-11**). Both of these were *ca.* 45cm long and *ca.* 10cm thick, and had a semi-spherical depression *ca.* 8-10cm in diameter and *ca.* 3cm deep roughly in the centre of their flat upper surface.

Other Stone Products

Miscellaneous stone artifacts included half a mace head made of limestone (**Fig. 20: 2**), four small whetstones made of reddish sandstone (**Fig. 20: 3-4**), three amorphous scoria pebbles possibly used for scrubbing grime off the skin (**Fig. 20: 5**), and a few cuphole-like slabs made of limestone (**Fig. 20: 6**). Of further interest is an anthropomorphic figurine from a middle fill layer (*loc.* 48-516.sfl) in Unit 48 (**Fig. 20: 1, Fig. 21**). This small figurine was made of

buff-colored, finely-textured limestone, and was 7.5cm high, 4.1cm wide and 1.6cm thick. It was complete except for the distal end of the left arm. Typologically, it can be defined as a torso typical of Neolithic anthropomorphic figurines from the southern Levant. A series of identifying traits -- a relatively small trapezoidal face, a narrow forehead, large eyeholes, an elongated nose, a long and robust neck, squared shoulders, short arms and a slender body -- were noted. The absence of represented mouth and ears also attracted our attention. The gender of the figurine is uncertain, but the absence of breasts suggests that it may be male or gender-free. This figurine is original in many respects and no parallel examples have so far been reported from contemporary sites in southern Jordan.

Clay Objects

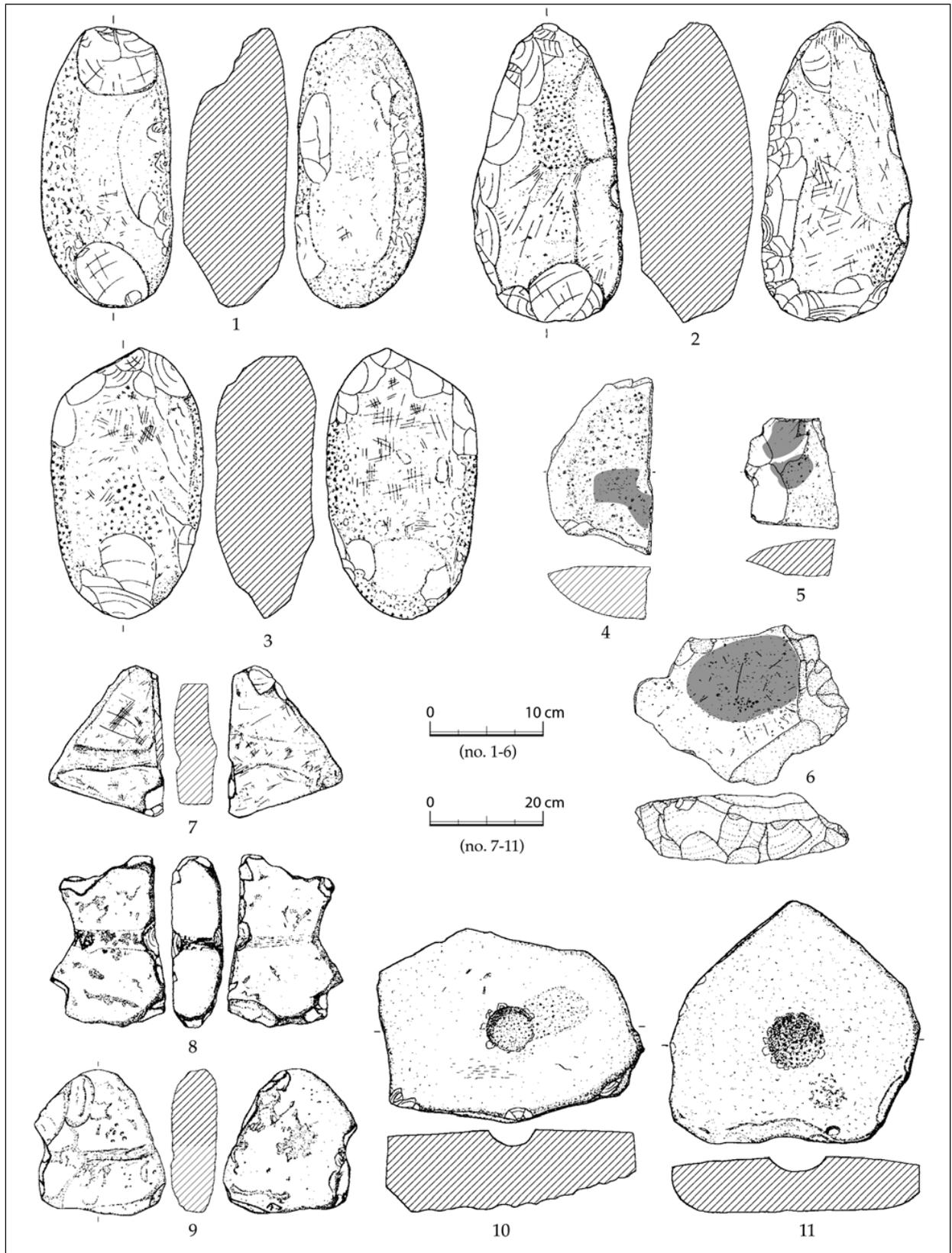
A total of twenty-seven unbaked, grit-tempered clay objects were found from various loci in Complex 00 (**Fig. 20: 7-27**). All of them were very small in size, measuring *ca.* 2-4cm in length or diameter. Typologically, they fell into stick (**Fig. 20: 7-24**) and ball (**Fig. 20: 25-27**) categories; neither representational nor geometric specimens were included. Of interest are two sticks coiled with clay strings (**Fig. 20: 7-8**), both of which occurred from the middle fill layers of Unit 48 (*loc.* 48-512. sfl and 48-516. sfl), in association with the anthropomorphic figurine referred to above.

Bone Tools

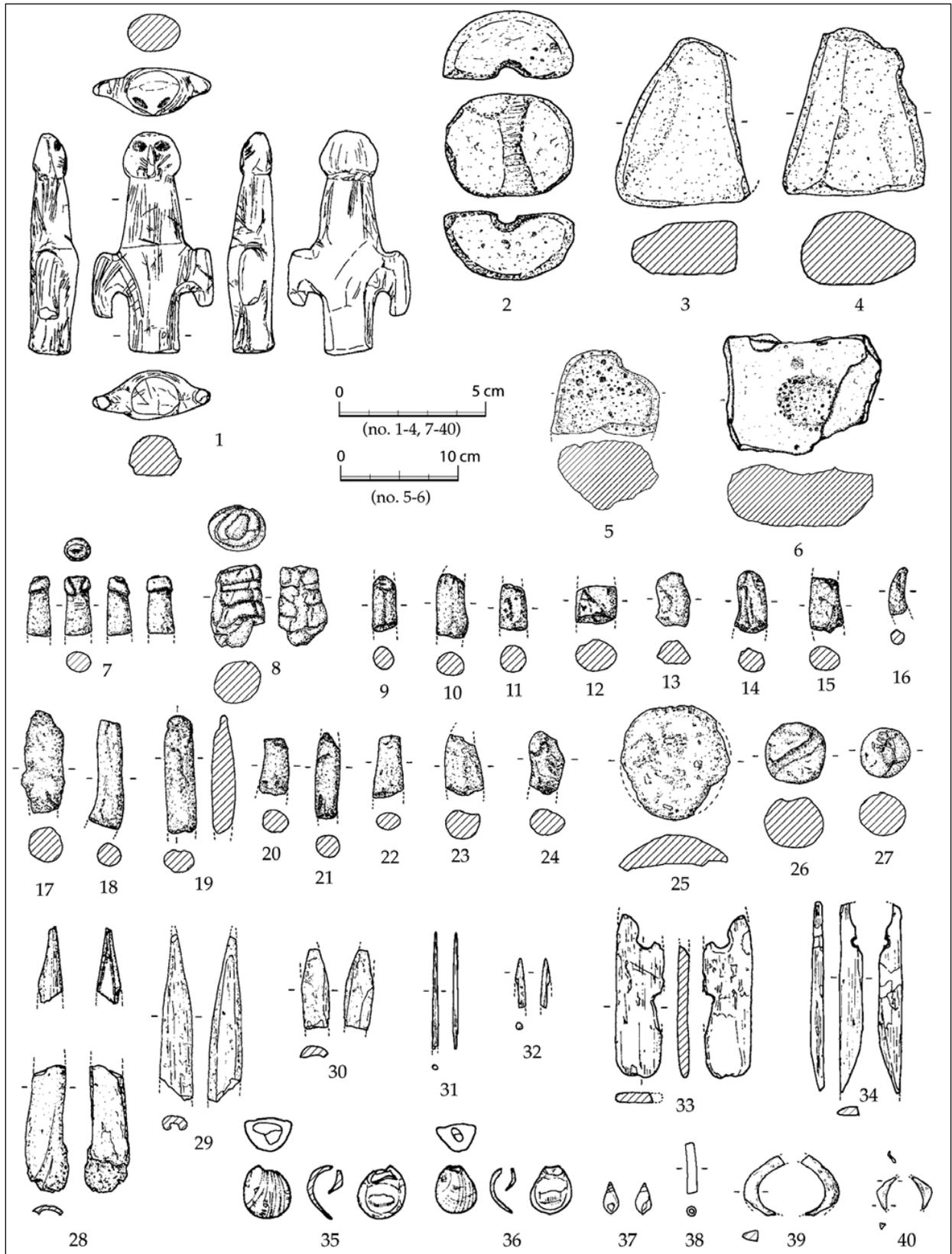
Only seven bone tools were found this season. They contained three awls (**Fig. 20: 28-30**), two needles (**Fig. 20: 31-32**) and two spatulas (**Fig. 20: 33-34**). A small hole was recognized at the butt end of the spatulas. As previously noted (Fujii 2008a), the worked bone assemblage is modest at the site.

Adornments

The production of adornments also appears to have been infrequent at the outpost and this season yielded several specimens only. They included three snail shell beads (**Fig. 20: 35-37**), a tube-type pendant made of snail shell or bone (**Fig. 20: 38**), and other miscellaneous objects made of unidentified material (**Fig. 20: 39-40**). The excavation also produced an unmodified



19. Finds from Complex 00: groundstone artifacts.



20. Finds from Complex 00: miscellaneous artifacts.



21. Finds from Complex 00: anthropogenic figurine from Unit 48 (Reg. no. WAT-8251).

quartz-like pebble *ca.* 4cm in diameter and two calcite fragments *ca.* 3cm long, both of which may have been imported as raw material for adornments.

Pigments

Red pigments were recovered throughout Complex 00. They occurred either in laminate form or in the form of a solid fragment *ca.* 1-3cm long, the latter probably representing the state in which they were originally brought to the outpost. There is little doubt that the traces of red pigment remaining on the palettes derived from them. Our preliminary examination identified these pigments as sedimentary rock containing iron oxide and carbonate minerals (Hoshino 2008). They were probably imported from the mountain range to the west where similar rocks are exposed.

Petroglyphs

In addition to the two examples found last season (Fujii 2008a, 2008b), five additional petroglyphs were identified this season. Complex 00 yielded only one these; the other four were discovered by the rain-swept walls of previously excavated structures. All of these were incorporated into masonry walls as foundation stones or doorjambs, and were buried in thick PPNB fill deposits containing distinctive artifacts such as naviform cores and blades. Thus, they can confidently be dated to the same horizon as the outpost, namely, the Middle - Late PPNB. Technologically, they were produced by means of shallow pecking; no line drawing

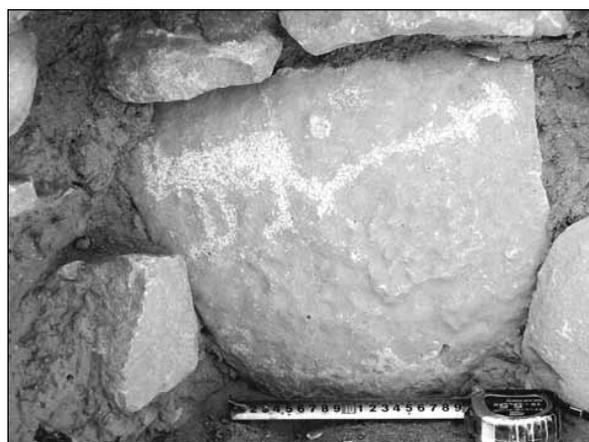
was recognized. Iconographies fall into animal designs and geometric patterns. Petroglyph 47 (found in the western wall of Unit 47 of Complex 00) depicted three quadrupeds running in a line. Petroglyphs F1 and F2 (from the western wall of Structure F of Complex VI) represented a gazelle-like quadruped and an ostrich-like biped respectively. In contrast, Petroglyph 13 (from Unit 13 of Complex I) consisted of a mesh design. What interested us most was Petroglyph 01 (from Unit 01 of Complex I), which represented a caged, cheetah- or caracal-like feline tethered to a stake (**Fig. 22**). These unique finds will be described in more detail elsewhere (Fujii in prep.).

Faunal and Botanical Remains

A certain quantity of faunal and botanical remains were recovered, but since analysis is still in progress nothing specific can be said. All we can say is that the faunal remains are dominated by gazelle bones (Dr Hitomi Hongo, pers. comm.) and that the botanical remains include wheat and barley grains (Dr Hiroo Nasu, pers. comm.).

The Excavation in Area S-I

Area S-I is a collective term for a total of eighteen 1m x 5m test trenches that were opened this season in the narrow space between the main area of the outpost and Barrage 1 (**Figs. 2 and 23**). Work in this area was aimed at locating animal pens associated with the outpost. In light of the general orientation of individual structures, as well as the prevailing north-westerly



22. Petroglyph from Unit 01 of Complex I (Reg. no. WAT-8903).



23. Area S-I: general view (looking SE).

winds in this area, animal pens -- if they existed -- might well have occupied the area covered by the trenches. Taking both the expected diameter of the pens and the need for digging efficiency into consideration, the trenches were arranged in three rows, at 5 m intervals north - south and 10m intervals east - west.

Structural Remains

Unfortunately, no clear evidence for stone-built pens was forthcoming, despite the careful arrangement of the test trenches. Features found on the upper surface of Layer 4, or the construction surface of the neighboring PPNB outpost, were limited to a short stone alignment (loc. 105 at Trench E-8), ashy deposits (loc. 102 at Trench E-6 and G-4), a small hearth (loc. 103 at Trench G-8), and an amorphous depression (loc. 102 at Trench I-7). These results allows for various interpretations. One possibility is that if pens existed, they were constructed exclusively of perishable material such as thorny bushes and, for this reason, left no trace in the archaeological record. This interpretation seems less than convincing, however, first because suitable stones are abundant in the adjacent wadi bed to this day and, second, because stone was the predominant constructional material at the neighboring outpost. It is most unlikely that animal pens would have been the only structures not to utilize them at all. This would have been especially true if animal pens were situated in Area S-I, which is even closer to the wadi bed than the outpost it-

self. Thus, a more plausible explanation is that suggested for the contemporary site of 'Ayn Abū Nukhayla (Henry *et al.* 2003; Albert and Henry 2004), i.e. some of the semi-subterranean structures doubled as (or were converted to) small pens and, therefore, no specific animal pens were ever constructed. Since the first option is questionable, and since domestic sheep and goats are known to have existed at the outpost, albeit in small numbers, (Hongo 2008), this latter interpretation seems the more likely. Whatever the case, our work has testified to the absence of full-scale stone-built pens at the outpost. This fact probably means that any herds brought out to the outpost from a parent settlement to the west would have been limited in scale. This assumption is consistent with the fact that domestic sheep and goat bones account for merely ca 1 % of the faunal assemblage (Hongo *op.cit.*). Thus, it may well have been the case that transhumance played only an auxiliary role at the outpost.

The Finds

Considering the total area and volume of deposit excavated (90 square meters and ca. 20 cubic meters respectively), the finds from Area S-I were unexpectedly scarce, comprising only a few animal bones and a total of 718 chipped stone artifacts. Thus, the density of finds is calculated at just ca. 35 specimens per cubic meter, and these were concentrated in several trenches nearer to the outpost. Among them is Trench

G-4, which produced two naviform cores (**Fig. 24: 1-2**), a single-platform core, several dozen unmodified blades and flakes (**Fig. 24: 3**), a few Byblos and Amuq points (**Fig. 24: 4**), drills (**Fig. 24: 5-8**), retouched blades and flakes (**Fig. 24: 9**, **12-13**), end- and side-scrapers (**Fig. 24: 10-11**), and a few hammerstones (**Fig. 24: 14**). In light of their density and well-balanced contents, the assemblage is interpreted as part of the outdoor flint production activities that were probably associated with the neighboring Complex IX.

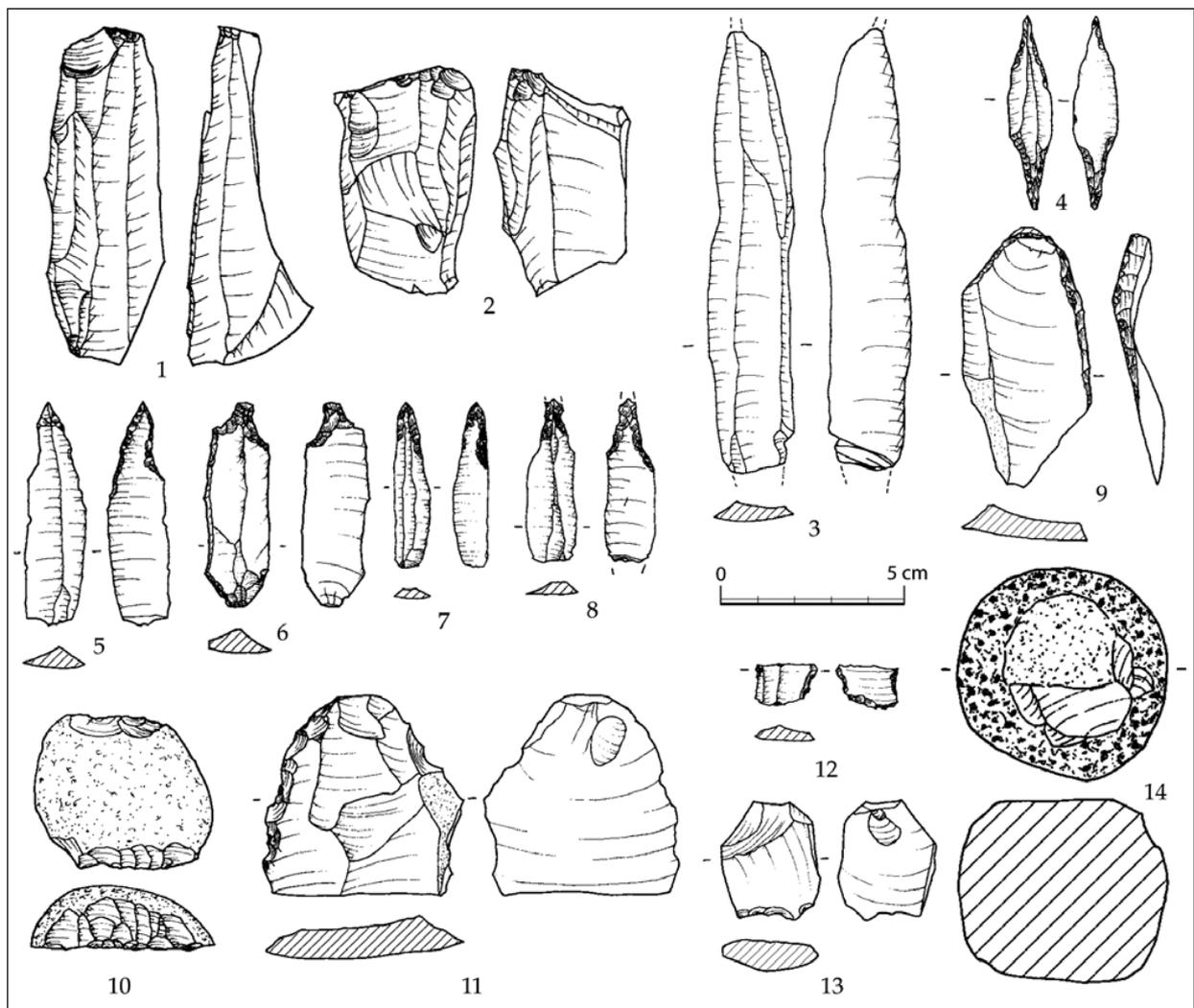
Continued Excavations in Area W-III (Structure M)

Last season's excavations in Area W-III revealed a large semi-subterranean composite structure (Structure M) which was tentatively

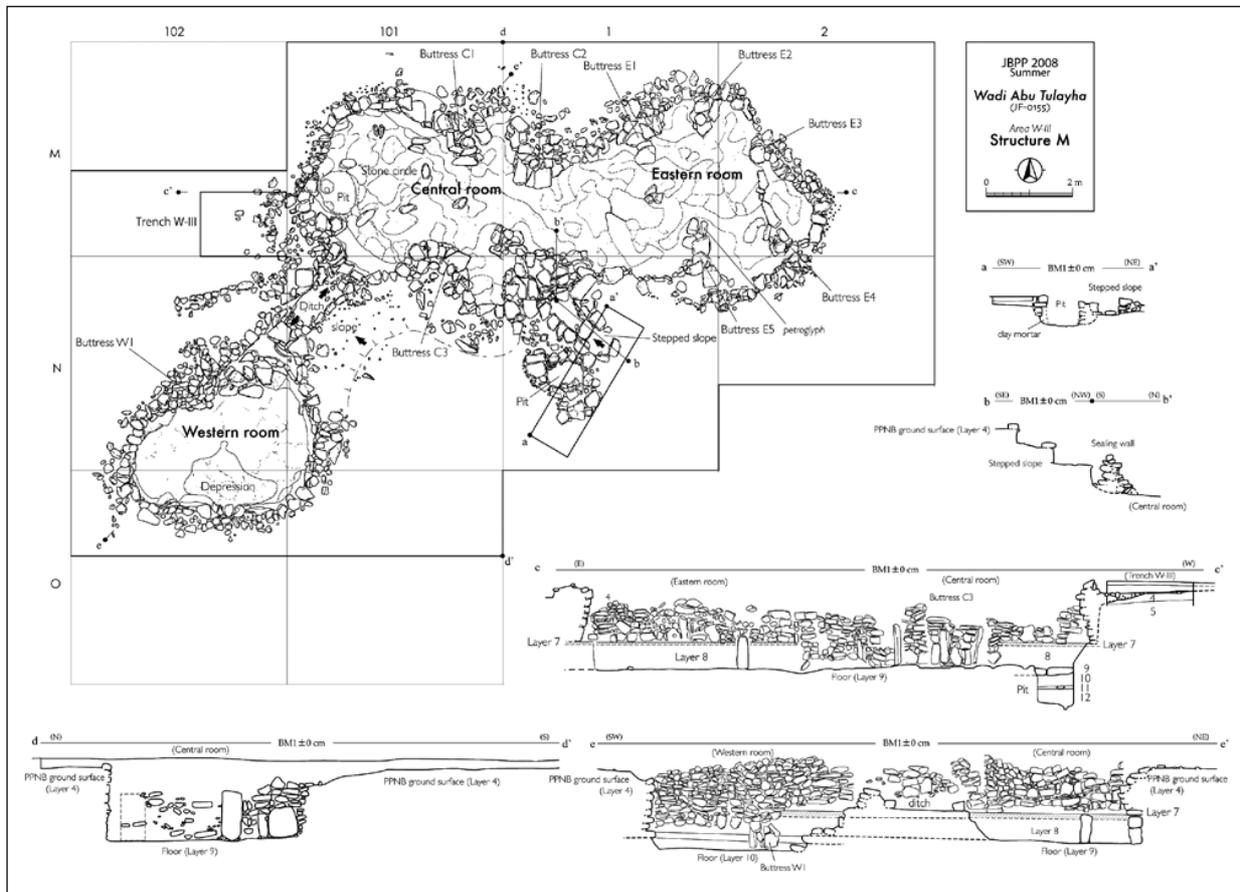
identified, on the basis of indirect evidence referred to below, as a cistern for supplying drinking water to the neighboring outpost (Fujii 2008a, 2009). In order to further scrutinize the nature of this unique feature, we continued our intensive investigation of the western and central rooms, which were not fully excavated last season owing to time constraints (**Figs. 25-30**).

The Central Room

It turned out that the central room was analogous to the eastern room in many aspects (**Figs. 31, 32**). First, as was the case in the eastern room, the foundation pit of the central room dug through a total of five layers, including limestone bedrock, thereby attaining a depth of ca. 1.7 - 1.8m below the ancient ground surface



24. Finds from Area S-I.

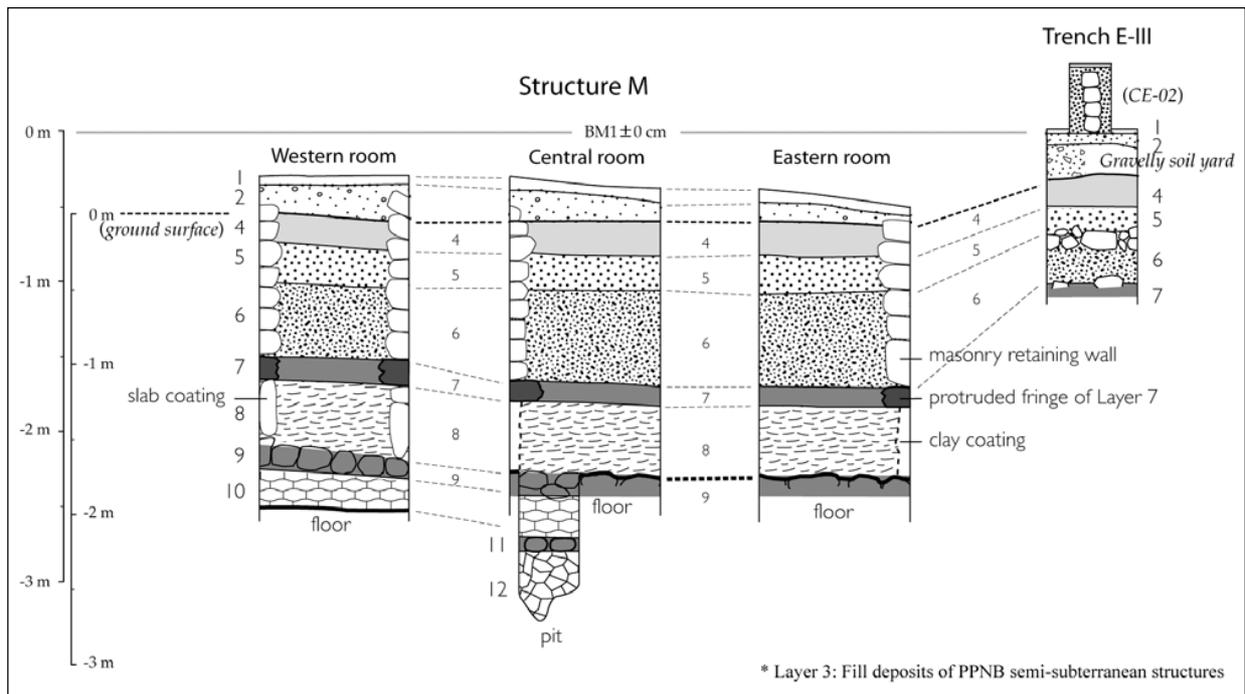


25. Structure M: general plan and sections/elevations.

(Fig. 26). Second, the hard limestone surface reached in the base of the pit (top of Layer 9) was used as an uneven (owing to massive flint nodule inclusions) yet impermeable floor. Third, the masonry retaining walls defining the room were constructed on protruding ‘steps’ of the upper hard limestone layer (Layer 7) which had been dug through during construction, thereby covering the upper, permeable layers whilst leaving the lower, impermeable layers exposed. Fourth, a robust buttress wall (Buttress C1) was constructed against the northern wall to cope with a serious lean and its eventual collapse owing to strong lateral soil pressure (Fig. 33). It is evident that there was technological consistency between the two rooms sharing a continuous stretch of floor.

It is, however, most unlikely that both rooms were constructed as a single structure at the same time, since the central room shows a few technological innovations. First, two semi-circular buttress walls (Buttress C2 and C3) were

systematically incorporated into the peripheral walls from the beginning (Fig. 33). In contrast, Buttress C1 (referred to above) was attached at a later stage. These walls must have enhanced the structural durability of the room to a significant extent. As a matter of fact, the central room escaped from critical wall collapse and consequently reinforcement work was limited to the construction of Buttress C1. In contrast, no less than five buttress walls were constructed against the peripheral walls of the eastern room, at ca. 2m intervals. Second, a clay coating ca. 7 - 10cm thick was applied to the western corner of Buttress C2 (Fig. 34). This coating was probably intended to enhance the less than complete impermeability of the exposed limestone bed-rock layers. No clear evidence for such a coating was confirmed elsewhere, but this may have been due to the difficulty in distinguishing clay layers from cemented fluvial deposits. A similar ‘render’ may well have been applied throughout the structure, including the eastern room exca-



26. Structure M: stratigraphical columns.



27. Structure M: general view (looking N).

vated last season. In addition, the masonry was of higher quality in the central room, especially in the western wall. It appears that these technological innovations were introduced against a backdrop of some trying experiences in the eastern room.

Typological innovations included the appearance of various small features, other than the buttress walls. Among them is a large cylindrical

cal pit found beside the western wall (Fig. 35). This pit, measuring *ca.* 1m in diameter and *ca.* 0.8m in depth, not only dug through the hard floor (Layer 9), but also three underlying layers of limestone bedrock (Layers 10 to 12). Interestingly, it slanted slightly toward the western edge, where a small hole *ca.* 0.2m deep was dug. Such a careful device strongly suggests that the cylindrical pit was used for a sludge tank or



28. Structure M: general view (looking S).



29. Structure M: general view (looking W).

sump. A heavy-duty digging tool was found *in situ* in the nested hole (Fig. 44: 19).

What also interested us was a circle of upright limestone boulders found in the western half of the central room (Figs. 31 and 32). This stone circle, *ca.* 0.5 - 0.8m high and *ca.* 2m in diameter, crossed the eastern edge of the cylindrical pit. It consisted of eight upright boulders, but four of them were paired up to form two composite features (the stone circle thus comprises six standing features). The function of this unique feature is still unknown. Seeing that

no boulders had a notch at their top end and that a similar, albeit much smaller, stone circle was found in an identical position within a middle fill layer (Fig. 36), it may have had a ritual significance rather than a practical use such as floor supports (Kuijt and Finlayson 2001; Rollefson 2008). An upright boulder found in Unit 03, a key structure of Complex I (Fujii 2007a), also argues for a ritual interpretation, but a final conclusion must await further scrutiny.

Other remarkable features included an elongated stepped slope and a small masonry pit,



30. Structure M: general view (looking NE).



31. Structure M: central room (looking N).



32. Structure M: central room (looking S).



33. Structure M: Buttress C1 (left) and C2 (right) of the central room (looking N).



34. Structure M: clay-coating between Buttress C1 and C2 (looking N).



37. Structure M: small features along the southern wall of the central room (looking W).



35. Structure M: nested pit of the central room (looking W).



36. Structure M: stone circle on an upper fill layer of the central room (looking W).

both of which were found along the southern wall (Fig. 37). The stepped slope, *ca.* 3m long and *ca.* 0.5m wide, looks like an entrance leading down to the central room. This interpretation seems questionable, however, first because it descends a depth of *ca.* 1.8m in only three ir-

regular steps, and second because it was covered with *ca.* 5 - 10cm thick clay mortar. Thus, its use as some sort of input channel seems more likely. The masonry pit beside it, measuring *ca.* 0.8m in diameter and *ca.* 0.7m in depth, was also coated with thick clay mortar. The function of this small feature is also uncertain, but it is intriguing to hypothesize that it was used as a waterhole for livestock kept in the neighboring outpost. It seems to make sense in view of public hygiene that a watering place for livestock would have been separated from the main body of the cistern-like feature.

The Western Room

Unlike the other two rooms, the western room was roughly oval in plan (Fig. 38) and much smaller in floor area (*ca.* 4m by *ca.* 3m). Nevertheless, it was *ca.* 0.2 - 0.3m deeper, at *ca.* 1.9 - 2m depth. This is because it dug through Layer 9 (used for the floor in the other two rooms) and part of Layer 10, to say nothing of the overlying five layers.

The western room showed further technological improvement. To begin with, it introduced the curvilinear general plan, which was probably intended to more successfully absorb strong lateral soil pressure. This, coupled with the use of more standardized construction materials and superior masonry, must have lowered the risk of leaning walls and collapse. As a matter of fact, the western room underwent no obvious reconstruction, with the sole exception of the addition of a small buttress wall (Buttress W1). Second, the floor depth was increased to a certain extent, although this might have been a last resort to



38. Structure M: western room (looking N).

offset the reduction in floor area rather than a positive policy to increase the reservoir capacity per unit area. Third, the laminar limestone layer (Layer 8) sandwiched between the two hard limestone layers was covered with clay-mortared limestone slabs arranged in an upright position (Figs. 26, 39). This device makes no sense in terms of the structural reinforcement of the wall, because the masonry walls stood on solid ‘steps’ of the upper hard limestone layer (Layer 7) and therefore needed no support. This device probably aimed to supplement the less than completely waterproof properties of the laminar limestone layer. It is partly for this reason that the limestone slabs were attached with their flat surfaces oriented outwards.

Small features associated with the western room were limited to the compact buttress wall



39. Structure M: the eastern and southern walls of the western room (looking N).

referred to above, a narrow ditch (Fig. 40) and a stepped entrance below it (Fig. 41). The ditch measured *ca.* 2.5m long, *ca.* 0.5m wide and *ca.* 0.5m deep, and connected the western and central rooms. Interestingly, it was fringed and paved with clay-mortared limestone slabs. It is also noticeable that it was sandwiched between an artificially erased gentle slope to the south (towards the wadi) and a stone pile on the opposite side. Both observations clearly indicate that it was used as a water channel for the two rooms. It therefore follows that the stepped entrance utilizing exposed limestone bedrock layers functioned as an inlet leading from the channel. Incidentally, a few small features were found in middle fill layers (Figs. 42 and 43), which will be referred to below in connection with the reuse history of Structure M.

Supplementary Operation 2: Trench W-III

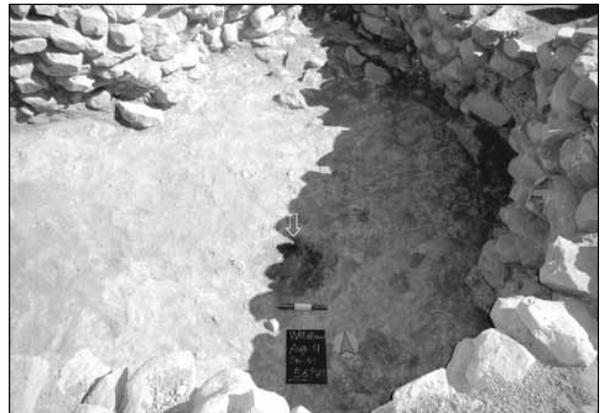
In addition to the main excavations described above, a 2m by 1m trench was opened beside the western wall of the central room to examine the stratigraphy behind the masonry retaining wall. It turned out that the stratigraphy around Structure M is more or less consistent with that of Trench E-III in Area E-III, except that Layer 6 was not capped with angular limestone pebbles. The results from this trench are incorporated into the upper part of the three stratigraphic columns (Fig. 26).



40. Structure M: ditch between the central and western rooms (looking NW).



41. Structure M: northeastern part of the western room (looking N).



42. Structure M: hearth on an upper fill layer of the western room (looking N).



43. Structure M: quern found in situ on an upper fill layer of the western room (looking N).

Supplementary Operation 3: Areas W-IV and W-V

In the hope of finding another cistern-like feature, we conducted a limited sounding in two areas where promising stone alignments were confirmed (Fig. 2). However, they proved to be a wall segment of two ground level rectangular structures. In addition, finds from Area W-IV were limited to two modern iron artifacts and 78 undiagnostic flint artifacts (2 cores, 9 blades and 67 flakes), probably washed in by the upper stream of the wadi. Finds from Area W-V were even poorer, containing only 6 nondescript flint artifacts (2 blades and 4 flakes). Although no stratigraphic comparison was available owing to the location of the two structures in the middle of fluvial deposits, it is indisputable they are different in both date and function from Structure M. The same probably applies to the other less substantial stone alignments dotted around them. Thus, we may tentatively conclude that Structure M was the only feature likely to have been used as a cistern. In this context, it may reasonably be assumed to have undergone repeated extension and reconstruction.

The Finds

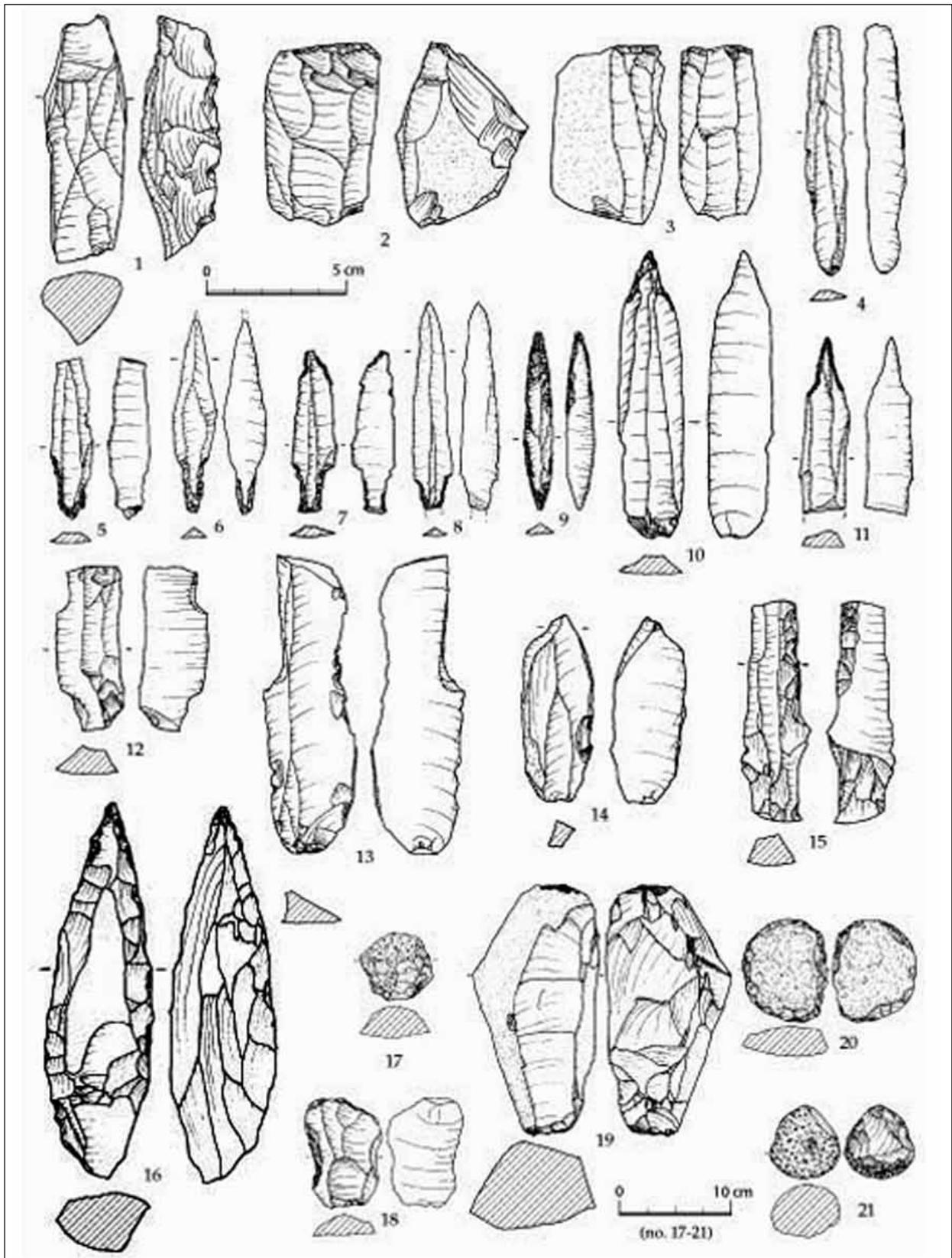
The central and western rooms of Structure M yielded a certain number of chipped stone artifacts, although some of them may have been washed in by floodwater. Overall, the assemblage was based on the naviform core and blade technique, an indicator of the PPNB lithic industry (Fig. 44: 1-4). This trend is consistent from the floor deposit up to the topmost layer of fill, suggesting a PPNB date for the structure. The tool kit included various types of projectile points (Fig. 44: 5-9), drills (Fig. 44: 10-11), burins (Fig. 44: 12-14), retouched blades (Fig. 44: 15), a bifacial spearhead (Fig. 44: 16), end- and side-scrapers (Fig. 44: 17-18), and a few heavy-duty digging tools (Fig. 44: 19). In addition, hammerstones and retouchers occurred in small quantities (Fig. 44: 20-21). The projectile points included Byblos (Fig. 44: 6) and Amuq (Fig. 44: 9) type specimens, but no clear evidence for Jericho points was forthcoming this season. Overall, there was no major difference between the flint assemblage of Structure M and that of the outpost, except that Jericho points were less clearly evidenced in the former. This makes

sense, however, given that the structure seems to have been reused as a temporary shelter within the time range of the PPNB (see below).

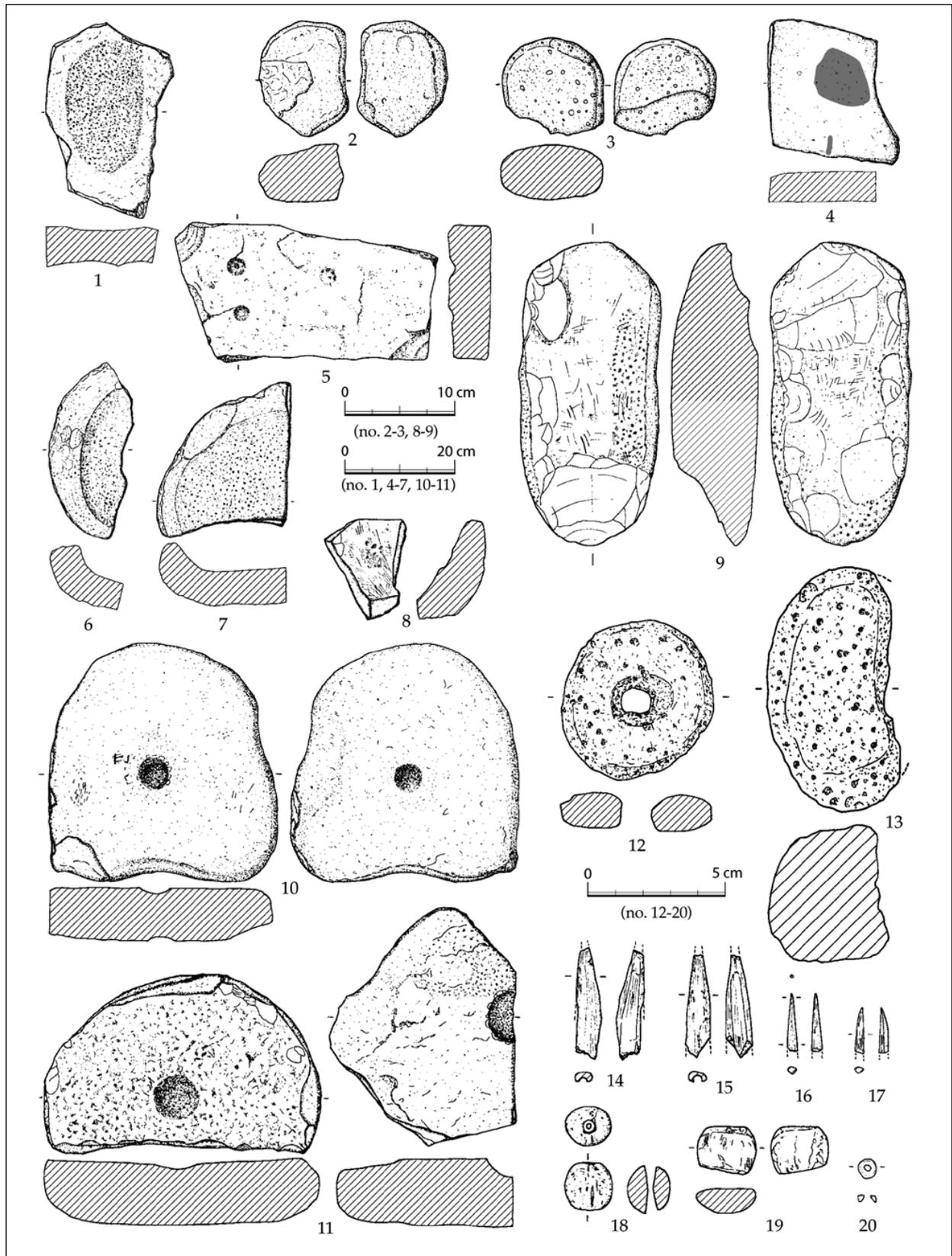
Other finds included several grinding tools made of limestone or flint (Fig. 45: 1-3), a cosmetic palette (Fig. 45: 4), a half-finished gaming board (Fig. 45: 5), a few stone vessel fragments (Fig. 45: 6-8), three diagonally truncated stone bars (Fig. 45: 9), two large pillar bases (Fig. 45: 10-11), a perforated disc made of scoria (Fig. 45: 12), two scoria pebbles (Fig. 45: 13), four worked bones (Fig. 45: 14-17), and three adornments made of malachite or snail shell (Fig. 45: 18-20). It is interesting to note that stone weights, whetstones and clay objects, to say nothing of anthropomorphic figurines, did not occur at Structure M. Also of significance is the fact that many of the finds, especially those found *in situ*, were concentrated in the middle and upper fill layers. The half-finished gaming board, for example, was found sticking into an upper fill layer as a component of the small stone circle (Fig. 35). The scarcity of finds in both floor deposits and the lower fill layers is a most singular phenomenon for ordinary structures, emphasizing the unique nature of Structure M. The only exception to this observation concerns the chipped stone artifacts, which occurred throughout the layers. In addition, the three diagonally truncated stone bars were focused on a lower fill layer of the central room (*loc.* M-572). This is understandable, however, since they were probably used for digging through the limestone bedrock layers.)

Date and Function of Structure M

We will briefly discuss these two major issues in light of results of the last two field seasons. Regarding dating, three C-14 determinations are now available (Table 1). All of them fall within a period ranging from the end of the 10th to the second half of the 9th millennium BC. (uncalibrated), suggesting a date of the Middle - Late PPNB. The consistency of PPNB flint artifacts throughout the layers also supports this dating. There is no doubt that Structure M dates to the same chronological horizon as the neighboring outpost. It is however questionable whether such a large-scale composite structure would have been constructed at one time. Noticeable in this regard are the remarkable techno-typologi-



44. Finds from Structure M: chipped flint artifacts.



45. Finds from Structure M: miscellaneous artifacts.

cal differences between the three rooms. While the eastern room had an irregular general plan, the central and western rooms were a roughly rectangular or oval. As a consequence, the number of buttress walls drops markedly from five in the east to, essentially, zero in the west. In contrast, the depths of floors and quality of the masonry walls both increase from east to west. This strongly suggests that the construction of Structure M began with the eastern room, followed by the central and western rooms. It is interesting to note that westward development is a general trend in the neighboring outpost.

The function of Structure M is also now clear, on the basis of the various lines of evidence available. First, it is located between the outpost and the barrage, and therefore doesn't disturb either of them. Second, it is situated *ca.* 100m upstream of the barrage, an ideal position for a cistern. If it were downstream of the barrage, it couldn't collect and store runoff water from the side wadi. If it were situated further upstream, it wouldn't work properly in combination with the barrage. Such careful choice of location is essential for any water catchment facility. Another line of evidence comes from its depth of up to *ca.* 2m, which is twice as deep as the deepest structures in the neighboring outpost. This is all the more noteworthy, because such this depth was achieved by digging through more than 1m of thick layers of limestone bedrock. We should also note that the upper surface of the massive limestone layer thus reached was used as an impermeable floor, and that the masonry retaining walls only covered the upper, permeable layers, leaving the lower, impermeable layers exposed. No less important is the fact that a thick clay coating covered even the lower, impermeable parts of the structure. All of these factors – along with the total absence of hearths and ashy deposits on the original floor, the relative scarcity of finds in the floor deposits and the lower fill layers, and the presence of a few suggestive features, such as the nested sludge tank, the input channel and the water channel -- indicate that Structure M was most likely used as a cistern. When full of water up to the top level of the impermeable limestone bedrock layers, the pondage is estimated at *ca.* 40 - 50 cubic meters, a sufficient volume for a few months' stay for a small group of transhumants.

Summary and Discussion

The sixth and final field season has clarified our overall understanding of the site. In conclusion, we will briefly review the results of all six seasons, focusing on several general aspects. It should however be emphasized that the following is a tentative summary and subject to minor modifications in future publications.

Settlement Date

The series of C-14 dates from the outpost are concentrated within a relatively short time period ranging from 8,700 to 8,400 BC (uncalibrated) (**Table 1**). It follows that the overall occupational history of the outpost falls within a few centuries spanning the end of the Middle PPNB and the beginning of the Late PPNB. It should be noted, however, that radiometric dating of the Phase I / II features of Complex 00, now in progress, may push back the start of the sequence to some extent. Thus, the chronological gap between the outpost and the cistern could, to a certain extent, be filled.

Archaeological evidence also supports this dating. To begin with, the tripartite or honeycomb layout characteristic of Complex 00 is common to Middle PPNB settlements in southern Jordan such as al-Bayḍa Layer 6 (Kirkbride 1966, 1968; Bryd 2005), Shaqarat al-Musay'id (Hermansen and Jensen 2003; Hermansen *et al.* 2006; Jensen 2004; Jensen *et al.* 2005) and 'Ayn Abū Nukhayla (Kirkbride 1978; Henry *et al.* op. cit.; Albert and Henry op. cit.). On the other hand, Structure B, a key feature of Complex IV, has much in common with a large square structure in al-Bayḍa Layer 2 that is probably dated to the first half of the Late PPNB. Further support for this dating comes from the typological sequence of projectile points. While Complex 00 yielded a certain number of Jericho points as well as Byblos and Amuq points, subsequent assemblages are dominated by a combination of the latter two types (Nagaya, in prep.). Although such a unilinear sequence is now questioned at 'Ayn Abū Nukhayla, our data seem more or less consistent with the traditional perspective (Gopher 1994). In addition, the occurrence of diagnostic finds such as flint bowlets and gaming boards also corroborates our view. There is no doubt that the outpost can be dated to the Middle - Late PPNB.

Table 1: A list of C-14 dates from Wādī Abū Ṭulayḥa 2005-2007.

No.	Area	Complex	Structure	Locus	Remarks	BP±1σ	cal. BC	d13C	Lob. no.
Outpost									
1	E-III	00	Unit 29	29-512. hfl	hearth on floor	8674±36	7709 - 7695 (13.2%) 7683 - 7603 (86.8%)	-11.8	(NUTA2-) 13114
2	E-III	00	Unit 31	31-510. sfl	floor deposit	8533±36	7589 - 7567 (71.8%) 7563 - 7550 (28.2%)	-23.0	13537
7	E-III	00	Unit 32	32-510. sfl	floor deposit	8458±42	7573 - 7517 (100%)	-23.6	13188
8	E-III	00	Unit 33	33-525. hfl	hearth on floor	8367±41	7516 - 7450 (66.2%) 7408 - 7367 (33.8%)	-12.5	13189
9	E-III	00	Unit 33	33-527. hfl	hearth on floor	8462±42	7573 - 7519 (100%)	-13.5	13190
10	E-III	00	Unit 33	33-529. hfl	hearth on floor	8425±35	7539 - 7486 (100%)	-20.2	13387
11	E-III	00	Unit 35	35-510. sfl	floor deposit	8407±42	7539 - 7459 (100%)	-13.5	13191
12	E-III	00	Unit 35	35-512. hfl	hearth on floor	8656±43	7706 - 7697 (7.7%) 7682 - 7597(92.3%)	-18.6	13194
13	E-III	00	Unit 38	38-507. hfl	hearth on fill layer	8295±41	7458 - 7309 (100%)	-11.9	13195
14	E-III	00	Unit 38	38-519. sfl	floor deposit	8609±42	7649 - 7582 (100%)	-13.0	13196
15	E-III	00	Unit 38	38-521. hfl	hearth on floor	8531±43	7589 - 7549 (100%)	-14.6	13197
16	E-III	00	Unit 38	38-523. hfl	hearth on floor	8499±42	7580 - 7538 (100%)	-27.1	13198
17	W-I	IX	Str. K	E3-105	lower fill layer	8409±41	7539 - 7464 (100%)	-10.9	11406
18	W-I	IX	Str. K	E3-113	floor deposit	8464±51	7578 - 7514 (100%)	-18.5	11408
19	W-I	IX	Str. K	E3-113	floor deposit	8443±51	7569 - 7557 (13.2%) 7555 - 7491 (86.8%)	-26.0	11409
Cistern									
20	W-III	-	Str. M	M-513. sfl	eastern room middle fill layer	8365±35	7513 - 7451 (66.9%) 7407 - 7370 (33.1%)	-12.9	13111
21	W-III	-	Str. M	M-517. sfl	eastern room middle fill layer	8355±39	7496 - 7447 (46.6%) 7433 - 7425 (6.1%) 7412 - 7358 (47.2%)	-25.0	13112
22	W-III	-	Str. M	M-559. sfl	eastern room floor deposit	9144±41	8424 - 8404 (15.7%) 8392 - 8375 (11.6%) 8349 - 8287 (72.6%)	-15.4	13113

Settlement Size and Form

The extensive excavation has enabled us to estimate the size of the outpost at *ca.* 0.1 - 0.15ha (*ca.* 100m in total length by *ca.* 10 - 15m in average width). This estimate should be reasonably accurate, as Areas E-0, W-II and S-I clearly limit three sides of the elongated outpost. The only uncertainty concerns a possible further extension to the north but, in view of the general layout, any resulting increase in area is likely to be insignificant. Thus, it is concluded that the Middle - Late PPNB outpost of Wādī Abū Ṭulayḥa is much smaller in size than coeval sedentary settlements to the west, and roughly equivalent to desert sites such as 'Ayn Abū Nukhayla (*ca.* 0.12 ha; Henry *et al.* op. cit.) and Wādī Jilāl 26 (*ca.* 0.1ha; estimated from Garrard *et al.* 1994: Fig. 3). It is interesting to note that while the farming communities vary in settle-

ment size to a considerable degree, the desert outposts / settlements seem to converge on a range of 0.1 - 0.2ha.

Also noteworthy is the arc-shaped settlement plan facing south or south-east. Jilat 26 again provides a comparable example (Garrard *et al.* op. cit.). Such an unusual settlement plan may be a natural consequence of the prevailing north-westerly winds endemic to the Transjordanian plateau. It should be noted, however, that Complex 00 has a honeycomb layout common to Middle PPNB settlements in southern Jordan. Taking this into account, it may be more correct to say that the arc-shaped settlement plan is characteristic of the post-Complex 00 outpost. Whatever the case, both settlement forms are unique to PPNB desert sites in the southern Levant and may help to define them.

Settlement Seasonality

To begin with, the harsh environmental conditions of the Jafr Basin, especially the total absence of perennial water sources, casts doubt on the year-round use of the outpost. Even if average annual rainfall during the Middle - Late PPNB period was much higher than at present (< 50 - 100mm), it is highly questionable that the basin would have permitted a sedentary way of life. As a matter of fact, no fully-fledged Neolithic settlements have been confirmed in the basin (Fujii and Abe 2008). The custom of sealing entrances and the frequency of grinding tools left upside down on floors are both consistent with seasonal use of the outpost (Fujii 2006a). Of particular interest in this regard is the predominance of juvenile gazelle bones in the excavated faunal assemblage (Hongo op. cit.) and the frequency of cereal grains among the botanical remains (Nasu *et al.* 2008). Both of these observations are suggestive of seasonal occupation from spring to early summer, a likely assumption in view of the availability of water in this arid landscape.

So, for how long was the outpost used each season? This is a difficult question to approach, but a range of indirect evidence -- for example, the large pondage of the cistern and the existence of elaborate structures such as Structure B -- points to a relatively long stay. The occurrence of a few dozen gaming boards, including a few half-finished examples, is also understandable in this context. Thus, we hypothesize that the outpost was used for a few months from spring to early summer.

Subsistence Strategies and Site Function

Available evidence suggests that the outpost had a mixed economy, based mainly on hunting of gazelle and hare, short-range transhumance involving a limited number of domestic sheep and goats, and small-scale basin-irrigated agriculture within the flooded area of Barrage 1 (Fujii 2007b, 2007c, 2009; Hongo op. cit.; Nasu *et al.* op. cit.). It therefore follows that the site served as a seasonal agro-pastoral outpost, probably derived from contemporary farming communities to the west.

To begin with, evidence for hunting comes from the predominance of wild taxa in the faunal assemblage and the frequency of hunting

and butchering implements in the tool kit. There is no doubt that hunting played an important role at the remote outpost. Second, evidence for agriculture includes the occurrence of cereal grains and pulses (including domestic forms) on the one hand, and the presence of reaping and grinding tools on the other. It should be noted, however, that the basin-irrigated field produced by Barrage 1 would not have covered more than a few hectares. This probably means that basin-irrigated agriculture was a subsidiary activity. Third, evidence for transhumance consists of the fact that domestic sheep and goats were present at the seasonal outpost. However, in view of the fact that they seem to account for just *ca.* 1 % of the excavated fauna assemblage (Hongo op. cit.), it is reasonable to assume that herds brought to the outpost was limited in size. This assumption is consistent with the absence of specific animal pens at the outpost.

Given that both basin-irrigated agriculture and transhumance were subsidiary economic activities, it is possible that the outpost was established as a remote hunting station rather than a narrowly-defined agro-pastoral outpost. That is not to say, however, that the outpost itself was necessarily sustained by hunting, since hunted game may not have been consumed there, especially if it was not very far from its parent settlement. Suggestive in this regard is the fact that excavated faunal remains were unexpectedly scarce considering the frequency of hunting / butchering tools. This discrepancy, though undoubtedly partly due to poor bone preservation, could mean that the outpost was originally established to supply meat to the parent settlement. Our tentative assessment is that the outpost was intended as a hunting base but was, in terms of on-site subsistence, sustained by small-scale transhumance and basin-irrigated agriculture.

Water Exploitation Strategy

Our previous investigations revealed three barrages along the tributary wadi. To date, they are among the earliest anthropogenic water catchment facilities known in the entire Near East, let alone Jordan. The barrages fall into two types: a large V-shaped barrage occupying flat, permeable terrain beside the outpost (Barrage 1), and two small but robust dams built in a slightly

dissected stony valley in the lower course of the wadi (Barrages 2 and 3). A line of collateral evidence suggests that Barrage 1 was used for basin-irrigated agriculture to sustain a seasonal, yet relatively long-lasting stay at the neighboring outpost (Fujii 2007b, 2007c). Barrages 2 and 3, on the other hand, probably supplied supplementary drinking water for livestock.

The fifth and sixth field seasons have shown that the outpost was equipped with a large composite cistern in addition to the barrage system. The finding of the large cistern settled the problem of why the outpost was situated as much as ca. 300 m from the two small dams (Barrages 2 and 3). It is now evident that the cistern, rather than the dams, supplied drinking water to the outpost. Presumably, it was the systematic water exploitation strategy based on at least three barrages and one cistern that first enabled the early transhumant population to maintain a fixed outpost in the Ḥamād. This, in turn, probably means that during the PPNB the Jafr Basin received sufficient precipitation to make the construction of such large-scale water catchment facilities worthwhile.

Settlement Formation Processes

Since we have repeatedly discussed this issue elsewhere (Fujii 2006a, 2006b, 2007a, 2008a), we will here restrict ourselves to presenting a few minor revisions based on our most recent results.

The first revision concerns the date at which the outpost was established. Our previous report suggested that part of the outpost may date back to the Middle PPNB (Fujii 2008a). This assumption has now been clearly validated by the series of C-14 dates (**Table 1**). It is evident that the outpost lasted for a few centuries spanning the end of the Middle PPNB to the beginning of the Late PPNB. We should note, however, that the earlier limit is based on several C-14 dates from Phase III / IV features of Complex 00. C-14 dates from Phase I / II features may push it back further. Noticeable in this regard is the construction date of the cistern, which we suggest may date back to the very beginning of the Middle PPNB or even the end of the Early PPNB. The outpost may also date back to this same period, although it is equally conceivable that there was some chronological gap between the two.

Second, the transition from Complex 00 to Complex 0/I has become more reasonably understood, since the dataset from ‘Ayn Abū Nukhayla suggests that a temporary climatic deterioration intervened during the latter half of the PPNB (Henry *et al.* op. cit.). The occupational shift at Wādī Abū Ṭulayḥa may also be understood in the same context. Presumably, the outpost was largely abandoned for a short time due to a temporary reduction in rainfall, and then made a fresh start at Complex I -- perhaps with a cluster of several huts (Complex 0) in the intervening period (Fujii 2008a). Complex I consisted of a large core structure (Unit 03) and several subsidiary features, illustrating the techno-typological transition from the tripartite layout of Complex 00 to the dichotomous arrangement characterizing subsequent complexes.

The correlation between Complex I and Barrage 1 has also become clearer. Our previous investigations suggested that the occupational shift from Complex 00 to Complex I may have been related to the construction of Barrage 1 (Fujii op.cit.). The last season added another line of collateral evidence for this assumption. A protruding reinforcing wall incorporated into the converging point of Barrage 1 (and the other two barrages) is common to Unit 38 (belonging to Phase IV of Complex 00) and the central room of the cistern (probably representing the second phase of this feature). Given the rough contemporaneity of these three features, it follows that the barrage was also constructed somewhat after the initial establishment of the outpost, perhaps at the very end of the Middle PPNB or the very beginning of the Late PPNB. Of significance is the brief time lag between the establishment of the outpost and that of the barrage, which implies that the barrage was subsequently added in an attempt to stabilize and increase the productivity of opportunistic agriculture taking advantage of seasonal ponding on an existing mud playa (Henry *et al.* 2003). The westward enlargement of the cistern may also be understood as a measure to cope with the climatic deterioration.

Correlation Between the Half-Buried Cistern and Pastoral Nomadization

The sixth field season shed unexpected light on a possible correlation between the function-

al conversion of the cistern and the process of pastoral nomadization in the Jafr Basin. The former episode is evidenced by the existence of several heaths (Fig. 42), a few querns found *in situ* (Fig. 43), and a small stone circle (Fig. 35). Interestingly, all of them were concentrated in the middle fill layers. This means that the 2m deep cistern was converted to a 1m deep temporary shelter after it was buried up to the top level of the impermeable layers and, for this reason, was no longer able to fulfill its original function. A series of C-14 dates indicates that this episode took place in the middle of the Late PPNB, immediately after the westward development of the neighboring outpost finally ended with Complex IX (Table 1).

Of significance are those who left their mark on the middle fill layers of the cistern. They may be defined as the first group of pastoral nomads in the basin, in the sense that they could no longer maintain a fixed outpost (probably as a result of the environmental crisis and consequent failure of the water catchment system) and, instead, camped by the disused, half-buried cistern. It is important to note that this episode was followed by the appearance of two unique cemeteries at Ḥarrat al-Juhayra (Fujii 2005b) and Qā' Abū Ṭulayḥa (Fujii 2000, 2001, 2002b, 2002c, 2006b). Our investigations have confirmed that both sites directly inherited the unique burial practice (i.e. façade-side cairn burial), as well as the distinctive settlement form and formation process (Fujii 2002c, 2006b), of the outpost. Thus, the transition from the Middle - Late PPNB fixed outpost of Wādī Abū Ṭulayḥa to the Late Neolithic cemetery of Qā' Abū Ṭulayḥa, with the functional conversion of the cistern in the intervening period, is considered to reflect the initial process of pastoral nomadization in the Jafr Basin.

Concluding Remarks

The second phase of the Jafr Basin Prehistoric Project finally ended with the sixth field season at Wādī Abū Ṭulayḥa. We are now able to reconstruct the transition from initial transhumance to early pastoral nomadism on the basis of specific archaeological evidence. Our present perspective is that the multi-faceted Middle - Late PPNB transhumance evidenced at Wādī Abū Ṭulayḥa paved the way for the fully-fledged

pastoral nomadism suggested by the two unique funerary sites in the same area. Presumably, the climatic deterioration at the end of the PPNB caused a serious reduction in both cistern pondage and productivity of the basin-irrigated cereal field, which in turn led to the abandonment of the fixed outpost and a consequent process of pastoral nomadization. The next step is to test this working hypothesis in a broader context. The third phase of our project is scheduled to start in the near future.

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EXTRAORDINARY REVELATIONS FROM THE 2008 BROWN UNIVERSITY PETRA GREAT TEMPLE EXCAVATIONS

Martha Sharp Joukowsky

In 2008, Brown University Petra Great Temple archaeologists excavated several trenches focusing on the West Perimeter Wall, which included investigation of the Roman-Byzantine Bath Complex to the west of the Great Temple. Not only was astonishing architecture recovered, but noteworthy sculpture as well.

Brown University archaeologists included director Martha Sharp Joukowsky and photographer Artemis A.W. Joukowsky; trench supervisor Eleanor A. Power served as a most valued staff member, assisted by Süreya M. Köprülü. The author prepared the catalogue, and Rune Frederiksen spent the season researching the theater-in-the-temple, assisted by Elizabeth Gebhard. Marshall C. Agnew provided surveying expertise, and Susan A. Alcock and Ian Straughen, Christopher A. Tuttle and Donald Keller volunteered their services. The excavations took place between June 14 and July 3 2008. Our excellent Jordanian Department of Antiquities representative was Samia Falahat, and Suleiman Farajat and Mohammad Abdel Aziz al-Marahleh were also most attentive to our needs.

Built by the Nabataeans and situated in the very center of the spectacular landscape of Petra, the Great Temple is the religious and administrative focal point of the Nabataean capital. The Great Temple consists of a network of buildings organized on a series of terraces with the temple situated on the highest terrace; the middle terrace serves as the Lower Temenos which extends down to the Propylaeum, with a further drop down to the Roman Road. To the east are landscaped gardens, the Nabataean Garden Pool Complex, and to the west and beyond the temple precinct is the Small Temple, a Roman Imperial Cult Building, constructed post-annexation in

the second century AD.

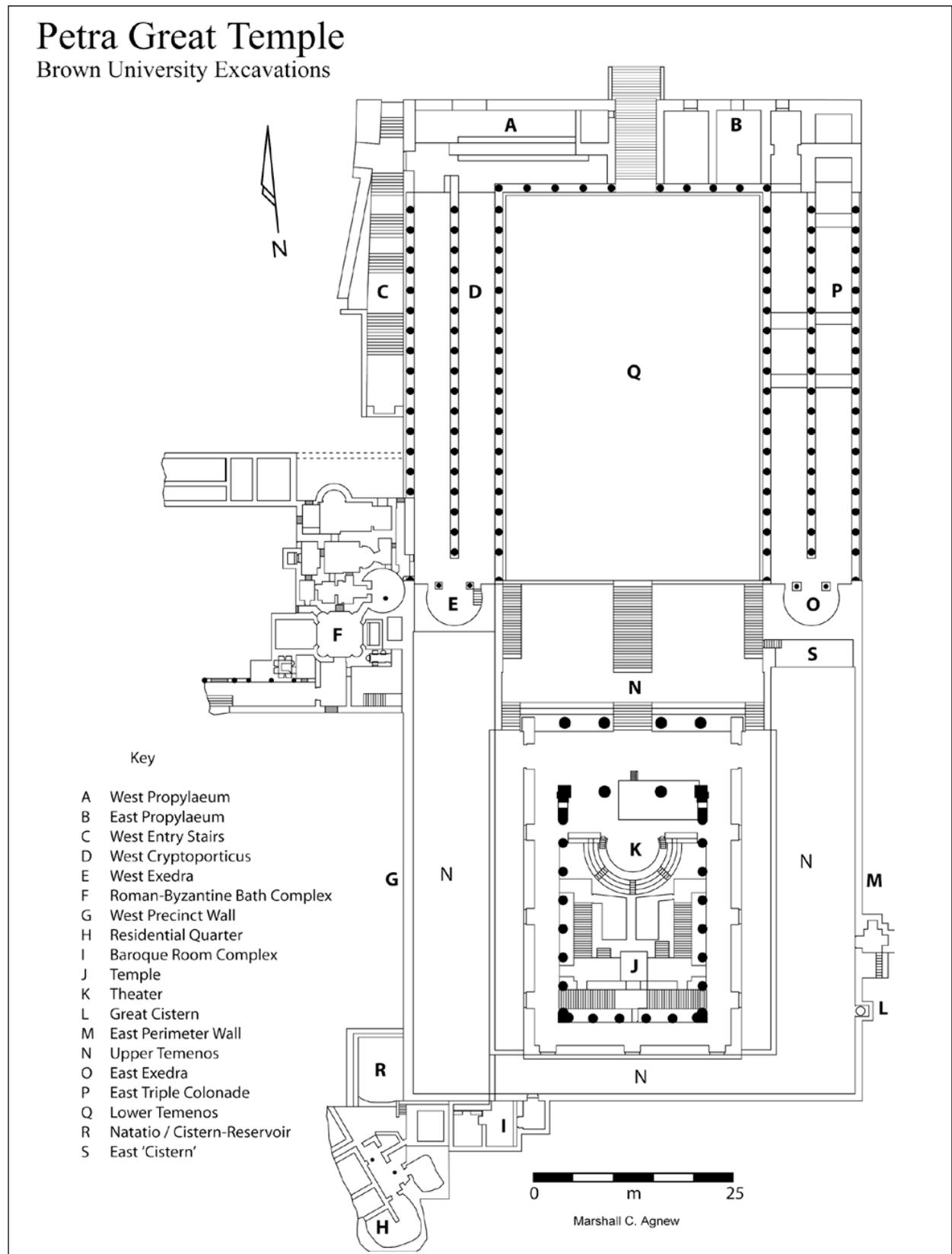
The Great Temple Roman-Byzantine Baths are sited between the Great Temple area and the West Perimeter Wall. The massive West Perimeter Wall serves as the west perimeter of the Great Temple precinct. This monumental construction remained unexcavated until the 2008 Brown University field season. Additional significant features of the Roman-Byzantine Bath Complex had been a priority from previous excavations -- we wanted to ascertain their relationship to the structures we had already uncovered as well as to the Baths-Palatial Complex excavated in the 1960s by the Department of Antiquities. **Fig. 1** is a 2006 plan of the site with major areas referred to in this report, and **Fig. 2** is a provisional 2008 plan showing the trenches excavated.

In 2008 we initiated excavations which partially uncovered the West Perimeter Wall, which physically separates the Great Temple precinct from the Small Temple lying below. Previous excavations at the Roman-Byzantine Bath Complex, covering 908.80m² had hinted at more standing architecture associated with it. The results provided important information, including a clearer plan of the baths and their spatial development, as well as a better understanding of the Petra urban layout.

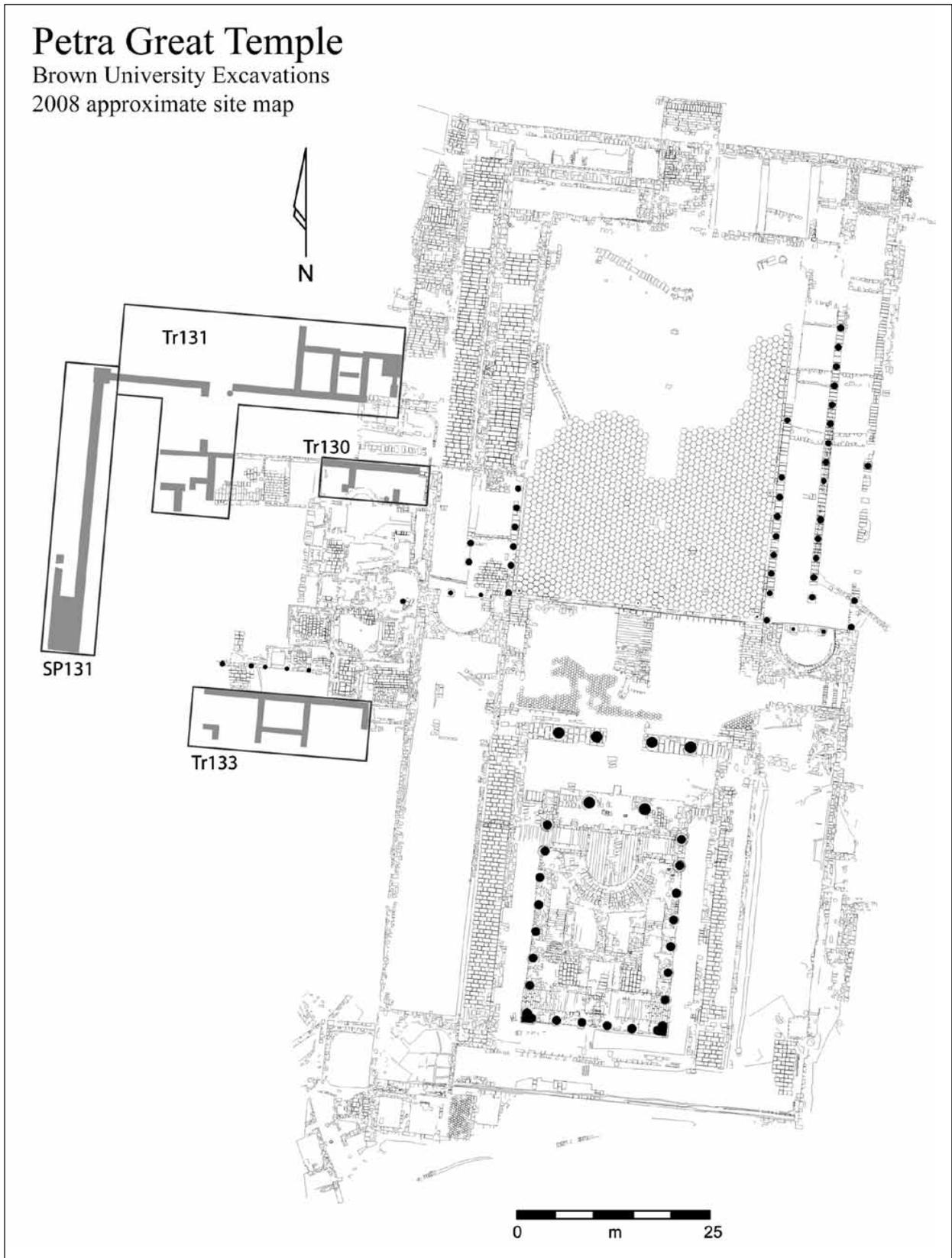
The following discussion deals first with the West Perimeter Wall excavations and the sculpture recovered, moves on to a discussion of the Roman-Byzantine Bath Complex and concludes with a summary of our inter-season activities.

2008 Sponsors

This campaign would not have been possible without the generous assistance of the Jordanian Department of Antiquities, its Director Dr Fawwaz al-Kraysheh, director of the Petra National



1. Plan of the Great Temple with major features indicated (Marshall C. Agnew).



2. Site Map of the Great Temple with 2008 trenches indicated (Marshall C. Agnew).

Park Suleiman Farajat, and Samia Falahat, our Department of Antiquities representative. The American Center of Oriental Research, especially director Barbara A. Porter, was also most helpful with logistics. We would also like to express our gratitude to Brown University and for the generous assistance of the Luther I. Replogle Foundation for making this season possible. We would also like to thank our Foreman, Dakhilallah Qublan, and his intrepid son, Mohammad, for their constant help in the field and direction of 20 workmen.

West Perimeter Wall

The site topography is irregular with the underlying bedrock falling away to the west. The Nabataean creation of a level building surface for the temple was achieved by cutting away 12m of bedrock on the south-east of the temple, and constructing support walls on the west where bedrock was lacking. For the Lower Temenos, the situation was complicated, for massive amounts of fill had to be brought in to create a level platform. This necessity explains the build-up of the temple's west precinct and the need for a West Perimeter Wall to serve as a retaining wall for the Lower and Upper Temene fill.

Special Project 131 was excavated by the author. The West Perimeter Wall, shown in **Fig. 3**, is oriented north-south and appears as a massive element in the west flank of the temple precinct, separating it from the remaining elements of the west city. It is parallel to the longitudinal axis of the Great Temple site, and its foundations rest at the same elevation as the Small Temple, or approximately 3m below the Great Temple Lower Temenos. This Special Project measured approximately 34m north-south x 3.10m east-west, and approximately 100m³ were excavated.

The top of the extant West Perimeter Wall

rests at the same elevation as the platform of the Roman-Byzantine Bath Complex. At the outset of excavation four to five courses of the great wall were exposed on its west, as well as to the north. The anatomy of the wall shows that just above its foot, it is composed of enormous Nabataean sandstone mega-ashlars, laid over a much larger width of wall. Although we have not reached the foundation of the wall we suspect that it will result in at least two or three more massive ashlar courses -- a substantial foundation for the 34m length we have already excavated.

The wall is constructed with a substantial rounded buttress at its north end. As excavated, it stands eight courses in height or 2.55m below its elevation as originally found; its length is 33.90m north-south. Its width is difficult to ascertain because its east face rests against the earth embankment fill of the Roman-Byzantine Baths. At its north end, where it is freestanding, it is approximately 2.60m in width; 10m from the north it is approximately 1.80m in width.

It is comprised of two courses of regularly laid, large hewn sandstone ashlar set as stretchers with some snecking stones. The upper wall courses are carefully laid ashlar of intermixed stretchers and headers. The typical ashlar of the lower courses excavated measures 1.20m length x 0.60m wide x 0.30m high. As a casemate construction, it is two rows in width, with a wide center core of once wet rubble fill that appears to surround a hollowed out core, which might possibly have served for the passage of water. Water could have flowed through this passage from the as yet unexcavated south portion of the wall, exiting to the north (and may have supplied the west Baths-Palatial Complex). There has been constant, erosive attrition to the upper wall courses, and its structural integrity has been compromised; the upper ashlar have been



3. West Perimeter Wall to the east, Special Project 130 (Artemis W. Joukowsky).

badly battered over time, there is slippage of some blocks, and others have broken or fallen away from the wall fabric. The wall's construction also degrades in the middle with ashlar and rubble fill that have slumped out of place. It appears to have been dry-laid, but there are some indications that a mortar was employed for bonding specific areas. Now lacking its original support, this wall is slumping to the west and its condition is fragile.

Thus, the West Perimeter Wall, dating to the mid-first century BC or Great Temple Site Phase II (Stage 1), is situated west of the temple, separating the temple Roman-Byzantine Baths precinct from the Small Temple-Roman Imperial Cult Building (located further west, outside and beyond the Great Temple precinct). The lower courses of this wall are characteristic of the earliest Nabataean walls at the Great Temple, particularly the Portico Wall of the Propylaeum and the two east west walls of the Roman-Byzantine Baths. The wall's earliest phase, Site Phase II or mid-first century BC, is interrelated with the original design plan of the precinct when the position and building of a massive wall served to retain the fill that was deposited to build up and level the area.

Stage 2 of this wall's history took us by surprise, as courses of alternating blocks and voussoirs were added into the matrix of the West Perimeter Wall in Site Phase IV (first century BC to first century AD). These voussoirs spring to the west, and those that are prominent number eight along the west face of the wall; others at the north end of the wall have either eroded away, fallen in earthquake tremors, or may indicate that the vaults did not exist at all at the north end of the wall, but were inserted some 10.40m from the north. This new structure absorbed the earlier wall, and produced a vaulted cryptoporticus.

The east face of the West Perimeter Wall of Site Phase II (mid-first century BC) was then reformatted in the Grand Design of Site Phase IV (Stage 2), or first century BC-first century AD.

West Cryptoporticus Wall

To the west and parallel to the West Precinct Wall lies the west cryptoporticus wall, serving as the west wall of the cryptoporticus, which postdates the earlier Stage 1 West Perimeter

Wall. During excavation it was evident that the north portion of this wall had collapsed in antiquity, for along a 26.80m length starting at the north end of the West Perimeter Wall, only one single sandstone ashlar course was recovered. This was probably due to the collapse of the West Perimeter Wall, which fell to the west, carrying the upper portions of this wall with it. Excavated to seven courses in height, this case-mate wall is two ashlar rows in thickness with a central core of rubble; it measures 12.20m in north-south length and 1m in width. Its preserved height in the north is 1.08m, but with the vaults its excavated height is 2.55m. The well-hewn ashlars average 0.72 m in length x 0.37m in width x 0.37m in thickness, and are set with snecking stones. On the west are five apertures, three of which are square, opening to the west. These openings served for ventilation and as a light source for the semi-subterranean cryptoporticus.

Fig. 4 illustrates the vault between the West Perimeter Wall and the west cryptoporticus wall, which has an east-west interior width of 1.60m. Its length is unknown, but is assumed to extend a further 7.00m or more to the south. Its preserved excavated height is 2.55m. This vault is composed of four hewn sandstone ashlars set as headers from the east (West Perimeter Wall) and springing to a middle keystone with four additional ashlars springing from the west cryptoporticus wall. Together there are nine ashlar courses that comprise the vault, which bonds the West Perimeter Wall to the west cryptoporticus wall. The lowest course is set as headers, with a number of header courses behind, and the upper courses are set back from and overlapping the lower courses. An unidentified number of courses are placed behind each other, and their configuration is not clearly delineated.

The vaults appear to be solidly constructed, and were put in place at the same time as the other Site Phase IV upper wall elements of the West Perimeter Wall system. Additionally, they provide support for the superstructure of an upper passage walkway / passageway level with a presumed colonnaded portico. Thus, in Site Phase IV, as part of the building boom of the "Grand Design", the West Perimeter Wall was enlarged with the addition of a cryptoporticus (which also are found in the Lower Temenos and



4. West Perimeter Wall, vault to south (Artemis W. Joukowsky).

the Propylaeum of the Great Temple site), which supports a porticoed walkway that marked the west perimeter of the Great Temple.

Colonnaded Walkway / Passageway

Above the cryptoporticus are the remnants of a limestone-paved walkway extending the length of the wall south, which was initiated at the same time as the construction of the vaults. Hypothetically, this upper walkway includes what appears to be a columned portico. This portico may have measured 5m in length and, judging from the width of the walkway, probably about 3m in width.

Colonnade

The colonnade accentuates the vertical dimension of the temple precinct. The evidence suggests that there may have been an open gallery above the high substructure bordering the longitudinal axis of the baths. Perhaps this was an open portico with columns on its inner face, overlooking the palaestra that may have served for official functions, e.g. award ceremonies that could have taken place in front of the people gathered below. Those standing in the portico could view the whole bath complex as well as the temple beyond.

Judging from the column drums found in the collapse, their diameters average 0.57m, so the projected height of the portico must have been approximately $> 10 = 5.70\text{m}$, $> 9 = 5.13\text{m}$, or

$> 8 = 4.56\text{m}$, plus the architrave. The columns are embellished with Nabataean type Corinthian capitals, which are smaller and less deeply chiseled than those of the Great Temple. The volutes are flattened, and instead of being deeply incised and elaborately carved, as are those from the Great Temple, their overall appearance is not as elaborately decorated with fruits and vines, and their features are not as deeply chiseled as the temple capitals.

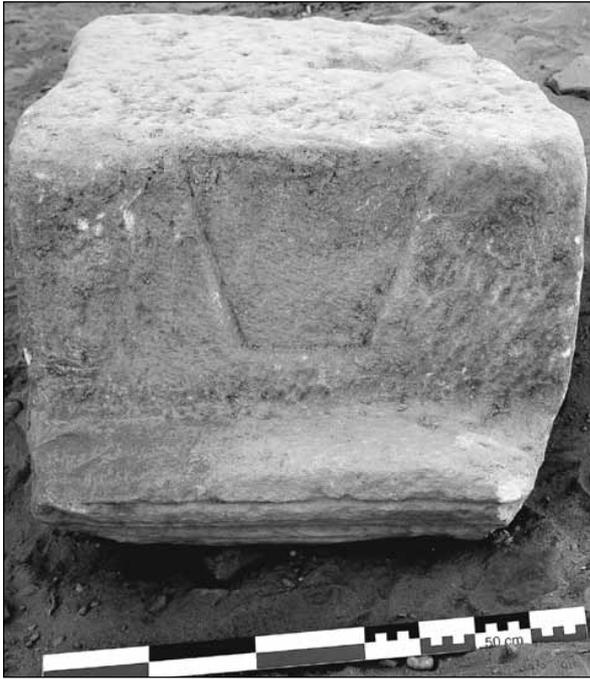
Sculpture

Discovered in the debris fill of this area, under the vault, were a number of sculpted objects including a horned altar, a torso of a marble warrior and a marble head, each of which are described below.

Seq. No. SP131042

Sandstone horned altar (**Fig. 5**) was found tipped on its side in the collapse below the vault. This altar has horns carved in low relief on all four corners, and its base is composed of a cornice divided into four levels. It is square in appearance and it stands 0.64m in width, 0.40m in height and 0.43m in thickness. The rear is not as well carved as the front, and it bears a drill hole — perhaps for attachment.

As a god block, the horned altar is a meaningful talisman. Symbolizing the presence of god, it is a religious metaphor for the power of the god and it carried a universal imagery for the



5. Horned altar (Artemis W. Joukowsky).

Nabataeans. Its form has roots extending to the Bronze Age where it can be traced to many sites. This horned altar is similar to the one found in the West Propylaeum in 2000 (Joukowsky 2007: 82, Fig. 2.45). Its position in the vaulted portico collapse must have lent some religious significance to this passageway.

Seq. No. SP131041

This battered, but skillfully modeled crystalline marble head fragment (**Fig. 6**) has a full fleshy cheek, one open eye, and hair on the left side of the face. The head measures 0.14m to the eye, its thickness is 0.23 m, and the width is 0.124m. The eye is 0.03m in width and 0.02m in height. The nose is battered, as is the right side of the face. The hair hangs in wavy tendrils encircling the cheek, and there is a drill hole where the hair and the neck meet. The hair on the right side flows to the rear. On the battered right face, the hair is obviously more crudely sculpted. The hair on the left and ridges in the back may have held a diadem or crown, or the figure may have been veiled.

Although the marble is similar to the Warrior torso (see below), the proportions are sufficiently sized, and the styled angle of the hair bears a likeness, no joins have been found between the two sculptures. If in fact the two sculptures be-



6. Marble head, right side (Artemis W. Joukowsky).

long to the same piece, a fragment is missing from the neck. What is clear is that a statue or perhaps many statues decorated the walkway, two of which we recovered from the collapse.

Seq. No. SP131040

This headless, marble, double-sided warrior torso (**Figs. 7 and 8**) is carved on both sides. Its height is 0.45m, and its width is 0.53m from arm to arm.

The front (**Fig. 7**) shows that the right breast is bare with emphasized pectoral muscles. The clavicle is emphasized, as is the scapula. The right arm is partially battered but was once protected with a now incomplete armband 0.10m in height. There is a deeply chiseled groove between the arm and the chest. The front is sculpted with a V-shaped baldric — the height of the right baldric is between 0.65m and 0.70m, whereas



7. Marble Warrior (front), (Artemis W. Joukowsky).



8. Marble Warrior (back), (Artemis W. Joukowsky).

the left baldric measures 0.65m in height. To the left of this baldric is a partial cuirass, with the fringe of the breastplate extending over the figure's left shoulder.

The left front is sheathed with a baldric measuring 0.10m in width at the top. Two raised areas include a fringed cuirass¹ with a sheath, perhaps in leather. The cuirass is decorated with a fringe that continues to the rear, showing that this figure wears both a breastplate and a backplate. There is a faint inscription, scratched like a graffito, irregularly incised on the front base, which may in fact be a later addition to the sculpture. It reads:

L – Φ – I E I

On the rear right (**Fig. 8**), there is a single baldric. The flowing hair extends over the shoulders to 0.14m and is emphasized with deep grooves; individual locks are grouped or bunched into clumps. On the right 13 locks are bundled together, whereas on the left only 11 locks are grouped together. Including the shoulder locks, the hair is grouped into 19 bunches. Several drill holes are found in the rear that in all probability serve for attachments. From the rear right-to-left, the cuirass fringe also has a deep hole drilled into it, and on the strap at the

shoulder there is another puncture, as if to hold a decoration of some sort. The baldric is also notched. Additionally, to the left there are two perforations in the baldric, suggesting that appliqués, such as weapon(s), may have been attached to the rear. Although the sculpture is to be viewed from both sides, the rear is not as well sculpted as the front, and portions of the figure's back appear to be unfinished.

It is obvious that the Romans had statues brought to Petra for display. Numerous inscriptions have been found in the Small Temple-Roman Imperial Cult Building, and the heads of emperors have been unearthed at the Qaşr al-Bint. The presence and iconography of this warrior bust suggests that the West Perimeter Wall portico was an official place, perhaps where ceremonies were held. This warrior sculpture may commemorate a Roman victory, or it could have been a votive gift. Does it represent the statue of a god or a demigod? Could it be a mythological hero or famous Roman? Or may it be an honorific statue of a local citizen or benefactor? Clearly it is associated with the cultural activities of the baths and the West Perimeter Wall. An epigraphist will be consulted to help us elucidate the inscription.

In summary, these 2008 excavations help us visualize the west precinct of the Great Temple. Founded in the Nabataean period, the West Perimeter Wall delimited the precinct to the west and appears to have been an important strategic landmark in the Nabataean and Roman periods. The façade of the portico faced east, where the officials could enjoy an unobstructed view of the palaestra. The portico may have had a ceremonial character, being decorated with at least one marble statue, perhaps two, found in the portico's collapse. We assume it was accessorized also with the display of the god-block or horned altar.

Although the West Perimeter Wall and its portico existed for over 300 years, part of it fell out of use in the 4th century AD (Stage 3) and was abandoned sometime thereafter. A series of natural earthquake disasters struck the Petra Great Temple. For the meantime, however, this did not seem to affect all of the activities taking

¹ This is similar to the sculpture with the edge of the cuirass shown with the Medusa head; see McKenzie in

Markoe (2003: 167, Fig. 171).

place in the Roman-Byzantine Baths, which remained a focus of activity. Likewise, further to the west, the Roman Imperial Cult Building also continued to be an active element in the city. Although the West Perimeter Wall ruins probably must have been visible long after the earthquake of the 4th century, no rebuilding by the then residents seems to have been undertaken to restore it. The days of prosperity and the building boom were long gone.

Now we turn to the 2008 Roman-Byzantine Bath excavations.

Roman-Byzantine Bath Excavations

These trench excavations and removal of overburden focused on the area south and adjacent to the Roman-Byzantine Baths, excavated in 2005 and 2006. Three trenches in the bath complex were excavated, Trenches 130, 131 and 133. Trenches 130 and 131 combined, measured approximately 21m north-south x 35m east-west. These excavations were under the supervision of Eleanor A. Power. We will discuss Trench 130 followed by Trench 131, and conclude with a brief statement about Trench 133. Presented here are excerpts from Eleanor A. Power's 2008 trench reports.

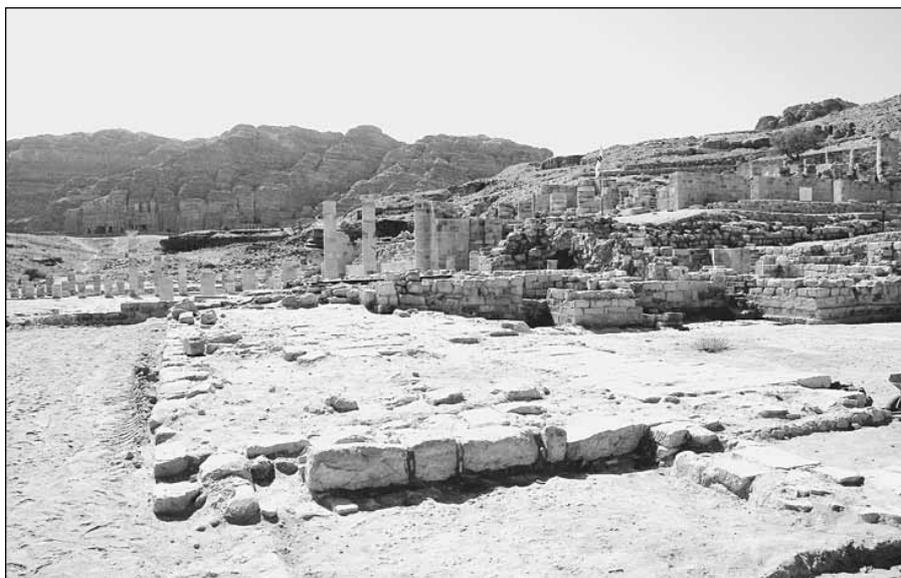
Trench 130

The goal of Trench 130 (**Fig. 9**) was to clarify the architectural plan of the remaining area in the north-west of the Roman-Byzantine Bath Complex. This area is located at what would have

been a central access point, linking the Great Temple West Entry Stairs, the Lower Temenos with its Triple Colonnade, and the Roman-Byzantine Bath Complex. In an attempt to better understand this nexus, the excavation of Trench 130 was undertaken. More is now known of the architecture of this area, though a myriad of questions still remain regarding the use of this space and the traffic patterns through it.

As only the tops of walls were exposed, phasing of the loci of this trench must remain very tentative. We expect that the floor-level of these rooms was rather near the surface, as the extant floors of the 'platform' and the 'hypocaust room' suggest. As both of those rooms also had sub-floor architecture for their hypocaust systems, the lack of any extant floor in Trench 130 could simply suggest that a similar sub-floor support collapsed at some point, lowering the level at which we would expect to find remains of the floor. Without much sense of the depth of these rooms then, little can definitively be said about their use, and the phasing of their construction / destruction must remain similarly vague.

The earliest stage of construction in this trench is dated to Site Phase VI, 106 AD and the 113 / 114 earthquake, and corresponds to the main construction of the Roman-Byzantine Bath Complex. The major walls of this construction period are two east-west walls and the two westernmost north-south walls. In the west of the trench, these four walls form a small room. Given the heated rooms to the south and to the



9. Roman-Byzantine Baths, Trench 130 to east (Artemis W. Joukowsky).

west of this room, it is likely that this space was also heated. A low wall in the south of the room may be part of the sub-floor support for the hypothesized hypocaust system in the room. Access to this room would have been from the south (connecting with the 'hypocaust room' of 2006 Trench 126) or from the east. What was in the space to the east is less clear. The semicircular apse of the 'hypocaust room' juts into the center of the space, giving the room an awkward shape. Furthermore, the room appears to have been open to the east at this time.

Given the cursory nature of excavation in Trench 130, only the overburden and topsoil covering the walls were removed. There were hints, however, of collapse emerging in the deeper soil. The partially exposed, but not removed, ashlar are thought to be part of the major collapse of the Great Temple and Bath Complex in the 363 AD earthquake of Site Phase IX.

Following the presumed period of collapse, there are some suggestions of later re-use and building in the trench. The wall extending north-south into the middle of Trench 130 appears to be later in date, and is associated with some re-used architectural fragments (e.g. a column drum) supporting the later dating of this locus. It is thought that this wall likely continues to the north, with courses lower down being better preserved than those already exposed. It is possible that the wall is actually earlier in date and contemporaneous with the main construction of the bath complex. It is being phased later because of related blockage using re-used architectural pieces. The insertion of this wall may have been to facilitate dumping in the area, or to shore up the extant architecture. Without further excavation, we cannot be sure.

The final stage in the history of Trench 130 is a long period of collapse and the accumulation of debris and sediment over the extant architecture. This process has likely been a long and gradual one, continuing to the present.

Trench 131

We wanted to understand the relationship between the Great Temple Roman-Byzantine Baths and the West Baths-Palatial Complex that was excavated in the 1960s by the Jordanian Department of Antiquities, under the supervision of Mohammed Mershed. The most compelling

feature of the Baths-Palatial Complex is the elegant stuccoed grand staircase with its colorful yellow plastered and painted walls. The north section of Trench 130 lies adjacent and fronts the earlier Baths-Palatial Complex excavations and this staircase (these dangerously deep excavations have remained exposed ever since). For clarity and understanding of the features in the following discussion, the Baths-Palatial Complex feature the 'grand staircase', whereas the Great Temple Roman-Byzantine Baths Trench 130 includes the so-called 'sea urchin staircase', so named because of the thousands of urchin spines found in the debris above the stairs.

It is clear that we may be dealing with two bath systems that were in use at the same time, from the 1st century AD onwards. It may be that one system was reserved for women and the other for men, but this is conjecture. The following report of the Trench 131 excavation is written by Eleanor A. Power who supervised the excavations.

Trench 131 (**Fig. 10**) is located in the area west of the Lower Temenos, north of the previously excavated Roman-Byzantine Bath Complex. It was excavated in three areas: first, to the west of 2006 Trench 121, second in the area north of Trench 121, and third in three new rooms just west of the top of the West Entry Stairs and south of the massive spiral staircase of the Baths-Palatial Complex, excavated by the Department of Antiquities in the 1960s. The first part of the trench located in the west measures roughly 7m north-south x 5m east-west. The second part of the trench extends from the west boundary of the first section roughly 28m to the east. This area is defined by the major east-west perimeter and terrace wall to the north, and the north wall of the platform to the south. More extensive excavation was focused in the north-east area of the trench, north of 2006 Trench 122, west of the upper platform of the West Entry Stairs, and south of the massive spiral staircase of the Baths-Palatial Complex. This third area is roughly 6m north-south x 12m east-west.

The goal of this trench was to expose the architecture north of the bath complex, where it meets the West Entry Stairs and the so-called Baths-Palatial Complex. The relationship between these spaces was not clear, and the full extent of the bath complex was not known. Af-



10. Roman-Byzantine Baths, Trench 131, overview (Artemis W. Joukowsky).

ter exposing the walls and features in the 7m x 5m area in the west, work shifted to the north-east rooms north of the West Entry Stairs. The rest of the season was focused in this area, and especially the easternmost room (measuring 3.95m north-south x 3.79m east-west). There, the unique assemblage in the soil loci in that room resulted in a shift in strategy, from one focusing on simply exposing the tops of walls, to a more systematic excavation of the room. The soil in the room appears to be the result of regular dumping in the area, but lacks clear stratigraphy. There were two main lenses with different assemblages, but they were intermixed in a way that made excavating them separately unfeasible. To retain some information about broader changes in the assemblage, each day of the excavation of this area was assigned a unique locus number, so that if there are changes with depth, that at least can be recorded. Unfortunately, time limitations did not allow for the full excavation of the room. In a bid to establish the floor level, a 1m x 1m sondage was sunk in the south-west corner of the room. When no floor was found at the expected level (the threshold in the west doorway to the room), the balk at the west threshold was pushed back to see if the floor extended. Instead, we discovered that the room was actually a staircase, meaning that the floor level was much deeper than we had anticipated. By the time of this discovery, there was not sufficient time to excavate the remainder of

the room. To preserve the remaining soil and additionally to allow easy tourist access through the space, the sondage in the south-west corner of the room and the area exposing the first two steps were covered with mesh and backfilled. In view of the unique assemblage of the soil (full of shells, sea urchin spines and pottery) and the importance of the stairway, this area merits further study.

Although much of the work in Trench 131 involved the removal of sediment and overburden containing little material culture, the finds in the east room of the north section of the trench were rich and unique. In the west and central sections of the trench, little of merit was found. One coin (SF#1, Seq. No. 131013) was recovered near the north face of Locus 14, though it was not properly *in situ*. Work in the east room, however, yielded many impressive finds. Loci 4 to 7 (which can be considered separately excavated spits of the same deposit) were densely packed lenses of dumped material, comprised primarily of pottery, shell and bone. Most surprising of all were the thousands of sea urchin spines found in the room. Fourteen special finds were found in the area: four complete lamps, two microliths, four pieces of worked bone, a piece of worked ivory, a buckle made of bone and copper wire, a pendant made of bronze alloy, and a small cup. A piece of plaster with gold inlay was also found.

The excavation of Trench 131 covered a

large expanse of space and, despite the mainly shallow exposure of features, managed to reveal much of this crucial area connecting the Great Temple, the Roman-Byzantine Bath Complex and the Baths-Palatial Complex. The plan of this area has now been partially completed, and areas for further study identified. Though much of it must be very tentative and await further excavation, a preliminary reconstruction of the history of construction, use and destruction of this area is now possible.

The first construction event (Stage 1) in Trench 131 was that of the main east-west wall, that served as a perimeter retaining wall for the area to the south. This wall and the north-south wall cleared in Special Project 130 combined to form the boundaries of what would later become the Roman-Byzantine Bath Complex area. This construction took place in Site Phase II or the mid-1st century BC, when preparations for the Great Temple and the surrounding features were underway.

The second major construction event (Stage 2) was the Grand Design of Site Phase IV, dated to the last quarter of the 1st century BC and beginning of the 1st century AD. Within Trench 131, features dating to this period are located in the north-east section and are associated with the West Entry Stairs and the monumental spiral staircase of the Baths-Palatial Complex. Along with the construction of those two large staircases were the three rooms of the north-east section, most important of which is the easternmost 'sea urchin staircase room'. This east staircase room connected the top platform of the West Entry Stairs to the west, leading people back down, probably both to the west (into the center room and through that into the monumental spiral staircase) and to the south (presumably into parts of the Baths-Palatial Complex). The center room (with the collapsed arch) and the west room both connected the spiral staircase to areas further to the south. With the easy flow of traffic through these rooms, all three were likely important arteries, allowing for free movement from the spiral staircase and the Baths-Palatial Complex into the area of the Roman-Byzantine Bath Complex. Of interest, too, are all of the staircases in the area: the West Entry Stairs, the monumental spiral staircase of the Baths-Palatial Complex, and Trench 131's 'sea urchin

staircase'.

The 'sea urchin staircase' is defined as the staircase in the east room of the north-east section of the trench. It has been partially exposed. It is closely related to the threshold that essentially serves as the top step of the staircase. Only just over a meter of the length of the stairs were exposed, with more still under the dump deposits in the south. Presumably, the stairs continue the length of the room, extending to abut the south wall. The top step of the staircase has a width of 0.50m and a height of 0.18m. In the north-east corner of the step is a carved rectangular depression of unknown function, measuring 0.30m north-south x 0.22m east-west. The second step has a width of 0.39m. A small part of the third step is visible, but because of a collapsed ashlar resting on the second step and limited excavation time, more could not be exposed. The steps are constructed of long well hewn sandstone ashlar, and it is thought that they may pivot around the feature so that the lower steps would be oriented north-south instead of east-west. However, that is similarly confusing, as it would essentially result in two stairways mirroring each other — this staircase and the West Entry Stairs. This seems unnecessary and repetitive. It may be that the stairs extend east-west, with a platform below the rectangular feature allowing for entry into the rooms to the west. Clearly, this room should be fully cleared, both to reveal the direction of the stairs, and because of the important nature of the dumps that cover them. Connected as they are to both the West Entry Stairs and the monumental spiral staircase of the Baths-Palatial Complex to the north-west, these stairs are associated with the Grand Design of Site Phase IV.

Four layers of dumping cover the north-east 'sea urchin staircase' and are assigned by the excavator to Site Phase VIII, or the late 2nd century AD.

Why so many staircases were necessary in one area is still not clear. Hopefully, further excavation of the 'sea urchin staircase' will provide an explanation. There is clearly a drop-off of the bedrock in this area, and the Baths-Palatial Complex monumental spiral staircase makes clear that this area has two floors, which may still be intact in the north-east section of the trench. Unfortunately, given the current state of

the exposed walls of the spiral staircase in this area, full excavation of those rooms seems impossible.

The next construction stage in Trench 131 (Stage 3) is of those features associated with the Roman-Byzantine Bath Complex, located primarily in the south-west section of the trench. The walls and water features just to the west of Trench 121 (the platform of 2006) appear to have been connected with the Bath Complex, bringing it water and defining what is thought to be the west boundary of the palaestra. What was uncovered would have been just below floor level. This stage is attributed, along with the construction of the Roman-Byzantine Bath Complex, to Site Phase VI (the Roman annexation and the 113 / 114 earthquake).

Stage 4 marks the first substantial period of disuse and abandonment of some of the area lying within Trench 131. The 'sea urchin staircase' room was blocked up and filled with dump. The dumped material (Loci 4, 5, 6 and 7) was extremely dense, rich and unique. Huge numbers of shells, sea urchin spines and bones reveal new information about the probable eating habits of the Nabataeans / Romans at this time. The pottery was surprisingly consistent, with large numbers of sherds from Nabataean bowls, cups and large storage vessels. Many complete profiles were recovered, along with a number of complete lamps. A cursory look at this pottery assemblage suggests that it dates primarily (if not exclusively) to the 3rd century AD. One particularly unique glazed turquoise piece from Locus 5 could however be of later date, and the dumping events could clearly have continued for some time. At the very least, this assemblage provides a clear *terminus post quem* for the dumping in this area, and it cannot have occurred before Site Phase VII, dated to the mid-2nd century AD. Given the consistency of the material, an early date in Site Phase VIII, or the late 2nd century AD, for this dumping is suggested. This is further reinforced by the Roman cement seen in the construction of Locus 26, one of the blocking walls. It is certainly possible that dumping in this area continued after the 363 AD earthquake, but this episode is still tentatively attributed to Site Phase VIII, prior to that event. Site Phase VIII is generally associ-

ated with a period of minor disuse around the Great Temple, so it is not inconceivable that dumping would have occurred at this time. The purposeful blocking and dumping in this space could have been precipitated by changes in the use of the area. In the north trenches of the Roman-Byzantine Bath Complex, there is similar evidence for collapse and modification.

Stage 5 covers presumably substantial collapse in the trench during the 363 AD earthquake (Site Phase IX). The only direct evidence of this in Trench 131 is the collapsed arch (Locus 21) of the center room in the north-east section of the trench. All other evidence of this event is either no longer extant or still buried.

Stage 6 covers the later blockage and disuse seen in the west room of the north-east section of the trench, dated to Site Phase X or 4th-5th centuries AD. Locus 17 (the narrowing of that room) and Locus 19 (the blockage of its doorway) are attributed to this post-363 AD period because of the re-use of an elephant head in the construction of Locus 17. Most likely, the earthquake compromised the integrity of the architecture of this space, requiring reinforcement of the walls if it was to continue in use.

Stage 7 is the final period of abandonment and sedimentation, continuing from Site Phase X to the present.

In conclusion, Trench 131 was a surprising trench that generated much new information about the linkages between the public spaces to the west of the Great Temple. It was an extensive trench, with a primary goal of exposing the plan of this area. This was accomplished and, as a result, goals for future research can now be focused on the intriguing and enigmatic features found here.

The enormity of finds from this deposit was significant. Notable finds were approximately 5,500 sea urchin spines, worked bone fragments, oyster shells, a wide variety of Nabataean and later wares, complete lamps, and several coins.

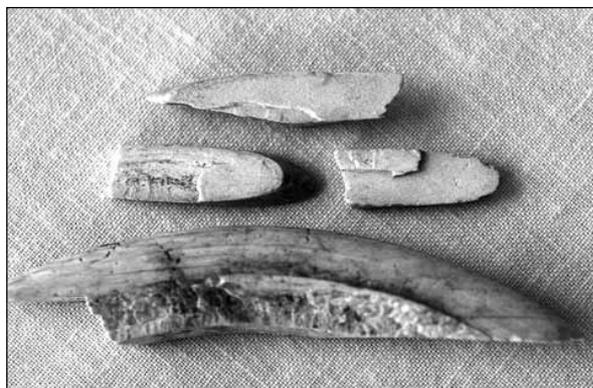
Also essential is a close study of the material remains from the dumping loci of Trench 131. The unique finds of the many shells and sea urchin spines is of course surprising, and the large pottery assemblage could give a very clear date for the dumping event, as well as providing much-needed information about Nabataean daily life.

Special Finds from Trench 131

Donna Strahan, Conservator at the Sherman Fairchild Center for Objects Conservation, The Metropolitan Museum of Art, examined a collection of worked bones found in Trench 131, Locus 6, Seq. No. 131090 (**Fig. 11**). She concludes that they are all hippopotamus tusk, and definitely not elephant, bone or antler. She also discovered that they all fit together to make part of one object which, she suggests, may have been a cosmetic box. These will be analyzed and published by David S. Reese in *Petra Great Temple* Volume III.

Seq. No. 131058

Lamp, Cat. No. 08-L-4 (**Fig. 12**), found in Trench 131, Locus 6, was analyzed by Deirdre G. Barrett who reports that it is known as a Darom lamp or molded Judaeen lamp, dating from 70 to 135 AD. (Israel and Avida 1988: 50, No. 88; 61, Nos. 134-136). These lamps feature rosettes and nozzles ornamented with small circles in the corners. The decoration around the filling hole is of tendrils, probably derived from the grapevine (Israel and Avida 1988: 62, No. 147). Similar fragments have been found at Petra, which possibly belonging to the same category (Khairy 1990: 17, Nos. 31, 33; Fig. 15, Pl. 8.) There are two lamp fragments from Trench 131, Locus 4 that also belong to the Darom lamp corpus (Khairy 1990: 75, Nos. 202 and 203). The motif on one of the fragments is of leaves / branches, found beneath the two raised ridges framing the nozzle. Other such lamps have been recovered from Masada. (Barag and Hershkovitz 1994: 66). The Masada fragments were found in rooms in the casemate wall occupied by the



11. Hippopotamus fragments from Trench 131 (Artemis W. Joukowsky).



12. Lamp, Cat. No. 08-L-4, Trench 131 (Artemis W. Joukowsky).

Zealots, and “therefore probably date from the last decade or two before the siege and fall of Masada” (Bailey 1994: 67). Examples of these lamps were also found at the Citadel in Jerusalem, unearthed in the burnt destruction level of 70 AD (Bailey 1994: 68).

Trench 133

A pedestrian survey in 2005 indicated that there were additional structures above and to the south of the Colonnaded Corridor, south of the Roman-Byzantine Bath Complex. The 2008 excavations gave us an exciting opportunity to evaluate this previously undocumented area. Adjacent to the Colonnaded Corridor to the north and the Sculpture Garden to the south is Trench 133 (**Fig. 13**), supervised by the author and Mohammad Qublan, and measuring 11m north-south x 28.5m east-west. The upper levels of soil were skillfully removed by mechanical equipment. After 62.70m³ was excavated, the walls of several rooms were revealed and prepared for future excavation. The Colonnaded Corridor Wall supports fragments of one primary building with one room delineated and a partially uncovered second room extending further to the east. To the south-west there is what



13. Trench 133 clearance of topsoil to east (Artemis W. Joukowsky).

appears to be the corner of an additional room. These rooms are on the same east-west axis as the baths, but they have to be excavated to confirm their function and to determine if they bear a direct relationship with the baths. These building remains are strategically placed and their excavation should reveal how and when they were built — giving a better understanding of the Great Temple west plaza — and whether or not they were associated with the Roman-Byzantine Baths building plans.

Removal of the bath overburden involved the excavation of approximately 219.45m³ of earth. The results of these 2008 excavations have shown that the archaeological evidence for the building is as well preserved as those structures already excavated. It appears not to have been disturbed by geo-morphological effects or occupation since antiquity.

2008 Catalogue - Special Finds

In addition to the artifacts described above, 18 objects were recorded as special finds. Of these, four coins, four complete lamps, a ceramic cup, the bone leg (see below), the Trajanic inscription (see below), and the marble sculptures were handed in to the Petra office of the Department of Antiquities of Jordan.

Other Projects

Ballista Balls

Recovered from the Great Temple Propylaeum west in 2005 was an assemblage of 423 bal-

lista balls, which were documented at that time (Joukowsky 2007: 62-63). Because of the partial loss of the previously collected ballista ball size and weight data, Süreya M. Köprülü undertook the re-measurement and re-weighing of 102 ballista balls. This discussion will be forthcoming in *Great Temple Volume III*, but a summary of the results indicates that their average diameter is 13.6cm, with an average weight of 2.2kg.

Inter-Season Research

Great Temple consolidation and restoration

Preservation of the site remains a priority of our research design. In 2008, Dakhilallah Qublan's team of restorers skillfully constructed a protective shelter for the well-preserved caldarium of the Roman-Byzantine Bath complex, so that the public can view this excavation, and at the same time the structures and features are protected.

In the Lower Temenos West, the west face of the west cryptoporticus wall was in danger of collapse. This wall has been reinforced, rebuilt and stabilized, and is strong enough to support elements of the West Triple Colonnade. This lends symmetry to the overall aspect of the site.

Publication

This year the publication of *Petra Great Temple, Volume II* appeared (Joukowsky 2007) and work continued on *Petra: Great Temple, Brown University Excavations 1993-2007, Volume III: Architecture and Material Culture*.

Coin Catalogue

The 759 coins recovered and registered from the Great Temple 1994-2006 excavations have been put into our catalogue database. The Coin Catalogue has been edited and is now available on the internet for researchers at *Open Context* (<http://www.opencontext.org>). Christian F. Cloke, Christian Augé, Deirdre G. Barrett and this author have been responsible for this successful achievement.

Bone Leg

During analysis of the bones, Sarah Witcher Kansa recovered a finished bone artifact, pictured in **Fig. 14**, which I took to Donna Strahan, Conservator at the The Sherman Fairchild Center for Objects Conservation, The Metropolitan Museum of Art. The following is Strahan's careful analysis.

"The Petra carved leg is 9.8cm long and was carved from a single piece of bone with a slight bend at the knee. When examined under magnification the typical bone structure of small vein holes are especially evident along the bottom edge of the upper thigh. The toes, now missing, were pinned to the foot by a copper-alloy pin. Whether this is a repair or the original method of fabrication is unclear. The remains of the pin extend out the front and back of the foot. It is severely corroded and has cracked the bone across the bottom of the foot.

The leg appears to be the handle portion of an object. The slight curve of the leg helps it fit very comfortably in a small hand. The toes would have extended upward below the hand. The top of the thigh is finished and has four decorative lines running around its circumference. There is a deep, round drilled hole into the top of the leg 3.5cm deep. It was likely drilled to hold the tang of an unknown object, perhaps a blade or comb. A large loss runs across the top of the thigh down the length of the hole. If the leg is held as a handle and a strong downward force



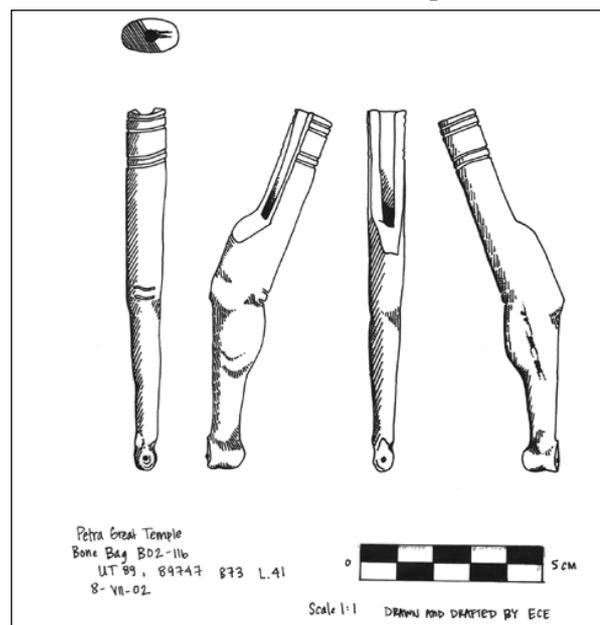
14. Bone handle, leg-shaped (Artemis W. Joukowsky).

was applied it may have caused pressure from the 'blade' to crack the bone, thus causing the loss across the top of the hole. The hole does not have any visible traces of metal corrosion such as iron, copper, or silver; so it is unclear what was held by the handle".

The leg was then drawn and drafted (**Fig. 15**) by Emily Catherine Egan, and handed in to the Petra Museum with the 2008 artifact catalogue.

An Imperial Inscription from the Petra Small Temple

Under the direction of Christian Augé, archaeologists working at Petra's Qaṣr al-Bint examined the Small Temple-Imperial Cult Building, located to the east of Qaṣr al-Bint. This structure was excavated in 2001-2002 by the Brown University Petra Great Temple team, under the supervision of Sara Karz Reid who published the results in 2005. Found lying face up was a marble four-line inscription that had fallen away from the south-west exterior wall of the Small Temple. Its secondary use had been as wall facing for the dado of the Small Temple. So it would be hidden from view, the French excavators covered the inscription over with earth, and the discovery was reported by Christian Augé to Christopher A. Tuttle, Associate Director, American Center of Oriental Research (ACOR) in Amman. On December 12 2007, Tuttle visited the Petra Small Temple, found the



15. Drawing of the bone handle (Emily Catherine Egan).

inscription plus a second fragment and photographed them (Fig. 16). He recovered the piece and carried the inscription to the American Center of Oriental Research in Amman for safekeeping. The author was informed of the discovery, and it was agreed that the inscription should remain at ACOR until it could be documented. On June 7 2008, Tuttle presented the inscription to Joukowsky who, in turn, asked Traianos Gagos of the University of Michigan to examine and analyze the fragment. Gagos confirmed that it was indeed Trajanic. Shown in Fig. 17, this Trajanic inscription was transferred with the 2008 catalogue to the Department of Antiquities at the Petra Museum. Its translation and significance will be published by Traianos Gagos in *Petra Great Temple Volume III*.

The autumn of 2008 was also marked by successful defense of Christopher A. Tuttle's Ph.D. dissertation at Brown University's Joukowsky Institute for Archaeology and the Ancient World. Tuttle's work is entitled *The Nabataean Coroplastic Arts: A New Approach for Studying Figurines, Plaques, Vessels and other Clay Objects*. This is a seminal study, and one in which



16. *Small Temple, Trajanic Inscription with impression left in the wall* (Christopher A. Tuttle).



17. *Small Temple, Trajanic Inscription* (Martha Sharp Joukowsky).

we take great pride.

In conclusion, the long history of use in the Great Temple West highlights the dense nature of the public buildings in the central city of Petra. It further reveals a degree of interconnectedness that is surprising. The easy flow of traffic through the Great Temple, the Baths-Palatial Complex and the Roman-Byzantine Bath Complex blurs their boundaries. The 2008 Great Temple excavations reveal a dense multi-storey urban space. Hopefully, further excavation will expose more of the architecture of this area west of the Great Temple. The project goals of establishing a chronology for the Petra Great Temple cultural sequence, and of attaining an understanding of the thriving Nabataean and Roman culture through these Brown University excavations has been attained. Through these syntheses we have identified a major Nabataean — Roman center — a monumental institution — resulting in a better understanding of religious, social, economic and political traditions. Petra was a developed capital capable of ruling the desert highway. Nabataean kingship and Roman leadership constituted the base of its elites. The

Great Temple is a remarkable reflection of this time period, and the extraordinary revelations of our 2008 season have proved crucial to our understanding of Nabataean Petra, its pervasive Romanization and its urban crystallization.

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PRELIMINARY REPORT ON EXCAVATIONS IN THE NABATAEAN TOWN AND ROMAN VICUS AT ḤUMAYMA (ANCIENT HAWARA), 2008

M. Barbara Reeves, Ian Babbitt, Katie Cummer, B. Vicky Karas, Brian Seymour and Andi Shelton

Introduction

Ḥumayma, ancient Hawara, is the largest Nabataean and Roman period site in the Ḥismā desert of southern Jordan. Two decades of archaeological work at the site (under the direction of John P. Oleson of the University of Victoria) have revealed much about the cisterns and aqueduct built in conjunction with the Nabataean town, as well as about the Roman fort (established in the early second century AD), five Byzantine churches (built in the fifth-seventh centuries AD), and the Abbasid family's qaṣr and mosque (built in the seventh century AD). In spite of all this past archaeological work, however, two fundamental components of the site's history remain poorly understood: the Nabataean and Roman period civilian communities.

In 2008 a new cycle of excavations was begun (under the direction of M. Barbara Reeves of Queen's University) with the goal of investigating the character and extent of Hawara's Nabataean and Roman period civilian communities and, more specifically, to see how the nature of these communities changed as the Roman military presence at Hawara evolved¹. Hawara, which had been founded as a Nabataean town in the first century BC, was chosen

as the site for the one of the earliest and largest forts built immediately following the creation of the Roman province of Arabia. Hawara's military garrison and civilian community would co-exist for a further 300 years, during which there were great changes in social and political conditions in *Provincia Arabia*. Based on Oleson's past work on the Roman fort (E116) and Reeves' past work on the *vicus* (the civilian community outside the fort), five critical periods in Hawara's history have already been identified which will now be targeted in order to trace the evolution of military - civilian relations at this site: (1) the Nabataean town before the arrival of the Roman garrison, (2) the imposition of a 500 man Roman garrison in the early second century, (3) the revolt of Zenobia and the departure of the garrison in the late third century, (4) the return of a much smaller garrison in the early fourth century, and (5) the abandonment of the fort in the late fourth century. For the 2008 campaign, we targeted four different areas around the perimeter of the fort where, on the basis of past probes and geophysical data, we hypothesized that we would find buildings dating from the Nabataean to the Byzantine periods, as well as traces of the *Via Nova Traiana*, or the earlier

1. The 2008 season of the Humayma Excavation Project took place between 4 May and 17 June 2008. The project was run under the aegis of Queen's University, Kingston, Ontario, Canada. Project funding was provided by the Taggart Foundation and Queen's University. Fellowships from ASOR (Heritage Fellowship, V.B. Karas) and CASOR (Mary Louise Mussell Fellowship, K. Hadfield) assisted with the participation of specific team members. The project director was M. B. Reeves. Field supervisors were Ian Babbitt (E121), Katie Cummer (E128), Barbara Fisher (E077) and Brian Seymour (E129 and E130). B. Vicky Karas served as the conservator, Andi Shelton as the ceramicist, and Devon Skin-

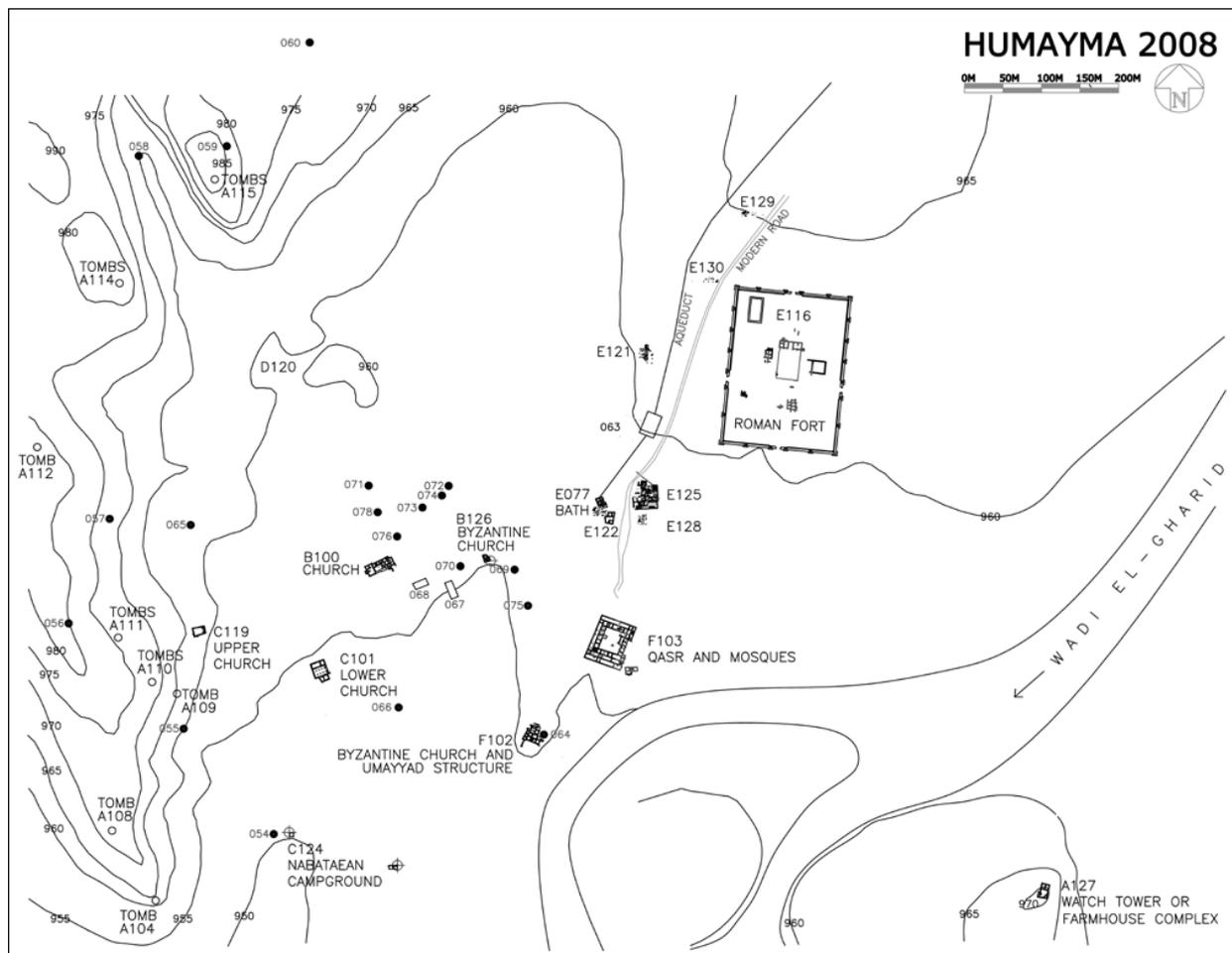
ner as the architect. Amer Bdour was the representative of the Department of Antiquities to the project. Profiles for the pottery plates were drawn by Sherry Hardin and inked by Andi Shelton. The Humayma Excavation Project is accredited by the Archaeological Standards Committee of the American Schools of Oriental Research and licensed by the Department of Antiquities of the Kingdom of Jordan. The Project Director is very grateful to Dr Fawwaz al-Khraysheh, Director General of the Department of Antiquities, and to Dr Barbara Porter, Dr Pierre Bikai, Dr Chris Tuttle, and all the staff at ACOR for their assistance with the project.

King's Highway.

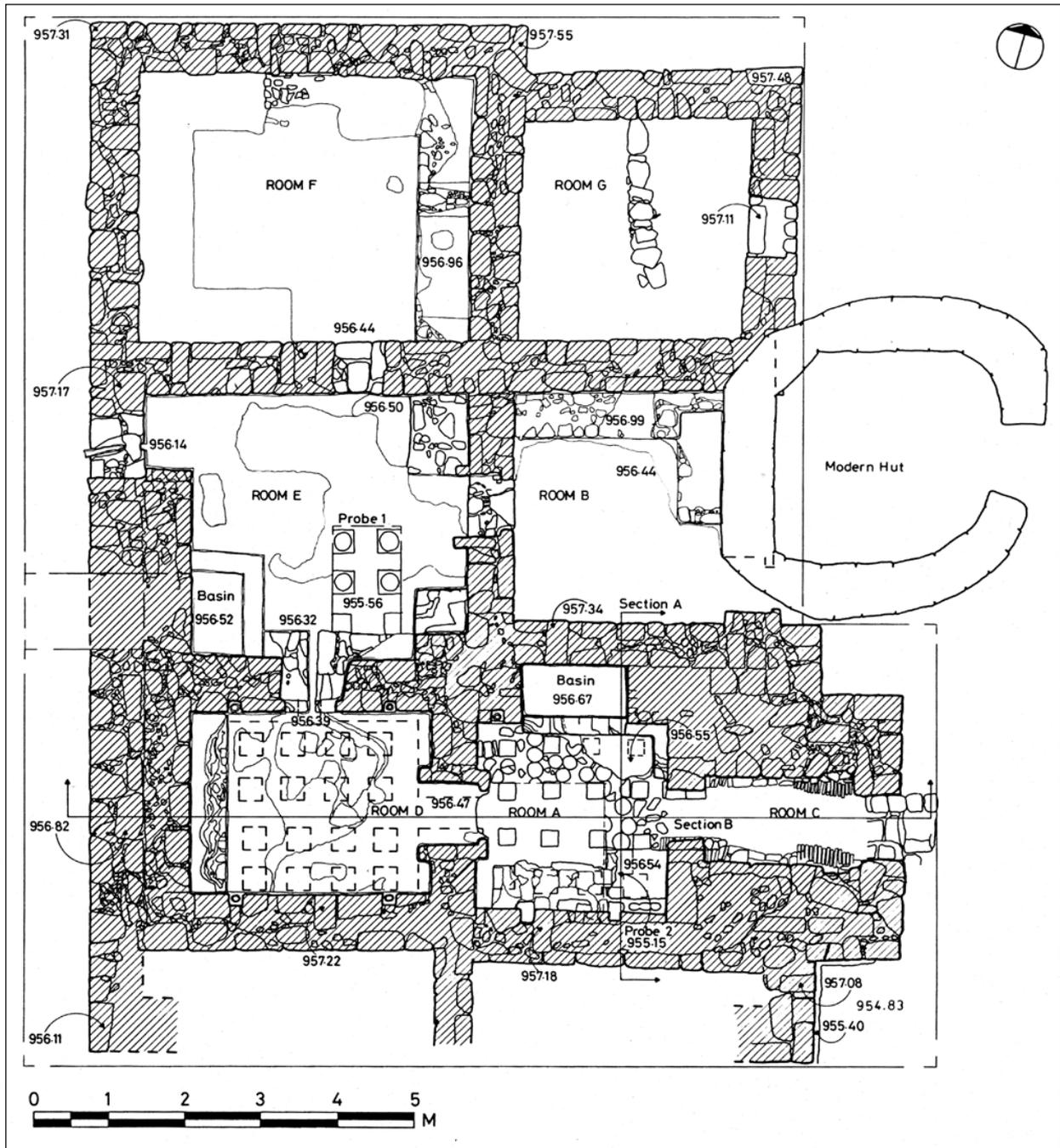
Field E077: Leveled Nabataean Structures and the Roman Bath-House (M.B. Reeves)

Field E077 was reopened in 2008 with the goal of learning more about high status structures in Nabataean Hawara and to examine their fate following the arrival of the Roman garrison and the construction of its bath-house in the early second century AD. The field is located *ca* 150m south-west of the south-east corner of the Roman fort (Field E116) and near to the Nabataean and Roman structures in Fields E122, E125 and E128 (Fig. 1). Above ground all that can be seen of the ruins in Field E077 is the Roman period bath-house which Oleson excavated as part of his Hydraulic Survey in 1989 (Fig. 2; Oleson 1990: 294-306; cf. Reeves 1996). At that time Oleson determined that the walls of the bath-house had been laid on top of the

walls of a partially dismantled Nabataean structure that had extended at least one meter south of the bath-house and whose walls (of sandstone blocks with diagonal trimming) had been more carefully constructed than the mortared rubble walls of the later bath-house. Subsequent small probes in 1996 and 2000 revealed the presence of another robbed-out wall (Fig. 3), indicative of a second Nabataean building, to the south of the south-west corner of the building under the bath. As excavations done at the site since 1989 had revealed that all other traces of non-hydraulic structures of Nabataean Hawara had been built over in subsequent centuries, it was decided to target the structure to the south of the bath in 2008. As no wall-lines were visible on the surface to the south of the bath it was hoped that this second Nabataean building would not have been built over. Moreover, its stone construction, which places it on par with



1. Plan of site with indication of ancient structures.



2. Plan of E077 after 1989 excavations.

the Nabataean shrine in Field E125 as opposed to the Nabataean mudbrick structures in Field E128 and elsewhere in Field E125, further suggested that this building would be of high status, perhaps a civic administrative structure or the house of an important individual.

Our strategy for the 2008 excavations in Field E077 was both to determine the extent of

the remains of the southern Nabataean building and to excavate fully (for the first time) the southern edge of the northern Nabataean building. For consistency with other excavated fields at the site a cardinally oriented grid of 6 x 6m squares was laid over the southern portion of the field (Fig. 4). The first square excavated encompassed the south-west corner of the northern



3. Sections of two Nabataean buildings in probe to south-west of bath-building in 2000.

building (which is oriented 20° west of north) and the previously exposed portion of the southern building, as well as the areas to their south, west and east. Subsequent squares bear numbers corresponding to the order in which they were opened for excavation.

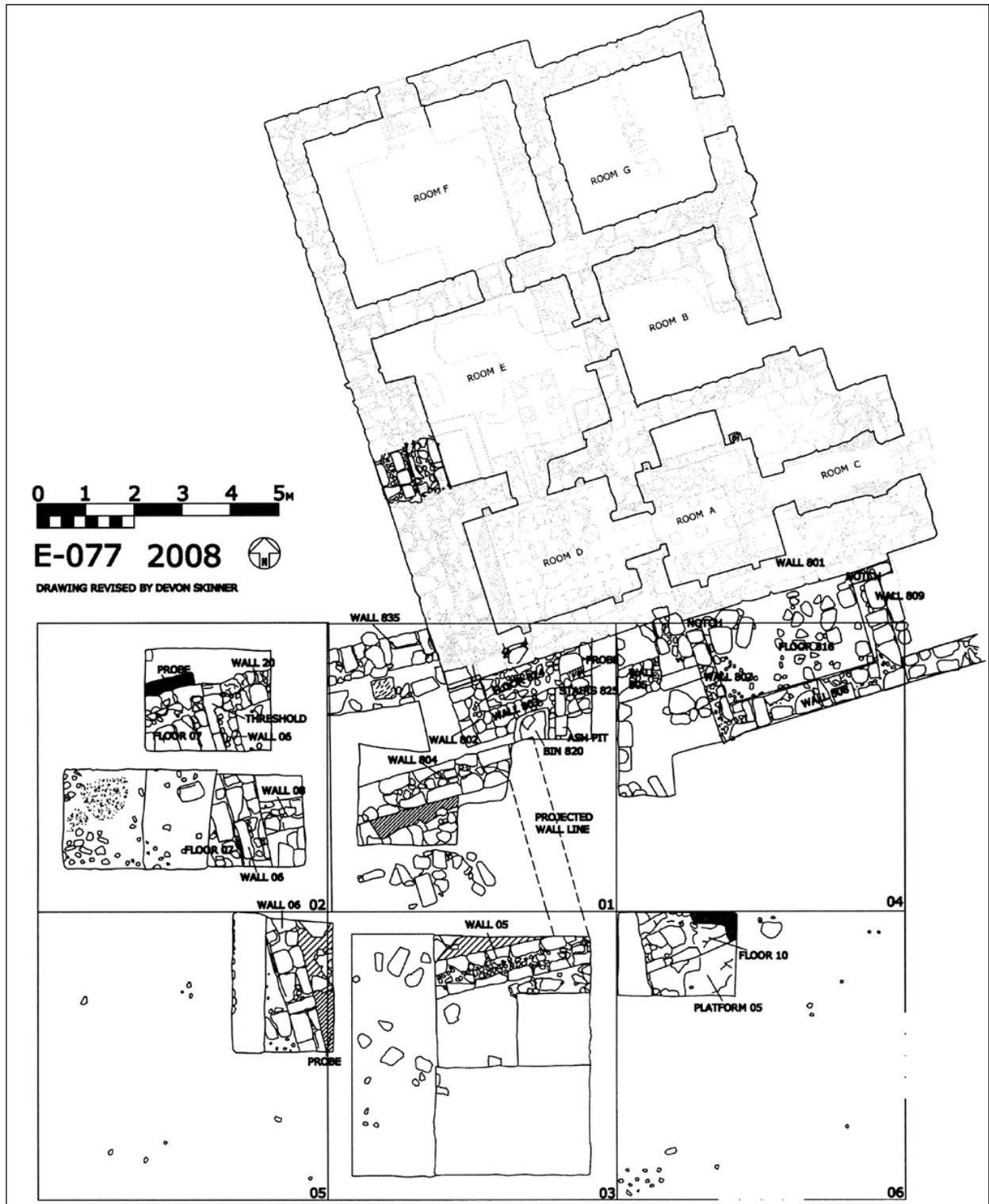
Before describing the findings of those excavations, a few comments are necessary regarding the fill over the buried Nabataean structures. The probes conducted in 1996 had suggested that the upper layers of the fill had been contaminated by twentieth century activities in this area which included the disturbance associated with an individual who had lived in this field between 1948 and the mid-1960s (Oleson 1990: 294), with the excavation of the bath-house in 1989, and with the bath-house's consolidation in 1996 (Oleson *et al.* 1999: 446-7). During the 2000 excavations at the site, the directors had therefore taken advantage of the presence of a bulldozer and dumptruck in order to remove the most

heavily disturbed layer of the surface against the south face of the bath. Probes conducted immediately afterwards suggested we had been successful in removing the contaminated overburden, a finding supported by the stratigraphy of our 2008 excavations in this area.

The 2008 excavations in this area confirmed that at least two finely constructed stone buildings were erected in this part of the site in the Nabataean period. The two buildings shared a common orientation of 20° west of north, which differs from the due north orientation of the Nabataean buildings in nearby Fields E125 and E128, suggesting that the E077 buildings formed part of a distinct neighborhood. It is also important to note that adjacent walls of the two buildings (in Square 01) come within *ca.* 0.20m of each other, probably meaning that they abut at foundation level just like the walls of adjacent Nabataean buildings in Field E125 (Oleson *et al.* 2008: Fig. 3).

The southern edge of the northern building extends 1.35m past the later southern wall of the bath on the west and 2.8m past it on the east, forming the southern edge of three rooms. The western room had a cobblestone floor and three short stairs leading to an external door in the center of the room. The central room has two symmetrical but unexplained notches in its side walls (just south of where the southern wall of the bath was inserted) and no visible door, meaning its entrance must have laid within the side of the room incorporated into the bath. Finally, two of the walls of a room to the east were also exposed but will not be explored until a future excavation season.

A corner of the southern buildings was first found in Square 01 (exposed in the fill of later Bin 820). From there traces of the building were revealed in Squares 01, 02, 03 and 05. To the west of the wall in Square 02 there is a carefully laid flagstone floor with a deep cobble packing (**Fig. 5**), indicating that this must once have been an important building. A further sign of the care taken in constructing this building are the thick layers of extremely hard-packed soil containing white nodules found beneath both the flagstone floor in Square 02 and the wall in Square 05. Although this soil is probably of natural origin (see discussion of Fields E129 and E130 below), by choosing to build upon it (rather than on sand as



4. Plan of E077 after 2008 excavations.

was often the case in Field E125), the builders gave this building a very secure foundation. The full plan of the building will have to wait until a

future season as the flagstone floor in Square 02 indicates that the building continues to the west and the wall in Square 05 indicates that it also



5. E077 Square 02: Floor 07, Walls 06 and 20.

continues to the south. As for the wall running enigmatically between Wall 06 in Square 02 and the western edge of the bath-house, it is a cruder construction than all the Nabataean walls, suggesting that it was not part of the original southern building.

Although the phasing of these buildings must remain tentative until foundation probes can be laid in sealed contexts, the excavations we have done suggest the Nabataean buildings were probably constructed in the first century AD. In the second century, in association with the construction projects of the new Roman garrison, the buildings in this area underwent a profound change. On the one hand, the buildings in this area were extensively robbed of their architectural blocks, and on the other hand, a bath-house for the Roman garrison was built overtop of parts of the northern building.

Oleson's original excavations of the bath had already shown that the bath's walls were built overtop of a robbed out Nabataean structure, but the extent of this robbing was only made clear in 2008. As **Figures 5 and 6** show, extant sections of the original walls of the southern Nabataean building and the western side of the northern Nabataean building have generally been robbed out to either the level of the floor or, lower still, to the level of the cobblestone foundations. It is also clear that sometimes the floor and wall stones have been completely taken away, as is the case on the north side of Square 02 (**Fig. 5**) or in the north-east corner of Square 05 where the expected continuation of Wall 05 from Square 03 was not found. Foundation probes done along the east face of Wall 06 in Square 05 (where the cross wall is missing) and along



6. E077 Square 02: Nabataean floor (07) and robbed-out walls (06 and 08)

the north extant edge of the flagstone floor in Square 02 suggest the southern building was robbed out after the first century AD. Moreover, the fill overlying the cobblestone floor in the south-west corner of the northern building contained fragments of hypocaust tiles, flue tiles and water pipes, along with pottery sherds dating from the late first to the second century AD, implying that this area against the bath's new southern wall lay open when the Roman period bath was being constructed. Given the extensive reuse of Nabataean architectural blocks in both the Roman fort and the Roman bath it is likely that the soldiers of the new garrison acquired some of those blocks by robbing out the Nabataean buildings in Field E077. It is also possible that the extant structures to the south and west of the new Roman bath were deliberately dismantled so that they could not block light from entering the windows (attested by glass fragments) of the bath's heated rooms (Room D and Room A), which, just as the Roman architect Vitruvius recommended, faced south and west to take in the afternoon sun (*De Arch.* 5.10.1).

In contrast to the extensively robbed out walls on the western side of the excavation area (Squares 01, 02, 03, 05 and the western side of Square 04), the walls in the north-east corner of Square 04 (corresponding to the truncated central room south of the bath) are preserved to a greater height (**Fig. 7**). The reason for these differences between the two sides of the field seems to be explained by the ceramics overlying the room's floor. Whereas evidence suggests that the structures on the western side of the field were abandoned in the Roman period,



7. E077 Square 04: Room of Phase I bath-house abandoned in Phase II renovations.

the ceramics found on Floor 816 suggest this area was abandoned in or after the Early Byzantine period. Moreover, since Oleson found evidence that Room A (the *calidarium*) in the bath-house had been renovated in or after the Early Byzantine period and that Room C (the *prae-furnium*) had been renovated in or after the Late Byzantine period (Oleson 1990: 304-5), it seems likely that our area was abandoned during one such revision of the bath. The floor level of this area (similar to that of the lowest floor in Room A) and the characteristics of the (later) southern wall of the bath (whose eastern section abuts the western section and is slightly south of it), further suggest that this area formed part of the Phase I bath-building. The first phase of the bath corresponds to the time when there were up to 500 soldiers living in Hawara's fort and using this bath. In contrast, the Phase II renovations correspond either to the fourth or early fifth centuries when a much smaller garrison occupied the fort, or to the subsequent period when the fort had been abandoned. Since this bath was intended for the use of the Roman soldiers, it makes sense that it would have been larger in Phase I when the garrison was larger. Next season we plan to look for more evidence of this larger Phase I bath-house to the east of this area, where the south wall of another room has already been observed just beneath the fill. We also need to determine the relationship of the platform and floor in Square 06 (overlain by fifth century ceramics) to the Byzantine and earlier phases in this area.

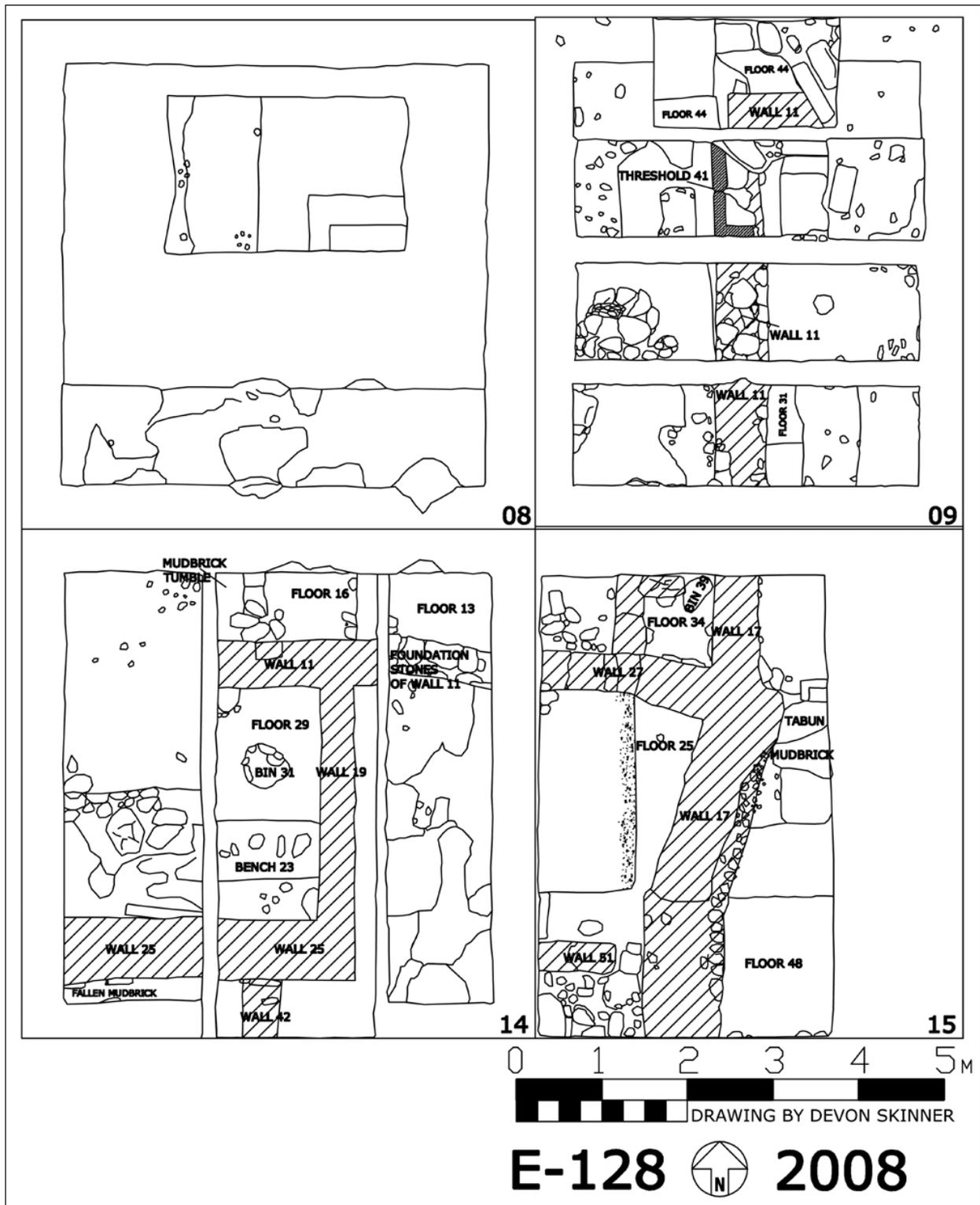
After the eventual abandonment of each of these areas, strata formed above them which record the subsequent uses of this field over the

next several hundred years. These strata reveal that the area was repeatedly used as a place to dump the ash pulled out of the bath's furnace when it was being cleaned. In addition there are other layers of bath dump which contain not just ash but also broken flue and hypocaust tiles suggesting that they relate to renovations carried out on the bath-house. Strata containing concentrations of lime nodules or gravel may also relate to such renovations (**Fig. 6**). Finally, there are occasional later floor levels and features (such as the plastered bin overlying Wall 803 in Square 01) which provide evidence of continued human activity in this area, perhaps also associated with renovations to the adjacent bath. The latest pottery overlying the highest floor consists of two sherds dating to the Abbasid period, but further evidence will be needed to determine if the bath-house was still in operation at that time.

Field E128: Nabataean and Roman Mudbrick Structure (M.B. Reeves and K. Cummer)

Field E128 consists of a small mound immediately south of Field E125. Given the proximity of this field to the Nabataean and Roman period structures in Fields E125, E122 and E077, we thought it likely that the mound would contain a structure of a similar date. Moreover, as there were no wall lines or large stones visible from the surface, we thought the field would probably contain another mudbrick structure, similar to those discovered in Field E125. To test these hypotheses, we probed the highest point in the mound at the end of our 2005 excavation season. This probe confirmed the presence of two walls from a mudbrick structure, possibly of Nabataean origin, which showed signs of successive use (Oleson *et al.* 2008: 317-8). To learn more about this structure and about how the field was used in the Nabataean, Roman and later periods, we began more extensive excavations in Field E128 in 2008. A grid of squares (6 x 5-6m, sequentially numbered from the mound's north-west to south-east corner) was placed over the field. For our first season, the square containing our original probe was more fully excavated (Square 15), and three new squares were opened to its north, west and north-west (**Fig. 8**).

Our 2008 excavations confirmed the presence of a building oriented on a north - south, east - west grid, just like the Nabataean and Roman



8. Plan of E128 after 2008 excavations.

structures in Field E125. Somewhat surprisingly, however, the construction technique of those walls did not directly match any of many con-

struction techniques already observed in E125's walls or elsewhere on site. As **Fig. 9** shows, the walls of E128 contained an eclectic mixture of



9. Mudbrick walls and later 'bin' over debris in north-west corner of Square 15.

building blocks. Both mudbricks and ashlar were laid together in a seemingly random fashion on top of the building's multi-course cobblestone foundations. Moreover, mudbricks used in the same section of wall sometimes varied considerably in color and fabric, suggesting they had been made in at least three separate batches. The impression is that the building in E128 had been constructed from building blocks taken from all over the site.

The reason for the building's eclectic construction materials may relate to the date of its construction. A sherd of NPFW-3b pottery found in a foundation probe outside a corner of the building suggests the walls were built sometime after the third quarter of the first century AD. A large concentration of semi-restorable vessels

and pottery sherds (Fig. 10) found in an external corner of the building (Square 15, north of Wall 27 and west of Wall 17) further suggest the building was constructed before the middle of the second century AD. This pottery collection is discussed more fully below in the ceramicist's report. The ceramics were found immediately west of three mudbricks laid at a right angle to the corner (Bin 39; Fig. 9). Below these mudbricks was a 0.5-0.6m thick layer of building debris which sat on a probable first century soil layer. Although the full archaeological context of this assemblage cannot be known unless we remove the baulks to its north and west, the lack of any complete vessels and of a related cooking or domestic context suggests that the vessels and other objects represent a dump of broken or unwanted objects thrown outside the walls of the building.

Putting all of this information together, it seems that the building was constructed sometime between the third quarter of the first and the middle of the second century AD. Its construction from such an eclectic mixture of building materials may suggest that it was constructed from recycled stones and mudbricks taken from damaged structures located around the site. Similar recycling of building materials is observable in Hawara's Roman fort (E116) which was constructed soon after AD 106 from stones taken from the pre-existing Nabataean town. Whether



10. Semi-restorable vessels found together in E128 dump.

the structures in the Nabataean town had been knocked down by the Roman army (cf. Schmidt 1997) or by an earthquake (perhaps in 113 / 114; Russell 1985) is still not clear. It is likely, however, that E128 was built after the town had been damaged by a cataclysmic event.

As originally constructed, the external edge of the building ran north-south along the north side of Square 14 to the center of Square 15 where it turned north and ran almost to the top of Square 09 where it turned eastward. All of Square 08, as well as the northern quarter of Square 14, the north-west corner of Square 15, and the western half of Square 09, is either outside the building or in a courtyard. The only possible features in this area were the mudbricks laid out in the corner of Square 15. A door in the northern half of the north-south wall in Square 09 led from this external / courtyard area into the rooms of the building. There was one large room in the eastern half of Square 09 and at least four rooms south of the northern perimeter wall in Squares 14 and 15. The two northernmost rooms in Square 14 and 15 are less than 3m north - south and the easternmost room (straddling Squares 14 and 15) is *ca.* 4m east - west. Almost half of the north-south stretch of the westernmost room is taken up by a wide mud-plaster bench and there was a bin or pit cut into the room's floor. Another wall extends southward from the bottom of Square 15 indicating that more rooms lie in that direction. Based on the direction of walls and the projected size of rooms, it is also likely that the building continues to the west of Square 14, to the east of Square 09 and, by projection, to the east and south of Square 15.

The pottery sherds found on the earliest floors and bench inside the rooms are consistent with the building first being used in the second century AD. This period of use probably came to an end when an earthquake caused great damage to some of the walls in Squares 14 and 15. This can be seen most clearly in the plan (Fig. 8) where the southern extent of Wall 17 in Square 15 has shifted considerably westwards. At present there is not enough data to speculate on the date of this earthquake. The tabun and bin on the east side of Wall 17 were much higher than the building's original floor levels, indicating subsequent use later in the second century (to judge by the ceramics) or in the early third cen-

tury (to judge by a coin). More excavation will be required to finalize the dating of this reuse and to determine if this reoccupation pre-dates or post-dates the earthquake. After it was last occupied in the third century, Field E128 seems to have been used as a dump up until the sixth century. There are a great deal of animal bones, seashells, ash and artifacts associated with this dump. Moreover, the dump is somewhat stratified, being sealed on several occasions by layers of decomposed mudbricks which have probably fallen from the adjacent walls. A selection of the artifacts found in this dump is included in the catalogue at the end of this section. After the sixth century, there is no evidence that there was any activity in this field until the middle of the twentieth century. According to our bedouin workers, the late Abu Adeg had lived in a tent in this area at that time. Three postholes pushed into the decomposed mudbrick (Fig. 11), a line of stones and a large quantity of camel bones just below the surface may date to his occupation. Finally, it must be noted that the occupational history of this field has been obfuscated by a series of rodent tunnels running throughout and between the decomposed mudbrick layers (Fig. 11). Indeed, on more than one night, rodents dug into the areas we had just cleared and we returned in the morning to find a hole in our excavation area with a pile of pottery sherds pushed out of its interior (Fig. 12).

Catalogue of Objects from the E128 Dump

Abbreviations: D: Diameter; H: Height; L: Length; MPL: Maximum Preserved Length; Th: Thickness; W: Width.

Fig. 13.1. H05.0264.01. Copper alloy cosmetic instrument consisting of a rod with a bulbous lower termination and a leaf-shaped upper termination (whose tip is lost). The square shaft has been twisted for a neat, decorative spiral form. MPL: 11.2cm; W: 1cm; Th: 0.2-0.5cm. Found in E128.15.26. Associated ceramics date to the late first to third century; phasing probably second-early third century.

Fig. 13.2. H08.0005.02. Round flat worked shell disk with a hole drilled through the center; broken. The hole has been drilled from one side only. D: 1.8cm; hole D: 0.3cm; Th: 0.25cm; < 2 g. Found in E128.14.01. Associated ceramics date from the late first to late third or early



11. Decomposed mudbrick layer with old animal burrows and possible posthole, E128 Square 14.

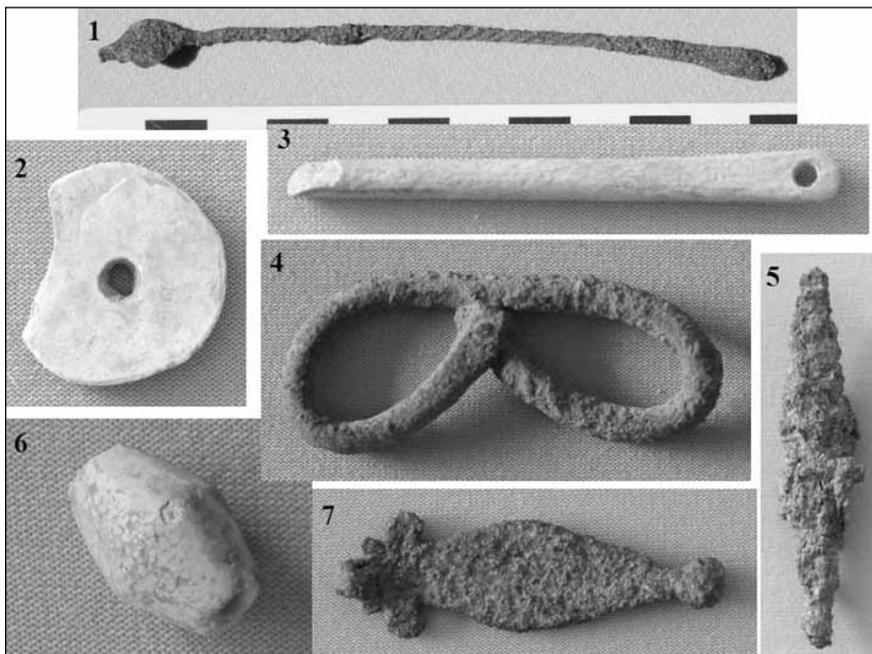


12. Pilgrim flask fragment pushed out of a new rodent hole in E128.

fourth century AD.

Fig. 13.3. H08.0063.02. Eye and part of shaft of a bone needle. Sides are relatively flat. MPL: 5.1cm; width tapers from 0.45cm (at eye) to 0.35cm (at break); Th (at eye): 1.5cm; Th (at break): 0.35cm; hole D: 0.2cm; < 2 g. Found in E128.08.01. Associated ceramics date from the first to third century AD; phasing probably second century.

Fig. 13.4. H08.0013.01. Copper alloy object made from a rounded piece of wire folded into the center from both ends and punched flat and riveted to form a shape like a capital "B" (i.e. flat on one side and curved on the other). The object may be a string or harness attachment. L:



13. Objects from E128 dump.

4.8cm; W: 1.9cm; Th (wire): 0.3-0.4cm. Found in E128.14.03. Associated ceramics date from the late first to fourth or fifth century.

Fig. 13.5. H08.0253.01. Corroded iron arrowhead; pointed tip broken. Measurements after cleaning: MPL: 6.6cm; MPL (head): 4.5cm; head Th tapers from 1.5 to 0.4cm (at broken top); tang L: 2.0cm; tang D: 0.5-0.7cm; 10 g. Found in E128.08.02. Associated ceramics date from the late first to early third century AD.

Fig. 13.6. H08.0002.01. Worked bone bead perforated through the length with a hole. Melon shaped with widest section (W 0.85cm) midway between two holes; five flat faces taper from midline to each end. L: 0.12cm; W (at center): 0.8cm; W (at each edge): 0.5cm; hole D: 0.2cm; < 2 g. Found in E128.14.02. Associated ceramics date from the late first to second century.

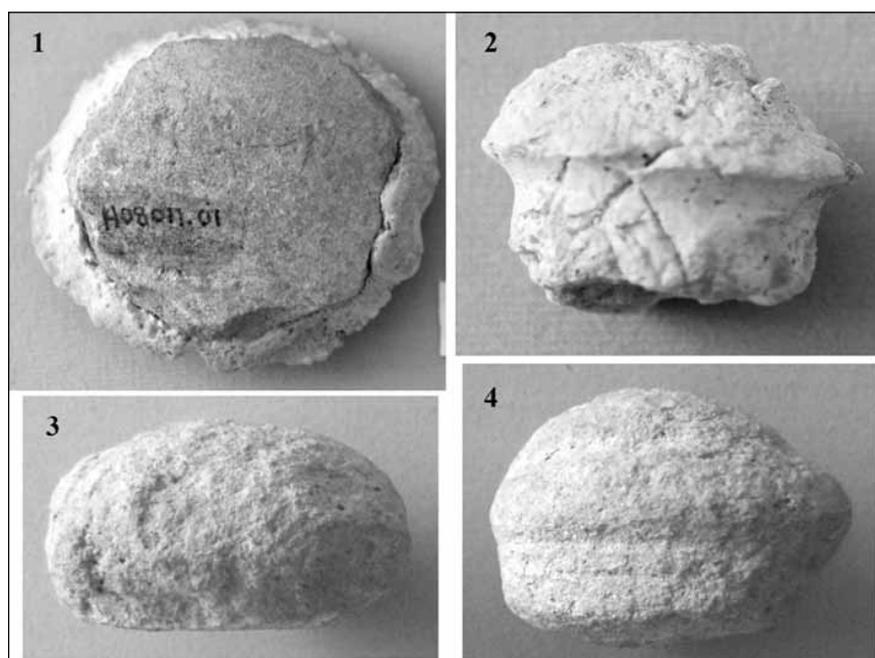
Fig. 13.7. H08.0005.01. Copper alloy pendant constructed from a piece of sheet metal. Thin tang bent at top for suspension extends 0.3cm both above and out from flat plane of body. Rhomboid-shaped with two projecting arms above. Spherical knob at lower end. knob D: 0.5cm; L: 4.1cm; W (central bulge): 1.2cm; W ("arms"): 1.25cm; W (above bulge): 0.35cm; W (loop): 3.5cm; body Th: 0.2cm. Perhaps attached to military dress or a horse harness (cf. James 2004: 91). Found in E128.14.01. Associated ceramics date from the late first to late third

or early fourth century AD.

Fig. 14.1. H08.0011.01. Jar stopper formed from a reworked body sherd "plug" covered by a circular plaster sealant with a curved top. The sealant runs partway down the sides of the plug. The coarse ware body sherd has been reworked into a roughly round shape. The attached plaster sealant is very hard and retains the impression of the jar which it covered. The ceramic plug has pale red fabric (10R 6/3) with very pale brown slip (10YR 7/3). On the surface the plaster sealant appears to be whitish with many small voids. Plaster D: 5.1-5.6cm; ceramic plug D: 4.1-4.4cm; total thickness varies from 0.9cm (on one edge) to 1.9cm (in center); plaster thickness *ca.* 0.7cm; plug thickness: *ca.* 0.9cm; 48 g. Found in E128.14.01. Associated ceramics date from the early second to fifth / sixth century.

Fig. 14.2. H08.0271.01. Complete vessel stopper crudely molded from hard sandy white plaster. Top is convex; bottom concave. Bottom shows imprint of vegetative material, probably straw (stalks 0.1cm W). Th: 2.0-2.35cm; head D: 2.8-3.0cm; shaft D: 2.5cm; 14 g. Found in E128.08.06. Associated ceramics date from the first to third century AD; phasing is probably first / second century.

Fig. 14.3. H08.0138.01. Friable yellow sandstone vessel stopper with one flat face and one curved face. Th: 3.0cm; D (flat face): 4.1cm, D



14. Vessel stoppers from E128 dump.

(curved face): 5.3cm (at widest), tapers in towards each face. 36 g. Found with similar object H08.0138.02 in E128.09.10. Associated ceramics date from the late first to early third century; phasing probably late first to early second century.

Fig. 14.4. H08.0138.02. Sandstone vessel stopper with one flat face and one curved face. In profile, object forms two halves, with widest part of the object in the center (D: 5.9cm). Above this, object has a rounded top; below this, object is roughly flattened. Plug D: 4.8cm; plug H: 1.1cm; object Th: 4.4cm; 192 g. Found with similar object H08.0138.01 in E128.09.10. Associated ceramics date from the late first to early third century; phasing probably late first to early second century.

Fig. 15. H08.0179.02. Head of baboon broken from a larger figurine. Deeply pierced eyes, extended snout ending with slightly opened mouth. The back of the head slopes gently towards the back of the neck. Neck is hollow. Back of head is worn and possibly chipped. Coarse red fabric (10R 5/6) with gray slip (5YR 5/1). MPH: 2.7cm; W (ear to ear): 1.8cm; L (back of head to mouth): 2.9cm; Vessel wall thickness (measured at break) 0.3cm. Further discussion in ceramicist's report. Found in E128.08.02. Associated ceramics date from the first to fourth century; phasing is probably second to third century.

Field E121: Roman Platform and Early Byzantine Structures (I. Babbitt and M. B. Reeves)

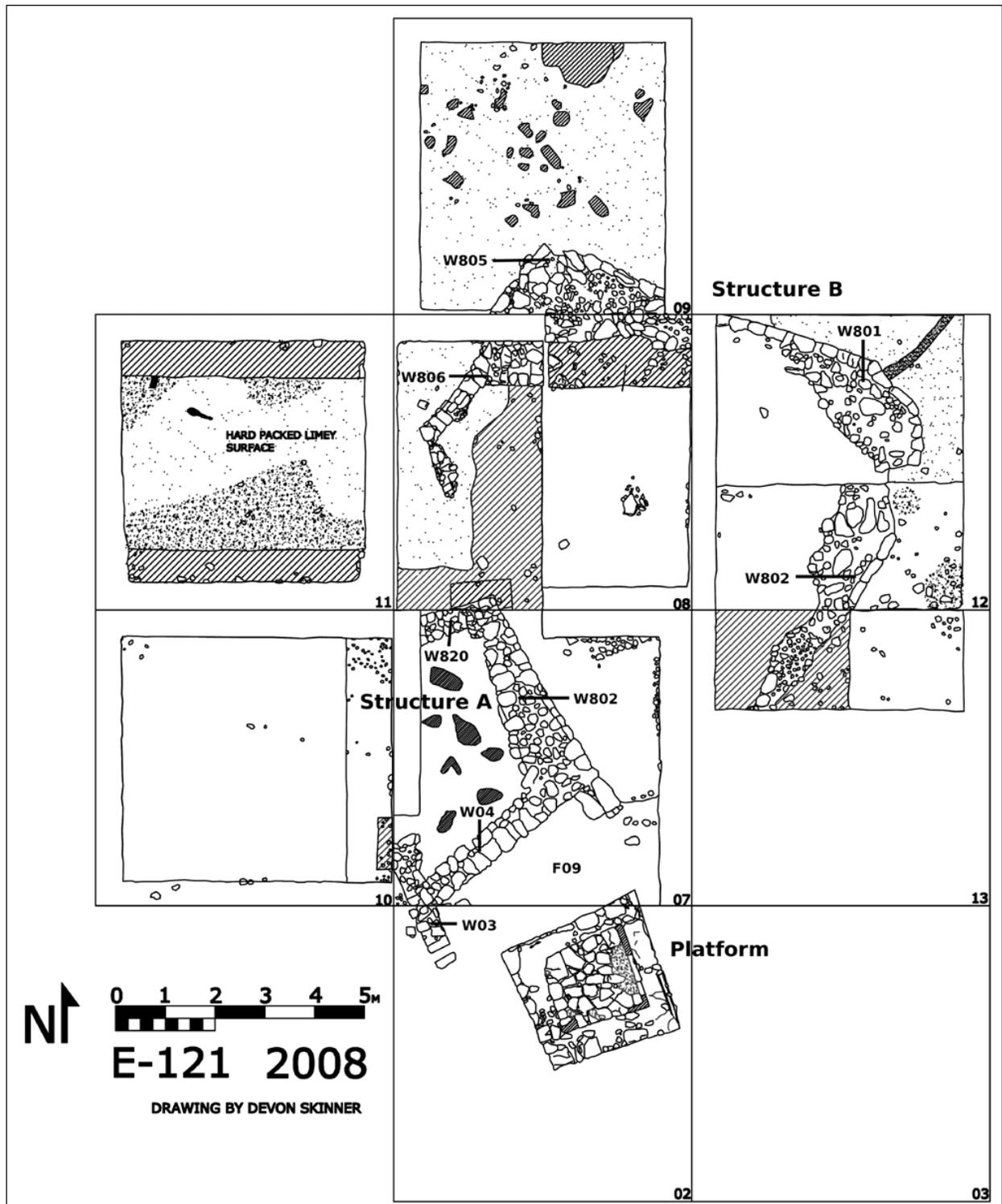
Field E121 is located on a west-south-west downward slope of the shallow mound *ca.* 20m west of the division tank of the Nabataean aqueduct and *ca.* 70m north of Nabataean Pool / Reservoir 63. This field was originally opened in 1995 in an attempt to uncover further Naba-

taean hydraulic infrastructure. The area was selected because of several pieces of architecture jutting out from the shallow slope. After three weeks of excavation in 1995, this architecture was uncovered and included a large stone platform and a few associated walls. Neither were associated with the hydraulic works of the site. The associated pottery and a collection of 32 bronze coins pointed to a fourth to fifth century AD occupation. With excavation not producing the desired results, E121 was closed for the remainder of the 1995 season. In 2008, once the research objectives of the project had shifted towards understanding the *vicus*, excavation at E121 was renewed with the hope of fully uncovering an Early Byzantine period construction. Such a structure would fill in a gap in the *vicus*' chronology and would be helpful for determining the character of the *vicus* in the Early Byzantine period after a smaller garrison had returned to occupy Hawara's fort.

Excavation in 1995 (not previously reported in *ADAJ*) focused primarily along the southern edge of E121. The most interesting discovery was the stone platform located in Square 02 (**Fig. 16**). To the west of the platform was a short, robbed out stone wall (Wall 03), which runs parallel to the west edge of the platform and proceeds north-west through Square 07. To follow the wall, a 2m wide probe was excavated in Square 07 along its southern edge. Excavation here revealed another short stone wall (Wall 04), almost perpendicular to and partially bonding with Wall 03 (**Fig. 17**). Attached to the eastern edge of Wall 04 was a truncated southern extension of a wall, represented by only two foundation stones. This presumed wall appears to have been opposite Wall 03 extending south towards the north-east corner of the stone platform. To understand more fully the relationship shared between these walls and the platform, the baulk between Square 02 and 07 was removed. No new architecture was revealed, but a collection of bronze coins, all dating to the fourth and early fifth century (up to the reign of Arcadius) was found. All the coins were very near to each other, suggesting they were dropped at approximately the same time. The coins were found between W03 and the north-west corner of the platform and about 0.2m above a beaten earth floor (Floor 09), indicating that they were



15. Terracotta baboon head from E128 dump.



16. Plan of E121 after 2008 excavations.

dropped shortly after the abandonment of E121. Subsequent foundation probes along the face of Wall 04 produced Early Byzantine pottery, suggesting that the structures in this area had been

constructed in or after the fourth century. Given that an Early Byzantine hydraulic structure was not considered a priority for excavation in 1995, this field was then closed.



17. Squares 02 and 07 at end of 1995 excavations.

In 2008, the project returned to E121 with altered intentions and a renewed interest in the peculiarities of the structures. We initially sought to define the known structures further and determine more clearly their phasing, construction methods, orientation and possible function. With this in mind, a 6m x 6m grid was laid over the area and excavation was continued in Square 07. This revealed a large, three course north-south stone wall (Wall 802), which continued into the north baulk of Square 07. Removal of that north baulk revealed another stone wall (Wall 820), running opposite to Wall 04 and bonding with Wall 802. Subsequent excavation in Square 10 failed to find the continuation of Wall 820 or Wall 03. Collectively Walls 03, 04, 802 and 820 form what is left of Structure A (**Fig. 18**). This is an entirely stone structure, built of a mixture

of ashlar blocks, boulders, and cobbles, held together with mud packing. Although this structure has been heavily robbed out, the remains of the walls suggest that it once contained at least two square rooms that would have been oriented *ca.* 20 to 30° west of north.

The most well-preserved and well-constructed segment of Structure A is the bonded corner of Walls 802 and 820. The construction is entirely of large ashlar blocks forming about a 95° angle (**Fig. 19**). Wall 802, however, between this northern, bonded corner and its southern corner, bends becoming slightly concave and creating a *de facto* 105 degree angle at the north corner. The wall also begins to contain irregular boulders and cobbles and a few ashlar, diminishing in quality by the corner of Wall 04 and Wall 802. Similarly, Wall 04 and Wall 03 contain mostly boulders and cobbles, with ashlar used only oc-



19. Northern corner of Structure A, E121.



18. Structure A, E121.

asionally in their foundations. The wall tumble, present in the interior of the structure also suggests that the upper courses were constructed of boulders and cobbles, as opposed to ashlar or mudbricks. The tumble was highly concentrated in the southern interior section, just north of Wall 04. Tumble in the northern section, closer to Wall 820 was far less concentrated, possibly indicating that the northern section of Structure A did not collapse but was dismantled.

The architecture of Structure A is of particular interest. Unlike many other structures in the *vicus* (e.g. E125 and E128), Structure A does not show any signs of mudbrick construction. The quality of the stonework, however, clearly varies. Structure A's northern section displays exceptional quality, most comparable with the fort's interior structures, such as the Latrines or *Principia* (e.g. Oleson *et al.* 2003: 40-45). The southern section of Structure A, represented by Wall 03, 04 and the south half of 802 is cruder, seen clearly in the stonework and W802's concavity. This disparity between the north and south halves likely suggests a partial reconstruction of the building with the northern half being the earlier portion. It seems most plausible that this reconstruction occurred in order to make use of the likely pre-existing stone platform, immediately south of Structure A, as a floor. The beaten earth floor (Floor 09), uncovered in the space south of Wall 04, and the platform's surface have very similar absolute elevations and form an unbroken surface. With this in mind, the concavity of Wall 802 might have been intentional; the robbed out southern extension of Wall 802, as suggested by the foundation stones uncovered in 1995, would have passed through the platform if Wall 802 was not concave. The slight concavity, however, ensures that any southern extension goes around the platform's north-east corner.

Structure A's interior ceramics help date its collapse. The tumble produced a typical Early Byzantine lamp base and a few other diagnostic cooking pot fragments, dating from the fourth to the fifth centuries. The thin layer of soil immediately below the tumble and resting on top of the interior beaten earth surface (Floor 814) produced pottery sherds dating to the fourth century AD, which probably represents the latest occupation of Structure A. The collection of

bronze coins dating up to the early fifth century AD found 0.2m above Structure A's floor level (in soil from a tumble-free area) suggest this structure had been abandoned by the fifth century. Taken together, the accumulated evidence suggests that Structure A's occupation and abandonment were concurrent with the reoccupation of the fort (in the early fourth century) and its final abandonment (in the late fourth century).

The phasing of Structure A suggests its existence was somehow dependent on the fort, but there is no evidence to indicate whether it was a military or civilian structure. There is also no conclusive evidence suggesting what function this building served. So much of Structure A has obviously been robbed out that it is now impossible to guess at its original plan. None of the pottery sherds found over the floor were from vessels crushed *in situ*. The predominance of coarse kitchen and storage wares among the scattered sherds on the floor hints that there was a food storage and preparation area in the vicinity, but no other artifacts or installations relating to such an area were found, except perhaps for the shallow pits sunk through Floor 814. These pits were devoid of any finds which could point to their function. A tentative hypothesis is that they might have once been used to support the base of vessels, but the shapes of the pits cannot provide conclusive evidence.

Excavation to the north-east of Structure A also revealed a second, large, ring-like stone construction, Structure B, which stretches through Squares 08, 09, 12 and 13 (**Fig. 20**). Structure B's construction is far cruder than anything in Structure A. Its perimeter wall consists of cobbles, boulders and some recycled ashlar, laid in a mixture of dry masonry and mud packing. There is extensive tumble all around the interior of the structure with far less on the exterior. At its widest, between Wall 806 in Square 08 and Wall 802 in Square 12, Structure B is 9.23m wide. It was probably not roofed. Additionally, the tumble, as seen particularly in the north probe of Square 08, suggests a wide but rather short wall. Moreover, Structure B clearly post-dates the abandonment of Structure A as indicated by a large ash layer, stretching through Squares 08, 09, 11 and 12, and proceeding beneath the walls of Structure B, but not those of Structure A. Ceramics from the ash date to the fourth century

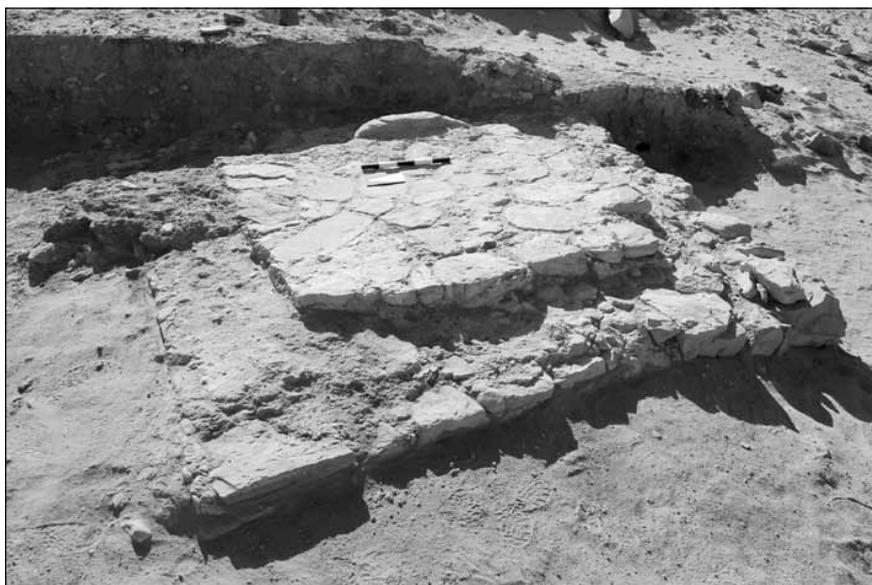


20. E121 overview from north-west; Structure B in foreground.

AD, contemporaneous with Structure A. On the other hand, ceramics collected from beneath the wall tumble in Square 08's northern probe date from the fourth to the fifth centuries AD. Considering the size of the structure and its lack of finds, these preliminary excavations seem to indicate that Structure B likely functioned as some sort of animal pen. It seems likely that while Structure B was in use, parts of Structure A were also still standing, particularly the north corner of Structure A, which possibly could have been used to close Structure B.

Contrary to our expectations when reopening Field E121, the fourth century AD occupation was not the first occupational phase uncovered

in our 2008 campaign. The very distinct north corner of Structure A, coupled with the clear reuse of the platform as a floor, indicates there was a previous phase of occupation. The platform is likely the primary feature of this earlier period. It is a relatively square stone structure with two apparent courses: a larger cobble and boulder lower course held together with a light grey mortar, and a smaller flat upper course covered with a thick, white pebble-filled floor plaster. The two courses create a stepped appearance (Fig. 21). The use of mortar as a binding agent is also unique to the platform among the E121 structures. The larger lower course of the platform is 2.95m wide on its north and east edges



21. E121 platform after excavation.

and 2.62m wide on its south and west edges. These measurements create a slightly skewed quadrilateral, which extends further out at its north-east corner. The upper course, in contrast, is only 1.76m wide along its south and east edges and 1.62m wide along its north and west edges. These dimensions form a second slightly obtuse trapezoid, which is missing part of its north-west corner.

One of the most fascinating characteristics of the platform is that its most well-preserved segments, the lower north and east edges, measure almost exactly 10 Roman feet. The Roman foot (0.296m) was the basic unit of measurement used throughout Hawara's Roman fort (Oleson *et al.* 2008: 318-32). Its application in a structure outside the fort both dates the platform to after the Roman occupation of the site in the early second century AD and implies the involvement of Roman soldiers in its construction. Without a probe through the platform, the exact date of its construction is difficult to determine. Considering the quality of the stonework both on the platform and on the north corner of Structure A, and the unique use of mortar, it seems probable that the platform and the first phase of Structure A date to the first occupation of the fort (mid second to late third century AD). There was considerable activity in the *vicus* during this first occupation, as evidenced by the construction of the garrison's bathhouse (in E077), a house (in E122), and an *insula* and community shrine (in E125).

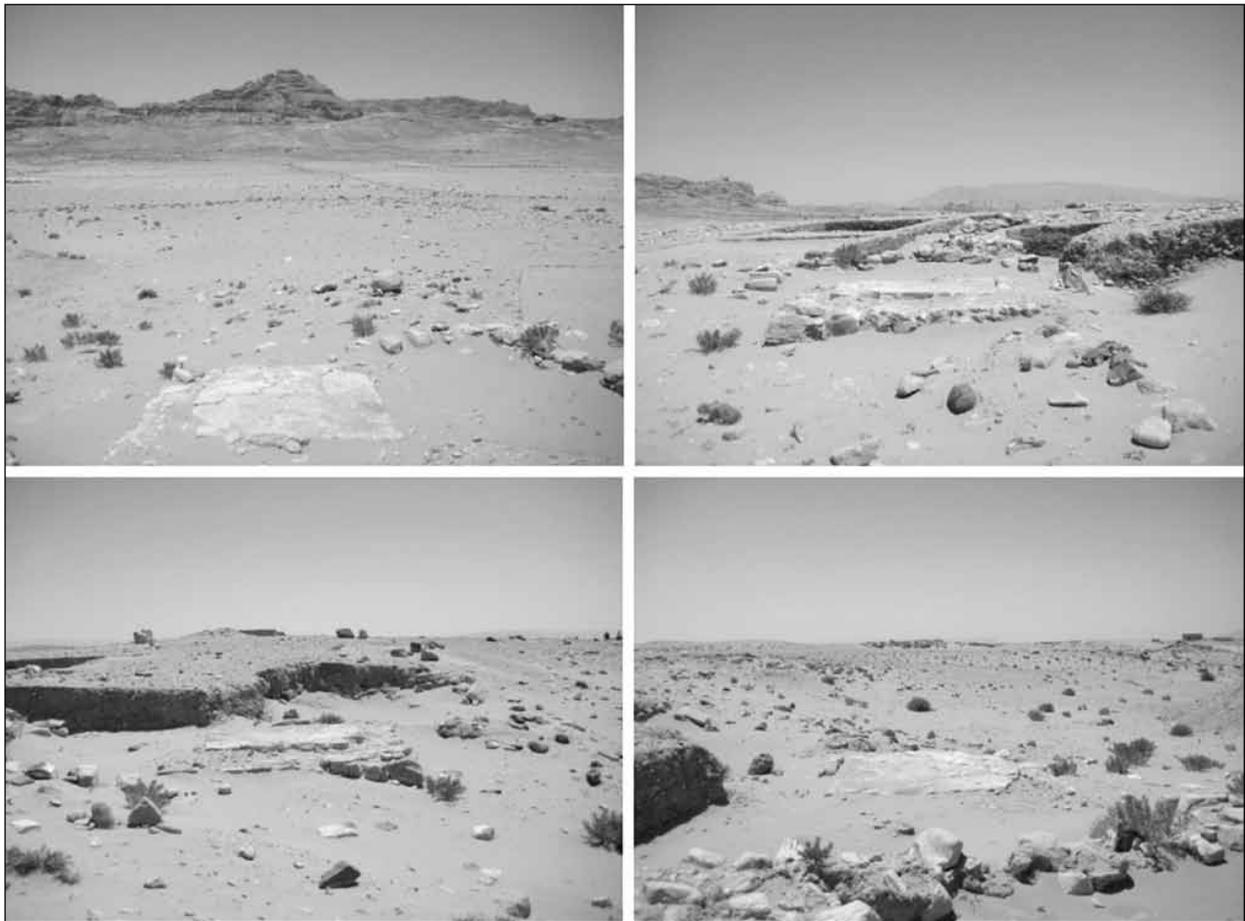
It is difficult to determine the function of E121's platform when the area immediately around it has been so heavily disturbed by later construction. If the soldiers built it for a military purpose, its location (just west of the west gate of the fort) suggests the platform might have been a raised tribunal in the fort's military parade ground (the *campus*), used by the commanding officer when reviewing troops parading or practicing their drills (cf. Webster 1985: 228-9). If, however, the Roman period inhabitants of the site had built the platform for a civic function, it might have held betyls or a commemorative monument intended to be viewed by people entering the town from the north. In regard to this theory, it is interesting to note that of the four possible backdrops to the platform (Fig. 22), the one that would have been seen by

someone passing on the eastern side of the platform (where the *Via Nova Traiana* is thought to have run) is aligned with the very same hill that is the focus of the community shrine in E125 (Reeves forthcoming). Finally, it is also possible that the platform was the base of an altar or religious platform, the presence of which might indicate an associated structure nearby, possibly still buried in the deep fill to the platform's north-east. This area will be probed in a future season to test this theory.

One other interesting characteristic of both the platform and the carefully constructed corner of Structure A is that they are oriented approximately 20° west of north. This is very different from the orientation of the fort or of the structures in Fields E125 or E128, but it is the same orientation as the Nabataean and Roman structures in Field E077. The reason for this overlap is not yet clear. The two fields are far apart, so the similar orientation may be accidental if the structures in each field are oriented in terms of local factors. On the other hand, the possibility that this orientation is indicative of some organizing principle at the site warrants further investigation.

Fields E129 and E130: Ancient Roadways, Ploughed Fields and the Site's Most Northerly Structure (M. B. Reeves and B. Seymour)

Fields E129 and E130 were opened in an attempt to confirm the existence of the *Via Nova Traiana* at Ḥumayma and to trace its route through the ancient community. The *Via Nova Traiana*, *Provincia Arabia's* most important north-south road, was built over the ancient caravan route known as the King's Highway. Compelling evidence that Ḥumayma had been located along these routes is provided by the *Tabula Peutingeriana*, which shows Haurra (Ḥumayma) on the only road between Aila ('Aqaba) and Petra, and by milestones and intact paved sections of the road found just to the north and south of the site (Graf 1995). Exactly where the road entered Ḥumayma, however, is not known nor is its route through the site. Finding definitive evidence of the *Via Nova Traiana* or the King's Highway at the site of Ḥumayma would add much to our knowledge of this ancient community. It would allow a better understanding of the town's layout, provide clues to the locations



22. Backdrops to the E121 platform from the north-east (top left), south-east (top right), south-west (bottom left) and north-west (bottom right).

of infrastructure such as pipelines and subsidiary roads, and allow predictions of where commercial and military zones or important private or civic structures might be located.

As early as 1990, Oleson had hypothesized that the *Via Nova Traiana* would run from north-east to south-west through the site in order to enter in tandem with the aqueduct and exit without having to cross over the Wādī al-Ghārid (Oleson 1990: Figs. 1, 2). The hypothesized entry point for the *Via Nova Traiana* was based on the facts that it and the aqueduct had been observed to run in parallel north of the site and that the aqueduct must enter the site from the north-east in order to supply both the fort and town's reservoir (063). Additional evidence for the route of the *Via Nova Traiana* was provided by my 2000 excavations in Field E125 which found that the Nabataean pipeline bringing aqueduct water to the shrine ran under the modern dirt

road through the site just north of E125 (Oleson *et al.* 2008: Fig. 2). It was hypothesized that an ancient road, possibly the *Via Nova Traiana*, was located in the same position (Oleson *et al.* 2003: 49). Unfortunately, however, this hypothesis could not be demonstrated without damaging the modern route through the site. Then, in 2002, a geophysical survey, conducted to look for buried structures near the fort, uncovered evidence suggesting that outside the north-west corner of the fort the ancient roads might not be covered by the modern road (Oleson *et al.* 2003: 50-54 and Fig. 14). The data in this area showed three linear anomalies to the west of the modern road running down the west side of the fort. All three anomalies ran from the north-east to the south-west. Based on their signals, two were hypothesized to correspond to buried roadways or the aqueduct, and the third (coinciding with a low earth mound visible on the surface) was

attributed to road repair or ploughing.

All of this previous work suggested that the most likely place to find the physical remains of the *Via Nova Traiana* at Ḥumayma would be to the west of the modern road outside the fort's north-west corner. In 2008 series of probes were excavated to the north-west of the fort both to find evidence of the *Via Nova Traiana* and to test the veracity of the 2002 geophysical data. Surface inspection of the area uncovered an alignment in the surface pebbles *ca.* 95m north-north-west of the north-west corner of the fort. It was therefore decided to place some squares there (Field E129) even though this was outside the area of the geophysical survey. A series of squares were also placed across the area where the geophysical data was collected (Field E130). The methods and results of each area will be discussed separately, followed by a discussion of the features revealed.

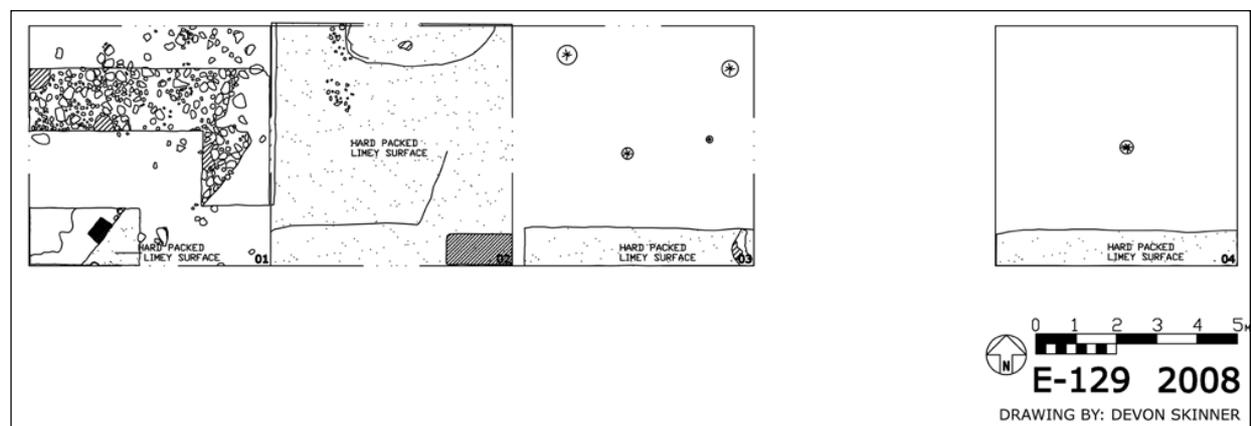
Field E129

Field E129 was chosen for excavation because the combination of a low ridge (extending less than 1m above the surrounding flat desert) and two possible edges, *ca.* 4 to 6m apart, to the concentration of surface cobbles aligned north-east to south-west that together suggested the presence of a paved section of the *Via Nova Traiana*. A 6 x 6m square (Square 01) was laid out across the possible road so as to capture the potential road edges in the north-west or south-east corners. Subsequent excavation revealed that the cobbles, although only one course deep, might have constituted a surface having an eastern edge angled 40° east of north and pos-

sibly a parallel western edge *ca.* 5m away (Figs. 23 and 24). Beneath the eastern extent of the cobbles was a layer of extremely hard packed yellowish-brown soil containing white nodules. A subsequent probe in the south-west corner of the square revealed that this distinctive soil level terminated in an edge angled 42° east of north. In Square 01 this layer was 0.9m thick with some cobbles and pebbles at its bottom. As this surface seemed considerably more durable than the cobble surface and hence a more likely candidate for the *Via Nova Traiana*, we decided to trace its extent to the east (Fig. 25). Based on the width of the *Via Nova Traiana* reported elsewhere in the Ḥismā we were expecting that the other side of the potential road would be found in Squares 02 or 03. To our surprise, the surface was still present in Square 04, more than 27m away. This surface will be discussed in detail at the end of this section, after the results from Field E130 have been presented. Before leaving Field E129, it must be noted that another feature



24. Possible cobble surface in E129 Square 01.



23. Plan of E129.



25. *Hardpacked soil with white nodules extending across E129 Square 02.*

was found in the south-west corner of Square 01, just west of the western edge of the hard packed soil with nodules. This feature, now quite decomposed, seems to be the south-east edge of a rammed mud (*pisé*) platform which extends into the west and north baulks of the excavated probe. Unlike the two angled surfaces, this platform is on an orientation close to true north, just like the Roman fort. A high concentration of disturbed boulders, probably representing wall stones, was found above both the platform and nodule-bearing soil along the south edge of the square. Immediately over the platform in the south-west corner of the probe was a high concentration of wall plaster (including polychrome fresco fragments), roof tile or hypocaust fragments, white mortar, and cobbles and pebbles. To the south of Square 01 other building fragments, including tiles and pebbly floor plaster, can be seen on the surface of the desert. All of this evidence suggests that an important structure (with frescoed walls) was located somewhere in the vicinity. Pottery sherds in the associated loci suggest this building dates to the Roman or Late Roman period, making it contemporary with the first phase of the Roman fort.

Field E130

Although the edges found in E129's Square 01 were on a similar orientation to one of the possible roads revealed by the geophysical survey, no direct proofing of the geophysical predictions could be made as E129 lay outside the range of that survey. Our next strategy was therefore to open Field E130, which lay inside the range of the geophysical survey. Six squares were eventually laid across this area in order to study what

lay beneath the surface in a 38.66m-wide strip extending due east from the western edge of the modern road (Fig. 26). In all cases, the 1 m strip along the northern edge of each square was excavated in order to create a continuous plot of the area's stratigraphy. Some squares were also excavated more fully in order to describe features and search for their edges. The excavations in this area confirmed the presence of the ploughed area (with intact furrows; Fig. 27) predicted by the geophysical survey (in Squares 02, 03, 05 and 06), but could not confirm the presence of the other two linear features which were shown in the geophysical results as being *ca.* 7-10m wide with distinctive edges (Oleson *et al.* 2003: Fig. 14). Our excavations indicate that rather than there being two narrow features running down the western side of the fort, there is actually another patch of hard packed soil with nodules which extends more than 38 meters across this whole area (and presumably to its east and west as well). Sometimes this soil is found just 0.05m beneath the desert surface; sometime it is buried up to 0.9m beneath other layers of soil (such as the plough furrows). The



26. *Excavation areas in E130 to west of modern dirt road.*



27. *Plough furrows in E130 Square 02.*

thickness of the nodule-bearing soil also varied considerably (from 0.3 to 0.9m) and sometimes it disappeared for several meters before resuming. When it disappeared in E129's Square 01, it had an edge orientated 42° east of north. When it changed thickness in other squares, a variety of angles were observed. Any of these variations could have produced significant variations in geophysical readings which were taken in bands spaced 2.5m apart. Based on our excavations, the idea of discrete 7-10m wide linear roads in this area should be abandoned. It is also clear that the aqueduct did not pass through this area. On the other hand, it is very interesting that such a wide stretch of the area adjacent to the fort's north-west corner was both devoid of buildings and covered with a type of soil which would have provided excellent traction.

Discussion of the Features in Fields E129 and E130

Although the excavations in Fields E129 and E130 did not reveal a paved section of the *Via Nova Traiana*, they did uncover four distinct features: the extensive area of hard packed soil with nodules, dried-out plough furrows, a cobble surface, and a *pisé* platform. Each will be discussed in turn.

The hard packed soil with nodules found throughout Fields E129 and E130 is extremely interesting in its implications. Soils containing nodules of calcium carbonate concretions form naturally in calcareous soils from desert regions (see Ruellan 1973). Natural layers of such soil regularly vary in thickness from 0.2 to almost 1m. Given that all of the nodule-bearing soil layers in our probes were devoid of artifacts, it is likely that this expansive soil layer throughout Fields E129 and 130 is of natural origin. What seems very likely, however, is that the ancient inhabitants of Ḥumayma would have taken advantage of the extremely firm nature of these soils. Foundation probes in Field E077 revealed a 0.38m-thick layer of this soil under the Nabataean structures. Previous years' excavations in the Roman fort have also revealed layers of this soil under some roads and walls where they would have provided a firm footing. For example, **Fig. 28** shows a 0.85m-thick layer of this soil directly beneath the *Via Principalis Dextra* in the Roman fort (Oleson *et al.* 2008: 328-9).

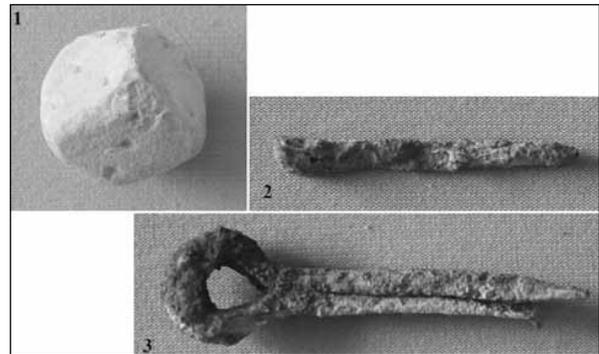


28. Hardpacked soil with white nodules beneath the *Via Principalis Dextra* and sub-road drain in the Roman fort (E116).

Anyone digging trenches into the desert surface for wall foundations or defensive works (e.g. the trench around the fort, Oleson *et al.* 2008: 332) would have quickly encountered this extremely hard soil layer and realized its usefulness as a surface. Indeed when Stein traveled through the site in the 1930s he speculated that the *Via Nova Traiana* could not have passed through the settlement because of the difficulty presented by crossing the heavy sand in this area (Stein 1940: 437). What he did not know was that the sand could be cleared to reveal a firm surface. The strength and durability of this lime-bearing soil was proven to us when fully laden construction traffic began using the dirt road bordering the eastern edge of E129 during our excavations. While elsewhere, the dirt road through the site turned to silt, the section next to E129 (which contained nodules on its surface) remained in much better condition (**Fig. 26**). It seems reasonable that the ancient inhabitants of the site might have cleared off the overlying soil to expose this surface, perhaps even digging it up and re-laying it where they desired better support or traction (cf. the “lime mash” layer under the fort at Lajjūn, Groot *et al.* 2006: 164). Whether the wide expanse of this soil to the west of the Roman fort constitutes part of either the *Via Nova Traiana* or the King's Highway cannot be determined with certainty. It is thought that the *Via Nova Traiana* constituted a paved road (Graf 1997: 273) and sections of the road found elsewhere in the Ḥismā were certainly paved (Graf 1995: 252-57). Pavers might have sat directly on this surface as they did in the road in Ḥumayma's fort. On the other hand, other Roman

period roads both in Arabia (Kennedy 2000: 64 and 115) and throughout the Roman Empire were commonly only cleared tracks (Graf 1997: 272-3). Such tracks can be extremely wide: the 'Via Severiana' north of Azraq is 15-20m wide (Kennedy 2000: 64) and roads through the Uvda Valley vary between tens of meters and 200 meters wide (Avner 1990: 138). The nodule-bearing soil in Fields E129 and E130 may have constituted a similar firm, wide surface which could both be used as a road and as a parking lot where wheeled vehicles could be left in the protective shadow of the fort. In addition to camel caravans, a huge number of wheeled vehicles would presumably have regularly traveled along the *Via Nova Traiana* to the fort, in order to supply the garrison with food and other necessities. These vehicles would have required a firm and relatively level surface. A firm, leveled, and relatively wide surface is also what was required for the military parade ground (*campus*) that would have been located outside every Roman fort (Webster 1985: 228-9). It therefore seems likely that the extensive, extremely firm natural surface discovered outside the north-west corner of the fort (and probably covering an even wider area) would also have been used as a place for the garrison's soldiers to carry out their regular military drills and training exercises (cf. Davies 1974: 310-11).

One of the reasons that this nodule-bearing soil would have provided a firm footing is that it was more water resistance than other soils found on the site. It is perhaps because of this soil's ability to trap or slow the movement of water that people were farming the soil which had accumulated above it. Evidence came in the form of dried-out plough furrows found in Field E129. The date when this land was farmed is not clear. The furrowed soil was packed with cultural debris including a sandstone die (Fig. 29.1), two iron pins (Fig. 29.2-3), glass and mortar fragments, and pottery sherds ranging in date from the first to the fifth centuries AD. There were no datable objects of later date but this does not mean no farming took place later. Although this area was not being farmed during any of the excavation or survey seasons over the past 20 years, one of our young workers maintains that the area has been farmed in his lifetime, and some recent aerial photos of the site



29. Artifacts found in the plough furrows: (1) H08.0131.01: Sandstone gaming die; each face 1.6 x 1.6cm; (2) H08.0156.01: Three-sided iron pin or nail; 3.6cm long; one flat end 0.4cm thick; one end tapers to a point 0.2cm thick; (3) H08.0134.01: Double-spiked loop (cf. Manning 1985: 130-1); 5.1cm long.

(e.g. Kennedy and Bewley 2004: Fig. 10.4B, taken in May 1998) show the furrows clearly. As the elevations in this area lie above the site's run-off field (Oleson 1995: Fig. 4), it is likely that these fields could only have been farmed when irrigation water was available.

The last two features identified in this area were the surface of cobblestones *ca.* 5m wide, lying just beneath the surface and partially over the nodule-bearing soil, and the considerably deeper *pisé* platform located just west of the sharp edge of the nodule-bearing soil in Field E129. Either the cobble layer, or the platform, or both might be contemporaneous with the building debris found in and around E129 Square 01. The nature of the debris (fresco fragments, roof tile or hypocaust shards, and pebbly floor plaster fragments mixed with stones and pottery) imply the presence nearby of a well-constructed structure of Roman or Late Roman date. As this structure would be the northernmost building at *Ḥumayma*, it should be targeted in a future season in order to determine its function in relation to the fort and the town.

2008 Ceramic Overview (A. Shelton)

Shelton became the project's ceramicist in 2008, succeeding previous ceramicists Yvonne Gerber (1998-2005) and Khairieh 'Amr (1991-1996). Shelton wishes to thank 'Amr and Gerber for useful discussions about *Ḥumayma*'s ceramics. This preliminary assessment of the ceramics is based on material excavated Fields E077, E121, E128, E129 and E130 in 2008.

General Observations

The ceramics from the 2008 season date from the late first century BC to the early ninth century AD, with the major concentration falling between the late first century AD and the fourth century AD. As previously noted by Oleson, most of the loci at Ḥumayma are not homogeneous and are thus difficult to date (Oleson *et al.* 2008: 319). A rare exception was a rich assortment of partially restorable vessels, mostly dining and cooking vessels dating from the late first to the mid-second century AD, which was discovered in a homogeneous stratum in E128's dump (**Fig. 10**; see above for context description and below for partial catalogue). Based on forms and fabric, the pottery in this cache appears to have been imported from Petra and, with the exception of the cooking pot, show few signs of wear. All of the forms have close parallels in the Petra / az-Zanṭūr corpus. Found with this cache of early to mid-second century ceramics was a Class 47 amphora handle, dated to the third and fourth centuries, possibly starting in the very late second century (Peacock and Williams 1986: 193-195). The presence of this amphora, a relatively common one at Ḥumayma, in a cache of earlier vessels might be a displacement caused by burrowing rodents (see above) or may indicate a slightly earlier date for the amphora than previously thought. Research into the matter will continue.

Coarse Wares

Of the *ca* 26,000 sherds processed this season, the vast majority were coarse wares, all of which were (presumably) imported to Ḥumayma since no kilns have been discovered at the site. The paucity of homogeneous loci at Ḥumayma hinders the creation of a secure typology of coarse wares at this time; data from future excavations will hopefully clarify the matter. The 2008 coarse wares are continuing to be studied, but a preliminary assessment follows. The reader should also consult Gerber's more comprehensive discussion of Ḥumayma coarse wares, based on the 1998-2005 seasons (Oleson *et al.* 2008: 334-341).

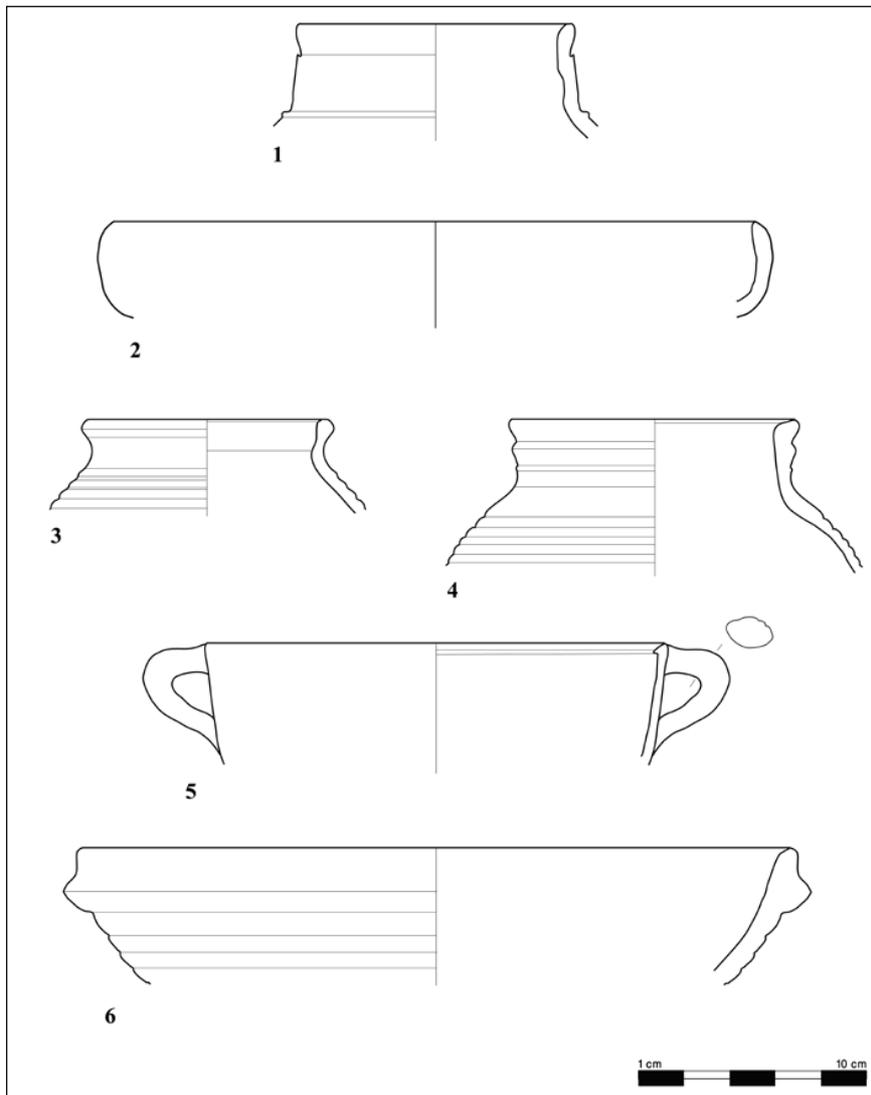
Most forms and fabrics were fairly consistent with ceramic repertoires from Petra (including surrounding sites) and Roman Aila / 'Aqaba (**Fig. 30**), suggesting these were the two pri-

mary suppliers of ceramics for Ḥumayma. Imports from Aila are present in the Ḥumayma assemblage, although in far smaller quantities than those from Petra. This would seem to indicate that Ḥumayma, although located roughly equidistance between Petra and Aila, remained strongly within Petra's trading sphere. The Aila imports were mostly medium sized storage vessels, such as ribbed-necked jars (**Fig. 30.4**) and strainer-neck jars (**Fig. 31**). The imports from Petra include cooking vessels, jugs, jars, bowls of varying sizes, and large storage vessels and pithoi. Closed vessels included jugs, jars, cooking pots, and multiple sizes of storage vessels. Cooking pots are imported almost solely from Petra and generally seem to follow the typology suggested by Gerber (Gerber 1997 and 2001; Gerber and Fellmann Brogli 1995).

Fine Wares

The Nabataean painted and unpainted fine wares found at Ḥumayma during the 2008 season generally date from the mid-first century AD to the third century, represented as Schmid's Phases 3a-4 (Schmid 2001, Figs 32.1-3). The relative absence of first century BC to mid-first century AD (Phases 1-2) fine wares that was previously noted by Gerber for the ceramics from the 1998 to 2005 seasons continues to hold true (Oleson *et al.* 2008: 335). This is particularly interesting considering these fine wares are present not only at Petra but also, beginning in Phase 2, at Aila (Parker, pers. comm.). Nabataean fine wares were found in all excavated areas, but make up a fairly small proportion of the corpus as a whole. Approximately 257 sherds of NPFW were recorded, accounting for about 1 % of the ceramic finds.

Although few Eastern Sigillata A (ESA) sherds were found (approximately 27 sherds), they represent some of the earliest datable fine wares found this season. ESA vessels usually date from the second century BC to the second century AD. Both closed and open forms are present in the corpus, but unfortunately the vast majority of these sherds are too small to attribute to a specific form. One base could be identified as the type represented by Hayes Form 28, which dates from the last quarter of the first century BC to the first quarter of the first century AD (**Fig. 32.4**; Hayes 1985). ESA was found in



30. Selection of 2008 coarse wares.

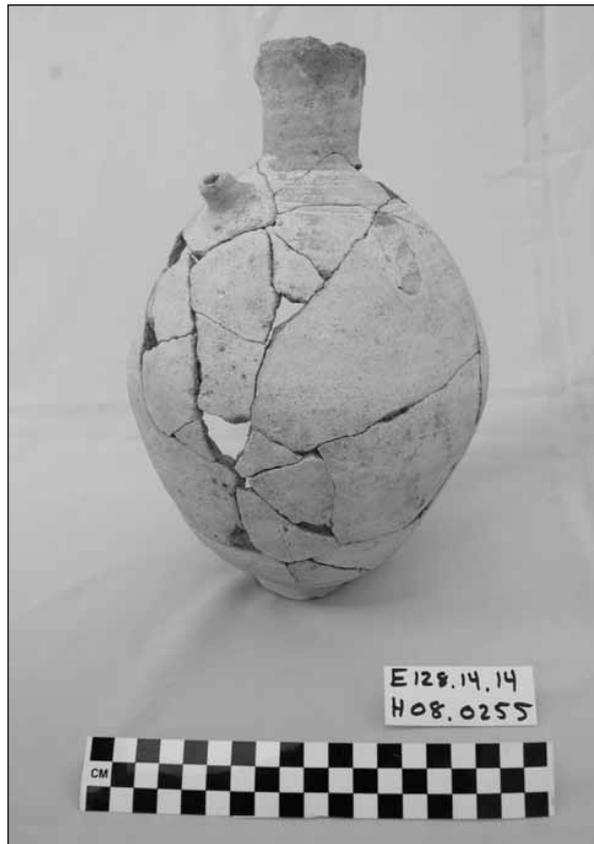
areas E128 (20 sherds), E077 (4 sherds), E121 (2 sherds) and E130 (1 sherd). One Eastern Sigillata B (ESB) sherd was also found in E077, but was unfortunately too small to identify according to Hayes's typology.

Late Roman / Byzantine imported fine wares were also present in the areas excavated in 2008. African Red Slip (ARS) was the most abundant late imported fine ware identified at Ḥumayma. Most of the ARS sherds (26 out of 27) recovered this season are the ubiquitous Form 50 bowl, dating from the mid-third century to the mid-fourth century (Hayes 1972: 69-73), whereas only one body sherd is in the later "D" fabric described by Bonifay (Bonifay 2004). It is expected, however, that future excavations will show that the dominance of the Form 50, based

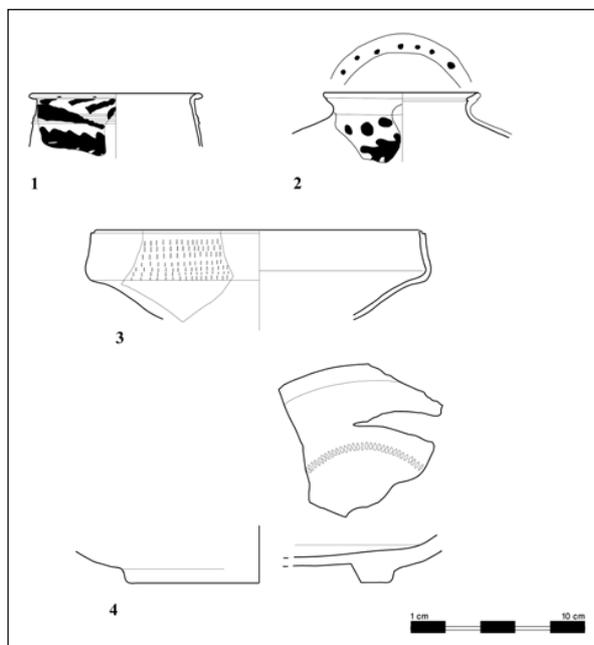
on this season's evidence, is an anomaly. One sherd of Phocaean Red Slip (from E121) and one sherd of Egyptian Red Slip B (from E128) were also found.

Amphorae

One of the most interesting initial observations from the 2008 season was the variety of imported transport amphorae discovered. This season's excavations uncovered transport amphorae sherds from Egypt, Gaza, North Africa, Palestine and the Aegean. Almost all of these were from the Roman and Byzantine phases (late second century to the fifth century). The Class 47 ("Hollow-foot") amphora, possibly an Aegean wine amphora dating to the late second through fourth centuries AD (Peacock and Wil-



31. Strainer-neck jar from Roman Aila found in E128 dump. H08.0255a.



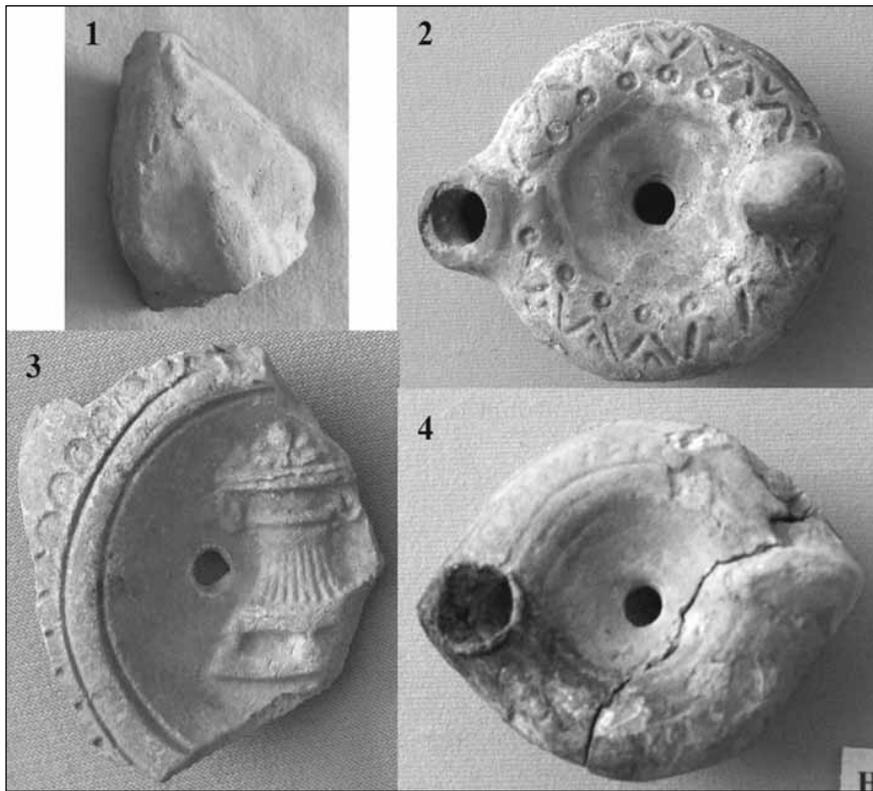
32. Selection of 2008 fine wares.

liams 1986: 193-195), was the most abundant imported amphora discovered this season, ac-

counting for 30 of the *ca* 66 imported amphorae sherds identified. Class 47 sherds were found in E077, E128 and possibly E130, but were most prevalent in E121. The Gaza Class 48 and Class 49 (Peacock and Williams 1986: 196-199) are the second most common imported amphorae. It is interesting to note that some of the more common amphorae that appear at Aila seem to be rare at Ḥumayma (Shelton 2008). These include the Egyptian Classes 52 and 53 (Peacock and Williams 1986: 204-207) and the Palestinian Bag Jar, Class 46 (Peacock and Williams 1986: 191-192). Although few in quantity (4 sherds identified), the appearance of the African Class 33 (Peacock and Williams 1986: 153-154) should be mentioned since it is “attested but extremely rare” at Aila (Parker 2002: 424). The early Roman imported amphorae, such as the Rhodian Class 9 and Koan Class 10 (Peacock and Williams 1986: 102-106) were absent from this season’s corpus. There were also several imported amphorae which have yet to be identified; study of these will continue.

Lamps

Approximately 200 lamp fragments were found, dating from the Nabataean to the Byzantine periods. They are mostly types found at Petra. Common were the Nabataean / Negev lamps (Grawehr 2006: 296-306), decorated and undecorated round lamps with small fill holes (Figs. 33.2 and 33.4; Grawehr 2006: 310-317), decorated round lamps with large fill holes (Grawehr 2006: 322-333, Type 2, variants a, b and c specifically), and the Petra-Early Roman lamps (Grawehr 2006: 340-349). Most lamps appear to be of regional manufacture. One fragment from a molded-handle lamp resembles that found in the az-Zurrāba kilns (Fig. 33.1; ‘Amr 1999: 7.4). Of particular interest is a fragment from an embossed discus lamp (Fig. 33.3) depicting an altar resting atop a two-stepped platform. The altar column is fluted and is topped with fruit clusters. Ribbons flow from both sides of the column top. The shoulder of the lamp is decorated with two incised lines inside a scalloped motif. While no exact parallels have been found for this lamp, the altar motif, usually with snakes, appears on similar lamps from the first and second centuries AD (Rosenthal and Sivan 1978: 31-32, no.109).

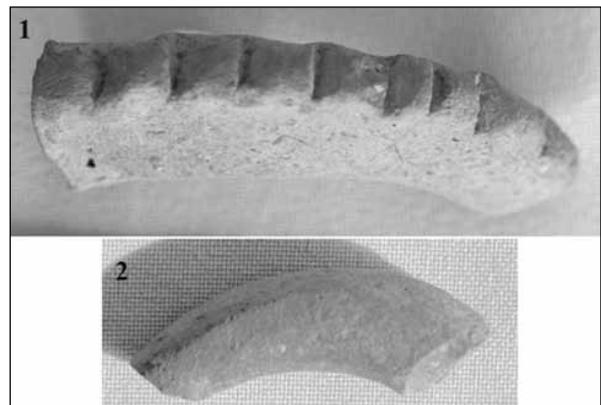


33. Selection of 2008 lamps: (1) H08.0100; (2) H08.429.02; (3) H08.0271.02; (4) H08.0378.01.

Figurines and Zoomorphic Vessels

One figurine fragment and two horns from zoomorphic vessels were recovered this season, all from E128. Both horns appear to be from ibex zoomorphic vessels. **Fig. 34.1** is similar to those found in Petra (Tuttle 2009: 521, cat. no. 177; 526, cat no. 183). Although from the E128 dump, this horn can be dated to roughly the second to fourth centuries AD based on associated ceramics. The other horn (**Fig. 34.2**) is a plain, conical curve which has no known parallels (Tuttle, pers. comm. May 2009). This horn, also from the E128 dump, was found with ceramic material dating generally to the second and third centuries AD.

The figurine fragment is a delicately carved baboon head (**Fig. 15**; description in catalogue from E128 dump) with no regional parallels (Tuttle 2009: 194). The head resembles the dog-faced baboon (*Papio hamadryas*), whose range includes Egypt and the southern Arabian peninsula. In Egypt, the baboon was sacred to Thoth and was depicted in art and on coins through the Roman period (Geissen 2008: 169). Further investigation of the figurine will be needed to determine its origin.



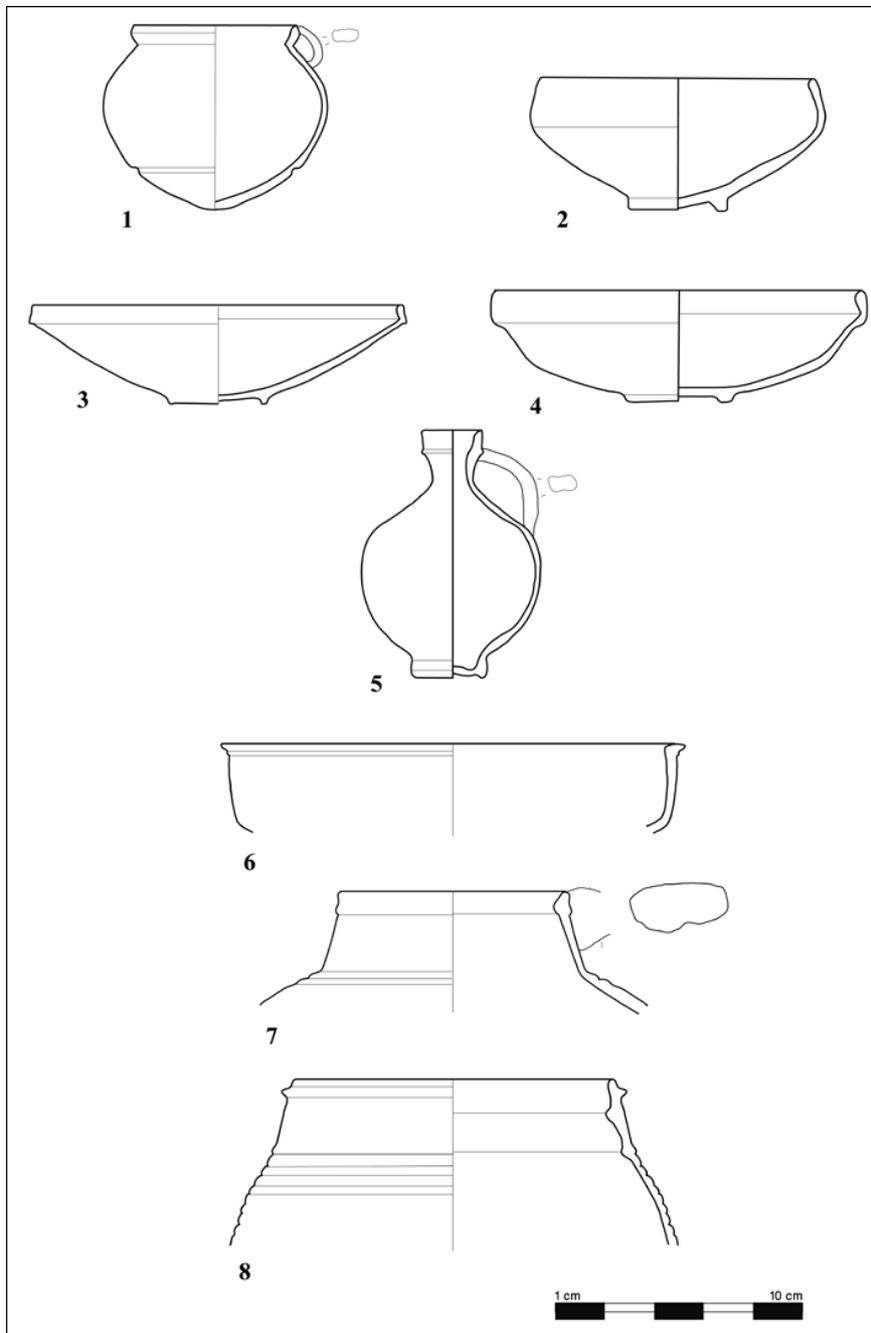
34. Horns from zoomorphic vessels.

Catalogue

Below is a selection of the coarse wares (**Fig. 30**) and fine wares (**Fig. 32**) excavated this season, as well as a selection of some of the semi-restorable vessels from the E128 dump (**Fig. 35**; cf. **Fig. 10**). All will be published more fully in future reports.

Figure 30.1

H08.0003a. Jar with rounded rim. Notch just below rim. Diam: 12cm. Fabric: 2.5YR5/8; Exterior: 5YR6/4; Interior: 2.5YR6/6 [E128.14.01] Par-



35. Selection of semi-restorable vessels from the E128 dump.

allel: Gerber 2001: Figure 2.M (first century AD).

Figure 30.2

H08.0056a. Large bowl with incurving, slightly thinning rim. Thick grey slip on exterior. Base suggests a flat bottom. Diam: 28cm. Fabric: 2.5YR6/8; Exterior: 2.5YR6/1; Interior: 2.5YR6/8.[E077.01.808] Parallel: Gerber in Oleson *et al.* 2008: Figure 23.29 (second-third centuries AD).

Figure 30.3

H08.0036a. Jar with rounded, everted rim. Ribbing on body. Diam: 11 cm. Fabric: 5YR6/6; Exterior: 5YR7/3; Interior: 5YR7/3 [E121.07.807] Parallel: Brogli 1996: Abb. 742, 744 (fourth and fifth centuries).

Figure 30.4

H08.0405a. Jar with flattened rim and ribbing on neck and shoulder. Thick white slip on

exterior. Aqaba ware. Diam: 12.5cm. Fabric: 5YR7/4; Exterior: 5Y8/2; Interior: 10YR8/2 [E077.05.05] Parallel: Dolinka 2003: Figure 20.J2b (second century AD).

Figure 30.5

H08.0141a. Bowl / casserole with beveled interior rim. Vertical loop handle. Whitish slip on exterior. Diam: 20cm. Fabric: 2.5YR6/8; Exterior: 5YR8.2; Interior: 2.5YR6/8 [E121.09.803] Parallel: Brogli 1996: Abb. 773-774.

Figure 30.6

H08.0291a. Large bowl with thick ridge below rim. Wide ribbing on exterior. White slip on exterior. Aqaba ware. Diam: 31cm. Fabric: 2.5YR6/6; Exterior: 2.5Y8/2; Interior: 2.5YR6/6 [E077.04.811] Parallel: Whitcomb 2001: Figure 1.G (early Islamic).

Figure 32.1

H08.0137a. Nabataean painted fine ware cup / small jar. Everted rim with band of fine ribbing on exterior body. Elongated slanted triangles painted on exterior of rim, continuing onto body. Below these is a horizontal triangular swath of paint above a leaf / vine. Paint is dark reddish-brown. Diam. 10cm. Fabric: 2.5YR6/8; Exterior 2.5YR6/8; Interior: 2.5YR6/8; Decoration: 2.5YR3/2 (dusky red). [E128.15.30] Parallel: Schmid 2000: Type F 2c 64, Phase 3c (100 AD to mid-second century AD).

Figure 32.2

H08.0137b. Nabataean painted fine ware jar. Flattened everted rim; globular body. Red slip applied to exterior and rim interior (drip lines extend down body interior). Small dots are painted on the rim flange. Larger dots are just below the neck; below these is a horizontal leaf / vine. Diam: 8.5cm. Fabric: 2.5YR6/8; Exterior: 10R5/6; Interior: 2.5YR6/8; Decoration: 2.5YR3/2 (dusky red) [E128.15.30].

Figure 32.3

H08.0100a. Nabataean fine ware bowl. Shallow rouletting on exterior. Notched rim. Sharp carination between below rouletting. Diam: 18.5cm. Fabric: 10YR6/8 (thin dark gray core); Exterior: 10YR6/8; Interior: 10YR6/8 [E128.09.05] Parallel: Schmid 2000: Type E 8a

95, Group 9, Phase 3 (20 / 30 AD to first quarter of the second century AD).

Figure 32.4

H08.0208a. Eastern Sigillata A plate base. Rouletted ring on interior. Ring base. Diam: 15cm (base). Fabric: 5YR7/4; Exterior: 10R4/6; Interior: 10R4/6. [E128.08.02] Parallel: Hayes 1985: Tavola IV.10-11 (last quarter of the first century BC to first quarter of the first century AD).

Figure 35.1

H08.0177a. Nabataean fine ware cup. Rounded base. Everted rim. Single vertical loop handle. Deep groove on exterior near base. Diam: 6.75cm. Fabric: 2.5YR6/8; Exterior: 2.5YR6/8; Interior: 2.5YR6/8 [E128.15.38] Parallel: Schmid 2000: Type G 1a 274, Phase 3 (20 / 30 AD to first quarter of the second century AD).

Figure 35.2

H08.0177b. Nabataean fine ware hemispherical bowl. Ring base. Diam: 11cm. Fabric: 2.56/8; Exterior: 2.5YR6/8; Interior: 2.5YR6/8 [E128.15.38] Parallel: Schmid 2000: Type E 4a 35, Group 5.

Figure 35.3

H08.0173a. Nabataean fine ware carinated bowl. White slip on rim exterior. Ring base. Diam: 15cm. Fabric: 2.5YR6/6; Exterior: 2.5YR5/6; Interior: 2.5YR 6/6 [E128.15.38] Parallel: Schmid 2000, Group 6.

Figure 35.4

H08.0177c. Nabataean fine ware carinated bowl. White slip on rim exterior. Ring base. Diam: 15cm. Fabric: 2.5YR6/6; Exterior: 2.5YR 5/6; Interior: 2.5YR6/6 [E128.15.38] Parallel: Schmid 2000, Group 6.

Figure 35.5

H08.0177d. Nabataean fine ware juglet. Ring base. Diam: 2.5cm. Fabric: 5YR6/6; Exterior: 5YR6/6; Interior: 5YR6/6 [E128.15.38] Parallel: Schmid 2000: Type G 14d 305, Phase 3 (20 / 30 AD to first quarter of the second century AD).

Figure 35.6

H08.0173b. Shallow bowl / casserole with

flattened rim. Thin white slip on exterior. Diam: 19cm. Fabric: 2.5YR6/6; Exterior: 10YR8/1; Interior: 2.5YR6/6 [128.15.37] Parallel: Gerber 2007: Figure 61 (early second century).

Figure 35.7

H08.0174a. Jar with folded rim; slightly inverted. Slight ribbing on shoulder below neck. Vertical handle attached at rim. Thick grey slip on exterior. Diam: 10cm. Fabric: 2.5YR6/6; Exterior: 2.5YR5/1; Interior: 2.5YR6/6 [E128.15.38] Parallel: Gerber: unpublished Humayma reference database from 1998 season (second / third centuries).

Figure 35.8

H08.0174a. Jar with slightly inverted rim. Flanged ridge just below rim. Ribbing on body. Diam: 13cm. Fabric: 2.5YR5/8; Exterior: 2.5YR6/3; Interior: 2.5YR5/8 [128.15.38] Parallel: Gerber 2007: Figs. 19 & 22 (last quarter of first to early second century).

Object Conservation (B. V. Karas)

Karas' role as conservator for the 2008 Humayma Excavation Project (HEP) focused on processing small finds, mostly metal artifacts and ceramics, for study and storage. Small finds were treated following standard conservation methods as well as HEP specific methods established by J. Logan during her tenure as the project's primary conservator (see Oleson *et al.* 1999: 443-46; 2003: 61-62). Other conservation initiatives for the 2008 season included the relocation of a large three-dimensional sandstone betyl from Humayma's Field E125 to the 'Aqaba Museum, and the compilation of guidelines for artifact storage preparation, based on a survey of the 'Aqaba Museum storeroom. These conservation goals were funded, in part, by a generous Heritage Scholarship from the American Schools of Oriental Research.

Sandstone Betyl from E125 (H08.0463.01)

A large (0.58 m tall) three-dimensional sandstone betyl was discovered in 2000 during the first season of excavations in Field E125's Nabataean and Roman period shrine (Oleson *et al.* 2003: 47, Fig. 11; 2008: Fig. 6). As the object was extremely heavy and surrounded by 0.70 m high baulks, it was decided at the end of the

2000 season to leave it *in situ* at least until the full excavation of the shrine could be completed. In 2004 the directors arranged to have Na'if Zaban re-attach the top of the object (which had been broken off in Antiquity) to protect it from further damage (Fig. 36). By 2008, however, the new join had broken, the high baulks had been removed, and vehicle and human traffic through the site had increased significantly due to the construction of a new military base. Upon re-evaluating the pros and cons of leaving the betyl *in situ* in the shrine, Karas and Reeves subsequently decided it would be best to relocate the object to the storage facilities at the 'Aqaba Museum.

To have left the betyl *in situ* any longer would have put it at high risk of further damage by both humans and natural processes. Although many sandstone types are very well suited to use as building material, sandstone that is weakly bonded by minerals such as calcite or clay can be inherently friable and thus easily broken (Robertson 1982). The two pieces of the betyl were moved to the 'Aqaba Museum's artifact storeroom. The bottom portion of the betyl was wrapped in a padded sheet and placed on a wooden pallet to elevate and protect it from any ground water that may enter the store room. The top part of the column was wrapped in polyester batting and placed on a layer of sand inside a soft rubber bucket.

Rather than attempting to repair the column during 2008, it was decided that it should remain in two pieces until a thorough evaluation of its condition could be carried out. Further conservation treatment will focus on maintaining the stone's structural integrity by providing a per-



36. Na'if Zaban re-attaching top of betyl in E125 shrine in 2004.

manent storage or display mount to safely house the betyl in one or two pieces. Reattaching the top of the column will require an assessment of the stone's porosity, strength and condition of its break surfaces. Continued conservation treatment of the break may hurt rather than help the betyl due to the stone's inherent weaknesses. A free-standing mount, supporting the top part of the column slightly above the break edge of the lower portion, would be a simple and attractive solution, one which would not compromise the material integrity of the betyl. The betyl will remain in the 'Aqaba Museum indefinitely owing to its at-risk status. Reeves ultimately hopes to have a replica of the betyl placed in the shrine room of E125.

'Aqaba Museum Storeroom Survey

With the permission of Manal Basyouni, Director of the 'Aqaba Museum, Karas carried out a preliminary evaluation of the condition of the collections storeroom. The objective of the evaluation was to inform and improve our team's approach to packing artifacts for storage in the museum's specific physical and environmental conditions. A secondary objective was to make these guidelines available to excavation directors who use the 'Aqaba Museum collections storeroom or use other storage facilities with similar conditions. It is extremely important for an object's long term survival to prepare it for storage in a way that mitigates against accelerated deterioration in its new *ex situ* environment. Fluctuating temperature and relative humidity cycles can irrecoverably damage all types of archaeological material. Assessing the storeroom's environmental conditions and physical limitations allowed for the compilation of simple and effective guidelines for preparation of objects for storage.

The 'Aqaba Museum's storeroom experiences fluctuating temperature and humidity. There is limited space, artifacts are often unprotected and un-housed, and there is no clear designation or labeling of objects and object project affiliation. These are typical storeroom conditions for many local and regional museums throughout the world. Based on these observations, broad recommendations for housing registered finds were made:

- Avoid the use of paper or cardboard for hous-

ing artifacts. Typically, these materials are not acid free and absorb moisture. Both acid and moisture will transfer to objects being stored, accelerating the degradation of metals, ceramic, glass, bone and all organics. Paper and cardboard are also very attractive to insects, especially silverfish. By weakening or destroying its organic container (paper or cardboard), insects can accelerate the deterioration of the actual object or compromise its safety.

- Purchase various sizes of Tupperware-type boxes (found locally in 'Amman or 'Aqaba). Pack artifacts by material categories, i.e. all iron together, all bronze together etc. If plastic boxes are not available, employ large Ziploc-type bags. The goal is to avoid having the current paper artifact bags exposed to fluctuating relative humidity and temperature, which can lead to moisture damage. Durable and clear artifact storage containers for individual objects or groups of objects can also protect against any physical impact on the objects from man-made or natural forces.
- To further protect the objects, use plastic crates to house the Tupperware or Ziploc containers. When possible, keep like objects together.
- Label the plastic boxes or bags clearly in both English and Arabic. Labels for containers or bags clearly stating, in English and Arabic, the project name, year and contents will help to ensure the object's safety and deter haphazard rummaging.
- In addition to these broad guidelines, more specific recommendations were made for future implementation into the Humayma Excavation Project's conservation approach:
- Notify the conservator as to what objects are being registered as readily as possible. The conservator can then begin making storage mounts for those objects, as they pass through the conservation lab.
- Use cavity mounts — of volara or some similar material — for housing registered finds. The object in its mount can be easily slipped into an appropriate size of polyethylene bag (available from conservation supplies vendors such as "Conservation Resources" in the United States) and remains secure in its mount in the bag.
- Storing objects in clear containers (clear boxes, polyethylene bags etc.) will do away with

the need to shake objects out of the paper bags currently used for small finds and will facilitate searching for a particular object. Clear storage will also allow for visual monitoring of an object's condition in storage, again without having to shake the object out of a paper bag.

In 2008, all of the Humayma Excavation Project's registered finds were housed in their original small-finds paper or plastic bags and separated into material categories: metals, bone, stones, plasters and mortars, and ceramics. These categories were packed into medium-sized plastic Tupperware-type containers (purchased locally) and labeled clearly in both English and Arabic. The plastic storage containers will serve as a buffer to the fluctuating relative humidity (RH) and temperature of the 'Aqaba Museum's collections storage. The containers will also provide physical protection and mitigate damage to the artifacts caused by handling of the unprotected bags during storage.

Site Conservation (M. B. Reeves)

When our project set out to investigate how relations between Roman soldiers and civilians changed at this site through time, little did we expect that we would experience a modern reflection of the same interaction. When we arrived for the 2008 excavation, we learned that a new military base was being constructed just west of the archaeological site at Humayma and extremely heavy vehicles filled with construc-



37. Construction vehicle passing beside E125 and E128.

tion materials were continuously passing back and forth along the dirt road through the site (**Fig. 37**). The bedouin residents of the area were extremely upset that the vehicles were damaging the archaeological site, which they view as a source of their identity and income. In many places the dirt road had turned to powdery silt under the weight of the vehicles (**Fig. 38**). Moreover, since some sections of the modern dirt lie over buried structures (Oleson *et al.* 2008: 317), ancient remains that had not yet been studied were in danger of being exposed and run over. The potential for damage was even greater in the random places where two trucks needed to pass, causing one truck to divert off of the modern road and onto the archaeological site proper. Additional potential damage was being done by four-wheel drive military vehicles that were being driven off of the roads and all over the site,



38. Dirt road through archaeological site damaged by construction vehicles.

including areas marked off for our excavation.

The modern civilian inhabitants of the *Humayma* region were justifiably upset that in the process of constructing a fort, the adjacent archaeological site was being damaged. They implored the truck drivers to take a different route, set up stones to block the road and wrote letters to the newspapers. When we arrived, they asked for the help of archaeologists. As the site belongs to the Department of Antiquities, our Department representative, Amer A. Bdour, and the 'Aqaba Regional Director, Dr Sawsan Fahkri, took charge and devoted considerable time to communicating with the Governor, the military and the construction contractor in order to resolve this issue. As a result of their hard work, a new (non-destructive) route to the military base was found that did not lead through the archaeological site. By the last week of the excavation, almost all of the construction and military vehicles were using that route. Thanks to the Department of Antiquities, the past had repeated itself: soldiers and civilians at *Humayma* were once again co-existing in harmony.

Conclusions and Future Plans (M. B. Reeves)

The 2008 excavations succeeded in their research goal of producing new evidence about *Hawara*'s civilian communities in several critical periods which span the 300 year history of *Hawara* as a Roman garrisoned town. Excavations in Fields E077 and E128 revealed stone and mudbrick buildings from the original Nabataean town which were heavily damaged around the time of the Roman annexation. The fate of the two carefully constructed, presumably high status, buildings in E077 is particularly evocative because their stones seem to have been appropriated by the Roman soldiers building the fort and the garrison's bath-house. The excavations in E077 also produced evidence that during the first phase of its operation (corresponding to the presence of a 500 man garrison), the bath-house had been bigger than previous excavations had suggested. During this same period the mudbrick structure in E128 was once again occupied, corroborating previous findings from Fields E125 and E122 showing the eventual revival of the civilian community. The enigmatic platform in Field E121 dates to this same period but it is not

clear if it was part of a military *campus* where the Roman soldiers practiced their drills, or if this platform, oriented towards the same hill as the E125 shrine, supported symbols of the town's Roman period identity. Except for traces of a structure at the west end of Field E129, the structures in E121 were likely some of the most northern structures in the Roman and Early Byzantine period *vicus*. Excavations in Fields E129 and E130 had hypothesized that a paved extension of the *Via Nova Traiana* would run through these areas on a route down the west side of the fort. Instead of a paved road, a natural layer of extremely firm soil was found throughout this area, leading us to hypothesize that the natural surface would have been utilized by the ancient inhabitants of the fort and town as a wide roadway and military drill field. The fort was occupied up until the late fourth century, as were parts of the *vicus* as indicated by the excavations in Field E121's Structure A. These excavations suggest Structure A was built in the fourth century, concurrently with the smaller garrison's reoccupation of the fort, and was abandoned in the late fourth century close to the time when the fort was abandoned.

In our future excavations we plan to expand upon these initial findings in order to obtain a deeper understanding of the character of the structures outside the fort over the course of a garrison's presence. In particular, our next season's excavations will focus on learning more about the plan, function and phasing of the Nabataean stone structures and the garrison's bath-house in Field E077, and the Nabataean and Roman mudbrick structure in Field E128. We also plan to probe the deep fill to the northeast of the platform in Field E121 to find out if a temple or associated structure once stood there.

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A REPLICA OF THE HERMES PROPYLAIOS BY ALKAMENES FOUND AT QAŞR AL-ḤALLĀBĀT

Ignacio Arce

Introduction: Location and Discovery

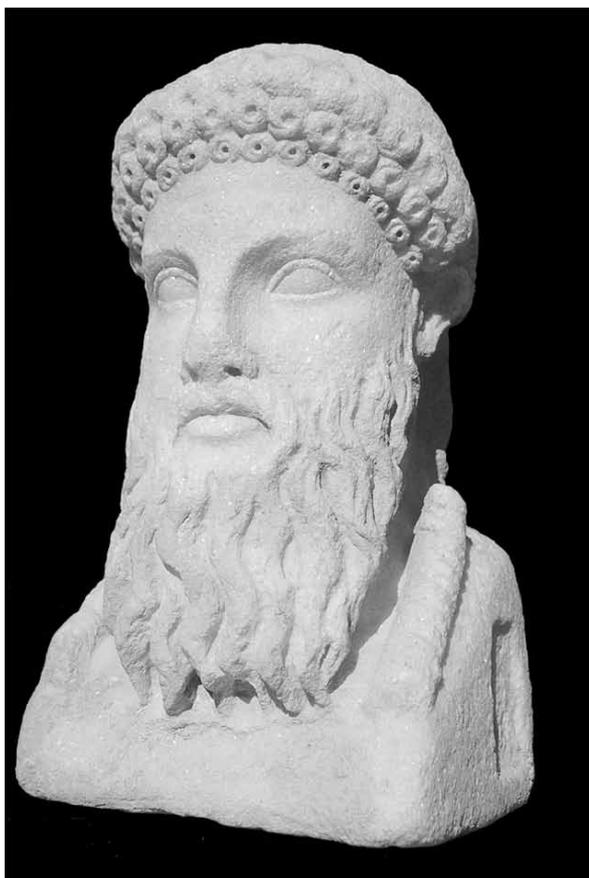
During the 2002 season¹ of the Qaşr Al-Ḥallābāt excavation and restoration project, a marble sculpture was found within the remains of the structure. It was located in collapse debris outside the south-eastern wall of the Qaşr, just outside Room 3 and close to eastern Tower 1. The extraordinary state of preservation² of the sculpture, which had just a few scratches, is all the more surprising considering the place from which it was retrieved.

Description

The sculpture represents the bust of a bearded man with a distinctive hairstyle of two lateral braids (Figs. 1-8). It was carved from a prismatic block of medium- to macro-crystalline white marble, which was a little too small for the intended final dimensions. As a result, the otherwise well-proportioned head is slightly snub-nosed. At first sight, the nose appears to have been chipped as a result of erosion or damage, but a more accurate assessment of its profile (Figs. 2 and 3) indicates that the defect was the result of an inaccurate volumetric estimation on the part of the sculptor before work commenced. This can be also ascertained from the treatment of the hair at the back of the head, which is very flat and schematic for the same reason (Fig. 4). The sculpture does not display any trace of fine polishing, probably because of the type of marble used. The height of the piece is 29cm., its base measures 15 by 16cm. and its

weight is approximately 12kg.

This bust was certainly part of a herm (ἕρμα; plural: ἕρμαα, hermai) or bust that would have topped a high cubic, almost square-section shaft,



1. *Hermes Propylaios. Replica found at Ḥallābāt; oblique view of bust.*

1. This ongoing project started in June 2002, with the sculpture being found in mid-October. It is a collaborative project between the Jordanian and Spanish authorities, funded by the Spanish Agency for International Co-operation. It also receives logistical support from the Spanish Ministry of Culture and the Spanish

Embassy.

2. The artefact did not require any conservation other than gentle brushing. It was not cleaned with water or any other solvent in order to guarantee preservation of paint, although none has been found so far, and its original patina.



2. *Hermes Propylaios*. Replica found at Ḥallābāt; left profile.



3. *Hermes Propylaios*. Replica found at Ḥallābāt; right profile.

usually carved from a single block with ithyphallic male genitalia below (see **Fig. 11**). This was a very popular type of apotropaic sculpture during the Classical period, which was originally closely associated with the god Hermes³ (see below).

In our case the bust of the herm was placed atop a separate pillar-base, now lost. On its lateral sides are the two rough, rectangular depressions (common to all hermai) that were used for fixing two arm-like tenons that would have projected from either side of the column. A piece of cloth or garlands of flowers would have been suspended⁴ from these wooden beams.

3. These pillars were also used to mark frontier and estate boundaries (see below).

4. In other examples, grooves for the attachment of chan-

The long-bearded head of the god is shown frontally, with the characteristic idealised countenance of calm and majesty that is typical of the High Classical period. The main fractions are proportionate, albeit with some slightly reduced dimensions in comparison with other examples (see below). The result, though peculiar, is balanced. This is especially true with regard to the ears, which are small in comparison with the head (see **Fig. 6**). The thin-lipped, wavy mouth is also small; it appears closed with the upper lip being almost obscured by the moustache (**Figs. 6 and 8**). The nose is narrow and straight, notwithstanding the abovementioned snub profile.

cels can be found at the sides of the base (e.g. those from the Fabricius Bridge on the Tiberine Island, Rome).

I. Arce: A Replica of the Hermes Propylaios by Alkamenes Found at Qaṣr Al-Ḥallābāt



4. *Hermes Propylaios*. Replica found at Ḥallābāt; back of bust.



5. *Hermes Propylaios*. Replica found at Ḥallābāt; detail of hairstyle.

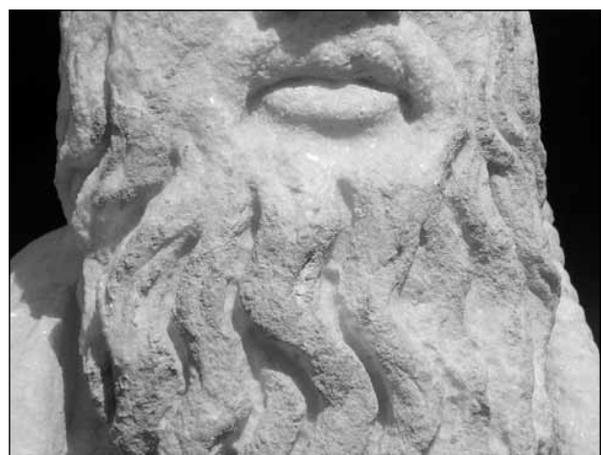
Its ridge merges without wrinkles into a flat forehead, emphasising its elegant length. The almond-shaped eyes glance calmly at the viewer. Embedded within the orbital cavities, they fix



6. *Hermes Propylaios*. Replica found at Ḥallābāt; detail of face.



7. *Hermes Propylaios*. Replica found at Ḥallābāt; detail of beard. Note macro-crystalline quality of the marble.



8. *Hermes Propylaios*. Replica found at Ḥallābāt; detail of mouth and beard. Note drill-work.

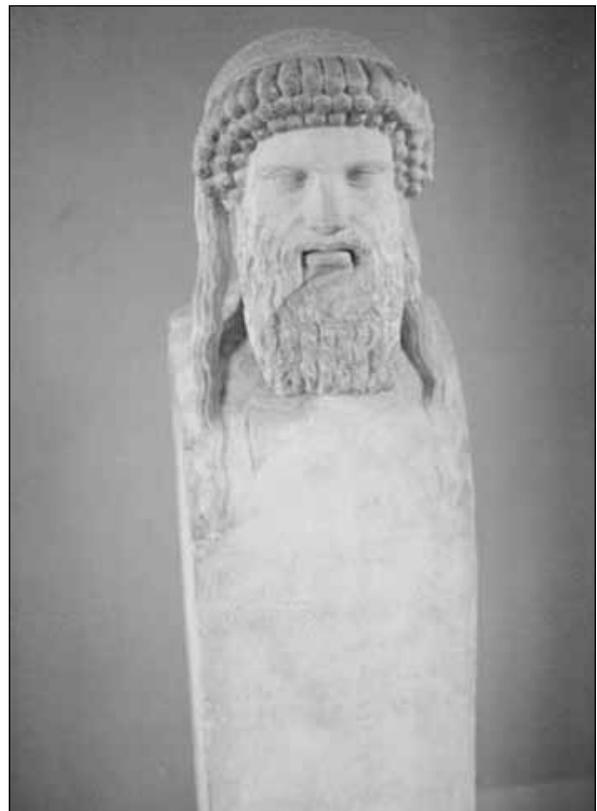
their expression by means of sharply cut lids, despite the absence of drilled pupils (**Figs. 1 and 5**).

The beard is carved in quite a naturalistic style, using a drill to create a remarkable chiar-oscuro treatment that enhances the volume of the head. The beard develops from the cheeks down to the chin, in an almost rectangular outline that is divided in curled pointed locks ending at the chest (**Figs. 1, 6, 7 and 8**). The hairstyle deserves special comment: it is tied by means of a thin taenia, or hair band, running above the ears and around the back of the head. This taenia also divides the hair into two different sections. First, in the frontal area the high forehead is surmounted by three rows of snail-shaped curls, decreasing in size with proximity to the brow (**Fig. 5**), that leave the conches of the ears uncovered. In contrast to other known examples, the singular coiffure of this particular example does not sharply frame the face of the god, but enhances the elegance of its clear forehead (compare with **Fig. 9**). Second, at the crown and back of the head, the hair is combed backwards in wavy strands (**Fig. 4**). These hang over the nape of the neck and down the back, where they take on the abovementioned simpler and more schematic appearance: almost flat with no volumetric treatment. Finally, two long spiral braids hang down each shoulder and on to the chest. They display the only evidence of damage on the statue, being an old fracture which is already covered with the creamy-golden patina of the figure as a whole. In other examples, e.g. that from Pergamon (see **Fig. 9**), these braids are substituted by two long locks brought forward over each shoulder.

The extensive use of the drill, e.g. in the strands of the beard or curls of the forehead, and simplification of other features suggests that this piece dates to the end of the 2nd or first half of the 3rd century AD⁵.

Identification and Typology

Following a detailed assessment⁶ of the or-



9. *Hermes Propylaios*. Replica found at Pergamon (Istanbul Archaeological Museum).

igin and character represented in this herm or bust, it can be confirmed that it is one of the better-preserved copies of the famous *Hermes Propylaios*, or *Hermes-beyond-the-gates*, carved by the great Classical sculptor Alkamenes. The original work by Alkamenes, which was most probably sculpted between 420 and 410BC, has been lost, but the fame of his work gave rise to several replicas during the Hellenistic and Roman periods.*

Alkamenes, who lived between approximately 440 and 400BC, is thought to have been born, or at least raised, in the Athenian colony on the island of Lemnios. He was one of the most renowned Greek sculptors of the High Classical

5. Thus, coeval with the construction of the Via Nova Trajana and the initial fort at Hallābāt (see below).

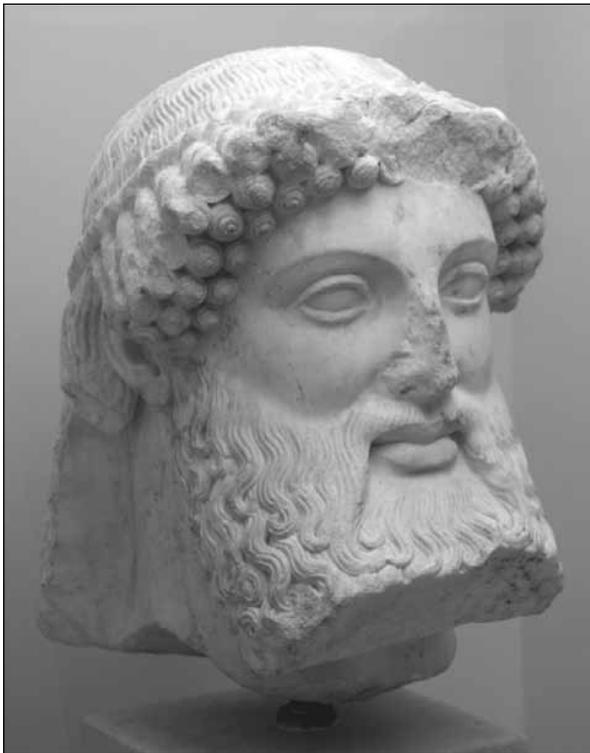
6. I am grateful to Dr Thomas M. Weber, Mainz University for his kind collaboration in this assessment and identification.

* The Alkamenes' *Hermes Propylaios* would be an archaic, retrospective work which comprises different elements of Greek art dating approx. between 480 and 400BC. Francis (1998) undermines the traditional attribution of the Pergamene herm as a copy of the Al-

kamene type. The most striking point in her argumentation is her suggestion that the Pergamene specimen is apparently an ancient pasticcio, consisting of a head and a shaft originally not belonging to each other. Even if this would be the case (there is no consensus at all on this issue), other samples like the one from Ephesos (that bears also the same inscription that support the attribution of the original to Alkamenes), would support this more agreed hypothesis.

period, a disciple of Phidias with whom he collaborated on the reliefs of the famous Temple of Zeus at Olympia. His most renowned work, a cast-bronze statue of the Pentathlon Winner, was stamped “classic” by his contemporaries and given the epithet of “enkrinomenos”, much as the the Doryphoros of Polycleus was given the epithet “kanon”. Among his other remarkable works are the Aphrodite-in-the-gardens at Athens, or the colossal relief in pentelic marble of Athena and Herakles found at the Herakleion of Thebes, which was dedicated by Thrasybulos.

Among the best-known replicas of the original Hermes Propylaios are those from Athens, housed at The Agora Museum (**Fig. 10**), Thasos, Ephesos and Pergamon, housed at the Istanbul



10. *Hermes Propylaios. Replica found at Athens (Athens Agora Archaeological Museum). Photo: Bibi San Pol.*

Archaeological Museum (**Fig. 9**). The replicas from Ephesos and Pergamon are famous for bearing the inscription that identifies this recurring image in Classical sculpture with that described and praised by Pausanias, who saw it at the entrance, or Propylea, of the Akropolis at Athens from which its name was derived:

“I am not just anyone’s work: in my form, if you look closely you’ll see the most beautiful image wrought by Alkamenes, the Hermes Propylaios”.

“Pergamios offered it”.

“Know thyself”.

The basic figurative characteristics of hermai devoted to Hermes seem to have been established in Archaic period, as the collection from this period at the National Archaeological Museum in Athens (**Fig. 11**) demonstrates. In this collection, the basic elements found in all hermai of the Classical period (and in later replicas from Roman and Hellenistic periods, like ours) are all present⁷, albeit represented in the hieratic style of the period. This was undoubtedly related to the popularity of the image and its serial production; there were actually artisans responsible for its production, who were known as Hermoglyphi pl. (see **Fig. 12**).

Archaeological Context of the Findspot⁸

The building where this herm was found was the result of a series of transformations by which a Roman military structure became, in the 6th century AD, a monastery and palace, before its final refurbishment as an Umayyad⁹ Qaşr, destruction by earthquake, and eventual abandonment in the mid-8th century AD as a result of the Abbasid political take-over.

7. Later Hermes were to be represented as a young man, usually wearing a broad-brimmed traveler’s hat or a winged cap (petasus), wearing winged sandals (talara) and carrying a Near Eastern herald’s staff - either a caduceus entwined by copulating serpents, or a kerykeion topped with a symbol similar to the astrological symbol of Taurus the bull. Hermes wore the garments of a traveler, worker or shepherd, and was represented by purses or bags, roosters and tortoises. When depicted as Hermes Logios, he was the divine symbol of elo-

quence, generally shown speaking with one arm raised for emphasis (see Smith, Wayte and Marindin 1890).

8. For a complete analysis see Arce 2006, 2007, 2008a, 2008b, 2009a and 2009b.

9. The Umayyads implemented a further refurbishment of the complex, enriching it with new mosaic floors, carved stucco panels and wall paintings, and adding an extramural mosque and a bath-house (Ḥammām as-Sarāḥ) located three kilometres to the south-east.



11. Archaic 'hermahermes' (Athens National Archaeological Museum). Photo: Bibi San Pol.

The original nucleus of the structure was a small Roman fort, most probably dating to the Severan period, which was intended for the defence of the Via Nova Trajana as part of the Limes Arabicus, or eastern border of the Roman



12. Depiction on an ancient Greek vase of a Hermoglyphos at work, carving a 'hermahermes'.

Empire with their successive Persian opponents: the Parthians and Sassanians. This fort was enlarged during the Tetrarchic period, taking on the shape of a quadriburgium, i.e. fort with four corner-towers (see Arce 2008a).

In the 6th century AD, following its abandonment after a change in Limes Arabicus defence strategy by Justinian, who dismissed the limitanei and replaced them with Christian Arab foederati, and its destruction by an earthquake (probably that of 551 AD), the fort was rebuilt and re-used as a monastery and palatine structure.

The reconstruction and transformation of the fort into a combined monastic and palatine structure was most probably carried out under the patronage of the Ghassanids, the Christianised Arab tribe that was entrusted with the task of defending the Limes Arabicus in the 6th century AD. Their leaders were nominated by Justinian in the foedus of 530 AD as Basileus and Archiphylarchs of all the allied Arab tribes. Their political nomination as effective kings of the Christian Arab tribes and religious zeal in promoting Monophysite Christianity through monasticism, as a tool of proselytism, would explain this peculiar transformation of the former military structure (see Arce 2007, 2008 and 2009). This event would most probably have seen the final destruction and / or desecra-

tion of any remaining pagan cultic object, like our herm, which was likely embedded in the reconstructed perimeter wall, from the collapsed remains of which it was finally retrieved by us.

Significance of the Deity and Typology of the Sculpture: Hermes and herm

Among the ancient Greeks, and as the related word herma (“boundary stone”, “crossing point”) would suggest, Hermes embodied the spirit of crossing-over.¹⁰ He was thought to be manifest in any kind of interchange, transfer, transgressions, transcendence, transition or transit, all of which involve some form of crossing, including that of borders and boundaries. This explains his connection with transitions in one’s fortune, with the interchange of goods, words and information involved in trade, with the interpretation (hermeneutic) of what is hidden (hermetic) and needs an interpreter (hermeneus) to be comprehended, and with the transition to the afterlife.¹¹

The primitive custom of worshipping the gods, especially Hermes, in the form of heaps of stones placed at crossroads or crossing points (where travelers added a stone to the heap to attract the divine protection¹²) gave way to the practice of erecting phallic pillars or cones¹³ in the gods’ honor, which were in turn eventually replaced by hermai.

This association of Hermes with guarding borders and crossing points, and the traditional location of hermai in these places (as well as the etymological confusion between the name of

the landmark and that of the deity), is similar to that of the Roman god Terminus with the landmarks or boundaries¹⁴ that are also denoted by the same term. Actually, the iconography of the god Terminus adopted the Greek model of Hermahermes,¹⁵ i.e. hermai representing the god Hermes.

This all relates to one of the hypotheses to explain the presence of our sculpture at Qaşr Al-Ḥallābāt, viz. the fact that the Roman fort of Ḥallābāt protected traffic passing along the Via Nova Trajana and was also part of the Limes Arabicus, or eastern border of the Empire, could explain the presence of such a herm or terminus in this particular location.

Hypotheses for the Origin and Function of the Sculpture

Although the original Greek sculpture, as well as most of the replicas, was in the form of a complete herm which combined head and shaft, in our case the bust was carved as a separate piece intended to be fixed to the top of the shaft (see above). This fact, together with the relatively high quality of the marble, means that it was probably a luxury object intended to be transported a long distance¹⁶ from the original workshop which avoided the extra weight of the shaft.

How such an outstanding sculpture arrived in this remote corner of the Roman Empire is still unclear, as are the vicissitudes that befell it after the official adoption of Christianity and the abandonment of the Classical pagan cults.

10. It has been argued, following Karl Otfried Müller’s (1848) demonstration, that the name Hermes is derived from the Greek word herma (ἕρμα), denoting a landmark. However, owing to the god’s attestation in the Mycenaean pantheon as Hermes Araoia (“ram-Hermes”) in Linear B inscriptions from Pylos and Mycenaean Knossos (see Ventris and Chadwick 1973), the connection is more likely to have been the other way round, from deity to pillar representations. Subsequently, Hermes acquired patronage over land travel by association with these cairns, which were used in Athens to ward off evil, and also as road and boundary markers all over Greece.

11. As a crosser of boundaries, Hermes Psychopompos (Hermes-conductor-of-the-soul) was a psychopomp, meaning he brought the souls of the newly-deceased to the underworld and Hades.

12. It was customary for passers-by to show respect to the simplest form of the god, the heap of stones, by adding a stone to the heap. This practice can still be seen today at many crossroads; even on the extremely

Christian pilgrim route of St. Jacques, the so-called “Cruz de Ferro” (an iron cross on top a wooden pole which stands over a huge heap of stones, all thrown at its base by pilgrims) can be seen close to the final destination.

13. This was also the origin of the Nabataean betils (Gr. Baityloi).

14. In Roman religion, Terminus was the god who protected boundary markers; his name was the Latin term for such a landmark, an etymological confusion similar to that between herm and Hermes. Sacrifices were performed after erection to sanctify each boundary stone; landowners celebrated a festival known as Terminalia in Terminus’ honor each year on February 23rd.

15. According to the god that it was represented atop the shaft, we can have Hermahermes, Hermanubis, Hermares, Hermathena, Hermaphrodita, Hermopan, etc.

16. It must be mentioned the lack of true marble in the region, so that most of the marble sculpture from Classical period was imported from Greece or Anatolia.

Two main hypotheses can be put forward to explain its presence at Qaṣr Al-Ḥallābāt: The first is linked to its ‘use value’ as a cultic object, particularly its religious use and symbolism as landmark. The second is related to its ‘exchange value’, i.e. it may have been looted from a nearby urban settlement and retrieved by the Roman troops controlling the area. These troops were deployed not only to counter the Persian military threat, but also to guard against the unrest caused by pastoralists’ raids against the settled and urban areas under Roman control.

The first hypothesis is linked to the cultic value of the hermai and hermean heaps which, as discussed above, were used by the Greeks as landmarks and placed by them on public roads and boundaries. The function of Hermes as protector of roads and boundaries could explain its location at Ḥallābāt as border landmark, or terminus, of the Limes Arabicus. Any symbolic or cultic value associated with the defence and protection of the border would however have become redundant with the disappearance of this geopolitical frontier under the Umayyads, after their victory over both of their former rivals, i.e. the Byzantine and Sassanian Empires, or perhaps even earlier with the advent of Christianity.

The second hypothesis is more prosaic and circumstantial, as it sees the herm merely as a valuable object that would have played, or was intended to play, a symbolic role as described above but in a very different context, i.e. looted in a raid and afterwards retrieved by the Roman troops controlling the Limes. Despite its apotropaic character and possible intended use, it is strange to think that such a high quality, cultic piece could have been intended for such a small and forgotten military outpost of the Eastern frontier. After all, the other replicas are from important Hellenistic and Roman cities such as Pergamon, Ephesos and Thassos. Thus, an alternative hypothesis can be proposed, in which the presence of the sculpture at Ḥallābāt was the result of Roman troops confiscating goods looted by nomadic plunderers from an impor-

tant nearby settlement. Indeed, one of the roles of the Roman army was to provide protection and stability to the sedentary populations under their rule, in the face of periodic raids by pastoralists.¹⁷

Regarding the sculpture’s final resting place, it can be hypothesized that it was embedded in the wall during the reconstructions of the 6th century AD, when the complex was transformed into a monastery and palace. Its fate would be thus similar to re-used basalt stones bearing the Anastasius Edict — seemingly brought from a nearby city¹⁸ — which were utilised regardless their original function or purpose. In the case of our Pagan herm, it may have been treated with such disrespect precisely because of its religious origin and significance as a symbol of a Pagan past that Christianity was trying to obliterate from the region.

Destination and Display

As part of the visitor presentation strategy, which is an integral part of the project, a site museum has been built at Ḥallābāt, where the bust will be displayed. A key role has been given to the herm as the character that welcomes and guides the visitor to the site-museum display, thereby fulfilling the role that Hermes played in Classical world as interpreter (*hermenus*), patron of commerce and eloquence, protector of merchants, travellers and whoever crosses borders and frontiers, travelling the roads and tracks of Earth.

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Director of the Spanish Archaeological Mission to Jordan

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17. This was related to the twin nature of this border. In the area of the Limes Arabicus there were actually two different borders: the ‘external border’ between the two major regional political superpowers of Rome and Persia, and the ‘internal border’ separating the settled population of Hellenised villagers and townsfolk living in Roman territory west of the Limes from semi-

nomadic pastoralists living on the steppe margins between the Limes and the true desert (see Arce 2008b).

18. This could lead us to an even more prosaic hypothesis explaining its location at Hallabat, that would see the sculpture solely as reclaimed building material brought in with the basalt stones re-used in the 6th century AD reconstruction of the Hallabat complex.

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THE SECOND PRELIMINARY REPORT OF THE SOUTH JORDAN IRON AGE II SURVEY AND EXCAVATION PROJECT (SJIAP): THE 2004, 2005 AND 2006 SEASONS OF SURFACE SURVEY

C.M. Whiting¹, J. Fraser, T. Jakob, H. Miller, Ina Kehrberg

Introduction

This report presents the results of the 2004, 2005 and 2006 seasons of surface survey in the area around the late Iron Age site of Khirbat ad-Dabba in southern Jordan. The survey covered an area of 400 km² located between Shawbak and Wādī Mūsā, focusing on the area between Bīr Khidad and Ud-hruḥ (see **Fig. 1**). Surface collection concentrated on sites identified from aerial photographs of the area (Royal Jordanian Geographical Centre 1:10,000 series), random sampling of field systems in the three environmental zones of the survey region, as well as revisiting previously surveyed sites. While the focus of the project is on the Iron Age archaeological remains in the area, the survey recorded the remains of all periods encountered.

Project Aims

The South Jordan Iron Age II Project (SJIAP) seeks to enhance our understanding of the nature of late Iron Age settlements in southern Jordan to serve as a basis for reassessing traditional models of late Iron Age society in the region.

Current models focus on the existence of ethnic groups, the very existence of which derives directly from historical sources. By thinking in terms of bounded, homogenous ethnic groups, such as the ‘Edomites’ in the case of southern Jordan, explanatory frameworks have been severely constricted. This approach has led to a circular, self-referential use of historical and archaeological evidence to produce a history of Iron Age southern Jordan. Traditional archaeological theory – which associates material culture with ethnic groups and relies on frameworks provided by literary evidence into which

archaeological data can be placed – has been successfully challenged in other areas of archaeology but remains unquestioned in the study of Iron Age Jordan.

In addition, recent studies have criticised the interpretation of national or ethnic material culture groups in Iron Age southern Jordan, based on the increasing recognition of regional variation in the Iron Age ceramics from this area (Binkowski 2001a, 2001b; Whiting 2007). Furthermore, the diverse patterning of ceramic use in Iron Age southern Jordan has demonstrated that, inasmuch as pottery is indicative of social practices, particular styles of pottery were integrated within local Iron Age social practices in a variety of ways, with sites and their inhabitants participating differently in the available material culture (Whiting 2007). This implies that we must think in terms not of a homogenous Iron Age ‘culture’, but of an Iron Age world that encompassed the coexistence of diverse communities and lifestyles, which could draw on particular types of pottery to greater or lesser degrees.

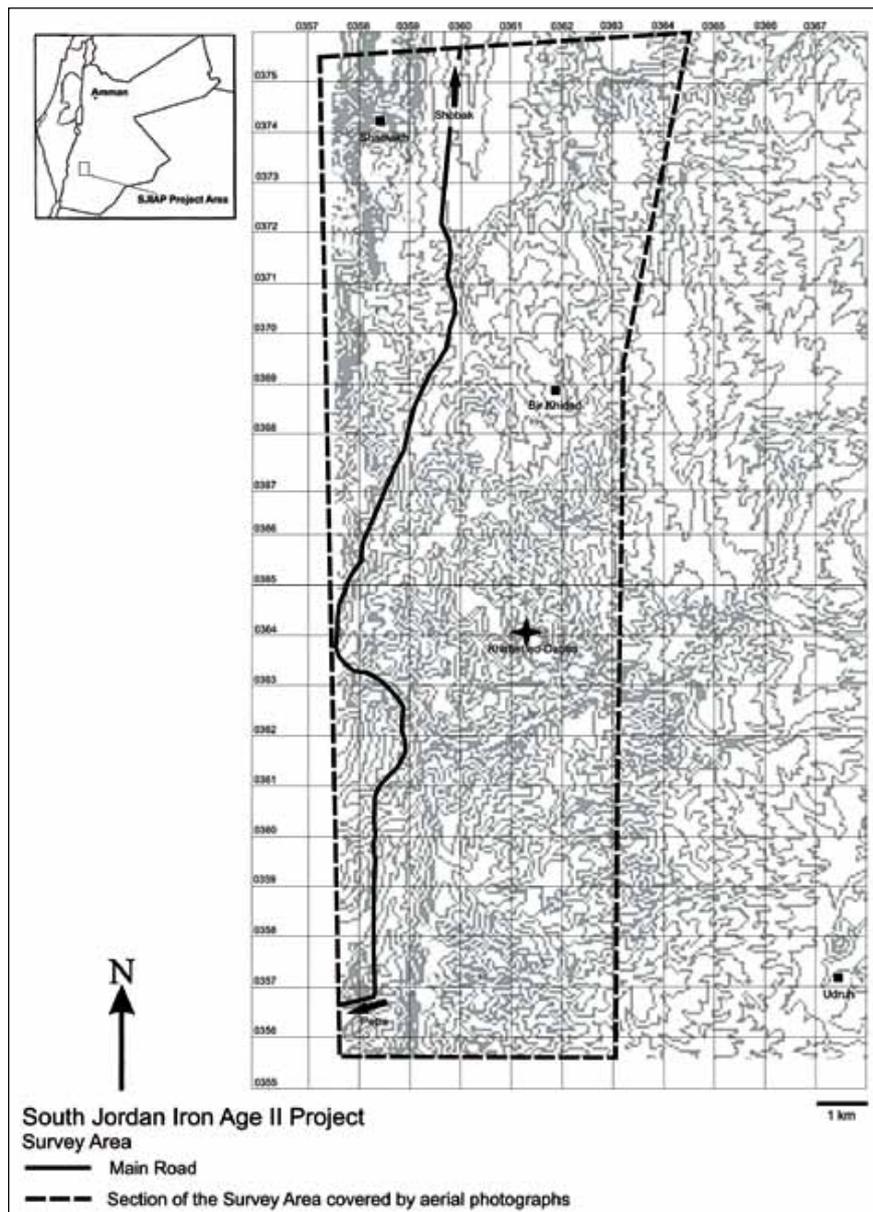
In line with these recent developments in Iron Age research on southern Jordan, SJIAP aims to provide a suitable dataset with which to explore these new ideas in more detail.

Fieldwork Strategy

In order to pursue these aims, the fieldwork strategy had a double emphasis, focusing on the one hand on the excavation of Khirbat ad-Dabba (Whiting *et al.* 2008), as well as the surface survey of a 400 km² area surrounding the site (**Fig. 1**). The survey area incorporated three environmental zones, including desert, rain-fed pla-

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1. Map of the SJIAP survey area showing the location of Khirbat ad-Dabba.

teau and the Jordan Valley escarpment. Survey of sites in these three areas was to allow comparison of site type, size and associated pottery across these zones to assess potential settlement patterns and variation in landscape use with a particular focus on the Iron Age.

Ceramic samples from all sites were collected for dating purposes. Pottery from predominantly Iron Age sites were further sampled for Neutron Activation Analysis to allow ceramic production and distribution patterns to be analysed in combination with the ceramic data from the excavations at Khirbat ad-Dabba.

The combined use of excavation and survey was to allow a macro-scale (regional) and micro-scale (site-by-site) approach to enable a detailed contextual analysis of the dynamics of individual sites and their local environs to be undertaken. By combining different scales of analysis, the project not only investigates the nature of economic and social structures at individual sites, but places them within a regional context. As a result, this research has implications for modelling late Iron Age society on both a local and a regional scale. At a local scale, the research investigates the nature of Iron Age life-

ways at individual sites in southern Jordan. On a regional level, this research offers the opportunity to evaluate new and alternative models for understanding the nature of late Iron Age society in the southern Levant as a whole.

Methods of Surface Survey

The project area includes ploughed terraced fields, brush rangeland, olive groves, apple orchards and some built-up areas. It is topographically complex with deep wadi cuts, steep hill slopes and minor valleys, which combine to make intensive surface survey very difficult. The location of sites was therefore based on locating standing architectural remains from aerial photographs. This strategy proved highly successful since even very small or ephemeral structural remains were highly visible on the photographs, allowing a comprehensive record of sites in the area to be compiled. In addition, remains often overlooked by archaeological surveys such as irrigation systems, cairns, wall lines, field walls and terraces could be recorded directly from the photographs, allowing a more inclusive record of the archaeological landscape to be produced. The use of aerial photography therefore offered a fast and accurate way of mapping large-scale archaeological features such as field systems, water management structures and cairn clusters.

In addition to these standing remains, off-site transects were walked to find potential artefact scatters as well as smaller sites not visible on the photographs. Off-site transects were also walked in the vicinity of Iron Age sites. This was done in order to assess possible patterns in landscape use and farming practices in this period.

Sites identified on the aerial photographs were located in the field using maps (1:50,000 Arabic and English series) and hand-held GPS (Garmin ETREX). In addition to the off-site transects placed next to Iron Age sites (see above), additional off-site transects were placed so as to sample all the different environmental zones of the project area, incorporating a variety of topographical locations including hilltops, hillslopes, valley bottoms and undulating plains.

When a site was located, or an off-site location targeted, its position was marked by GPS, colour digital photographs were taken and the site was recorded by written description, measurements and sketches on a field recording form.

The field recording form was a modified version of that used by the Sydney Cyprus Survey Project (Given and Knapp 2003: 25-58). All recorded data was entered into the project database to allow detailed analysis of site distribution patterns across the landscape. The results of the survey were mapped using GIS, with an emphasis on correlating this data with topographical, geological, hydrological, climatological, and vegetation information to allow detailed investigation of landscape use through time, especially with regard to the Iron Age period.

If artefacts were present, these were collected to provide dating evidence. This was done by walking two or three transects laid across the site. The transects consisted of a series of 5 x 25m rectangles, up to a maximum total length of 100m, depending on the size of the site. Each transect was walked by a team member who collected and bagged finds separately according to each square. This allowed systematic collection of artefact samples in addition to an assessment of artefact density and potential variability in artefact distribution across the site by period.

Lithics were examined by H. Miller, human skeletal remains by T. Jakob, Nabataean to Early Islamic ceramics by I. Kehrberg and Prehistoric, Iron Age and Islamic pottery by C. Whiting. Preliminary statements on these analyses are presented below; full publication will appear in the final project report.

Investigation of the entire survey area was not possible as some parts were within enclosed olive groves, apple orchards and private ground. Other areas were covered by bedouin camps. The survey therefore concentrated on accessible areas of field and open ground.

Mapping

A base map for the survey area was produced, utilising the 1:50,000 Arabic series 3150IV map sheet as the primary map. However, when checking the co-ordinates of fixed points on the ground it became apparent that the GPS co-ordinates derived from satellites did not agree with the UTM co-ordinates derived from the map. Further research determined that the map was inaccurate in places and that the co-ordinates taken from the map may have been up to 200m away from the co-ordinates obtained from the GPS. This is a known problem encountered by

other survey teams (e.g. Mortensen 1993; Flanagan and McCreery 1995). It should be noted that the error on the map is variable, both on this particular map sheet and across Jordan. Therefore, there is no formula that can be applied to the GPS-derived co-ordinates to calculate the corresponding UTM map co-ordinates. The sites recorded by the survey should be located on the ground by GPS only, since the survey map is inaccurate by up to 200m in places.

All co-ordinates for the SJIAP survey sites derive from GPS readings, using the WGS 84 co-ordinate system, and are the true UTM co-ordinates for the archaeological sites identified. The accuracy of the GPS reading was usually within +/-5m, but occasionally increased to +/-6 or 7m. The level of accuracy was recorded in the field records.

Topography and Geology

The survey area stretched from the top of the Jordan Valley escarpment in the west, across the rain-fed plateau, to the edge of the desert in the east. It extended between ash-Shawbak in the north and Udhruh in the south. Deep wadis cut the plateau in the survey area including, from north to south, Wādī al-Halasa, Wādī Umm al-Waizat, Wādī al-'Arja, Wādī Ash'ar and Wādī Rumayl. The topography of the survey area therefore consists of steep hillslopes separated by minor valleys, as well as areas of undulating plain. The elevation of the plateau varies between 1400 and 1600m, dropping to between 1200 and 1400m along the escarpment and in the desert.

Across most of the survey area, the hill slopes and valleys have been extensively terraced for agriculture, giving them a stepped appearance. This terracing is in an excellent state of preservation owing to the fact that development of the land for housing and other purposes has hitherto been limited. This is changing however, especially along the desert edge where an increasing number of large apple orchards have destroyed sites which were visible on the aerial photographs prior to the orchards' establishment.

A wide variety of terracing methods are present, which include a variety of wall types

as well as soil and stone banks. Field clearance cairns litter the landscape. Today the land is used for habitation, grazing, apple orchards, olive groves and ploughed fields.

The geology of the project area² is dominated by the Wadi Umm Ghudran Formation (B1), which is composed of white chalk, chert and microcrystalline limestone concretions with phosphatic chert (see **Fig. 2**), and the Wadi as-Sir Formation (A7), which represents the lower part of the B2 A7 aquifer, one of the most important aquifer systems in Jordan (see **Fig. 2**). It is distinguished by dolomitic limestone with some gypsum in its upper parts. The Amman Silicified Limestone Formation (B2a), which is lithologically composed of dark gray to brown chert intercalated with limestone (see **Fig. 2**), is also present in the area. Marl and chalky dolomite laminas are also found within this formation, in addition to some phosphate granules in the uppermost parts. Lastly, the project area includes the Al Hasa Phosphorite Formation (B2b), which is composed of phosphatic chert, phosphatic limestone, phosphate, chalky limestone, micritic limestone, marl and oyster shells (see **Fig. 2**).

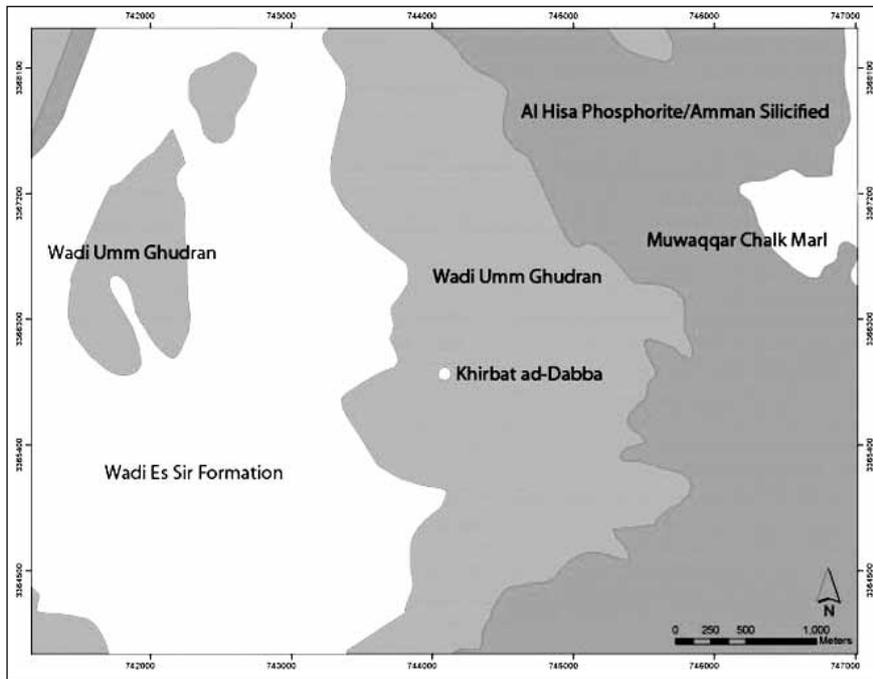
The soils in the survey area vary between undulating plains with a deep colluvial / aeolian mantle, which allows very intensive rain-fed arable cultivation as well as some tree crops, to moderate to steeply sloping lower colluvial foot-slopes within limestone hills with shallow to moderately deep colluvium, which supports rain-fed arable cultivation and brush rangeland. Soils on plateaux at the top of the escarpment and on upper slopes are mostly rocky and shallow with some deep colluvial pockets. This supports mainly brush rangeland, open natural forest and some tree crops. Steep-sided minor valleys and convex upper slopes have shallow and stony colluvium providing brush rangeland.

Overview of survey results

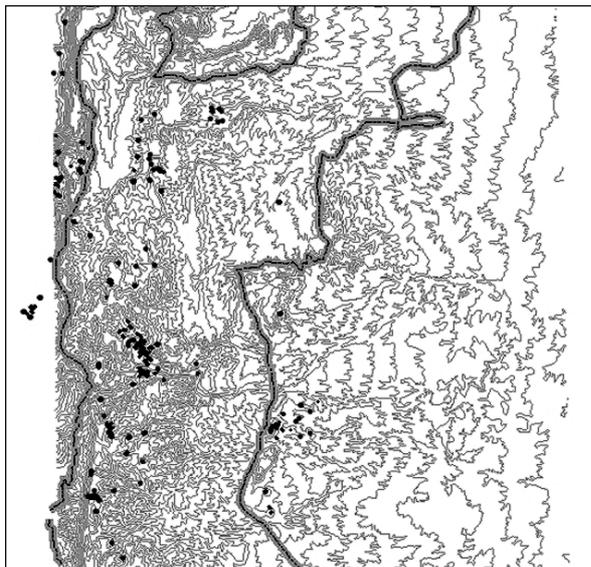
A total of 139 survey units were recorded in the survey (see **Fig. 3**). Many of these can be further subdivided since they were multi-featured sites (e.g. walled structure with a cistern), or repeat-featured sites (e.g. group of cairns).

2. Geological information on the project area was kindly provided by Marwan Raggad from the Department of

Geology at the University of Jordan.



2. Map showing the main geological formations in the project area (by M. Raggad).



3. Plot of the survey units in the project area showing contours and environmental zone boundaries (by J. Bradbury).

Large examples of the latter were mapped by area rather than individual feature location (see below). Some units fell into more than one site type. A simple sum of the numbers of site types therefore does not equal the total number of sites found or units walked.

The following discussion presents a brief description and breakdown of the survey units by site type, although it must be emphasised that

the interpretation of these is only at a preliminary stage and that the pottery and lithics – although analysed – have not yet been written up in final form.

Settlements

Transects were walked across a total of 30 sites classified as settlements. Sites were classified as such if they comprised of clusters of more than six separate structures. Not all of them are discussed in detail here, except to highlight a few of the best preserved examples which could clearly be dated by pottery.

Several substantial mediaeval sites were located, the largest of which was situated east of the modern settlement of Jarba, in the desert zone of the survey area (Unit 114). This settlement included 20 or more rectilinear structures built of limestone, flint and basalt blocks. Decorated and undecorated handmade mediaeval wares littered the surface (see Islamic pottery analysis below). Other mediaeval sites were found off the plateau edge and on the plateau. Mediaeval sites were thus equally spread across the different environmental zones of the survey area, but were usually situated near a spring.

A large number of Roman / Byzantine settlements were found, the most notable of which included Units 68, 75 and 119. All of these

settlements consisted of clusters of rectilinear structures of different internal layouts, often associated with cisterns, threshing floors and enclosure walls. Many of these structures were well-built of square-hewn stone blocks. Roman / Byzantine remains were found in all environmental zones of the survey area. In addition, they were located in a range of different topographical locations within these zones, such as hill-tops, wadi bottoms and hill slopes.

Nabataean settlement sites were ubiquitous in the survey area, being located in all of the environmental zones and in different topographical locations. Several smaller settlements comprised of 6 - 10 rectilinear structures were located on the hill slopes close to Khirbat ad-Dabba, including Unit 44. More extensive settlements located in wadi bottoms next springs are, for example, represented by Units 8 and 79. These consisted of extensive well-preserved remains, comprising more than 10 rectilinear structures. The layout of some Nabataean sites differed, for example, by incorporating a large round structure alongside rectilinear building remains such as Unit 49. This hints at different site functions, an issue which will be explored through the pottery analysis.

Several Iron Age sites were found located off the edge of the plateau, including Units 69 and 121. Many of these were located on top of small spurs with steep slopes on their south, west and north sides. They consisted of clusters of rectilinear structures, sometimes associated with threshing floors and wall lines. Iron Age sites such as Unit 20 were also situated in the desert zone of the survey area. Iron Age sites on the plateau ranged widely in layout, hinting at a wide variety of functions. Unit 25, for example, represented a simple cluster of rectilinear structures on a low hill in a valley, while Unit 139 was a very large site with the remains of large well-built rectilinear structures surrounded by a wall and a possible gateway on a high spur surrounded by steep cliffs.

The remains of a possible Chalcolithic / Early Bronze Age settlement were found in Unit 53. It comprised of a series of rectilinear structures and an extensive Chalcolithic / Early Bronze Age pottery scatter to the east of the structures. These remains were possibly associated with a several large stone cairns. Some of these cairns

had been bulldozed resulting in the presence of human remains along the walked transects (see human skeletal remains report below). A Chalcolithic / Early Bronze Age pottery scatter, possibly associated with some rectilinear structures, was also found in Unit 114 down-slope from the mediaeval settlement of al-Jarba (see above).

Artefact Scatters

Considering the size of the survey area very few artefact scatters were found. There was a general background 'noise' of pottery sherds and lithics, but there were only a few dense artefact scatters that might represent occupation.

A very extensive Lower Palaeolithic lithic scatter was recovered from Unit 55 in the northern part of the survey area (see lithics report below). It covered a large area and formed part of the large lithic surface accumulated in the Fjaje area previously identified by Rollefson (1981).

A smaller, but much denser Early PPNA lithic scatter was recovered from Unit 116 (see lithics report below). It was located on a small knoll in the centre of the large wadi east of modern al-Jarba. The knoll was flat-topped and measured *ca* 50-75m in length. Lithics were the only artefacts recovered from the top of the knoll.

A small concentration of Chalcolithic / Early Bronze Age sherds was noted around a large stone cairn in Unit 52. The cairn represented a large tumulus tomb measuring *ca* 12 by 6m in size. It comprised of a retaining wall which enclosed several internal cists, all of which had been constructed from massive flint blocks. The cairn had been badly damaged by bulldozing on its north and east sides. The tomb was quite big, but resembled many others recorded in the survey. This one was distinct from the others because human remains from the cairn had been exposed by the bulldozing (see skeletal report below).

Another Chalcolithic / Early Bronze Age pottery scatter was recovered from Unit 53 (see also settlements above). The scatter was located adjacent to several stone cairns, rectilinear structures and field walls.

Cisterns

Nine cistern sites were located in the survey area. Several cisterns were found in association with settlement sites or related to structural re-

mains. A number of cisterns were also found in isolation, often surrounded by an enclosure wall which delimited an open space around the cistern mouth. Others were enclosed within a small structure. Other examples include Unit 13 which comprised three heavily damaged cisterns on a high hilltop. Each cistern mouth was enclosed by a circular wall.

Threshing Floors

Ten threshing floors were located within the survey area. These floors comprised of an area of exposed bedrock enclosed by low rubble walls. Most of them were in association with structural remains or settlement sites, but many of them were also found in isolation surrounded only by arable land. Some threshing floors were associated with rock-cut features such as cup holes (e.g. Unit 134), while ground stone objects were found in association with others (e.g. Unit 26). Unit 64 represented a threshing floor in association with a cistern and a single structure.

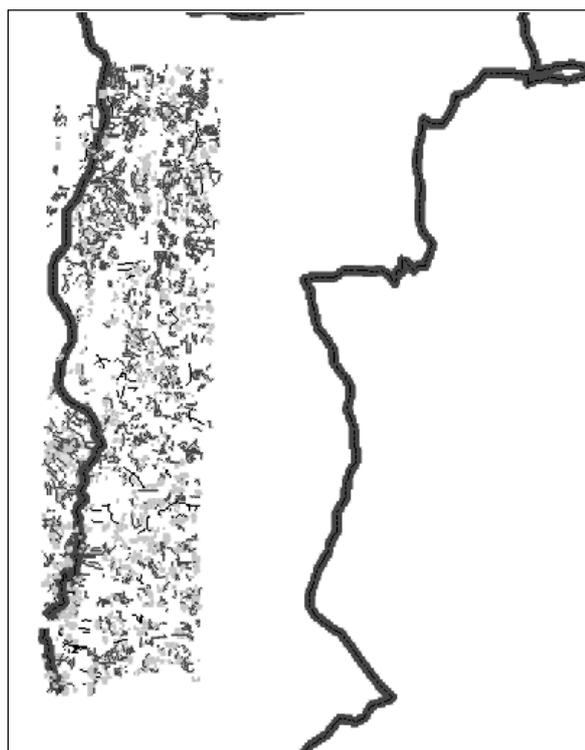
Single Structures

11 units represented single structures. These included large well-built, multi-roomed rectangular structures with internal sub-divisions represented by Units 32, 65, 73, 80 and 85 for example. These sites were always associated with Classical pottery and may have represented farmsteads.

Simple single-room structures dating to a variety of periods were also found. Units 7, 22 and 51, for example, represented isolated rectilinear buildings situated on high hill-tops and probably dated to the Iron Age. Units 18 and 117 were similar structures situated in the desert zone of the survey area and were associated with exclusively Classical pottery. These sites may have formed part of the Roman *limes*. A small square structure in Unit 54 was associated with exclusively Chalcolithic / Early Bronze Age pottery.

Wall Lines

Many wall lines were noted in the survey area. These represented field walls, terrace walls, water management walls and wall lines of unknown function. Due to their number and sometimes immense length, they were largely recorded from the aerial photographs and plotted using GIS (see **Fig. 4**). Ten of the more



4. Plot of field walls (light gray), long wall lines (dark gray) and cairns (lightest gray) mapped from aerial photographs, showing environmental zone boundaries (by J. Bradbury).

prominent walls that may have been associated with water management or cairns were recorded separately.

Unit 70, for example, represented a long ephemeral wall line extending across a hilltop with associated cists and a megalithic structure constructed across / as part of it (their stratigraphical relationship could not be discerned). Unit 61 represented a substantial well-built wall running adjacent to a wadi channel and ending in the remains of a dam, which would have blocked the channel where it narrowed to control water flow down the wadi. A long, low wall line with no identifiable function was also identified as part of Unit 59. It extended across the ridgeline of a hill and was associated with cists. All along the wall stones were placed upright which were visible against the skyline from a distance.

Off-site Transects

62 off-site transects were walked by teams spaced at 5 m intervals. It is interesting that these revealed very little that was not already

identified from the aerial photographs, suggesting that the archaeological record for the Iron Age onwards, as identified from aerial photographs, is fairly complete.

In addition, the off-site transects revealed a general background ‘noise’ of Nabataean to Late Byzantine / Early Islamic ceramics. This attests to the occurrence of midden spread from the Classical period onwards, since very little Iron Age pottery was found outside the immediate vicinity of Iron Age sites. This is in contrast to Iron Age sites in the north of Jordan where midden spread was attested (e.g. at Tall al-‘Umayri). Mediaeval and post-mediaeval wares were also much more site specific, possibly indicating that midden spread was not used in these periods or that changes had taken place in ceramic disposal. Not enough Chalcolithic / Early Bronze Age pottery was found to identify patterns in its distribution.

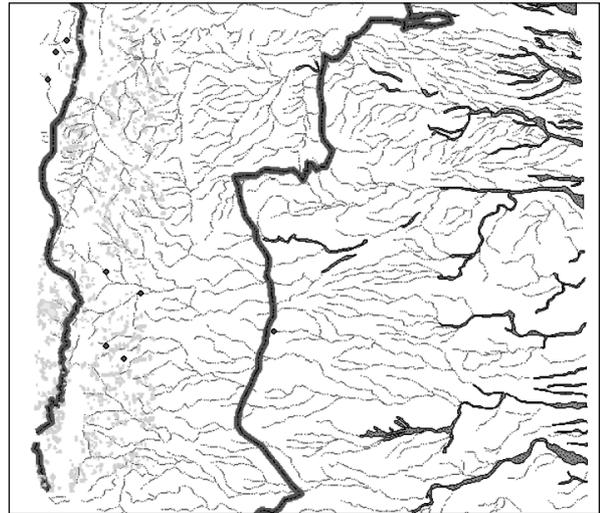
Apart from the specific lithic scatters discussed above, the chipped stone also formed a general background ‘noise’ of material across the landscape. Most of these lithics were very difficult to date since they consisted for the most part of undiagnostic flakes which could have been produced in any period.

Cairns and Cairn Fields

The entire survey area was densely covered with stone cairns of a variety of types and sizes. An impression of their sheer density is provided by the distribution map produced by mapping the cairns straight off the aerial photographs (see **Fig. 5**). This proved very straightforward as they were clearly visible on the photographs. Eight of the most interesting cairn clusters were ground-checked and recorded in more detail. Three of these were further subjected to a detailed cairn survey, the results of which are presented below.

Cairn Survey (JF)

During the 2004 and 2005 field seasons, SJIAP noted thousands of rubble cairns (*rujm*) throughout the survey area. These cairns are



5. Plot of cairns mapped from aerial photographs of the project area, showing environmental zone boundaries (by J. Bradbury).

probably monumental funerary structures, given parallels with cairn-tombs elsewhere in southern Jordan (e.g. Creighton *et al.* 2007: 115-124; Fujii 2004), and the fact that, in 2005, SJIAP found human remains in two cairns partially destroyed by bulldozing (see human skeletal remains report below). The large number and extensive distribution of cairns in the Sharra highlands may therefore constitute a vast and highly visible mortuary landscape. A special cairn survey was created as part of the 2006 field season in order to document the various types of cairns present in the area, and to articulate patterns in their distribution³.

The cairn survey investigated three “survey units”, each measuring 2km north-south by 3.5km east-west. These units included areas with varying densities of cairns in different topographic locations:

1. Survey Unit 1 extended east of a large radio tower at UTM 741898E 3358789N, and included a dense concentration of large, rubble tumuli running along the ridge and slopes of Jabal Zubayra;
2. Survey Unit 2 centred around Khirbat ad-Dabba itself, and contained a more dispersed spread of smaller cairns;

3. The survey was led by James Fraser (University of Sydney) as part of his postgraduate research into megaliths in Jordan. The team consisted of Anne-Marie Beavis, Guadalupe Cincunegui and Ngaire Richards (all of the University of Sydney) and Holly Miller (University of

Liverpool). The fieldwork was funded by the Carlyle Greenwell Bequest, as well as a Grant-in-Aid from the Near Eastern Archaeology Foundation, both of the University of Sydney.

3. Survey Unit 3 covered gentler, cultivated slopes immediately north of ash-Shawbak. This area has a lower density of cairns than the other two areas, but included one cairn (UTM 747571E 3377881N) from which the previous SJIAP survey had retrieved human remains.

Over 500 features were mapped using a differential GPS, and each feature was documented on a comprehensive recording sheet. These sheets contained fields for each cairn's size, shape, structural characteristics (including wall-lines, kerbing and cists), and the composition of the tumulus itself. The nature of each cairn's location was also recorded, including its topographic and geomorphological setting, as well as its visual relationship with other cairns and with topographic features in the surrounding landscape. Select examples were drawn, and soundings were excavated in seven structures. Several different types of cairn were noted, as well as other archaeological features including cists, stone circles and wall-lines.

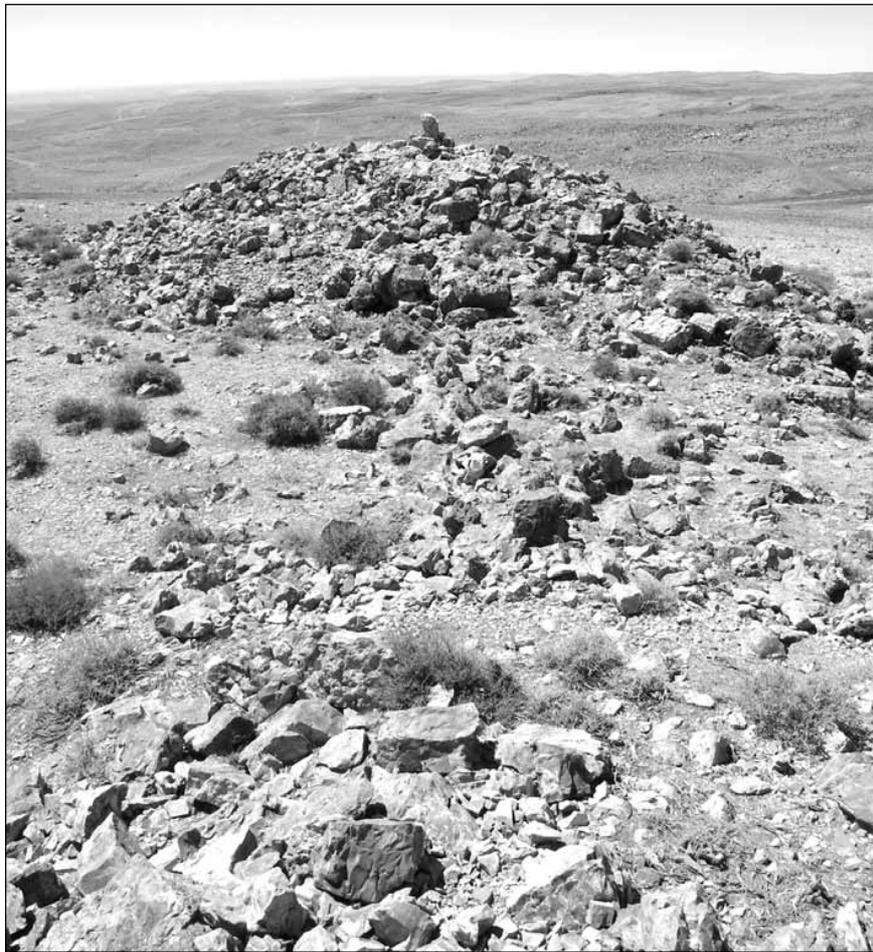
The survey also mapped several hundred piles of rubble "field-clearance". The identification of a cairn-tomb as opposed to a pile of field-clearance presents a critical methodological problem, one also encountered (but not fully resolved) in the nearby survey at Wādī Faynān (Creighton *et al.* 2007: 115). For our purposes, if a rubble pile exhibited no apparent structural or architectural features, then it was mapped as "field-clearance". This distinction is coarse at best, although generally the distribution of "field clearance" piles corresponds to areas under cultivation. If, however, the cairn displayed any form of structural design (such as kerbing, interior wall-lines or cists), or if it was found in an area unsuitable for cultivation, then the cairn was mapped as a potential cairn-tomb and recorded in detail. The following discussion briefly outlines some of the main types of monuments found during the survey.

1) The most striking type of cairns are "megalithic cairns", so-called because of the large, angular chert blocks (up to 50 by 50 by 30cm) used to construct their tumuli. Megalithic cairns are circular or ovoid in shape and, on average, *ca* 15 by 15m in size and *ca* 2m high (Fig. 6). These features rarely contain any apparent internal architecture,

although rectangular burial chambers are evident in a few robbed examples. Occasionally a low stone enclosure had been built against the side of a megalithic cairn, and several cairns are joined by low walls. Almost all these cairns were found clustered along the ridgeline of Jabal Zubayra in Survey Unit 1, with excellent views to the marginal eastern desert fringes. One cairn, which sits within the main group of cairns on the ridgeline, was significantly larger than the rest, measuring 27 by 27m and *ca* 9m high. This particular cairn is visible from everywhere else on the ridge, and it may have served as a visual reference point (Fig. 7). A large wall with up to six courses runs for 40 m along the northern side of the Jabal Zubayra ridge, defining the northern extent of this particular cluster of megalithic cairns.

2) "Rubble cairns" are stylistically similar to megalithic cairns, although their tumuli consist of smaller rocks cleared from the surrounding area. Most of these features are *ca* 10 by 15m in size, and stand 0.5-2m high, although they can be as large as 30 by 30m and as small as 5 by 5m. These cairns are usually ovoid and run down-slope. Their highest point is always at the upper-slope end, which is commonly defined by a curved kerbing of larger rocks that occasionally encloses the entire tumulus, as shown in Fig. 8. Several examples contain possible square or rectangular cists. Although less striking than the "megalithic cairns", the "rubble cairns" are far more ubiquitous, found almost everywhere in the surveyed area. In Survey Unit 1, they scatter along the slopes east of Jabal Zubayra, while in Survey Unit 2 they concentrate on a ridge west of Khirbat ad-Dabba. The few rubble cairns in Survey Unit 3 were isolated monuments found on the tops of gentle ridges and knolls.

3) "Stone rings" are another common feature. These consist of low, circular enclosures no larger than *ca* 5m in diameter and no more than two courses high. These features are not covered by a tumulus and do not appear to contain any central cist or chamber, although this remains to be clarified by excavation. Most "stone rings" were found on the ridge west of Khirbat ad-Dabba in a large cluster



6. Two “megalithic cairns” joined by a small wall (photograph by J. Fraser).



7. View down the Jabal Zubayra ridge, facing east. Largest megalithic cairn in centre (photograph by J. Fraser).

- of rubble cairns in Survey Unit 2.
- 4) “Stone circles” were much larger enclosures, some up to 30m in diameter. They consist of a low circle of roughly aligned rocks or, more commonly, piled-up rubble. These structures may be nothing more than modern animal corrals. However, the two largest circles were

found on the ridge-top immediately south of Jabal Zubayra, an area that seems unnecessarily exposed for an animal pen. Rather, like stone circles elsewhere in Jordan (Scheltema 2008: 21-23), these features may have been associated with the surrounding rubble cairns and the field of megalithic cairns on Jabal Zubayra opposite.

- 5) The few “rectangular structures” found during the survey were all located on low spurs running east from the Jabal Zubayra ridge. These structures are *ca* 30 by 8m in size, and stand *ca* 2m high in three or four courses. The outer walls are constructed of large rocks, whereas the interior space is filled by rubble and soil. Many features have traces of interior architecture, probably platforms, although this can only be confirmed through excavation. Large and medium rocks usually fill the interior of the smaller, lower rectangular structures.



8. "Rubble cairn" enclosed by a ring-wall (photograph by J. Fraser).

6) "Cists" are rectangular or, less commonly, circular features in which low vertical slabs enclose a chamber usually no bigger than 1.5 by 1.5m. Most cists were found in Survey Unit 3, and are lined with upright brown and orange chert slabs. While small rock cairns cover some cists, most had been robbed or were heavily deflated.

Many more types and sub-types of cairns and other features were found during the cairn survey. Given the nature of these monuments, however, there comes a point where detailed typological distinctions become blurred. As Creighton *et al.* (2007: 115) observed when recording similar features in the Wādī Faynān, many features are destroyed or degraded to such a degree that their original form is lost, whereas others have been significantly re-used, often as field-clearance, and can not be identified as tombs with any certainty at all. Ultimately, the identification of most structures as "cairn-tombs" can only be substantiated through excavation. Small soundings, however, fail to adequately reveal the architectural complexities concealed beneath the vast rubble tumuli. The cairn survey opened several 2 by 2m soundings in seven megalithic and rubble cairns, but these excavations were inconclusive. While these small exposures did reveal several additional wall-lines hidden below the tumuli (**Fig. 9**), they were not able to show how these architectural features were integrated within the structure as a whole, let alone identify areas within each tumulus with a high probability of yielding material culture or hu-



9. Sounding through the tumulus of a rubble cairn, showing an outer ring-wall (photograph by J. Fraser)

man remains.

Consequently, the chronology of these megalithic structures remains ambiguous, a situation not helped by the paucity of surface material in the cairn-fields. Other cairns in Jordan have been dated to the late-prehistoric periods, as in Wādī Faynān (Creighton *et al.* 2007: 122) and the Jafr basin (Fujii 2004). Nevertheless, we must assume that cairns were constructed over a long period of time, particularly as cairns have been found with material dating to as early as the PPN (Rosen *et al.* 2007) and as late as the Classical (Bradbury 2009) periods.

Human Skeletal Remains (TJ)

Incomplete human remains were recorded in two locations during the 2005 season of the SJIAP survey. Unit 53 yielded scattered human

remains from two ditches adjacent to a bulldozed track. Parts of this track had cut through the middle of a stone cairn. The skeletal remains from Unit 52 were found scattered over the northern aspect of a bulldozed stone cairn. None of the skeletal remains were *in situ* and, therefore, their chronological age and archaeological context cannot be established. However, their location and pottery found in the vicinity indicates a possible Chalcolithic / Early Bronze Age date.

The remains of at least four individuals were analysed macroscopically prior to reburial. Two young-middle adult (26-35 years) individuals, both probably female, were found in Unit 52. One individual had experienced trauma to a lumbar vertebra (spondylolysis). One adult, probably a male, was found in Unit 53 and had joint degeneration of the right shoulder. Unit 53 also produced a neonatal individual represented only by an incomplete femur.

The following report includes an inventory of all anatomical elements, their state of preservation, minimum number of individuals (MNI), age and sex estimation, metric and non-metric traits, as well as macroscopically observed pathological changes, following recommendations for data collection outlined by Buikstra and Ubelaker (1994). All measurements were taken with a pair of sliding callipers (OMC Fontana Inox-Temp) and are given in mm.

Unit 52

Inventory

Skull

Not present.

Axial skeleton

Three thoracic vertebrae (two with body and neural arch, one with neural arch only).

One lumbar vertebra, possibly L5 (complete, but inferior articular facets missing due to spondylolysis – see pathological changes).

Sacrum (complete).

Two ribs (one complete right, one left with costal head – rib 11 or 12).

Appendicular skeleton

Radius (left proximal end and proximal third of diaphysis).

Pelvis (fragment of right ilium with auricular surface, part of acetabulum and iliac crest).

1st metatarsal (left, complete).

5th metatarsal (left, proximal end and diaphysis).

Preservation

All bones retain their original cortex with only small fragments missing; the ilium displays some cracks and shows minor flaking. Prolonged exposure to sunlight has bleached the bones to an off-white colour. However, the body and sternal end of the complete rib, as well as the isolated neural arch are stained slightly darker. These were the elements retrieved from underneath stones.

MNI

Although no duplication of skeletal elements occurred, the sacrum and ilium do not join together. In addition, the body of the lumbar vertebra is too large to fit the sacral promontory. This indicates that at least two individuals are present.

Sex

Ilium with preauricular sulcus and wide greater sciatic notch.

Sacrum with wide triangular shape, articular surface with ilium extends from S1-S2, inferior aspect with distinctive anterior curve.

All bones are of gracile appearance with smooth muscle insertions.

All sexually diagnostic skeletal remains indicate possible female sex for both individuals.

Age

Auricular surface with few visible grooves and ridges: Phase 2 (25 - 29 years), Lovejoy *et al.* (1985).

Sternal rib end shallow with well-defined margins: Stage 3 (24 - 28), Loth and İşcan (1989).

Iliac crest fused, but epiphyseal line visible.

Sacrum: S1-S2 recently fused.

All vertebral and costal epiphyses fully fused; vertebral bodies with faint grooves

All diagnostic elements indicate young - middle adult age (26-35 years).

Metrical data

Sacral promontory width: 31.5 mm.

Sacral width: 81.0 mm.

Lumbar body – inferior width: 42.5 mm.

1st metatarsal length: 39.8 mm.

1st metatarsal – proximal articular facet height: 23.5 mm.

Non-metric traits

The sacrum has an additional articular facet on each side located on the superior aspect of the ala.

Pathological changes

All three thoracic neural arches show beginning of ossification of the ligamentum flavum. The lumbar vertebra is missing its inferior articular facets – a pathological lesion known as complete bilateral spondylolysis, which is thought to be traumatic in origin, but which also requires an underlying congenital defect to occur. Modern clinical data indicates that this condition is more commonly seen in young professional athletes, such as gymnasts. The fracture line at the pars interarticularis shows remodelled new bone formation indicative of some instability due to the pathological condition. The anterior aspect of the superior margin of the vertebral body shows remodelled new bone formation extending onto the anterior aspect of the body. In addition, the anterior margin of the inferior body displays some remodelled new bone formation. This indicates forward slipping of the unstable vertebra on its neighbour, a severe complication of spondylolysis known as spondylolisthesis (Aufderheide and Rodríguez-Martín, 1998).

The posterior aspect of the first sacral element shows evidence of sacralization of the last lumbar vertebra in the form of rudimentary visible inferior articular facets and the sacrum consists of only four sacral elements. This congenital condition was probably asymptomatic during life, causing little or no problems.

Unit 53

Inventory

Skull

Two joining fragments of frontal bone – right side with parts of temporal line and coronal suture.

Fragment of left parietal bone with coronal and sagittal sutures (bregma).

Fragment of right temporal bone with mastoid process and external acoustic meatus.

Fragment of right sphenoid bone – greater wing with temporal suture.

Axial skeleton

Unisided rib fragment.

Appendicular skeleton

Scapula – right side with glenoid fossa and part of coracoid process.

Humerus – right side, distal third of diaphysis.

Ulna – right side, proximal third of diaphysis.

Femur – right side, middle and proximal third of diaphysis and distal articulation.

Two femur diaphysis fragments.

Femur – diaphysis (non-adult individual).

5th right metatarsal – complete.

Preservation

Bone colour is off-white, consistent with their exposure to sunlight due to bulldozing of the burial mound. Cortical integrity is mainly good, but severe flaking and fragmentation has occurred.

MNI

The presence of a non-adult femur fragment indicates that the remains of at least two individuals are present. The adult bones show no duplication of elements, but the presence of more than one individual cannot be ruled out.

Sex

The only sexually diagnostic element is the temporal bone with a large, robust mastoid process and pronounced suprêmeatal crest, both indicating possible male sex.

The linea aspera of the femur is robust and shows well-developed muscle attachments, again, indicating possible male sex.

The bicondylar width measurement of the femur indicates possible male sex. However, as population-specific measurements are unknown, this remains speculation.

Age

No age-diagnostic features are present for the adult skeletal remains; all epiphyses are fused indicating an age of 20+ years.

The non-adult femoral diaphysis derives from an individual of neonatal to 6 months of age (Ubelaker 1989). However, its state of preservation does not allow for secure length measurement and, with the population unknown, the age of this individual can only be given as an approximation.

Metric data

Non-adult femur length: 88.5 mm (not complete).

Femur – bicondylar width: 74.0 mm.

Scapula – glenoid fossa length: 42.5 mm; width: 31.5 mm (since the glenoid fossa displays degenerative change, these measurements should not be used to assess the sex of this individual). 5th metatarsal length: 69.0 mm (head-styloid process).

Non-metric traits

None observable.

Pathological changes

The right glenoid fossa shows evidence of remodelled new bone formation around its entire margin, especially on the posterior aspect. This additional new bone formation has led to contour changes of the joint's articular surface and is indicative of joint degeneration (Aufderheide and Rodríguez-Martín 1998).

Iron Age Ceramics (CMW)

The Iron Age ceramics collected during the SJIAP survey are generally similar to the pottery from known Iron Age sites in the area, and fit in well with Oakeshott's classification of the late Iron Age ceramics in southern Jordan (Oakeshott 1978). The formal classification of the Iron Age pottery therefore followed the terminology used by Oakeshott (1978).

Although all the Iron Age ceramics from the survey have been analysed in full, only a basic discussion of fabrics and forms is presented here to provide a sense of the nature of the survey pottery. Parallels and a detailed breakdown of fabric, form and surface treatment according to context type and excavation area will appear in the final report.

Much of the Iron Age pottery recovered throughout the investigation consisted of the standard range of bowl, jar, jug, and cooking pot forms found at late Iron Age sites in southern Jordan. In addition, a considerable number of 'Negev ware' vessels were present. The range of vessel types was however much more restricted than the range recovered through exca-

vations at Khirbat ad-Dabba, which formed the focal point of the project (Whiting *et al.* 2008). Whether this was due to difference in site size or site function, or both, remains a central question and one which will be address in the final report.

Decoration is present mainly in the form of painted bands applied in combinations of red, white, and black paint on both the interior and exterior of vessels. Geometric designs in the same paint colours are also present on certain vessel forms, although less commonly. Similarly less common are slipping and burnishing, as well as plastic decoration in the form of denticulated edges applied to the rims of flat open bowls. The majority of decoration was applied to bowls. In general, there was less decoration on the survey pottery compared to the material excavated at Khirbat ad-Dabba.

Fabrics were generally similar to other Iron Age sites in the area, the majority of vessels falling into the fabric category described by Oakeshott (1978: 59-61) as Fabric 1. The main inclusion in this fabric is calcite, followed by basalt, quartz and grog. Size, quantity and frequency of inclusions varies from well levigated fine wares to coarse wares. The fine to medium versions of Fabric 1 were used for bowls, jugs and juglets, while the coarsest version was used for storage jars. Cooking pots were almost all produced from Fabric 3c (Oakeshott 1978). The clay in this fabric has a high silica content, with quartz forming the main inclusion. The rough, handmade 'Negev ware' vessels were all produced from medium to coarse versions of Fabric 1, with the methods of construction and firing lending it a distinctive coarse appearance and feel. Several other fabrics were present in the assemblage, but occurred much less commonly. All fabric types will be described in detail in the final report.

Further study of the Iron Age fabrics is represented by the preliminary results of Neutron Activation Analysis (NAA)⁴ of the Iron Age survey ceramics (Boulanger and Glascock 2008). This study has identified a compositional macro-group which can be tentatively associated with ceramic production in the region around the Iron Age site of Khirbat ad-Dabba, which formed the

4. This study is being undertaken jointly with Benjamin Porter (University of California, Berkeley) the full re-

sults of which will be published in the final report.

focus of the SJIAP excavation project (Boulangier and Glascock 2008: 7; Whiting *et al.* 2008). The ceramic samples representing this group all derived from sites located less than 2km from Khirbat ad-Dabba. Ceramics from survey sites located more than 7km away from Khirbat ad-Dabba did not fall within this macrogroup.

Several small clusters of samples were identifiable within the macrogroup, suggesting that further sampling may yet reveal that the macrogroup is really composed of multiple similar, though discreet, compositional groups (Boulangier and Glascock 2008: 7). Unfortunately, at this preliminary stage of the analysis, the number of samples in any one of these clusters is too small to warrant establishing distinct compositional groups. Further sampling of Iron Age ceramics from the region is underway to facilitate examination and refinement of these small clusters into smaller context-specific compositional groups.

In addition, some small clusters of outlying samples appear to reflect compositional similarity suggestive of similar raw materials (Boulangier and Glascock 2008: 7). The low overall number of samples comprising these *proto*-compositional groups is however too small to permit statistical evaluation. Additional sampling of Iron Age pottery from the project area is therefore underway to assess the significance of these tentative associations.

Prehistoric, Mediaeval and Post-Mediaeval ceramics (CW)

Chalcolithic / Early Bronze Age pottery was found at a relatively small number of sites across the survey area. These sites were usually single-phase with very little later material. Mediaeval and Post-Mediaeval wares were found at a greater number of sites. These were sometimes single-phase sites, but Mediaeval and Post-Mediaeval material also occurred on sites dominated by earlier material. At the time of writing, analysis of this material is underway by Charlotte Whiting at the CBRL.

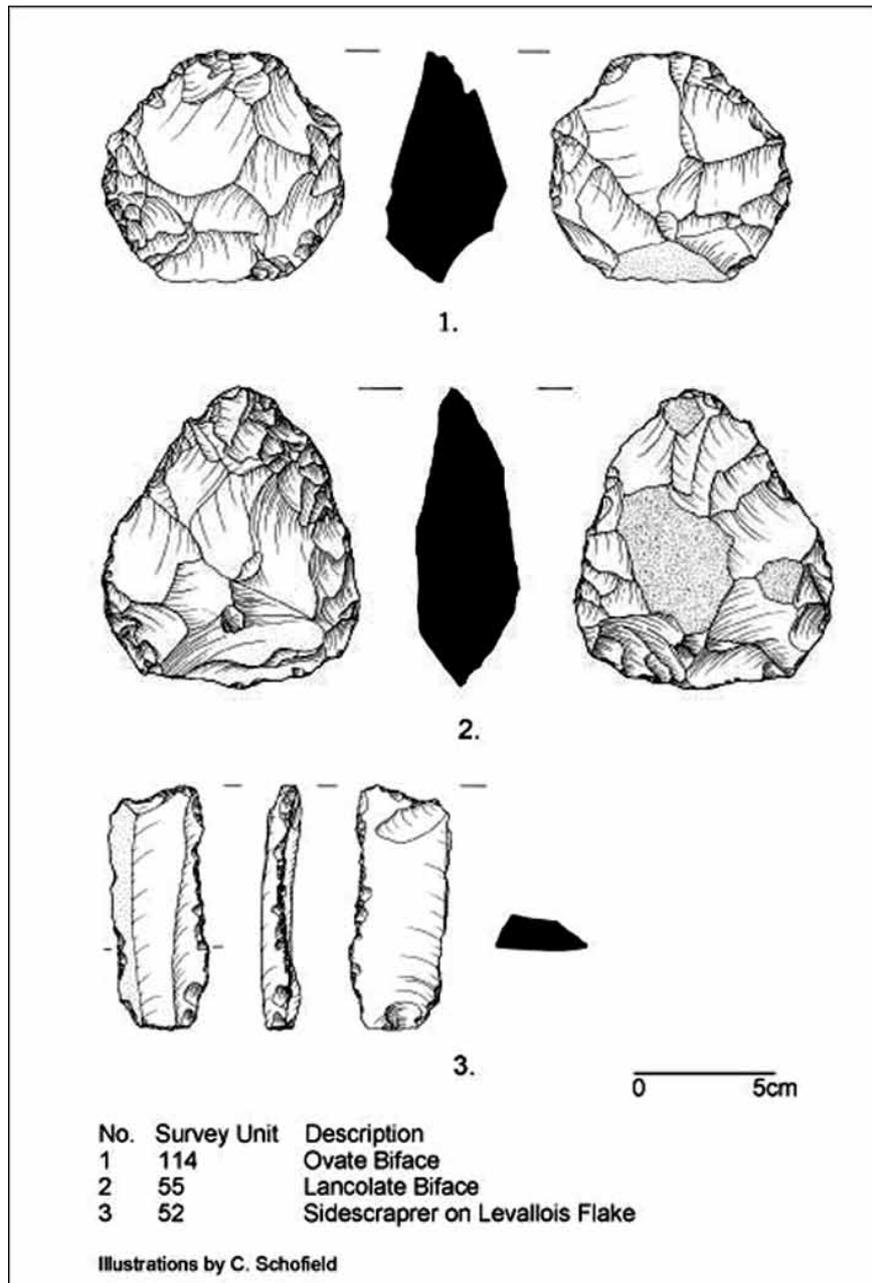
Lithics (HM)

Chipped stone artefacts were catalogued at the CBRL, Amman, following the 2006 season. Every piece of chipped stone observed within each transect was collected, resulting in

a sample of 6,217 artefacts. Each was categorised according to standard chipped stone blank type (flake, blade, core, etc), any retouch was recorded and tool typology assigned. Culturally diagnostic pieces, whether on the basis of typology or technology, were recorded accordingly; tool types, core reduction and flake production strategies were taken into account. The degree of mixing of artefacts from different cultural periods in a transect assemblage was assessed through variability in these criteria, as well as variation in artefact abrasion and patination. A full review of this material will be published in the final survey report. This overview outlines the general nature of chipped stone material recovered in the survey area as a whole, as well as some of the more notable assemblages.

Much of the survey area lies within the locality of modern ash-Shawbak and, as a result, many of the artefacts recovered throughout the investigation were related to the Lower Palaeolithic. A large lithic surface is known to have accumulated in the Fjaje area, owing to repeated visits by hunters exploiting seasonal migrations of herds over the Jordanian highlands (Rolleston 1981). Most of these artefacts, largely bifaces but also limited numbers of cores and flaking debitage, can be securely attributed to the Late Acheulean period in terms of both technology and typology (see **Fig. 10**). Surface patination and significant post-depositional abrasion on some pieces also indicates their antiquity. Unmodified Levallois flakes, reworked core-tools, irregularly retouched pieces and flake blanks were often recovered in conjunction with the more recognisable elements of the Palaeolithic tool kit; the assemblages from many of the transects are largely homogeneous.

By far the most notable material from the 2006 survey was a high density scatter from Unit 116 (see **Fig. 11**). 2,655 artefacts were recovered from an area covering 250 m². This assemblage consisted largely of artefacts made on a very high quality fine grained, grey flint; in terms of the raw materials recovered in the survey this is unique. No other surface finds were recovered and the scatter did not appear to be related to any other cultural features in the area. Typologically, single platform pyramidal bladelet cores and a number of backed Helwan type bladelets, as well as the general technological



10. Selection of Late Acheulean lithics (1 - 3) (illustrations by C. Schofield).

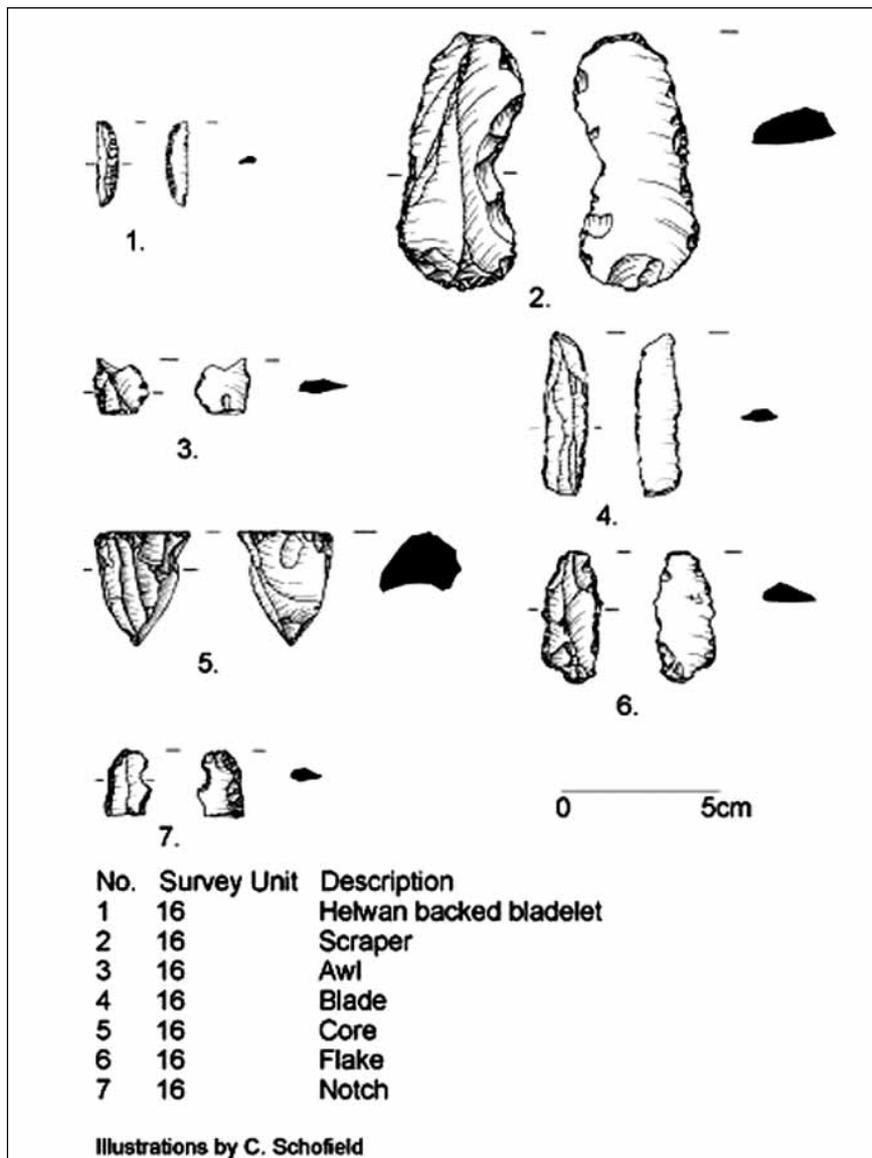
nature of the assemblage as a whole, indicate an Early PPNA date for this assemblage.

The survey material as a whole had few culturally diagnostic retouched pieces or technologies in evidence. Similarly, low proportions of retouched pieces in some areas made chronological designations difficult. In general, the chipped stone remains reflect continued use of the landscape throughout prehistory from the high intensity of the Middle Palaeolithic, to the seemingly isolated remains of groups from the

Neolithic and Chalcolithic periods, and into later prehistory.

Nabataean to Early Islamic Ceramics (IK) *Surveyed Settlement Sites*

The settlement sites selected here are representative of clusters with a high density of Classical-periods pottery. Whilst survey clusters cannot speak of occupancy as such, the pottery and their specific chronological-cum-period types indicate concentrated passage or intensive



11. Selection of Early PPNA lithics (1 - 7) (illustrations by C. Schofield).

use of the site. The clusters for each site (**Table 1**) show that the prominent diagnostic pottery dates to the Nabataean Early Roman period (1st and early 2nd century AD).⁵ The numerical ranking of periods shared by the sites is reflected in **Table 2**. As in **Table 1**, Early Roman Nabataean common and fine ware pottery [cow, fw] is the largest diagnostic group represented in 7 out of 10 sites.

The second group dates to the 1st century BC/AD, isolated under this category in preference to Late Hellenistic/Early Roman or Nabataean decorated and plain fine wares (Schmid 2003). This group is mostly made up of painted and plain fine ware which is not necessarily characteristic for each location with Classical pottery clusters. However, sites 6, 8 and 29 (see **Fig. 1**) are representative of clusters made up of these

5. At this point I have not applied specific dates as the pottery is not stratified and in situ contexts (transects) cannot provide relative numerical sequencing for closer dating; a definition by generic cultural periods within the Nabataean repertoire appears the least biased approach. It does not preclude closer definition in the

course of studies. On this see also Gerber's comments with regard to the Nabataean "coarse ware" [my common ware] and the necessity of broadly defined dating (Gerber 2001). The chronological-cultural phasing of Jordan has been followed.

Table 1: SJIAP Site Nos. 6, 8, 28, 29, 31, 114, 121, 134: diagnostic sherds.

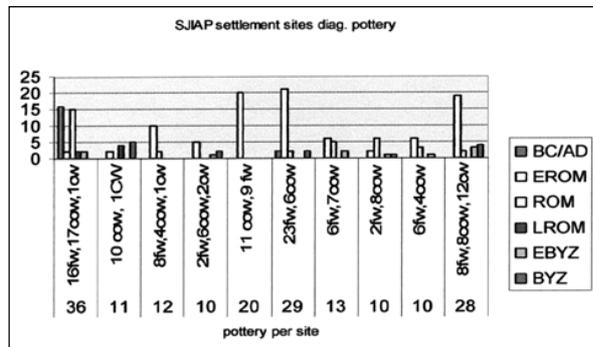
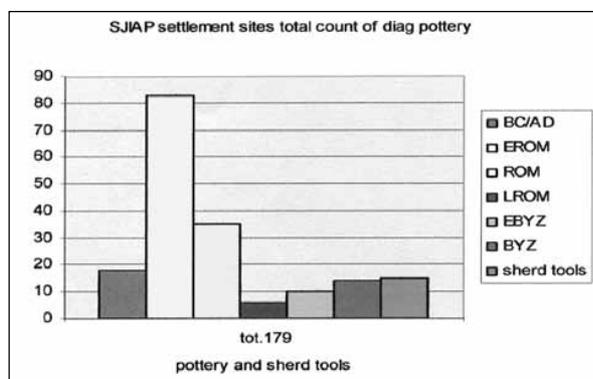


Table 2: Ratios of classical diagnostic pottery.



earlier types. The Roman period, broadly fitting within the 2nd and transition to the 3rd century AD, takes second place among the settlement site clusters.

The Late Roman (3rd-4th) and Early Byzantine (4th-5th) periods occur at seven sites; the generic Byzantine periods pottery (4th/5th-6th/7th) is present at four sites. Except for two sites (sites 8, 134), these later periods pottery are not prominent among the diagnostic sherds. This picture will change slightly when the body-sherds count is included in the final study. But the overall findings of predominantly Nabataean pottery from the floruit earlier Roman and Roman periods - reinforced by **Tables 3** and **4** of single sites 29 and 6 – will not alter significantly. It allows a tentative suggestion that settlement sites with least scatter of Prehistoric and Islamic pottery tend to fit mostly within these main historical and cultural periods of Nabataean hegemony reflected in the Nabataean Hinterland in general.

Surveyed Non-Settlement Sites / field contexts

Table 3 illustrates the numerical pattern of

Table 3: SJIAP diagnostic sherds from field transects.

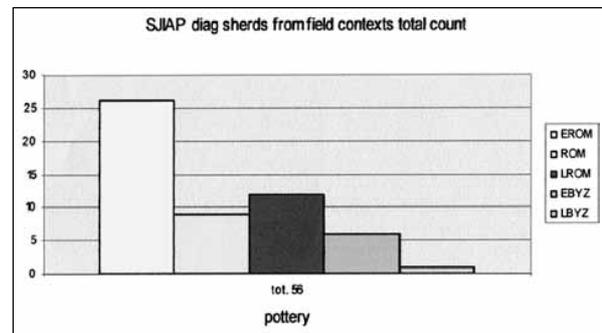
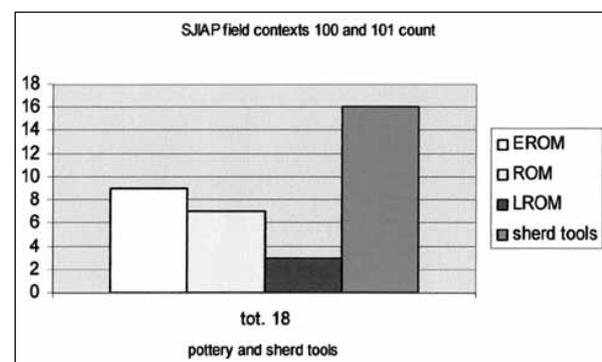


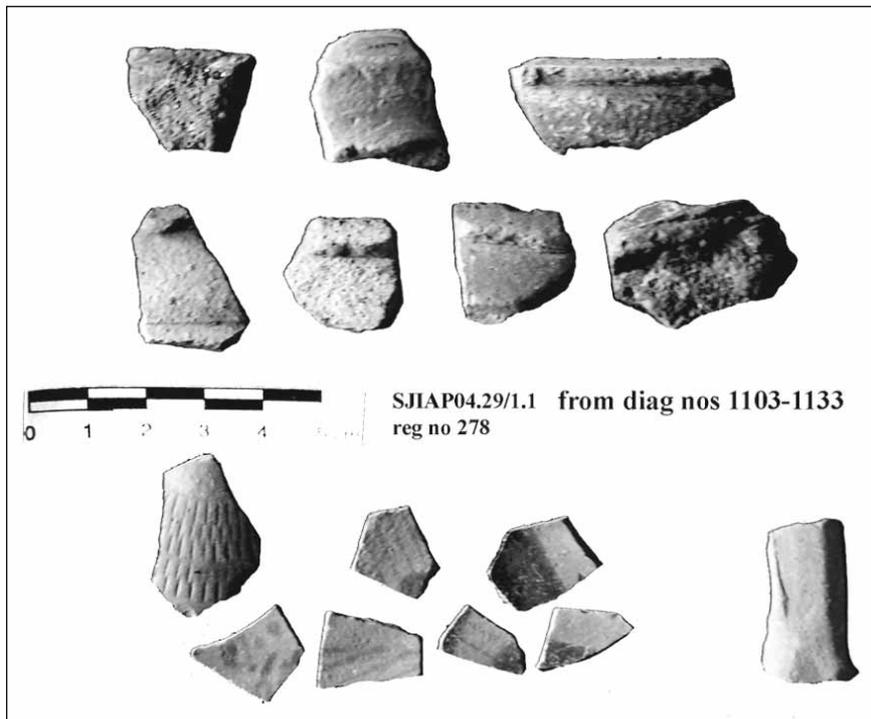
Table 4: SJIAP field transects 100 and 101, diagnostic pottery and sherd tools.



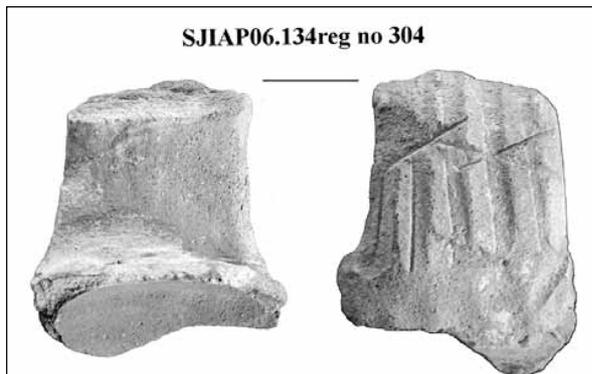
chronological pottery types and their numerical distribution. The dominant features are in first place the Early Roman, and in second and third place the Roman and Late Roman period pottery types. As before with the settlement sites, the Early Byzantine pottery is accounted for. **Table 4** shows a shift in ratios between the different cultural wares on two field sites numbers 100 and 101, and also a large proportion of “sherd-tools” (Kehrberg 1992, 1995).

To conclude this preliminary working report, **Fig. 13** is an apt representative of these “sherd-tools” showing that sherds were not just employed but made into a tool for specific tasks: such work in progress is demonstrated in **Fig 5**. **Fig. 4** illustrates that knapping was similar and in many cases identical to the manufacture of stone tools (Kehrberg 1992, 1995). The survey cannot date these tools other than providing the *post quem* by the ware of these pottery sherds. They could have been made in any period contemporary or subsequent to the floruit Nabataean dominance of the area.

The survey has provided a rich source for a detailed study of the pottery sherd tool industry first introduced by the author with assemblages



12. Site 29/1.1 illustrates the standard range of wares and types also reflected in the tables and found at other sites and contexts of the SJIAP survey (Image by I. Kehrberg).



13. Sherd tool from Settlement Site 134 (Image by I. Kehrberg).

from the Jarash excavations (kehrberg 1992, 1995).

Conclusions

The use of aerial photographs to identify areas of interest for sampling proved highly successful in this topographically complex landscape. A number of large Iron Age sites were found, in addition to various well-preserved classical and mediaeval sites, substantial pottery scatters dating to the Chalcolithic / Early Bronze Age, and lithic scatters dated to the Palaeolithic and Neolithic periods. The results of the survey were mapped using GIS, with an emphasis on corre-

lating this data with topographical, geological, hydrological, climatological, and vegetational information to allow detailed investigation of landscape use through time, especially with regard to the Iron Age II period.

Various Iron Age settlement types and sizes were observed. These were located across the landscape in different topographical locations, ranging from undulating plains of arable land, hilltops on the plateau, the desert, and off the edge of the escarpment. The site types encountered included settlement sites comprised of clusters of rectilinear structures situated within undulating arable land, large single rectilinear structures on hilltops, well-built clusters of rectilinear structures enclosed by large walls (e.g. Khirbat ad-Dabba and Unit 139) and smaller clusters of rectilinear buildings.

Nabataean to Late Byzantine / Early Islamic remains also included a variety of site types and sizes in a variety of locations in the landscape. Sites included those of an agricultural nature, such as farmsteads and settlements of various sizes, as well as those with a potentially administrative function such as watchtowers, sites at control points along routes, and forts. Remains of these periods were extremely well-preserved and are well suited for future landscape studies

relating to the Nabataean, Roman and Byzantine periods, rather than the urban studies which have predominated to date.

Mediaeval and Post-Mediaeval remains were mainly located next to springs and wells. In many instances, they also formed part of extant settlements such as Bir Khidad and Shakh for example. Compared to the number of Iron Age and Nabataean to Late Byzantine / Early Islamic sites, relatively few Mediaeval to Post-Mediaeval sites were identified.

The same applied to prehistoric sites. While Palaeolithic to Bronze Age sites were represented by a few flint and / or pottery scatters, relatively few sites of these periods were found in the survey area. This was probably due in large part to the survey methodology, which was focused on locating Iron Age remains and therefore did not concentrate on the kind of locations likely to produce prehistoric remains.

Off-site transects revealed very little that was not already identified from the aerial photographs, suggesting that the archaeological record from the Iron Age onwards, as identified through aerial photographs, was fairly complete.

Off-site transects also revealed that Iron Age material culture was very much focused on settlement sites with little material deriving from off-site transects. Although more Mediaeval and Post-Mediaeval material was found in off-site transects, the same general rule applied to these periods as well. This is in contrast to the Nabataean to Late Byzantine / Early Islamic periods, evidence for which was found across the landscape as a general background 'noise' in all of the off-site transects. This attests to the occurrence of midden spread from the Classical period onwards, since very little Iron Age pottery was found outside the immediate vicinity of Iron Age sites.

Off-site transects, as well as mapping directly from the aerial photographs, revealed extensive remains of field systems (terraces and field walls), water management systems (cisterns, wells and water management walls) and cairn clusters, which could be for interment and / or ritual and / or agricultural purposes.

Although analysis of the multi-period remains found in the survey reveals interesting changes in landscape use and settlement patterns through time, combination of the results

of the Iron Age surface survey with the results of the excavations at Khirbat ad-Dabba allows an analysis of Iron Age society on a broader scale.

Comparison of Iron Age site types, site size and site location (incorporating Neutron Activation Analysis of ceramic fabrics and clay samples from Khirbat ad-Dabba and the survey sites) provides important information on the production, consumption and distribution of ceramic vessels. Through this, specific activities associated with ceramic vessels such as food preparation, storage and serving are elucidated. These activities resonate in several spheres, including residential / non-residential complexes, household / centralised production, and the consumption and exchange of goods.

In combination with analyses of all other categories of find, the Neutron Activation Analysis will allow the project to address key issues such as the materiality of everyday life and the economic, social, and political functioning of communities during the Iron Age – research questions which until now have received little attention. By doing so, the project hopes to reassess traditional understandings of the Iron Age in the southern Levant.

Acknowledgements

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GHAWR AŞ-ŞĀFĪ SURVEY AND EXCAVATIONS 2008-2009

Konstantinos D. Politis, Adamantios Sampson and Margaret O’Hea

Introduction

Survey and excavations in Ghawr aş-Şāfi continued during January-February 2008 and February-March 2009 in collaboration with the Hellenic Society for Near Eastern Studies and the Universities of the Aegean and Adelaide. The project was jointly directed by Dr K. D. Politis, Professor A. Sampson and Dr M. O’Hea.

Survey

Survey work conducted during this season was limited to making a new contour map joining the Ṭawāḥin as-Sukkar, Khirbat ash-Shaykh ‘Īsā and an-Naq’ sites (**Fig. 1**), using work at Ṭawāḥin as-Sukkar and earlier surveys to con-

nect the areas and create an overall site map. This will form the basis of a map of historic Zoara / Zughar and guide future land expropriation.

The cemetery site at Arḍ Ramlat-Ghalib first identified in 2007 was more closely investigated, but it was not possible to gain access to the land to properly survey it as it is a private property surrounded by a wire fence. Pottery and an inscribed stone recovered from there dates to the 1st to 3rd centuries AD (**Fig. 2**).

The field survey of the eastern Dead Sea coast which was planned for this season was postponed, but aerial photographs were studied in preparation for it in the near future.

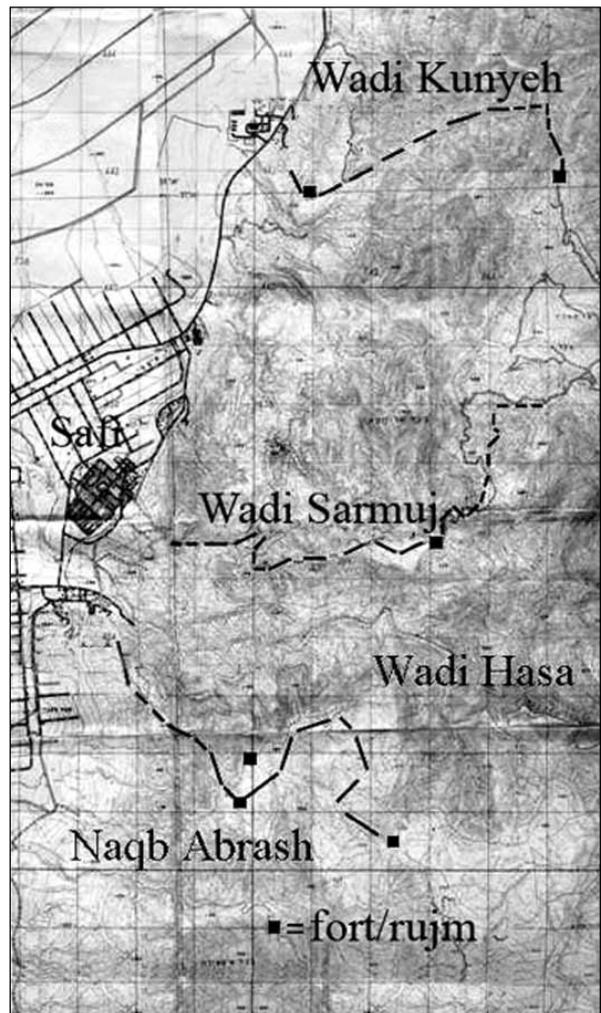


1. Up-dated contour map of Khirbat ash-Shaykh ‘Īsā and Ṭawāḥin as-Sukkar (after Q. Desouqi).



2. Funerary sandstone stele inscribed in Greek enclosed in a *tabula ansata* reading: "...Selames (son) of Soudelathes (?) who died 30 (?) years (old)". On top is a Nabataean *nefesh* sign. Dating to 1st-3rd centuries AD. From Arḍ Ramlat-Ghalib cemetery (photo: K. D. Politis).

During 2009 field-walking identified a third road connecting Ghawr aṣ-Ṣāfi with the Karak plateau (Fig. 3). This one was just north of Wādī Kunayyah (Fig. 4), was stepped in a simi-



4. Location map of Wādī Kunayyah.



3. Wādī Kunayyah descending to the Ghawr aṣ-Ṣāfi and Dead Sea from Karak plateau (photo: K. D. Politis).

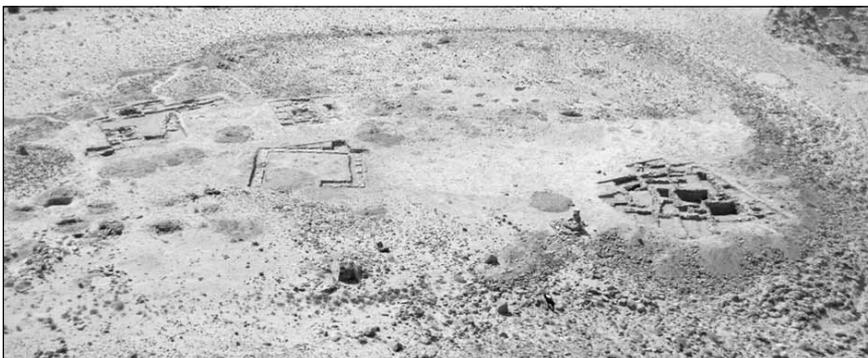
lar manner to the one at Wādī Sarmūj (Politis 2007) (Figs. 5 and 6), and was guarded by at least two small forts (*rujūm*), one near the valley floor and the other near the top of the plateau. Both had been recently disturbed by looters who exposed the internal architecture and 1st to 3rd century AD pottery sherds, including Nabataean fine wares. The lower section of the road was



5. Wādī Kunayyah stepped road'; lower, SW end (photo: K. D. Politis).



6. Wādī Kunayyah stepped road'; upper, NE end (photo: K. D. Politis).



7. PPN-B site at Wādī Suwayf-Hamarāsh (photo: K. Kostandopoulos).

cut through the Sarmūj conglomerates, and the upper section through limestone bedrock.

Excavations

Excavations were limited to two areas of Ghawr aş-Safi during this season. The first was at the intersection of Wādī(s) Hamarāsh-Suwayf and al-Ḥasā. The second was at Khirbat ash-Shaykh 'Isā, was aimed at completing trenches opened in 2006-07.

Wādī Hamarāsh-Suwayf

Two seasons of excavation were conducted at the PPNB site of Wādī Hamarāsh-Suwayf during during January 2008 and February-March 2009.

The site is located on an extended plateau north-west of the junction of Wādī(s) al-Ḥasā and Hamarāsh-Suwayf (lat 31°016.783' long 35°542.582'). Today the wadi flows at a much lower level than ten thousand years ago, when the river bed would have been close to the site. The arid plateau has Wādī Hamarāsh on the east, a smaller wadi on the west and steep mountains to the north. Today, the site is isolated and inaccessible; it is an eight-hour walk from the village of at-Ṭaybah on the Karak plateau, and about a three-hour walk from modern aş-Şāfi.

The Neolithic settlement extends for about half a hectare on its own plateau (Fig. 7). This plateau is roughly circular and elevated in relation to the surrounding area. On this plateau are closely-built house-walls, as well as stacked stones which may have been collected to form a perimeter wall around the settlement. Traces of buildings are however attested outside this perimeter wall. The area has been excavated in the past by looters. In their robber trenches we could see well-built walls, door and window openings,

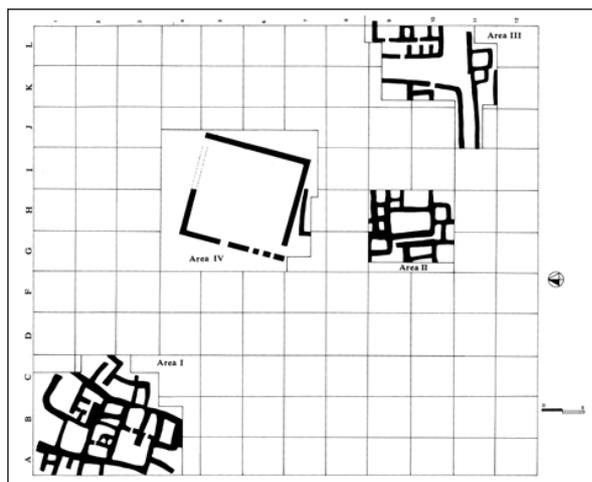
and even parts of possible staircases. Ground-stone tools, chipped-stone tools and fragments of stone vessels were visible all over the surface.

In 2008, two 10 x 10m trenches were opened (**Fig. 8**).

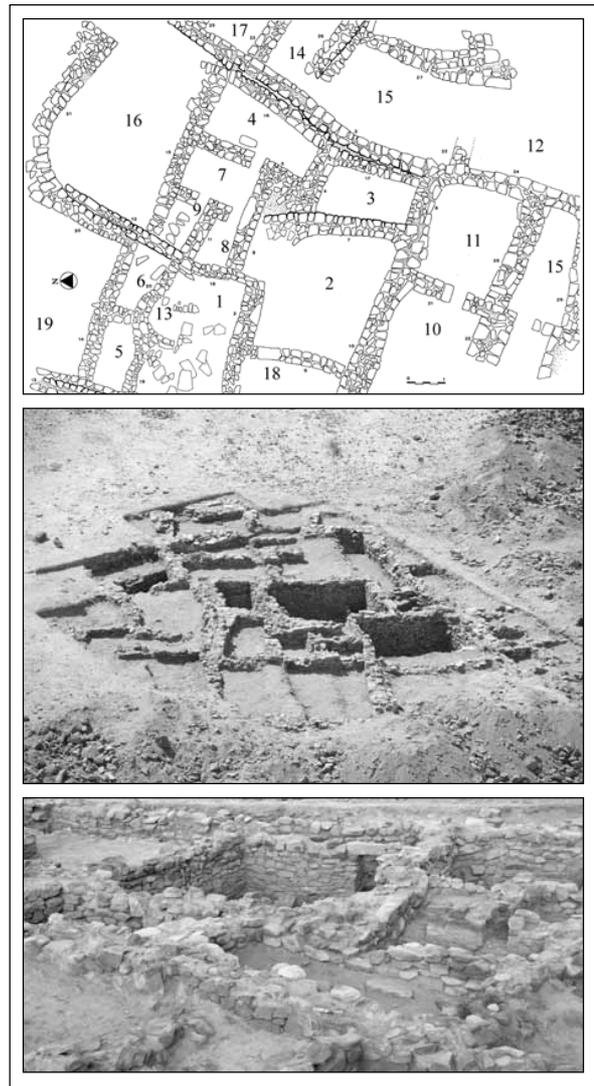
Area I (150m²) comprises the north-west part of the settlement (**Figs. 9a,b,c**). Thick walls, probably belonging to high buildings from earlier in the settlement's history of occupation, and thin walls separating rooms within buildings have been exposed by our excavations. Nineteen rooms were excavated in this section. They were trapezoid in shape with rounded corners. Floors were usually 0.30m below the plateau ground surface. Smaller rooms, possibly storage rooms (such as Rooms 7, 8 and 9), were connected to larger rooms via narrow openings. This architecture closely resembles that found at Bayḍa. Rooms 10, 11 and 15 are interconnected via similar openings.

In most cases, there were no doors between rooms. A slab discovered in Room 2 may be a door sill or threshold. Wall 12, between Rooms 7 and 8, belongs to a later architectural phase. Storage Rooms 5, 6 and 13, which are within a large room excavated to a depth of 1.40m below the plateau ground surface without reaching its floor, also belong to a later architectural phase. These three storage rooms were roughly-built. Among our finds from the rooms were many millstones and ground stones made of local sandstone.

Double walls were uncovered at the eastern side of section I (Rooms 16, 17, 3), which prob-



8. Plan of PPN-B site at Wādī Suwayf-Ḥamarāsh (after A. Sampson).

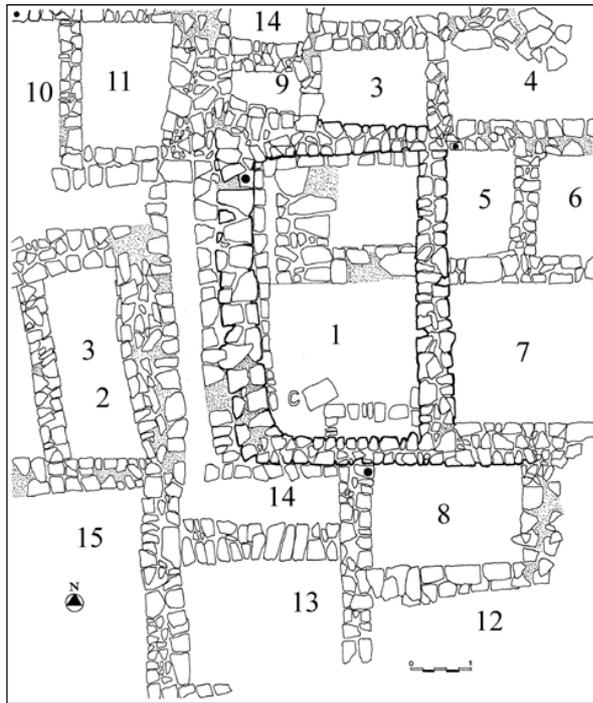


9. (a, b) PPN-B site at Wādī Suwayf-Ḥamarāsh (after A. Sampson).

ably indicates different ownership. Rooms 14, 15 and 17 belong to a building that continues further east. Our preliminary hypothesis is that there were three different extended structures and two or three architectural phases.

Apart from numerous ground stone tools, many flint artefacts (blades, pointed tools and cores) were recovered, along with several worked bone tools. A worked, rounded and incised piece of limestone was identified, which may be a non-standard tool or perhaps even part of a figurine.

Area II (80 m²) is at the south part of the settlement (**Fig. 10**). Parts of walls of a building previously excavated by looters were already visible. These walls were constructed of large



10. Plan of PPN-B site at Wādī Suwayf-Ḥamarāsh (after A. Sampson).

heavy stones. Traces of post-holes for the first floor beams were evident. Excavation concentrated on the northern part of this building. At 0.80 - 1m below the plateau ground surface, we discovered a stratum of burnt soil with chipped stone arrow-heads, fragments of stone vessels and animal bone. The next stratum consisted of dark soil, with numerous stone artefacts and traces of burnt remains.

Fewer artefacts and animal bones were found at 1.15m below the plateau ground surface, although the presence of an ovoid bead made of green stone should be noted. At 1.35m below the plateau ground surface we discovered a wall 1.30m wide, made of large flat stones and possibly belonging to an earlier architectural phase. Future excavation should clarify the architectural phasing of the buildings in Area II.

Small rooms have been discovered around this main building. In the north, there are four independent small rooms (Rooms 3, 4, 9 and 11) which we excavated to a depth of 0.30m below the plateau ground surface, discovering many millstones, ground stone artefacts and lithic blades (**Fig. 11**) in the process. Small rooms were also found to the east and the south. The excavation of Room 13 at just 0.20m be-



11. PPN-B site at Wādī Suwayf-Ḥamarāsh (photo: K. Kostandopoulos).

low ground surface was very interesting, since we discovered blades, arrow-heads and animal bones, including sheep / goat. Many animal bones and stone tools were discovered in Rooms 8 and 12 at the south-east side of the trench. Room 2 comprises a different entity and had been excavated by looters.

The architectural phases of Area II cannot be determined at this stage, and there is as yet no firm dating evidence. Soil samples were collected to help date the excavated rooms. Finds so far indicate a likely date of the earlier part of the Late PPNB. Excavation will continue next season, while post-excavation analysis will focus on the study of the stone tools, stone vessels and animal bones. So far, we can highlight an abundance of millstones, collected as surface finds and during excavation. Millstones made of limestone, the most commonly occurring stone in the area, suggest extensive food preparation as well as the cultivation of cereals. Since the area is located in an area of deep canyons and steep mountains, we assume that site’s occupants intensively cultivated the plateau around the settlement, taking full advantage of any water in the wadis.

During the 2009 season, excavations continued in Area I, with extensions to the west, east and north. On the western side five storage areas were discovered with many ground stone tools. Locus 1 was excavated to a depth of 3.10m but at 1.80m there was a buttress wall which may have supported an upper floor. A burnt layer was found at the height of the foundation of the wall. The overlaying Locus 2 floor layer was found at a depth of 2.20 metres. At the western

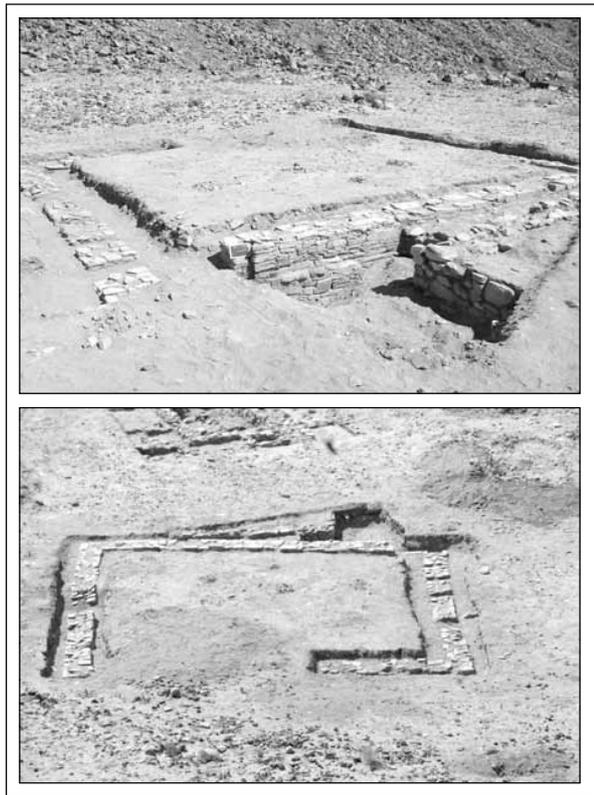
side of the room there were two semi-circular storage areas. On the eastern side, fragmentary human bones were discovered. Of particular interest was a low doorway leading to a smaller area (Locus 18). In this place many stone tools and vessels, ground stone tools, discs and mollusc shells were found. It is worth noting that in this room, possibly a workshop, there were also many drills which may have been used to make stone objects.

In Area II, the Locus 1 excavations begun in 2008 were completed at a depth of 2.30 metres. The last layer was a thick ash deposit. Excavations of Locus 13, begun in 2008, were continued with the discovery many stone tools and dozens of arrowheads.

East of Area II, a new trench measuring 16 x 10m was opened and designated Area III. Here, an open area was discovered, which may be a courtyard with small storage areas to the east and west which communicated via narrow doorways. The layout of these small narrow passageways where many ground stone tools were found is reminiscent of the 'beehive' buildings at Bayḍa. A 1m wide passageway leads to the central courtyard, which may be interpreted as a road. At the north-eastern side of Area III, a building with poorly preserved walls was excavated to a depth of 1.90m.

The biggest surprise of the season's work came during the final days when a 13m square building (Area IV) was uncovered in the centre of the settlement (**Figs. 12a,b**). Its construction using carefully-chosen flat slabs differed from that of other buildings on the site. Excavations here continued to a depth of only a few centimetres, but it is certain that this building is preserved to a great height. This was evident from our test-trench on its north side, which went down to 1.60 metres without finding the bottom of the wall. This building has three entranceways on three of the corners and three narrow openings, perhaps windows, on its western side. In contrast with other building and room plans from the site, the Area IV building is so far the only one which is square-shaped. The full excavation of this building remains to be completed next season.

A large number of lithics were found during the season's excavation, including points, borers, tanged and serrated tools, and sickle blades



12. PPN-B site at Wādī Suwayf-Ḥamarāsh (photo: K. Kostandopoulos).

(**Figs. 13 and 14**). It is very significant that over 500 ground stone tools were discovered during excavation, in addition to some 400 collected from the surface of the site (**Fig. 15**). A large number of open and closed-shaped bowls and basins were also found. Other interesting finds include pierced ground stones (**Fig. 16**), two bone borers (**Fig. 17**), pierced marine shells for a necklace, marble figurines (**Figs. 18 and 19**) and a bone ring. Animal bones were particularly abundant in Areas I and II.



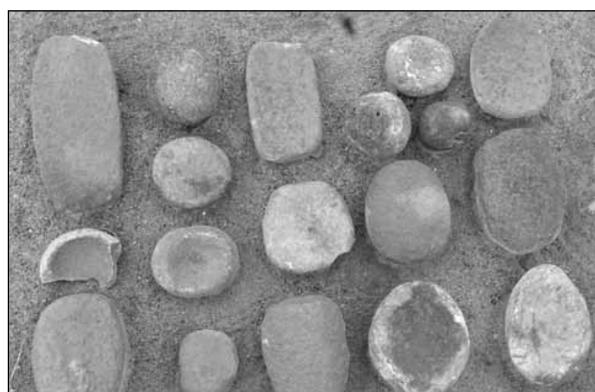
13. PPN-B flint tools from Wādī Suwayf-Ḥamarāsh (photo: G. Tampakopoulou).



14. PPN-B flint tools from Wādī Suwayf-Ḥamarāsh (photo: G. Tampakopoulou).



17. Bone tools from Wādī Suwayf-Ḥamarāsh (photo: G. Tampakopoulou).



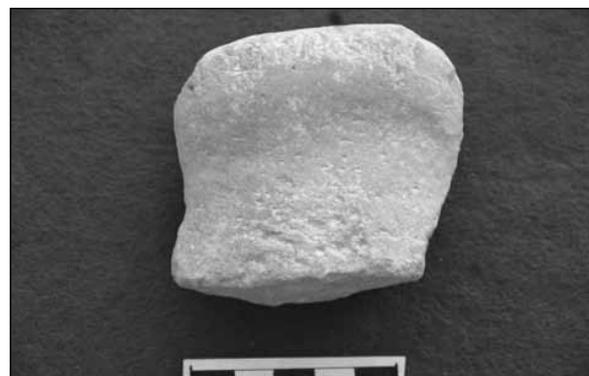
15. Ground stones from Wādī Suwayf-Ḥamarāsh (photo: K. Kostandopoulos).



18. Marble figurine (?) from Wādī Suwayf-Ḥamarāsh (photo: G. Tampakopoulou).



16. Pierced stones from Wādī Suwayf-Ḥamarāsh (photo: K. Kostandopoulos).



19. Marble figurine (?) from Wādī Suwayf-Ḥamarāsh (photo: G. Tampakopoulou).

Recently, a corresponding site has been excavated on a terrace situated on the south-eastern bank of Wādī al-Ḥasā (Peterson 2009: 311-323). This has similar architecture, PPNB flint tools (Peterson 2009: 315) and pierced ground stone (Peterson 2009: 318). Considering that the wadi would have been at a much higher level and the waters would have flowed past both these sites,

it is possible that they may have been associated in some way.

Khirbat ash-Shaykh ‘Īsā

Excavations at Khirbat ash-Shaykh ‘Īsā in Trenches II and VIII were continued from the previous 2006-7 season, revealing sequences of architecture and occupation from the Abbasid

(8th century AD) to the Mamluk (*ca* 15th century AD) periods (**Figs. 20 and 21**).

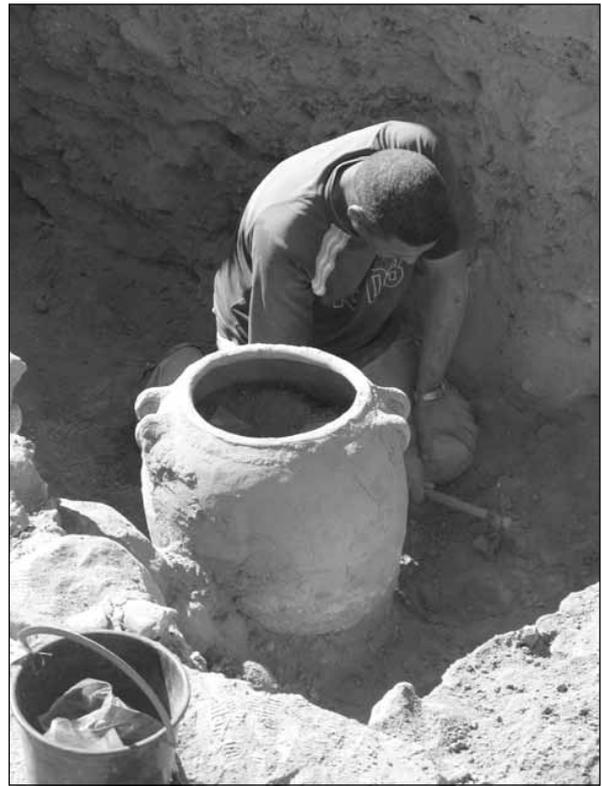
The most significant advance in our understanding of the architectural phasing came with the establishment of the history of a small paved street leading through an arched, 1.82m wide entrance in the north-south Wall 2 (**Fig. 22**). This 1.6m wide ashlar sandstone wall has a projecting room to the west, just north of the small archway which suggested that this might be a city wall with towers. However, the relatively narrow width of the archway meant that this was not the main entrance through this wall, and small-scale excavations in this area in 2004 could not fully clarify the function of either Wall 2 or the archway.

At the end of this season, a paved sandstone street was identified in Trench II, leading eastwards from the archway (**Fig. 23**). It extends more than 41m to the east, into Trench VIII. Time constraints prevented excavation beneath some of the pavers, so at present the chronology for the construction of the street remains unclear. At least two sandstone columns still *in situ* indicate that this was a colonnaded street. The pavement was laid after the construction of Wall 2 and its doorway.

To the west of the archway, a narrow lane or perhaps internal corridor was floored with an almost completely degraded mosaic floor of white limestone *tesserae*.



20. Western view of arched entrance blocked by stones and store jar of the Abbasid level. Khirbat ash-Shaykh 'Isā trench II (photo: M. O'Hea).



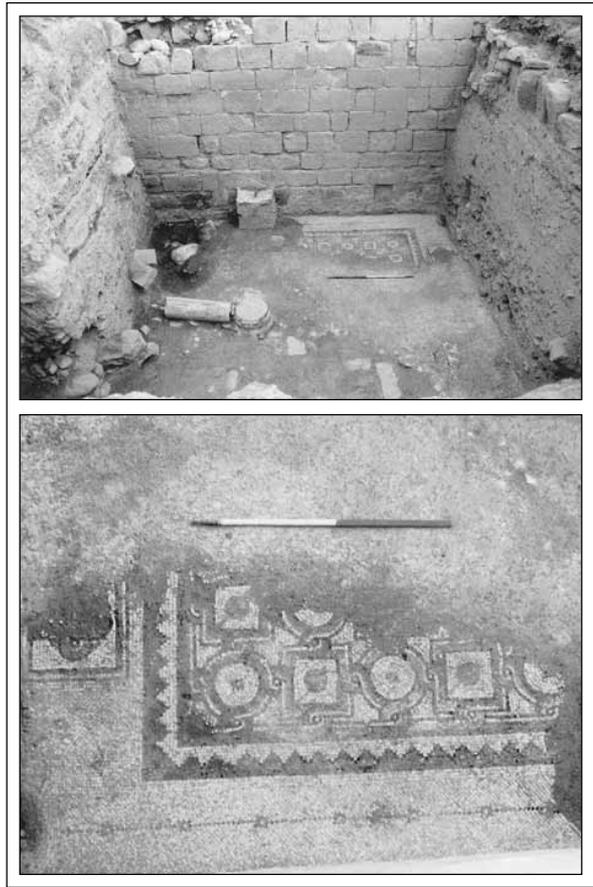
21. Abbasid-period pottery storage jar as found during excavations at Khirbat ash-Shaykh 'Isā. (photo: K. D. Politis).

Trench VII has an earlier, well-built ashlar sandstone Wall 11 running east-west, which continued to be used throughout the medieval period. As with Wall 2, it survives *ca* 3m (nine



22. View west of trench II at Khirbat ash-Shaykh 'Isā. (photo: K. D. Politis).

courses) above its original associated floor. This wall may belong to the same phase as the paving slabs and Wall 2 itself, but it is unlikely to be a southern return of that wall, as it is of different width. It forms the southern wall of a substantial building adorned by a mosaic pavement depict-



24. Mosaic pavement found at Khirbat ash-Shaykh 'Isā (photo: M. O'Hea).

ing pomegranates and florets in alternating interlaced squares and circles (**Fig. 24**). Scattered on the mosaic floor were marble fragments.



23. View east of trench II at Khirbat ash-Shaykh 'Isā. (photo: K. D. Politis).

Emergency consolidation was conducted on the mosaic by trained local staff, which was then buried for its protection and future conservation (Fig. 25).

The paved road in Trench II appears to continue along the southern face of Wall 11, and another marble column and colonnette were found in an abandonment phase over the paving slabs (Fig. 26).

The mosaic-paved room in Trench VIII was clearly degraded in antiquity. Part of the central floor bedding was so badly worn that earlier walls were clearly visible in the centre of the trench. Above the mosaic floor is a 10-15cm layer of nearly sterile soil, above which Abbasid-period occupation subdivided the building with rubble and adobe brick internal walls. Above this was adobe brick collapse, followed by two successive phases of burnt floors and oc-



25. Emergency conservation treatment of mosaic pavement at Khirbat ash-Shaykh 'Isā (photo: K. D. Politis)



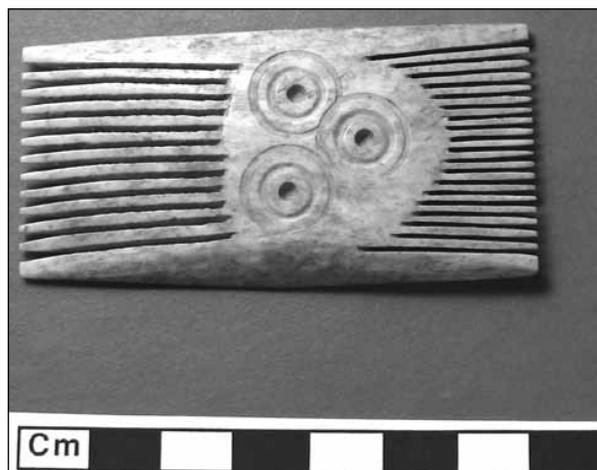
26. North view of 'abandonment phase' of paved street in Khirbat ash-Shaykh 'Isā trench VIII south of Wall 11. (photo: K. D. Politis).

cupation. Preliminary analysis of these phases is suggestive of the early Ayyubid period in both instances. Above the second burning and collapse, a Mamluk-period courtyard (excavated in 2006-7) with *tabuns* and low adobe brick corals suggests that this area was a modest domestic house in the 15th century AD.

Some of the more interesting finds of the season included a pottery 'kiln-tripod' used for stacking pottery bowls inside a kiln (Fig. 27), a finely carved and decorated bone comb (Fig. 28), a stone pebble painted as an anthropomorphic figure (Fig. 29), two pottery sherds inscribed in Kufic Arabic (Figs. 30 and 31) and, perhaps most remarkably, a copper alloy oil lamp re-filler (Fig. 32).



27. Pottery 'kiln tripod' from Khirbat ash-Shaykh 'Isā. (photo: K. D. Politis).



28. Comb carved of animal bone from Khirbat ash-Shaykh 'Isā. (photo: G. A. Sakelariou).

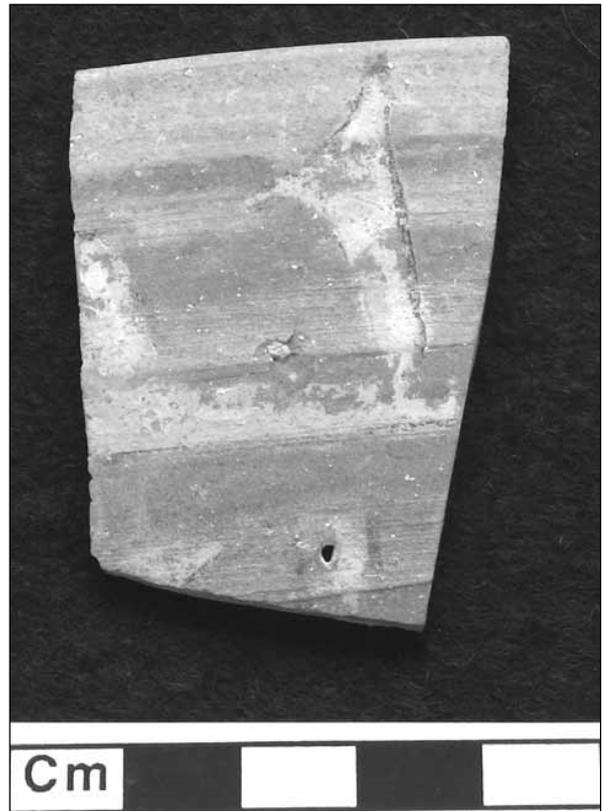


29. Pebble stone with painted anthropomorphic figure from Khirbat ash-Shaykh ‘Īsā. (photo: G. A. Sakelariou).

Excavations at Khirbat ash-Shaykh ‘Īsā clearly need to be continued on a larger scale in order to reveal the complete plan of the site and fully understand the function of the architecture. However, the depth of the deposits, wealth of the finds within them and extent of the site require more substantial support than was then available. Furthermore, a systematic conservation programme including finds and architecture is imperative. Therefore, it was decided that excavations would not resume during 2009, in order to complete the post-excavation studies and publish the preliminary results.

The Staff

The survey was carried out by Konstantinos D. Politis, with Quteiba Desuqi as technical surveyor of the Department of Antiquities. The archaeological excavations were supervised by Margaret O’Hea (KSI) and Adamantios Sampson (WHS). The field supervisors



30. ‘Fine Byzantine ware’ pottery fragment with Kufic Arabic script made in Jerusalem region (?) during 6th-9th centuries AD, from Khirbat ash-Shaykh ‘Īsā. (photo: G. A. Sakelariou).



31. Bowl fragment with opaque white tin-glazed and part of a cobalt blue Arabic letter made in Iraq during 9th century AD, from Khirbat ash-Shaykh ‘Īsā. (photo: G. A. Sakelariou).

were Varvara Katsipanou, Andreas Argiridis, Ioanna Katsagiorgiou, Konstantinos Nizamias, Stavros Bazas, Kalliopi Giannopoulou, Katherine Bradley, Margaret Hutchinson, Alexandra



32. Copper alloy oil lamp re-filler from Khirbat ash-Shaykh 'Isā. (photo: G. A. Sakelariou).

Ribeny, Anastasiya Silkatcheva, Stacey Stafford-Brookes, Amy Ziesing and Salha Suleiman Ghareeb (2008), and Panagiota Aneliki, Stylianos Klapakis, Ilias Sarantidis, Ioanna Karagiorgiou, Kalliopi Giannopoulou (2009). The objects and small finds were registered by Georgia Tampakopoulou and Sariah Willoughby (2008). The archaeological finds conservator was G. Aristotelis Sakellariou and mosaic conservator was Mohammed Ali Hashoush (2008). The photographer was Petros Konstantopoulos (2008 and 2009).

The Department of Antiquities was represented by Mohammed Zahran Hashoush in

2008 and Imad al-Drous in 2009. Locally hired workers came from Ghawr aş-Şāfi. The overall project was directed by Konstantinos D. Politis.

Post-Excavation Studies

In 2008-9 work began on studying the excavation finds with support from the Palestine Exploration Fund and Aegean University, concentrating on pottery (Tony Grey), small finds (Konstantinos D. Politis), animal bones (Louise A. Martin), and chipped and ground stone (Georgia Tampakopoulou).

The Committee of the Palestine Exploration Fund also agreed to publish a monograph on all the work done to date on the project in 2010.

Exhibition

Many of the objects from excavations at Ghawr aş-Şāfi will be on display in several exhibition cases in the new Museum At The Lowest Place On Earth, located at Dayr 'Ayn 'Abāta, near aş-Şāfi, as of 2010 (Politis 2009).

Acknowledgments

The project is grateful to the Director-General of Antiquities, Dr Fawwaz Khraysheh and his staff for granting permission to work in the Ghawr as-Safi. Thanks are due to the Jordan Valley Authority for allowing the project to use one of its housing units in Mazra'a-Sekine and Aramex International Couriers for logistics in Amman. The survey equipment was loaned from Municipality of Safi and the Department of Antiquities in Amman. The Palestine Exploration Fund and Optimiza Solutions provided additional support.

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THE DRUZE MARSH PALEOLITHIC PROJECT, NORTH AZRAQ JORDAN STRATIGRAPHIC SEQUENCES FROM THE 2008 AND 2009 SEASONS

Carlos E. Cordova, April Nowell, Michael Bisson, James Pokines, Christopher J.H. Ames and Maysoon al-Nahar

Introduction

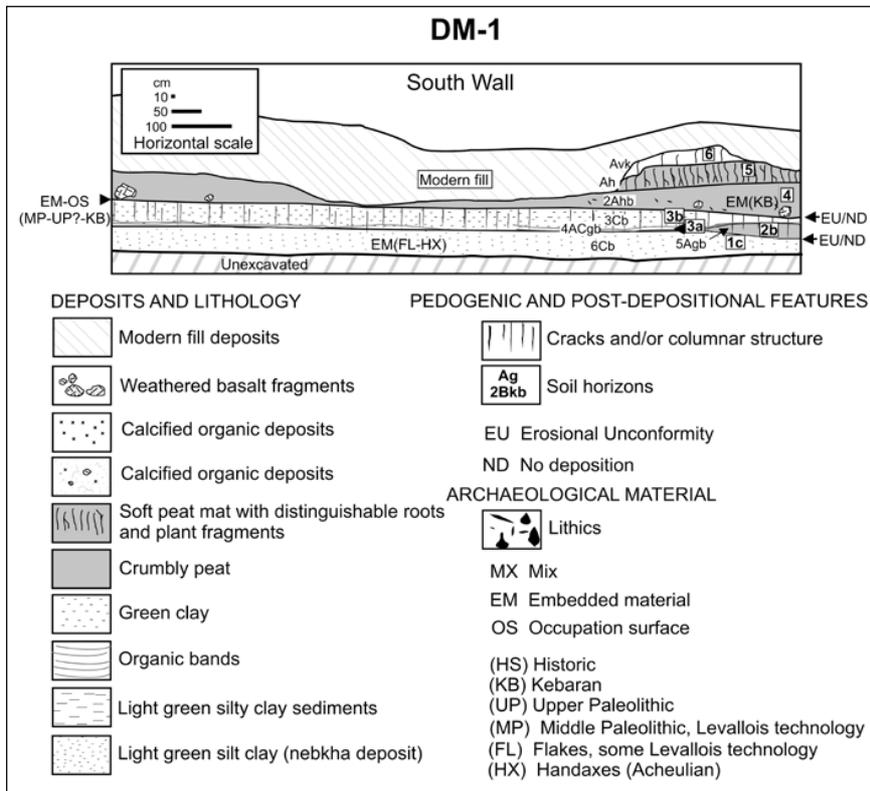
The sites that form part of this study are located in the former bed of the Druze marsh at north Azraq (Fig. 1). The drying of the marsh occurred in the late 1980s as water was pumped for use elsewhere in Jordan. Previously, no sites had been reported in the area of the marsh since the area was underwater and the water table was too close to the surface. With the water table now several meters below the ground, recent trenching for construction, ditches, and wells revealed a wealth of lithic material. In June 2008 our

team obtained a permit to investigate the sites in the Druze marsh.

The construction of the Children's Park (Fig. 1) in 2007 and early 2008 exposed deep stratigraphy and buried occupation deposits. Our team initiated a salvage archaeological project within the trenches opened for the construction of toilet facilities, a septic tank and water storage. These locations were named DM-1, DM-1X and DM-1Y. Owing to the rapid pace of construction, we were only able to document DM-1 (Fig. 2).



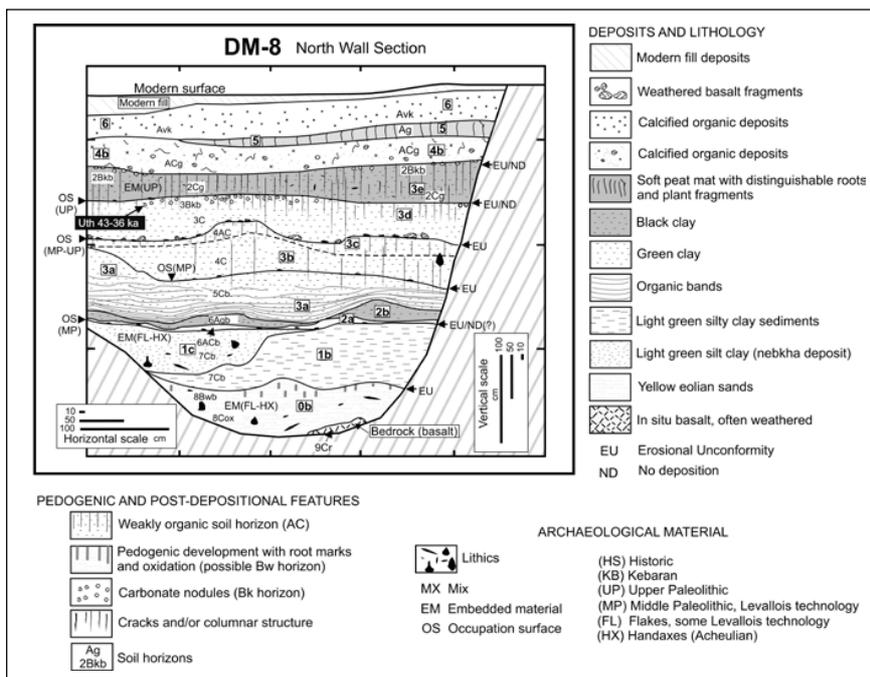
1. Aerial view of the Druze marsh sites; the photograph pre-dates the construction of the Children's Park.



2. DM-1, north section stratigraphy.

We also obtained permission to dig three 3 by 1.5m trenches, DM-7, DM-8 and DM9, on adjacent land (Fig. 1). Along a ditch on the same land, we excavated five 1 m. square test pits (DM-2 to DM-6). During our second season,

in May 2009, two more stratigraphic sections were documented, in a modern trash pit (DM-10) and backhoe trench (DM-11). In May 2009, we re-excavated a unit adjacent to trench DM-8 (Fig. 3) in order to obtain more detailed infor-



3. DM-8 long north section, 2008.

mation on the distribution of layers and lithics, and to collect biological and chemical samples for paleoenvironmental and paleoclimatic reconstruction. The excavation of DM-8 provided more detail on the stratigraphy and occupation surfaces (Fig. 4).

This report presents a description and discussion of the stratigraphy thus far examined in the Druze marsh. The first U / Th dates and distribution of stratigraphic layers allow for a tentative reconstruction of the marsh and hypotheses on the development of the sedimentary deposits and occupations. In this report we provide a brief description of the stratigraphic units, pedogenic units and associated materials for sections DM-1, DM-8 and DM-11.

Stratigraphy

Section DM-1

Modern trash deposits cap almost all stratigraphic units of this section (Fig. 2). Unit 6 is a calcified deposit associated with evaporation of the historic marsh. Unit 5 is an organic soil that was permanently saturated with water, which is believed to be the permanently waterlogged organic sediment of the historic marsh. Unit 4 is a layer of crumbly peat capped with basalt stones. The peat deposit lies on the erosional unconformity of the layer below. Abundant Kebaran

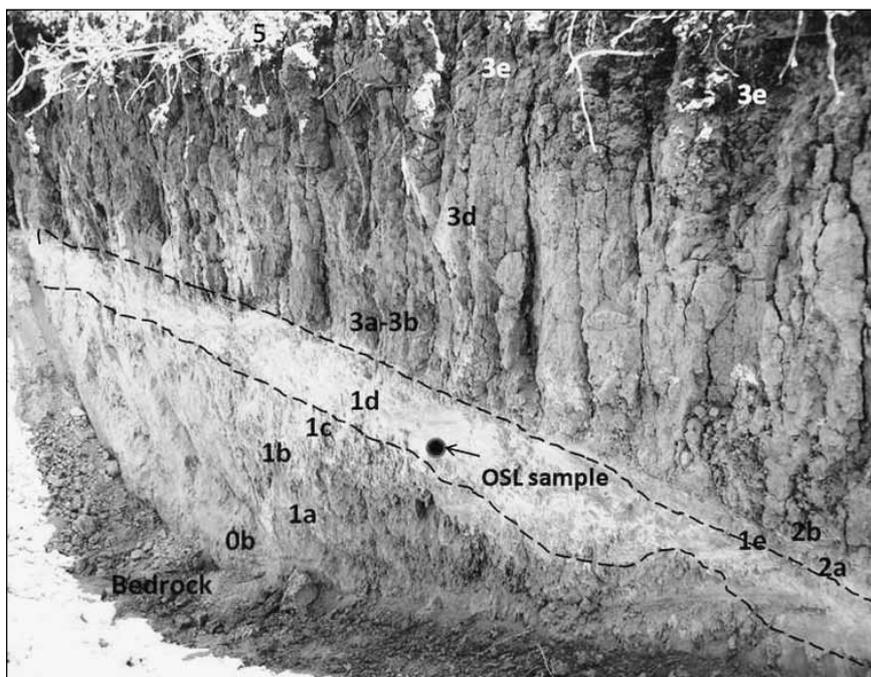
lithics were recovered from Unit 4. In addition to DM-1, DM-1X, and DM-1Y, this unit is also found in DM-10. It is absent, however, in all other sections investigated in the Druze marsh.

Units 3a and 3b are green clays with strong columnar structure and seem to represent lacustrine facies. Although both units are similar, Unit 3a is characterized by alternating green and dark bands; Unit 3b has only green clays. Unit 2b is a dark deposit of organic sediment of loamy consistency. It is found only on the southern side of the trench. Unit 2a is a thin (2-4cm) deposit of sand, also visible in a few parts of the section. Unit 1c is a deposit of green clays with sugary consistency and lack of structure.

Section DM-8

The section exposed in 2008 (Fig. 3) formed the basis of the 2009 excavations. The top 3 units (6, 5 and 4b) are late Holocene. They contain a mixture of Neolithic and Epipaleolithic lithic material and Byzantine pottery. Units 6 and 5 are similar to their equivalents in DM-1. Unit 4b is a channel fill, probably laid by mudflow caused by torrential rain.

Unit 3e consists of a black clay deposit. The environment that produced this sediment seems to have been an organic-rich lake. Carbonates are present in the top of this unit, indicating that



4. DM-11 trench, north section.

after the lake dried out the deposit was exposed to dry conditions for a period of unknown duration.

Layer 3d consists of green clays capped by nodular carbonates. In 2008, a sample for U / Th dating was collected. The date obtained was between 43 - 36 k.a. B.P., which correlates well with the lithic material recovered in this season's excavation. The sedimentary and pedogenic characteristics of Unit 3d indicate that this is a lacustrine deposit that dried out for short periods, allowing temporary occupations. The pedogenic carbonates suggest that these drying episodes may have been of reasonably long duration.

Units 3c and 3b should be considered a single unit; their separation is based on the slightly darker color of Unit 3c. The top boundary of Unit 3c is an erosional unconformity with predominantly Upper Paleolithic (UP) and a few Middle Paleolithic (MP) lithic artifacts. Unit 3c is a dark green clay deposit that grades into a lighter green, compact clay deposit (Unit 3b). A clear lower boundary separates 3b from 3a. Unit 3a is a dark green clay deposit with moderately firm consistency. Units 3c, 3b and 3a are suggestive of lacustrine deposition, with short periods of dryness during which lithic materials were deposited. Unit 3a, however, is for the most part sterile.

Unit 2b consists of an organic clay loam deposit and a sandy deposit of variable thickness, but never thicker than 5cm. Unit 2a is a layer of aeolian sand and silt no thicker than 2cm. The interpretation of these two layers is that 2a was a surface with hominid occupation that was eventually covered by aeolian silt and sand. Subsequently, water levels rose, flooding this surface with an organic body of water that resulted in the deposition of Unit 2b. The importance of this unit lies in the climatic and human character of the events. The context is that of a transition from arid to moist conditions. The age of this layer has not yet been determined, but we hypothesize that it could relate to the moist MIS 5e interglacial, or one of the two warm and wet interstadials that ensued (e.g. MIS 5c or MIS 5b).

Unit 1c is a deposit of light green clay with a very sugary consistency. It is possible that this is a deposit of aeolian clay, clay dune or nebkha. However, further micromorphological studies

will confirm or deny this assumption. Unit 1b is a light green clay deposit of lacustrine origin. Handaxes and flakes are the main cultural material found here. Unit 1a is a deposit with characteristics similar to 1c, but with orange stains. It is also a transitional deposit to Unit 0b, the basal deposit consisting of yellow sand. The orange mottles in it are the result of oxidation produced by the weathering of the underlying basalt.

Section DM-11

This section has a stratigraphic sequence similar to DM-8, as well as DM-7 and DM-9 (not discussed here). However, Units 1d and 1e, respectively identified as aeolian sand and intradunal pond deposits, have only been documented in DM-11. Unit 1d contained some artifacts, all of which are non-diagnostic. Unit 1c appears to be absent in DM-11, although traces of it are found in the north section (**Fig. 4**).

In DM-11, Unit 6 is absent but Unit 5 is present, suggesting that this area was underwater for most of the year when the historic marsh existed. This is confirmed by 1926 and 1927 aerial photographs of the area (Kennedy and Riley 1990). We hypothesized that Unit 5 is the area covered by water all year round, and Unit 6 is the higher ground that would have been covered by water during the winter, but dried out in summer.

Despite having been covered by the historic Druze marsh, the sequence in DM-11 lacks Unit 4 (Kebaran peat). Unit 3c is not clear in the stratigraphy and Units 3a and 3b appear as a single unit, here named Unit 3a-b. These variations with respect to the north and north-western parts of the marsh (e.g. section DM-10, plus DM-1, DM-1X, DM-1Y and DM-8) seem to be related to topographical changes through time, a topic that will be studied in future 4D reconstructions of the Druze marsh stratigraphy.

Other Stratigraphic Units with Limited Distribution

Unit 0a was identified in DM-1X as being a sandy deposit with bedding typical of beach deposits. Unfortunately, the contractor did not permit us to document it. Unit 1b in section DM-2 is capped by a layer of carbonates. The U / Th date provided by the carbonates was 141 - 150 k.a. B.P., which indicates a dry period, probably associated with the glaciations of MIS 6.

However, handaxes and other cultural material found in Unit 1b seem to be much older. The U / Th date on the carbonates is the minimum age of the deposit, which may post-date the deposition of Unit 1b by several tens of thousands of years.

DM-8 Artifacts

The following description summarizes the archaeological materials recovered from DM-8. **Table 1** summarizes the cultural inventory from all units excavated in this section. Units 6, 5 and 4b produced a mixture of Epipaleolithic and Early Neolithic material, mixed with glass and pottery dated to the Roman - Byzantine period.

Unit 3e - Upper Paleolithic

This unit produced 187 artifacts, including one core and three formal tools. Some artifacts in this unit were only slightly patinated (brown), but many were heavily patinated, partially desilicified and heat damaged, suggesting a harsh depositional environment including strongly acidic ground water. The clay deposits themselves were formed in relatively deep water; human occupation of this stratigraphic unit could therefore only have occurred during brief periods when the lake receded. Artifacts were dispersed in this layer, with no evidence of distinct occupation horizons. The formal tools from this layer included an atypical burin, a denticulated large blade and a borer on a large blade. The only core was a normal blade core. Among the technological elements, blades and blade fragments outnumbered bladelet fragments 27 to 21. Striking platforms were always either plain or cortical.

Unit 3d - Upper Paleolithic

Unit 3d extends from ca. 95 to 160cm below the surface and is a layer of green lacustrine clay, topped by a dense horizon of pedogenic carbonates. Much of this layer is archaeologically sterile with only a few widely dispersed artifacts, but there were two horizons where artifacts were common. In one, extending from 110 to 125cm below surface, lithics were only slightly patinated (brown and white); in the other, from ca. 150 to 160cm below surface, lithics bore a distinctive black and white patination. These horizons represent occasional occupations

of the lake shore during brief periods when the deep water receded.

This unit yielded a total of 861 artifacts including 13 cores and 9 retouched tools (**Fig. 5** left). The retouched tools include 4 end-scrapers (including a large end-scrapers on a retouched flake fragment found in the upper horizon), one borer on a blade and three double-backed bladelets. The cores include informal cores (6), blade cores (4) and bladelet cores (3). In the debitage, blades and blade fragments (147) outnumber bladelets and bladelet fragments (108). One noteworthy characteristic of the blade debitage is the presence of 'twisted' forms. 14 of the 27 whole blades, and all 6 of the whole bladelets, had twisted profiles. This unit also produced one Middle Paleolithic retouched Levallois point. This was wind abraded, in contrast to the Upper Paleolithic specimens, 93% of which were 'fresh', and was certainly not in its original depositional context.

Units 3a to 3c - Middle Paleolithic

The boundary between Units 3c and 3d is an erosional unconformity marked by heavily weathered basalt pebbles and cobbles. Units 3c, 3b and 3a were archaeologically almost sterile, yielding a total of only 14 artifacts of which 3 were formal tools. These included a Levallois point, a multiple tool (scraper / denticulate) on a Levallois flake and a triangular MP biface situated on the contact between Units 3a and 2a; this may have been derived from the rich MP layer immediately below (**Fig. 5** right).

Unit 2a - Middle Paleolithic

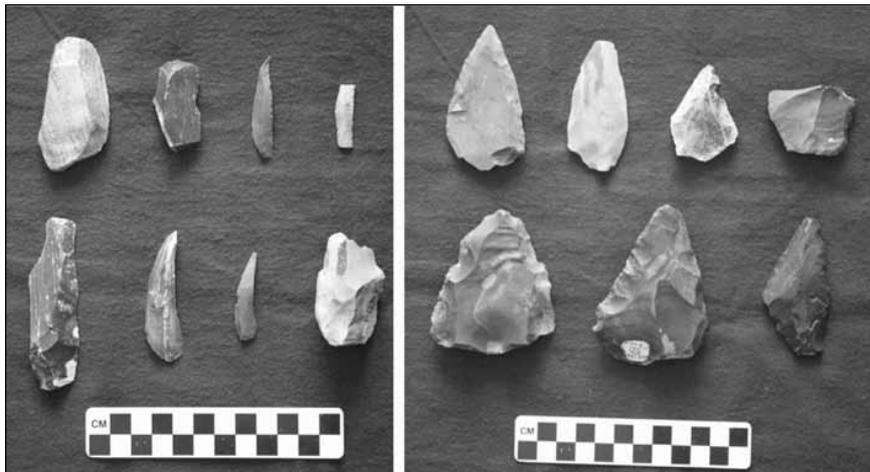
Unit 2a contained a single horizon of Middle Paleolithic artifacts that was, by volume, the richest deposit of archaeological material in the excavation (**Fig. 5** right). The assemblage included 44 point-located artifacts as well as abundant (562 pieces) small chipping debris. Much of this material was concentrated in the eastern half of excavation Unit B, and many artifacts were lying horizontally, suggesting that this layer represents an intact land surface. This layer also contained abundant small rounded basalt pebbles and gravel, suggestive of deposition on a beach. Over 85 % of artifacts were fresh or only slightly damaged; most of the damage was heat-fracturing (10 %). Heat-damaged speci-

Table 1: Artifact Inventory, DM-8; “L” after level number denotes artifacts over 2.5 cm. maximum dimension, “S” denotes smaller pieces. Flk = Flake, FlF = Flake Fragment, Bld = Blade, BldF = Blade Fragment, Bldt = Bladelet, BltF = Bladelet Fragment, Ang = Angular Fragment, Core = Core or Core Fragment, Tool = Formal Tool, Pot = Potsherd.

Level	Flk	Fl.F	Bld	BldF	Bldt	BltF	Ang	Core	Tool	Pot	Total
6 (L)	1			1							2
6 (S)	1						1				2
Subtotal											4
5 (L)	7	2		3							12
5 (S)	7	33		3		8	10		1	3	65
Subtotal											77
4b (L)	2			1				1	1		5
4b (S)	13	195		4		32	14			29	287
Subtotal											292
3e (L)	4	107		17		21	11				160
3e (S)	8	3	3	7			2	1	3		27
Subtotal											187
3d (L)	31	417		65		93	59				665
3e (S)	35	28	31	51	6	9	14	13	9		196
Subtotal											861
3c (L)			1	1					2		4
3c (S)		3									3
Subtotal											7
3a-b (L)									1		1
3a-b (S)	1	5									6
Subtotal											7
2a (L)	18	8	3	7			3	3	8		50
2a (S)	26	321		11			28				386
Subtotal											436
1c (L)	25	34		8			11	6	6		90
1c (S)	21	630		3			43				697
Subtotal											787
1a - 0b (L)	6	9		1			5		3		24
1a - 0b (S)	6	69					17				92
Subtotal											116
Total											2,774

mens were concentrated in the eastern third of the excavation, suggesting that one or more hearths may have been located nearby. The artifacts in this layer included retouched flake tools (notch, denticulate and scraper), two points (Levallois

and elongated Mousterian) and a Levallois point core. Given the presence of both cores and formal tools, this assemblage may represent one or more brief episodes of hominin occupation during which both tool manufacture and hunting /



5. Lithics from the DM-8 excavation. (Left) Upper Paleolithic, Unit 3d; top row, left to right: endscraper, endscraper, complete double-backed bladelet, double-backed bladelet fragment; bottom row, left to right: blade, twisted blade, twisted bladelet, bladelet core. (Right): Middle Paleolithic, Unit 2a; top row, left to right: elongated Mousterian point, elongated Levallois point, Levallois point (Unit 3a), Levallois flake core; bottom row, left to right: Levallois point core, elongated triangular biface, convergent scraper (Unit 3b).

butchering activities were taking place.

Unit 1c - Lower Paleolithic

This layer contained dispersed Upper Acheulian artifacts, with most specimens occurring in the top 20cm of this stratigraphic unit (Fig. 6). These sediments, which included small amounts of flint gravel, represent silt dunes adjacent to a water source. Land surfaces during the deposition of this unit may have either been stable for long periods or, because nearly a quarter of the artifacts have damaged or rolled edges, may have undergone repeated cycles of erosion and deposition. Artifact densities in the top 20cm of this unit were relatively high. A total of 697 specimens were recovered, including 90 pieces over 2.5cm.

Artifacts in Unit 1c included an equal mixture of flake and core tools. These included a backed blade, a notch and a denticulate, as well as three bifaces. The bifaces were ovate, a crude sub-cordiform and a small bifacial cleaver. Two poorly executed Levallois flake cores ('proto-Levallois') as well as a discoid core and three core fragments were also found. Technological elements were primarily normal flakes, but the collection also included small numbers of Levallois flakes and blades. There was also one 'tranchet flake' from the production of a bifacial cleaver. The large Levallois points and minimally retouched scrapers on blades that were encountered last year in Unit 1c during geological trenching and inspection of the Children's Park foundation trenches were not found *in situ*



6. DM-8, Lower Paleolithic, Unit 1c; top row, left to right: partial cordiform biface, heat-damaged amygdaloid biface, discoid biface, small bifacial cleaver; middle row, left to right: cleaver tranchet flake, retouched Levallois point, dé-jeté scraper on a Kombewa flake, scraper-denticulate; bottom row, left to right: Levallois core.

in the DM-8 excavations.

Units 1a and 0b - Lower Paleolithic

The sandy clay deposits of Unit 1a extend from ca. 2.35 to 3.10m below the surface. Artifact densities were lower in this stratigraphic unit, and over 55 % of specimens were moderately to heavily damaged or rolled. Combined with the presence of numerous small rounded flint and basalt gravels, this suggests that beach lines repeatedly transgressed across this location during the deposition of this layer. A total of 116 artifacts were found, almost all from Unit 1a. The formal tools were a retouched Levallois point, a rabot (push-plane) and the tip of a large lanceolate biface that was broken in manufacture. This biface fragment was located in the Unit 1a - 0b contact horizon and was the deepest artifact found. Most technological elements were flakes, with only one blade fragment.

DM-11 artifacts

A total of *in situ* 137 artifacts were collected from the sections of DM-11 (**Fig. 4**). An additional 9 bifaces were collected, but lack archaeological context. The upper levels of this trench were almost entirely sterile, with most specimens coming from Units 1c and 1b. The lacustrine clays of Units 3d and 3a-b yielded only 12 artifacts, a sample that is too small to warrant description. The samples from Units 2a and 1d are also too small to be able to say anything definitive. **Table 2** summarizes the artifacts recovered from this trench.

Units 1c and 1b - Lower Paleolithic

The 50 pieces from Unit 1c included only one retouched tool, a thick, steep edge-angled déjeté scraper on a Kombewa flake. More formal tools were found among the 69 specimens from Unit 1b. These were a utilized Levallois flake, a denticulate, 4 complete bifaces and two biface fragments. The biface forms were ovate, discoid, amygdaloid and lanceolate. Among the 6 cores from this unit were one informal core, two Levallois flake cores, two informal cores on flakes and a Levallois blade core made from the recycled proximal end of a biface.

Concluding Remarks and Future Research

The excavation of trench DM-8 and the open-

ing of trench DM-11 broadened the visibility of the stratigraphy, revealing additional information regarding the vertical and horizontal extent of the stratigraphic units and lithic materials within them. Of particular interest is the fact that the Kebaran peat (Unit 4) seems restricted to the northern margin of the Druze marsh area. It was also learned that the lacustrine deposits corresponding to Unit 3e date to somewhere between 36 to 20 k.a., and that the period represented by this unit ended with a dry episode, evidenced by carbonate formation on top. The excavation of DM-8 also provided information relating to the boundary between the MP and UP. The MP seems to be restricted to a progressively dry to wet phase (Units 2a, 2b and 3a - 3b), of as yet unknown date. An MP occupation surface was uncovered in Unit 2a.

Fieldwork in future seasons will include detailed excavation of DM-11 to expand our sample of the Acheulian levels, and excavation in the area of DM-10 for a better understanding of the Kebaran marsh, particularly its extent and correlations with similar occupations documented in south Azraq by Richter *et al.* (2007). Coring of the entire Druze marsh area will be implemented in order to create a 4D model of the lacustrine, palustrine and aeolian deposition and erosion processes, which will be supplemented by a detailed survey and dating of paleoshore benches and occupations on the surrounding basalt slopes.

Potential correlations with the sections in the south Azraq wetland and springs described by Rollefson *et al.* (1998), Richter *et al.* (2007) and Cordova *et al.* (2008) will also be examined in order to understand the extent of the paleolakes.

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Table 2: Artifact Inventory, DM-11; “L” after level number denotes artifacts over 2.5 cm. maximum dimension, “S” denotes smaller pieces. Flk = Flake, FIF = Flake Fragment, Bld = Blade, BldF = Blade Fragment, Bldt = Bladelet, BltF = Bladelet Fragment, Ang = Angular Fragment, Core = Core or Core Fragment, Tool = Formal Tool, Pot = Potsherd.

Level	Flk	FIF	Bld	BldF	Bldt	BltF	Ang	Core	Tool	Pot	Total
3e	1								2		3
Subtotal											3
3d	1			1							2
Subtotal											2
3a-b (L)	1	1		1				1			4
3a-b (S)		3									3
Subtotal											7
2a				1							1
Subtotal											1
1d (L)	1	2						1			4
1d (S)	1										1
Subtotal											5
1c (L)	1	2		1			1	2	1		8
1c (S)	2	37					3				42
Subtotal											50
1b (L)	19	8					3	6	7		43
1b (S)	2	17		3			4				26
Subtotal											69
NC									9		9
Subtotal											9
Total											146

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UMM AL-JIMĀL CEMETERIES Z, AA, BB AND CC: 1996 AND 1998 FIELD REPORTS

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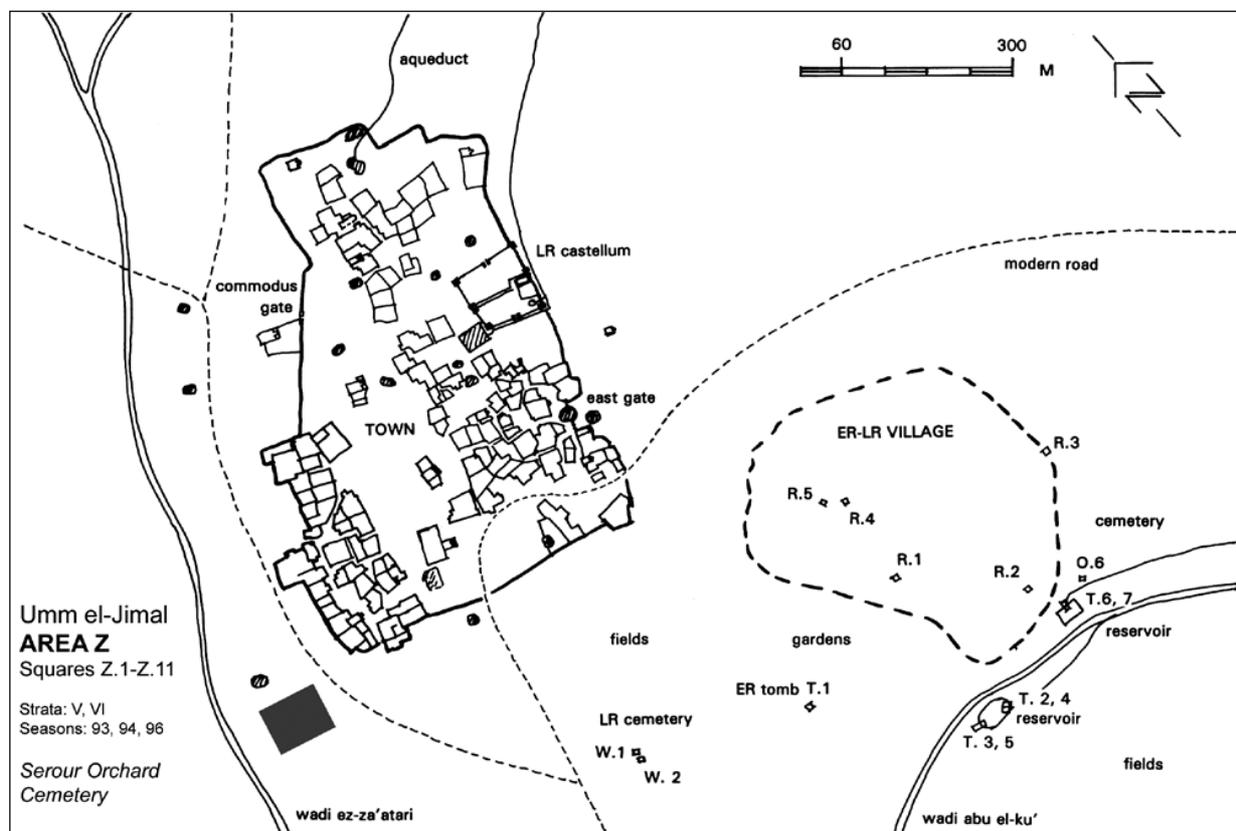
UMM AL-JIMĀL 1996: AREA Z CEMETERY (M. Cheyney)

Introduction

Area Z is located approximately 75 meters west of the southern limit of the Byzantine town ruins, in the olive garden of Shaykh Hail es-Serour (**Fig. 1**). Excavations began here in 1993 when a disturbed cist tomb, Z.1, was accidentally discovered by the owner of the property (Cheyney 1995). More systematic excavations continued in 1994 resulting in the discovery of

two additional burials, Z.2 and Z.3 (Brashler 1995). In 1996 excavation was resumed in an effort to reach three specific research goals.

The first goal was to increase the sample size of human remains from undisturbed burial contexts. This involved the excavation and recording of tomb structure, burial type and orientation, and cultural remains present. Osteological profiles for each interment including age, sex, pathology and Minimum Number of Individuals (MNI) distributions were also estimated where human remains were sufficiently preserved. The



1. Map locating Area Z relative to the Byzantine town ruins.

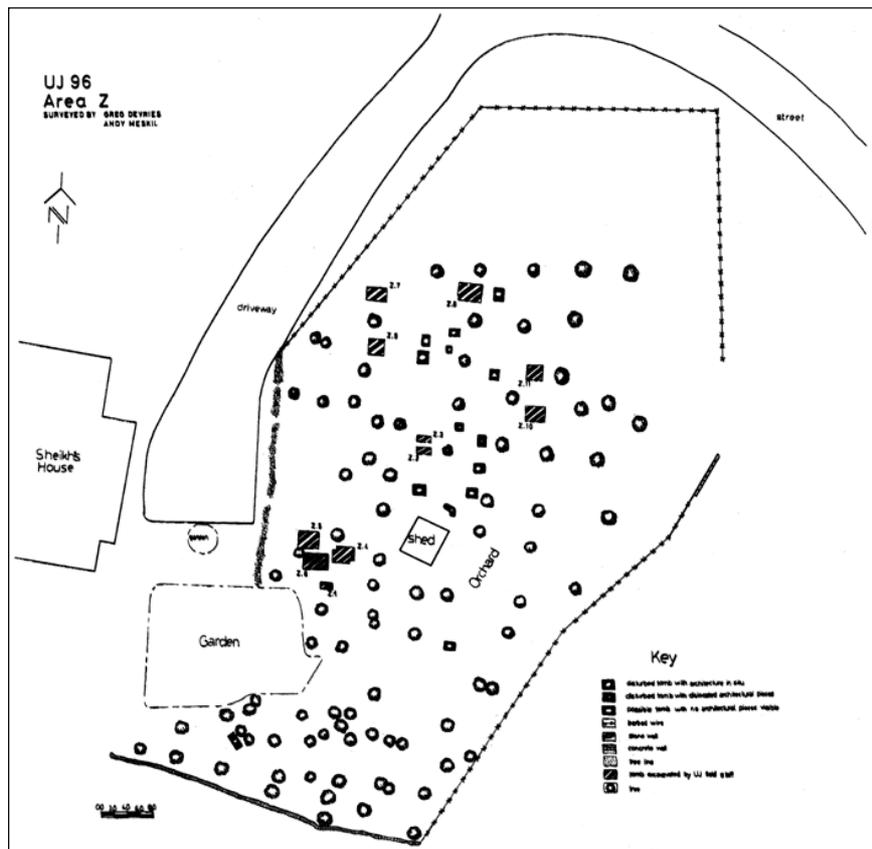
second goal was to sample and document tomb typologies and construction and to add these to the map of overall cemetery locations. The third goal of this season's excavation was the collection of wood and bone samples for C¹⁴ dating. The relative lack of pottery recovered from tomb loci has made a solid dating of this area elusive. The data collected during the 1996 season will add substantially to our understanding of paleodemographic trends, general health and disease levels and mortuary practice in antiquity.

Strategy and Progress of Excavation

In order to achieve the above goals, excavation was concentrated in two regions of Area Z. The first two and a half weeks were spent opening three squares in the vicinity of Z.1. Squares Z.4, Z.5 and Z.6 were located north of Z.1 and southeast of Z.2 and Z.3 (Fig. 2). During the last two and a half weeks excavations were moved to a second region of Area Z located north of all previously opened units. Squares Z.7, Z.8, Z.9, Z.10, and Z.11 were all concentrated in this region.

Units were located where above ground probing indicated the presence of stones occurring in a somewhat regular pattern below the surface. Probing involved the unsophisticated, yet highly effective, use of a metal bar driven into the soil in areas where, given the distribution of known burials, tomb lid architecture was expected. Once the unit was located above ground, a square was laid out, excavated and expanded to reveal the extent of tomb cover slabs. Grave lid architecture was mapped, photographed and lifted. The underlying stone-lined cist or simple dirt pit was then defined, drawn to scale, photographed and gradually excavated through a layer of nearly sterile fill, located within the pit or cist. Soil was removed down to a locus containing remains of either a disturbed or an intact human interment.

Excavation of human remains involved the complete articulation and recording of skeletal elements *in situ*. Small brushes and bamboo bone picks were used to remove the surrounding soil matrix. Photographs were taken and exposed remains mapped in full before the bones



2. Map of Area Z.

were lifted. This allowed for the differentiation of individuals prior to removal. Remains were exhumed and packaged by individual to avoid commingling. All skeletal remains were taken to a field laboratory where they were inventoried and evaluated for morphological and metric traits including age, sex, pathology, anomalies and stature. Bones were then packaged for shipment to Western Michigan University, and later moved to Oregon State University where they await a more comprehensive examination.

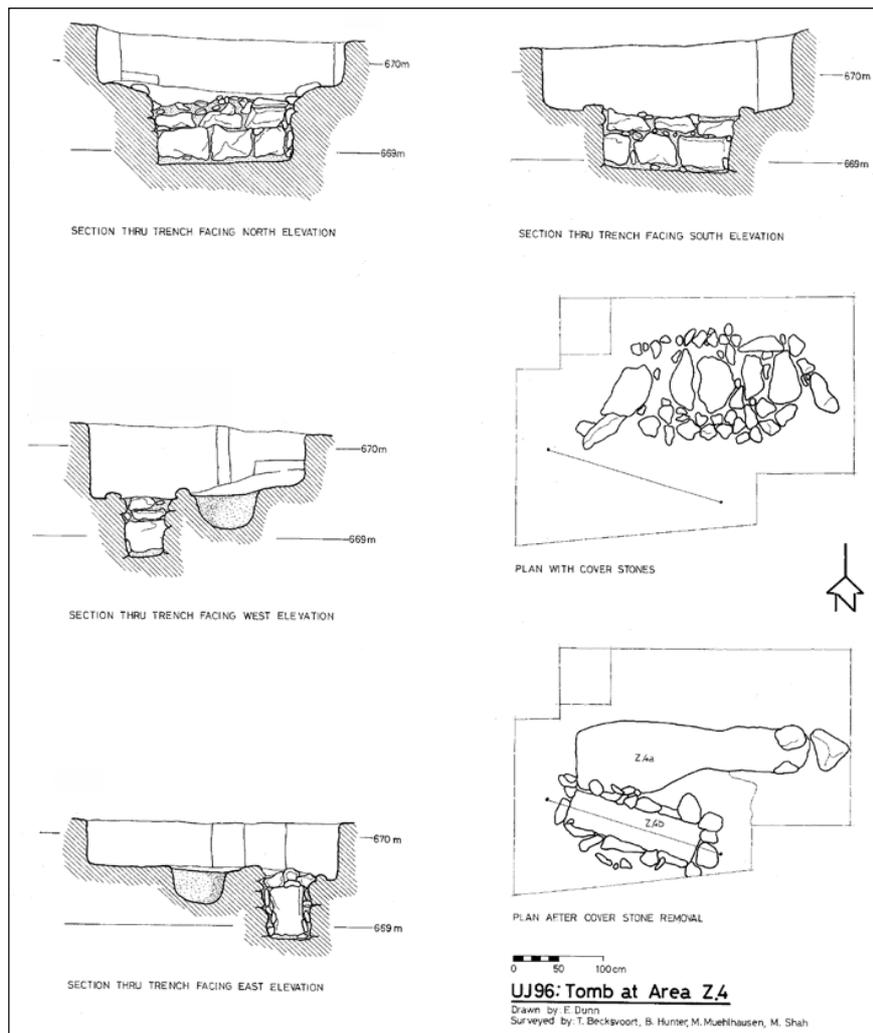
Summary of Results

Tombs Z.4a and Z.4b

The lid architecture of Z.4a, composed of five large basalt slabs, was discovered under 0.55m of naturally deposited sandy brown silt. Small to medium-sized chinking stones were used to line the outside of the lid and were also

placed in between each of the slabs. Beneath the cover stones, a pit of slightly softer soil was uncovered. The pit contained a few human skeletal fragments and small pottery sherds tentatively identified as Late Roman / Early Byzantine. A total of ten identifiable bone pieces resulted in an MNI calculation of two individuals based on the presence of an immature humerus fragment and several adult bone segments.

A second tomb, Z.4b, was uncovered running parallel with and to the south of Z.4a (Fig. 3). The lid architecture was of similar construction, although on a smaller scale, and built for a child. The contents of the cist contained the remains of one subadult individual aged at 7 years \pm 24 months on the basis of dental development (Ubelaker 1978; White 2000) and incomplete fusion of epiphyses. Vertebrae were completely fused suggesting that the age at death was probably



3. Plan and elevations for tombs Z.4a and Z.4b.

closest to the middle of the given range (Bass 1995). The disturbed nature of the upper body, due to a night-time looting part way through excavation, made it impossible to reconstruct the position of the arms, head and torso. The preservation of the legs and feet *in situ*, however, suggested that this individual was buried in an extended supine position with the head at the eastern end of the tomb facing west. No pottery was uncovered. Small metal fragments associated with the feet indicate burial with foot adornments, likely sandals. It is impossible to determine whether the relative lack of grave goods is attributable to the recent disturbance or to culturally dictate burial practices, perhaps related to the individual's status in antiquity.

The side wall architecture of the Z.4b tomb comprised two courses of basalt blocks and small chinking stones. Small fragments of plaster were found associated with the cist construction and bagged for analysis.

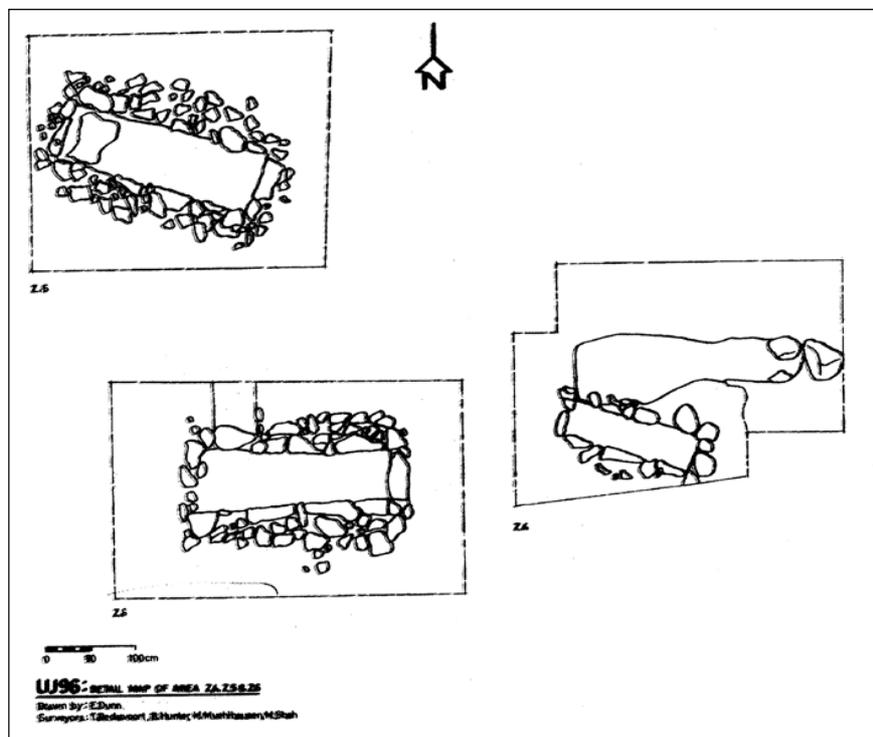
Tomb Z.5

Z.5 (Fig. 4) is of the same construction as Z.4b, with side wall architecture consisting of two courses of basalt blocks, chinking stones of the same material and some plaster fragments, but no other associated cultural material. Within

the walls of the tomb, a layer of soil was uncovered which contained evidence of a disturbed burial. A nail, one copper bead, two glass fragments, and undifferentiated segments of human bone were found in association with dark, irregular stains occurring in a roughly rectangular pattern. A few pottery sherds were also uncovered in this locus and identified as Early Roman / Late Roman. Beneath this soil layer and within the side wall architecture, a dark brown soil stain indicated the remains of a coffin bottom.

Tomb Z.6

Z.6 lid architecture consisted of five large basalt slabs *in situ* and a sixth, disturbed cover stone standing on end at the western end of the tomb. Basalt chinking stones lined the edge of the grave with the smallest ones wedged between the slabs. Beneath the cover slabs, side wall architecture was uncovered that consisted of two courses of finely hewn basalt blocks with intermittent smaller stones. Small plaster fragments and a large Late Roman jar handle fragment were the only cultural materials located in the top layer of burial cist fill. A large 'pocket' of botanical remains was found associated with the handle fragment and collected for flotation sampling. Some human bone fragments, a large



4. Detail map of Z.4a, Z.4b, Z.5 and Z.6.

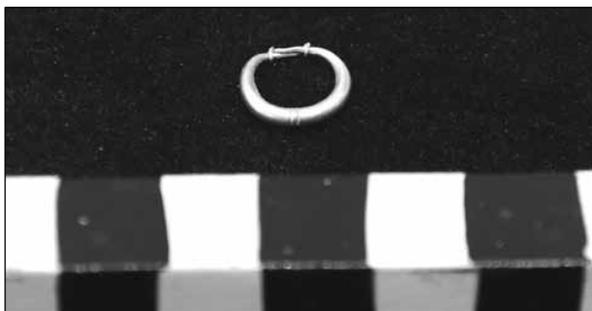
array of copper and glass beads, one small gold earring (Fig. 5) and the badly decayed remains of a wood coffin were uncovered just above sterile soil.

The human remains from this soil layer were inventoried and analyzed in the field laboratory which resulted in the identification of 46 fragments. From these remains a minimum number of one subadult individual, age 15 years \pm 36 months, was calculated.

Tomb Z.7

Z.7's tomb capping consisted of seven large slabs, one a reused lintel, and smaller basalt chinking and liner stones. Beneath the tomb lid architecture, a pit of soft, flaky soil was defined. Excavation yielded wood fragments, dark soil stains in a distinct, rectangular pattern and articulated human remains. A copper ring was uncovered on the right hand of the uppermost individual. Pottery found in this locus was dated to the Roman period. In addition, four nails were found approximately 0.10m in from each corner along the long axis of the wood, likely coffin, soil stain.

The articulation of human remains *in situ* revealed the presence of two individuals oriented east to west from head to foot. In addition, three diagnostic bone fragments belonging to a third immature individual were found beneath the fully articulated skeletons. Both complete individuals were uncovered in the extended supine position. Individual number one, the uppermost burial, was interred with legs extended, the left hand placed across the pelvis and the right arm completely flexed at the elbow joint, with the right hand resting on the right shoulder. Individual number one's skull was uncovered facing north and separated from the mandible, which was located with the mandibular symphysis



5. Gold earring from Z.6 (Photo by Open Hand Studios).

facing west – a configuration best explained by postmortem settling. Individual number two's right arm was flexed at a 90 degree angle across the inferior thoracic vertebrae. The left arm was fully extended and lying adjacent to the left innominate. The skull of the second individual was turned to the side and facing south.

Laboratory analysis revealed that individual one was a female of approximately 14-16 years of age at the time of death based on degree of fusion in long bones. Living stature was estimated at 1.46-1.54m from the right tibia using Trotter and Gleser's formula for white females (1952; White 2000). No evidence of pathology was noted in the field.

Individual number two is an adult male who was between the ages of 27 and 35 at the time of death. Age was calculated from pubic symphyseal morphology (Brooks and Suchey 1990), dental attrition patterns (Bass 1995; Brothwell 1965), sternal rib extremity development (Iskan *et al.* 1984) and medial clavicle fusion. A living stature of 1.65-1.74m was estimated from the right femur using Trotter and Gleser's formula for white males (1952; White 2000). Primary osteoarthritis was noted in the thoracic vertebrae in the form of minor osteophytic lipping of the centrums. The phalanges and metatarsals of the right foot evidenced the early stages of rheumatoid arthritis. The presence of these degenerative pathologies may indicate that individual number two was closer to the upper range of the age estimate given. Finally, extensive enamel hypoplasia was noted in all of the mandibular and maxillary dentition, indicating a period of severe disease and or dietary stress during the years of tooth formation (White 2000).

Tomb Z.8

Beneath the topsoil layer, eight intact cover slabs and chinking stones were uncovered – the largest of the lids excavated this season. Below this locus, pottery sherds dated in the field as Late Roman, coffin remains, metal brackets, nails and human remains were exposed and excavated. Like Z.4a and Z.7, Z.8 was a simple pit inhumation with no sidewall architecture.

One adult individual was uncovered in the supine extended position facing west. The left arm was flexed at a 90-degree angle with the hand lying across the thoracic vertebrae. The right

arm was flexed 110 degrees with the hand lying across the pelvis. The skull, located at the east end of the tomb, was turned and facing north with the mandible tucked towards the sternum.

Morphological analysis of skeletal remains indicates that this individual was a male between the ages of 30 and 40 years at the time of death. Age estimation was based primarily on sternal rib extremity phase, metamorphic changes in pubic symphyses and dental attrition patterns. Stature estimation based on the length of the right femur suggests a range in height between 1.65-1.73m (Trotter and Gleser 1952; White 2000). Dental analysis revealed several carious lesions. Two large occlusal caries were found in the left first molars of the mandible and maxilla. One smaller interstitial caries was located in the right third mandibular molar. No other forms of pathology or skeletal anomaly were observed in this individual.

Tomb Z.9

The excavation of Square Z.9 uncovered the southernmost edge of a badly disturbed tomb running into the north balk and underneath the backfill pile. The decision was made not to excavate further and the unit was closed and back-filled.

Tomb Z.10

The removal of topsoil above tomb Z.10 revealed the presence of cover slab architecture that varied to some degree from the typical plan for Area Z tombs as described above. A large ring of cobble stones was found above the cover slabs, encircling a pit of soft, dark soil (Fig. 6). Pottery in this locus was identified in the field as Late Roman. The removal of the rock circle and the soil within revealed what appeared to be intact, horizontal cover slabs without the chinking stones between cover slabs noted in other Area Z mortuary structures. A burial pit was visible around and contiguous with the outer edge of the cover slabs, suggesting that the tomb lid structure was placed within and level with the top of the pit. This is unlike the plan for the rest of the lid architecture in Area Z where cover slabs are placed over the top of a narrower pit. Cover slabs typically occur above the pit stratigraphically and not within and contiguous with the pit as in Z.10. In general, these differences



6. Tomb Z.10, showing stone-encircled pit above cover slab architecture.

combine to suggest a somewhat unique method of burial for this unit, though the significance of this architectural difference is not determinable at present. Beneath the cover slab and cobble ring structure, the pit continued down to a soil layer containing the skeletal remains of one individual and no associated objects or pottery sherds.

Laboratory analysis of skeletal morphology indicates an adult female between the ages of 35 and 45 at the time of death. Age estimation was based on sternal rib extremity phase (Iskan *et al.* 1985) and dental wear patterns. Pubic symphyses were too poorly preserved to provide evidence for aging. Alveolar resorption resulting from antemortem tooth loss was observed in both the mandible and maxilla. The only other pathology noted in the field was an arthritic phalanx of the right hand. Robust muscle attachments on both humeri were also noted.

Tomb Z.11

Z.11, located next to and to the north of Z.10, was of nearly identical plan and construction to Z.10, differing only in that the former was built to a smaller scale with only four basalt cover slabs. Pottery identified from within the circle of cobbles was Late Roman. The pit that was contiguous with and beneath the tomb lid architecture contained the remains of wood, presumably a coffin, and a single subadult individual. No pottery or other cultural materials were found in this locus.

Skeletal analysis of the immature remains indicated an individual between the ages of 4 and 6 years. This estimation was based primarily on the degree of occipital and vertebral epiphyseal union and dental development and eruption. Skeletal data collected from the 1996 Area Z tombs are summarized below (**Table 1**).

Discussion and Preliminary Interpretations

Dating

The question of dating the loci associated with the pit and cist burials has relied on small pottery sherds and several pieces of jewelry as the only forms of chronological evidence. All of the pottery found within the burial pits and cists this season was dated to the Early Roman / Late Roman period (**Table 2**). Similarly, all of the ceramic material found in the soil associated with the tomb lids was given dates of Early Roman / Late Roman, with one Early Byzantine exception in Z.6. Soil above the tomb (Locus 001) was dated to the Late Roman / Early Byzantine period. The only exception to this pattern was in Z.2 and Z.3 (Brashler 1995). Z.2 had a few Early Byzantine sherds, though most of the pottery found within the burial pit was Late Roman. Z.3, on the other hand, yielded tentative

Table 1: Summary of Area Z skeletal data from the 1996 season.

TOMB	ARTIC. REMAINS	MNI	SEX	AGE	PATH/ ANOMALY	STATURE	BURIAL TYPE	COFFIN	OBJECTS	POTTERY CALLS ASSOC. WITH PIT OR CIST	BURIAL ORIENTATION
Z.4a	N	2	ID	1 adult 1 sub-adult	ID	ID	pit	N	none	LR	E-W
Z.4b	Y	1	ID	7y ±24 mos.	ID	ID	cist	Y	metal foot adornment	—	E-W
Z.5	N	ID	ID	ID	ID	ID	cist	Y	glass, nail, 1 copper bead	LR	ID
Z.6	N	1	ID	15y ± 36 mos.	ID	ID	cist	Y	beads, floral sample, carring metal frag.	LR	E-W
Z.7	Y	2	F M	14-16y 27-35y	possible cranial pathology arthritis, enamel hypoplasia in male	1.46m-1.54m 1.65m-1.74m	pit	Y	nails, ring	R	E-W
Z.8	Y	1	M	30-40y	3 dental caries	1.65m-1.73m	pit	Y	metal brackets, nails	LR	E-W
Z.10	Y	1	F	35-45y	alveolar resorption, robust muscle attachment	ID	pit	N	none	LR	E-W
Z.11	Y	1	ID	4-6y	ID	ID	pit	Y	none	LR	E-W

Late Roman / Early Byzantine dates for pottery associated with human remains. The presence of a Byzantine cookpot, plastered over to create a chalice, pushes the date into the Early Byzantine time period. Collectively, pottery evidence suggests that both pits and cists are early fourth century burial structures.

Table 2: Pottery dates from the Area Z tombs for the 1996 season.

Topsoil	LR / EByz
Tomb lid architecture	ER / LR / EByz
Cist or pit	ER / LR
Sterile Soil	

Dating by grave goods is consistent with Late Roman / Early Byzantine attributions but is not helpful for refining the dates. Preliminary analysis suggests a relatively long and somewhat non-specific chronology, on the basis of beads, nails and gold earrings from Early Roman to Late Byzantine times (Ibrahim and Gordon 1986; Waterhouse 1973; Stirling 1976, 1978; McNicoll *et al* 1992; Winnett and Reed 1964; Tushingham 1972).

In terms of dating by tomb structure, reports from Dhībān suggest that pit and cist burials are roughly contemporaneous and Byzantine (Tushingham 1972; Winnett and Reed 1964). At Umm al-Jimāl, the pottery from Area Z supports a theory of concurrence. However, there seems to be more evidence, at least for the tombs excavated this season that use began in the Early Roman period and continued into Early Byzantine times. This is further substantiated by the similarity of burial type reported for the pre-Byzantine graves at the Queen Alia Airport cemetery (Ibrahim and Gordon 1986) and the Roman tombs at Jericho (Kenyon 1965). The differences in tomb structure in Area Z are most likely more attributable to disturbance and the ability of individuals to acquire resources rather than changes in burial construction over time.

Diversity of Burial Type

Area Z can be characterized as variable in burial style, a matter further complicated by the

disturbed condition of many of the graves. For example, although all of the human remains uncovered this season were facing west with skulls positioned in the east, 1994 excavations discovered individuals facing east and west, with small infants oriented north-south (Brashler 1995). Grave goods vary from complete absence, to several beads and gold and copper jewelry remaining in robbed or otherwise disturbed tombs. In addition, burials range from single interments in simple pits to 13+ individuals in a large block lined cists. Multiple interments of four or more individuals buried in tombs with side wall architecture seemed to be the norm prior to this year's excavation. This season's finds now, however, suggest that a higher degree of variability in number of individuals, orientation and burial type is characteristic of Area Z.

In addition, tombs with distinct architectures are interspersed throughout the cemetery, rather than being concentrated in specific sectors. Square Z.4 is the best example of this with a disturbed pit burial abutting a single, subadult cist interment with finely-constructed side wall architecture.

Disturbances in Antiquity

The second unusual aspect of the Area Z excavation this season was the extensive robbing and / or disturbance evidenced in the region of Z.1. Tomb Z.4a and Z.6 were uncovered with completely intact cover slabs and chinking stones, but contained only fragments of human remains, coffin stains and small grave goods. All but one of Z.5's cover slabs were discovered intact, despite the fact that the grave was extensively disturbed. It is likely that Z.4a, Z.5 and Z.6 were disturbed relatively soon after they were buried because the coffins appear to have been removed intact.

The question with these disturbances is whether the human remains and associated objects were removed as an aspect of culturally defined mortuary practice, involving secondary burial (perhaps in the larger, monumental tomb structures of Area BB, see Brashler, this volume), or in the process of extensive robbing during antiquity. The possibility of robbery seems likely at first glance, given the modern problem of grave looting and object hunting. However, it must also be noted that the disturbance noted

in Z.4a, Z.5 and Z.6 differs markedly from the robbing noted in Z.1 in 1993 (Cheyney 1995). In Z.1, the majority of bones were left behind and piled in one corner of the tomb as though they had been systematically sorted through in an effort to recover grave goods. Only the (presumed) objects were removed. The cover slabs were also left disturbed, with no attempt to replace them. In contrast, the robbers / modifiers of Z.4a, Z.5 and Z.6 made a real effort to restore the cover stones. Even the small chinking stones were replaced between the slabs.

One possible interpretation is that the ancient inhabitants of Umm al-Jimāl systematically reused burial cists over a period of time. Several reports from tomb excavations in Jordan describe the removal of primary burials to make room for new interments (McNicoll *et al.* 1992; Waterhouse 1973; Stirling 1978; Ibrahim and Gordon 1986). This behavior has also been suggested for other tombs at Umm al-Jimāl (Brashler 1995 and this volume).

In Area Z itself, strong evidence for the reuse of graves comes from Z.7. A detailed inventory of human remains from this burial revealed two complete individuals – a subadult female and an adult male. In addition, three diagnostic fragments were found during screening that could not have belonged to the first two individuals. A fragment of an iliac crest that was in an earlier stage of union than those found for the subadult female and two fully unfused distal epiphyses of an ulna were uncovered. Based on duplication and developmental stage, these fragments must belong to a third individual. They were uncovered beneath the deepest burial, and therefore, must predate the two complete individuals. The remains left behind in the disturbed tombs Z.4a, Z.5 and Z.6 were similar to these, in that they were small fragments that conceivably could have been left behind when remains were removed in an attempt to clear a tomb for reuse.

Reports from Ḥisbān describe nearly empty burial shafts with intact covering structures (Stirling 1978; Waterhouse 1973). The authors attribute this arrangement to looting, but also note evidence for reuse in other contemporaneous tombs. Further investigation, including C¹⁴ dating of skeletal material and coffin remains, is necessary to clarify these questions of burial practice and post-depositional disturbance.

However, at present, it seems likely that both robbery and reuse combined to play a role in the complexity and diversity of burial types evidenced in Area Z.

UMM EL-JIMĀL 1998: AREA AA CEMETERY (M. Cheyney)

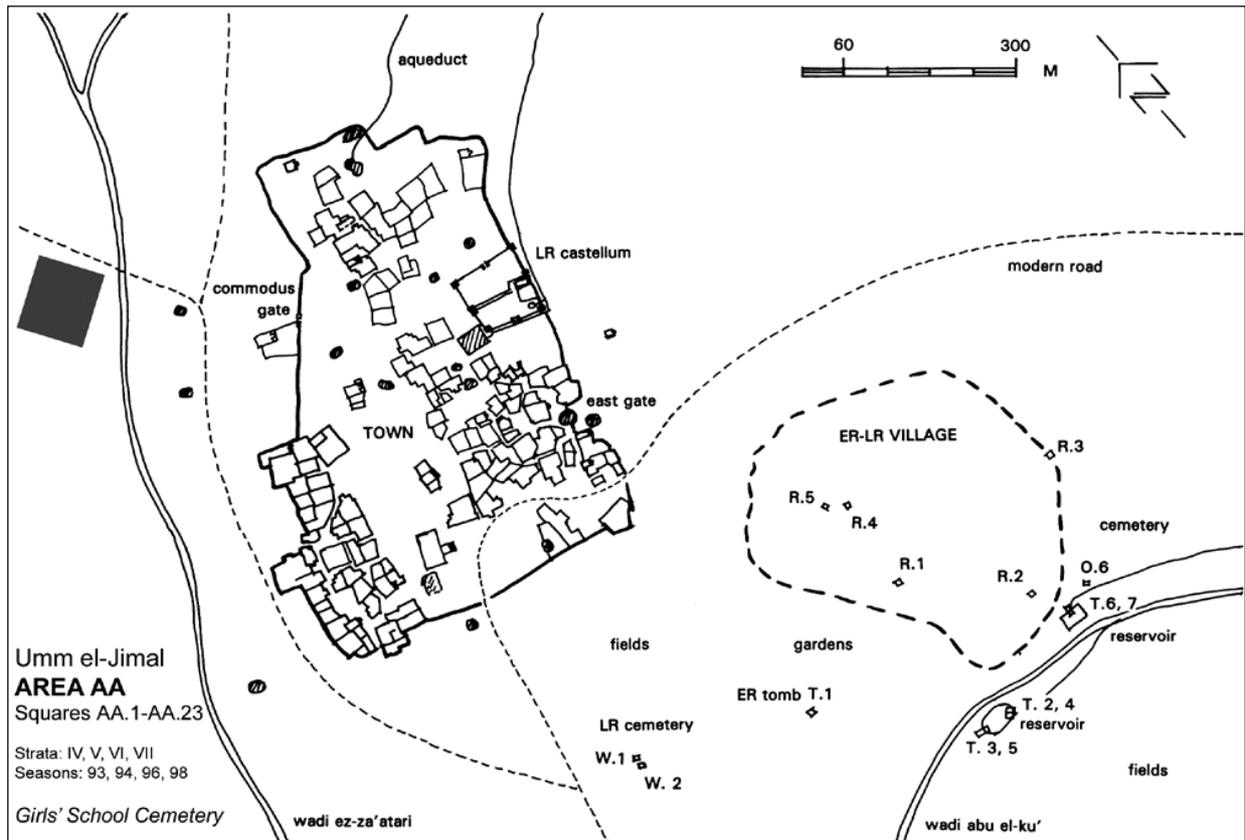
Introduction

The primary goal of excavation in Area AA in the 1998 season was to continue to increase the sample of human remains from undisturbed burial contexts, so that existing paleodemographic statistics calculated for the 1993, 1994 and 1996 collections could be incorporated into a more representative examination of Umm al-Jimāl's burial population. In addition, more extensive data on stratigraphy and ceramic chronology was needed to help refine dating estimates for the Area AA burials. In order to achieve these goals, excavation and recording of tomb structure, burial type and orientation, cultural remains present and basic age, sex, pathology and Minimum Number of Individuals (MNI) distributions were completed for four new mortuary units. In this report, I present preliminary stratigraphic and osteological results from Area AA's 1998 excavation and discuss how these findings add to previous research at Umm al-Jimāl and relevant comparative sites.

Strategy and Progress of Excavation

Area AA is located adjacent to the Umm al-Jimāl girls' school, approximately 200m west of the main standing ruins at the site (**Fig. 7**). Excavations were concentrated along the northern edge of previous units from the 1994 season (Brashler 1995: 458, 460). The patterning of known installations was projected to the north and used, with some degree of accuracy, to estimate the location of new structures. Above-ground probing allowed for relatively precise estimation of subterranean mortuary architecture. The placement of excavation units was further determined by modern building activity and estimates of likely disturbance in a given sector.

Excavations in Area AA demonstrated a consistent stratigraphic sequence of naturally deposited, red-brown aeolian soils, interrupted by tombs excavated in antiquity down to eroded bedrock. Initial excavation involved the removal of one to three loci (0.4 to 1m) of overlying soil



7. Map showing Area AA in relation to the Byzantine town ruins.

deposits until tomb architecture (cover slabs) or simple burial pits were identified. As tomb architecture became evident in the original unit, a series of extensions were opened to expose the full plan of structures running along an east-west axis. Tomb lid architecture was mapped, photographed, and removed revealing outlines of pits beneath the cover slabs. Pits were mapped and photographed before excavation of the burial space began. Human and cultural remains from the graves were systematically exposed/articulated, photographed, and mapped. Bones and associated materials were removed sequentially and, where possible, by individual until sterile soil was identified. All of the tombs excavated in Area AA this season followed a similar progress of excavation, with minor modifications related to the number of burial units uncovered per square.

With the exceptions of AA.17, AA.18 and AA.22, where no skeletal or significant cultural remains were found, all tombs in this area revealed multiple interments. As such, significant care was taken in the field to determine MNI,

sex, age and pathologies, as well as position relative to the tomb and any associated grave objects. As bones were removed, they were wrapped in newspaper and labeled. All skeletal and associated cultural material were inventoried, analyzed in the field laboratory and packed for shipment to more permanent curation facilities in the United States. At the time of writing, the skeletal material is being stored and analyzed at Oregon State University.

Summary of Results

AA.19 Stratigraphy and History of Use

The stratigraphy of AA.19 reveals a complex history of use and reuse. The remains of disturbed tomb lid architecture were discovered in the eastern end of the unit 0.8m below datum, while a reused, inscribed grave marker and six undisturbed cover slabs were found at the western end. Immediately below the slabs were wood fragments, iron nails and hinges, all remnants of an ancient coffin, along with Roman/Byzantine sherds. Glass and alabaster fragments were also present. At the base of the coffin re-

mains, an articulated skeleton (AA.19:010) was recovered (osteological analysis summarized below). Glass fragments were found in the soil surrounding the skeleton along with an *in situ* earring and a copper ring on the right middle finger. While it appears to have been common practice in the AA cemetery to deposit remains into coffins or pits that were too small (requiring disarticulation or forcing of the body into the confines of the burial structure), AA.19:010 was unusual in that the skeleton fitted easily within the coffin.

Beneath the disturbed slabs at the eastern end of the grave, another burial pit (AA.19:015) was discovered. This pit, extending down to a depth of 1.5m, contained the remains of a single individual (AA.19:20) that was complete with the exception of a missing right femur. A copper ring was found near the left hand of this individual. At the bottom of the pit, beneath the skeleton, the remains of a wooden coffin, with three iron nail fragments, and an additional set of cover slabs were uncovered. Upon removal of these slabs, a pit containing another human skeleton (AA.19:018) was revealed (Fig. 8). At the eastern edge of this pit, a small ossuary (AA.19:017) held the disarticulated remains of three adult individuals (Fig. 9).

It is likely that these three individuals were the original occupants of the pit in AA.19:015. At some point in the history of the grave's use, fully decomposed skeletons were removed from the pit grave and placed in the adjacent ossuary in what appears to be one reburial event, as little or no soil was found between the individual bones. The skeletal remains were apparently moved with great care into the ossuary space,



8. Photo of AA.19 burial pit showing skeleton AA.19:018, with cover slabs AA.19:016 still in place over the legs and feet (photo by Nathan Contant).



9. Photo of AA.19 burial pit showing ossuary with skeletal remains of three individuals on the right; articulated skeleton AA.018 is in the main pit on the left (photo by Nathan Contant).

as no postmortem fractures were inflicted until excavation this season. There also seems to have been some measure of organization to the removal and placement of ossuary remains as a distinct layer of long bones with skulls piled on top was noted during excavation.

A single individual (AA.19:020) was then interred in burial pit AA.19:015 and sealed with stone cover slabs, as was the custom in the vast majority of Umm al-Jimāl's pit and cist burials. Coffin AA.19:021 could have been associated originally with either the primary burials later moved to the ossuary, or with the fourth person who was deposited after the creation of the separate bone repository. At some point later in the history of cemetery use, another burial pit, AA.19:018, was dug through a portion of AA.19:015 and its associated cover slab architecture. This later excavation disturbed the cover slabs and the right femur of the 020 skeleton. A fifth individual (AA.19:018) was then deposited in the 018 pit and covered with stone slabs.

AA.19 Human Remains Analysis

AA.19:010: The single burial in the western half of the square, AA.19:010, was uncovered in the extended supine position, the left arm flexed across the chest cavity, and the right arm bent, hand resting on the pelvis. The skull was turned to the right, facing north with the chin tucked slightly toward the sternum.

AA.19:010 was determined to be a female on the basis of morphological characteristics including the flatness of the sacrum, the presence of ventral arcs, extremely narrow and gracile

medial aspects of the ischiopubic rami, a wide subpubic angle, and a pointed mandible (Bass 1995). Age was estimated at 35-45+ years, or late adulthood, on the basis of molar attrition patterns, anterior dental wear, antemortem tooth loss and the well-preserved faces of both pubic symphyses (White 2000). Pathological conditions in this individual included severe osteophytic lipping on the fourth lumbar vertebra, sacralization of the fifth lumbar, severe osteophytic development of the right first distal phalanx and two occlusal surface pit caries in RM₂ and RM₃. A total of nine teeth were also lost antemortem and full alveolar resorption had occurred in all locations. Attrition of the anterior dentition was so severe that secondary dentin formation was evident and crowns were frequently fully obliterated. As a result, the dental roots apparently functioned as chewing surfaces. Stature for this individual was calculated using Trotter and Glesser's (1952, 1977; White 2000) formula for the combined maximum lengths of the femur and tibia. Both complete right leg bones were used, and an estimated living stature range of 145.56-152.66cm (4'9"-5') resulted.

AA.19:017: The individuals recovered from the Locus 017 ossuary within pit AA.19:018 were fully disarticulated and commingled. However, excellent preservation and relative completeness made it possible to establish a MNI of three, and to reconstruct age, sex and pathology profiles for these individuals.

Individual #1: Individual #1 was sexed as female on the basis of cranial, sacral and pubic symphyseal morphology. Age was estimated at 17-23 years based on the non-union of the medial clavicles and the anterior iliac crests, full eruption of the third molars, and the remaining presence of visible lines of fusion in the long bones. Pathology included one occlusal surface caries in the mandibular first molar and eight additional small, pit caries in the mandibular and maxillary first and second molars on both sides. In addition, Linear Enamel Hypoplasia (LEH) of the canines, and a partially healed fracture of the clavicle with periostitis were noted. The pattern of pathologies in this individual, i.e. high caries incidence, LEH, and problematic healing of a clavicular fracture, are consistent with poor nutritional status and / or chronic disease stress.

Individual #2: Individual #2 was sexed as male based on robust and squared mandibular morphology, a pelvic fragment with an extremely narrow, classically male sciatic notch, and a complete left pubic symphysis with a narrow subpubic angle and a wide medial aspect of the ischiopubic ramus. Pubic symphyseal face morphology was estimated at early Phase IV, giving an age range of 35-45 years old at the time of death (Brooks and Suchey 1990). Extreme anterior dental attrition and uneven molar wear, especially of the left, mandibular first molar were consistent with the age estimate from the pubic symphysis. Large occlusal surface dental caries were noted in RM₃ and LM₂, along with antemortem loss and alveolar resorption of RM₁. Living stature for individual #2 was estimated at between 162.28-170.16cm (5'4"-5'7") from the maximum length of the right femur.

Owing to commingling and the similarity in size and stage of development of individuals #2 and #3 (latter described below), it was not possible to distinguish which of the following conditions afflicted which of these two adults. A survey of postcranial remains revealed that one of the two late adults suffered from a healed fracture of the left fibula (large bone callus is still present which suggests the break occurred late in life), severe hyper-ossification of the costal cartilage at rib and sternal attachment sites, a lytic lesion of the posterior manubrium, *spondylosis deformans*, osteoarthritis of the first metatarsal and the adjacent distal phalanx, and vertebral lipping.

Individual #3: Individual #3 was sexed female on the basis of mandibular morphology. Dental wear patterns indicated an estimated age range of 35-45 years. The maxillary molars and premolars in particular showed extreme attrition and uneven wear of occlusal surfaces. No intact pubic symphyses were available for corroborating age calculations. Calculus buildup was observed in five teeth and LEH could be detected on the three present canines and in one incisor. Additional dental pathologies included one caries in a mandibular molar, antemortem tooth loss and associated alveolar resorption of both mandibular third molars. Living stature was calculated at 152.14-159.6cm (5'-5'3") from one of the complete femurs (L) from the ossuary. The maximum femoral head diameter measurement

suggested that this long bone belonged to one of the two females in the ossuary. The absence of lines of fusion, which were noted as still visible in long bones belonging to individual #1, suggest that this stature calculation is most reliably associated with the late adult female, individual #3.

AA.19:020: This individual was uncovered fully articulated with the exception of the right femur which was apparently removed when the intrusive pit burial *AA.19:018* was excavated in antiquity. *AA.19:020* was interred extended supine, with the right arm flexed across the thoracic region, left arm extended, skull turned to the right, or south, and the chin tucked against the sternum. Either through settling or intentional placement, this individual was angled towards their left side so they appeared in a nearly side-lying position.

Individual *AA.19:020* was determined to be female on the basis of pelvic and cranial morphological traits. The maximum femoral head diameter also measured 36mm, or within the range expected for females. Age was evaluated from the sternal rib extremities and dental wear patterns, as the pubic symphyses were too poorly preserved and fragmentary to allow for interpretation. Dental wear patterns suggested an age range of 25-35 years with relatively low attrition for two to three molar sequences in the upper and lower jaws. Sternal rib extremity morphology, however, suggested a somewhat older age range of Phase IV/V, or between 30 and 45 years of age. Taking all available data into account, the age of individual *AA.19:020* was estimated at 30-40 years.

A dental inventory of both upper and lower arcades for the *AA.19:020* individual revealed the antemortem loss and subsequent resorption of LP_3 , LM_1 and LM_2 . In addition, both maxillary third molars were congenitally absent and an enormous occlusal surface caries (30% of the biting surface consumed) in RM_2 was identified. This configuration of diseased or absent teeth would have caused this individual to rely more heavily on anterior dentition for food processing. Indeed, this adult's anterior teeth are extremely worn. A second caries in a maxillary lateral incisor, calculus buildup of the anterior teeth, and LEH of the right mandibular canine

were also observed, along with osteophytic lip-ping of the vertebral bodies and articular facets. This pattern of pathology helps to reconcile the apparent disjunction in dental and skeletal age, and supports an older age estimate than that indicated by molar wear patterns alone. Stature for the *AA.19:020* individual was estimated at 141.7-148.8cm (4'8"-4'11") from the combined maximum lengths of the left femur and tibia.

AA.19:018: A single individual was uncovered fully articulated in intrusive pit *AA.19:018* in an extended supine position, arms flexed and hands resting on the left innominate. In addition to the complete remains of this individual, two extra incisors were also recovered. Based on duplication and differences in wear patterns these elements could not have belonged to the *AA.19:018* individual. However, the degree of wear is consistent with the young adult female buried in the *AA.19:017* ossuary, who had sustained postmortem loss of five incisors. Given the intrusive nature of the 018 pit, the most likely conclusion is that these teeth are simply commingled from the early burials. The overall MNI for the *AA.19* unit, therefore, stands at six.

Sex estimation was problematic in this individual because pelvic remains were not well preserved. Cranial features were somewhat ambiguous, although most suggested a male sex determination. A curved sacrum, pronounced brow ridges, rounded supraorbital margins and intermediate mastoid processes were observed. In addition, the mandible, though somewhat fragmentary, appeared squared or typically masculine in morphology. The *AA.19:018* individual was aged at between 30 and 40 years at the time of death on the basis of molar wear patterning and sternal rib extremity morphology. The later criteria suggested an age of 25.7-34.3, or Phase IV sternal rib development (Ischan *et al.* 1984, 1985). Molar sequences indicated an age estimation towards the upper end of Brothwell's (1963; White 2000) 25-35 year range. Extreme anterior dental wear was noted in the *AA.19:018* individual with all premolars and incisors worn to only a few mm above the cemento-enamel junction. Additional dental pathologies included five caries (one extremely large consuming over 25 % of the crown), antemortem tooth loss, and the subsequent alveolar resorption of the three

left mandibular molars and one right lower molar. Osteophytic lipping of the thoracic and cervical vertebrae and the distal phalanges of the feet was observed, along with a partially healed fracture of the interosseous crest in the right radius. Long bones were too fragmented to allow for stature assessment.

AA.20 Stratigraphy and History of Use

In the western half of grave AA.20, five large basalt cover slabs and associated chinking stones were uncovered at an average depth of 0.6m below datum. Beneath these cover slabs, a large burial pit (AA.20:008) with commingled, disarticulated human remains (AA.20:009; **Fig. 10**) concentrated in the south-west end of the pit was uncovered, associated with Late Roman/Early Byzantine pottery sherds. This skeletal material was likely the primary burial that was later moved to the western end of the pit in order to make room for additional burials added over an extended period of time. Adjacent to the 009 remains, at the eastern end of the pit, an articulated skeleton (AA.20:011) was uncovered interred within a poorly preserved wooden coffin facing west (AA.20:020). Within the boundaries of the coffin and beneath the 011 individual, a soil layer (Locus 012) approximately 0.1m deep and completely devoid of any skeletal or cultural material suggests that a substantial period of time separated the deposition of the AA.20:011 individual and the remains found beneath the Locus 012 soil layer - AA.20:013.

The AA.20:013 individual was fully articulated, though the upper thoracic vertebrae, associated ribs and cervical spine had settled substantially to a deeper level during decomposition or as a result of coffin base decay. Be-



10. Commingled disarticulated human skeletal remains, AA.20:009 (photo by Nathan Contant).

neath individual AA.20:013, the remains of the bottom of the coffin (AA.20:014) were found, along with small bone fragments and coffin nails. AA.20:015, located underneath what appeared to be the bottom of the coffin (014), contained the incomplete and commingled remains of three individuals. Although some articulation of these individuals was distinguishable, the remains were largely disarticulated and commingled prior to the burial of the two articulated individuals within the coffin. An analysis of the skeletal material from the commingled bone Locus 009 revealed that the AA.20:009 and AA.20:015 remains were from the same three people who comprised the primary interments of the AA.20 grave.

The history of use of the AA.20 grave likely began with the burial of the three individuals found in loci 009 and 015 during a single burial event. The remains were commingled due to settling and reburial disturbance but very little, if any, soil separated the individuals. At some point later in time, after complete skeletonization had occurred, the primary burials were partially removed and placed in the western end of the pit to make room for a coffin containing the AA.20:013 individual. Still later in time, the AA.20 grave was re-entered (after 0.1m of soil had either accumulated or, perhaps, been intentionally deposited) and a fifth individual (AA.20:011) was interred.

Following the excavation of the large burial pit described above, a 0.5m extension was made in order to expose four small stones (Locus 018) protruding from the northern balk. Beneath the cover slab structure, a small pit (AA.20:19) was uncovered. The pit contained loose reddish soil, tiny bone fragments, one tooth bud, a copper bracelet with a small round pendant, and a bead. These remains indicated the burial of a very young infant or neonate whose bones would have been too fragile to survive over the hundreds of years leading up to our excavation.

AA.20 Human Remains Analysis

AA.20:009 and AA.20:015: A minimum of three individuals were recovered from loci 009 and 015. This determination was based on the duplication of skeletal elements including long bones, pelvic remains and mandibles. In addition, developmental stage indicated the pres-

ence of at least two adults and one late subadult.

Individual #1: Individual #1 was determined to be a male on the basis of mastoid process, subpubic angle and mandibular morphology. Although this individual was largely disarticulated, it was possible to associate cranial and pelvic remains because age estimates from pubic symphyses and dental wear patterning overlapped. In addition, the diagnostic elements from the other individuals indicated the presence of two females. The pelvis, skull and mandibular fragments attributed to individual #1 were the only elements that demonstrated typically male morphology. Age was estimated at between 20 and 27 years on the basis of molar wear patterns and pubic symphyseal face morphology (early Phase II, 20-27 years). LM_3 was congenitally absent, and a living stature range of between 159.03 and 166.9cm (5'3"-5'6") was calculated from the left femur.

Individual #2: Individual #2 is a late subadult female aged 14-18 years on the basis of pubic symphyseal morphology (early Phase I, 15-24 years), epiphyseal union, and dental eruption patterning. Third molars were unerupted, and the anterior iliac crests and femoral heads were not fused at the time of death. Pelvic morphology suggests female for sex estimation, and no skeletal or dental pathologies were observed in any of the remains that could be associated specifically with the late subadult female.

Individual #3: The third individual recovered from the commingled remains of AA.20:009 and 015 was determined to be an adult female between the ages of 25 and 35+ years. Small mastoid processes, a high frontal elevation and pointed mandibular morphology all support a sex estimation of female. Dental attrition patterns of three molar sequences suggest an age range between Brothwell's early (17-25 years) and middle adult (25-35 years) ranges, for an overall age estimation of 20-30 at the time of death. None of the pathologies observed in bones and teeth could be attributed directly to this person. However, of the loose teeth excavated from Loci 009 and 015, Linear Enamel Hypoplasia (LEH) was observed in nine of the eleven canines recovered during excavation. This indicates that all three commingled individuals experienced some degree of LEH, although the poor state of preservation and the lack of articulation makes it im-

possible to associate the prevalence or severity of the condition with individuals of known sex or age. In addition, six dental caries were noted in commingled teeth, for an uncorrected average (ante- and postmortem loss not accounted for) of two caries per individual.

AA.20:011: The single individual recovered from Locus 011 was found in the extended supine position, arms at the sides, hands resting on the ilia. The cranium was uncovered in the western end of the pit facing west.

The sex of the AA.20:011 individual was determined to be male based on a number of morphological and metric traits including robust mastoid processes, sacral curvature, a narrow sciatic notch, and a maximum diameter of the femoral head within the range expected for males (45mm). An age range of 30-40 years was estimated for the AA.20:011 individual on the sole basis of dental attrition patterning (the late end of Brothwell's 25-35 years age range), as pubic symphyses were too poorly preserved to allow for evaluation. Osteophytosis of the fourth lumbar vertebra was observed along with a relatively high rate of antemortem tooth loss and alveolar resorption in this individual. Seven teeth (RM^2 , RM^3 , LM^1 , LM^3 , RM_1 , RM_3 , LM_3) had been lost prior to death, and at least partial resorption of the alveolus had occurred in all cases. Living stature for the AA.20:011 individual was calculated from the maximum length of the right femur (44.2cm) and estimated at between 164.13 and 172.0cm (5'5"-5'7"), Trotter and Glesser 1952, 1977; White 2000).

AA.20:013: The AA.20:013 remains were deposited in an extended supine position with the feet partially overlapped, the right arm flexed at the elbow, hand resting on the sternum, and left arms flexed with the hand resting on the lumbar spine just above the pelvis.

The AA.20:013 individual was sexed male on the basis of the sacral curvature, a narrow subpubic angle, a wide medial aspect of the ischiopubic ramus, and the absence of a ventral arc. Pubic symphyseal face morphology was consistent with an estimation of 35-50 years of age at the time of death (early Phase IV development). Dental wear patterns of three molar sequences indicated an age range of 25-35 years.

The combination of criteria suggests an overall estimated range of 30-40 years, or middle to late adulthood. Skeletal pathology included osteophytic development of the cervical vertebrae, and of the sacrum and coccyx. Minor vertebral lipping was observed in the superior thoracic region (T1 - T4), and the manubrium and sternal body were also fully fused. Dental pathologies included calculus deposition on LP³, LM¹, LM², the mandibular incisors, and both lower canines. Finally, occlusal surface dental caries were observed in RM₂ and in a loose premolar that was too badly preserved for further identification. Stature was estimated from the maximum length of the right femur (42.4cm), and a living height range of 160.0-167.8cm (or 5'3"-5'6") resulted.

AA.20:019: The AA.20:019 burial contained the badly preserved remains of a small infant. One small phalanx and a single tooth bud were the only skeletal elements that survived and were identifiable. A small copper bracelet, a bead, a necklace pendant and the tooth bud were recovered from locations that suggest the infant was buried with the skull in the eastern end of the grave facing west. The developmental phase of the molar bud indicates an age of birth \pm 2 months for the AA.20:019 neonate.

AA.21 Stratigraphy and History of Use

In AA.21, five large cover slabs were uncovered 0.77m below datum. These were identified as tomb lid architecture, although the layout of the structure was less orderly than many of the others excavated in Areas AA and Z. Beneath the cover slabs, an oval burial pit running E-W was uncovered. At approximately 0.9m below datum, human remains were encountered within the soil stain and remnants of a wooden coffin (AA.21:009). One unidentified pottery fragment, a fully articulated subadult skeleton (primary burial) and an adult individual buried in a flexed position above the child were all found within a coffin that, apparently, was constructed to fit the dimensions of the child. The adult was added later with some degree of difficulty as the individual was substantially larger than the child-size coffin (see **Fig. 8**).

AA.21 Human Remains Analysis

Individual #1: The first individual interred in

the coffin (subadult, primary burial) was buried in an extended supine position with the arms slightly flexed at the elbows and hands resting on the innominates. The right leg was straight, while the left knee was slightly flexed at a 160 degree angle. The AA.21:009 subadult was aged 4 years \pm 12 months on the basis of dental eruption patterns (Ubelaker 1978; White 2000). Permanent central incisors and the first adult molar buds were well-preserved and consistent with this age category. No skeletal or dental pathologies could be detected in this individual. Preservation was poor, particularly for the superior skeletal remains, and the cranium remained as little more than a rounded soil imprint.

Individual #2: Individual #2, an adult, was uncovered above the primary burial within the confines of the decayed coffin outline. The positioning of the skeleton, supine with lower limb flexion, suggests that this individual was manipulated to fit within a space designed for the much smaller subadult. The knees were bent at approximately a 110 degree angle with the feet pressed into the western edge of the coffin. Due to the lack of space within the coffin, the right arm was extended against the adult's side and the left arm was positioned above the chest and pelvic cavities with the hand resting on the left innominate. The shoulders were tilted slightly toward the south (the individual's right) because of the small coffin size.

Morphological and metric traits including the maximum diameter of the femoral head (36mm), the presence of a preauricular sulcus, and an elevated sacroiliac joint suggested a sex estimation of female for individual #2. Preservation was quite poor for this person and additional diagnostic criteria like the pubic and mandibular symphyses could not be analyzed with any degree of accuracy. However, the extremely gracile build of this individual supports the estimation of female. Age was calculated from molar attrition patterns that indicated an age range of 25-35+ years. Dental pathologies included calculus buildup on the maxillary central incisors, two large caries at the cemento-enamel junction in two premolars, and one pit cavity in the occlusal surface of a loose and poorly preserved mandibular molar. A full survey of skeletal pathology and stature estimation were precluded by poor preservation.

AA.23 Stratigraphy and History of Use

AA.23 was excavated down to between 0.6 and 0.75m below datum, where a pit outline was identified (**Fig. 11**). Beneath the pit fill and within the confines of the pit structure, five large basalt tomb cover slabs and associated chinking stones were uncovered 1.45m below datum. One of the five cover slabs was a reused grave marker with an inscription that, due to time constraints, was not read or translated before the end of the field season. Beneath the cover slabs and reused inscription, a layer of pit fill that had apparently silted through the cover slabs into the tomb chamber was identified above a layer of human skeletal remains (AA.23:008). One small ceramic sherd was recovered from this fill and tentatively attributed to the Late Roman, or possibly Early Byzantine, period. Below this, a second layer of partially disturbed human skeletal remains (AA.23:009) was recovered. The soil surrounding the bones contained a few small sherds identified as Late Roman, Roman and Byzantine. Locus 009 contained disarticulated skeletal material in the upper 0.20-0.30m of soil. Beneath these remains, skeletal material was less disturbed, although no individuals were fully articulated.

The organization of remains within the burial pit indicates that the AA.23 grave was reused over time in antiquity. The bones of the first individual to have been interred, the primary burial, were moved to the sides and to the eastern end of the pit in order to accommodate a second individual. The cranium of the second burial was also later moved to the eastern end



11. West half of cist grave AA.23 with skeleton of the subadult (fourth successive burial) exposed on top of the second adult burial whose leg bones protrude on the left (photo by Nathan Contant).

of the tomb to make room for a third individual, in what would have been the third burial episode. The last reuse of the tomb, the fourth burial episode, involved the interment of a small child (**Fig. 11**). During this episode, the third individual was almost completely removed from the pit prior to the deposition of the subadult. Once the child was interred, the third individual was redeposited in the grave. The upper half of the skeleton from the pelvis to the skull was partially articulated indicating that some soft tissue remained on the bones when they were removed and replaced by the subadult. The lower body was disarticulated with bones occurring both above and beneath the subadult. Disarticulation of the majority of remains (with the exception of the subadult) is due to reuse and intentional postmortem movement of remains, whereas commingling is due primarily to settling of bone material over time. The subadult was found lying on the decayed remains of a wooden plank and wrapped in a goat hair shroud or blanket (**Fig. 12**). Skulls of disturbed individuals were found in the eastern half of the pit, while articulated remains of the later burials indicate that individuals were interred with skulls in the west facing east. A copper coin, leather sandal fragments (associated with the subadult), two copper rings and a copper bracelet were also uncovered in this locus.

AA.23 Human Remains Analysis

Articulated Subadult: One fully articulated



12. Cist grave AA.23 showing goat-hair shroud containing subadult shown exposed in **Fig. 11**; some disarticulated bones of the adult replaced above the subadult remain, with the leg bones of the adult below the subadult on the left, as in **Fig. 10** (photo by Nathan Contant).

subadult was uncovered in an extended supine position, with the right and left arms flexed across the pelvis. The remains were wrapped in a goat hair blanket or shroud and the left arm wore an oxidized copper bracelet. Age was calculated from dental eruption patterns at 4 years \pm 12 months. This age category was also corroborated by vertebral ossification. No pathologies were observed.

Commingled adults: A minimum number of three individuals was calculated from the remainder of the AA.23 skeletal material, on the basis of the most frequently occurring sizable element. In this case, long bones, jaw material, and clavicles were most useful in distinguishing individuals. Pelvic and mandibular fragments indicated the presence of two males and one female. For all three individuals, dental attrition patterns and pubic symphyseal face morphology could be used to estimate age. The first of the commingled individuals, sexed male, was aged 17-25 years on the basis of three molar attrition sequences and the presence of early Phase II pubes (19-24 years). A total of three dental caries were observed, one in the right mandibular canine and two in LM₃. Linear Enamel Hypoplasia (LEH) was also present in both mandibular canines.

The second of the commingled adults was identified as female based on pelvic and mandibular morphology. A right pubic symphysis fragment was too poorly preserved to allow for an age estimate, although the presence of lipping along the ventral surface is consistent with the age estimate of 45+ years suggested by dental attrition patterns. Extreme and uneven dental wear was observed in this individual along with a relatively high rate of antemortem tooth loss and subsequent alveolar resorption (minimum of ten teeth). No caries were observed in this individual, although it should be noted that the maxilla was extremely fragmentary and several teeth from the upper and lower jaw were either broken or had been lost postmortem.

The third commingled adult was sexed male on the basis of cranial, pelvic and mandibular morphology. Age was calculated at 25-35 years or middle adulthood from dental attrition patterns in three molar sequences. In addition, the pubic symphyses were estimated at early Phase IV, giving a corroborating age range of 26-36

years at the time of death. Dental pathologies included calculus deposits on the maxillary left lateral incisor and right canine, one caries in the LM₃, and the antemortem loss and resorption of the alveoli at LP₁, LP₃, LM₁, RP₃ and RM₃.

Additional commingled skeletal and dental pathologies and/or anomalies that could not be associated with specific adults included calculus deposit on two loose incisors, LEH of one loose canine, a congenital sternal aperture, abnormal ossification of the costal cartilage in the form of osteophytic development of the xiphoid process, and osteoarthritis of lumbar and thoracic vertebrae.

Summary of Burial Data

A summary of all burial data discussed in this article is given in **Table 3**.

Discussion and Preliminary Interpretation

New ceramic evidence from this season was not helpful for further refining the dates of the Area AA cemetery. All pottery for loci associated with grave installations was either Roman, Late Roman or Byzantine, as has consistently been the case in past seasons. Basic stratigraphy and pottery dates are summarized in **Table 4**.

This season's excavations provided additional evidence for themes discussed in past in research (Brashler 1995; Cheyney 1995, 1997, this volume). These include: (1) the prevalence and patterning of grave reuse, (2) questions of population continuity and discontinuity and the use of cemetery space at the site over time, and (3) what appears to be the preferred treatment of subadult individuals and their tendency to be buried with status goods.

The stratigraphy of the Area AA cemetery indicates that graves were intentionally reused over time, although, at present, it is not possible to determine whether use occurred over a relatively short period of time (i.e. within generations) or over much longer periods of time (e.g. 300-400 years). The accumulation of substantial soil fill between remains in some contexts and the evidence for movement of partially articulated individuals (indicating that some soft tissue remained at the time of re-interment) in others suggests that reuse occurred over relatively short, as well as more extended, periods of time. While previous reports have emphasized ar-

Table 3: Summary of burial data from Area AA 1998 excavations.

Burial Locus	Articulated Remains	MNI	Sex	Age	Pathology	Stature	Burial Type	Pottery calls from pit/cist loci	Ori-entation	Objects	
AA.19:010	Y	1	F	35-45+	Osteoarthritis, dental caries, alveolar resorption, sacralized 5 th lumbar	145.56–152.66 cm	pit	R/Byz	E-W	coffin, copper ring, nails, hinges, glass, alabaster fragments, earring	
AA.19:017	N	3	F	17-23	LEH, caries, healed fracture, periostitis		ossuary				
			M	35-45	Dental caries, alveolar resorption	162.28-170.16 cm					
			F	35-45	LEH, dental caries, alveolar resorption	152.14-159.6 cm					
AA.19:020	Y	1	F	30-40	Dental caries, alveolar resorption, congenitally absent M ³ *S, LEH, Osteoarthritis	141.7-148.8 cm	pit		W-E	Copper ring, coffin, nail fragments	
AA.19:018	Y	1	M?	30-40	Dental caries, alveolar resorption. Osteoarthritis, partially healed fracture		pit		E-W		
AA.20:009 AA.20:015	N	3	M	20-27	LM ₃ congenitally absent, LEH	159.03-166.9 cm	pit	LR/ EByz			
			F	14-18	LEH						
			F	25-35+	LEH						
AA.20:011	Y	1	M	30-40	Osteoarthritis, alveolar resorption	164.13-172.0 cm	pit	none	W-E	Coffin wood	
AA.20:013	Y	1							W-E	Coffin wood	
AA.20:019	Y	1	subadult	Birth ± 2 mos.			pit	none	E-W	Copper bracelet, bead, pendant	
AA.21:009	Y	2	subadult	4 ± 12 mos			pit	UD	E-W	Coffin wood	
			F	25-25+	Dental caries						
AA.23:008 And AA23:009	Partially	4	subadult	4 ± 12 mos			cist	LR, R, Byz			Goat hair shroud, copper bracelet
			M	17-25	LEH, dental caries						
			F	45+	Alveolar resorption						
			M	25-35	Dental caries, alveolar resorption ¹						

1. Several other pathologies were noted in the remains from AA.23:008 and 009, though they could not be associated with individuals. See text of report for a description.

Table 4: Pottery dates from the Area AA tombs for the 1998 season.

Top soil	Locus 001	Roman, Byzantine, Ummayad, Abbasid, modern debris
Subsoil	Locus 002	Roman, Late Roman, Early Byzantine, Byzantine
Subsoil	Locus 003	Late Roman, Early Byzantine
Cover slabs		
Burial pits		Roman, Late Roman, Early Byzantine, Byzantine

Areas AA and Z as Late Roman/Early Byzantine cemeteries, mounting evidence for successive use helps to answer the question of where the Late Byzantine residents of Umm al-Jimāl were buried. Reuse over multiple generations is also consistent with the archaeological evidence for the frequency of intrusive pits that disturb older structures, as later occupants of the site may have had difficulty relocating graves (Gordon 1987: 35). A clear direction for ongoing research is the radiocarbon dating of individuals from Areas AA and Z where stratigraphy provides relative dating of interments. This should help to clarify periods of use for both the Area AA and Z cemeteries.

A closer examination of subadult individuals is also necessary, though preliminary assessments of associations between infants/children and grave goods suggest two hypotheses that will be discussed in more depth in future publications. First, in the Area AA and Area Z graves, wealth is represented in the adornment of children and infants. This suggests that the Roman and Byzantine period occupants of Umm al-Jimāl utilized a system of ascribed rather than achieved status where kinship relationships and birth rights played an important role in deciding where and how individuals were treated in death. Secondly, the concentration of wealth in the form of moveable objects like jewelry is common in semi-nomadic populations (Ibrahim and Gordon 1987; Kobusiewicz *et al.* 2004; Porter 2002). Insofar as treatment in death can be expected to reflect social organization in life (Peleg 2002; Porter 2002), patterning of grave goods corroborates evidence from site layout and written historical accounts that suggest a mixed subsistence strategy of pastoralism and semi-settled, seasonal agriculture.

UMM AL-JIMĀL 1996: THE EXCAVATION OF TWO MONUMENTAL TOMBS, AREAS BB.1 AND BB.2
(J. Brashler)

Introduction

This article describes the clearing and excavation of two Late Roman/Early Byzantine monumental tombs. These tombs, designated Areas BB.1 and BB.2, are respectively located 1500 and 1000m south of the ancient Byzantine town and early Roman village (Momani and Horstmanshof 1995). Both were excavated with the multiple objectives of: (1) salvaging two disturbed loculus tombs and documenting their architecture, (2) making additions to the growing sample of systematically collected human remains and (3) in the case of BB.1, creating an opportunity for additional site interpretive development. Continuing research interests related to the 1996 field work (de Vries 1982, 1993 and in press; Cheyney 1993, 1995; Brashler 1995) include questions related to spatial and temporal dimensions of mortuary behavior, and aspects of nutrition, health, disease, burial custom, population demography, socio-economic status and site abandonment. Both tombs are similar to the monumental loculus tombs described by Butler (1913) which dot the landscape surrounding Umm al-Jimāl. BB.1 is farther from the ruins than any loculus tomb described by Butler (1913), but was probably associated with the ancient community. A similar outlying tomb was excavated by Bruce Dahlberg in 1984 (Area V; de Vries 1993: 445). The location of the tombs outside both the Roman and Byzantine communities is consistent with the Roman practice of burying the dead outside of the residential community and along roads.

and within each loculus at the contact between walls, floor and, occasionally, ceiling. Beneath the plaster on the floor, two inscription stones were located between the stairs and the entrance to loculus BB.1:006 in the NW corner of the tomb, indicating the use of earlier tomb inscriptions in the construction of the existing floor. A probe beneath the flagstone floor produced Late Roman pottery, two small round glass beads, a copper bracelet fragment and a bead fragment, all small objects which could have been introduced through cracks in the floor during various episodes of use, re-use or vandalism. The main chamber was accessed by stairs located at the N end of the tomb (**Figs. 14 and 15**). The SW and SE corners of the tomb contained two large loculi with an indirect access from loculi that opened on to the main chamber. The E, W and S 'walls' of the main chamber each had direct access to three loculi. The main chamber was nearly square, measuring 2.85m N-S by 2.81m E-W. Loculi varied in size depending on wheth-

er they were corner loculi accessed through another loculus, or one of the nine loculi accessed directly from the main chamber. These nine loculi were all approximately 2.4m in length and their interiors approximately 1.2m high, giving overall horizontal dimensions for the tomb of 5.25m N-S by 7.61m E-W.

Fill within the main chamber (BB.1:001, 002) contained a variety of objects, presumably disinterred from loculi. These included several concentrations of Early Roman to Early Byzantine pottery from BB.1:002, located near the floor in the north-west and north-east portions of the main chamber, and numerous objects in BB.1:001 and 002 including glass, a bronze cross, corroded iron and copper fragments, a bone bead, two carved bone hairpins and a bone knob, possibly from a make-up bottle (**Fig. 16**). Individual loculi were constructed with floors lower than the main chamber floor. In some cases (BB.1:009 and 013), the floor may have been formed from eroded bedrock since no small cobble stones were present.

Based on the presence of Early Roman pottery in four loci and the tomb architecture, it is reasonable to hypothesize that the initial construction of BB.1 took place during Early Roman times, perhaps during the first or second century. This would affiliate the tomb with the Early Roman occupation at Umm al-Jimāl (Moman and Horstmanshof 1995; de Vries 1995). The use of funeral stele with Greek epitaphs in the floor of this tomb suggests that initial construction occurred after the population at Umm al-Jimāl was established and had buried some of its dead. Late Roman pottery occurred in 13 of the 15 excavated loci, suggesting the tomb's heaviest use was during the third or fourth centuries. The adaptive re-use of the inscription



14. Overview of chamber tomb BB.1 (facing north).



15. Overview of chamber tomb BB.1 (facing west), showing the entrance stairway and three western loculi; the left loculus gives access to 'hidden' loculus BB.1:009, which fills the corner between the west and south loculi.



16. Assemblage of small objects from BB.1.

stones may have occurred during remodeling in this period (Fig. 17). Early Byzantine pottery in five loci is interpreted as continued use of the tomb as a mortuary facility in the fourth century, while three Umayyad sherds may be evidence of continued use or robbing in the seventh to eighth centuries. Curiously, however, these three sherds occurred in loculi with relatively better preservation, and from which articulated remains were recovered (Loci 006, 011 and 015). In both 006 and 015, the Umayyad sherds were from close to the surface of the loculus fill, while the lower fill was not disturbed, at least by individuals leaving behind Umayyad pottery. Perhaps Umayyad use of the tomb was not robbery, but rather some other use, since the lower portions of these two loci were not disturbed.

Small quantities of human remains, pottery and objects were recovered from only four loculi: BB.1:007, 008, 009 and 010. The number



17. Inscribed tombstones in floor of BB.1, located between stairway and south chamber wall. The closest reading is AKRABH ZABDOU, or “Aqrabe (daughter of) Zabdos”; names are typical of Nabataean - Roman era inhabitants.

of individuals who once reposed in BB.1 will therefore never be known. Architecture of these four loculi was exposed prior to our excavations, and large quantities of rubble, plastic and other modern debris occurred in each. Loci BB.1:006, 011 and 016 had substantial quantities of human bone and a few objects. Locus BB.1:015, which showed the least evidence of disturbance, contained *in situ* skeletal remains and 12 objects (Fig. 18). Loci BB.1:012, 013 and 014, which were more disturbed, contained fewer objects and pottery, owing to either re-use or robbery.

The relatively well preserved nature of BB.1:015 provides the best opportunity of any loculus burial excavated to date at Umm al-Jimāl to make projections of total tomb population once minimum numbers of individuals for that loculus are calculated. However, evidence for re-use in the loculus (bones pushed to the sides and back of the tomb, disarticulated skulls and a secondary cremation deposit) provide cautionary evidence of disturbance which could



18. Headless skeleton B.1.015 in Loculus B.1:016.

mean that the contents removed in 1996 excavations represent only a fraction of the total use of the tomb. Work to decipher the taphonomic transformations of the archaeological deposits in BB.1 will be necessary to gain further insights into its history of use.

Tomb BB.2

BB.2 was located during the 1996 survey of existing monumental tombs at Umm al-Jimāl. This is a small N-S oriented vaulted chamber tomb with two loculi (**Fig. 19**), a narrow entranceway defined by a door and side wall architecture, which is situated south of a 3.2m long entrance passage, or *dromos*, with four steps and a sloping plaster lined floor leading from the ground surface to the doorway (**Fig. 20**). The tomb, including its entrance passage, is approximately 6.6m N-S; the E-W dimensions vary from 1.0 m (interior measurement of the

entrance passage), to 0.72m (interior measurement of the small entryway into the vaulted loculi chamber), to 1.8m (interior measurement of the vaulted chamber). Like BB.1, plaster was used to point the joints between the walls and stairs, and the walls and plaster floor of the long entrance passage at the base of the small entryway, but not the floor of the small entry way itself. The two loculi and the vaulting system over them were constructed of well dressed, carefully laid basalt. In BB.2:008, the eastern loculus, one of the cover slabs was a re-used inscribed stone found at the S end of the loculus.

Though human remains were recovered from all loci, the only articulated skeletal material in the tomb was retrieved from the entryway. These remains, though fragmentary and very badly preserved, represent re-use or robbing of loculi in antiquity since they are partially articulated, occur mid-way down through the fill in the long



19. Vaulted chamber of Tomb BB.2, with doorway and fallen door in foreground; the two loculi are not visible.



20. Re-erected door with dromos and entry steps of Tomb BB.2 beyond; taken from top of chamber vault (facing north).

entrance passage, and appear to have been exposed to the open air for a period of time before they were covered by windblown soil. Other evidence of clearing operations in antiquity are the presence of at least five partly restorable lamps, three partly restorable ceramic vessels and large concentrations of broken pottery on and above the steps in the long entrance passageway.

Relatively little bone was recovered from the W loculus (B.2:007) within the vaulted area of the tomb. Pottery from this loculus was Roman, Early Byzantine and Byzantine; objects included two copper bracelet fragments, a thin, possibly modern metal fragment, a copper coin, and a fragment of an iron bracelet. The most unusual discovery in this loculus was a naturally mummified desert fox (*Vulpes* sp.), which was apparently using the far southern end of the loculus as a lair at the time of its death.

The east loculus (B.2:008) within the tomb contained a larger quantity of skeletal material, most notably the remains of an unusually high number of well preserved foetal, infant and juvenile bones in comparison with other loculi excavated in either BB.2 or BB.1. None of these remains appeared articulated, but the surprising number of recovered objects may reflect the larger number of items initially buried in this loculus, given that it -- like BB.2:007 -- was disturbed and contained plastic debris throughout its fill. Objects recovered include a marble fragment with curved smooth surfaces, glass beads, a plaster doll torso (head missing), a bone disc from a juglet, an iron fragment, corroded copper or bronze fragments, a copper or bronze section of chain, a gun shell (from the rear of the chamber) and ca 50 uncarbonized olive pits, most of which were gnawed by rodents.

The use history of BB.2 is complex. Pottery suggests that the initial construction and use of this tomb was Roman, though all but one of the 'Roman' pottery attributions (n = 12) are 'generic' Roman or Late Roman, which might place initial construction of the tomb in the second or third centuries AD. Use of the tomb probably continued into the fourth or fifth centuries, given the eight Byzantine or Early Byzantine sherds. A single sherd each was attributed to the Late Byzantine, Late Umayyad and Late Abbasid periods, which may be related to a period of re-use or robbery. The Late Umayyad sherd was from

Locus 004, above the loculi in a convenient location for tomb robbers to leave their booty and snack food remains (as did the 20th century robbers). The Late Abbasid sherd came from midway through the deposit in the long entrance chamber, and may reflect a visit to the tomb at a time when the chamber had filled halfway with windblown soil and clean-out from earlier uses, as evidenced by the partially articulated remains in Loci 002 and 005. The single Late Byzantine sherd was from Locus 008, the east loculus, and may be related to a late re-use of the tomb in the sixth or seventh century.

In antiquity, the long entrance passage to the tomb proper would have been open to the air, but it and the small entrance between the door and the tomb were filled with soil, rock and other debris when excavation began in 1996. Although the small entrance to the tomb and vaulted chamber contained plastic bags, tea cups, crisp packets and other remnants of recent digging in the two areas, the fill of the long entrance passage was largely devoid of recent debris. Thus, it is likely that the small entryway to the tomb was covered by a roof that was removed not long before 1996, perhaps so the thieves could gain access. Some architectural elements, including an inscribed stone were recovered inside the long passageway, but the lintel for the door was not found. Possibly the roof and top of the door structure for this part of the tomb were removed, most likely during the recent robbing of the tomb.

The variety of ceramics, unusual architecture and surprising number of infant remains make this tomb stand out from other loculus tombs recorded in the vicinity of Umm al-Jimāl. The apparent over-representation of infants is curious. In other parts of the Roman Empire infants were not always accorded the same treatment as adults. Soren and Soren (1995: 43) and other sources on Roman burial custom suggest that "there was no tradition of burying babies in cemeteries at all" and further postulate that a malaria epidemic may have been responsible for numerous infant remains recovered from a fifth century AD cemetery north of Rome. Thus, the location of a cemetery with numerous infant remains at Umm al-Jimāl may provide tentative evidence of community depopulation prior to abandonment, but much additional research

will be required to gain a comprehensive understanding of the context of these remains.

Conclusion

The two Area BB tombs, along with the Area V tomb are significant additions to the group of chamber tombs published by the Princeton University Expedition survey of 1905 to 1909. The original use of these tombs was in the Roman period (second to third centuries). The fact that both tombs incorporate re-used tombstones with Greek epitaphs indicates that they were not the first tombs of the Nabataean-Roman era at the Umm al-Jimāl settlement. One can therefore envisage a period of about two centuries in which such chamber tombs were being constructed to accommodate the burial needs of elite residents. It is also possible – especially in the case of Tomb BB.1 – that these re-used tombstones were introduced during Early Byzantine remodeling and repairs. Ceramic sequences and artifacts indicate the re-use of these tombs in the fourth to fifth centuries, or

Early Byzantine period, as the population began to include Christians. Finally, both tombs have evidence of ancient disturbance and robbing, which could have taken place during the later Umayyad and Abbasid periods. However, as noted above, the ceramic evidence for this is rather scant.

UMM AL-JIMĀL 1998: CEMETERY AREA CC
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Introduction

Area CC is located in an old olive orchard north-west of the main standing ruins (Fig. 21). The area is bordered to the north by a road and to the west by a modern cemetery and houses. The purpose of excavations in Area CC was to establish the limits of the cemetery partially excavated in Areas Z and AA in previous seasons. Further goals were to increase the sample size of datable skeletal remains excavated from burial



21. Map with location of Area CC relative to the main site

sites surrounding the site of Umm al-Jimāl, and to establish the relative chronology of the different burial areas.

Strategy and Progress of Excavation

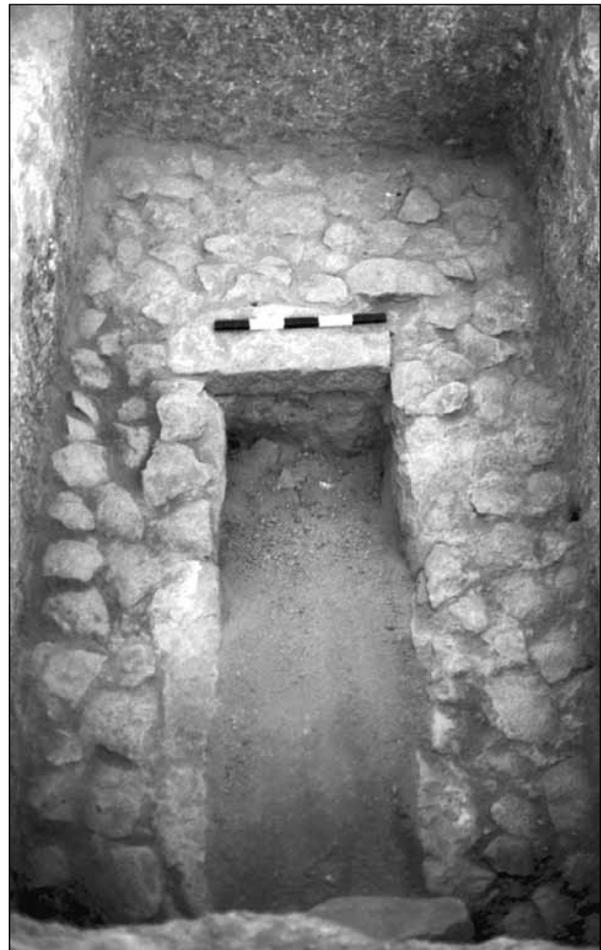
The location of the Area CC units was based on the likelihood of finding grave architecture below the surface, as determined by ground probing. Upturned cover slabs visible through wind deposited and plough disturbed topsoil loci also helped to indicate the presence of graves beneath the surface. Squares were oriented north-south in an attempt to locate graves running in the usual east-west direction. As with all probes and extensions, plans were drawn and photographs taken before excavation.

The general method of excavation in Area CC involved the removal of stratified soil layers in spits of 10cm. Once burial pits were detected, excavation centered on defining the pit outline, excavating the pit contents, articulating the bones and/or objects present, and removing the skeletal remains for analysis. All human skeletal remains were analyzed in the field and shipped to the United States for further assessment.

Summary of Results

CC.1 Stratigraphy and History of Use

Three layers of soil (Loci CC.1:001, 002 and 003), differentiated by color and texture, were excavated to reveal disturbed basalt grave markers or cover slabs (004, 006) within a pit (007) that had been excavated into eroded bed-rock (005) sometime in antiquity. Within the pit, in the uppermost layer, disturbed cover slabs, associated chinking stones, Late Roman and Early Byzantine pottery sherds and highly fragmented human bone were uncovered (CC.1:008). Beneath the disturbed cover slabs, a cist grave (CC.1:009) surrounded by a ring of cobblestones (CC.1:011) was revealed (**Fig. 22**). Adjacent to the cobblestones in the pit fill located outside the cist, the presence of metal fragments, remains of a wooden coffin and highly fragmented human remains also indicated that the remains of the cist had been disturbed in antiquity. Human remains within this cist fill (C.1:010) were disarticulated but otherwise well preserved. No other grave goods or pottery were found associated with cist contents, making dating problematic.



22. Tomb CC.1:007 showing cist architecture C.2:009.

CC.1 Human Remains Analysis

Within the single grave (CC.1) uncovered within the confines of the CC.1 trench, a minimum of two individuals were accounted for, primarily on the basis of the duplication of cranial bones, including the full preservation of two distinct frontal bones. Both individuals were less than 50% complete. One possible female was identified on the basis of frontal elevation and nuchal crest morphology. In addition, the maximum diameter of one present, complete left femoral head was 37.5mm, or within the range of expected diameters for females as determined by Stewart (1979; F<42.5mm). The sex of the second individual was indeterminate, as it was not possible to establish whether the two sex diagnostic elements described above were from the same or separate individuals. The absence of sex-specific male skeletal remains is inconclusive because that may be accounted for by

the disturbed nature of the grave and incomplete preservation of individuals.

Molar attrition patterns indicated the presence of two adult individuals. The first was aged at 17-25 years, or early adulthood, and the second was estimated at 25-35 years, or within the middle adult range, at the time of his or her death (Bass 1995; Brothwell 1965; White 2000). The degree of epiphyseal union in long bones was consistent with age indications from dental wear. Because remains were not articulated and no full diagnostics, *i.e.* skull and mandible or complete innominate, were recovered, it is not possible to associate age and sex for either individual.

The same femur used to estimate sex from femoral head diameter was analyzed to provide a living height calculation using Trotter and Glesser's (1952, 1977) formulae for white females. Because its maximum length was 41.5cm, the living stature range was calculated at between 152.9 and 160.3cm (5'-5'3"). The only pathology preserved in the CC.1 skeletal remains was a small occlusal surface pit caries in a loose and fragmented adult molar.

CC.2 Stratigraphy and History of Use

In Unit CC.2, a layer of wind deposited soil (CC.2:001) was excavated to reveal a rocky stratum (002) approximately 45cm below the ground surface. The partial outline of a pit was discovered in the north-east corner of the unit, following removal of an additional sterile soil layer (CC.2.003) below Locus 002. An extension was cut to reveal the entirety of the pit structure. Although the section showed that the pit extended as high as 002, the pit outline did not become clearly visible in plan until reaching the bedrock cap, Locus CC.2:004. Continued excavation of Loci CC.2:001, 002 and 003 throughout the extended unit revealed the outlines of two more pits in excavation unit CC.2. The pits are referred to by the loci which first described them. Pit CC.2:005, the first uncovered, is located near the middle of the square. To the north-east lies pit CC.2:006, and to the south-west pit 007. In the process of exposing the entirety of all three pits, a fourth and much smaller pit outline (CC.2:018) was uncovered.

Excavation of pit CC.2:005, revealed the near complete skeleton of a horse, CC.2:021

(Fig. 23), and an infant, CC.2:025 (Fig. 24). The smaller pit (018) adjacent to 005 contained the tarsals and metatarsals of the horse from 005. The abdominal cavity and tail of the horse were not completely skeletonized and were marked by green soil staining that resembled copper oxidation residues. However, these appear to have a fully organic make-up as no copper or other metals were found in association with the stains, though metal and leather remnants of a bridle or halter were found around the horse's mandible and occiput. The green material was fibrous, filled with hollow tube-like structures and could either be the remnants of fabric of some kind



23. Skeleton of horse CC.2:021 in pit CC.2:005



24. Child burial CC.2:025 against the horse's forelegs; its bones are poorly preserved.

or, more likely, the decaying organic residues left by the interaction between soft tissue and microorganisms. Grave CC.2:005 may have been left open initially, covered only by a tent or wooden structure as evidenced by four possible post stains found to the west and south-east of the CC.2:018 pit. It is possible that the decay process began whilst the remains were exposed, and were later covered by dry soil after partial decomposition had taken place. The fact that the rib cage was packed with soil while maintaining a relatively large volume (i.e. the rib cage had not collapsed) suggests that fill seeped in gradually as or after some of the soft tissue decayed. Laboratory analysis of the stained soil will be reported in future publications.

The infant remains uncovered in pit CC.2:005 were placed next, and inferior to the horse, the head resting on the animal's front legs (**Fig. 24**). Soil stains and the remnants of leather or thick fabric indicate that the child was wrapped in a shroud, blanket or garment, and wore a necklace at the time of deposition. The pit containing the infant appears to have been dug partially into the soil next to the distal forelimb of the horse. Full articulation of the horse's forelimbs suggests that the baby and horse were buried at, or close to, the same time—before substantial decay of soft tissue had occurred in the horse. Small stones located superior to the infant's skull and spine suggest that a pile of rocks was laid to define the space between the infant and the horse's abdomen. Small unidentifiable pottery sherds were also found in pit CC.2:005.

The relationship between pits CC.2:005 and 018 remains unclear. The presence of tarsals and metatarsals in pit 018 indicate that the later was intrusive, having been dug after the deposition and at least partial skeletonization of the horse in 005. The rear legs of the horse closest to pit CC.2:018 were also disturbed, and the sacrum of the horse was found near the eastern end of pit 005. Pit 018 may have been intended for an infant's burial before it accidentally disturbed the horse and infant burial. As discussed in previous reports, new graves are commonly dug into older pits and cists suggesting a period of use substantial enough to allow Umm al-Jimāl residents time to lose track of precise tomb locations (Cheyney, this volume: Area AA). Once the horse burial was disturbed, the

ancient inhabitants apparently stopped excavation, perhaps choosing another location for the intended burial. Pit 018 may have originally been intended for the infant in 005, though the lack of disturbance of the forelimbs of the horse and, as discussed above, the placement of stones between the horse and infant suggest that they were intentionally buried together at about the same time. The most likely scenario at present is that 018 is an intrusive burial pit that was never used. However, it is also possible that 018 was dug to hold additional funerary objects, that were either looted in antiquity or removed as part of culturally constructed burial practices. No pottery or other datable materials were found in 018.

The excavation of pit CC.2:006 uncovered Late Roman pottery sherds, small glass fragments and a copper ring along with numerous loose, disarticulated human bone fragments that were concentrated at the center of the pit's southern side. Further excavation revealed tomb cover slabs (**Fig. 25**) and a surrounding rock pavement. These cover slabs were removed and the tomb beneath them excavated. Another concentration of disarticulated bone was found in the center of the pit. A third bone concentration was



25. Tomb CC.2:006, showing partly preserved cover slabs CC.2:023.

discovered below these in the eastern half of the pit (Fig. 26). Directly below this bone concentration was an articulated skeleton, running east to west from head to toe, and lying on the left side. The remains of leather sandals were associated with the feet and a small pocket of ashy, burned organic material was found adjacent to the mandible of the articulated interment, perhaps indicative of a ceremonial offering made at the time of burial. The walls of the burial cist were covered with the remains of mud plastering, and a dark soil stain at the bottom of the cist may represent the remains of a coffin or shroud (Fig. 26). In addition, a few small water-washed Roman period pottery fragments, a glass bracelet, black glass rings and very small dark glass beads were found associated with the articulated burial. This pattern of skeletal deposition suggests that the primary burials of CC.2:006 were



26. Tomb CC.2:006 showing intermingled human skeletal remains CC.2:032.

moved to the edges of the grave to make room for the fully articulated individual after skeletonization was complete -- a common practice at Umm al-Jimāl (see Brashler 1995 and this volume; Cheyney 1995 and this volume).

Grave pit CC.2:007 was clearly visible in plan, being cut into bedrock (CC.2:004). Surrounding the pit were nine small darkened soil stains that were roughly circular and interpreted as possible post holes. Excavation within 007 revealed a smaller pit within the larger one. Included in this smaller pit was a pierced saltwater shell that may have been used as a pendant, two earrings and the poorly preserved bones of an infant. In addition, an articulated skeleton of a child was discovered in the larger pit 007. Skeletal remains and associated grave goods including Late Roman sherds, two *in situ* copper and amber earrings, glass beads and a necklace pendant with metal clasps were found associated with the fifth cervical vertebra of the child. The CC.2:007 individual was buried in an extended supine position running east to west from head to toe, with the legs flexed 120 degrees. The smaller pit containing the infant was cut into the soil anterior to the child's femurs.

CC.2 Human Remains Analysis

Square CC.2 contained three separate graves (CC.2:005, 006 and 007), and possibly a fourth, abandoned one (CC.2:018), that were all identified within the confines of the original excavation trench. Distinct graves were distinguished in field notes and square supervisors' weekly reports by the locus number assigned to the portion of the pit first recognized during excavation.

Grave CC.2:005 contained the undisturbed remains of a fully articulated horse and a small child aged 2-3 years on the basis of dental eruption patterning and adult tooth bud development. Adult central maxillary incisor buds indicated an age of 3 years \pm 12 months, although the permanent first molar buds were between 2 yrs \pm 8 months and 3 yrs \pm 12 months according to Ubelacker's (1978) standards. Neural arches were fully fused and the ossification of primary fusion centers between the vertebral arch and centra had not yet occurred. Epiphyseal fusion, thus, corroborates an overall age estimate of 2-3 years of age at the time of death. No skeletal

pathology was observable, although a possible dental caries on the buccal surface of a deciduous maxillary central incisor was observed.

Grave CC.2:006 contained the remains of partially disturbed human burials located above a fully articulated individual. A minimum number of four individuals were identified on the basis of duplication of diagnostics, including pelvic, dental and cranial remains. The fully articulated primary burial was identified as a subadult female based on pelvic and mandibular morphology, as well as overall gracility. Although the three other individuals were commingled and only partially complete, excellent preservation of the innominates and mandibles indicated the presence of an additional adult female and two adult males. Where preservation allowed, age for all four individuals was calculated separately for upper and lower jaws and for both public symphyses (Brooks and Suchey 1990). These ages corresponded sufficiently to suggest the association of cranio-dental remains and pelvic elements for the three commingled individuals, and helped to refine age ranges based on both dental and skeletal morphologies. Epiphyseal fusion of long bones was also used to calculate age at the time of death of the articulated burial. Age and sex estimates are summarized in **Table 5**.

Two femurs were sufficiently well preserved to allow for living stature calculation in the field. A right femur associated with the late, subadult

female measured 35.7cm, indicating an antemortem height of between 138.6 and 146.0cm (4'7"-4'9"). A second intact femur (L) was uncovered in the commingled remains above the articulated individual and could not be clearly associated with an individual of known age or sex. However, the maximum diameter of the femoral head suggested that the femur most likely belonged to one of the two males interred in grave 006. A stature estimate of 168.8-176.7cm (5'6"-5'9") resulted when Trotter and Glesser's (1952 and 1977) formula for white males was applied.

A total of seven dental caries were observed – three in loose teeth that could not be definitively associated with particular individuals, and four in the teeth still present in identifiable jaw fragments. The undisturbed, subadult female had one small buccal cavity in LM₂. Linear enamel hypoplasia was also present on the upper and lower incisors and canines of this individual, indicating periods of prolonged disease or nutritional stress during early childhood (the years of dental enamel formation). A 45 degree rotational misalignment of the left mandibular canine, due to crowding, was also noted. In addition to dental pathologies, the female subadult evidenced a partially healed fracture of the superior sternal body. The break was not completely healed at the time of death and, because the individual was so young and at a point in development where osteoblastic activity would have been high (*i.e.* healing should

Table 5: Age and sex estimates for skeletal remains from CC.2:006.

<i>Individual</i>	<i>Sex</i>	<i>Pubic symphysis phase</i>	<i>Dental attrition phase</i>	<i>Overall age estimate</i>
1*	M	Early Phase II 23.4 ± 3.6 yrs.	20 - 25	20 - 30
2*	F	Fragmented, mid to late adult	35 - 40	30 - 40+
3*	M	Late Phase V 45.6 ± 10.4 yrs	35 - 45+	40 - 50
4 (articulated)	F	Early Phase I ≤ 18 yrs	15 ± 36 months	14 - 18

* Commingled individuals uncovered above the fully articulated burial

occur relatively quickly), this injury could be a perimortem trauma. A lytic lesion on the posterior surface of the manubrium indicates that a bone infection was introduced at the sternal fracture site. Hypertrophic muscle attachment sites located superior to the medial epicondyle on the left humeral diaphysis were also noted, and may be indicative of heavy use associated with a habitual, subsistence-related task.

The male individual aged 20 - 30 years had one large, occlusal surface caries in RM_1 . In addition, a large buccal abscess associated with the decayed tooth extended from the alveolar ridge down approximately one centimeter into the mandibular body. Rounded, smooth bone formation along the rim of the abscess indicates that some antemortem healing occurred prior to this individual's death. Some osteoarthritis of the vertebral bodies was apparent in all three of the commingled adults.

A large caries at the cemento-enamel junction of RP^4 was noted in the female adult aged 30-40+ years. Both first maxillary premolars were severely worn, to the extent that the dental roots functioned as occlusal or chewing surfaces for this individual. Antemortem tooth loss and at least partial alveolar resorption were apparent for all maxillary molars and for LP^3 . Osteoarthritis of the centra, marginal osteophytic development of the articular facets in the thoracic region of the vertebral column, and a possible case of Diffuse Idiopathic Skeletal Hyperostosis (DISH) were also noted. Finally, a healed fracture in a right femoral shaft fragment was observed. It is likely that the fractured femur belonged to this female, as it is found in the smallest of the upper leg bones uncovered among the commingled remains deposited above the articulated burial.

The late adult male, aged 40-50 years, is represented by a complete lower jaw that contains one occlusal surface caries in the LP_4 . The RM_1 was severely worn to the extent that the pulp chamber was completely exposed in the occlusal plane. In addition, all lower left molars and the right third molar were absent antemortem with at least partial alveolar resorption in all cases. Consistent with the older age suggested by the pubic symphysis morphology and dental remains, this individual, like all of the commingled adults in this burial, showed signs of

osteoarthritis in the form of severe lipping of vertebral bodies in the thoracic and cervical regions. Finally, calculus buildup was observed in several loose, mandibular incisors, which may have belonged to either this late adult male or to the late adult female described above.

Grave CC.2:007 contained the remains of two undisturbed subadult individuals. A minimum of two individuals could be distinguished on the basis of the duplication of tibiae and by obvious differences in size and developmental phase of non-duplicated skeletal elements.

The undisturbed individual at the bottom of the grave was a subadult of unknown sex, aged 9 years \pm 24 months on the basis of dental eruption and developmental patterns. The roots of the permanent incisors and the adult canine buds were well formed, yet deciduous canines were still present. The first adult molars were fully erupted and the second and third permanent molar buds were at age stages of eight to nine and 11 years respectively (Bass 1995; Ubelacker 1978). Epiphyseal fusion of growth centers was consistent with dental age estimates. Grave goods, including a pair of earrings found *in situ* (or where the individual's ears would have been prior to decomposition), may suggest that this child was female.

The second individual, a small infant aged less than one year, was uncovered lying on the semi-flexed femurs of the primary burial. It appeared as though the infant was placed on the lap of the first subadult with the skull in the direction of the primary burial's feet. This individual was poorly preserved, represented by only the tibiae and small skull and rib fragments. The thinness of the cranial remains and the size of the long bones are consistent with an age estimate of between birth and one year of age.

The infant was too poorly preserved to analyze for skeletal or dental pathology. However, evidence for Linear Enamel Hypoplasia (LEH) was noted in the central incisors of the child, indicating a period of nutritional or disease related stress during foetal development. Skeletal data is summarized in **Table 6**.

Discussion and Preliminary Interpretations

Excavations in Area CC have expanded the known range of burial practices at Umm al-Jimāl, while providing further evidence for

Table 6: Summary of burial data from Area CC 1998 excavations.

Burial Locus	Articulated Remains	MNI	Sex	Age	Pathology	Stature	Burial Type	Pottery calls from pit/cist loci	Orientation	Objects
CC.1:007	N	2	F unknown	17-25 ¹ 25-35	One small occlusal surface pit caries	F 152.9-160.3 cm	cist	Late Roman Early Byzantine	E-W	Metal fragments, Coffin
CC.2:005	Y	1	unknown	2-3			pit		E-W	Horse, leather and metal bridle/halter, post molds, shroud, necklace
CC.2:006	One articulated, Three commingled	4	M	20-30	Caries, abscess, osteoarthritis	168.8-176.7 cm ²	cist	Late Roman	E-W	Glass fragments, copper ring, leather sandals, ash, coffin or shroud, glass bracelet, rings and beads, earrings
			F	30-40+	Caries, severe dental wear, alveolar resorption, osteoarthritis, DISH, healed femur fracture					
			M	40-50	Caries, extreme dental wear, alveolar resorption, calculus, osteoarthritis					
			F	15±36mos	Buccal caries, LEH, partially healed fracture, lytic lesion, muscular hypertrophy	138.6-146 cm				
CC.2:007	Y	2		9-24mos birth-one year	LEH		cist	Late Roman	E-W	Earrings, post molds, saltwater shell, copper and amber earrings, glass beads, pendant with metal clasps

¹ Age and sex estimations could not be correlated for individuals due to commingling.
² The femur used to calculate this stature estimate could have belonged to either of the adult males in this burial.

those with which we were already familiar (Cheyney 1997). The four (CC.1:007, CC.2:005, 006 and 007) or possibly five (CC.2.018) burial pits uncovered in Area CC this season display evidence of intentional reuse for multiple interments, a tendency to bury individuals in sandals and shrouds within pits, stone-lined cists and / or wooden coffins, as well as deposition in the expended supine position with east-west orientation. Children and infants also tend to be buried with grave goods, especially earrings, bracelets, beads and pendants, suggesting a social structure where status was ascribed at birth and wealth was concentrated in portable goods --

two observations that are consistent with ethnographic evidence from other mixed subsistence strategy groups dependent on settled agriculture and pastoral or semi-nomadic transhumance (Ibrahim and Gordon 1987; Kobusiewicz *et al.* 2004; Porter 2002). As with the other cemetery areas at Umm al-Jimāl, pottery evidence is scant with the majority of diagnostic sherds being Roman and Early Byzantine.

In terms of new finds, the evidence for post holes surrounding some of the burial pits is particularly interesting. These soil stains, as discussed above, have been interpreted as the remnants of temporary structures that may have

sheltered exposed remains for a length of time before cover slabs and chinking stones were used to enclose the graves on a more permanent basis. Remains of these structures may indicate the presence of multi-stage funerary rituals that seem also, on occasion, to have included burnt floral offerings, as in the case of Z.4 (Cheyney, this volume) and CC.2:007. The interment of an infant with a horse is particularly unusual and may be a somewhat extraordinary example of the prestige apparently afforded infants and small children in death in this population. No cut marks or other skeletal anomalies were observable on the horse skeleton that might help to predict the manner or cause of death. However, at present, given what we know of burial practice at the site, the most likely interpretation is that the horse and bridle/halter are best understood as very high status grave goods associated with the associated infant. Radiometric dating of skeletal remains and more detailed assessments of the associated grave objects are clearly a priority. Both may help to contextualize the burial practices and demographic profiles reconstructed from four seasons of burial excavations at the site.

1996 CEMETERY AND TOMB SURVEY (J. Brashler)

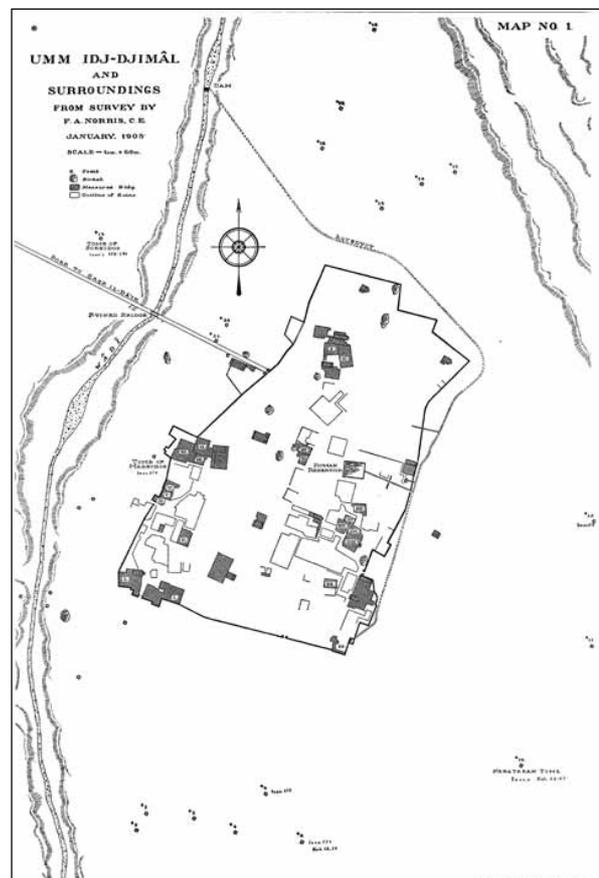
Introduction

A proportion of the 1996 season at Umm al-Jimāl was devoted to a walk-over survey of cemetery and tomb locations, with the objectives of: (1) developing a regional map and database that could be used to interpret spatial and temporal distributions of tombs and cemeteries and (2) to interpret the implications of spatial patterns for understanding and reconstructing the social fabric of people in the ancient community. Of special interest was information pertaining to the chronology, distribution, planning and architecture of tombs and cemeteries as it related to the community, seeking understanding of status, and socio-economic and political organization as revealed through both the professionally excavated burials and the more informal knowledge that current residents have gathered over years of excavation.

Methods and Procedures

No systematic tomb survey has been con-

ducted at Umm al-Jimāl since Butler (1913) recorded a series of monumental tombs in conjunction with his map of the ancient community. Survey began with a review of Butler's (1913) work as well as consideration of previous tomb excavations conducted during the last 15 years. Effort was made to re-locate and map as many of the monumental tombs described by Butler as possible, though the scale and detail of the map (Fig. 27) made it difficult to associate tombs still visible with those he mapped. However, all four of the tombs Butler presented in detail were relocated and their current condition recorded. In addition to relying on previous research by Butler and other field seasons, information on tomb and cemetery location was gathered from knowledgeable residents and previous research by de Vries (pers. comm.) about the site and its



27. Princeton University Expedition map of Umm al-Jimāl and surroundings showing location of monumental chamber tombs mapped by F. A. Norris and documented by H. C. Butler in 1905 (Butler 1913). Each tomb is represented by a small square, 21 of which are numbered, excluding 7 to the south-west (photo by Janet Brashler).

burial facilities. Finally, the modern town of Umm al-Jimāl was riddled with telephone and electric cable trenches during the summer of 1996. A survey of most of the exposed trenches resulted in identification of several new cist tombs and revealed areas where pit and/or cist tombs are not evident from the surface. While a significant area around the community was covered during this survey, numerous undocumented mortuary locations remain to be discovered and documented. Tombs with visible architecture were field mapped, photographed (e.g. **Figs. 28 and 29**) and described, and the architectural team prepared formal drawings of several tombs.

Survey Results

Including the BB.1 and BB.2 tombs excavated in 1996, 21 monumental tombs were visited and described during the survey. In addition, 13



28. Recently quarried vaulted tomb to the east of Umm al-Jimāl (**Fig. 27**, no. 12). Note doorpost to left and dislodged stone door in the middle foreground. The arch of the removed vaulting remains visible in the facade of the three end loculi (photo by Janet Brashler).



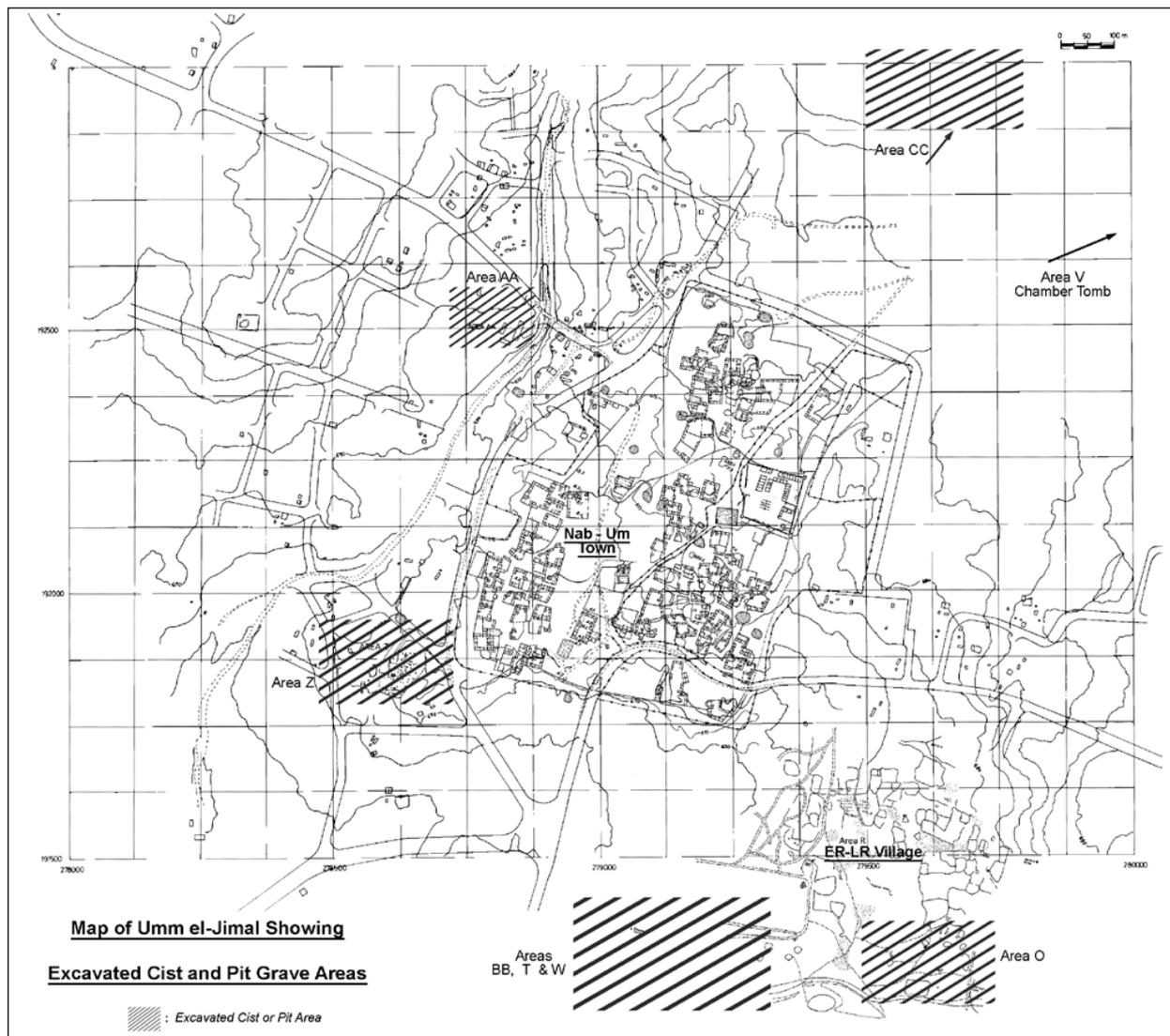
29. Vaulted tomb located on hill overlooking the Early Roman-Late Roman settlement (al-Hirri) from the east, not documented by H. C. Butler (photo by Janet Brashler).

areas of cist and/or pit tombs were noted, including five which that were partially excavated (**Fig. 30**; Cheyney 1993, 1995, Brashler 1995). Work was done in two areas of cist tombs in 1996 and 1998 (see Cheyney and Brashler this volume). While monumental or chamber tombs have discrete locations (**Fig. 27**) based on architecture, cemeteries containing cist and pit tombs have ephemeral boundaries (**Fig. 30**) that are very difficult to define from surface evidence alone. It is possible that cemetery distributions may be more or less continuous in some areas around the ancient community. In the past, limited excavation in cemeteries created a false sense of ‘boundedness’, though a possible cemetery wall may be present in the cemetery area designated Area AA (Brashler 1995; Cheyney 1995 and this volume).

Spatial Distribution of Tombs and Cemeteries: Pattern and Hypotheses

An extensive series of monumental tombs and cemeteries dot the landscape surrounding Umm al-Jimāl, but few tombs and no cemeteries, with the possible exception of two tombs and one cemetery area, occur within the limits of the Nabataean-Roman-Byzantine town. This pattern suggests the separation of the living from the dead typical of many cultures (in this case, at least for the pre-Christian era in view of the fact that no cist and pit graves excavated outside the settlements have evidence of Christian culture). Reasons for such divisions can be both pragmatic and spiritual. The distribution appears to be to involve a concentration on three sides, the north, west and south, but mortuary facilities do occur in abundance to the east as well. To the north, several monumental tombs have been recorded and a pit cemetery was sampled as Area CC in 1998. Given that monumental chamber tombs exist on all four sides, it is possible that further sampling would reveal that cist -- pit burials are also located in all directions around the areas of settlement (al-Hirri, or Area R, in the Nabataean to Roman periods, and the enclosed town from the Nabataean to Early Byzantine periods).

The distribution of monumental tombs is interesting in that they are scattered across the landscape and do not appear to occur in clusters or groups. These may be mausolea for kinship groups, such as extended families or lineages.



30. Umm al-Jimāl Project map of Umm al-Jimāl and surroundings showing locations of excavated areas of cist end pit graves.

This hypothesis may be testable by analysis of epigenetic traits of individuals recovered from the three excavated loculi tombs and, if bone collagen is present, perhaps eventually by DNA analysis. Evidence of extended family relations in these chamber tombs also comes from funerary inscriptions (documented by Enno Littmann in H.C. Butler 1913) in at least three instances: the Nabataean Tomb to the south, the Sareidos Tomb to the west and the Stelae Tomb to the north (Butler 1913: 206-210). This spatial distribution may indicate that kin-based ownership of chamber tombs meant that they were located on agricultural land owned by the respective family groups. This would not only explain the

scattered locations of these tombs, but may also be a key to the distribution of agricultural lands among these presumably elite families.

It is likely that the tombs were used and re-used over, perhaps, one or more centuries, and it also seems probable -- given patterns of re-use (dismemberment, disarticulation and general disregard for the body, and the occurrence of ossuaries) -- that non-kin with no ties to the deceased may also have used a tomb constructed for someone else. Tombs might also present a dispersed pattern across the landscape because they were oriented along a system of roads or paths connecting Umm al-Jimāl to other communities. Certainly in other parts of

Roman Arabia, and also in the western Empire, this pattern has been noted (Toynbee 1971). In fact, it is fairly certain that roads radiated out from Umm al-Jimāl in four directions, roughly matching the locations of chamber tombs on all four sides.

Another dimension of spatial relationships noted is the apparent association between monumental tombs and cemeteries containing cist graves. In the vicinity of at least seven monumental tombs, there are cist tomb cemeteries located within less than 100m. The relationship between these tombs and cemeteries is unclear, but Brashler (1995) has suggested that perhaps the cist tomb cemeteries contain the remains of a population of transhumant herders who had some kind of symbiotic relationship with residents of the community, or perhaps affiliation with specific sub-groups of the community identified by individual family mausolea. Chronological evidence (see below) suggests that the excavated cist and pit tomb cemeteries (**Fig. 30**, Areas O, T, W, Z, AA and BB) are contemporary with the Roman to Early Byzantine construction and use dates for the monumental tombs in their vicinity (Cheyney this volume, Brashler 1995 and this volume).

At present, it is not clear whether cemetery and cist tomb locations described above are discrete and discontinuous, or whether there are more or less continuous distributions in some areas and more discrete cemeteries in others. Evidence from two areas excavated in 1994 and 1996 (Brashler 1995; Cheyney this volume) demonstrates a level of planning and organization in areas 700m apart, but cist tombs also occur between these two areas. Cheyney (this volume) has suggested that these may be continuous. Until large areas are excavated, or architectural features such as cemetery walls from which boundaries can be inferred are discovered, it will be difficult to resolve the issue of whether cemeteries are discrete or continuous with one another.

Finally, the discovery and therefore the known distribution of tombs and cemeteries depends on what is visible on the surface at a given time unless systematic sub-surface investigation is used, as in the case of the probing and trenching in Areas AA and Z (Brashler 1995; Cheyney this volume). Tombs buried beneath more than a

few centimeters of fill or aeolian deposit will not be seen on the surface unless it is removed by professionals or by treasure hunters. In the case of most mortuary facilities at Umm al-Jimāl, the modern day gold-seekers and house builders got there first, but they at least leave traces of the architecture and human remains behind. However, any additional survey research should carefully employ aerial photographs and should consider the issues of landscape, climate and geomorphic processes that might result in the burial or exposure of tombs and cemeteries in the area. Until a much more comprehensive survey is done employing these techniques, it is premature to use cemetery data to make any population estimates for the community as a whole.

Tomb and Cemetery Chronology

Evidence for tomb and cemetery chronology currently derives from two sources: inscriptions and tomb contents, most notably pottery. Only three tomb inscriptions from an assemblage of several hundred at the site appear to date the event of an individual's death and the date of tomb construction or use. Inscription #274 at Butler's Tomb No. 6, south of the ancient town and south of al-Hirri (Area R), refers to the 90th year and AD 195. Inscription #275 at Butler's Tomb No. 5, also in the south, has a date of AD 208, and Inscription #276, which is associated with the Masechos Tomb west of the ruins, has a date of AD 223. No inscribed stones have been found with dates associated with cist-pit cemeteries.

Dating tombs and cemeteries by pottery and other objects provides a more extensive set of cross-dated contexts. All three excavated loculus tombs (Areas V, BB.1 and BB.2) have ceramics that suggest Early Roman or Late Roman construction, with continued use into the Early Byzantine period (forth-fifth centuries) but little evidence for use thereafter, with the possible exception of robbery. In the excavated cemeteries (Areas AA, Z, O, and W), Roman to Early Byzantine pottery is predominant, with little evidence for use after the Early Byzantine period (Cheyney 1993, 1995; Brashler 1995). This begs the question: where are the Late Byzantine and Umayyad burials at Umm al-Jimāl? Small samples might account for the lack of tombs dating to these later periods at the site,

but a radical change in burial practices or locations, or both, which may have been associated with the spread of Christianity and the rebuilding of the Byzantine town (de Vries 1998) can reasonably be hypothesized at this point.

Orientation of Tombs

Monumental tombs are almost exclusively oriented along cardinal directions with one exception. In many cases this orientation provides opportunity for east-west oriented burials, a pattern observed in cemeteries as well (Cheyney 1995 and this volume; Brashler 1995). However, there are two notable exceptions: the north-south oriented BB.2 tomb, and Tomb #3, or Iyaduh Cemetery tomb, which seems to run approximately 42 degrees east of north. While slight deviations from cardinal or magnetic north-south, east-west orientations can be accounted for by orientation of tombs *vis á vis* seasonal shifts in sunrise and sunset, a deviation of 42 degrees may indicate an important exception to what appears to be a strongly held cultural principle with regard to positioning of individuals at death.

Use and Re-Use of Tombs: When Does Re-Use Stop and Robbing Begin?

Many excavation reports on tombs in Syro-Palestine comment on the frequency with which they have been robbed. Excavations at Umm al-Jimāl in 1994, 1996 and 1998, plus the tomb survey, have presented interpreters with challenges in understanding the pattern of use, re-use and subsequent robbing. The activities of snails, insects, roots, irrigation, burrowing, gnawing rodents and larger mammals that have been documented in Areas Z, BB.1 and BB.2 are more than enough to affect burial position and bone preservation. However, it is clear that multiple phases of use and re-use occurred in monumental tombs, with some evidence, as seen in Z.3, of re-use in cist tombs as well.

What appear to be examples of dismemberment and disarticulation of bones or body parts while connective tissue is still present is not unusual and occurs in at least nine separate contexts excavated so far (AA.9, Z.2, Z.3, BB.1:006, 011, 012 and 015, and BB.2:002 and 005) and may have occurred in virtually all the loculi burials in BB.1, BB.2 and Area V. We

must be careful in attributing such dismemberment to motives of robbery when the motive might be simply clearing a space for a newly departed loved one. Only by carefully deciphering the causes of bone movement and deterioration can we begin to understand the patterns and motives of human behavior in the past, as well as the robbery occurring in the present time.

Acknowledgments

Much of the work on this survey was made possible by two individuals, Bert de Vries and Muaffaq Haza who generously shared their expertise. Both have an encyclopedic knowledge of Umm al-Jimāl and this brief summary only begins to capture some of their knowledge related to tombs in the area. Recording of the tombs was accomplished with the able assistance of Roger Kiers. This report will be updated to include subsequent tomb excavations and will be published with a complete map of the tomb locations, fixed with GPS, in the Umm al-Jimāl Project's final report on funerary culture.

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UMM AL-JIMĀL SITE PRESENTATION: PRESENTING ANTIQUITIES AND HERITAGE TO SERVE DIVERSE COMMUNITIES

Melissa Cheyney, Bert de Vries, Sally de Vries, Laurie Koning, Sarah Oord, David Roukema, Mary Workman¹

ARCHAEOLOGICAL DEVELOPMENT AND THE ECONOMY OF HOUSING AT UMM AL-JIMĀL: SOME PRELIMINARY FINDINGS (M. Cheyney)

The primary objective of the 1998 ethnographic survey was to explore local residents' perceptions of the proposed development of archaeological features that surround and are integrated into the modern settlement. This project was motivated by the recognition that the people living in the immediate vicinity of the ruins will experience the effects of tourism and development most acutely and should, therefore, have the opportunity to voice viewpoints, concerns and suggestions. The portion of the research presented here focuses on the Umm al-Jimāl residents' interpretations of archaeology as it pertains to the ownership of the past and their negotiations of the ideals of ownership with the present realities of economic struggle².

Extensive plans for the preservation and consolidation of standing stone structures that have become destabilized over years of natural and human disturbance (de Vries 1994; de Vries *et al.* 1996) have been developed along with outlines for the design of a walking tour and a museum/visitor center (see de Vries, this volume). Proposed preservation and restoration at the site is based on the notion that archaeologists must attempt to slow both natural and human destabilization processes if the ruins of Umm al-Jimāl are to be maintained for research and tourism. Solving the problem of 'human interference' at the site in the form of vandalism and theft of

movable objects such as inscriptions and carved masonry fragments, is, in some ways, more difficult to address.

The proposed means of halting the destruction – the instilling of shared heritage by teaching appreciation and understanding of the antiquities – is based on two assumptions: (1) that an appreciation for the ruins as part of a common heritage does not already exist, and (2) that if this understanding did exist, the inhabitants of Umm al-Jimāl would no longer remove objects from the site. Interviews with Umm al-Jimāl residents, facilitated by a local translator, were designed to test these assumptions. Preliminary study suggests that the actual relationship between the villagers and the ruins is more complex than assumed in the current version of the development proposal. Responses indicate that, from the Umm al-Jimāl residents' perspectives, an appreciation and indeed a deep love for the material remains of the site are not necessarily in conflict with an ethic that allows for removal, alteration and reuse of ancient objects. Interviews revealed three distinct facets or levels of appreciation for the Umm al-Jimāl ruins that I have termed the (1) *Historical*, (2) *Aesthetic / Status* and (3) *Utilitarian Models* of archaeological properties.

The first category of informants' responses revolved around the notion of architectural remains as central to the historical identity of villagers. All of the study participants (n = 10), young and old, shared stories about the tribe's original settlement in the ruins and the process of gradually moving from the goat hair tents

1. Paul Christians, Jeff DeKock and Craig Mulder; Open Hand Studios. Tawfiq al-Hunaiti and Mowafaq al-Fayez, Department of Antiquities of Jordan. Bernhard Lücke, German-Jordanian University. Muaffaq Haza,

Umm al-Jimāl.
2. Muaffaq Haza has made significant contributions to several aspects of the research reported in this article.

erected in spaces between ruined structures and the use of old buildings as kitchens, storage facilities, and places in which to work during the heat of the day, to the more permanent mud and stone dwellings built outside the limits of the ruins in the 1960's and 70's. In addition, older informants walked with me through the Byzantine town and identified the tumbled structures they had lived in as children. They pointed out that the Arabic words painted over some of the ancient doorways were names of families who had occupied specific buildings (**Fig. 1**). This occupation appears to have been status-based with the most prominent families utilizing the most elaborately constructed and well-preserved of the ancient structures. Painted names and other identifying marks, or the 'vandalism' of remains from the archaeologist's perspective, are, for the residents of Umm al-Jimāl, potent reminders of their tribe's historical connection to Umm al-Jimāl.

A second pattern that I have labeled the *Aesthetic /Status Model* is based on informants' reports, as well as on my observations of the connection between family status in the village and the reuse of decorative fragments as architectural accents in courtyards, gardens, and fences (**Fig. 2**). The integration of antiquities into building designs is pervasive throughout the village; so pervasive, in fact, that in my four summers of field work there, I never visited or walked past a single home that did not boast some fragment of a column, arch, carved lintel or decorative relief. However, the most telling evidence of the significance of these antiquities is in the house of the village Shaykh, Hail el-Serour. The original



1. Family names of Talal es-Serour and Jamal es-Serour inscribed on painted lintel doorways (historical model).



2. Late Ionic capital used as a decorative piece on porch of house built by Shaykh Hail es-Serour (*aesthetic/status Model*) (photo by Bert de Vries).

Serour family home was elaborately constructed solely from basalt blocks and decorative fragments removed and re-cut from the ancient town. In more recent years, a concrete addition has been added creating a striking juxtaposition of old and new (**Fig. 3**). Many of the study participants indicated that the Shaykh's house was an important status symbol and source of pride for the community. One resident put it this way:

"Whenever the most important people come to visit our village, they must see the house of the Sheikh. It is the most beautiful of all the buildings. You know this is true. Where did I take you when you first came to Umm al-Jimāl? It is so beautiful. Don't you agree? It is very expensive to build a house like this. The stones are so heavy and you must pay the Egyptian workers to carry them and to cut the stones. It will cost maybe one million JDs".

None of the participants discussed any negative associations with Umm al-Jimāl villagers transferring objects from the ruins. However, when asked why removal and reuse were so prevalent, two informants said it was done to prevent people from al-Mafraq (the nearest town) from taking 'their' stones.

In addition to concepts of history and tribal identity, and aesthetics and social status, informants also distinguished a third interpretation of the meaning of cultural heritage objects that I have called the *Utilitarian Model*. The ruins of the ancient Umm al-Jimāl are, for some of the poorer members of the community, a source of free and accessible building materials. Homes constructed with mud and rubble can be com-



3. House built by Shaykh Hail es-Serour showing old and new construction (aesthetic/status model). The original basalt house built in the 1960s is on the left and the madhafa addition, which replaced the majlis tent in the 1990s, is on the right. Monumental architectural fragments are visible on the porches (photo by Bert de Vries).

pleted with minimal economic investment and can be distinguished from the method of reuse seen in the Shaykh's house in at least three ways. In the domestic structures occupied by the poorest segments of the population, stones are not recut and refitted for reuse, the homes are generally much smaller, usually consisting of one or two rooms, and the work is carried out by household members and not paid Egyptian laborers (Fig. 4). Participants were quick to distinguish this type of housing reuse from the more aesthetically pleasing construction of the Shaykh's home.

These distinguishable, yet overlapping, models suggest that cultural resources embody a multiplicity of values simultaneously, including those that form links to the past and those that fill immediate material, status, and subsistence needs in the present. From a Western academic perspective, it may be difficult to reconcile these apparently opposed views of the ruins as culturally and historically significant on one hand, and a source of free building material or status items on the other. For example, researchers may discuss this behavior as 'theft',

or at least 'disturbance', of cultural heritage properties. For many archaeologists, a primary goal of research and preservation is to be able to accurately reconstruct and protect ancient structures in as close to their original form as possible. This goal of maintenance or preservation is perceived of as being tied to the ability to assess and interpret the historical and contextual significance of structures. Hence, utilitarian, status / aesthetic, and historical models of archaeological remains may be viewed as contradictory value systems.

Umm al-Jimāl's residents, however, do not interpret or view these models of material culture as inharmonious. In fact, they may view the destruction of *in situ* archaeological remains that inevitably accompanies systematic excavation as contrary to the expressed goals of site interpretation and preservation. From a villager's perspective, reuse of building materials and decorative fragments may simply represent the most recent phase of occupation or period of history at the site, for certainly the ancient inhabitants altered and reused the remains of previous generations.



4. Older, poorer home to the east of Umm al-Jimāl, now used for storage, constructed of stone rubble and spoiled blocks taken as free building material (utilitarian model) (photo by Janet Brashler).

SITE PRESENTATION IN JORDAN: CONCEPT DESIGN AND JANUARY 2009 DOCUMENTATION SEASON AT UMM AL-JIMĀL (B. de Vries, S. de Vries, L. Koning, S. Oord, D. Roukema, M. Workman, P. Christians, J. DeKock, C. Mulder, T. al-Hunaiti, M. al-Fayez, B. Lücke and M. Haza)

Introduction

During the last two seasons of excavation, the Umm al-Jimāl Project (UJP, 1996 and 1998) developed a site preservation and development plan that proposed the consolidation of key buildings of the Byzantine-Umayyad site (see Dunn 2002), especially the Praetorium, the layout of a signed walking tour and the reversible adaptation of the Umayyad Farm House (House 119) as a Museum Visitor Center (**Fig. 5**) designed by Amjad al-Bataineh (de Vries 1995: 423-433). Several years ago the Department of Antiquities, under the direction of its own architects, began implementing the restoration of Umayyad House 119 and its adaptation as the proposed Museum Visitor Center using this plan in concept, though not its construction details. This process is nearing completion in 2009.

In 2006 a new non-profit organization, Open Hand Studios (OHS), founded by Calvin College graduates to work in partnership “with communities across the world to create hands-on museum exhibits and virtual media that nurture social justice”, adopted the Umm al-Jimāl Project as one of its pilot programs (see www.openhandstudios.org).



5. DoA mason poses against wall of House 119, which is being consolidated as part of the adaptation of the structure as a Museum Visitor Center (photo by Bert de Vries, June 2008).

The objective of the partnership is to present Umm al-Jimāl and all its data and research as a virtual museum linked to the site and presented as a museum in reality. These linked museums will be structured to enable access and engagement of all interested communities, ranging from the local village to the people of Jordan as a whole, and including Jordanian government ministries responsible for antiquities, tourism, cultural heritage and education, academic communities and their agencies in Jordan and around the world, and anyone interested in popular heritage and tourism.

Inception and Implementation of the Work of the UJP-OHS Partnership

OHS and UJP have worked together since 2007 to complete the long process of digitizing the vast amount of UJP field data for digital structuring and presentation. The new UJP website, www.ummelJimal.org (opened May 2008), functions as a carefully planned ‘museum’ with complexes of wings and rooms which will eventually contain all the Umm al-Jimāl research and site materials ranging from raw data to field reports, publications, photo and other records, project history, site tours and much more. While ‘front’ rooms will present attractive and informative displays, the ‘back’ rooms will contain fully searchable GIS-integrated project data.

To complete the installation of these virtual ‘exhibits’ and ‘store rooms’, new documentation using state-of-the-art equipment and methods was necessary. For example, integration of the real site with the virtual one required the installation of a walking tour on the ground that matches a visually recorded virtual tour on the internet. This tour, designed to be followed and read on location was first published in 1982 for the Department of Antiquities, and then revised for al-Kutba Jordan Guides in 1990 (de Vries 1990: 21-35). To give a realistic rendering of the structures of the site in virtual reality, a photographic regimen for three-dimensional rendering needed to be developed, for which the process and software adaptation was developed by OHS.

In addition, this site documentation enabled connection with at least three of the ‘communities’ listed above. First, the team began docu-

menting the living heritage of the 6000 inhabitants of the village of Umm al-Jimāl (Fig. 6), both to reconnect it historically with the antiquities, and to make it a ‘stake-holder’ in the hosting of visitors and management of liaison between Umm al-Jimāl and the rest of the world. The creation of archaeological educational curriculum for Umm al-Jimāl was planned, in order to promote intellectual appreciation at all levels from local to international, and from popular to academic. Bringing a team of documentation and museum specialists to the site also satisfied the interests of the Department of Antiquities of Jordan (DoA) in two ways. First, computer technicians in the DoA joined the team working on three-dimensional photographic rendering of structures. Second, the field team and DoA staff began working together on the design and installation of the museum on the ground.

Thus, the documentation field work done in January 2009 functioned as a four-way partnership between the Department of Antiquities of Jordan, the Umm al-Jimal Municipality, Open Hand Studios and the Umm al-Jimāl Project, with adjunct participation by Jordan’s Ministry of Education, Calvin College and the American Center of Oriental Research (ACOR). All this will continue into the indefinite future both in Jordan and at Calvin College, and will include a second documentation season in January 2010.

Documentation of Ruins and People at Umm al-Jimāl in January 2009

The goal of the multifaceted January 2009 season was to gather documentation for the site presentation program described above. As diverse as the potential audience, the team members came from Calvin College (Grand Rapids, Michigan), Open Hand Studios (Chicago, Il-

linois), the Department of Antiquities (Jordan) and the village of Umm al-Jimāl itself. The central goals for the team’s work included:

1. Museums: Creation of Umm al-Jimal Virtual Museum, interfaced with Umm al-Jimal in reality (Museum-On-The-Ground).
2. Heritage: Gathering data in the living village for integration into the antiquities of Umm al-Jimāl, thereby working towards the goal of establishing the site as a southern Hauran cultural center.
3. Environment: Sampling historic soils as part of Jordan-wide research into ancient soils and documentation of modern ecology.

To achieve these goals the project staff was divided into six teams, each with their own areas of specialized expertise:

The Video Production Team, led by Jeff DeKock (OHS), documented the entire site in film and still photography and filmed numerous interviews with experts (Fig. 7) and local heritage interviewees. Jeff De Kock reports:

The video production team’s principal goal was to document the Umm al-Jimāl site in both



7. Jeff DeKock (OHS), Abdelsami‘ Abu Daya (DoA), Paul Christians (OHS) and Rafe Harahsheh (DoA, project liaison) after Mr Abu Daya was interviewed on World Heritage Site qualifications (photo by Bert de Vries).



6. View across water-filled Roman reservoir, May 2009, and Byzantine houses towards the north-west sector of the modern village. The picture demonstrates the extreme proximity of the residents to the antiquities and the interconnection symbolized by the way the ancient water system is serving the modern community (photo by Bert de Vries).

still photography and video imagery. Nearly 100% of the Byzantine site was covered. Images were captured of every remaining building, with additional film work focusing on all of the major sections of the site including construction techniques, inscriptions, the water system, home life, religion and city planning. Images were framed aesthetically and did not include a meter stick or any other scientific measures. Second, the team did the visual documentation for the Umm al-Jimāl heritage interviews of Umm al-Jimāl residents in their homes. Third, the team filmed various interviews with experts on the site, including members of the Department of Antiquities, the site Director, and other experts working on specific projects dealing with geology, heritage preservation and site presentation. Fourth, the team visually documented the work being done by the other team members in order to produce a video that explains what digital heritage preservation is, and how it is being done at Umm al-Jimāl. Fifth, the team filmed a brief tour of the site in Three Dimensional Film. Sixth, the team took a series of High Dynamic Range Photography of the site. Finally, all of this visual data was logged into the project database. Every shot, both still and video, is fully documented and searchable under multiple categories. The video team achieved the majority of its goals and has collected a vast array of data that will be used to produce a series of films, supporting visual material for various articles, and web content in the coming years.

The Virtual Museum and Site Development Team, led by Paul Christians (OHS), created a visual tour of the site using elaborate photography techniques, developed the script and signage for such a tour (**Fig. 8**), and is developing the design for the installation of the site museum and walking tour on the ground.

Paul Christians reports:

Data recording for all objectives was completed on schedule during the project's allotted work time. Staff created a finished map of POIs for the walking tour, as well as an accompanying detailed outline for eventual creation of specific sign text to be installed along Umm al-Jimāl's main guest pathway. Panoramic photography for each POI was captured for subsequent stitching into a series of linked, interactive, 360° by 360° images accompanied by audio to match the site's physical signage. All objects in al-Mafraq DoA office were digital documented in QTVR object photography, 3D stereo pair photography, still photography and in text. Objects are planned to be integrated into an online, museum-style exhibition. Both the virtual tour and object exhibit will be published primarily through the project's official web site, www.ummelJimal.org. However, museum work during the 2009 study season at Umm al-Jimāl is envisioned to contribute not only to public knowledge of ancient Umm al-Jimāl, but to facilitate existing academic research and ongoing preservation efforts. In the same vein, this season's efforts will also form an open-access digital complement to related



8. View of double window and east rooms of House XVIII at sunrise—a key stop on the tour (photo by Bert de Vries).

project components such as the on-site museum (under construction at House 119) and proposed community cultural heritage center.

The Virtual Reconstruction Team, led by Craig Mulder (OHS), did photogrammetric field documentation for the three dimensional portrayal of two buildings, the Umayyad House (by DoA experts Tawfiq al-Hunaiti and Mowafaq al-Fayez), which is to serve as the new Museum Visitor Center, and the Cathedral (by OHS-UJP staff; **Fig. 9**). Craig Mulder reports:

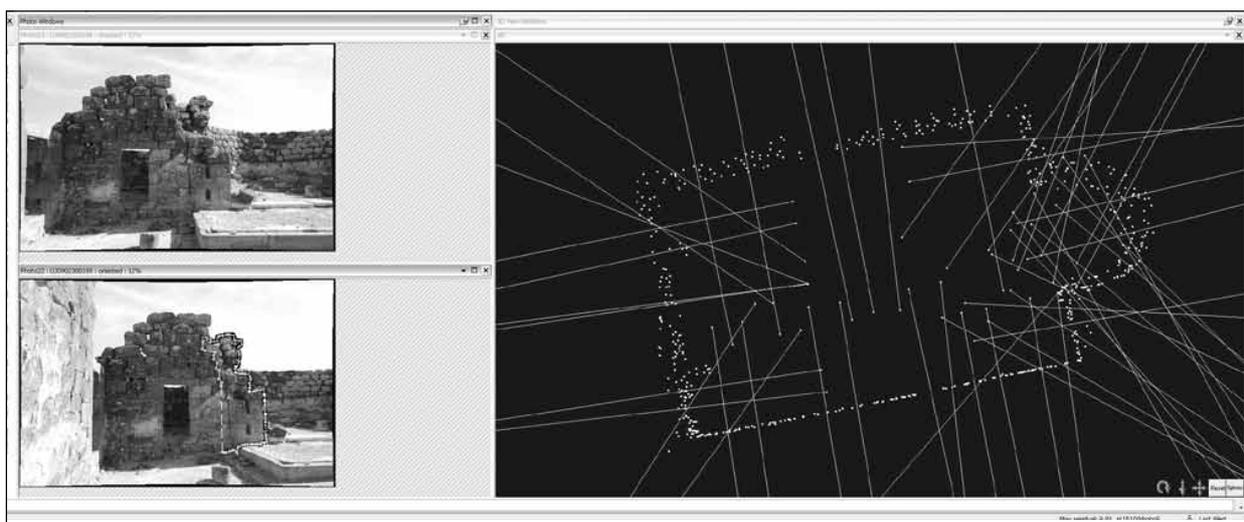
The main objective for our team was to develop a repeatable process for documenting the existing ruins using photogrammetry software. The software, PhotoModeler Scanner, uses photographs to accurately recreate virtual 3D surfaces that have the same texture and shape as the original. Achieving this reconstruction objective involved several sub objectives that must be met. First, the UJ09 staff and students needed to be trained on the software and in the use of the cameras and photography equipment. Additionally, since the UJ09 season was run in partnership with the Jordanian Department of Antiquities, the DoA engineers that were assigned to the project also needed to be trained in the same way. Once the training was completed, the DoA engineers and UJ09 staff and students developed a common practice for taking correct photos and using the software.

After this the two teams began to photograph

the site. Each team focused on an individual building -- the DoA engineers took the Museum and the UJ09 team started with the Cathedral. This process is also applicable to small objects and inscriptions, but the teams each decided to start with a building as it would be the most complex and strenuous test of their skills. The student team completed the reconstruction of the interior walls of the Cathedral, and the DoA team several sections of the exterior of the Museum. The output of these buildings (to be completed in 2009) will be used as Surface Documentation and also in other programs to create a immersive panoramic environment that will be posted on the Umm al-Jimāl Archaeology Project website. This digital reconstruction will recreate the site with this software so that it can be viewed as it currently looks over a broadband internet connection. This is also the first step toward recreating ancient Umm al-Jimāl as it would have looked during its height in the Byzantine era.

The Modern Cultural Heritage Team, led by Sally de Vries (UJP) documented the tent and house occupation of the ancient site during the past century and conducted interviews with numerous members of the community to document their remembered heritage (**Fig. 10**). Sally de Vries reports:

The goal of the heritage team was to do oral and visual documentation of the culture of the



9. Screen shot with plan of the Cathedral showing the camera positions and directions for stereoscopic imaging of the interior walls.



10. Sally de Vries and Calvin College students with heritage interviewee in heated tent.

modern village of Umm al-Jimāl, inhabited mostly by about 6000 members of the Masa'id tribe, but also some others, including at least one Druze family. To achieve this, a number of interviews were conducted on location in homes, in family tents and in the fields among the animals. The interviews were recorded by the Video Production team and are being edited and transcribed over the course of 2009. Goals of the heritage documentation included recording: (1) memories of life in the ruins during the first half of the 20th century and the resettlement into the modern community, (2) awareness of traditional culture, including customs like use of henna, material goods like household implements and crafts like weaving, (3) reflections on life today, especially family life, including household economy and gender matters. That these interviews were conducted with the blessing of the municipality and the willingness of interviewees is itself testimony of the close relationship between the community, the project and the antiquities. On the archaeological side, the numerous tent sites remaining from Masa'id life in the antiquities were mapped, photographed and described.

The interviews will continue next year, and comprehensive reporting of results will only be possible after transcription and thorough analysis. For now, a brief summary of a successful interview with a lady who estimates her own age at 91 will serve as a sample:

“She described living in the ruins (west of the Barracks) back in 1930 when she was twelve years old and said that in an ideal world she would still live there. She was married at 30 years old and the wedding ceremony was three days and three nights. Her husband was part of the first military in Jordan. At about age 13 a gypsy woman from Syria used a needle and ink in ash to permanently color her facial skin. She went on to describe her tattoos as a symbol of beauty and anyone that did not have tattoos was not considered beautiful. She would not do the tattoos today because they are against her religion but in those days her tribal community was less conscious of that. She was nostalgic of the past because back then the Bedouin valued community and trade and now people tend more to themselves. People were more dependent on each other than they are in the present. She went into great detail explaining how she made a tent out of goat hair, a craft still practiced today” 1/8/2009.

The Educational Curriculum Team, led by Sarah Oord and Mary Workman (Calvin College education majors) developed a multi-disciplinary strategy for the teaching of archaeology to Jordanians in primary and secondary schools. Based on that, they developed thirteen lesson plans using the archaeology of Umm al-Jimāl and formulated a proposal to the Ministry of Education for integration of archaeology into the



11. Education and Heritage Teams listen to Muaffaq Haza explain a Masa'id tent site from the 1950s inside the ruins (photo by Bert de Vries).

national curriculum (**Fig. 11**). Sarah Oord and Mary Workman report:

Educational theory. Our approach to teaching archaeology has three facets: (1) multi-disciplinary arrangement of topics so that lessons can be used in all parts of the school curriculum rather than just social studies, (2) starting with the familiar, like introducing the children of Umm al-Jimāl to the ruins of their own village, and (3) grading the material by developing model lesson plans at three grouped age grade levels, the primary, middle and secondary grades.

Curriculum development. To prepare ourselves we conducted research via site tours led by Bert de Vries, reading from "Umm al-Jimal: A Frontier Town and Its Landscape in Northern Jordan" by Bert de Vries. We also attended many interviews with a variety of people throughout the current town of Umm al-Jimāl. In particular we interviewed teachers and students to obtain information about the schools in Jordan, particular focus being given to the regional area, and how schools operate. The knowledge acquired through these processes then helped in the creation of lesson plans. Thus prepared, we wrote thirteen lesson plans which ranged across the disciplines including, amongst others sociology (how children lived), archaeology (pottery, architecture), biology and health (skeletal remains), environment, trade (objects and food products), physics and geology (properties of basalt), diet (agriculture) engineering (water), and more.

Teaching Umm al-Jimāl in Jordan. On a visit to

the Ministry of Education in Amman the team was hosted by the Under-Secretary, Toujan Bermaret. At her invitation, we submitted a proposal on curricular development for the teaching of archaeology in Jordanian schools to the Minister. This was subsequently accepted and we are now editing the documents we prepared in partnership with the Ministry, working with the head of curriculum in Amman and the director of the al-Mafraq Department of Education.

The Historical Ecology Team, led by Bernhard Lücke (German-Jordanian University) and Laurie Koning (Calvin College graduate in geology) took samples of ancient soils for laboratory analysis in order to study the ancient climate patterns and agricultural adaptation of the various communities inhabiting Umm al-Jimāl from past to present. These samples were collected from four strategically chosen locations, two in former excavation trenches inside the walled site, one from a former trench in Area R (al-Hirri) and one from an agricultural field to the south of al-Hirri. This study will form part of Professor Lücke's comprehensive sampling and analysis of paleo-soils over two huge transects running west-east across Jordan and north-south across Syria and Jordan. Laurie Koning is analyzing these samples in preparation for writing her MA thesis on Umm al-Jimāl's paleo-soils at Brandenburg Technical University.

Conclusion

Expected results of the work include imagi-

native, attractive and educational site presentations to be posted both on the internet (www.ummeJimal.org) and installed on the ground, thereby enabling both virtual and actual visits. Director Bert de Vries and his talented collaborators consider this thorough and multi-tiered site presentation structure to be a potential model for other sites in Jordan and elsewhere. We view the results as a step towards the overarching goal of providing a structure that enables equal, open and fair access to antiquities sites and the information based on them. Our model of multiple intersecting partnerships also serves to facilitate the just implementation of that goal within the normal strictures of local, national and international civic societies.

Credits

The field work was funded by Calvin College (field school) and the Norwegian Research Council (Global Moments in the Levant collaborative research), and received strong support from its project partners, the Department of Antiquities of Jordan and Open Hand Studios. In addition to the core staff listed above, expressions of deep gratitude are due to Dr Fawwaz al-Khrayshah (DoA Director General) for his gracious enablement of our partnership, Muaffaq Haza (long-time UJP team member) for his tireless local arrangements and community coordination, David Roukema for his coordination of activities, organization of data and editorial assistance, Saleh Fallah (Mayor of Umm al-Jimal Municipality) for his visionary blending of the heritage dream and economic practicality (**Fig. 12**), and the entire ACOR staff for its encouragement of our vision and enabling of our work. We're also grateful to Sultan es-Serour for allowing us to use his father Shaykh Hail's house for our 'camp' and its great *madhafa* for our communal computer lab, living room and lecture hall.



12. *The Umm al-Jimal Municipality offices seen from the ruins, with the ancient basalt stones and antiquities perimeter fence in the foreground emphasizing the close proximity of the two spheres of governance (photo by Bert de Vries).*

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Laurie Koning, Sarah Oord,
David Roukema and Mary
Workman, Calvin College

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PRELIMINARY REPORT ON THE FOURTH SEASON OF EXCAVATION BY “LA SAPIENZA” UNIVERSITY OF ROME AT KHIRBAT AL-BATRĀWĪ IN UPPER WĀDĪ AZ-ZARQĀ’, 2008

Lorenzo Nigro and Maura Sala

1. Introduction

In May - June 2008, the “La Sapienza” University of Rome expedition to Jordan¹ carried out systematic excavation and restoration at the Early Bronze Age site of Khirbat al-Batrāwī² under the auspices of the Department of Antiquities of Jordan³. Financial support was provided by “La Sapienza” University of Rome, the Italian Ministry of Foreign Affairs and the Italian Ministry of University and Scientific Research⁴.

The site of Khirbat al-Batrāwī (**Fig. 1**), a fortified town of the Early Bronze Age, was almost completely untouched when exploration started in 2005 (Nigro 2006a: 229-230; Nigro ed. 2006: iii-vii). It dominates the surrounding landscape, overlooking the valley below and the ford across the az-Zarqā River. Al-Batrāwī appears to have been the principal settlement of upper Wādī az-Zarqā’ during the earliest Jordanian urbanization in the third millennium BC (Nigro 2009).

During the fourth season⁵, excavation and restoration was focused on three areas (Area B North, Area B South and Area F), respectively located in the middle of the northern side of the hill, both outside and inside the main city wall, and on the easternmost terrace of the site (**Fig. 2**; Nigro 2008b).

2. Aims of the Fourth Season, May - June 2008

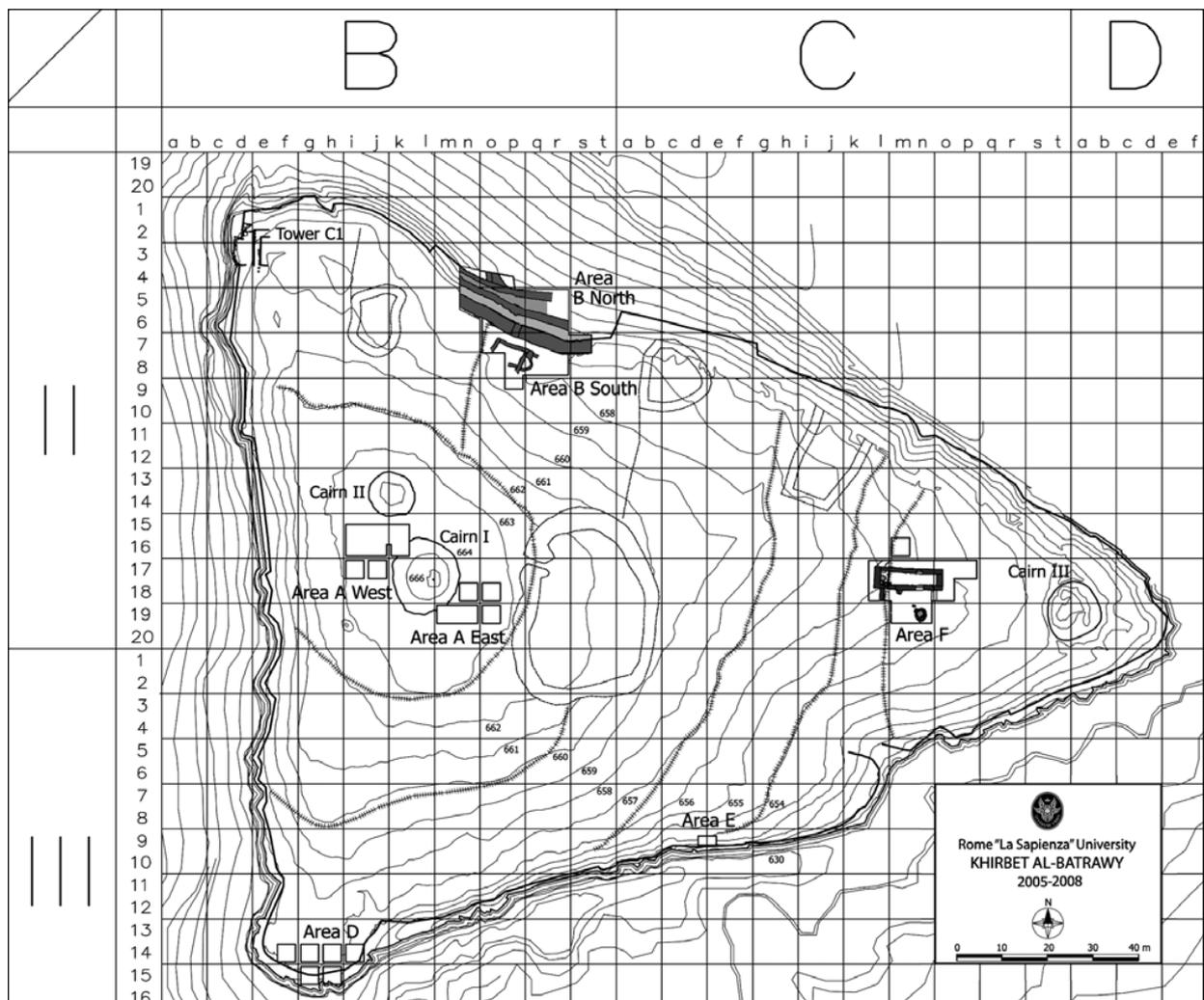
The fourth, 2008 season of excavation at Khirbat al-Batrāwī was mainly devoted to survey in the upper and middle reaches of Wādī az-Zarqā’ (Sala 2008a) and to restoration of the Early Bronze II - III (2900 - 2300BC) city walls and gate (Nigro, Sala and Polcaro 2008). These activities indicated that further investigations would be needed at the site, both to clarify the earliest phases of occupation on the hill and its transformation into a fortified town at the begin-

1. “La Sapienza” University of Rome team during the fourth season included: L. Nigro, Director; M. Sala, Supervisor of Areas B North, B South and F; A. Di Michele, V. Tumolo (Draughtsperson), P. Vitolo. The Department of Antiquities representative, whose helpful collaboration in the field was much appreciated, was Inspector Ahmed Shorma.
2. 32°05’ N 36°04’ E; JADIS site no. 2516.011, p. 2.172 (Nigro 2006a: 233-235, fig. 1; Nigro ed. 2006: 16-22, maps 1-6, plan I).
3. The expedition wishes to express its gratitude to Dr Fawwaz al-Khraysheh, Director General of the Department of Antiquities of Jordan, for his invaluable support, as well as to the academic authorities of “La Sapienza” University of Rome: the Rector, Prof. Luigi Frati; the Dean of the Faculty of Humanistic Sciences, Prof. Roberto Nicolai; and the Director of the Department of Historical, Archaeological and Anthropological Sciences of Antiquity, Prof. Gilda Bartoloni, who strongly supported the expedition.
4. The authors would like to thank the Italian Embassy at Amman; the former Ambassador, H.E. Gianfranco Giorgolo; the present Ambassador, H.E. Francesco

- Fransoni; and Dr Stefano Stucci, for their cooperation, and the Italian Ministry of Foreign Affairs - General Directorate for Cultural Promotion and Cooperation, Office V.
5. In previous seasons (Nigro 2006a, 2006b, 2006c, 2007a, 2007b, 2008a, 2008b; Nigro ed. 2006, 2008), the main chronological, topographical and architectural features of the site were established (Nigro 2006a: 233-236, 2007a: 346-347, tab. 1; Nigro ed. 2006: 9-36, fig. 1.2, 2008: 7-8), and five areas opened, respectively on the Acropolis (Area A: Nigro 2006a: 236-240, 2007a: 347-349; Nigro ed. 2006: 63-102, plan II, 2008: 9-63), the northern slope (Areas B North and South: Nigro 2006a: 240-246, 2007a: 349-354; Nigro ed. 2006: 153-196, plans III-IV, 2008: 65-240, plans I-II), at the north-western and south-western corners (respectively Area C: Nigro ed. 2006: 25-27, figs. 1.27-1.31 and Area D: Nigro 2007a: 355-357; Nigro ed. 2006: 32-33, figs. 1.38-1.41; 2008: 241-244), on the southern side (Area E: Nigro 2007a: 357-358; Nigro ed. 2008: 245-268) and on the easternmost terrace of the Khirbat (Area F: Nigro 2007a: 358-359; Nigro ed. 2006: 22, fig. 1.25, 2008: 269-316, plans III-IV).



1. General view of the site of Khirbat al-Batrawi with the EB IIIB triple line of fortifications and EB II restored city gate, from north.



2. Topographical plan of Khirbat al-Batrawi with the areas excavated in seasons 2005 - 2008.

ning of EB II, and to further our understanding of the internal layout of the city and the development of its defensive system. Restoration work was focused on the city gate and associated main

city wall in Areas B North and B South.

For this reason, archaeological activities in the fourth, 2008 season focused on:

Continued excavation of the imposing Early

Bronze II - III triple fortification line in Area B North (§ 4) to the west, north and east;

Restoration of the western stretch of the main city wall, especially staircase W.181 in Area B South (§ 4);

Completion of excavation and restoration in the Broad Room Temple in Area F (§ 5).

3. Stratigraphy and Revised Chronology of Area B North and Area F

On the one hand, in Area B North, the fourth season of excavation refined our understanding of the impressive Early Bronze Age fortifications. On the other, in Area F, it clarified the stratigraphy and phasing of the Broad Room Temple, confirming that it was founded with the city in Early Bronze II and was destroyed at the end of Early Bronze IIIB. The easternmost terrace of the Khirbat was then reoccupied during Early Bronze IVB by a cluster of farmhouses before finally being abandoned around 2000BC (**Table 1**).

4. Area B North: the Early Bronze II - III Fortification System

Excavation of the Early Bronze Age fortifications in Area B North was extended to the west⁶, north⁷ and east⁸ with the aim of exposing more of the EB IIIA and EB IIIB triple line of defences and associated structures (**Fig. 3**). In addition, a central stretch of outer wall W.155, facing city gate L.160, was restored by filling in a gap in the inner face of the structure.

4.1 Stratigraphy of Area B North

Excavations in Area B North provided a detailed insight into the occupational and architectural sequence, not only of the fortification system, but also of the city as a whole⁹:

Phase 1: Topsoil, representing natural erosion and dust accumulation following the final abandonment of the site around 2000BC.

Phase 2: Consisting of stone embankment W.199, which stabilised the collapsed defensive

Table 1: Chronology, stratigraphy and structures at Khirbat al-Batrāwī.

Archaeological Period	Absolute Chronology	Site Period	Area B North		Area F	
			Phases	Structures	Phases	Structures
EB I	3400-3000 BC	Batrawy I	-	-	-	-
EB II	3000-2700 BC	Batrawy II	Phase 5b-a	City-Wall W.103c+W.163c + W.104c + W.105c+W.161c; City-Gate L.160; street L.144b	Phase 4	Temple F1; platform S.510
EB IIIA	2700-2500 BC	Batrawy IIIa	Phase 4b-a	City-Wall W.103b+W.163b + W.104b + W.105b+W.161b; blocking wall W.157; street L.144a; Outer Wall W.155; Round Outwork W.185	Phase 3	Temple F2; platform S.510
EB IIIB	2500-2300 BC	Batrawy IIIb	Phase 3c-b	City-Wall W.103a+W.163a + W.104a + W.105a+W.161a; Outer Wall W.155; Scarp-Wall W.165		
EB IVA	2300-2200 BC	Batrawy IVa	Phase 3a	-	-	-
EB IVB	2200-2000 BC	Batrawy IVb	Phase 2d-a	Embankment W.199	Phase 2c-a	Rural village
Later Periods	2000 BC-1950 AD	Batrawy V	-	-	-	-
Contemporary frequentation	1900-2005 AD	Batrawy VI	Phase 1	-	Phase 1	-

6. Including squares BnII4 and BnII5.

7. Including squares BpII4 (southern half), BpII5, BqII4 (southern half), BqII5 and BrII5.

8. Including squares BrII6 and BrII7, and the excavation

of the baulk between squares BqII6 and BrII6.

9. For the stratigraphy of Area B North up to and including the third, 2007 season see Nigro ed. 2008: 66-76.



3. General view of the EB IIIB triple line of fortifications on the northern side of the site, and EB IIIB Building B1 excavated inside the EB II - III main city wall, from east.

structures of the Early Bronze IIIB city in order to support and protect the Early Bronze IVB dwellings erected within the main city wall in Area B South.

Phase 3: The most recent, Early Bronze IIIB urban phase which includes:

Event 3a: the abandonment and progressive collapse of destroyed defensive structures;

Event 3b: violent destruction, with burned layers of dark grey ash, charcoal and reddish-yellow mudbrick fragments, which marks the end of the third millennium BC city; excavated between the main city wall and outer wall W.155, between outer wall W.155 and scarp wall W.165 and to the north of the latter;

Event 3c, the final rebuild of the Batrawy IIIb fortification system, in which the main city wall and outer wall W.155 were retained from the previous phase, with the addition of new scarp wall W.165.

Phase 4: The Early Bronze IIIA reconstruction of the defensive system, which includes:

Event 4a: again represented by a violent destruction layer excavated between the main city wall and outer wall W.155;

Event 4b: blocking of the collapsed Phase 5 city gate with wall W.157 and the erection of outer wall W.155 with associated curvilinear outwork W.185.

Phase 5: Earliest phase of the city, including:

Event 5a: collapse of the main city wall and gate, attested to by a thick layer of compact yellowish-grey soil with limestone chippings, and fragments of greyish mudbricks found outside

the main city wall on the plastered floor of street L.144b, which lies directly over bedrock;

Event 5b: erection of the main city wall and gate, marking the foundation of the city.

4.2. Early Bronze IV Outer Embankment (Batrawy Period IV)

The structure, which stabilised the collapsed walls of the Early Bronze II - III defensive system, was stone embankment W.199. It filled in gaps between the original structures and prevented the slope from collapsing further (Fig. 4); its base it was supported by a heap of stones leaning on Early Bronze IIIB scarp wall W.165. The function of the embankment was to provide a stable footing for contemporary dwellings erected within the main city wall, in Area B South, and to prevent erosion of the northern slope of the hill.

4.3. Early Bronze IIIB Triple Fortification Line (Batrawy Period IIIb)

In Area B North, on the northern slope of the hill, the final urban fortification was a triple line of defence with several associated outworks, demonstrating that the city reached its most heavily defended state towards the end of the Batrawy III period (Nigro 2007a: 351-352; Nigro ed. 2008: 100-102, plan III). A further structure, scarp wall W.165, was added to the outer side of the original main city wall, now reinforced by outer wall W.155. Scarp wall W.165 was characterized by the placement of large, irregular stones on a foundation of medium-sized stones. It had already been exposed to the west, in square BoII4, during 2006. In 2008, it was followed eastwards through three more squares, BpII5, BqII5 and BrII5, where its five courses of



4. The EB IV embankment, from north-east.

stone attained a height of 1.2m, and westwards into BnII4, where its eleven courses attained 1.8m. Between scarp wall W.165 and outer wall W.155, was a rubble fill¹⁰ which was fully excavated in BnII4 (**Fig. 5**). Scarp wall W.165 strengthened the outer line of fortification and incorporated dismantled EB IIIA curvilinear outwork W.185 (see below).

The EB IIIB triple fortification line underwent a violent destruction. Several burned strata of ash and charcoal were identified:

F.802 in BnII5 (**Fig. 6**) and F.194 in BrII6, BrII7 and in the baulk between squares BqII6 and BrII6, that is to say between the main city wall and the outer wall; F.807 between the outer wall and scarp wall; F.804 on the outer slope, north of the scarp wall.

4.4. Doubling the Line of Fortification: The Early Bronze IIIA Reconstruction of the Main City Wall and Addition of Outer Wall W.155 (Batrawy Period IIIa)

At the beginning of Early Bronze IIIA, after the dramatic destruction of the EB II city in a violent earthquake (Nigro ed. 2008: 87, 255), the main city wall was reconstructed by blocking the collapsed city gate and rebuilding the superstructure of the wall, as clearly illustrated during the 2008 season by excavations in square BnII5 and



5. The EB IIIB triple line of fortifications, from west: in left foreground, EB IIIB scarp wall W.165; in middle, EB IIIA - B outer wall W.155; to right, EB II - III main city wall W.103 and W.163; in left background, EB IIIA curvilinear defensive outwork W.185.

in the baulk between squares BqII6 and BrII6. This baulk was at the intersection of two separate stretches of the original city wall, which were incorporated into the EB IIIA reconstruction.

In addition to this reconstruction of the main city wall, an outer wall, W.155, was constructed using boulders on its outer face and large stones on its inner face. The stretch excavated so far (**Fig. 7**), runs parallel to and 1.7m in front of the main city wall.

In square BnII5, the space between the main city wall and the outer wall was filled with a destruction layer of ash and charcoal, designated F.805 (**Figs. 8 and 9**). In squares BrII6 and BrII7, a further section of outer wall W.155 was exposed in 2008, which showed how a fill of limestone pebbles and chippings, F.803, had been deliberately deposited in order to regularize a step in the bedrock (**Fig. 10**). Just above it was a fill of loose brown soil and rubble, F.196.

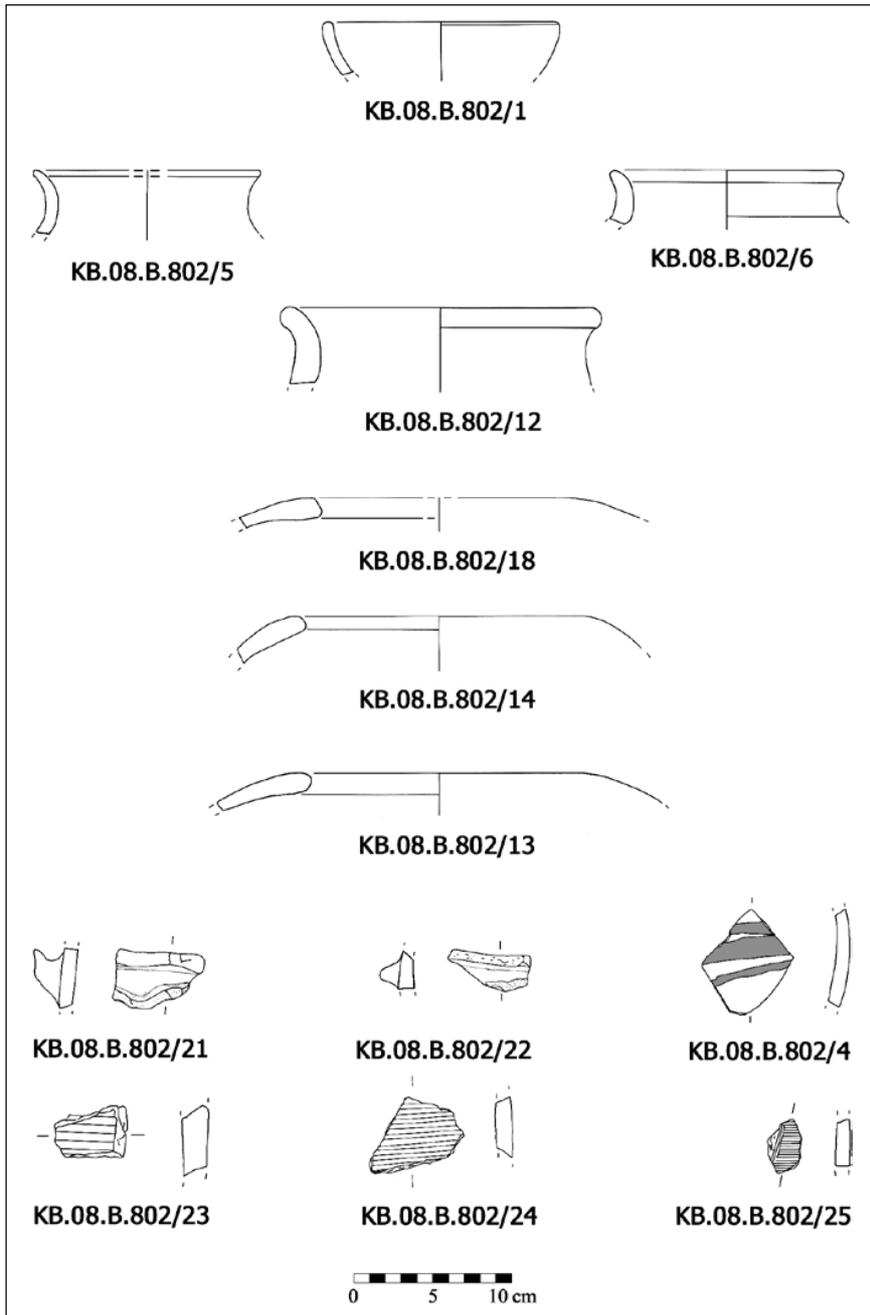
A major curvilinear outwork, W.185, abutted the outer wall, strengthening and protecting the north side of the city, the direction from which it was most easily approached.

4.5. The Early Bronze II Main City Wall and City Gate (Batrawy Period II)

The 2008 season allowed us to expose more of the Early Bronze II main city wall that was erected at the time of the city's foundation. To the west, in square BnII5, a monumental structure was preserved to a height of 3.2m in its later Early Bronze III incarnation, with the lower, original Early Bronze II courses of large boulders and protruding foot of the wall still clearly visible (**Fig. 11**). A collapse layer of broken greyish mudbricks, with small limestone grits, chips and pebbles (F.809), representing the destruction of the city wall superstructure was then removed, exposing the surface of street L.144. To the east, in square BrII7, the excavation reached the Early Bronze II street, L.144, which flanked the main city wall (**Fig. 12**), after removing destruction layer F.198 that covered it. In the lowest course of the outer face of the city wall, a pierced stone block was found which has been interpreted as a tethering ring (**Fig. 13**). It is notable that the animal remains from al-Batrāwī (Alhaique 2008) contain a high

10. This rubble fill was designated F.808 to the west, in

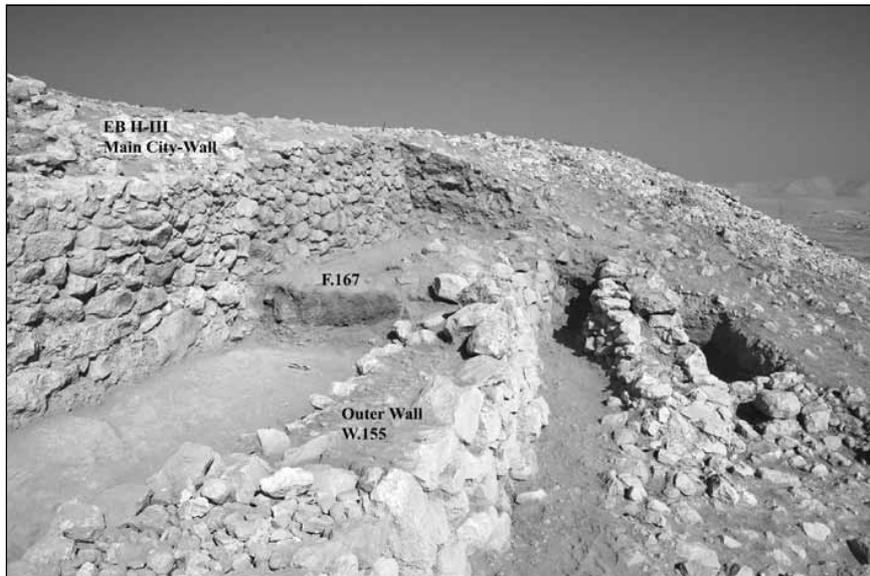
BnII4, and F.193 to the east, in BpII5 and BqII5.



6. EB IIIB pottery sherds from destruction layer F.802.



7. The EB IIIA double line of fortifications, with EB II - III main city wall to left and parallel outer wall W.155 to right, from north-east.



8. EB IIIA destruction layer F.167 between main city wall W.163 and outer wall W.155, from east.

frequency of donkey, interpreted as caravan animals working the important track between the Jordan Valley and Syro-Arabian desert that was controlled by the city.

4.6. Restoration of Staircase W.181

One of the most remarkable features of al-Batrāwī main city wall was a flight of stone steps, or supports for a wooden staircase, uncovered on the inner side of monumental structure W.181 (Nigro ed. 2008: 96-98). This so far unique architectural feature enabled us to calculate the height of the city wall as having been approximately 6.5m, and showed that the superstructure of the fortification line could be accessed for defence. This structure was restored with a modern approximation of the ancient mortar, preserving the burning visible on the protruding slabs used as steps and bringing the threshold of the staircase at the top of the stone section of the city wall to light (Fig. 14).

5. Area F: the Early Bronze II - III Broad Room Temple

During 2008, archaeological activities in Area F were focused on completing the excavation of the Early Bronze II - III broad room temple discovered in 2006, roughly in the middle of Terrace V (Nigro 2007a: 359). This monumental structure, though badly eroded and truncated at its north-eastern corner by later Early Bronze IVB

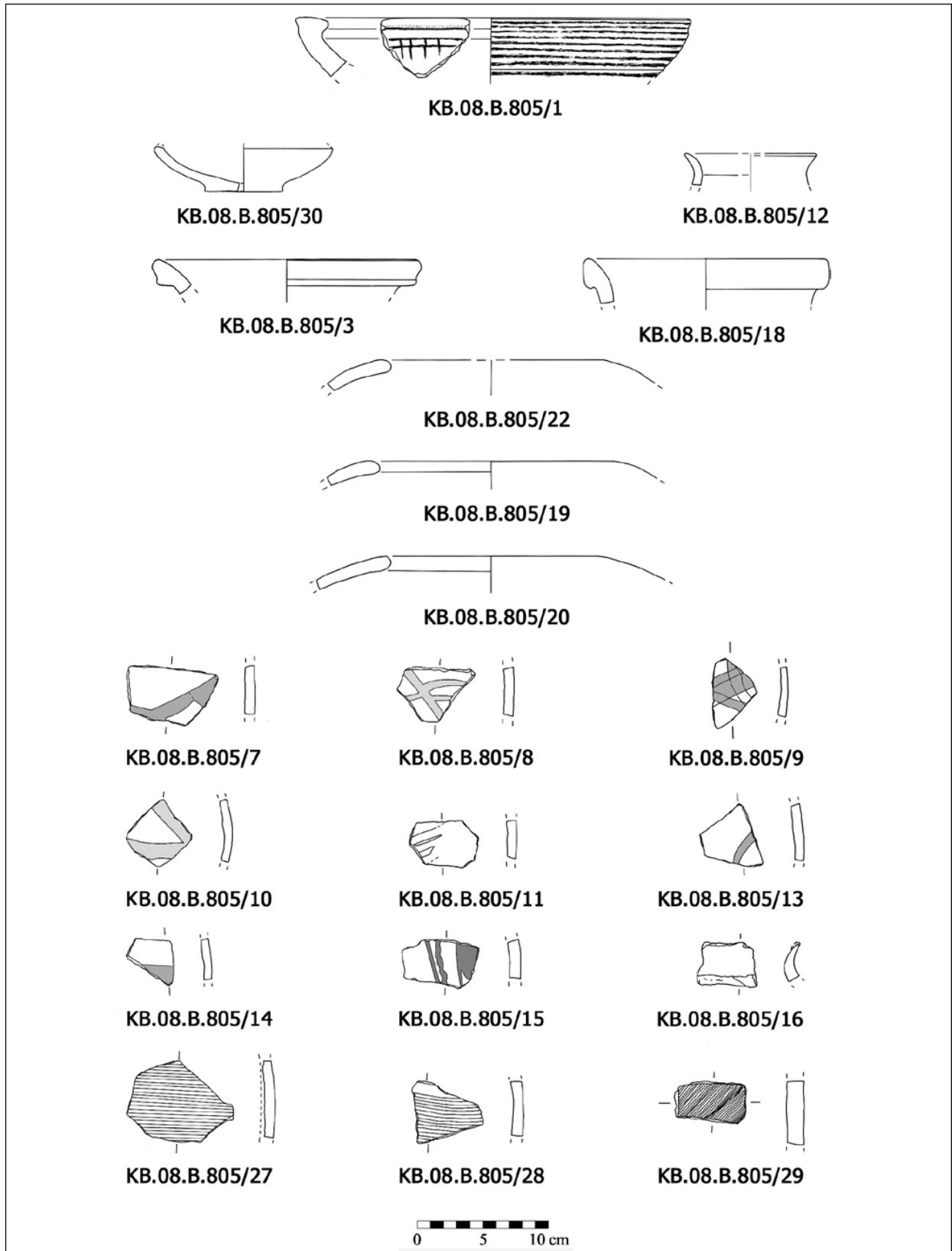
dwellings, could still be understood in terms of its two major constructive phases, attributed to Early Bronze II and III respectively (Fig. 15)¹¹. Three soundings dug within the temple cella and complete excavation of its western side clarified the transformation this religious building underwent when it was reconstructed at the beginning of Early Bronze III, around 2700BC.

5.1. The Early Bronze II Broad Room Temple F1

The original temple was erected directly over the bedrock, by filling in a shallow depression under the approximate centre of the building with virgin soil and small rock fragments (Nigro ed. 2008: 276-282, plan III). The presence of this depression weakened the central part of the structure, which in fact collapsed during the tremendous earthquake, which brought about the end of the Early Bronze II city.

The original walls of the temple were preserved along its southern, main façade (W.563E and W.563W) and its western (W.586) and northern (W.521) sides. The eastern wall was completely truncated by an Early Bronze IVB domestic building, which obliterated all previous structures. Only the south-eastern corner of the cella was preserved, but this allowed us to reconstruct the eastern wall (W.561) of the temple. The width of these walls varies from 1.0 to 1.2m, being wider on the western side where the temple abuts the bedrock step between terraces

11. For a comprehensive illustration of stratigraphy, Nigro ed. 2008: 269-275.



9. EB IIIA pottery sherds from destruction layer F.805.



10. Eastern stretch of outer wall W.155 and, to south, rubble fill F.803 levelling a natural step in the bedrock.



11. Western stretch of EB II - III main city wall W.163: west of city gate L.160 and up to 3.2m high, from east.



12. EB II street L.144 flanking the main city wall east of city gate L.160, from north-west.



13. The pierced block interpreted as a tethering ring, set into the lowest course of the outer face of the main city wall, from east.



14. EB III restored staircase W.181 abutting city wall W.161, from west.

IV and V. The rear wall of the temple was excavated all the way to its western end, which led to the discovery of a curvilinear structure (W.587) connected with the north-western corner of the building. This may represent a boundary wall, similar to the one known from the Early Bronze II temple at at-Tall / 'Ayy (Sala 2008b: 135-140, fig. 40).

The cella itself was a broad room measuring 2.7m in width and 12.5m in length, with the entrance (L.592) two thirds of the way along its length. The entrance was in the form of a passage 1.4m wide. Four stone bases were aligned along the main axis of the cella, as supports for the wooden pillars, which would have held up the roof. Facing the entrance, which opened out on to a forecourt, and in the rear wall of the temple was a niche (L.562), 1.3m wide, 0.8m deep and with an internal bench 0.2m high. A small slab, with two circular depressions, at the north-west corner of the bench suggests that the niche



15. General view of the EB II - III broad room temple and round platform S.510 in Area F, from east-south-east.

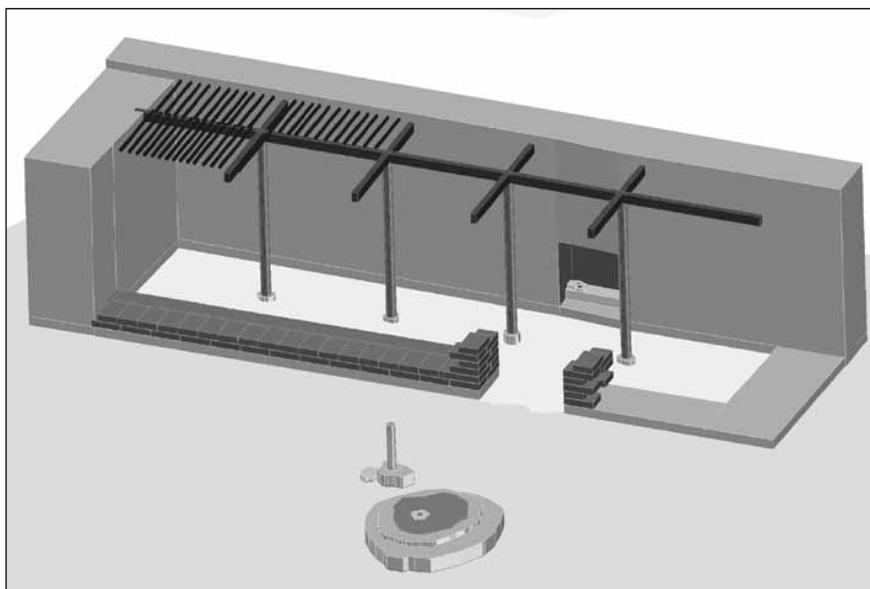
was the cult focus of the temple.

In the forecourt, facing the entrance, was a circular altar (S.510) with a central slab with a small cup mark in the middle, and a flight of three steps made of stone slabs by which to approach the altar from east. About 1m west of the altar, some stones set vertically into the ground (S.503) probably served as the base for a betyl (**Fig. 16**; Nigro ed. 2008: 283-284).

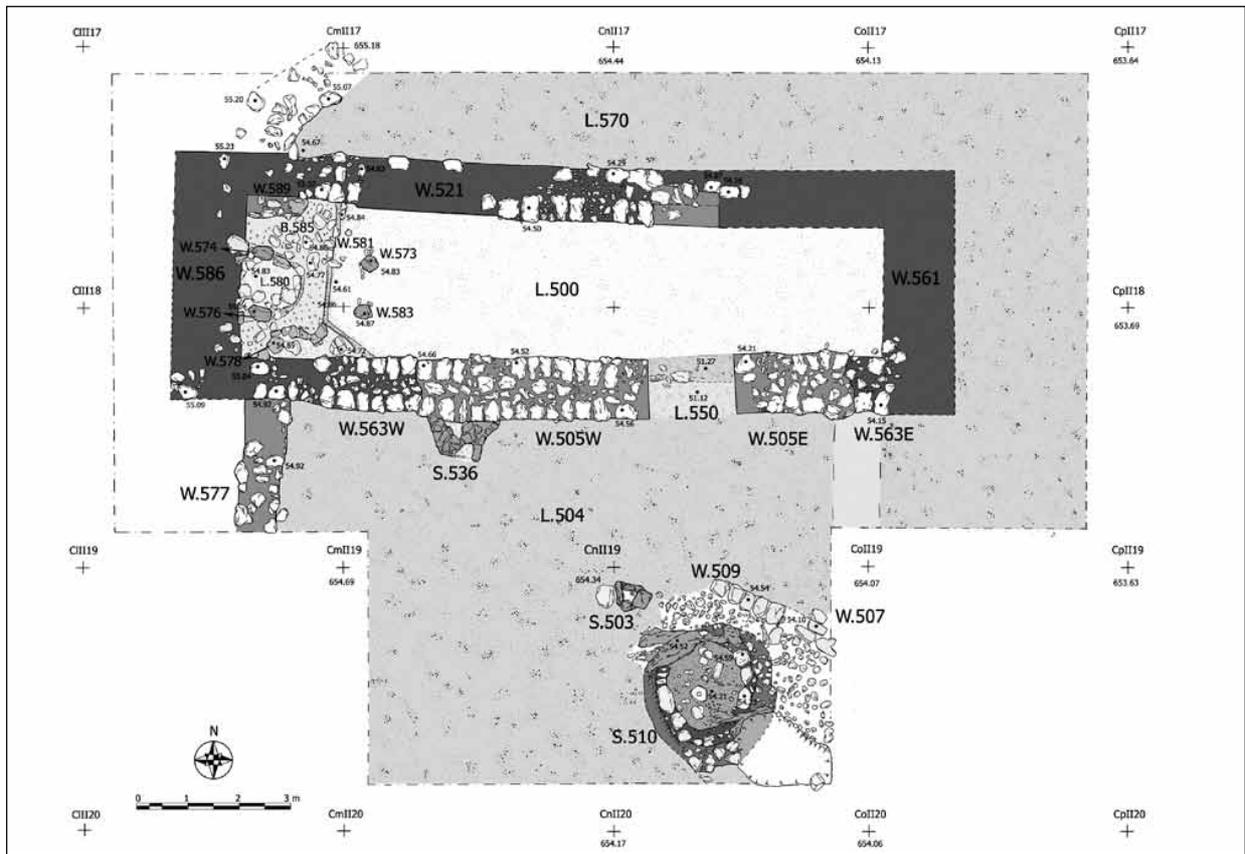
5.2. The Early Bronze III Bent Axis Temple F2

At the end of Early Bronze II, the earthquake, which destroyed the city of al-Batrāwī badly, damaged the temple in Area F. The collapse of the central part of the façade led to the reconstruction of the temple entrance at the beginning of Early Bronze III (**Fig. 17**; Nigro ed. 2008: 285-290, plan IV). The new front wall was wid-

er and more carefully built than its predecessor. The reconstructed part of the wall (W.505) was offset from the previous line by about 0.2m, and the entrance (L.550) included a small step 0.1m high. The rear wall was partly rebuilt and the niche facing the entrance closed off. The ceiling of the cella consisted of wooden beams spanning its entire width, as the pillar bases of the previous phase had been buried under the new floor of the room. The cult focus was shifted to the western side of the cella, which was reoriented (**Fig. 18**). A platform (B.585) 0.2m high was provided with a new style of raised niche (L.580), flanked by two vertical slabs and located in the middle of the western side. Against the southern wall of the cella was a stone-lined basin, delineated by stones set vertically into the platform, paved with flagstones and ending in a large slab. In front of



16. Reconstruction of Temple F1 with its forecourt (Phase 4, Early Bronze II).



17. Plan of Temple F2 (Phase 3, Early Bronze III).



18. General view of Temple F2 (Phase 3, Early Bronze III), from west: in foreground, raised platform B.585 with niche L.580.

the niche and its two antae, two round bases may indicate the location of two betyls (**Fig. 19**). A bench was placed against the northern side of the cella.

The transformation of this structure from a

classic broad room temple into a bent axis cult place, where the religious symbols were grouped at the end of the short side to the left of the entrance, perhaps reflects the same gradual transformation of the deeply rooted tradition of south-



19. Raised platform B.585 with niche L.580 erected at western end of Temple F2, from east.

ern Levantine religious architecture attested to at the contemporary sanctuary of Bāb adh-Dhrā¹².

6. Conclusions

The fourth season of excavation and restoration at Khirbat al-Batrāwī has provided important new insights into the history of the site, which appears to have been the major urban centre in upper Wādī az-Zarqā' during the Early Bronze II-III, and a rural village in the latter part of Early Bronze IV.

Excavations in Area B North identified a complex series of defensive works, starting with the original Early Bronze II city gate and city wall set on bedrock, and followed by successive developments of the fortification system, viz. the addition of an outer wall in Early Bronze IIIA and of a further scarp wall in Early Bronze IIIB, which remained in use until the final destruction of the city at around 2300BC. In Area B South, where a major rectangular building (Building B1) dating to Early Bronze IIIB was exposed, the eastwards continuation of the street inside the main city wall demonstrates that it runs all the way along the wall.

Restoration of staircase W.181 provided a unique perspective on the defensive architecture of the period, which allowed us to reconstruct the elevation and structure of the city wall.

Finally, excavation of the broad room temple allowed us to clarify the transformation of this sacred building between its first and second

phases, i.e. between Early Bronze II and Early Bronze III, when the cult focus was moved to the short western side of the cella and two antae were added to the front wall of the temple.

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TALL AL-ḤAMMĀM: PRELIMINARY REPORT ON FOUR SEASONS OF EXCAVATION (2006-2009)

Steven Collins, Khalil Hamdan and Gary A. Byers with contributions by Steve McAllister, Adeib Abu Shmais, Jehad Haroun, Michael C. Luddeni, G.K. Massara, Hussein al-Jarrah, Robert A. Mullins and Qutaiba Dasougi

Abstract

The Tall al-Ḥammām Excavation Project (TaHEP) is a joint scientific project between Trinity Southwest University, Albuquerque, New Mexico, USA and the Department of Antiquities of the Hashemite Kingdom of Jordan. The goal of TaHEP is to study the relationship of this immense and strategically-located site within its socio-cultural, economic and political contexts, and to ascertain its position, function and influence within those contexts.

In addition to this broader focus incorporating historical and archaeological data from neighboring sites in the southern Jordan Valley and beyond, the Project is studying the site as a microcosm of life and activity within its own local environment, seeking to determine its phases of settlement, urbanization and the reasons for its decline, destruction and / or abandonment at archaeological period interfaces.

Within this micro-context the Project seeks to shed light on how the inhabitants of Tall al-Ḥammām adapted to the local environment and environmental changes, and utilized available resources, enabling them to attain levels of city planning and building on a resultantly large scale, particularly during the Bronze Age.

The present report seeks to provide a general overview and introduction to the geographical, chronological, and archaeological data distilled from the first four seasons of exploration and excavation at this remarkable site, and to foster interest in Tall al-Ḥammām as a significant source of present and future information regarding the history of the southern Jordan Valley

and, indeed, of the southern Levant.

Introduction

The first four seasons of excavation at Tall al-Ḥammām¹ (TaH) were conducted with the authorization and support of Dr Fawwaz al-Khraysheh, Director General of the Department of Antiquities. TaHEP Season One (winter 2005/2006) and Season Two (winter 2006 / 2007) were directed by Dr Steven Collins (Dean, College of Archaeology, Trinity Southwest University, Albuquerque, New Mexico, USA). TaHEP Season Three, marked by the signing of a five-year Joint Scientific Project Agreement between Trinity Southwest University and the Department of Antiquities, was co-directed by Dr Steven Collins and Mr Abdesami‘ Abu Dayyeh (Department of Antiquities, Archaeologist and CRM). Season Four was directed by Dr Steven Collins and Mr Khalil Hamdan (Department of Antiquities, Head of Excavation Sector; Senior Archaeologist). (See additional information by season below.)

Primary funding for the first four years of the Project was provided through Trinity Southwest University, with additional monetary and in-kind contributions provided by individuals and businesses, augmented by small grants from private foundations.

Tall al-Ḥammām is located 12.6km NE of the Dead Sea, 11.7km E of the Jordan River, 8km S of the modern village of South ash-Shūna (the location of Tall Nimrīn) and approximately 1km SSW of the Al-Kafrayn Dam. This area of the southern Jordan Valley, particularly the eastern

1. The spelling of site names in Jordan, including Tall al-Hammam, is problematic. In much of the literature, our site is known as Tell el-Hammam or Tell al-Ham-

mam. According to the latest convention, technically, it should be Tall al-Ḥammām. For this publication, we have chosen to use “Tall al-Ḥammām.”

half of what many now call ‘the Jordan Disk’² (the circular alluvial area north of the Dead Sea, approximately 25km in diameter, also called the middle Ghawr), lies on the crossroads of the region’s ancient N - S and E - W trade routes³.

Several significant sites, all variously occupied during the high points of Levantine Bronze Age⁴ civilization, hug the eastern edge of the Jordan Disk beyond the spread of the ancient flood plain, bounded on the north by the throat of the Jordan Valley, and on the south by the rocky terrain of the Dead Sea area. Tall Nimrīm, with Tall Bulaybil and Tall Mustāḥ in close proximity, and sprawling Tall al-Ḥammām encircled by Tall aṭ-Ṭāḥūnah (NE), Tall Barakāt (N), Tall al-Kafrayn (NW), Tall ar-Rāmāh (SW), Tall Muways (SSW), Tall Iktānū (SSE) and several small named and un-named sites are all within a 0.75 to 2.7km radius of Ḥammām (Glueck 1945; Ibrahim and Yassine 1988; Khouri 1988; Leonard 1992; Chang-Ho 2002).

Although the ancient eastern Jordan Disk towns and villages vary site to site as to periodization, particularly during the Bronze Age, Tall al-Ḥammām was a connecting, common denominator positioned at the center of what must surely be described as a city state — and a relatively large one at that (see **Fig. 1**).

Also nearby are several large dolmen fields (Prag 1995; Aljarrah *tbp*; Clayton *tbp*) and tombs that, for the most part, remain unexcavated

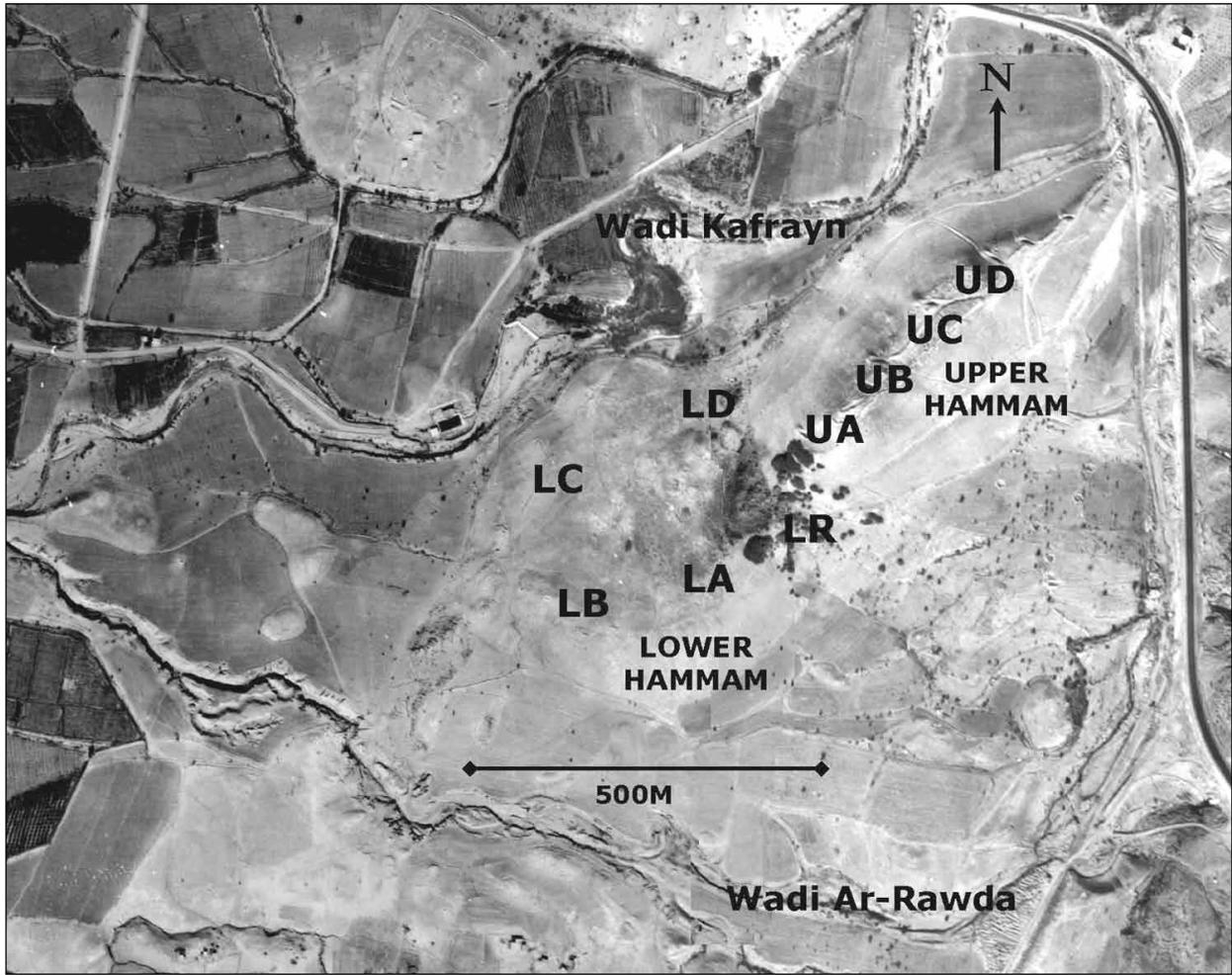
or robbed out⁵. The Hellenistic, Roman and Byzantine periods are represented architecturally at and near the site, including forts, guard towers, aqueducts, large cisterns, and by at least one monumental structure located on the S side of Tall al-Ḥammām near a warm spring⁶.

Tall al-Ḥammām is the largest of the Jordan Disk sites. It is certainly one of the largest, if not the largest, Bronze Age site in Jordan. The tall proper spreads over approximately 36 ha (360 dunams), bounded by Wādī al-Kafrayn on the N, Wādī ar-Rawḍa on the S, by the main road to the E of the tall, against the foothills, and by the confluence of the two wadis to the W (see **Fig. 2**). The site footprint for general settlement is well over 400 dunams (100+ acres). These dimensions approximate the areas of the site occupied in more remote antiquity, from at least the Early Bronze Age to the late Iron Age (there are probably period gaps in some locations on the site footprint⁷).

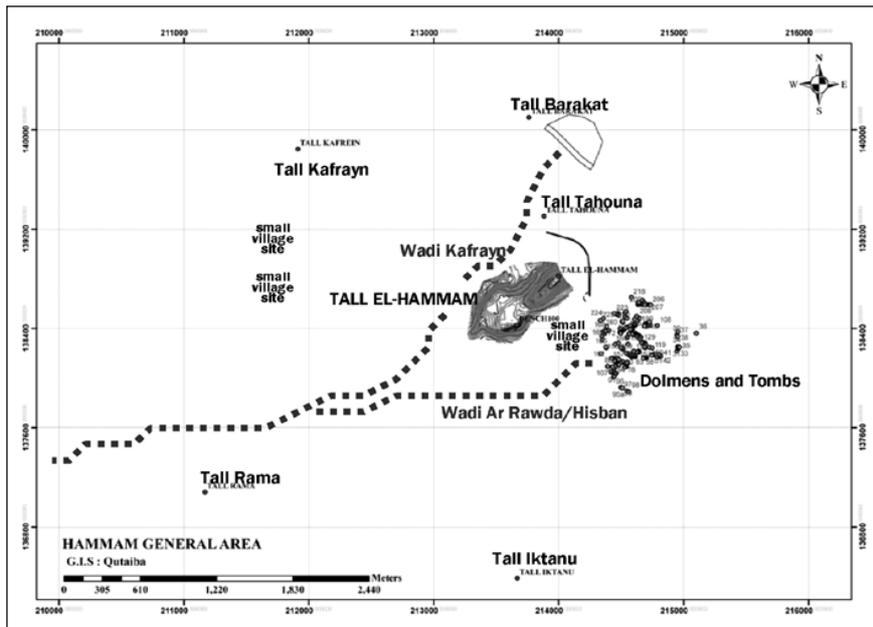
There is, additionally, ample evidence of a Hellenistic / Early Roman Period occupation off the main tall to the immediate south. Reports about the site from the late 19th century (Tristram 1874: 330-333; Thomson 1882: 371-376) describe an aqueduct that fed the area south of the upper tall. There is a warm spring at about the E-W center of the site in close proximity to what may have been a Roman bath complex, public building or large private residence (Field LR on the lower tall).

2. The wide, circular, flat alluvial area of the southern Jordan Valley immediately north of the Dead Sea is approximately 25km in diameter, and split down the center by the Jordan River. The biblical term for this phenomenologically disk-shaped region is *kikkar* (= disk, circle), appearing as *hakikkar* (the disk / circle) and *kikkar hayarden* (disk / circle of the Jordan River). When not used geographically, *kikkar* refers either to a talent (flat, circular weight of metal) or a flat, circular loaf of bread. Although cognate forms of *kikkar* appear in virtually all ANE languages (including Akkadian, Ugaritic and Egyptian), the term is never used in a geographical sense outside the OT, but always refers to a disk-like “talent” or “loaf.” The rare, geographical usage of *kikkar* lies at the core of the phrases “Plain (*kikkar*) of the Jordan River” and “Cities of the Plain (*kikkar*)” as seen in Genesis 10-19. The entire area was visible from the highland hilltops near the Jordan Valley WNW of Jericho, the location of Bethel and Ai (see Genesis 13:1-12).
3. There is debate regarding whether or not some kind of traversable route existed on or near the eastern and western shores of the Dead Sea by which travelers could move N and S through the Dead Sea Valley.

- Even though much of the terrain was difficult, it is hard to believe that at least some kind of stable footpath did not exist, affording one the opportunity to move from towns / sites near the Dead Sea shore northward into the Jordan Valley without having to climb up into the high terrain to connect up with roads on the Trans- and Cisjordan plateaus, then return to the Jordan Valley at a location farther to the N.
4. See the new archaeological period abbreviations in “Section V: Stratigraphy” in our activity report for Season Four (Collins and Hamdan 2009). It is available online at www.tallelhammam.com.
5. The Ḥammām (ar-Rawḍa) dolmens tend to be on the higher, flatter parts of the hills to the ESE of Tall al-Ḥammām, while the tombs are below them in the steeper walls of the wadis. However, there is evidence that at least a few dolmens were located very close to the tall itself, on the adjacent alluvial plain.
6. Dr David Graves and Dr Scott Stripling reason that this must somehow be connected to the ancient Roman city of Livias, perhaps a guesthouse or palatial structure on the eastern edge of the Livias precincts.
7. For example, the smaller Iron Age occupation, confined to the upper tall, covers approximately 12 ha.



1. Area within a 3km radius of Tall al-Ḥammām.



2. Aerial photograph (1972) of Tall al-Ḥammām before the beginning of heavier agricultural activities; the general settlement area occupies all of the terrain between Wādi al-Kafrayn and Wādi ar-Rawḍa, and E of the highway; Fields on the upper tall are UA, UB, UC and UD; Fields on the lower tall are LA, LB, LC, LD and LR.

There is also a possible ‘lookout tower’ in Field UA on the upper tall. Some pottery sherds from the Byzantine Period are present, but not in abundance. There also seems to have been some minor re-use of IA2 structures on the upper tall during IA2c, IA3, and the Hellenistic, Roman, Byzantine and Islamic Periods. However, pottery from these later periods, while present, is rare.

Surface surveying and excavation reveals occupation beginning at least during the Chalcolithic period (some Pottery Neolithic material may also be present) and extending with detectable consistency through the Early Bronze Age, Intermediate Bronze Age and into the Middle Bronze Age (all with associated architecture). Late Bronze Age pottery seems to be systematically absent, and consequently there is no discernable LBA⁸ architecture thus far.

One of the more surprising discoveries during the 2008 season was that the EBA city wall extended not just around the lower tall (as originally thought), but also around the entire base of the upper tall as well. Equally surprising were indications that the MBA city fortifications were not simply confined to the mudbrick / earthen rampart ringing the upper tall (Parr 1968; Burke 2004; McAllister 2008), but also extended around the lower tall, often refurbishing and strengthening the former EBA fortifications with additional towers⁹, as a part of the MBA defensive strategy (Zayadine, Najjar and Greene 1987; Najjar 1992; Burke 2004; Falconer 2008).

Further, detailed surface sherding, and now excavation, of the lower tall has revealed a large quantity of ceramic forms dating to the Intermediate Bronze Age (cf. Homès-Fredericq and Franken 1986: 98-114; Brown 1991; Palumbo 2008), indicating that the city likely survived the ubiquitous period-ending calamity that caused the demise of EBA cities throughout the Levant, many of which never recovered (Richard 1987;

Ben Tor 1992; Finkelstein and Gophna 1993; Harrison 1997; Avner and Carmi 2001; Philip 2008). Perhaps owing to Tall al-Ḥammām’s access to multiple water resources (the Jordan River, seasonal rainfall and wadi flows¹⁰, and numerous nearby and on-site springs), residents seem to have overcome the negative factors that led to the decline and / or demise of other cities in the region (Prag 2007)¹¹.

Like Tall al-Ḥammām, nearby Bronze Age sites such as Tall Nimrīn, Tall Iktānū and Tall al-Kafrayn¹² (and all others in eastern Jordan Disk area, for that matter) seem to lack discernable, or any, Late Bronze Age occupation (Dornemann 1990; Prag 1974, 1991; Strange 2008). Is the ‘LBA gap’ — as the Tall Nimrīn excavators call it (Flanagan, McCreery and Yassine 1990, 1992, 1994, 1996) — a regional phenomenon, and can TaH shed light on what caused it? The data through four seasons of excavation seem to support such a gap at TaH. Whatever caused the absence of occupation at the eastern Jordan Disk sites during the LBA timeframe did, in fact, not continue, as most sites were resettled, albeit on a smaller scale, toward the end of Iron Age 1 into Iron Age 2 (cf. Dornemann 1983). Indeed, the IA2a-b occupation at TaH is relatively extensive, and surrounded by a 3+ m thick fortification wall, perhaps casemate, at least in part. What gave rise to the site’s Iron Age city, and what brought about its demise? The answers to these questions are only beginning to be answered.

Tall al-Ḥammām certainly holds key pieces of the archaeological puzzle from which a greater comprehension and appreciation of the regional history can emerge. The focus of the first four seasons of excavation has been to identify and sound sections of the site deemed likely to offer reasonable opportunities to expose stratigraphic sequencing on both the upper tall (Area U) and

8. See the new archaeological period abbreviations in “Section V: Stratigraphy” in our activity report for Season Four (Collins and Hamdan 2009). It is available online at www.tallemammam.com.

9. One particularly massive tower structure located at the far W extremity of the lower tall seems to be of MBA design, using large boulders (some slightly squared) not typical of EBA builders. MBA pottery is present in the area, but no excavation has taken place there to date.

10. In antiquity, both Wādī al-Kafrayn and Wādī ar-Rawḍa / Ḥisbān probably sustained perennial flows

more often than not.

11. Tall Iktānū, 2km to the S of Tall al-Ḥammām, also has strong IBA occupation, but not fortified. Although Tall Iktānū has generally been seen as a defining IBA representative in most of the relevant literature, it must now be interpreted as one of many satellites of the much larger, and fortified, Tall al-Ḥammām.

12. Although not much has been published on the ongoing excavation at Tall al-Kafrayn, our personal contact with the director of that excavation confirms that there is not an LBA architectural presence at the site. There is a strong EBA and MBA presence, as at Tall Nimrīn.

lower tall (Area L) while, at the same time, continuing to survey, map and document important geographical features and archaeological sites on the eastern Jordan Disk, with a view to determining the relationship of Tall al-Ḥammām to the territory under its hegemony and to surrounding polities.

Methodology

When considering its constituent components collectively, Tall al-Ḥammām is enormous. But there are four considerations that have assisted us in narrowing the focus of the first four seasons. First, our extensive explorations of the TaH general occupational area have led us to postulate its position as a major, fortified city at the hub of a definable Bronze Age city-state, particularly during the EBA through the MBA. We have extended the scope of this research to include not only Tall al-Ḥammām and its occupational platform between the Wādī al-Kafrayn and Wādī ar-Rawḍa, but also its relationship to smaller sites encircling it, particularly to the N, W, and S, all within a radius of 5km¹³. Therefore, it was imperative for us to complete the GIS topographical survey of Tall al-Ḥammām. This was finished by the end of Season Four. It was also imperative for us to complete our detailed sherding (settlement density) sweeps of the general occupational area, and also to incorporate these areas within our GIS survey. This was also accomplished by the end of Season Four. Beyond this, it was important for us to survey the locations of outlying tall, dolmens and tombs in order to produce a more complete picture of the socio-political structure existing between Tall al-Ḥammām and its many satellites. This phase of research is well underway, and will be continued in future seasons.

Second, the ruins of the Iron Age city (mainly IA2a-b), which spread over the top of the upper tall, contain many exposed domestic and monumental wall foundations, including the 3m thick IA city wall. Considerable segments of the fortification walls are visible, especially on the northern-most side. The remains of mudbrick walls and stone foundations, both domestic and

monumental, are clearly visible in several locations. The first four seasons of excavation have helped to define the periodization of the Iron Age occupation, but a great deal remains to be clarified, including the nature of the now-exposed IA gate complex (which is certainly not the main gate, but a secondary, inner entrance). The sequence of IA occupation is likely quite readable in this 'upper' gate complex. One question that needs to be addressed is whether or not Iron Age 1 is represented by any of the gate / plaza phases (IA1 pottery has been found in this location, but not in abundance). Thus, we designed to continue excavating segments along the IA city wall (which was built over the MBA earthen / mudbrick rampart, as revealed in the 2007 and 2008 seasons), including the 'upper' gate area.

Third, the ease of access to the EBA / IBA / MBA lower city led K. Prag, in 1990, to excavate a few soundings on the far western extremity of the lower tall (our Area L) (Prag 1991). In that location, the fortified Bronze Age occupation spreads over a roughly circular area some 500m in diameter, much of which is exposed to, or near, the surface. Fortification walls and towers are clearly visible in many places, making the approximate parameters of the Bronze Age city on the SW half of the site relatively easy to identify. Thus, the lower tall is at least a partially-known quantity, with some stratigraphic sequencing already revealed by K. Prag in her 1990 trenches. However, Prag's probes were relatively shallow and did not extend into the deeper layers of the lower tall. It was our design that Season Four would make a significant penetration into the lower tall. That location (Area L, Field A = Field LA) was singled out for several reasons: (a) it was adjacent to, and included, a well-defined section of the city wall; (b) it included several visible, apparently domestic structures; (c) it was a raised area offering the potential of deep stratification; (d) it was heavily populated with Bronze Age pottery sherds; and (e) it had not fallen prey to 'deep disking' agricultural activity. Thus, the initiation of excavations in this location was logical and practical.

13. Many of these sites tend to hug the circle of foothills to the S and N, while others occupy positions on the alluvial plain to the SW, W and NW. Distances from the center of Tall al-Ḥammām range from 0.25km to

approximately 5km. All are within direct line-of-sight from the top of Ḥammām's upper and lower tall within a visually and geographically defined and defensible space.

Fourth, the large Roman / Byzantine structure in Area L, Field R needed work as the key period-feature at the site. Thus, we designed to pursue excavations in that location.

Site Surveys

Under the expert direction of Mr Qutaiba Dasouqi, the GIS topographical survey work proceeded at a remarkable pace during Season Three and Season Four. The results are dramatic, allowing almost endless combinations of highly useful data manipulation for purposes of geographical proximity studies, theoretical projections, 3D modeling, stratigraphic layering and excavation data collection with integrated photographic record.

The site grid developed by our first surveyor during the first two seasons was incomplete. Because of this, Dr Collins decided during the 2009 season to have a new site grid surveyed and triple-checked for accuracy. The embedded photographic data newly shot from previously-excavated squares allowed work done on the old grid to be instantly incorporated into the new grid. The 6m grid (designed for N and E balks of 1m) is now able to be projected easily from the total station over the entire site. All work during the 2009 season was done using the new grid, with excellent results integrated with the GIS.

The first three days before Season Four excavations commenced was spent with most of the team undertaking sweeping surface surveys of the area between the tall proper and the surrounding wadis. Team members assembled into a line at arms' length intervals, with a 'floater' using a GPS device to record sherds visible on the ground. The results were quite good, showing concentrations of sherds and other artifacts (such as grindstones) in certain raised areas (potentially with intact stratigraphy), revealing at least two settlements to the S of the main tall near Wādī ar-Rawḍa. The survey also suggests that the land between these small settlements was likely used for agricultural purposes in antiquity, perhaps being farmed by families living in these 'hamlets' within the shadow of the large fortified city. The small EBA occupation on nearby Tall aṭ-Ṭāhūnah (NE) is as close as these, and may have served in a similar capacity, or perhaps as a garrison site.

H. Aljarrah (DoA, Jordan) had already

performed a detailed survey of what has been called the ar-Rawḍa Dolmen Field—still awaiting publication as of the date of this report—documenting 226 of what had been a much larger number of the funerary monuments in antiquity (Aljarrah *tbp*). The parameters of this survey are also being included in research conducted by L. Clayton (Department of Anthropology; SUNY, Binghamton) (Clayton *tbp*). Most of these dolmens fall well within a .5km to 2km radius of Tall al-Hammam's extensive EBA/IBA city, mostly to the E and SE. Mr. Aljarrah (DoA Director of the area in which the dolmen field resides), has kindly facilitated the inclusion of the GPS locations of the ar-Rawḍa dolmens into the TaH database in what we now call the Ḥammām Dolmen Field, since TaH is obviously the epicenter of the funerary/cult rites/activities that created the dolmens (likely) during the Early Bronze Age (Prag 1995).

In order to augment the work done by H. Aljarrah and L. Clayton in documenting the Ḥammām (ar-Rawḍa) Dolmen Field (Aljarrah *tbp*; Clayton *tbp*), we undertook to identify, GPS, and photograph as many of the associated tombs as possible. Thus far, we have documented 36 cave and rock-cut tombs, and have tentatively identified about 20 more. These are mostly confined to the steep sides of the wadis (above water flow levels) in rock strata suitable for making tombs. Some seem to have been created from natural caves; others have cut entrances and / or artificially-enlarged interiors (cf. Schaub 1973; Harrison 2001; Chesson and Schaub 2007). Depths vary widely, mostly because of rock decomposition and the collapse of overhanging ledges, but some of the larger ones have interior dimensions well in excess of 3m. This is the first time these tombs have been identified and documented.

Thus far, without exception, each tomb is in close proximity to one or more dolmens located on the higher, more level ground immediately above. Many of the tombs are robbed out. One was recently robbed (Tomb HT.1), with EBA pottery still in the night diggers' debris pile. Several of these tombs seem to be intact, and should be excavated soon before they are found and destroyed by looters. It is likely that these tombs number in the hundreds (perhaps thousands), and we expect to continue to find and

document them in future seasons.

We are also continuing to explore, GPS, sherd and document as many of the eastern Jordan Disk's ancient towns and villages as possible, including the more well-known sites in the immediate vicinity such as Tall Iktānū, Tall Muways, Tulaylāt al-Ghassūl, Tall ar-Rāmāh, Tall al-Kafrayn, Tall at-Ṭāḥūnah and Tall Barakāt, as well as the cluster 6km to the N, including Tall Nimrin, Tall Bulaybil and Tall Mustāḥ. Most of these have been surveyed in the past, but some have not, including a few un-named sites. It is a critical part of understanding the workings of these (likely) city-state clusters to have an intimate geographical 'feel' for each one relative to all the others, including surrounding local terrains, walking distances and times to other locations, likely courses of connecting roads / paths, and lines of sight between locations. We also perform 'sherding' each time we visit one of these sites in our area. We have made a special effort to visit the mentioned sites, and many others, during each season. Unfortunately, two of the sites we attempted to visit during Season Four, Tall 'Udhayma North and South, have been entirely obliterated by sand / gravel mining on the southern edge of the Disk just SW of Tall Iktānū. Dr Kay Prag was part of the exploration team that day, and shared our sadness at the loss of those two Bronze Age sites. Thankfully, both Drs Prag and Collins had explored them in the past.

Season One Excavation Summary

The first season of excavation at Tall al-Ḥammām (Collins, Byers and Luddeni 2006) was conducted from 27 December 2005 to January 22, 2006, with the assistance of Department Representative Mr Muhammed al-Khatib. The excavation proceeded under the direction of Dr Steven Collins, assisted by a team of nineteen scholars, students and volunteers from Jordan, the United States and Canada. Military Trench (MT) clarifications and excavation squares were supervised by Dr Collins and Mr Gary Byers, with photography provided by Mr Michael Luddeni, and survey work performed by Mr Tawfiq al-Hunaiti of the Department of Antiquities.

With known quantities in Area L (dominated by the Bronze Age city) and Area U (the surface-exposed Iron Age occupation) we chose to focus on a series of squares in locations that

would yield, in this and coming seasons, the nature of the unknown quantity, i.e. the stratification that lies below the Iron Age in Area U (the upper tall). Thus, we chose locations in Area U represented by squares in Field UA and Field UD that were proximate to the city wall (later confirmed to be IA2) that might eventually lead to the detection and assessment of earlier fortification systems that would also exist at the edges of the upper tall.

We also selected two squares in Field UB, each for a different reason. The first we chose because it lay over surface-exposed monumental walls, giving us two clearly-defined corners to work with. The second was placed because it represented the lowest spot on the upper tall, with 2+ m already removed by MT (military trenching). Our square selection in Field UC was driven by a significant amount of IA2 pottery, including both large jars and smaller vessels, exposed in an MT clarifying procedure, giving every indication of a sizeable storage room.

The team concentrated initially in Field UD, immediately north of where the MT had bulldozed through the eastern-most portion of the upper tall. As the cast-up from that MT activity was cleared, it became apparent that a 3m high section through the city fortifications had been created. In that massive section it was easy to ascertain that the foundation trench for the IA city wall (3m thick) was cut into a packed-earth / mudbrick matrix of significant proportions. The IA wall was substantial, but it seemed dwarfed by the structure into and over which it was constructed. The glacis associated with the IA wall was clearly visible in the MT section, and it, too, was built over the top of the earlier earthen structure. Two squares were then excavated just N of this MT section, further exposing the IA city wall and how it was constructed. We followed this general procedure in each area, using MT clarifications and visible surface features in order to determine the placement of squares. This approach yielded significantly more results than could have been achieved had not the MT and fortuitous preservation of the IA surface structures occurred. Both turned out to be highly advantageous to the Project's first season.

Field UA

Field UA is cut approximately E-W by MT.

A 3m deep trench through the highest point of the tall destroyed a 5m wide swath of ancient occupation, including massive stone and mudbrick structures. Our goal in this area was to clarify the ‘mess’ created by the MT, and to determine what stratigraphy was still discernable. MT clarification had revealed at least three occupational levels: Hellenistic / Roman, Iron Age and Bronze Age (initially indeterminate as to periodization and / or phasing).

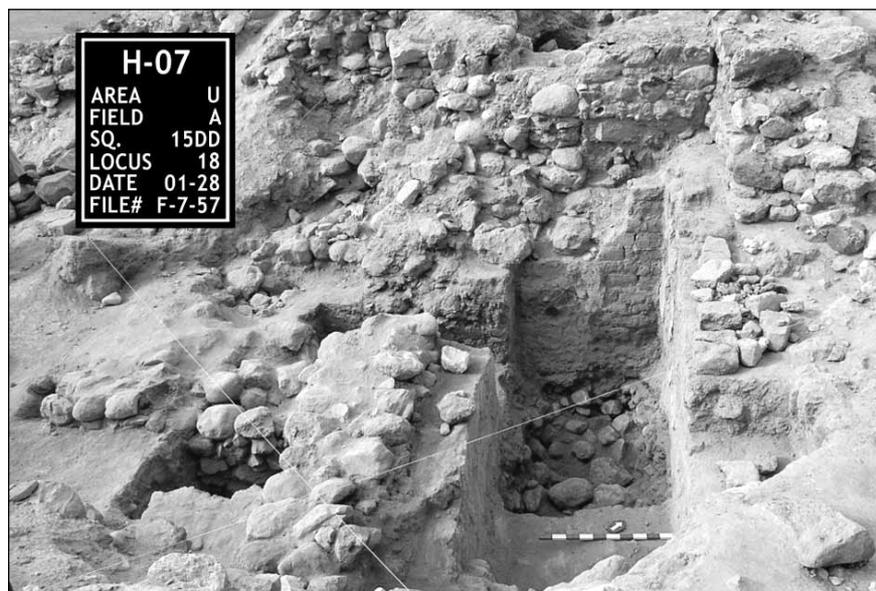
Square UA.15DD¹⁴ spans about 3 m of the area destroyed by MT activity, but managed to include a significant portion of the original height of the acropolis. The latest phase was what appears to be some sort of tower structure built of medium to small, undressed field stones and chink (loci 2 and 4). Late Hellenistic / Early Roman pottery associated with this structure seems to date it to that period. It is built into and over the remains of an earlier 3m thick wall (locus 9) and adjacent smaller stone and mudbrick walls (loci 6 and 7), the construction of which is visibly different in character than the later wall. The walls underneath the LH / ER tower are clearly IA2 in date and are, in turn, built into and over an earlier monumental, mudbrick structure with sections of well-preserved plaster over orange-colored, sun-dried brick (bricks average approx. 25 x 45 x 14cm) (see

Fig. 3). The mudbricks of the earlier phase are associated with both EBA and MBA pottery, but further clarification is needed to determine the likely date of construction.

Field UB

MT activity in Field UB cut through numerous walls, both stone and mudbrick, as well as floors and deposits of debris-strewn ash. The amount of ceramic debris and range of types from represented periods is impressive. Field UB encompasses the lowest level in the ‘saddle’ of the upper tall, and is also the most extensively damaged by MT activity. However, Field UB also has a significant amount of undisturbed surface with evidence of many structures clearly visible.

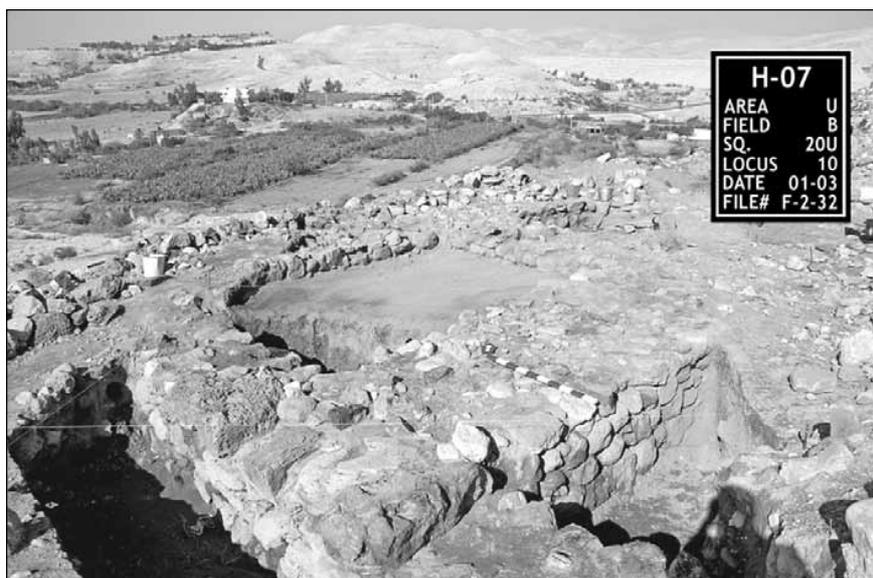
We selected Square UB.20U for excavation because of the surface visibility of a monumental foundation within its balk boundaries, walls of 1m (loci 1 and 6) and 2m (locus 2) thickness, the intersection of which forms two inside corners (loci 3 and 4, and subsequent loci within the wall boundaries) (see **Fig. 4**). The well-lev-eled tops of wall loci 1 and 2, with reddish decomposed mudbrick tightly packed between the stones, seems to indicate that the boulder and chink foundation is preserved to its full height. The bulk of the pottery associated with the wall



3. Iron Age stone foundations built into/over a monumental Middle Bronze Age mudbrick structure; Field UA.

14. All excavation squares given for Season One through Three use numbers from the initial grid system. Beginning in Season Four, square numbers are derived from

the new (2009) grid system, with old square numbers often given parenthetically for clarity.



4. Foundations of a monumental Iron Age 2 tower; Field UB.

foundation is IA2a-b. We did not find the bottom of the wall, or any associated surfaces, at well over 1m in depth.

Square UB.21W represents the lowest level on the upper tall. It was thought that this would give us a good opportunity to excavate through the IA material into an earlier stratum, if possible, because the MT at this point had already removed about 2+ m of *in situ* occupational debris. A 2 x 2m sounding was made to a depth of just over 3 m, and the results were instructive. An IA2 structure with a plastered stone wall and contiguously plastered mudbrick wall were encountered just below the surface (loci 3 and 4), giving us the corner of a room. The walls ran to a depth of nearly 2 m, and ended on a firmly packed layer of mixed debris (locus 6) from 20cm to 30cm thick. Inside the corner of the room to the full depth of the wall were layers of collapsed debris (loci 1, 2 and 5). The sequence revealed the collapse of what was probably a two-story structure: from top to bottom, earth and plaster, the remains of wood beams, and a thick matrix of ash, mudbricks and stone. There was no discernable floor at or near the base of the wall. The pottery was IA2a-b. Under the IA walls and locus 6 was a clean, clear interface with hard, yellowish mudbricks. The bricks were tightly laid and very solid (locus 7), with EBA and MBA pottery mixed.

Field UC

There were numerous structures and lay-

ers visible after MT cast-up was cleared away in several locations. One location in particular seemed to constitute a hoard of vessels such as storage jars and smaller juglets from IA2.

Square UC.28J was placed to include the pottery discovered by MT cleanup. The context clarified rather quickly with the discovery of an *in situ* mudbrick wall (locus 2) laid over the top of the destruction debris (locus 3) containing the pottery hoard. We could not get a good read on the mudbrick wall (further excavation will probably clarify the date), but the pottery in the burn layer underneath was definitely IA2a-b. One distinctive vessel was a Cypro-Phoenician olive oil jug, white-slipped with reddish-brown painting, found nearly intact with only the spout broken (see Fig. 5) (cf. Amiran 1970, 288). Two small spouted juglets were also excavated, along with at least ten medium-sized storage jars, and that was only within the confines of a 2 x 2m probe.

Field UD

The MT makes a 3 m deep cut through the eastern boundary of the upper tall, effectively creating a 3m vertical section in which several features are discernable. One of these features is a 3+ m wide fortification wall that we suspected was Iron Age in date. But the cut also revealed that the wall was built into and over an earlier packed-earth and mudbrick structure. Pottery imbedded in the earthen structure was MBA. The earthen structure (possibly a rampart) seemed to carry a facing of hard, yellowish



5. IA2a-b Cypro - Phoenician 'olive oil' jug; Square UC.2&J.

mudbrick on its outer surface. The clearly-defined glacis associated with the 3m-thick wall, as well as the wall itself, rides atop the earlier earthen structure, which was obviously thought by the builders of the later city wall to provide a substantial substrate over which to build their towered fortification perimeter. This deep look at a cross section of at least two fortification systems, one atop the other, provided a key insight into the history of the site. It also gave us a very good reason to place two adjacent squares perpendicular to the city wall line immediately N of the MT cut.

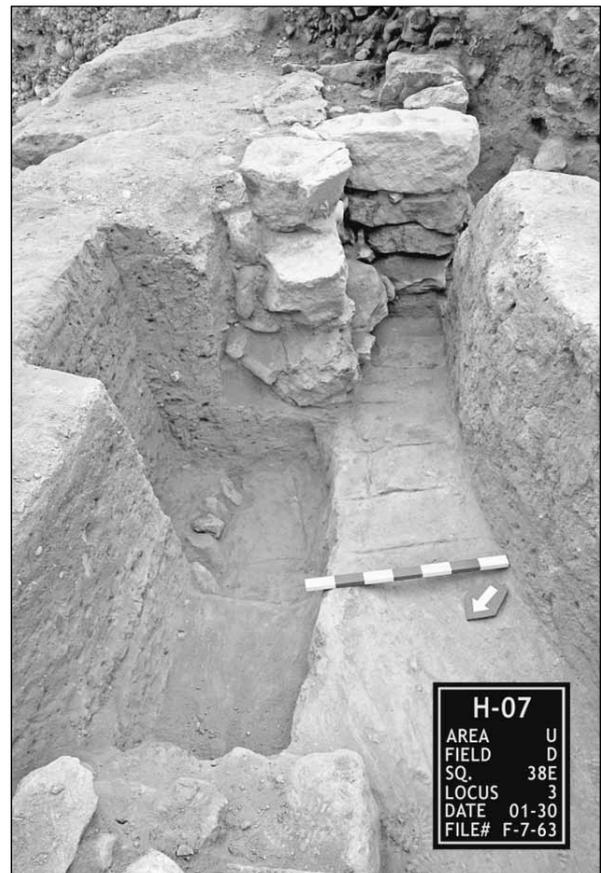
Square UD.37E, dubbed 'the kitchen' by excavators, yielded numerous artifacts of food preparation within a relatively small area of locus 1 (about 2 x 2m): five grindstones, a mortar and pestle, and a very large IA2a-b cooking pot that could be accurately described as a cauldron. A stone wall averaging approximately 0.80m in thickness (locus 4) seemed to define the NE extent of the room. A mudbrick wall (locus 5) seemed to bond at a near right angle to the stone wall (locus 4).

The width of the 3+ m city wall (locus 2) is contained entirely within Square UD.38E, thus both inner and outer faces of the wall were able to be exposed. As the excavation proceeded, our suspicions were confirmed that (a) the wall dated to IA2a-b, and (b) it was indeed built on

and over an earlier, massive structure made of very hard, yellowish mudbricks (loci 5, 6, 10 and 12) laid tightly at right angles squaring with the direction of the earthen rampart and IA city wall. The extent of the mudbrick structure runs at least 3m inside the inner face of the IA wall, and extends beyond the outer face as well (see Fig. 6). In order to confirm the date of the 3+ m wall, constructed of medium to large field stones (some squared for the corners of tower offsets), we cored through it in two places (locations 7-11 and 25-29 / 31-35). The pottery dated the wall to IA2a-b. We had yet to determine a firm date for the mudbrick structure.

Season Two Excavation Summary

Season Two of the Tall al-Ḥammām Excavation Project (Collins, Byers *et al.* 2007) was conducted from 22 December 2006 to February 4 2007, with the assistance of Dr Mohammed Najjar, Director of Excavations of the Department of Antiquities of Jordan, and Departmental



6. IA2a-b city wall foundation 'footing' trench dug into the MBA mudbrick rampart; Field UD.

Representative Mr Mohammad Ali Al-Khatib. The excavation proceeded under the direction of Dr Steven Collins, assisted by a team of 102 scholars, students and volunteers from Jordan, the United States, Canada, England, Australia, Russia and Ukraine. Field Supervisors were (alphabetically): Mr Gary A. Byers, Mr Adeib Abu-Shmais, Dr David Fouts, Mr Hussien al-Jarrah, Dr David Maltsberger and Dr Sahar Mansour. TaHEP professional archaeologists and specialists were assisted by a team of Square Supervisors from TSU — graduate and doctoral students in archaeology — along with students and scholars from other institutions.

Field UA

In the previous season, this procedure cleared away approximately 1 m of MT cast-up, revealing a significant sectioning, albeit ‘bulldozer fine’, of what we thought might be the westernmost section of the IA city wall, with about the same dimensions (3m thick) as had appeared on the opposite side of the tall. However, additional excavation in Season Two revealed that the thickness of the wall actually represented two phases, one seemingly LH / ER, built alongside the IA2 wall for the purpose of creating a larger foundation during the later period. The configuration of the walls suggests a large building and not fortifications.

After the first season, one of the most difficult tasks in Square UA.15DD was determining the relationship between the mudbrick construction and the boulder construction built into it. By the end of the second season there was no doubt that the mudbrick structures were built first, then the ‘rounded-bottom’ boulder foundations (+/- 1m thick) were added later. But how much later? The mudbrick structure itself was built directly over a massive and seemingly deep field of medium-to-large dry-laid leveling-boulders. A sequence of (a) leveling boulders, (b) mudbrick walls and (c) stone foundations, built as a single project, makes little or no sense. The mudbricks are full of EBA and some MBA pottery sherds as binding. The stone walls in / above it are definitely IA2. It seems most logical to postulate that the monumental mudbrick structure(s) underneath the IA2 walls at least belong to an earlier IA phase, or perhaps the MBA.

The stratification in Square UA.15EE is the

same as in UA.15DD, with the same difficulties regarding the relationship between the (lower) mudbrick walls and the boulder / chink walls built into and over them. Several mudbrick walls exist with plastered faces. There is also an abundance of wattle and daub roofing material present in the collapse matrix representing the inside of rooms and / or chambers.

Field UB

Work in Field UB expanded significantly during Season Two, exposing several phases of Iron Age tower construction, and revealing underlying MBA material.

Trenched through by modern military activity, Square UB.19U is a complex pile of tumble and poorly-laid, re-used stones along its northern third for a depth of about 1m. However, once the surface ‘mess’ was removed, several phases of IA construction became apparent. A cobble surface at about the same level as the cobble layer in UB.20U (see below) is perhaps an extension of the same road or plaza. Some aspects of the larger walls in the square suggest that we may be in a gateway or something related to it.

Square UB.20T preserves a complete small room of the monumental IA2 building excavated first in UB.20U. The room was excavated to a depth of about 2m below surface level. At that depth both IA and MBA pottery were present in a mixed locus. Further excavation may clarify the separation between the two periods, as occurred in UB.20U.

In Square UB.20U, the pottery associated with the monumental (tower) foundation is IA2, and exists in at least two, perhaps three phases. The final (likely IA2b-c) phase is delineated by a clear burn layer, the conflagration of which was hot enough to crack large boulders and leave behind many ‘clinkers’ (melted mudbrick and other material). This final phase was built squarely over at least one earlier phase which defined the footprint of the monumental structure at this location. It is probably a tower built for defensive purposes.

The first phase of the IA2 tower was built over a layer of cobbles (20 to 30cm thick) that seems to form a stretch of road or plaza pavement associated with a wall-stub of only one preserved course installed over the cobbles (early IA2a or late IA1?). Under that wall stub and

cobbles is another wall (at least 1m thick) existing as one preserved course of large boulders (at an oblique angle relative to the later phases) (late IA1?). These are cut into a mixed matrix of decomposed mudbrick, mudbrick fragments and ash, associated with two earlier walls and a floor with clay-lined silo (see **Fig. 7**). The pottery associated with these two earlier walls, floor and silo is MB2, and all associated loci seem to be sealed and free from later intrusion. Significant portions of two MB2 storage jars and a distinctive piriform juglet were discovered in this context.

Square UB.21T was opened primarily to extend our excavation of the multi-phased IA monumental structure first seen in UB.20U. Along with two additional walls from that structure,

another building was discovered adjacent to it (E). This new structure is also from IA2, and contains a well-preserved doorway (see **Fig. 8**).

In Square UB.21W, another 2 x 2m sounding was begun this season, and reached a depth of about 2m. The material in the probe was mostly washed-in sediment and tumbled stones, without any discernable architecture other than the opposite side of the mudbrick wall unearthed in the previous season. Unfortunately, a rainstorm filled the probe with water, making it too muddy to continue for the remainder of the season.

Field UC

The hoard of IA2 vessels unearthed during Season One continued into Season Two in Square UC.28J. Two additional squares were



7. MB2 structure with clay-lined silo, covered in 1 m of ash and destruction debris; underneath several phases of IA plaza and tower construction; Field UB.



8. IA2a-b building with doorway; Field UB.

opened about 50m to the S in what appeared to be an area containing domestic structures, the walls of which were exposed to the surface.

In this season, Square UC.28J was opened up to its full extent. Several phases of an IA2 structure were unearthed, including an installation appearing to be some sort of cultic, stone and plaster 'table' or 'altar' on a floor, with fragments of several juglets and chalices dating to IA2 (see Fig. 9). The mix of ceramics is interesting throughout this square, as IA2a-b-c forms are present, often in the same context. This suggests re-use and remodeling of these structures throughout IA2. The earliest phase seems to be domestic, while the latest phase, and the one prior to it, seem to be cultic, containing not only the chalices, but fragments of at least one figurine.

The house excavated in Square UC.29P contained several storage jars, juglets, and cooking pots. Several hearths were present, with associated tabun fragments. Possibly destroyed by an earthquake during one of the latest phases, several repairs and remodels were visible, represented by numerous floor levels and wall additions. The residence was obviously rebuilt and re-used over a long period of time. Storage jars were of types used both in IA2a and IA2b. IA2c sherds were rare. Underneath the floor of the IA house were the remains of an oval-shaped structure, perhaps Bronze Age.

Square UC.29Q contains an extension of the same IA2 house excavated in UC.29P. Doorways and cooking installations are present. A

virtually intact cooking pot was found in the ashes of a hearth. A short distance away an intact IA2b storage jar was discovered (see Fig. 10).

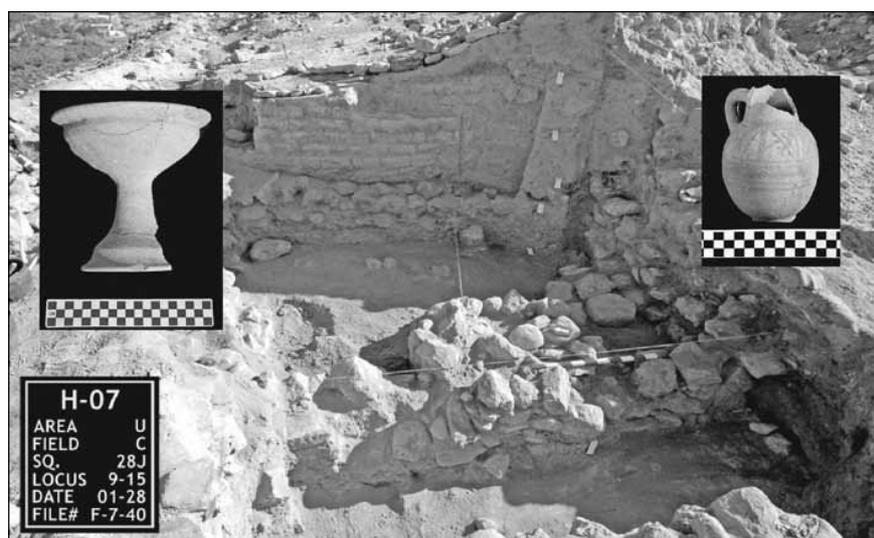
Field UD

This season, activity expanded to include two additional squares east of 38E, creating a deep trench and further exposing the phases and extent of the fortification systems for both the IA2 and MBA.

As Square UD.37E was taken down through



10. IA2b storage jar from a house in Square UC.29Q.



9. Multiple phases of IA2 structures in Square UC.28J; pottery finds inset.

several IA phases this season, it became clear that each had been at least partially cut into a pre-existing mudbrick structure of immense proportions. Floors and storage silos were literally carved into the thick mudbrick matrix of an earlier period. It now seems reasonably clear that that mudbrick matrix belongs to the inside ‘half’ of the MBA fortification rampart which was likely terraced down into the MBA city.

During the previous season we discovered that the extent of the mudbrick structure in Square UD.38E ran at least 3m inside the inner face of the IA wall, and extended beyond its outer face. As we had said of the mudbrick / earthen structure during the first season, “Whatever it is, it is monumental in nature”. However, we were unable to determine its date with certainty. During Season Two, with the help of hired local workers over a period of about three weeks, the date and nature of the structure became clear: it is a typical MBA fortification rampart system of common, but excellent construction (Pennels 1983; McLaren 2003).

In order to discover the extent of its height and breadth, we extended a trench eastward (Squares UD.39E and UD.40E). The results of this decision were nothing short of dramatic. Approximately 9 m of the MBA rampart face was uncovered, to a height (or depth, depending on perspective) of 5m (see **Fig. 11**). We did not reach the (typical) revetment wall at the base of the rampart, and we estimate that it could be as much as 3m to 5m lower down, possibly making the full height of the MBA rampart something on the order of 10m, with a 38° sloping face of 16m to 18m. The construction is similar to MBA ramparts at both the ‘Amman Citadel (Dornemann 1983; Zayadine, Najjar and Greene 1987; Greene and ‘Amr 1992) and Tall al-‘Umayri (Herr, Geraty, LaBianca and Younker 1991).

Season Three Excavation Summary

Season Three of the Tall al-Ḥammām Excavation Project (Collins, Abu Dayyeh *et al.* 2008) was conducted from 3 January to 13 February 2008. The first segment of Season Three was directed by Dr Steven Collins, assisted by Mr Hussein al-Jarrah, Mr Gary Byers and Mr Steve McAllister. The second segment of the season, marked by the signing of the Joint Agreement, was co-directed by Dr Steven Collins and Mr Ab-



11. Standing atop the MBA earthen / mudbrick rampart; Field UD.

desami’ Abu Dayyeh, and assisted by Mr Adeib Abu Shmais, Mr Gary Byers, Mr Khalil Hamdan, Mr Hussein al-Jarrah, Mr Jehad Haroun, Mr Michael C. Luddeni, Mr Steve McAllister and Mr Qutaiba Dasouqi. TaHEP professional archaeologists and specialists were assisted by a team of Square Supervisors consisting of TSU graduate and doctoral students in archaeology, along with students and scholars from other institutions. Seventy-six volunteer excavators from the USA, Canada, Germany and Italy, and local workers, completed the team.

Area L

Several sweeps of the lower tall were made for sharding purposes. EBA, IBA and MBA forms were abundant, and in similar quantities (Chalcolithic sherds were comparatively infrequent). We also spent a considerable amount of time and care tracing the Bronze Age city walls, towers and (possible) gates, and placing these on the site survey. After much discussion, we concluded that sections of the fortification walls had likely been added or refurbished during the MBA, as signaled by square towers and megalithic construction over segments of the

4m-thick EBA / IBA city wall. The EBA / IBA walls are fundamentally different in character, and made primarily with ‘one-man’ field stones and cobble fill, with rounded towers at frequent intervals.

Field LR got some much-needed attention, as local treasure hunters had created many large holes and trenches through previously-deposited heaps of soil bulldozed in or out (depending on the location) for military and / or agricultural purposes. We took advantage of the situation to clean away debris from several sections of walls that turned out to be a very large structure (nearly 40m square), possibly a water reservoir or bath complex (see **Fig. 12**). There was an abundance of Roman (and some Byzantine) pottery and glass fragments. Many of the ashlar in this structure exceed 1m in length, and some are as large as 2m. Floors and plaster are evident.

Area U

We spent a considerable amount of time carefully tracking the Bronze Age city walls from the lower tall around the upper tall, effectively doubling its size, or nearly so. We also discovered that the MBA city stretches out from the upper tall onto the lower tall, making it nearly as big as the earlier city, if not re-occupying the entire EBA footprint. All of this activity was surveyed. Minimally, TaH is one of the largest Bronze Age sites in the southern Levant. Our work on the upper tall expanded somewhat during Season Three, mainly due to the need to extend our knowledge of stratigraphy for the later periods, beginning with late IA1 or IA2.



12. Interior walls and floor in the monumental Roman structure; Field LR..

Field UA

Field UA got a general cleaning from the uppermost MT debris, but no additional excavation was accomplished. The cleaning, however, facilitated continued analysis of exposed stratigraphic sequences.

Field UB

Square UB.20U was cleaned in Season Three, but no further excavation was performed. This allowed adjacent squares to be opened for a better look at what we now believe is a (twin) tower overlooking a gate complex. Square UB.21U was opened this season to extend our look at the tower. Mixed pottery from the Iron Age, Hellenistic (rare) and Islamic (rare) periods attests to possibly continuous re-use of this massive structure over many centuries. UB.21U is also revealing monumental walls below the tower (date undetermined).

We opened UB.21T in Season Two primarily to extend our excavation of the multi-phased IA2 monumental building first seen in UB.20U. Along with two additional walls from that structure, another building was discovered adjacent to it. This new structure seems also to date from IA2, and contains two well-preserved doorways. UB.22T extends our view of this structure. Mixed pottery also signals re-use of this facility over several periods. However, occupation after IA2c may have been merely squatter-presence, as the pottery from this period forward is extremely scarce.

Field UC

In Square UC.28J we unearthed two additional installations (loci 27 and 29) at a level earlier than the previous ‘altar’, but seemingly associated with the same walls. Several remodels appear to be in view. Square UC.30K, near UB.28J, provided a look at the level below the base of the MT cut, and immediately revealed IA2 foundations and floors. Pottery was mixed EBA, IBA, MBA and IA2.

Field UD

Most of the work done in UD.37E this season was to remove the debris from a storage pit dug into the MBA mudbrick matrix to a depth of almost 2m. Squares UD.35D and UD.36D were opened to extend our understanding of

the relationship between the numerous super-imposed structures in UD.37E and the IA2 city wall, which was built squarely on top of the MBA rampart (Parr 1968; Dornemann 1983; Kemp 1983, 1991; Zayadine, Najjar and Greene 1987; Herr, Geraty, LaBianca and Younker 1991; Greene and 'Amr 1992; Burke 2004). IA2 pottery is most abundant in Field UD, but a few forms from the Hellenistic and later periods do appear from time to time, again suggesting some level of re-use. The IA2 structures are clearly 'carved' into the massive mudbrick matrix of the MBA rampart. One fragment of a grey, burnished Tell el-Yahudiya Ware juglet (MB2) was also found in UD.35D, giving some indication of what might be the terminal period for the Bronze Age city.

A 1.5m trench was laid down the 35 line northward from the IA2 city wall, using grid Squares UD.35A, 35B and 35C. The purpose of this trench was to reveal a long section of period fortification systems in an area where wall structures seemed relatively close to the ground surface. We began at the top of the IA2 city wall, cleaning the outer face to the bottom of the foundation. Immediately it became clear that it was built (as in Square UD.38E, Season Two) on top of the MBA rampart, only this time the mudbrick of the rampart's top surface extended out from below the IA wall by over 2m (see **Fig. 13**). In other words, no 'leveling' was done to support the IA wall in this location (as was the case in Square UD.38E), as it sat firmly atop and inside the rampart's outer edge.

Season Four Excavation Summary

Season Four of the Tall al-Ḥammām Excavation Project (Collins, Hamdan *et al.* 2009) was conducted from 9 January to 26 February 2009. The season was directed by Dr Steven Collins (Dean, College of Archaeology, TSU; Chief Archaeologist) and Mr Khalil Hamdan (DoA, Head of Excavations; Senior Archaeologist), with the assistance of Mr Hussein al-Jarrah (DoA Regional Director, Al-Kafrayn District; Field Archaeologist), Mr Jehad Haroun (DoA; Field Archaeologist), Mr Gary Byers (TSU; Senior Archaeologist), Dr Steve McAllister (TSU; Field Archaeologist), Mr Michael C. Luddeni (TSU; Director of Photography), Dr David Graves (Atlantic Baptist Univ.; Field



13. Stones of the IA2 city wall (top) built over the MBA earthen / mudbrick rampart; mudbricks visible at meter-stick; Field UD.

Archaeologist), and Mr Qutaiba Dasouqi (DoA; Surveyor). TSU graduate and doctoral students served as Square Supervisors, assisted by 33 volunteer excavators from the USA, Germany, Canada and Russia. Mr Adeib Abu-Shmais (former DoA Archaeological Inspector of Amman; Senior Archaeologist) provided consultation during the reading of diagnostic pottery. Dr Kay Prag (Univ. Manchester, retired; Senior Archaeologist) provided on-site consultation for three days at the end of the season, offering valuable insights based on her extensive experience with exploration and excavation on the eastern Jordan Disk, including directing many seasons of excavation at Tall Iktānū and at Tall al-Ḥammām (1990).

Field UA

During Season Four we spent some time re-assessing the sequencing in Field UA, and found nothing to change our minds regarding

the periods represented. We observed that the 'red' mudbricks (the red color was created by an extensive fire) in the MBA monumental structure average 30 x 50 x 15cm, which is quite distinct from the 20 x 40 x 10cm mudbricks present in most of the EBA construction. The MBA monumental mudbrick building seems to cover the entire acropolis area of Field UA.

Field UB

During this season we confirmed that the cobble surface did, in fact, extend fully between the two towers — in essence creating a road, where formerly the cobbles had created a more expansive plaza before the 'gate' towers were constructed during IA2a-b. Thus, the cobble surface was originally part of an earlier phase, likely IA1b, according to the pottery in associated loci. The stronger E tower has two phases from IA2, while the W tower seems to be almost an afterthought (same dimensions, but much poorer construction) built later in IA2b-c, creating what is perhaps an upper / inner gate. We think that the main gate is outside and lower than this complex — at least that is what the topography suggests.

Under the cobble street / plaza and associated IA1b walls, at a depth of nearly 3m, are two earlier walls and a floor with a clay-lined silo installation. As we observed in previous seasons, the pottery associated with these two earlier walls, floor, and silo dates to MB2, and all associated loci seem to be sealed and free from later intrusion. Square UB.10MM (and adjacent squares W and S; formerly Square UB.20U) got an interpretive cleaning in Season Three, but no further excavation was performed. However, during this season we 'triple dated' the MB2 domestic structure by coring the wall. The MB2 date was upheld through the final pottery reading.

In addition, a 1.5m-wide trench was laid out

over the IA city wall going N from the E tower. It was almost immediately apparent that the IA city wall was built directly over the MBA mudbrick / earthen rampart as in Fields UC and UD (cf. Greene and 'Amr 1992; Herr, Geraty, LaBianca and Younker 1991; for Egyptian analogies see Kemp 1983, 1991)¹⁵. After two weeks we suspended activity in Field UB in order to survey and lay out the new grid before further work is done there in a future season.

Field UC

Two 1.5m-wide trenches were laid out across the IA city wall in Field UC, with the same result as the trench in Field UB: the IA city wall had been built directly atop the MBA mudbrick / earthen rampart. After two weeks we suspended activity in Field UC in order to survey and lay out the new grid before further work is done.

Field UD

Two 1.5m-wide trenches were laid out across the IA city wall in Field UD, with the same result as the trenches in Fields UB and UC: the IA city wall had been built directly atop the MBA mudbrick / earthen rampart. After two weeks we suspended activity in Field UD in order to survey and lay out the new grid before work is continued.

Field LR

Excavation of the monumental Roman building continued during the first two weeks of the 2009 season. The NW corner of the structure was exposed, along with an intersection of interior walls with a well-paved floor (both were recovered for preservation). It seems that the Roman construction used large limestone blocks, while the Byzantine rebuild used a rather poor quality of grey sandstone of the same type found near Tall ar-Rāmāh to the SW. The common quarry for this sandstone is equidistant between

15. The MBA rampart system ringing the upper tall at Tall al-Ḥammām effectively creates an inner city defensive perimeter, the interior of which is populated with both monumental buildings (as in Field UA) and domestic structures (as in Field UB). The rampart's outer slope is 38 %. The flattened top of the rampart exceeds 7 m in width. The height of the rampart from the exterior dimension is estimated to be in excess of 20m, and constructed primarily of mudbricks. Based on Schaub's (2007) formula, we estimate that, given its

estimated dimensions, it took something on the order of 40+ million bricks to build the rampart around the upper tall. It has been excavated to a height of 6 m in Field UD. There seems to be little doubt that TaH's upper city preserves a virtually-complete MBA rampart system. In the future we hope to accomplish a complete sectioning of the rampart that will reveal its full dimensions, design, and methods of construction. We have not yet determined the location of the MBA gateway through the rampart.

ar-Rāmah and al-Ḥammām. The nature of the large Roman / Byzantine building in Field LR has yet to be determined. Nineteenth century explorers usually interpreted it as a bath complex, taking advantage of the nearby warm spring (Tristram 1874: 330-333; Thomson 1882: 371-376). Late in the season, the corner of another building of similar construction was discovered about 40m E.

Field LA

After week two of the season, our focus shifted from the upper tall to the lower tall. With the new site grid now available for Area L, we set our sights on Field LA on the southern side of the site. We laid out a trench down the 28 N-S grid-line comprised of Squares LA.28J1, LA.28K1, LA.28L1, LA.28M1, and LA.28N1¹⁶. We generally refer to this trench as Trench LA.28. Each square was sub-balked to create a 2m trench running for 30m. Surface features included at least 4m width of what was likely the first EB3 city wall phase, of boulder-and-chink construction (EB1c and EB2 city walls were generally made mostly of mudbrick) (Rast and Schaub 1980; Schaub 2007), and several domestic-sized stone foundations. Our extensive sherding in Area L has confirmed previous estimates showing that 99 % of the surface pottery dates to the EBA, IBA and MBA¹⁷. The excavations of K. Prag on the western side of our Area L gave the same indications (Prag 1991).

It is not an exaggeration to say that Trench LA.28 delivered in dramatic fashion. Not only did we get a good look at the EB3 city wall construction, with phases during which its width was extended from 4 m to 9 m, and then to over 15m (separately-built walls with rubble fill), but also we got a good sense of the stratigraphy and phasing, along with some excellent sections that were quite 'readable' with regard to destructions, collapses and rebuilds (see **Fig. 14**). Sealed loci with a great deal of pottery were in abundance,

and many architectural indicators were present that revealed close relationships between occupational phases.

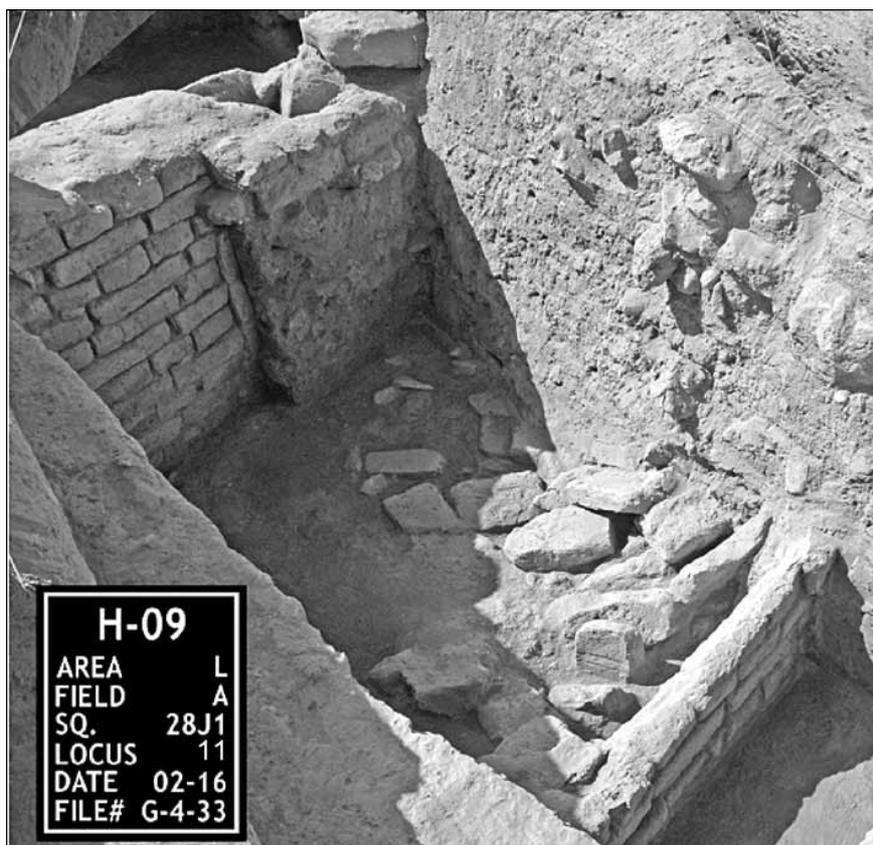
Each square along Trench LA.28 had an identical occupational sequence spread over what appears to be two or three domestic structures, all built with the same wall dimensions, and all oriented parallel and perpendicular to the city wall. In each square the following sequence was obtained: (a) EB3 foundations of two to three courses of medium-sized cobblestones (10-20cm) — with a hard mud-plaster floor sealing against them — were topped by a mudbrick superstructure built with alternating header / stretcher bonding (the EB3 mudbricks were uniformly 20 x 40 x 10cm), using mud / ash mortar, with resulting average wall-widths of 0.75m, including layers of mud plaster; (b) EB3 walls were partially destroyed (fire? earthquake? attack?), but were rebuilt with a bonded layer (again, header / stretcher) of slightly thicker and wider IB1-2 mudbricks on top of 6-10 courses of original EB3 mudbricks; (c) new IB1-2 floors were installed about 20cm above the original EB3 floors, generally sealing against the top of the EB3 foundation stones at the base of the first course of EB3 mudbricks, often running across EB3 stone thresholds into adjacent rooms; (c) the EB3 / IB1-2 domestic structures underwent a major destruction with thick (30+ cm) layers of ash over a tumbled mudbrick and ash matrix; (d) the same walls built and used by the EB3 and IB1-2 builders, probably standing to their present height (8-12 mudbrick courses) within the destruction matrix, were then topped by medium-cobble foundations following the previous wall lines (with a few new walls), likely built during MB1 and used into MB2; (e) all that remains of the MBA occupation in Trench LA.28 are numerous stone foundations and associated pottery.

Final pottery reads from mixed and sealed loci support this sequence of occupation, and

16. A note on the size of Tall al-Ḥammām: our surveyed site grid now contains over 12,000 6 x 6m squares extending over 43 ha.

17. The ceramics seem to reveal the presence of all sub-phases of the EBA, IBA and MBA, including transitional forms at period and subperiod horizons. No LBA sherds are evident. In other words, Tall al-Ḥammām preserves a remarkably consistent Bronze Age city that was able to withstand the negative factors

(climate fluctuations, people migrations, wars) that often created settlement gaps or terminations at other sites — that is, until all the eastern Jordan Disk sites came to a seemingly-abrupt end toward the end of the MBA. Interestingly, there appear to be no LBA settlements at all on the 300km² parcel of the Jordan Disk east of the river. Cities, towns and villages reappear about the mid-Iron Age.



14. Multiple building phases - including EB3, IBA and MBA - in Square LA.28J on the lower tall; note the tumbled bricks wrenched out of a wall (earthquake?).

even suggest that no real break in occupation occurred at this location on the site. Thus far, Trench LA.28 suggests that, whatever befell the residents of Tall al-Ḥammām through the EBA, IBA and MBA, they reorganized quickly to rebuild, refurbish, and re-create their urban environment.

Some of the notable features unearthed in Trench LA.28 include two doorways with stone thresholds (Squares LA.28K1 and LA.28L1), one threshold with an *in situ* socket stone¹⁸ (Square LA.28K1), and an EB3 sub-floor storage installation created from a well-used large holemouth jar (Square LA.28K1).

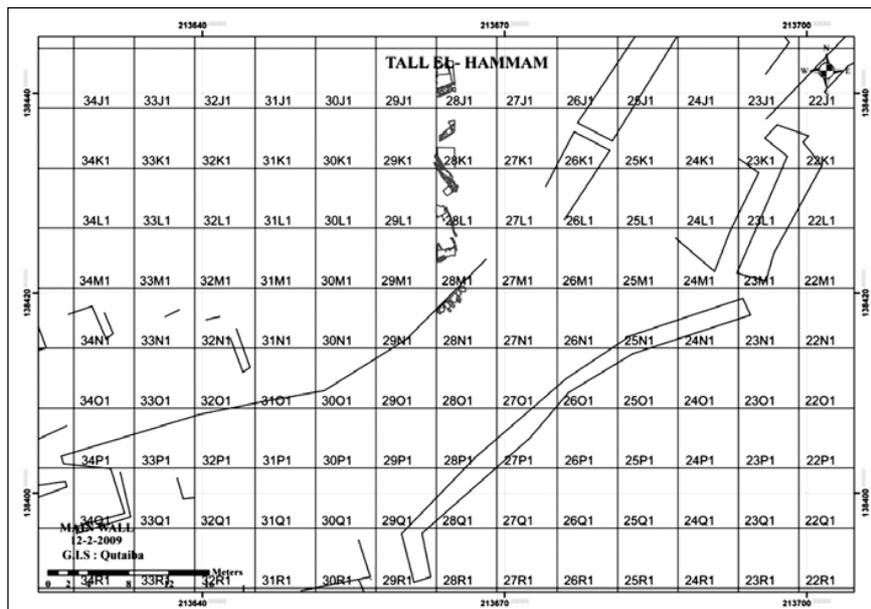
The EB3 city wall was likely re-used and refurbished several times during the IBA and MBA. In Square LA.28N1, its stone foundation stands to a height of 1.7m. It is built over a matrix of mixed debris (ash, mudbrick, stones, pottery) approximately 1m thick, with interspersed stone foundation stubs and some laid mudbricks. At 1m underneath the EB3 city wall foundation, another substantial stone foundation

has emerged, obviously belonging to an earlier phase of the EBA.

We also accomplished some intensive surveying of surface-visible walls in Field LA, adjacent to, and E and W of, Trench LA.28, for a distance of about 200m. The city fortifications are very complex in this area (see **Fig. 15**): red lines depict excavated structures in Trench LA.28; blue lines show fortification walls, including what appears to be a major gateway. Multiple towers are visible, as well as many other structures both monumental and domestic.

Approximately 200m NW of Trench LA.28 we discovered and surveyed what appears to be a monumental Bronze Age building measuring over 20 x 60m, with many interior walls, and perhaps surrounded by platform terraces. It sits on a rectangular, raised area almost in the center of the city wall perimeter of the lower tall. Whatever its function, it must have been central to the daily life of the city. In future seasons, it will be interesting to determine if this surface structure has precursor phases like the domes-

18. What appears to be the upper socket stone was also found near the one doorway.



15. New site-grid with outlines of EBA / IBA / MBA fortification structures, with houses excavated in Trench LA.28, N of the city wall; Field LA.

tic structures excavated this season in Trench LA.28.

Field LB

In the southern part of Field LB we surveyed many city wall segments, and observed two massive structures of solid mudbrick on each side of an area obviously bulldozed out for banana fields. These two mudbrick structures, now separated E-W by nearly 100m, are very much in character with the massive MBA mudbrick rampart surrounding the upper tall and, if a connection is extrapolated, that stretch of now-missing mudbrick rampart or wall may have contained a city gate from one of the Bronze Age fortification phases. Both Drs Prag and Collins think that it has the topography suggestive of a major entryway. Dr Prag, during years of walking over Tall al-Hammām, had often speculated about the defensive nature of the massive mudbrick structures that were even more extensive and visible two decades ago. If it is a city wall, such a mudbrick defensive structure could date to EB1c / EB2 (Philip 2008). If it is a sloping rampart, it would likely date either to MB1 or MB2 (Dornemann 1983: 18; Burke 2004), or possibly earlier (Mazar 2002).

The W end of the mudbrick wall / rampart terminates at a large tower built of 0.75-1.5m boulders, sitting high on several terraces, and measuring 8 x 9m at the highest level. The city wall continues from that point to the N, but

much of the next 200m of the wall heading in that direction is rather out of character for EBA fortification builders who usually used ‘one-man-sized’ undressed field stones. In this section of the wall many of the stones are in the 0.75 - 1+ m range, which is more in character with the MBA style. Our current speculation is that these S and W sections of the Bronze Age city wall were rebuilt during the MBA, at which time the large tower was also added.

Field LC

We conducted some sherding in Field LC, but no other activity was pursued. City walls are traceable in several phases in this location, along with several exposed walls of (probably) domestic structures. The city wall segments were surveyed in the previous season.

Field LD

Field LD is heavily damaged by agricultural activity, mostly in the form of banana cultivation. Stones appropriately sized for building are strewn everywhere, with many of the larger ones bulldozed into linear piles along the banana field boundaries. Within Field LD is a large sink-hole that we first thought contained no visible structures or pottery. However, with further erosion between Seasons Three and Four, two stone foundations appeared in the resultant section, 1 m below the original surface, with another stone foundation 1m below that. Pottery em-

bedded in the higher wall dates to the late EB3 or IB1. The wall underneath it had no visible pottery associated with it. The interesting thing is that the sink-hole lies outside the EB3 city wall boundary that we surveyed during Season Three. Therefore, either these substantial structures were outside the city defenses, or the defenses were extended at some point, taking the city fortifications to the N, nearly to the edge of the Wādī al-Kafrayn. This effectively increases the known size of the Bronze Age city by 10-15%. No excavation was carried out in Field LD during the 2009 season.

Chalcolithic Period

During the first four seasons, no Chalcolithic material has been confirmed in an excavated context. This is understandable given the depth of the Bronze Age material overlying whatever earlier strata may be present. Our deepest penetration on the upper tall has exposed MB1 / 2 material. Our depth on the lower tall has reached well into EB3 and, in some loci, EB2 pottery is present, with occasional EB1 sherds in the mix.

We estimate that in the location of our LA.28 trench we are still approximately 2 m from bedrock, perhaps more. Thus, a Chalcolithic occupation is not out of the question, especially when one considers the number and quality of Chalcolithic objects (mostly bits and pieces) found on the surface. A 'thumb-notch' flint scraper belonging to the Ghassulian tradition, along with several Ghassulian-style basalt bowl fragments, attest to some level of Chalcolithic occupation.

Since Tulaylāt al-Ghassūl lies only a few kilometers to the SE, it makes sense that Tall al-Ḥammām's consistent on-site springs and flanking major wadis would have attracted settlers in the prehistoric eras. Indeed, when Tulaylāt al-Ghassūl lost its water source (almost overnight as many scholars depict it), TaH would have provided an attractive alternative site offering significant topographical advantages over the flat terrain around Tulaylāt al-Ghassūl. Perhaps future seasons of excavation will shed light on TaH's role at the dawn of civilization on the eastern Jordan Disk.

Early Bronze Age

Early Bronze Age Tall al-Ḥammām has emerged as a major fortified urban center that

obviously dominated the landscape of the southern Jordan Valley. Within a radius of 3km, TaH is surrounded by numerous small-to-medium-sized EBA towns, villages, and hamlets, several literally within its shadow. Most of the larger of these are named (Tall al-'Udhaymī North, Tall al-'Udhaymī South, Tall Muways, Tall al-Kafrayn, Tall Barakāt, Tall at-Ṭāḥūnah), while many of the smaller sites are not. That the configuration of this EBA cluster, with TaH as its immense center, constitutes a substantial city-state is hardly questionable. Its durability, consistency and extent must be determined by continued excavation.

Ceramic indicators strongly suggest that the city had EB1, EB2 and EB3 phases. Although we are not deep enough into the earlier sub-periods to confirm unbroken occupation, the EB3 does seem to have transitioned from the EB2 (Area LA). Forms from the early, middle, and late phases of EB3 are all present in the ceramic repertoire.

Given that EB2 and EB3 sherds are found mixed at what appears to be the interface between the two sub-periods, we anticipate a significant architectural phase dating to EB2. At least two stone foundations within a destruction matrix containing an abundance of tumbled mudbricks lies at approximately 1m below the EB3 city wall foundation (see **Fig. 16**). We cannot at this time confirm an EB2 date for the lower structures. A few EB1 sherds are present, but should not be expected to appear with frequency in the later contexts.

The size of the EBA city at TaH (see the Introduction and Survey sections of this report) ranks it among the largest in the southern Levant. Its fortification systems have wall thicknesses ranging from 4m to over 15m, built in multiple phases using well-faced-but-undressed field stones generally of the 'one-man' variety. Sections of the city wall have obvious rebuilds from the Middle Bronze Age utilizing much larger boulders (0.5 to 1.3m) installed directly on the smaller EBA stone courses. In places, the city walls were reinforced by the construction of additional walls (from 1 to 3m in thickness) running parallel, with rubble fill between them. There are so many of these walls and wall sections visible on the surface that is difficult to make sense of them at this point in the excava-



16. Phases of the Bronze Age city wall with associated ash / debris layers, with another wall visible (very bottom) 1m below the base of the EB3 foundation; the city wall seems to have been refurbished and re-used during the IBA and MBA; Trench LA.28 is 2 m in width; Field LA.

tion. We can say, however, that they comprise a highly complex system of fortification walls, gates, gate plazas, curtain walls, towers, bastions and buttresses, likely built over a very long period of time.

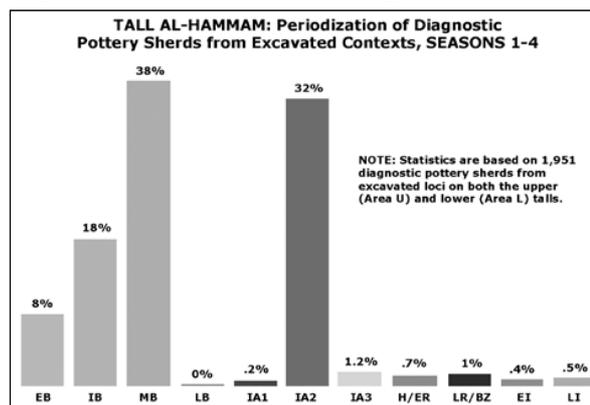
Significant indicators of re-use and re-furbishing of both monumental and domestic architecture have been found in excavated contexts from one end of the site to the other, but particularly on the lower tall in Field LA in the trench comprised of Squares LA.28J-N. For example, the refurbishing of more than one domestic structure is traceable, on the same footprint, from at least the EB3, through the IBA, and into the MBA (many with well-preserved plaster). IBA mudbricks were added directly on top of EBA mudbrick courses (and of a slightly different size), with the floor being raised about 20cm. Subsequently, MBA builders installed (over the IBA mudbricks) a new foundation of two to three stone courses following the same footprint. Ethnographic analogies of such reconstruction and refurbishing of mudbrick structures over many centuries abound¹⁹. It is interesting to note that some of the mudbrick courses from EB3 contexts were so well preserved that the corners of the bricks were still sharp as if extracted only recently from their molds.

The EB3 ceramic assemblages includes plat-

ters and platter-bowls, deep bowls, holemouth jars and cooking pots, storage jars, jugs, a variety of juglets and lamps (see **Figs. 17, 19 and 20**).

Intermediate Bronze Age

If there were (and there always are) surprises in the first four seasons of excavation at TaH, the size of the IBA city was certainly one. We knew from our extensive sherding of the site that there was a large amount of IBA pottery strewn over most of its surface. Although the extent of the IBA city is not confirmed, we suspect that it occupies virtually the same footprint as the EBA



17. Graph showing period percentage distribution of Tall al-Hammām diagnostic pottery from excavated contexts over both the upper and lower tells.

19. Myriad examples of the lengthy occupation of mudbrick structures can be found in the Native American pueblos of the American Southwest. Structures con-

tinuously used or occupied from five to ten centuries are not uncommon.

city (more than 30 hectares), including the re-use of the earlier fortifications.

This will certainly change the way the IBA is viewed both in the southern Jordan Valley and in the region. In most of the literature, Tall Iktānū is seen, more or less, as the quintessential IBA site in the area. It is now safe to say that the fortified IBA city at Tall al-Ḥammām is many times larger than Tall Iktānū which was not fortified (Prag 1991). At only a little more than 2km distance from TaH, we should now, more accurately, interpret Tall Iktānū as a satellite village within the hegemony of TaH (there are also other IBA sites in the area, including Tall Nimrin to the north). This seems to suggest that Tall al-Ḥammām retained its city-state status into the IBA, or at least something very close to that (cf. Cohen 2009).

The ceramic assemblages for Tall al-Ḥammām during the IBA reveal the full range of known forms for both the earlier and later phases. The ledge-handle repertoire is particularly instructive, and reveals a continuum of folded (earlier) to enveloped (later) forms, including what seem to be incremental transitions. In other words, there appears to be little or no break in the occupational continuity of the site during the approximately three centuries of this period. The IBA ceramic assemblages includes platter-bowls, holemouth jars and cooking pots, ‘milk bottles’, storage jars, jugs, ‘teapots’, lamps and amphoriskoi (see **Figs. 17, 19 and 20**).

Middle Bronze Age

The late IBA ceramic forms give way to the MB1 assemblage amidst the refurbishing of EBA / IBA domestic structures, strongly suggesting a continuation of occupation with little or no interruption. The nature of these rebuilds — indeed, the necessity for them — remains uncertain; however, the condition of some walls (including sections of the city wall) suggests earthquake activity. We often observe that walls have ‘lurched’ in the same direction, with sections of mudbricks ‘torn’ or ‘thrown’ from walls with similar directionality.

Once again, surface sherding reveals that both MB1 and MB2 are well represented over most of the site. However, in excavated contexts, the MB1 assemblage seems to dominate on the lower tall, while the MB2 assemblage

dominates on the upper tall. Further, fineware is significantly more predominate on the upper tall, while commonware forms appear with much greater frequency on the lower tall.

Presently, in the face of these observations, we theorize that virtually the entire fortified site footprint (30+ hectares) was occupied during both MB1 and MB2; however, the upper tall, surrounded by a massive earthen / mudbrick rampart (likely during MB2), became a true ‘acropolis’ during MB2, the location of most of the city’s monumental structures such as palaces, temples and administrative buildings. Although there is a 20 x 60m structure (as yet unexcavated) on the lower tall that probably dates to the MBA (following the analogy of the stratification in Trench LA.28), Field UA on the upper tall has already, by excavation, manifested a massive MBA mudbrick structure with meter-thick walls and numerous rooms. The function of that structure is presently unknown, but is suggestive of a palace or large administrative center.

In the ‘swale’ of the upper tall we excavated part of a structure dating to MB2, containing two storage jars and a grey-burnished piriform juglet (see **Fig. 18**). One room contained a clay-lined silo or storage bin. All this was covered with approximately 1m of destruction matrix filled with dark ash, broken mudbricks, pottery fragments and severely burned wattle-and-daub roofing material. But again, the juglet has to be classed as fineware.

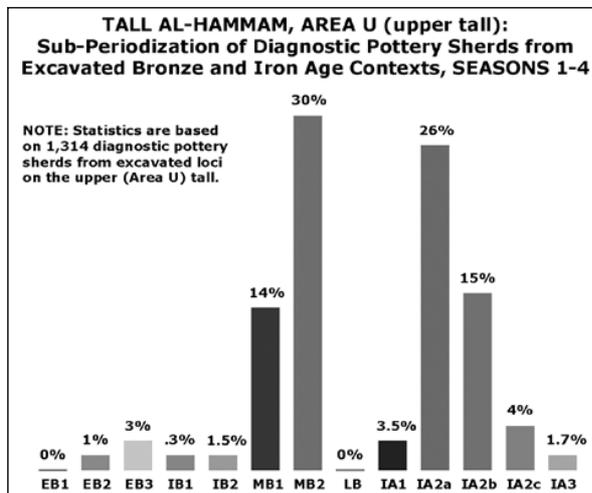
By the time TaH neared the end of MB2, it



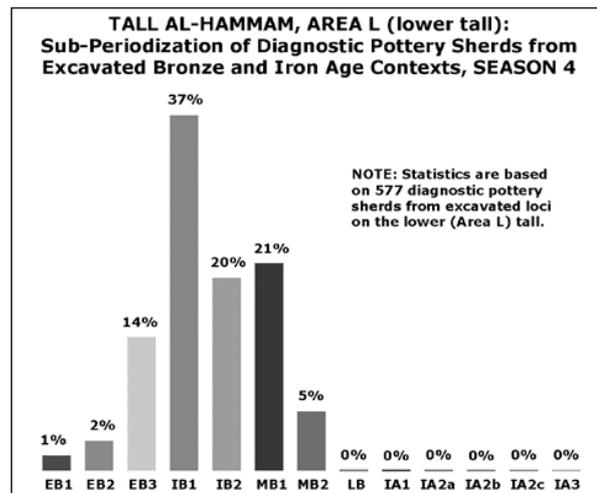
18. Grey burnished MBA piriform juglet, severely burned; Square UB.10MM (formerly UB.20U).

consisted of an outer city ringed by a massive fortification system with many towers (partly earthen / mudbrick rampart, partly stone walls), much of it constructed directly on EBA / IBA foundations. While TaH's EBA towers tend to be more circular, the MBA towers (where we can observe them) are generally square or rectangular, such as the large, well-preserved tower about 500m west of our LA.28 trench on the lower tall. This particular tower is abutted by the city wall (going northward) and by a massive earthen / mudbrick rampart²⁰ (going eastward); in other words, a corner tower. Much of this is visible on the surface (with additional exposure created by 'night-diggers'), and was the final phase of the Bronze Age city, followed by an occupational hiatus of at least five centuries. This 'LBA gap' is generally observed at all sites within a 10km radius of Tall al-Ḥammām²¹.

The MBA ceramic assemblages encompass a range of both common and fine wares including large storage jars, carinated bowls and chalices, large bowls, cups / bowls, kraters, cooking pots, handmade casseroles and a range of jugs and juglets, including Tell el-Yahudiyeh Ware (see Figs. 17, 19 and 20).



19. Graph showing sub-period percentage distribution of Tall al-Ḥammām diagnostic pottery from excavated contexts on the upper tall (Area U).



20. Graph showing sub-period percentage distribution of Tall al-Ḥammām diagnostic pottery from excavated contexts on the lower tall (Area L).

Iron Age

Following a Late Bronze Age occupational hiatus, the first signs of the re-occupation of the site appear toward the end of Iron Age 1. Very little pottery from IA1 has appeared in the excavation thus far, and none in a confirmed architectural context.

The first evidence of occupation above the MBA destruction level is a (gate?) plaza made of small-to-medium cobbles (Field UB) that may date to the latter part of IA1. On the NE edge of that cobble surface, a white-slipped, 'cupped' pilgrim flask, with shoulder lug handles and painted reddish-brown geometric decoration, was discovered, but in a location potentially disturbed by modern military trenching. The flask clearly dates to the latter part of IA1 (cf. Amiran 1970: 279). A few other IA1 sherds were found associated with the surface of the cobbles, along with sherds from IA2a (early 10th century BC).

The upper tall is ringed by a fortification wall, consistently 3m thick, dating to IA2a, of boulder-and-chink construction using mostly medium-sized stones, with a few larger stones set into the foundation at the inset - offset cor-

20. This feature was observed by K. Prag on many occasions, including while she excavated on the western edge of the lower tall in 1990. Over 150m of the earthen / mudbrick rampart in this area has now been bulldozed away for agricultural purposes. This information was documented in consultation between Drs Collins and Prag on site at the end of the 2009 TaH excavation season.

21. Jericho, approximately 25km to the west of TaH, has a fiery MB2 (MB IIC in K. Kenyon's chronology) destruction commensurate with that of TaH, followed by a gap in occupation during LB1. Unlike Tall al-Ḥammām, Jericho was re-occupied during LB2 (after 1400 BC), but there is little left of that settlement (Kenyon 1993).

ners. The builders of the IA2 city wall obviously followed the line of the MBA rampart with care, building squarely upon it, and digging their foundation trenches into it. Thus far we have excavated segments of the Iron Age city wall in at least seven locations along a 200 m stretch from Field UD westward to Field UB, along the northern side of the upper tall. Without exception, in each location the IA fortifications are built directly on / into the outer edge of the MBA rampart.

Interestingly, in Field UD, where the MBA rampart takes a turn to the south, the Iron Age builders extended the outer portion of their wall beyond the edge of the top of the MBA rampart by constructing a horizontally-compacted leveling, effectively widening the rampart, and allowing them to build their wall about 1.5m further E than the outer, top edge of the rampart. The amount of earthwork necessary to accomplish this slight eastward placement (less than 2m!) of the IA city wall relative to the top of the MBA rampart is puzzling. One can only think that there may have been a structure of some importance already in place when this phase of the fortification was built, requiring that the wall-placement be adjusted in order to accommodate it.

Field UB has revealed what appears to be a gate area along the northern fortifications, but not of the traditional Iron Age variety. Perhaps it is a smaller, secondary gate. It is flanked by two monumental towers with 1.5m-to 2m-thick foundation walls. While the western tower has the same dimensions as the eastern tower, its construction is not nearly as good (in fact, quite sloppy), giving rise to the idea that it was hastily built, almost as an afterthought. The foundation of the well-built eastern tower is preserved almost in its entirety, with the final leveling course of stones still showing evidence of the mudbricks laid upon them. The western tower dates to IA2a-b, with two phases plainly visible. It seems likely that the earlier phase was constructed toward the beginning of the 10th century BC, with the latter (terminal) phase being built during the 9th century BC. We do not yet have enough ceramic data from the western tower to suggest the date of its construction.

On the N side of Field UC we have excavated what appears to be a 'cultic' installation

of some kind, perhaps within the context of a larger administrative center or palatial structure. Around a small 'altar' consisting of several flat, hand-sized stones, we found five chalices (two nearly intact) and a fragment of what appears to be a human figurine. Immediately to the N of this 'cultic' installation was some sort of storage room in which we found numerous large storage jars (mostly broken) and several jugs / juglets, a few intact or nearly intact. One jug was Cypro-Phoenician in design, made of reddish clay, white-slipped, and painted with dark brown geometric designs (cf. Amiran 1970: 288). Another was a spouted juglet made of reddish clay and slip, and painted with a simple geometric design. All of these vessels were contiguous with the surface to a depth of 0.5m, tightly packed, and dating to IA2a-b. Thus, it appears that, for all intents and purposes, this represents the final significant occupation at TaH.

Several IA domestic structures have appeared in Field UD and Field UC, with an abundance of grindstones, mortars and pestles, cooking pots, storage jars, dipper juglets, bowls and kraters, mostly belonging to IA2a-b. A small number of IA2c and IA3 (Persian Period) sherds are also present in these contexts, suggesting that the IA2a-b domestic structures were re-used (squatters?) during the waning decades of the Iron Age. However, it is abundantly clear that the building and successful operation of the city centers on IA2a-b, with only a significantly diminished presence during IA2c and IA3. Perhaps the demise of the IA2b city is attributable to the Assyrian conquest of the region. Whatever the cause, life in the Iron Age city at Tall al-Ḥammām seems to have diminished dramatically after the 8th century BC.

Included in the IA ceramic assemblages are storage jars, kraters, shallow and deep bowls, flasks, decanters, cooking pots and casseroles, a wide range of juglets, amphoriskoi, cups, chalices and lamps (see **Figs. 17, 19 and 20**).

Hellenistic, Roman and Byzantine Periods

Only a handful of pottery sherds from the Hellenistic, Roman and Byzantine periods have been found on the upper tall, and less on the lower tall, except in the immediate vicinity of the monumental Roman / Byzantine structure in Field LR (see **Fig. 17**). Thus, we have tentative-

ly concluded that there is no evidence at TaH to suggest that any kind of town or village existed there during these periods.

However, this is not to say that these periods are not substantially represented at and around the site. Large cisterns and a fort (Roman) are present in the hills immediately to the E at ab-basa. Hellenistic forts are also in the area (at aṭ-Ṭāhūnah and further NE). A building of similar dimensions and (possibly) date as the nearby Hellenistic forts sits atop TaH in Field UA (but nowhere else on the upper tall). That structure in Field UA has yielded both Hellenistic and Early Roman pottery (including a Herodian-style oil lamp). We have also uncovered and identified approximately 165m of a Roman period aqueduct leading from nearby springs on the E side of the tall at the base of the hills in the direction of the large Roman building in Field LR.

This Roman building measures about 40 x 40m, with exterior walls constructed of finely-cut limestone blocks as large as 1 x 1.5m. It is divided on the interior by 0.5m walls, and has flagstone floors (no mosaics are visible at this point, and only a few tesserae have been found) on at least three levels. Some Byzantine pottery is present, and we have noticed what appears to be some reconstruction using a low-grade, grey sandstone from a quarry site approximately 2km to the SE. Architectural fragments such as column drums and bases, door-jams and decorative pieces, made of the same grey sandstone, are strewn around the area, and also on the slopes of the tall below Field UA (the highest point on TaH). There is a raft of speculation on the nature of this monumental structure, but we have no definitive answers at this point. Perhaps it was some sort of 'country estate', bath house, or pilgrim 'guest house'. Extensive excavation will be necessary to reveal its purpose.

The Islamic Periods

Thus far relatively few pottery sherds from the Islamic periods have been found, suggesting that any such presence at the site is likely inci-

dental (see **Fig. 17**).

Insights, Conclusions and Recommendations

The first four seasons of exploration and excavation at Tall al-Ḥammām have been successful in clarifying several geographical and stratigraphical issues, and have also provided a good foundation for the balance of the Project. Of course, many new questions have arisen that must be answered in future seasons. Not only has the excavation proper managed to clarify a great deal on the upper tall relative to IA2 sub-phasing and the clarification of the inner MBA rampart system of the site, but also it has given us a dramatic look into the EBA, IBA and MBA occupations on the lower tall vis-à-vis clear stratigraphic horizons.

Additionally, the completion of the topographical and area surveys — including dolmens, tombs and related town / village sites — has given us a much clearer picture of TaH's central role in the history of the eastern Jordan Disk and the region in general. Indeed, at approximately 36 ha, the sheer size of the heavily fortified Bronze Age city (EBA, IBA, MBA) — with its many satellite towns and villages tightly clustered around it — will certainly shed new light on the interpretation of the evolution of urban polities in the Transjordan context.

It is becoming increasingly clear that most of the archaeological sites in the vicinity, upon which interpretive analyses of the Transjordan Bronze Age have heretofore been based, were, in fact, subordinate satellites within the gravity of Tall al-Ḥammām's political influence (cf. Levy, Daviau, Younker and Shaer 2007; Adams 2008)²². This is no casual cluster (cf. Savage, Falconer and Harrison 2007). What we are witnessing is an EBA / IBA / MBA city-state configuration of significant proportions that, until the present work at Tall al-Ḥammām, had not found its way into any of the past or recent discussions of the Transjordan Bronze Age²³ (cf. Dornemann 1983; Najjar 1992; Savage, Falconer and Harrison 2007; Falconer, Fall

22. Tall al-Ḥammām and its intimate geographical cluster of sites is systematically absent (save for a few graphs of site-size comparisons listing TaH at 15 ha) from all past and recent discussions of the Transjordan Bronze Age both for the southern Jordan Valley, and Jordan in general. The only exception to this is the 1990 probe

excavation on TaH by Kay Prag (Prag 1991). Dr Prag was, and is, well-familiar with the size and prominence of TaH, but her work at the site is little known and less considered. Drs Prag and Collins explored the expanse of Tall al-Ḥammām together at the end of the 2009 season.

and Jones 2007; Falconer 2008; Palumbo 2008; Philip 2008).

The complex Bronze Age fortifications at Tall al-Ḥammām, including outer and inner city walls and mudbrick / earthen ramparts, are reminiscent of some Bronze Age urban centers in Mesopotamia (Burke 2004). TaHEP will surely add to our understanding of the Transjordan Intermediate Bronze Age (aka EB IV or Intermediate EB - MB), as all indicators seem to support the supposition that Tall al-Ḥammām was both large and fortified during that enigmatic period, and surrounded by smaller IBA sites — such as Tall Iktānū — in close proximity (cf. Richard and Long 2007), for which a city-state interpretation is certainly not out of the question²⁴.

Although not as large as the Bronze Age occupation, the Iron Age city at Tall al-Ḥammām was obviously an important crossroads center that played a considerable role in the local socio-political milieu. Without a doubt, the excavation of TaH will contribute a wealth of new information for all of its represented periods. It is possible that it has direct links to Solomonic Jerusalem and the subsequent Israelite hegemony as a Transjordan district commercial center.

As is now widely acknowledged, Tall al-Ḥammām and its Bronze Age neighbors remain a logical geographical epicenter for the rise of the Cities of the Plain tradition codified in historical sources (particularly the ancient book of Genesis), an observation not lost on several sectors of 19th, 20th and present scholarship (Tristram 1874: 330-333; Thomson 1882: 371-376; Collins 2002a, 2002b, 2002c, 2008; cf. MacDonald 2000: 45-61). That the enduring and powerful presence of Tall al-Ḥammām and its associated towns and villages on the eastern Jordan Disk during the Bronze Age gave rise to the Cities of the Plain (Disk) tradition is a reasonable hypothesis commensurate with the available geographical and archaeological data.

Finally, the continuation and building of relationships with local officials and residents, the extensive exploration of area geographical features and archaeological sites, and the experience of working side by side with our colleagues from the Department of Antiquities, have all come together to build positive expectations for the future of TaHEP.

We strongly recommend that the work of TaHEP continue, with the anticipation of providing significant contributions to the archaeology of Jordan and the entire region.

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23. This is not meant as a criticism, simply a statement of fact. One cannot expect an unexcavated, unpublished site, regardless of its size, to play a very large role in the interpretation of a regional archaeological picture, however inaccurate the picture may be without it. New interpretations will arise as information from Tall al-Ḥammām is integrated into the available corpus of archaeological data. But again, Prag's probe excavation report and description of TaH have been available

since 1991, so it cannot be said that information about the site was altogether invisible.

24. Once again we have an example in which a secondary townsite, Tall Iktānū, had, by default, become the interpretive epicenter for understanding the IBA in the southern Jordan Valley, even for much of the region. Tall al-Ḥammām will now be able to interject relevant data from a primary IBA urban site into the discussion.

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UMM QAYS: PRELIMINARY REPORT ON THE 2008 SEASON

Ken Matsumoto and Jafar Telfah

Introduction

Between August and October 2008, an archaeological team from Kokushikan University, Tokyo, Japan, conducted a second season of excavation at Umm Qays, ancient Gadara, in the lower city north of the main street or *decumanus maximus*, near the Early Roman gate (**Fig. 1**). The team was directed by Prof. Ken Matsumoto, Director of the Institute for Cultural Studies of Ancient Iraq. The excavated area extends over a wide area north of the main street, inside City Wall. The goal was to explore the nature and extent of the basalt wall which was discovered last season.

The Mosaic Pavement and Basalt Wall

The foundation of the basalt wall (**Fig. 2**) was excavated during the 2007 excavation season, and was the subject of further exploration this season. Upon excavation, it became clear that this wall is part of a huge structure associated with a mosaic pavement. Approximately 40m. of this east-west wall was excavated; its eastern end hadn't been reached by the end of the season. The wall turned to the north and was constructed of limestone blocks approximately 0.45m wide; the mosaic pavement was laid alongside it. Erosion has probably destroyed its north-west end, but in the north-western part of the excavated area almost three courses of stonework were preserved. Bedrock was reached at grid N11.

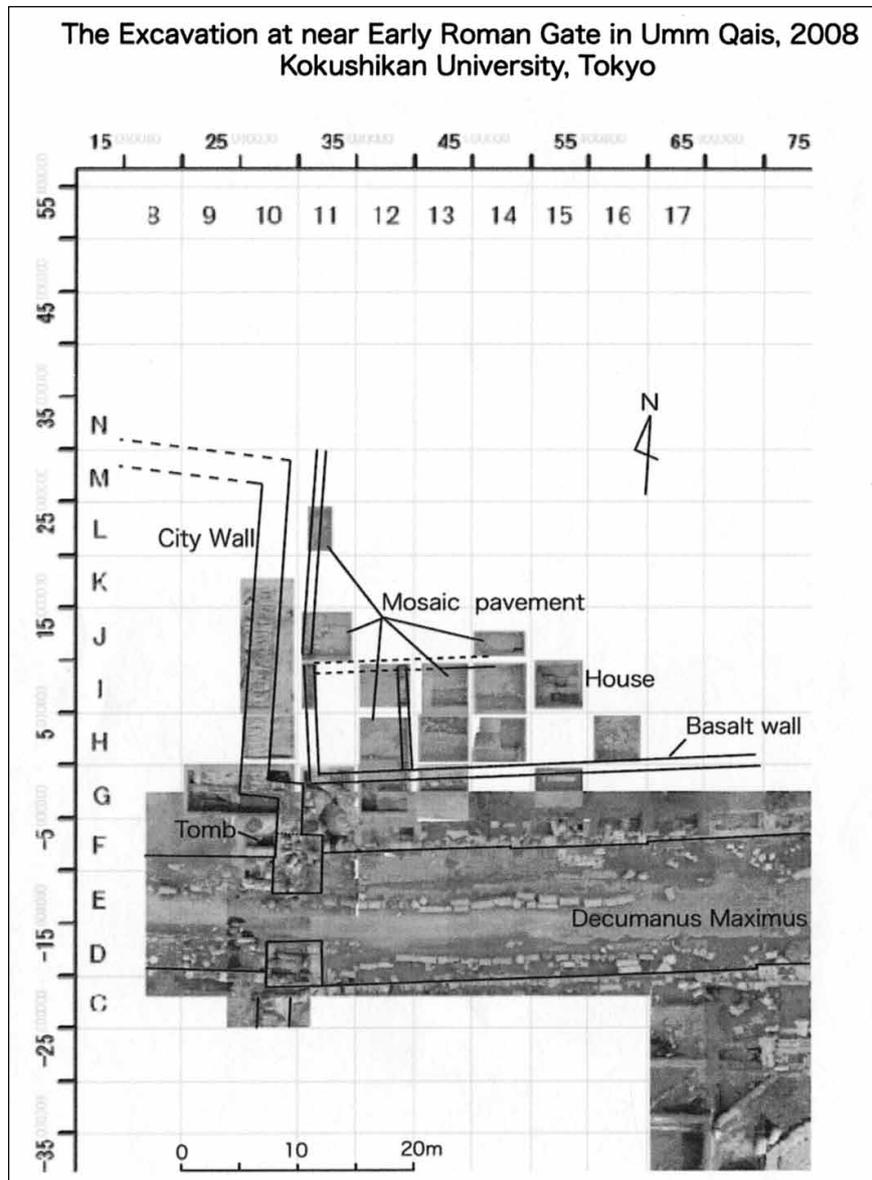
Excavation in the area north of the main street revealed a mosaic pavement, which was damaged or destroyed by military installations in squares I15, I14, J14, I13, H13, H15 and G16. These probably date back to 1967 (**Fig. 3**). It was decided to remove some of these installations, which exposed a hard, thick layer of white cal-

cite underneath. This deposit contained considerable quantities of plain white tesserae, many in clusters adhering to their original cement. Only scattered remains of mosaic patches associated with the paved foundation remained *in situ*. The original paving in the eastern part of the structure was a mosaic floor, paved with large plain white tesserae, which had unfortunately been completely destroyed during construction of the military installations. However, a partially preserved polychrome mosaic floor was excavated along the western part of structure (**Fig. 4**). The western part of the excavation area was entirely covered by a mosaic pavement. An almost complete floor was excavated in square H12; it was set within a double frame, with a central pattern that was hardly damaged. The colors of white, black, red and grey were used (**Fig. 5**).

Along the eastern end of the main mosaic floor, in squares H12 and I12, several rectangular alignments of well-cut limestone were found running north-south. These stones are bonded to the south-west end of the basalt wall (G12), which confirms that the mosaic pavement was an integral part of the basalt wall. The exact function of these stones is uncertain. However, the stones seem to separate the eastern and western mosaic pavements of the structure. Another extension of the mosaic was found in square J11, located in the north-west of the excavation area, which has been partly cleaned. This showed that small-sized white and red tesserae were used in this mosaic pavement. Large quantities of roof tile, and marble fragments with several iron nails were found in the thin soil layer that covered the north-west part of the mosaic pavement.

Residential Area

There are two main domestic areas which



1. Map showing the excavated area near Main Street.

have been excavated at the site; both are located south-west of the Acropolis Hill and have been dated to the Late Hellenistic to Early Roman periods (Kerner 1997: 287-289). The recently excavated domestic area is in the lower city, located on the northern slope overlooking Lake Tiberias.

Underlying the destroyed foundation of a mosaic pavement, a thick layer of very hard calcite, sloping down from west to east and containing large quantities of small and medium basalt chippings, was excavated. Its nature and extent indicated that this layer was a fill that had been deposited over the entire excavated area.

It was decided to remove this layer completely, which exposed the remains of a series of walls (Fig. 6). The main wall was located under the eastern balk of square H15, ran north-south and was built of both basalt and limestone. It is part of complex of four walls, forming the sides of a square structure consisting of two rooms adjacent to each other. These were partly excavated; the walls varied in height from 0.40 to 0.50m and were built of large and medium sized limestone and basalt blocks; small chippings of basalt and limestone filled the spaces in between. The interior faces of the walls display extensively preserved white plaster over a thick layer



2. Foundation basalt wall (square G11).

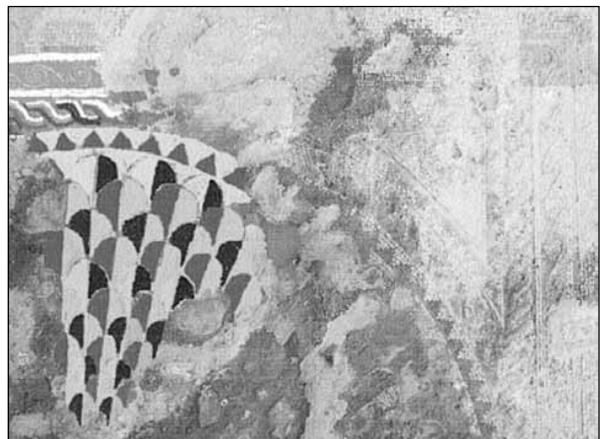


3. Defensive as a fortification on top of calcite layer (I15).

of mud plaster. The most significant plastered wall, situated in squares H15 and I15, was built of well-cut, large limestone blocks. Three courses of the wall remained; its unexcavated interior face seemed to be covered by a thin layer of fine, white lime plaster. Another rectangular room with an entrance and plastered corridor was partly excavated. The only entrance for the rooms was found in the north-east corner of the main eastern wall in square I15, and led to a room to the west. The doorway, 0.50m wide and 1m



4. Mosaic Floor , Main Carpet (H12).



5. Image design of Mosaic Floor (H12).



6. Top view showing the plastered rooms (H15 and I15).

high, was completely blocked, probably during later phase (**Fig. 7**). The fill inside these rooms was a thick layer of compact reddish soil, with several fallen large limestone blocks retaining traces of white plaster (**Fig. 8**). Numerous fragments of collapsed cornice and soft lime plaster



7. Blocked doorway in main eastern wall (I15).

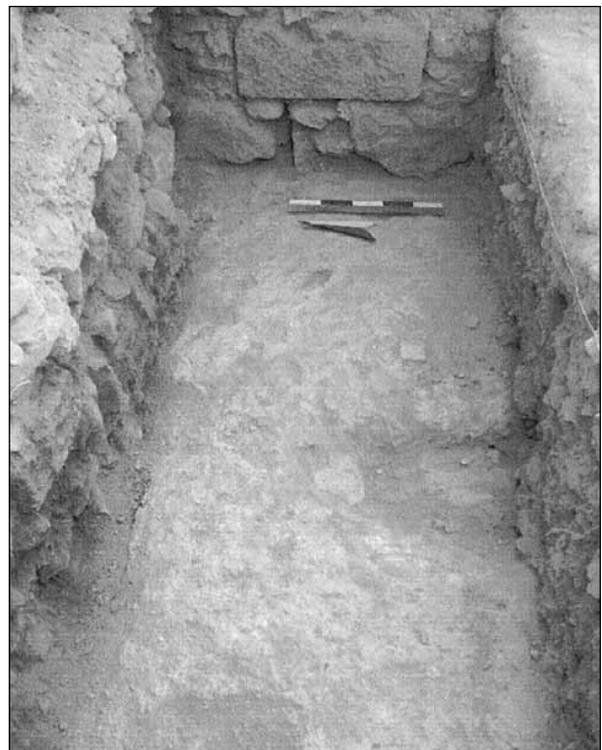


8. Debris inside room, including fallen blocks and plaster (I15).

were found; they probably belong to the ceiling. Fragments of colored plaster were found in the room fills, and provide evidence of decoration. However, none of the colored plaster fragments were *in situ*. The decoration consists mainly of wide horizontal bands of red, yellow and pink on a white background, which may have been part of large geometric design. The pottery from the fills included fragments of Megarian ware, roughly dated to around the late first century BC-early first century AD.

Excavation in square I15 reached a possible floor level at the base of the structure (**Fig. 9**). This consisted of small and medium stones, covered with a layer of compact white clay. It was decided to excavate a probe near the north-west plastered wall, located in the middle of square H15, in order to reach the foundations and recover some material with which to date the wall. Underlying this possible floor level, several east-west alignments of rectangular limestone and basalt blocks were found; these blocks averaged 0.40 by 0.60m in size. One was removed, and an east-west wall of large, well-cut limestone blocks was excavated. It was noticed that this wall extended along the eastern parts of squares H15 and I15, upon which the main east wall of the rooms was erected. According to its location, construction and orientation, it is probable that this wall represents an earlier phase of construction. Furthermore, it seems that the occupants of these rooms reused this earlier wall as a foundation, for their structure.

Further to the north, excavation revealed huge basalt wall (**Fig. 10**), located under the northern balk of square I15. The wall survives to a maximum height of 0.80m. The upper courses were probably removed and reused by the Army



9. Room compacted soil level (I15).



10. Basalt wall, and its foundation cut into floor level. Note the fortification's foundation to the left (H15).

for military purposes. The bottom of the wall was reached, where traces of ashy material were noticed. It became clear that the wall's foundation cut into the room's floor. The exact function of this wall is uncertain. Owing to the limited area of excavation, military installations and presence of irremovable mosaic patches, it was difficult to expose and date an entire house plan. This will be attempted next season.

Square H16

It was decided to excavate a square, H16, located east of square H15 in order to expose a blocked doorway and debris from square H15. This included various architectural fragments, e.g. blocks, limestone column drums etc. Moreover, it was noticed that these fallen stones (**Fig. 11**) included a complete Ionic basalt column which had fallen from east to west, indicating that these stones originated from a fallen structure located in square H15 to the east.



11. Debris of square H16, fallen stone, Ionic column in the right corner.

Squares G15 and G16

These two squares were opened in the southern part of excavation area, in order to expose the extension of the basalt wall foundation. In square G15, excavation revealed a staircase (**Fig. 12**) leading from the northern stylobate of the street to the north. It was attached to the outer face of the basalt wall, and was 2.70m wide. Three limestone steps were preserved *in situ*, with more being scattered across the excavation area. The full extent of the staircase to the north could not be determined, and no remains of an associated structure were found. The function and date of this feature is still obscure, although the stairs probably belong to a later phase of construction. Further evidence of a later phase(s) of construction appeared in square G16, where several simple walls were constructed of reused architectural fragments, e.g. shaft column, capital and large blocks. These were associated with a compact light brown surface, from which a large quantity of animal bones was recovered. The most interesting discovery in this square was an inscription (**Fig. 13**) found on a limestone column framed by a *tabula ansata*.

The excavation of a house in the lower city has resulted in promising discoveries, which will hopefully shed light on the settlement plan and early residential history of ancient Gadara.

Phasing

Recent Activity

The excavation area appears to have been intensively used by the Army. Several military installations and pits were identified. These



12. Staircase (G15).



13. Latter phase of construction. Inscription on lay out shaft column bottom of figure (G16).

cut into archaeological deposits, causing widespread destruction of the mosaic pavement and bringing earlier material to the ground surface. All of the military installations and pits extended down as far as the top of the white calcite deposits, which were utilized as floors.

Constructional phases

The thick layer of white calcite deposits contains a large quantity of limestone and basalt chippings. The layer slopes down from north-west to south-west and extends as far as the top of the main, east wall of the plastered rooms. It covers a large amount of the excavated area, which suggests that it was deposited to cover or conceal the collapsed plastered rooms. It is possible that it served as leveling fill for a later mosaic floor.

The huge basalt wall, which runs east-west through square I15 in the northern part of the plastered rooms, is associated with a later phase of construction. Its foundations were excavated and found to be associated with ashy deposits derived from firing activities. The wall cut into a possible floor level in the northern plastered room. Its function remains uncertain; further exploration of this area will be one of the aims of next excavation season.

The remains of east-west and north-south walls, constructed of large and medium blocks of soft limestone, suggest that these walls originally belonged to an earlier structure, and were subsequently covered and reused to level the floor and act as foundations of the plastered room.

The Finds

Almost all excavated deposits were sieved, and a rich variety of finds and objects listed, documented and computerized. They will be published as a separate appendix once analysis and classification is complete. Brief descriptions are however provided here.

Roof Tile: Many hundreds of red roof tile fragments and iron nails were found in a thin soil layer just above the mosaic floor. However, none of them were found *in situ*, especially in the north-west area of the floor. A study of their sizes and shapes could shed light on details of roof construction.

Marble: A considerable number of green, white and red marble fragments, thick and thin alike, were found in different areas close to the upper surface of the mosaic floor. The most significant of these were numerous decorative and inlay fragments, some representing leaves or flowers. These probably belong to a geometric design similar to that found in the church excavated at Pella (see Smith and Day 1988: 95, Pl. 24A-C).

Plaster: A substantial amount of plain white wall plaster remains *in situ*. Only a few pieces of painted plaster were recovered; these include red and yellow fragments, some of which have geometric designs represented by thin bands of red and yellow on a white background. Several pieces probably belong to a ceiling cornice.

Glass: Many pieces of glass were found, but few came from well stratified deposits. These await analysis.

Metal: Several iron nails were recovered from the mosaic floor surface and plastered rooms. Other metal finds include pieces of slag, which await analysis.

Coins: Seventy one coins were recovered during the excavation. Of these, five were well preserved, but none were useful in dating the mosaic floor and plastered rooms.

Inscription: One soft limestone column, with nine scratched Greek letters framed in a *tabula ansata*, was found in square G16, in a simple structure located behind the northern stylobate of the main street. The column was reused as part of a wall. It awaits analysis.

Acknowledgements

Our thanks go first and foremost to the Director General of the Department of Antiquities

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RESTORATION AND EXCAVATION AT AL-AZRAQ CASTLE DURING 2008

Ahmad Lash

Introduction

The restoration and excavation works conducted in 2008 complement those of 2006, which included restoration of Wall 20, excavation in Room 36 and redocumentation of all architectural features. The latter consisted of renumbering all rooms, entrances, walls, windows, arches and arrow slits, and describing these features in full detail. Each architectural feature was measured and photographed separately. During this documentation 46 rooms, 88 walls, 31 arches, 82 entrances, 27 windows and 63 arrow slits were identified, in addition to a bath house on the western side of the castle which was uncovered during excavations carried out by the Desert Castles Office in 2002.

Some of these features are original, whilst others are later appendages dating particularly to the period when the Druze used the castle. The Druze settled in al-Azraq castle following the outbreak of the Syrian revolution against French imperialism. They came to al-Azraq in 1925 with their families. They stayed in the castle, renovated its rooms and distributed them amongst themselves. We have documented the names of all these families and the rooms they occupied, and recorded the testimonies of some of the survivors of that period. One room, and ten windows, was added at that time.

In 2008, work focused on the following:

1. Reconstruction of Wall 22,
2. Excavation in Rooms 37 and 45, and completion of excavations in Room 36,
3. Excavation at the south-east corner of the castle courtyard.

Thanks are due to all involved in the project: archaeologists Ola al-A'war and Kefah Abu Assi, stone mason Jehad al-Shomari, Adib Abu Shmais and Jehad Haroun who identified

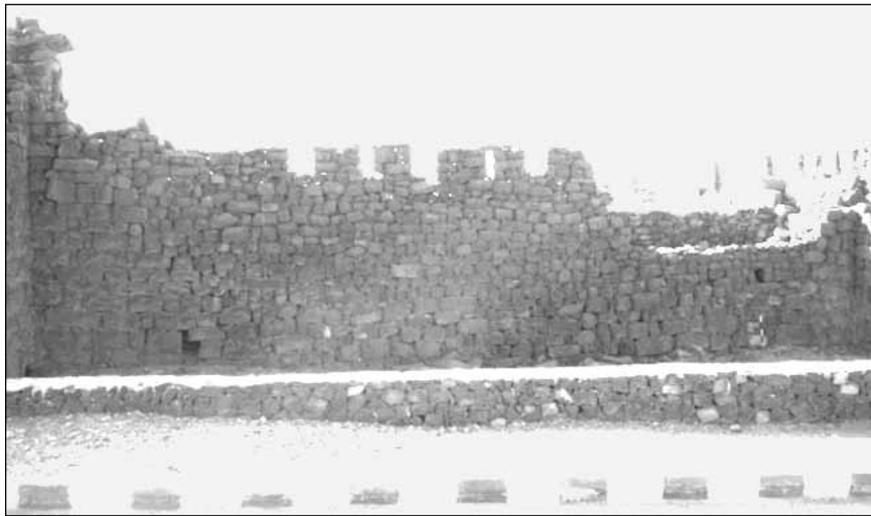
the pottery, Lisa Maher and Tobias Richter who identified the chipped stone, and draftsman Jamal Safi. Special thanks are due to the Directorate of the Department of Antiquities, which provided all possible and available assistance.

Reconstruction of Wall 22

Work began with reconstruction of Wall 22, which is 22.85m long and forms the south-western façade of the castle and the western wall of Rooms 12, 13, 14 and 15. It is not of even height, as some parts of it were subject to collapse and the ground upon which it is constructed slopes down from north to south. In this context, its height ranges from 6.15 to 4.40m, and its width from 1.17 to 1.40m. In the center of the wall, at the level of the arrow slits, its width is just 0.80m. There are three windows and two arrow slits in the centre of the wall, which were added at a later period, probably during the Druze occupation of the castle or in the late Ottoman period.

Perusal of the photographs and elevations included with this article immediately demonstrates the poor condition of Wall 22, especially in its middle portion where construction consists of largely random placements of relatively small stones. The wall was therefore in imminent danger of collapse (**Figs. 1, 2 and 3**).

It was therefore necessary to dismantle the central part of the wall, which was built at a later date, whilst maintaining the southern corner in its present condition and carrying out minor adjustments to the northern corner stones by pushing them slightly inwards, to align them with the remaining parts of the wall. Owing to its proximity to central Tower 4, which leans slightly outwards, the northern corner had adopted a slight slant to the west.



1. Wall 22 before reconstruction (looking to east).



2. Wall 22 before reconstruction (looking to north from the top).



3. Wall 22 before reconstruction (looking to north).

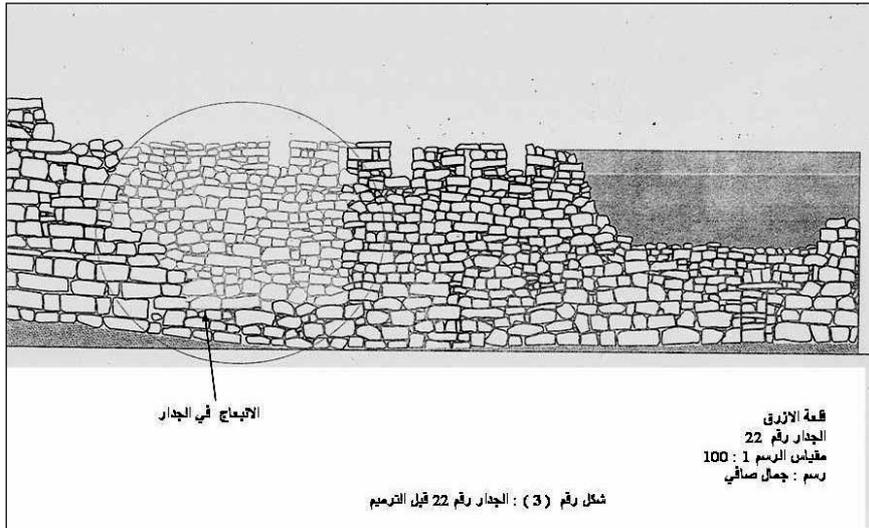
Before dismantling the wall, it was drawn and recorded (**Fig. 4**). Each stone was given a number and its dimensions recorded, so that it could be restored to its original location in the event that our work required it to be moved. Be-

fore work began we dug a test trench, 230cm long, 120cm wide and 211cm deep at the southern corner of the wall to establish the depth of the wall's foundations and relative position of the bedrock.

During excavation of this trench, a number of layers were revealed, some recent and some occupation deposits containing pottery of late Roman and Byzantine date. It is clear that we reached prehistoric strata, *viz.* layers 4, 5, and 6, where we found 31 chipped stone artefacts, some dating to the Middle Palaeolithic.

After dismantling the wall, we dug a 1m wide trench along the length of the wall foundations in order to assess whether or not the foundation stones could be reused. Five stones were replaced because of their poor condition. After photographing and documenting the foundation stones, we refilled the trench by placing white mortar in its base then, in order, an earth layer, a plastic layer, a gravel layer, a blend of white mortar with earth layer and finally an earth layer, (**Fig. 5**) so as to form a barrier against moisture and salts in order to protect the wall foundations.

The wall was reconstructed in the original manner, clearly visible where the stones had not been dismantled at the northern and southern corners, adjacent to corner Tower 3 and central Tower 4. Only earth available in the castle courtyard was used to bind the stones in place. Every course of stone was in turn covered with this earth; the central part of the wall was also packed with it.



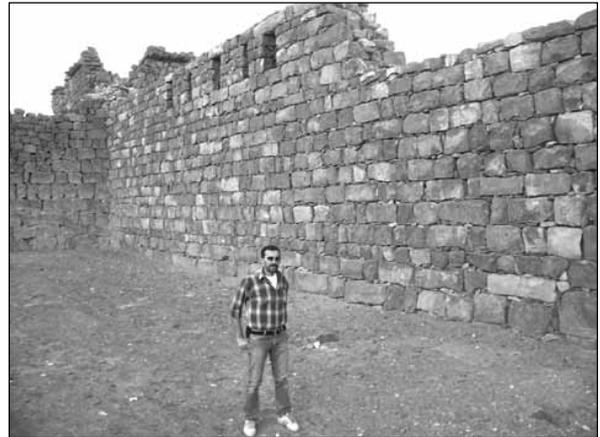
4. Wall 22 plan before reconstruction.



5. Wall 22 after dismantling (foundation preservation process).



6. Wall 22 after reconstruction (looking to east).



7. Wall 22 after reconstruction (looking to north).

It is worth noting that there is a recent entrance, built by the Druze in the 1920s, at the southern side leading into Room 12. We did not rebuild it from the outside, because it conflicts with the nature of the wall, but kept it in place on the inside to signify the utilization of the room at that time (Figs. 6, 7 and 8).

After the completion of the wall rebuilding,

we applied clay to the ceiling of Roof 13 which was rebuilt during the 2006 season. We also plastered the internal walls of this room using white mortar, *Suwayliḥ* sand and earth. The floor was rendered in the same way. Electricity was put in and wooden doors made in the traditional Arabian style. The room will be used to display artefacts excavated in the al-Azraq area.



8. Wall 22 after reconstruction (looking north from the top).

Discussion

Excavation in selected parts of the castle was also amongst the objectives of the project. These were conducted in Room 45, Rooms 36 and 37, as well as in the south-eastern corner of the castle courtyard parallel to Room 45, in the form of a trench 13m long by 5m wide.

Excavations were carried out in these areas for two reasons. First, to complete the excavation of the architectural features expected in the eastern part of the castle. It seems that this area is covered with layers of fill, as the ground slopes down towards the east. Second, there were still significant gaps in our knowledge of the castle's history. Much archaeological work was done in the vicinity of al-Azraq castle during the last century, by Bell, Musil, Lawrence, Crawford, Stein, Rees, Maitland, Field, Glueck, Harding, Parker and others. Mr. David Kennedy conducted an expanded study on al-Azraq Castle and the Latin and Greek inscriptions, which were found. These studies are among the most important studies on al-Azraq Castle. Mrs. Neveen Hashash obtained a Master Degree on al-Azraq Castle.

However, most of these studies focused on the Roman, Byzantine and Ayyubid periods. Consequently, questions about other periods remained unanswered, specifically concerning whether or not the castle was occupied during the Nabataean, Umayyad, Abbasid and Ottoman periods. It is well known that the al-Azraq area is referred to in many historical sources on account of its militarily and commercially significant location, as well as its position on the pilgrim route from Damascus to Mecca.

From historical evidence and archeological

indications, it is clear there was a trade route connecting the Arabian peninsula with the Levant via Wādī as-Sarḥān. Al-Azraq is located at the northern end of Wādī as-Sarḥān, from where the route headed up to Umm al-Quṭṭayn (via Rujum al-Madāwir, Tulūl al-Manāsif ash-Sharqī and Dayr al-Kahf) and on to Damascus via Busra. Other routes led south from al-Azraq to Bāyir, al-Jafir, Ma‘ān and on to Ḥijaz through Tabouk, or to Sinai and Egypt through al-‘Aqaba.

There was also a route that linked al-Azraq Oasis with western areas, such as ‘Amman and al-Balqā’, which passed through al-‘Uwaynid, Quṣayr ‘Amrah, al-Kharrānah, Mashāsh and al-Muwaqqar.

During the Umayyad period, al-Azraq was not as important in military terms as it was during the Roman and Byzantine periods. It was mentioned by Ibn al-Atheer, who wrote that “al-Waleed went out with people of his court and supporters, and he mounted down at al-Azraq at a water place in Jordan”. An indication that Al Waleed II Ibn Yazeed Al-Tabari also mentioned the same.

The strategic and military importance of Transjordan in general, and al-Azraq in particular, revived during the Ayyubid and Mamluk periods. The Ayyubids realized the strategic importance of al-Azraq during their operations against the Crusader occupation of Palestine and south Jordan, which posed a threat to communications between Egypt and Syria, and to the pilgrim road between Damascus and Mecca. In this respect, sultan al-Naser Dawood ordered the rebuilding of the Castle in 1236 AD / 634 AH. Izz Eddeen Aybak restored it, who was assumed the position of (Usta Dar)

The military importance of al-Azraq increased during the Mamluk period, when the Mongols began to make their way towards Iraq and Syria on their way to Egypt, in co-ordination with the Crusaders. This posed a real danger to the existence of the Mamluk state, as well as a threat to the holy cities of Mecca and Madina.

During the Ottoman period, al-Azraq was one of the stations on the pilgrim road into the Arabian peninsula. During the early twentieth century, al-Azraq Castle was used by Prince Ali bin al-Hussein and T. E. Lawrence (Lawrence of Arabia) as a base from which to launch the Great Arab Revolt towards Damascus. The last

utilization of the castle was by groups of Druze during the Syrian revolution against the French imperialism.

During the period of the Transjordan emirate, a force of border guards was formed at al-Azraq. This all demonstrates how the importance of al-Azraq fluctuated according to wider social and military conditions.

Excavation

The 2008 excavations yielded interesting results, as we exposed new architectural features such as Room 45, (Fig. 9) situated at the south-eastern corner of the castle, between south-east Tower 10 and Room 46. The area of this room is 43m² it consists of Wall 81A at the southern side, Wall 82A at the northern side, Wall 83 at the western side and Wall 79C at the eastern side.

It seems that the southern wall was pulled down and a new wall built adjacent to the original foundations; two new entrances also were built for this room. During excavation, 29 layers were revealed over the foundations. Further, the original foundations of Wall 81 were discovered. These extend east-west into this room, are 11.40m long, 1.40m wide, 1.80 to 2.25m high and consists of two rows of large stones. Five or six courses of the wall survive. A north-south wall was also discovered, which divides the room into two parts; it was designated Wall 89 and is 2.42m long, ca. 0.80m thick, between 1.75 and 2.15m high, and consists of seven to eight courses and two rows of stone. An entrance was discovered at the north-western corner of the room, which leads to the castle courtyard. This



9. Room 45 before excavation (looking to east).

was designated Entrance 83, and was 180cm high and 110cm wide. It consists of five courses constructed over the original floor of the Castle. This room was rebuilt by Mr Qasem al-Atrash during the Druze occupation of the castle in the 1920s. Late Roman, Byzantine, Umayyad, early and late Ayyubid, and Ottoman pottery was discovered during these excavations. In Layer 4 we found part of a milestone with a four line Latin inscription; the diameter of this part of the stone was 18cm and its height is 27cm. Excavation was focused on the western part of this room, where we reached bedrock (Fig. 10).

Excavations were also conducted in the Castle courtyard, parallel to Rooms 45 and 46, by digging a 13 by 5m trench adjacent to Wall 82, which also forms the northern wall of Rooms 45 and 46. This area was covered by stones arranged in the shape of a square following maintenance carried out by the Department of Antiquities in 1975 (Fig. 11). The courtyard of the castle measures 63.38m internally from west to east, over which distance it slopes down by 2.27m. The idea we bore in our minds is that the courtyard could slope down by more than this amount, as it is covered with layers of natu-



10. Room 45 after excavation (looking to west).



11. courtyard before excavation (looking S.W.).

ral and occupational fills. The Druze apparently changed the architectural features of the courtyard more than any other part of the castle. In the excavated trench, we found 31 occupation layers dating to recent, Ottoman, Mamluk, early and late Ayyubid, Umayyad, Byzantine and late Roman periods. A few pieces of Pottery Neolithic chipped stone were found on bedrock.

Only two pieces of Nabataean pottery were found, which suggests that there was not a Nabataean settlement at the castle. We also found one piece of Fatimid pottery. In Layer 7, we found a nineteenth century handmade Ottoman jar. In Layer 20 (Fig. 12), we found a pottery bowl dating to the same period (Fig. 13). In addition, we exposed an entrance leading to Room 46. In the eastern part of the trench, we found a north-south wall, 5m long, 0.98m wide, with a height of 35 to 105cm; it was designated Wall 90 (Fig. 14).

Room 37 is situated in the eastern part of the castle between rooms 36 and 38. It is 5.60m long,



12. Ottoman pottery jar found in courtyard trench (layer 17).



13. Ottoman pottery bowl found in courtyard trench (layer 20).

3m wide, and consists of the following walls: Wall 68B in the west, Wall 65 in the north, Wall 70 in the east and Wall 69 in the south. It has two entrances, Entrance 60 in the west which overlooks the castle courtyard, and Entrance 59 in the north which leads to Room 36. There are also two arrow slits in the western wall, and a north-south arch. In this room, there have been many alterations of the architectural features, especially on the western side. The arch stones are not of the same size and shape, signifying that it was rebuilt during consecutive periods.

During excavation of this room, it was found that it contained many episodes of infilling and that many deposits were truncated in the northern part of the room. Ten layers were identified. Some of them were recent, others were mixed as a result of the abovementioned disturbance to the stratigraphy, and some contained small fragments of plaster. The most important layer was Layer 6, which is identical to Layers 12 and 16 in the courtyard trench, and Layers 14 and 16 in Room 45. It is a compact layer of earth in the form of a floor, with clear traces of fire. The earliest floor of the room is paved with stones, and is situated 90cm. below the current courtyard surface. This room was reused during the Druze settlement period at the castle by Mr Zaid Isaid.

Among the important discoveries in this room was a west-east channel, built of two rows of uncovered stones with a stone-paved base. It flows from the base of western Wall 68B down to the east towards Wall 70 and has the appearance of a drainage channel leading out of the



14. Courtyard trench after excavation (looking S.W.).

castle courtyard, passing through Room 37. This channel is 290cm long, *ca.* 40cm deep, and 40 to 50cm wide (**Fig. 15**). This channel may be related to a not yet fully exposed architectural feature in the castle courtyard.

To the north of Room 37, excavations were conducted in Room 36(1) which is adjacent to the water well in the eastern part of the castle. It consists of Wall 64 in the south, Wall 66 in the north, Wall 65 in the east and Wall 67A in the west. It also includes two arrow slits. It has a main entrance at the western wall which leads to the castle courtyard, Entrance 58. There is also an entrance connecting it with Room 37, Entrance 59. The arch foundations are 56 cm. above the modern floor level of the room. This



15. Room 37 after excavation (paved water canal).

arch consists of 25 stones of varied shape and size, which supports the hypothesis that it was rebuilt in later periods. The length of this room is 5.80m and its width 4.12m; the south-west corner was restored by the Department of Antiquities in 1975 and 1977.

As a result of natural factors that affected the castle in successive periods, especially earthquakes, as well as deliberate destruction, restoration and renovation, many of the archeological deposits in this room have been disturbed. There were many mixed layers and fills, especially in the eastern, northern and central parts of the room. During the excavation, we identified parts of ten occupation layers, many of which contained mixed pottery assemblages. This room was used during the Druze settlement period by Mr Thoqan al-Qadi.

As for the architectural features, western Wall 67A was built in two phases. It was originally built with large stones with an average size of 80 by 50cm, whereas the size of the stones in the upper part of the wall averaged 60 by 28cm. Additionally, as in Room 37 the remains of a stone-paved floor were discovered at the south-west corner of the room.

One of the important discoveries in this room was that of an earlier entrance, below the current entrance, on its western side which overlooks the courtyard of the castle. Most probably

it was the original entrance of the room before its reuse in subsequent periods. It is at the level of the original floor of the room, which we believe is the surface of the courtyard in the eastern part of the castle (Fig. 16). This entrance is 155cm high and 95cm wide; it is blocked from the west side by the fills which cover the castle courtyard. Here, the original floor is 175cm be-



16. Room 36 after excavation (modern and ancient entrances).

low the level of the current courtyard.

Conclusions

As a result of the 2008 excavations, it is clear that there are traces of limited Umayyad occupation in the castle. Moreover, there is both Ottoman and prehistoric occupation (middle Paleolithic (Fig. 17), as well occupation during the late Roman, Byzantine, Ayyubid and Mamluk periods. On the other hand, there is no sign of significant Nabataean occupation. We also confirmed that the original level of the floors on the eastern side of the castle was lower than the current level of the floors (Fig. 18), because the hill on which the castle was built slopes down towards the east. Future work may reveal architectural features in areas which are still covered with layers of fill.



17. middle Paleolithic flints tools found in southern wall 22 corner trench.



18. Courtyard ancient and modern level.

A. Lash: Restoration and Excavation at Al-Azraq Castle

In order to obtain more information about al-Azraq castle, more excavation is required on the eastern side of the castle. This is because most of the western parts of the castle have no depth of deposit as they are close to bedrock. The sole exception appears to be Rooms 11 and 12, which were infilled when the Druze settled in the castle, thereby preserving the lower deposits of these rooms intact.

Ahmad Lash
Department of Antiquities of Jordan

المصادر التاريخية
ابن الأثير
الكامل في التاريخ ج ٤، بيروت. ١٩٦٦
الطبري
تاريخ الرسل والملوك ج ٧. ١٩٧٠

ابن أيبك
كنز الدرر وجامع الغرر، القاهرة. ١٩٦٠

المراجع
درادكة، صالح
١٩٩٧ طرق الحج الشامي في العصور الإسلامية.
غوانمة، يوسف
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THE BORDERS OF ARABIA AND PALAESTINA PROJECT: 2006 FIELD SEASON, PRELIMINARY REPORT

Kate da Costa

The administration of the Roman Empire, into which much of modern Jordan fell from either the conquest of Pompey in 64 / 63 BC or the annexation of Nabataea in 106 AD, has been the subject of scholarly investigation since at least Mommsen published *Die Provinzen (The Provinces of the Roman Empire)* in 1885. It comes as something of a surprise then to find that the route of most provincial borders is completely uncertain. There is some evidence scattered across the empire, such as milestones, boundary markers (Breton 1980; Urman 2006: map 8), toponyms¹, pilgrims' itineraries (Geyer and Cuntz 1965), church attendances and literary efforts². Much of the epigraphic, direct evidence ceases by the end of the 4th century AD, and none of it is ever extensive. However, in order to understand what a province was for, and to try and reconstruct the reasons for restructuring territorial boundaries, we need first to better establish where the border lines ran. There is in fact abundant evidence with which to tackle the problem. Work in the southern Levant has shown that the distribution patterns of low-profit coarse wares is distorted in the later Roman and early Byzantine periods (roughly 250-650 AD)³. The likely cause of this distortion is not distance from manufacturing centre, or difficulty of terrain, but rather the presence of a customs duty on some major provincial borders. The tax, even if only 2.5 % (Jones 1964: 429 and 825; Sijpestejin 1987), and the time taken to pay it or get reimbursed, was sufficient to deter distributors of cheaper ceramics. These ceramic classes, generally, were sold only within the province of their manufacture.

Although some leakage across the border can be expected, the bulk trade in these types of ceramics — storage jars, lamps, cooking pots and basins — should run close to but not over the provincial border.

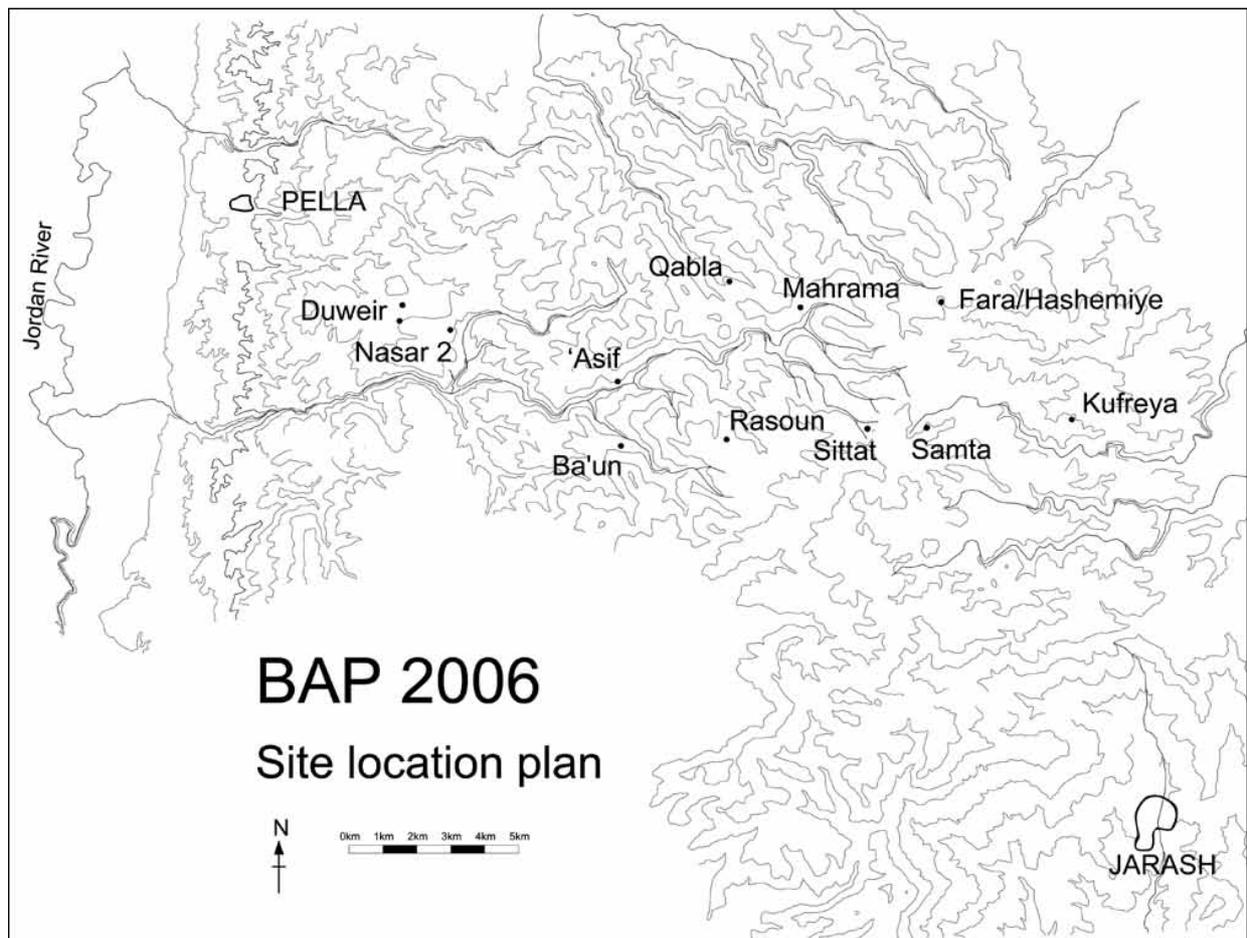
The Borders of Arabia and Palaestina Project is developing a new methodology based on targeted ceramic sampling to determine the route of Roman provincial borders. The project is using the area between Pella and Jarash as a case-study (**Fig. 1**) and will, in two field seasons, sample ceramics from up to 20 sites strung along the traditionally supposed route of the border between the Roman provinces of *Palaestina* and *Arabia*. For part of its length, this border is thought to be Wādī ar-Rayyān (previously Wādī al-Yābis), but east of the watershed there is very little indication of the border-line. We collect all ceramics found in our sampling squares, but are particularly focussing on material from the 3rd to 7th centuries AD.

In late 2006 the first field season took place, targeting sites previously identified in earlier surveys, including Wādī al-Yābis (e.g. Palumbo 1993), Wādī Ziqlāb (e.g. Banning 2001) and that of Mittmann (1970). Very little information is available for most of the sites we selected for sampling, and many were simply identified in previous surveys as having ceramics from the Roman / Byzantine period and usually have no plans or other information published. Additionally, the sites surveyed by Mittmann have been subject to more than 40 years of intensifying development pressure, and now often lie under villages or towns which barely existed in the

1. Ad Fines in Bosnia lies on the border line of Savia / Dalmatia (Talbert ed. 2000: Map 20E5).

2. Eusebius' Onomasticon; Ammianus Marcellinus' geographic digressions in Books XIV-XXVI, Res Gestae.

3. Magness 1993; *Galilee*: Adan-Bayewitz 1993; *Golan*: Hartel 2003; *Palaestina*: da Costa 2001b; 2003; *Pella*: Watson 1992.



1. Plan of BAP 2006 survey area with sites sampled.

1960s. We are aiming to document more fully the extant above-ground architectural remains of each site, within the time-constraints of the survey.

At each site visited, we attempted to maximise the recovered ceramic material by targeting our 5m x 5m and 1m x 1m collection squares in areas with relatively dense artefact coverage. One 5m x 5m square at each site additionally had the topsoil removed, and material collected from that. The 1m x 1m squares were used to obtain sub-surface ceramics. We spent between 2 and 5 days at each site, depending on the size of the site and the amount of ceramic and architectural material. Intensive study of the body sherds, as well as diagnostic material from each site, means that pottery processing will continue for some time.

Sampling was undertaken at the following sites:

Site name	BAP number	JADIS reference
Kh. Sāmtā	001	2219.018
Kh. Mahramah	005	2220.021
Bā'ūn	011	2119.008
Kh. ad-Duwayr	012	2120.027
Kh. Naṣṣār	013	2120.030
Kh. al-'Āsif	017	2120.035
Kh. Qāblah	026	2220.029
Kh. Sattāt	029	2219.012
Kh. Kufriyyah	036	2319.027
Kh. Fārā (now Kh. al-Hāshimiyah)	040	2220.031
Rāsūn	043	2220.022

Kh. ad-Duwayr (BAP012; Mittmann 117; Wādī al-Yābis 55)

SW corner of collection Square 3: 750071E 359093N, 420 m asl

Based on information from local informants and the UTM co-ordinates on JADIS, we selected the hillside NW of Kufr Abil, which had clear rock-cut rectangular shafts and basins, as the site of Kh. ad-Duwayr (Fig. 2). However, we were uncertain as to whether we were in the same location as that described by Mittmann in his survey (nr. 164). He did not mention any rock-cuttings, but did note the presence of an old house which we were unable to find. Fur-

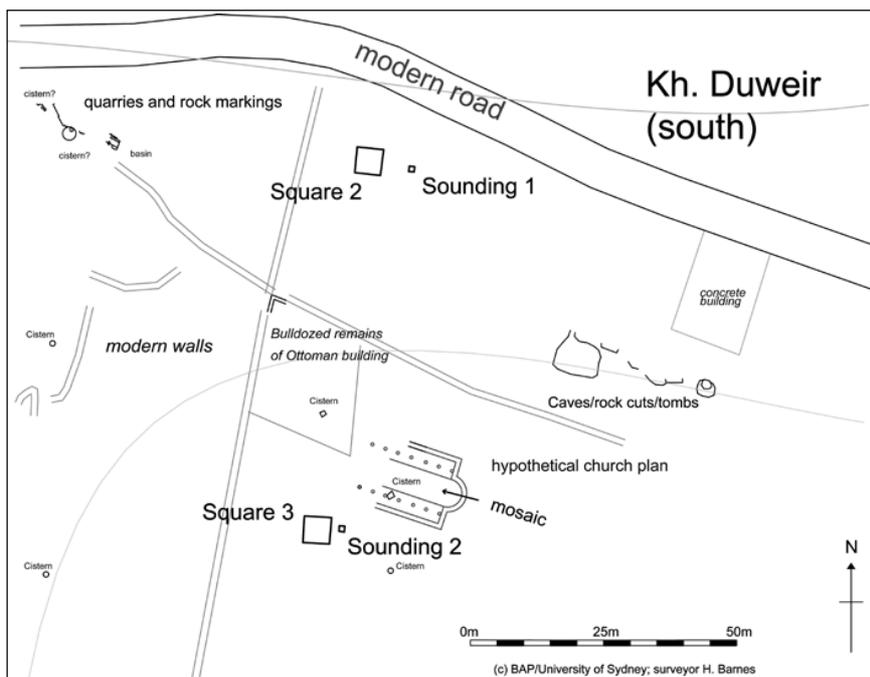
thermore, the pottery appeared small and water-worn, as if deposited from manuring.

Further questioning of the local landowners resulted in the discovery that the name “Kh. ad-Duwayr” referred to a much larger area, including a site to the south of the rock-cut shafts, where an Ottoman (possibly late 19th century) house had recently been bulldozed in order to eradicate snakes. A considerable quantity of large, sharply broken pottery was recovered from south of the bulldozer scar and, to the north, from the terraces of an olive grove. Significantly less pottery was found to the west of the private land boundary, although there were cisterns and an enigmatic series of rock-cuttings. These extend NW from a quarry, and consist of a small chamber flanked by triangular markers, with the edges of rectangular cuttings further to the NW. Excavation of the area may elucidate the function of the markers and basins.

A large in-situ mosaic survived the bulldozer, a small part of which was photographed. This clearly relates to a curved wall, with a section of straight walling to the north, and an apparently *in situ* column drum to the south-west. Given the carefully worked stones, some prepared for plaster rendering, considerable tesserae, and pottery in the bulldozer scar, our surveyor reconstructed a church on the site (Fig. 3). This would explain the limited visible architecture



2. Photograph of rock-cut shafts at Kh. ad-Duwayr (north).



3. Plan of Kh. ad-Duwayr (south).

and associated industrial rock-cut installations, along with the pottery which seems on first sight to be principally Byzantine.

Kh. Mahramah (BAP005; Mittmann 138; Wādī al-Yabis 62; Wādī Ziqlāb 60)

SW corner of collection Square 2: 762009E 3590227N, 971 m asl

The site is in two main sections, one large rectangular area to the south-west, and the main area of walling and vaulting to the NE (Fig. 4). A bedouin family currently camp on the northern section of the site, and some areas within the site have been cleared for tents and animal pens. Many rooms on the site have been robbed out, but not recently. The spoil from this robbing is probably confined to the south and south-east of the main area. Both the Wādī Ziqlāb and Wādī

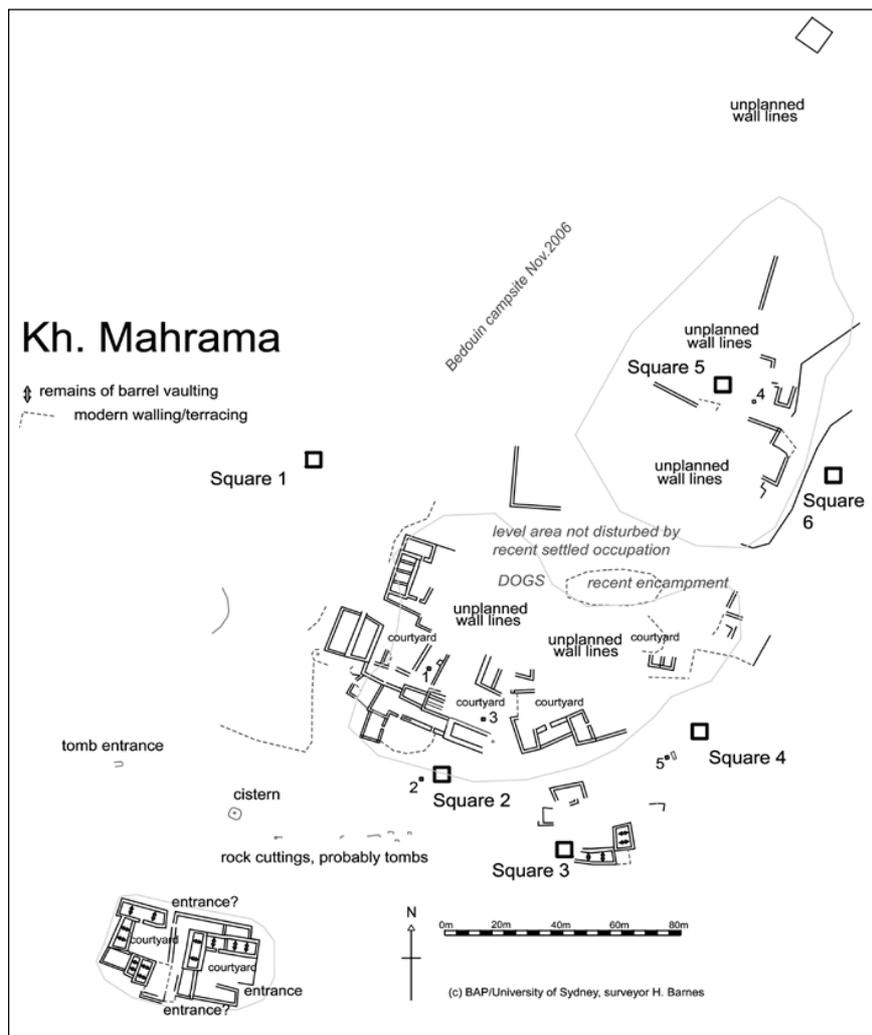
al-Yābis surveys sampled this site.

It appears from wall lines that the latest walls are Mamluk or later (Fig. 5), although several are built on earlier walls. The layout of the village is confused and many of the long rooms are quite narrow. The amount of rock tumble suggests that most buildings were constructed entirely of stone, many with two floors.

Most pottery appears to be glazed Islamic, Handmade Geometric Painted and other post-Abbasid wares. However, there are useful quantities of Late Roman, Byzantine and Umayyad pottery, and surprising amounts of Chalcolithic.

The main site is ringed by natural caves, mostly small. Some have been modified into Roman or Byzantine burial chambers, or cisterns.

5m x 5m squares were laid out to sample across the south-western part of the site. The



4. Plan of Kh. Mahramah.



5. Photo of Mamluk walls.

middle part was inaccessible owing to bedouin dogs and had been previously used for camping, so that the surface was covered with animal dung. It was not possible to sample under the oak trees as the composted leaves were too deep. Some 1m x 1m soundings were placed in areas deemed likely to preserve stratigraphy, but in two of these (soundings 1 and 3) rock tumble was reached before ancient deposits. Another 1m x 1m sounding appeared to be placed in robber spoil (sounding 5), but the others may have been sampling stratified deposits.

Kh. Naṣṣār (BAP013, Mittmann 120, Wādī al-Yābis 58)

SW corner of collection Square 1: 751755E
3589892N, 423.7 m asl

The UTM co-ordinates for this site in JADIS led us to a ploughed field, said to be owned by 17 people, with almost no visible ceramics. However, the field lies between the hillock of Kh. Naṣṣār and the main road down to the Wādī ar-Rayyān crossing. Kh. Naṣṣār, to the south-east of Kufr Abīl, is now almost entirely covered by houses and their yards. One family property attracted our attention on reconnaissance in April 2006 by having clearly worked stone blocks reused as garden edging. Investigation showed some rock-cut installations and considerable amounts of large, sharply broken pottery. During the field season in 2006, the team spent

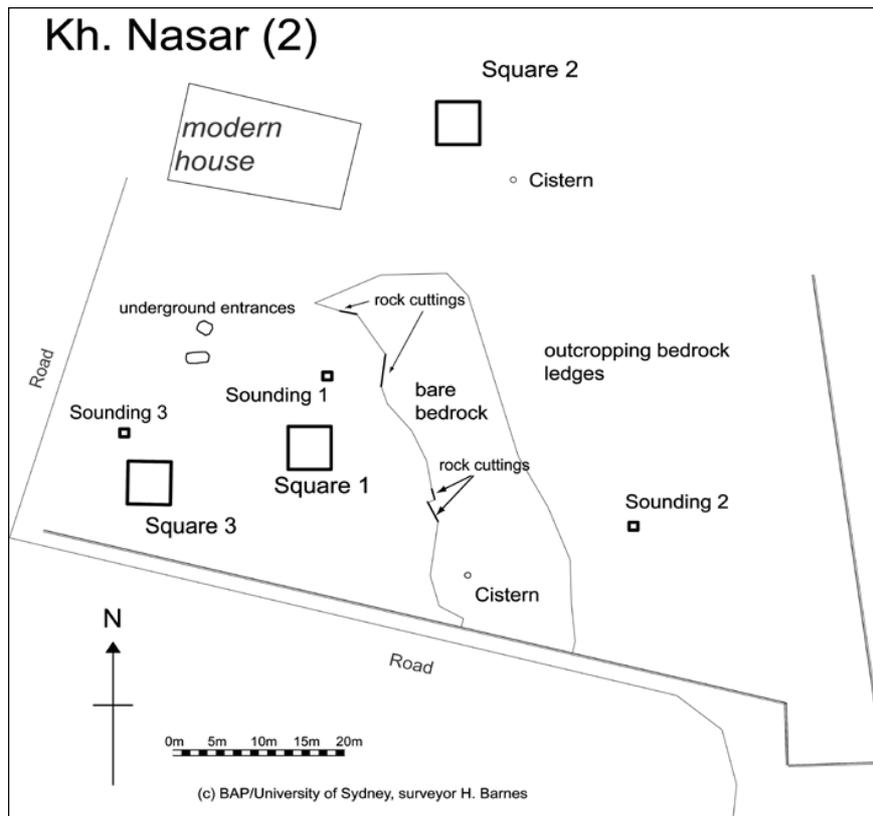
two days at Naṣṣār (**Fig. 6**). The yard is given over mainly to mixed orchard, although the soil depth is quite limited in most of it. 5m x 5m pickup squares were productive at Naṣṣār, but the 1m x 1m soundings rapidly reached bedrock. Nonetheless, large quantities of ceramics were recovered.

A particularly surprising early result from the ceramic processing was the identification of fragments of five pottery spacer rings, indicating ceramic production at the site (**Fig. 7**). No other particular evidence, such as wasters or quantities of ash, was found. Alternatively, these rings may have been used to seat round based storage jars, however they are relatively shallow and seem most likely to be kiln tools.

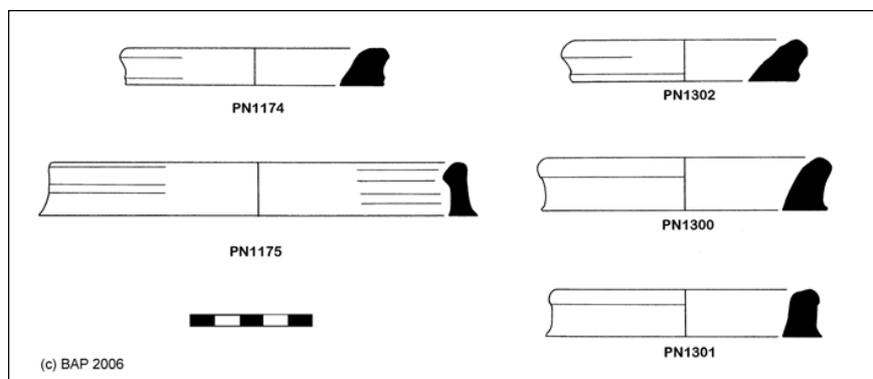
Bā'ūn (BAP011, Mittmann 164, Wādī al-Yābis 73)

SW corner of collection Square 1: 756639E
3586457N, 622 m asl

When Mittmann visited Bā'ūn, the modern village was quite small and a number of 19th century houses remained. By the time of our initial reconnaissance in April 2006, the listed UTM co-ordinates fell in the middle of the modern village, under a road next to the mosque. A vacant lot with some abandoned old stone houses seemed to have sufficient pottery on it for the purposes of the project, so we ear-marked this as our target site. Returning to Bā'ūn in Novem-



6. Plan of Kh. Naṣṣār collection area.

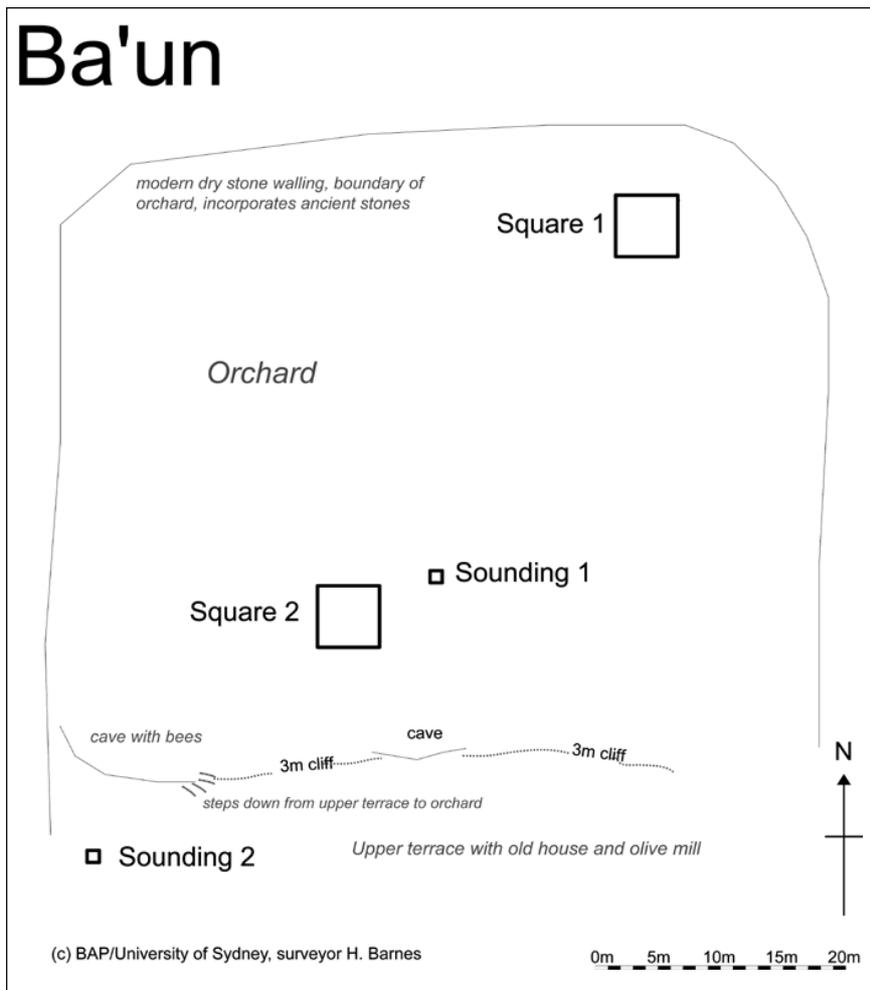


7. Drawing of Kh. Naṣṣār pot spacer rings.

ber 2006 and investigating further, we found a ploughed orchard field under the cliff of Bā'ūn which was littered with large, sharply broken pottery. We elected to sample this area, which also corresponded better with Mittmann's description of where he, too, had seen a concentration of pottery (Fig. 8). The landowner informed us that at some time in the past, the top of the cliff had been bulldozed over the edge to flatten the area for modern housing. We presume that part of these bulldozed deposits was pushed into the field we were sampling, but the area is also likely to have been the rubbish dump for ancient

Bā'ūn as well (Fig. 9).

There was so much pottery in the field that no scrape of a 5m x 5m square was made. Two 1m x 1m soundings were dug, one in the field and one at the top of the cliff, in order to determine whether settlement deposits remained above. Neither sounding detected definite stratigraphy, so the nature of both areas remains unclear. Excavation to a greater depth, probably in an area greater than 1m x 1m would be needed to determine the nature of the site, but is beyond the scope of the project. Examination of the ceramics suggests late Iron Age, then relatively little



8. Plan of Bā'un collection area.

settlement until the 6th century AD, with later occupation extending well into the mediaeval period.

Kh. Qāblah (BAP026, Mittmann 188, Wādī al-Yābis 92, Wādī Ziqlāb 112)

SW corner of Square 1: 760015E 3591074N, 810 m asl

This site consists of an ancient village, marked by a number of wall lines, under oak trees. It rings the top of the hill and extends downslope to the north towards the wadi between the site and Zūbyā (Fig. 10). On the south of the hill, out of the oak forest, are two large 'reservoirs', a number of rock-cut installations and the main cemetery for the site. Further to the south, across the shallow saddle of a wadi and under the scree slope of a modern quarry dump, are more elaborate rock-cut chamber tombs.

Within the ancient village confines are a num-

ber of underground chambers, of which two were investigated. At least one street was detected in the village, leading down from a large cleared area on the very top of the hill, which seems not to have had any structures on it in antiquity.

The southern slope of the hill was divided into three main areas. There are two large 'reservoirs', the southern one of which has plaster still adhering to the sides (Fig. 11), a rock-cut, stepped access, and the remains of a substantial wall forming the northern side. This was clearly used as a water reservoir. The northern 'reservoir' equally clearly had been a stone quarry — some half cut blocks remain *in situ* — and the edges are irregular. Nonetheless it could have also functioned as a water reservoir, although no trace of plaster remains.

To the north-east of the 'reservoirs' are a number of rock-cut installations. These include basins, quarrying marks and underground cham-



9. Photo of Bā'ūn site beneath cliff.

bers which are not tombs.

The best known underground chamber at the site is reached by a subterranean, constructed passage with a corbelled roof. In the chamber are two large millstones, storage niches and a cistern. There are indentations in the walls, probably made by beams being used in whatever processing work was being done in the chamber. One set of marks form an elongated cross, which the owners believe indicates that the chamber is an underground church. This is not the case.

Qāblah appears to be an important manufacturing site, using underground chambers for the processing of some kind of material. We plan to raise additional funds to further investigate the unusual features of the site.

The latest occupation appears early Mamluk in date, although the main period of use was probably during the Byzantine and early Islamic periods. The houses of the ancient village are relatively well preserved, and the underground chamber system is extensive. Although underground houses and stables are attested at other

sites sampled in the project (see Kh. Sāmtā and Kh. Sattāt), Qāblah has evidence of underground manufacturing.

Kh. al-al-‘Āsif (BAP017, Mittmann 167, Wādī al-Yābis 76)

SW corner of Square 1: 756959E 3588106N, 582 m asl

This site was difficult to define, but based on the visible surface pottery within an old olive grove, it extends over a limited area on a terrace on the south bank of the Wādī ar-Rayyān, opposite ‘Arjān. Remains of an old (late Ottoman) house exist in an area which had been cut into the olive grove. Only the north wall of the old *diwān*, a room (now incorporated into the current owner’s new house) and buried wall lines, said to be of the stable buildings, remain of this 19th / early 20th century AD complex. Originally the *diwān* wall had been assumed to be ancient, but the correct dating was provided by the current owner, who had been born in the old house complex.

The cutting into which the *diwān* was built provided a 3 m-high section, showing a very large amount of Roman — early Islamic pottery in a *ca* 30 cm-thick layer above the current complex’s courtyard level (Fig. 12). Surface collection was significantly less than the pottery revealed in the section (Fig. 13).

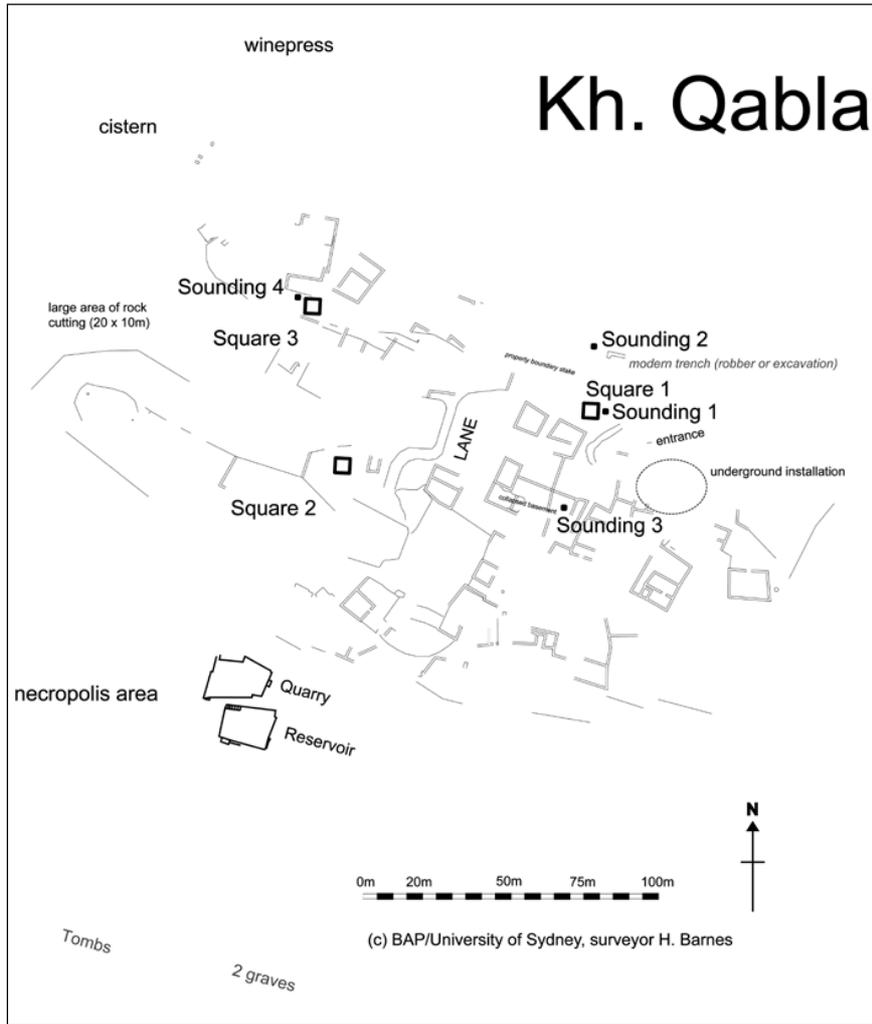
Downslope from this area, towards the wadi, a very complex interconnecting set of underground chambers was found. Time prevented planning and full investigation. There are also large pre-modern walls on this lower terrace, but they are difficult to access and plan.

Deep excavation would be needed to investigate the Roman and Byzantine deposits at Kh. al-al-‘Āsif, but that is not possible owing to the valuable and ancient olive trees on the site.

Kh. al-Hāshimiyah (previously Fārā) (BAP040, Mittmann 140)

SW corner of Square 1: 766045E 3590468N, 1011 m asl

This small, ancient village is on a little hill top to the west of the Irbid - ‘Ajlūn road. To the south-east of the village, a number of rock-cut basins and settling tanks were planned (Fig. 14); at least two cisterns were noted to the south of the village. As at several of the other sites in



10. Plan of Kh. Qāblah.

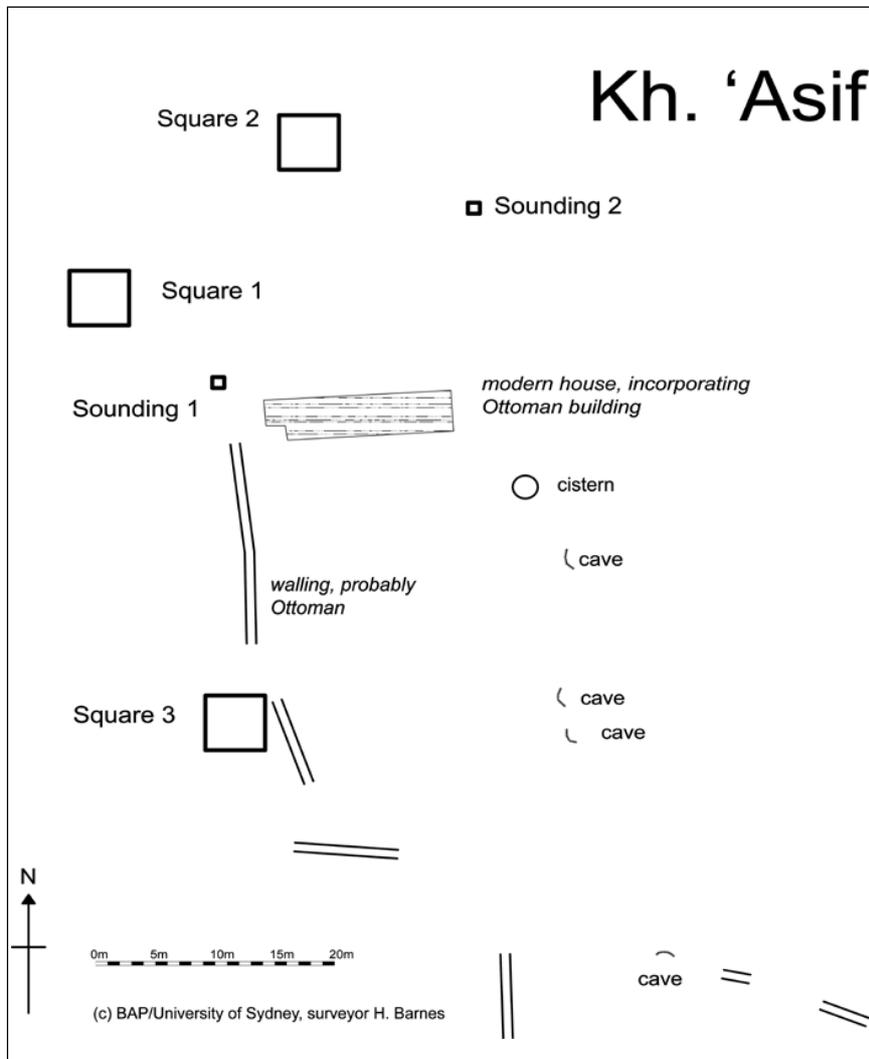


11. Photo of rock-cut reservoir at Kh. Qāblah, with Hugh Barnes pointing to plaster remains.



(c) BAP/Kate da Costa, photographer F. Reidel 2006

12. Photo of diwān wall at Kh. al-‘Āsif cutting into overburden, with pottery-rich layer at base.



13. Plan of Kh. al-‘Āsif collection area.



14. Photo of settling basins south-east of main Kh. al-Hāshimiyyah / al-Fārā village.

the project study area, natural caves within the area of the settlement had been modified for use as tombs or cellars. There was also one cistern reached by a short staircase. From the remaining wall lines and rock tumble, we estimate that some houses at the site are probably preserved over 2m high (Fig. 15). There is no substantial modern occupation at the site, and probably no significant post-Umayyad settlement.

Pottery retrieval at the site was one of the lowest in the project, and neither 1m x 1m sounding reached stratified deposits.

There is a carved lintel stone (of standard design and ordinary workmanship) lying near a tomb on the north-east side of the site.

Kh. Kufrayyah (BAP036, Mittmann 189)

SW corner of Square 2: 770412E 3587137N

Kufrayyah is the furthest east of all sites sampled this season. It is well past the Jordan / Yarmūk watershed and in an area where the provincial border line is very uncertain. It is south of Duḥalah, excavated by Dr Saleh Sari of Yarmouk University, which appears from the published lamps to have been located in *Palaestina* (Sari 1992).

In April 2006 a visit to the JADIS UTM coordinates revealed a terraced field on a ridge, with a few rock-cut basins and some very water-worn pottery of Iron Age to Islamic date. Returning to the site in December we found tombs, cisterns and underground chambers to the east of the UTM point, with increasing amounts of pottery in the ploughed fields to the north of the

modern road, again increasing in quantity as we moved east. A large quantity of glazed and Handmade Geometric Painted sherds was found in an unploughed field to the south of the road, associated with some wall lines. Earlier pottery seemed concentrated in the fields north of the road, and a series of 5m x 5m sampling squares were laid out in ploughed and unploughed fields (Fig. 16).

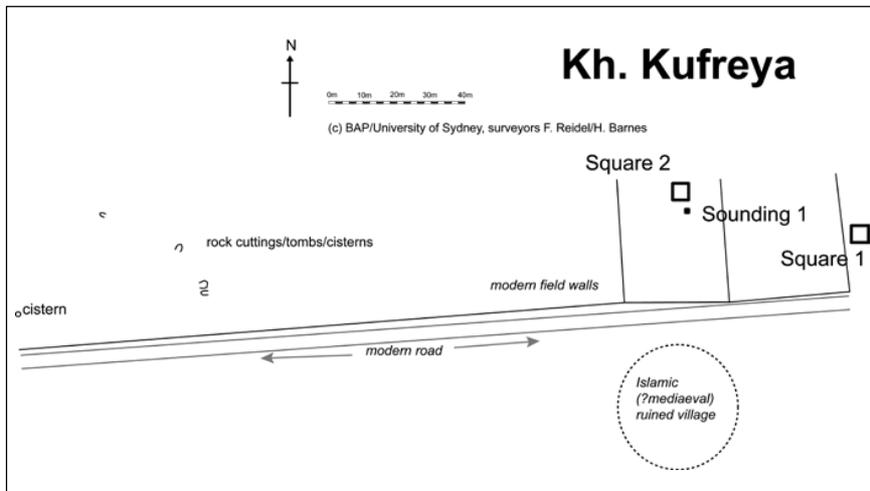
A single 1 m x 1 m sounding was excavated in an unploughed field. At a depth of 50-60cm tilted stone slabs were exposed, although the soil appeared to be exactly the same from just below topsoil to underneath the sloping slabs. When the slabs were lifted, a human skeleton was revealed. Excavation ceased immediately and the sounding was backfilled. There had been no cuts in the soil or markers on the surface to indicate a grave, but we marked out the square with stones, placing larger stones at the head and foot of the grave. We believe the whole area is an Islamic cemetery, possibly associated with the Ayyubid / Mamluk settlement to the south (across the modern road).

Because of the absence of architecture and poor weather, the team only worked two days at Kufrayyah and retrieved mainly Islamic period ceramics.

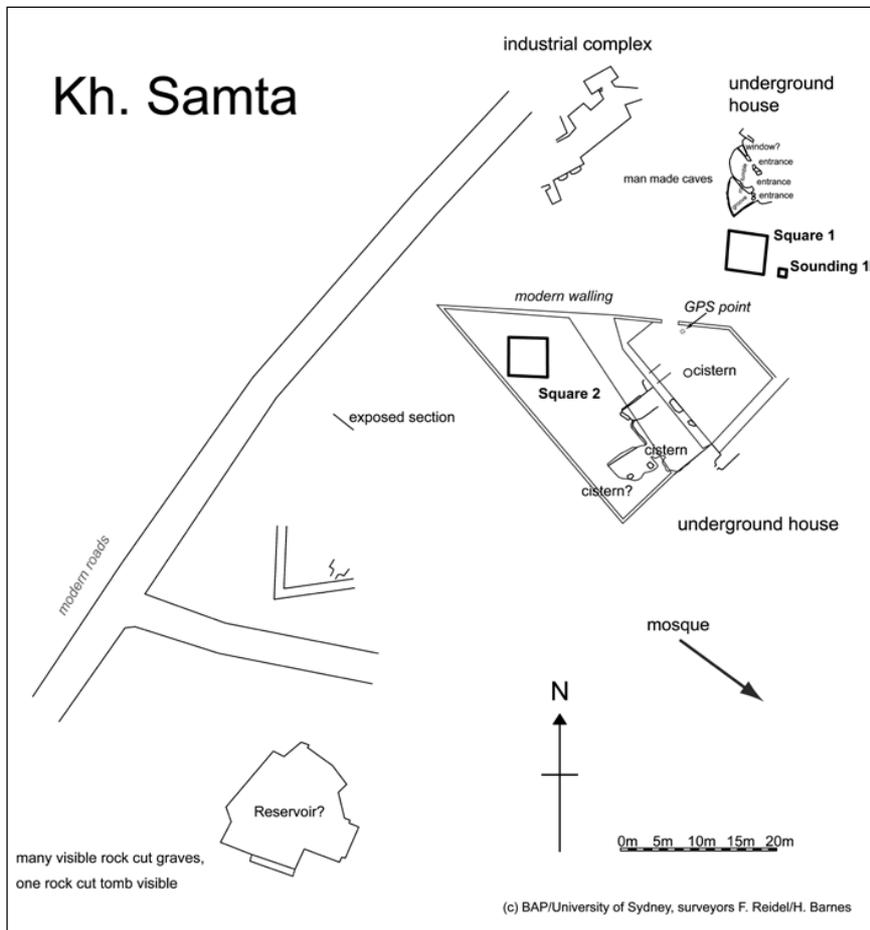
Kh. Sāmtā (BAP001, Mittmann 188, Wādī al-Yābis 92)

SW corner of collection Square 2: 765783E 3586910 N, GPS point 1100 m asl.

A well-known Mamluk mosque is situated



16. Plan of Kh. Kufrayyah collection area.



17. Plan of Kh. Sāmtā collection area.

case looked from the outside as if it were a tomb (Fig. 18).

There are a number of other rock-cut features, including quarries and industrial installations in Sāmtā, which need immediate documentation as the village is growing rapidly.

Rāsūn, ancient Resous (BAP043; Mittmann 169, Wādī al-Yābis 77)

SW corner of Square 1: 759897E 3587892N,
SW corner of Sounding 2 716 m asl.

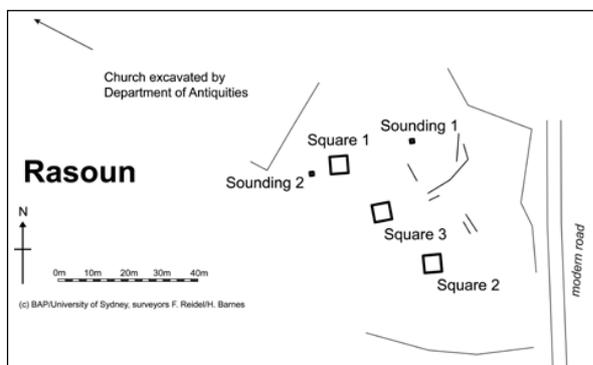
Our initial plan, based on Mittmann's description, was to sample the area south-east of



18. Photo of underground house at Kh. Sāmtā.

Rāsūn, near ‘Ayn Rāsūn, called Kh. Maslamānī. Reconnaissance in April 2006 had found only Iron Age pottery, with one large underground chamber of probable Roman / Byzantine date. On our return we were directed to another area of Rāsūn, further down the wadi, where clear Byzantine walling was found. Pottery was also relatively abundant in the ploughed soil within the old olive grove to the east of the wadi, as were wall lines as the land rose. Because the Department of Antiquities had excavated a church near the area (the wall lines are still visible in the wadi at 759799E, 3587970N, 709 m asl.), we located our collecting squares some distance uphill (Fig. 19).

Numerous large ancient wall lines were visible in the grove. Considerable amounts of small multi-coloured tesserae were collected from the surface, the 5m x 5m scrape and in both soundings. Sounding 2 uncovered a broken part of a miniature column, likely to have been a pulpit support or some other kind of church furnishing (Fig. 20). Pottery was found in medium quantities; very little of it appeared to be Islamic.



19. Plan of Rāsūn collecting area.



20. Photo of limestone column (RN4, BN230) in situ, Sounding 2, Rāsūn.

We also made a cursory examination of the openings in the hillside east of ancient Resous. Several were clearly tombs, many with *kokhim* openings, suggesting Roman rather than Byzantine construction. Others were more complex, with what appeared to be light wells, if they were underground houses, or collecting tanks, if they were cisterns. Several had collapsed into each other, although at least one had a nicely carved doorway linking two sets of chambers. This area needs to be properly surveyed, as it is likely to be the main necropolis for the ancient city.

Kh. Sattāt (BAP029, Mittmann 173, Wādī al-Yābis 81)

SE corner of collection Square 1: 763858E 3585847N, 1077 m asl

Because sampling at Kufrayyah, Sāmtā and Rāsūn had taken less time than expected, we added Kh. Sattāt to our sites for the 2006 season. Reconnaissance in April had been very limited, and we only saw the rock-cut basins and well-known tomb with its Greek inscription immediately south of the modern village. In December we were directed to the ruined village further south again, and especially to a very well preserved series of underground dwellings which incorporate extremely elaborately carved stables (Fig. 21). These underground structures, and the others in the ‘Ajlūn district (Qāblah and Sāmtā in particular), will be further studied in a future joint project with the Department of Antiquities.

Our collection squares were placed in what appears to be the eastern part of the built up area of the ancient village (Fig. 22). The rock-



21. Photo of one of the underground house / stables (Cave F, 02906) at Kh. Sattāt..

cut basins and necropolis lie to the north of the sampling area, and will be planned in 2008. The soil at Sattāt is very clayey, but nonetheless very large quantities of pottery were recovered, which seem mainly to be pre-Islamic.

Acknowledgements

Field work in 2006 was conducted under permits 2006/16 (initial reconnaissance) and 2006/81 (November 4 to December 14 2006). The project director, Dr da Costa would like to thank the Director-General of the Department of Antiquities, Dr. Fawwaz Khraysheh, for his kindness in granting the permits, and his help in facilitating the project.

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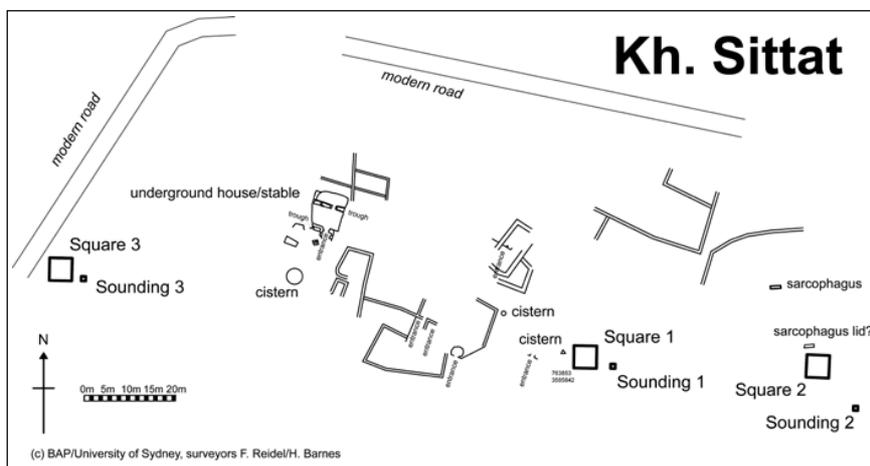
affiliated with the CBRL Amman since 2006, and Dr da Costa would like to thank all CBRL staff for their assistance. Project website: <http://acl.arts.usyd.edu.au/bap/>

Participating staff in 2006 were the director, Dr Kate da Costa (University of Sydney (UoS)), field director Franz Reidel (UoS), surveyor Hugh Barnes (Denmark), archaeologist Mel Kennedy (UoS), illustrator Toni Licciardo (University of Newcastle, Australia) and Department of Antiquities representative Dr Khaled Junaideh. Students were from the University of Sydney (Lily Taperell-Withycombe and Jacque Venesjärvi) and Macquarie University (Clare Rowan and Rob Bruce).

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22. Plan of Kh. Sattāt collecting area.

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THE FRANKS IN SOUTHERN TRANSJORDAN AND THE CONTRIBUTION OF CERAMIC STUDIES: A PRELIMINARY REPORT ON THE POTTERY ASSEMBLAGES OF AL-BAYḌA AND WĀDĪ FARASA

Micaela Sinibaldi

This contribution presents some preliminary results of the analysis of two ceramic assemblages of the Petra area and some observations on the theme of pottery of the Crusader period in southern Transjordan¹. The two ceramic groups are also compared to the pottery assemblage from the Crusader castle at al-Wu‘ayra, the main point of reference in the region for 12th century ceramics. The two assemblages were selected after the hypothesis of a Crusader phase on the site was put forward following recent discoveries by two different projects. When analysed and compared, the groups have shown patterns of similarities and differences, and some parallels with the site of al-Wu‘ayra. In the present state of research, the evidence can support a Crusader-period chronology; however, the state of work in progress must be taken into account. Preliminary results have highlighted a rich terrain for future research. Further study would contribute both to a better understanding of 12th century settlements in Transjordan, whose historical record is scarce, and of the local ceramic sequence of handmade pottery.

The Sites and Their Ceramic Assemblages Al-Bayḏa

Al-Bayḏa is located seven km north of the city centre of Petra. Over the years, the site has been the object of several surveys, excavations and clearance projects. The pottery described in this paper originates specifically from archaeological investigations carried out by the al-Bayḏa Documentation Project directed by Dr Patricia Bikai in the years 2003-2008 through six excavation seasons. The objective of the project is the documentation of the main features of a selected area of al-Bayḏa. Excavations have not therefore been planned for extended areas (Bikai, Kanellopoulos and Saunders 2005, 2007). Thanks to surveys and test excavations, the project has identified several structures related to a post-classical phase at al-Bayḏa. The regular layout of what appears to be a village occupying the central section of the investigation area, and the presence of Jerusalem crosses in wall carvings of a Nabataean rock-cut structure, which was later reused as a church, among other evidence, support the hypothesis of a Crusader-

1. This subject of this contribution was first presented as a paper at the 10th International Conference on the History and Archaeology of Jordan, 2007, Washington D.C. as a member of the archaeological mission Petra Medievale. I am very grateful to the archaeological mission Petra Medievale, University of Florence, and in particular to Prof. Guido Vannini, Director, for all the support during the many years as a member of the team. I thank Alessandro Neri for kindly providing data from his B.A. thesis. Robin Brown, Bethany Walker, Khairieh ‘Amr, Alan Walmsley, Anthony Grey, Denys Pringle and Ian Freestone have provided important insights for my research and I am deeply grateful to all of them. Precious and consistent support came from Barbara Porter and Christopher Tuttle, American Center of Oriental Research. The two pottery assemblages analysed here are objects of study for my PhD thesis

at Cardiff University, supervised by Denys Pringle and Ian Freestone, on 12th century rural settlements in Transjordan and their ceramics. The PhD programme is supported by an Arts and Humanities Research Council fellowship. The preliminary documentation work on 12th century settlements in the Petra area has been funded by a Bikai fellowship from the American Center of Oriental Research in 2006. The study of the al-Bayḏa pottery was possible thanks to a Bikai and a De Vries Fellowships at the American Center of Oriental Research in 2007. A preliminary study of the assemblage from Wādī Farasa is funded by a Bikai fellowship of the American Center of Oriental Research for the year 2009. Part of the current PhD fieldwork is supported by a Travel Grant for 2009-2010 from the Council for British Research in the Levant and by Cardiff University.

period phase on the site; this phase apparently succeeds an occupation in the early Islamic period that is evidenced by two mosques (Bikai, in press).

The medieval pottery analysed in this paper originates from stratified contexts and was excavated almost entirely in the western area of the site, which is located just east of Siq al-Bārid and south of the road to the Siq. The areas investigated by excavations include: (1) some village structures, (2) the area around a rock-cut Nabataean structure which was later reused as a church in the Byzantine period, (3) some rock-cut as well as built structures located opposite the entrance to the church, (4) a large cistern nearby, (5) some village structures between this cistern and the road, and (6) an area to the west of the village where a mosque has been discovered and which includes several rock-cut and built structures (information from fieldwork documentation material, courtesy of Director P. Bikai).

Several of these features were investigated by small test soundings and appeared at least partially on the surface before excavation; this is probably due to the action of natural agents on the site. In some areas, robbers' activities have been recorded, as well as a long-term disturbance of the original archaeological deposits connected to the structures owing to their use as animal pens. The original stratigraphy has therefore been partially compromised in some areas of the site. However, some undisturbed deposits have also been recorded in other areas. As a result of the sampling aims of the project, the excavations have not completely uncovered all structures (information from fieldwork documentation material, courtesy of Director P. Bikai).

The Pottery

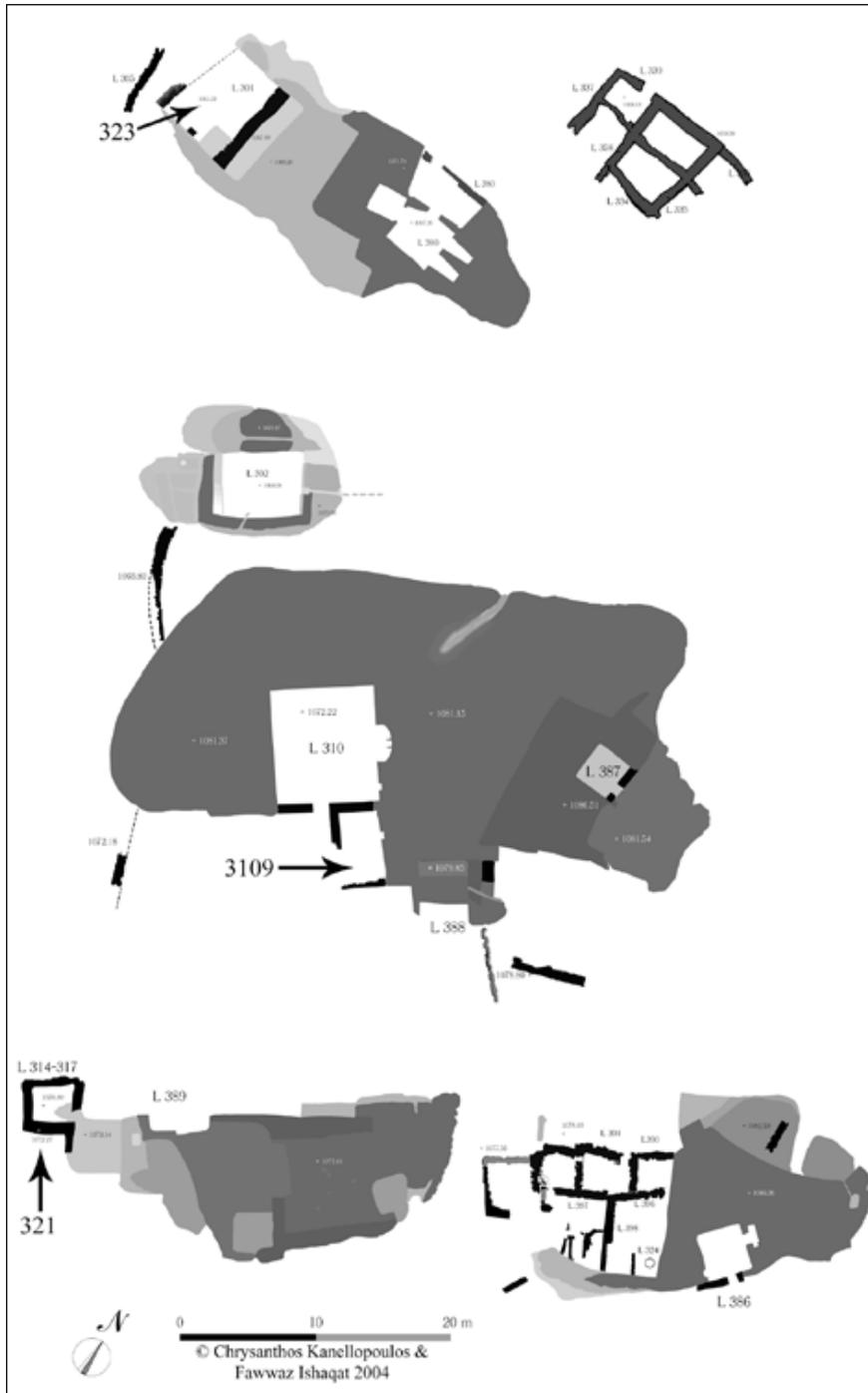
Medieval pottery has been found in all sampled areas, but most of the contexts associated with it have been excavated east and west of the village structures: the area of the church and the area of the western mosque. In particular, the area of the Byzantine church and nearby structures had the highest number of stratigraphic units containing medieval pottery (**Fig. 1**). Several of the excavated contexts on the site consisted of fillings of rock-cut structures, such as wine presses and cisterns, which seem to have been frequently used as garbage pits. Although this has usually disallowed the identification of a direct relationship between stratified pottery and built structures of the medieval period, it has nevertheless turned out to be a very valuable circumstance for the good state of preservation of many ceramic forms. In general, the assemblage is highly valuable because most of the ceramic associations are very homogeneous, and have all the character of a primary deposition. While an analytical and complete report on all medieval stratified assemblages from al-Bayḍa is in progress, some preliminary data and general observations are presented here to introduce the assemblage and to compare it with other ceramic groups².

Initial observations can be made on the basis of the analysis of the main pottery groups that are present in the medieval assemblage³. Chart 1 shows the proportion of groups that were selected on the basis of technological characteristics: Handmade Ware (HM), Unglazed Wheel-thrown Ware (UWT) and Glazed Wheel-thrown Ware (GWT). The handmade pottery group includes 99% of pottery fragments in the assemblage; only 1% is composed of wheel-thrown glazed and unglazed pottery. In the stratified as-

2. I am very grateful to Dr. Patricia Bikai for asking me to study the medieval ceramic material from excavations at al-Bayḍa, and for allowing the material to be used for my PhD thesis, now in progress. I thank her for providing the entire excavation documentation material, for sharing all the precious information about the site of al-Bayḍa and its stratigraphy, and for her constant support.

3. The assemblage consists of a total of 573 fragments, recovered from 56 stratified contexts; 12 fragments, which are not included in this report, have been recovered from surveys as unstratified finds. All analyses of the data on the pottery groups and on the surface

treatments reported in this paper have been done exclusively on the basis of counting of the total number of fragments and not of minimum forms number. Quantification of minimum forms number for the assemblages of both al-Bayḍa and Wadi Farasa sites is in process, and will take into account limitations for study on handmade pottery. Experience has demonstrated these limits, especially if dealing with a very irregular kind of production. This issue is in addition to the normal difficulty of trying to assess the forms number in any kind of assemblage; therefore, in this context special caution should be taken in evaluating this kind of quantitative data.



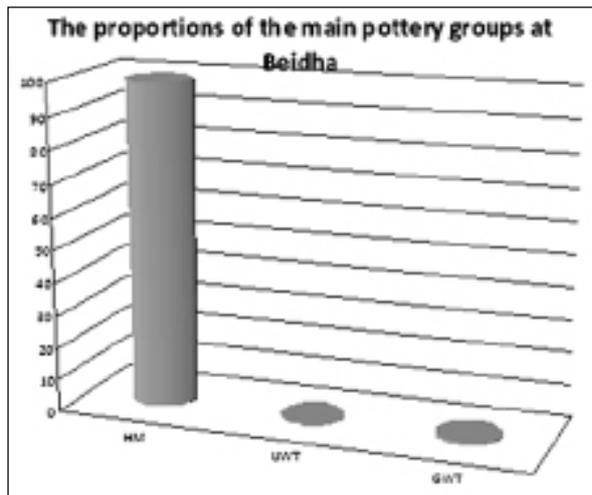
1. Some of the structures surveyed by the al-Bayḍa Documentation Project (map by C. Kanellopoulos and F. Ishaqat).

semblage, only 2 wheel-thrown unglazed fragments and 4 glazed, wheel-thrown fragments are present (Fig. 2).

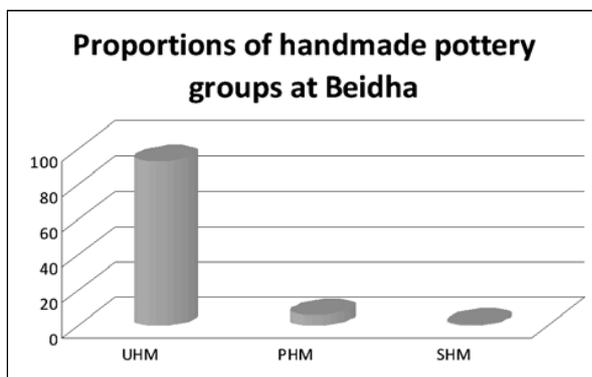
A further analysis of the handmade pottery group can be divided according to the main surface treatments. In Chart 2, Unpainted Handmade Ware (UHM) is 93%; Painted Handmade Ware (PHM) is 6% and Slipped Handmade Ware

(SHM) only 1% of the stratified assemblage. The Painted Handmade Ware group includes any painted fragment, with or without a slipped surface; the Slipped Handmade Ware group corresponds to fragments with a slipped surface, but without painted decorations (Fig. 3)

The painted ware group (PHM) includes decorations of three kinds: red, brown, and red and



2. Chart 1. Pottery from al-Bayḍa: proportions of the main pottery groups.



3. Chart 2. Pottery from al-Bayḍa: proportions of the handmade pottery groups.

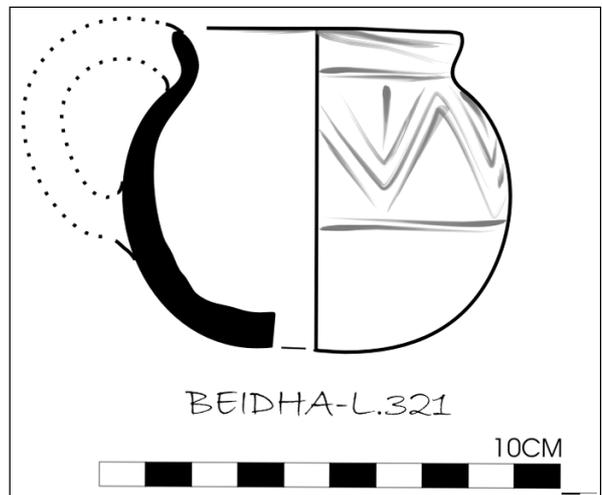
brown. All decorations can be very generally described as simple linear and geometric patterns.

Most fragments of PHM are decorated with red paint on an unslipped surface. An example of this group is a small cup recovered from Stratigraphic Unit 321. Unit 321 is one of several layers of fill in a structure south of the Byzantine Church; the structure may have been a storage bin (Fig. 4). The locus is one of the richest in pottery finds in the area and includes several reconstructable forms. The small cup in the picture has an unslipped surface, with simple decoration covering the external upper part of the body, shoulders and neck; the color varies from red to brown, a variation most likely due to the uneven firing of the object (Fig. 5; see Sinibaldi 2009: n. 43 for colour picture).

Some preliminary observations have been made also on the subject of form. Chart 3 shows the percentage of closed and open forms in the



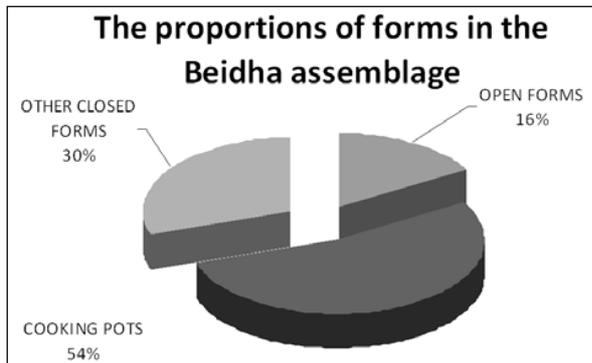
4. al-Bayḍa: area of stratigraphic Unit 321 (photo by S. Saunders).



5. Cup from stratigraphic Unit 321, al-Bayḍa: painted, unslipped handmade ware (drawing by Q. Twaissi).

al-Bayḍa assemblage. It is clear from the proportions that closed forms are dominant. The percentage of closed forms is about 80% of the stratified assemblage, while open forms are only 20% (Fig. 6). The assemblage includes various kinds of jugs and jars; however, a very high percentage of closed forms belong to cooking pots: their proportion is 64% of the identifiable closed forms, and 53 % of the all forms present on the site.

Handmade cooking pots at al-Bayḍa consist of a variety of forms and dimensions. Among the reconstructable examples, one type is well represented in the assemblage and can be illustrated by a reconstructed example from Stratigraphic Unit 323, which is a fill in the south side of a rock-cut structure north of the Byzantine church (Fig. 7). This type of cooking pot has



6. Chart 3. Pottery from al-Bayḍa: proportions of forms.

been found in all areas where medieval pottery has been excavated, suggesting that this type might have been a representative one for the occupation connected to the structures; it was also associated with Stratigraphic Unit 321, along with the painted cup (Fig. 5).

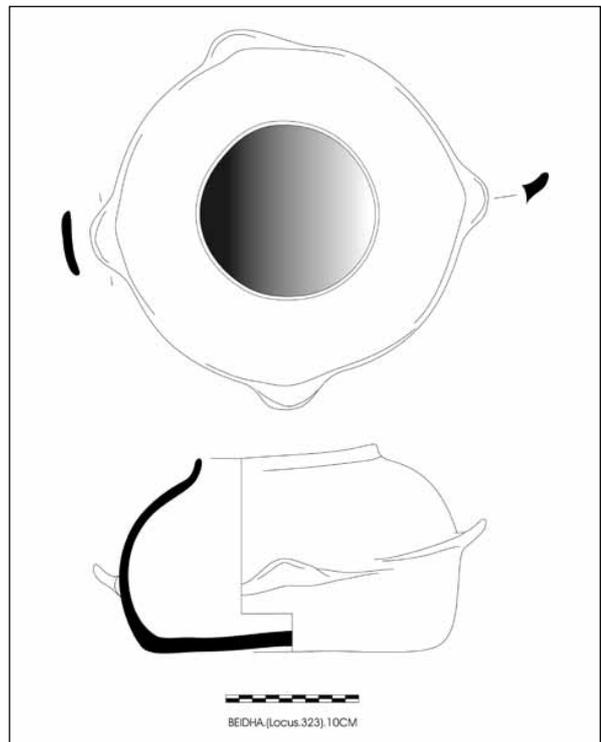
This type of cooking pot is characterized by ledge handles, an applied rope clay decoration that runs between the handles, the lack of a neck, a small rim and a flat bottom (Fig. 8). It also has irregular proportions and an uneven surface, which seem to suggest a non-professional manufacture of the vessel. The uneven firing is evident from the colour variation on the surface.

Open forms are also represented in the al-Bayḍa assemblage in a variety of forms and dimensions, both in handmade painted ware and handmade unpainted ware. One of the reconstructable forms is a basin, from Stratigraphic Unit 3109, a context associated with a structure excavated near the church entrance.

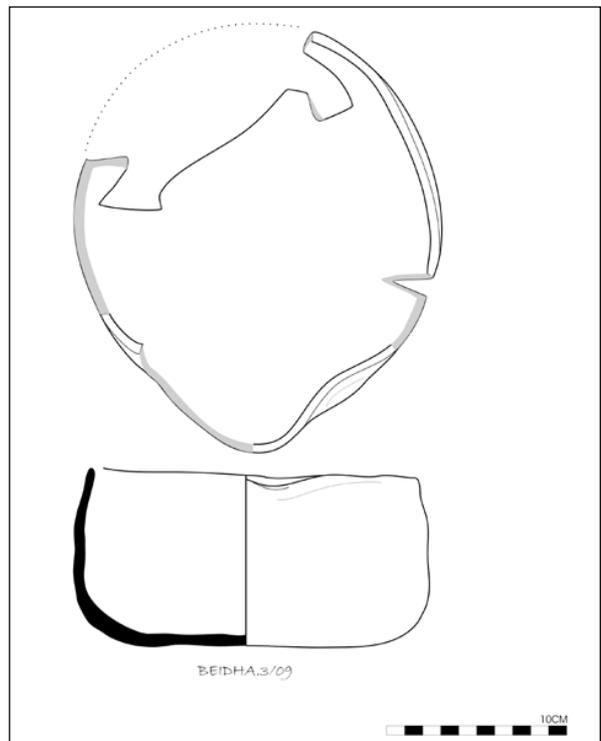
The manufacturing technique of the basin (Fig. 9; see Sinibaldi 2009: n. 39 for colour pic-



7. al-Bayḍa: area of stratigraphic Unit 323 (photo by P. M. Bikai).



8. Cooking pot from stratigraphic Unit 323, al-Bayḍa: unpainted, unslipped handmade ware (drawing by Q. Twaissi).



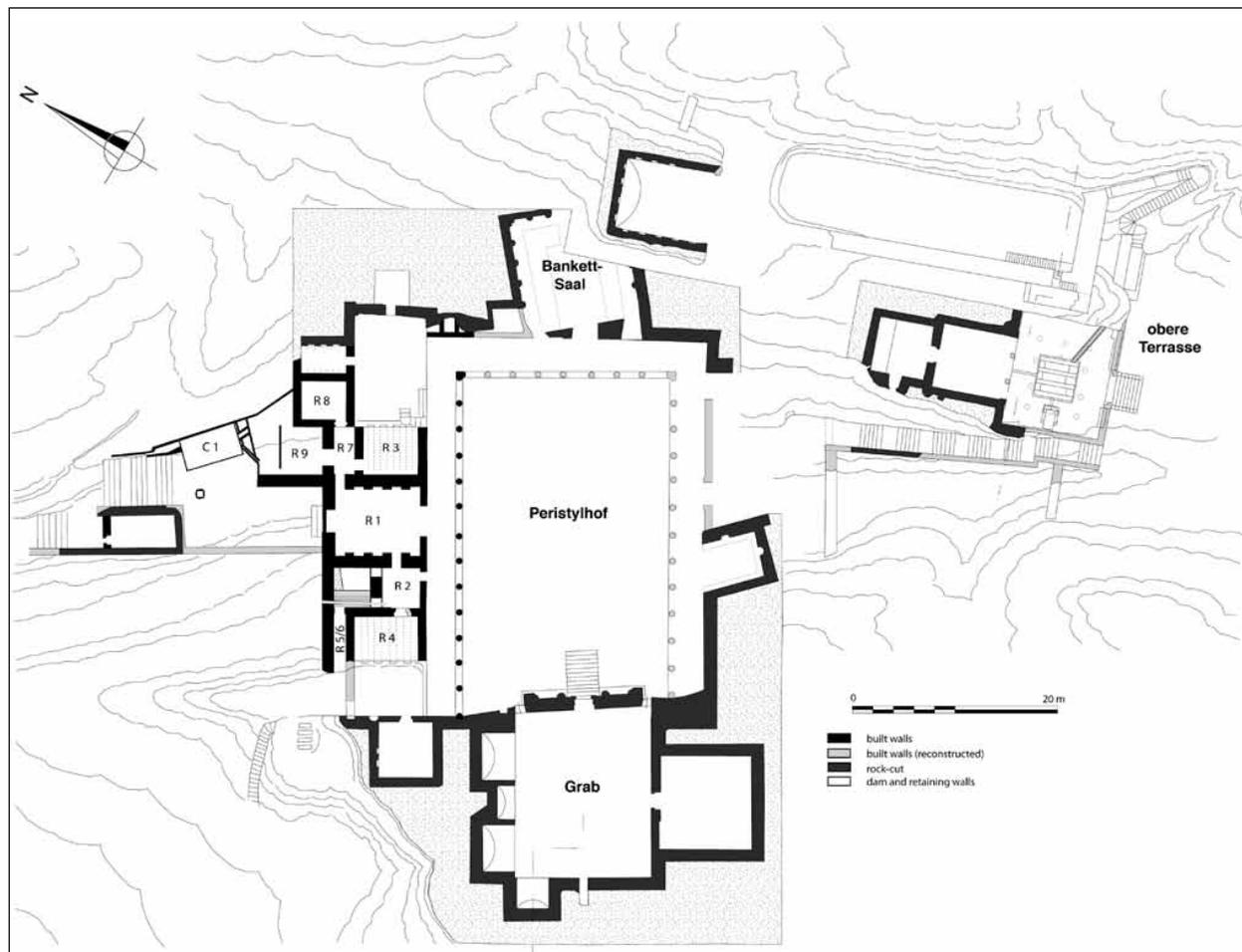
9. Basin from stratigraphic Unit 3109, al-Bayḍa: unpainted, unslipped handmade ware (drawing by Q. Twaissi).

ture) and its very irregular shape also suggest the work of a non-professional potter. The ware is characterized by a high variation in the color of the surface and in the cross-section of the walls, due to uneven firing conditions, which have created both an oxidized and a reduced atmosphere. This piece also shows very clear traces of surface smoothing, possibly with a cloth. The direction of the instrument used to smooth the object before firing is clearly indicated by the parallel marks on the entire surface of the basin (see Sinibaldi 2009: n. 39 for colour picture).

Wādī Farasa

Wādī Farasa is located south-east of the Petra city centre. The International Wādī Farasa Project has been studying the east part of the wadi since 1999; excavations are still ongoing. Archaeological investigations have discovered

an important complex of the Nabataean period with a funerary function, centred in the area of the Soldier's Tomb and extending on two natural terraces. During this period Wādī Farasa also had the function of collecting water by means of a sophisticated hydraulic system, and of connecting the Petra valley to the High Place of Sacrifice (Fig. 10). A medieval occupation of the area was recorded during the first excavation season; the project has gradually revealed evidence of a large medieval settlement that extended on both terraces. The medieval phase has been documented as the only one of importance after the Nabataean one. Excavation activity has recorded several built structures with a clear defensive function, which have reused pre-existing walls from the Nabataean phase. Moreover, medieval pottery has been recorded in all excavated areas, in connection with the use



10. Study area of the International Wādī Farasa Project (map by M. Dehner after Bachmann, Watzinger and Wiegand 1921).

and construction of walls, and with rubbish pits that filled previous rock-cut structures (Schmid 2001, 2002, 2005 and 2007; Schmid and Studer 2003; Schmid and Barmasse 2004 and 2006). Finally, five funerary stone slabs, carved with Christian symbols, have been excavated on the upper terrace; they suggest the presence of a still unidentified cemetery nearby and therefore a presence of Christians in the area for at least two generations (Schmid 2002, 2006 and 2009). All these elements suggest the presence a significant Crusader period settlement, perhaps a fortified post connected with the defence of the Petra Valley, which would probably have been associated with another fortification held by the Franks in the area of the High Place of Sacrifice (Schmid 2006). The medieval occupation therefore extended over at least the area explored by the project, including the upper and lower terraces, the small necropolis in the western corner of the Nabataean complex and the interior of the so-called Renaissance Tomb to its north.

The Pottery.

The International Wādī Farasa Project has been exploring the area with stratigraphic excavations since 2000. To date, important quantities of medieval pottery have been excavated, mainly in association with the following contexts: (1) the upper terrace area, the fills of two Nabataean cisterns and a fortified medieval structure in front of the entrance of the Garden Triclinium, (2) several contexts associated with medieval structures in the area of the lower terrace, more specifically the north-east and south parts of the complex, (3) the fills of some Nabataean rock-cut tombs, part of a small necropolis in the western corner of the complex, and (4) the fills of some Nabataean rock-cut tombs inside the so-called Renaissance Tomb (Schmid

2001, 2002, 2005 and 2007; Schmid and Studer 2003; Schmid and Barmasse 2004 and 2006). The stratigraphic deposits associated with medieval occupation are of different types. Deposits associated with built structures, both on the upper and lower terraces of the site and often characterised by the rather fragmentary state of the ceramics, have the advantage of having a direct relationship with walls, and in some cases of being included in the construction of the walls themselves. Different kinds of deposits, on the other hand, often interpreted as rubbish pits, are fills of previous rock-cut features; although disconnected from the medieval structures, these are generally characterized by a better state of ceramic preservation and are therefore very valuable for reconstructing pottery types.

Excavations in the Wādī Farasa have unearthed an important quantity of medieval pottery in primary deposition on a site with an articulated stratigraphy; the assemblage is therefore very significant, both in terms of the occupational phasing of the site and pottery typology.

Excavations are still ongoing at the site; the aim of this contribution is therefore to suggest only some preliminary observations on the assemblage and communicate the first available data in order to facilitate comparisons with pottery assemblages from other sites. A complete analysis of the entire pottery assemblage is planned⁴.

Some observations will be made on the basis of seven stratigraphic units, from four contexts that have been specifically selected for preliminary analysis in order to plan the best method with which to proceed with further study of the rest of the pottery group⁵. The stratigraphic units, which were selected for their homogeneity and stratigraphic usefulness, are: (1) the upper fill of the small cistern on the upper terrace,

4. I would like to express my gratitude to Prof. Stephan Schmid, Humboldt University, Berlin, Director of the International Wādī Farasa Project, for entrusting me with the analysis of the medieval pottery assemblage from Wādī Farasa, and for making it available for my PhD thesis. I am also grateful for sharing with me important information and comments, during my several visits to the excavation site, about the stratigraphic contexts of the analysed pottery from the Wādī Farasa excavations, and for providing the excavation documentation material.

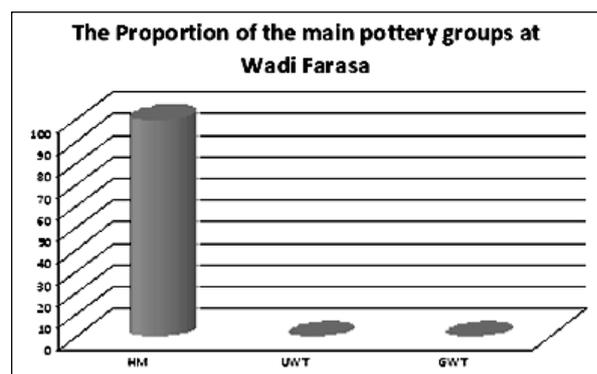
5. All observations contained in this contribution about quantitative data on the pottery from Wādī Farasa are

based on an analysis of the four stratified contexts done for a B.A. thesis by Alessandro Neri, submitted in 2008 to the University of Florence, Department of Historical and Geographical Studies: *Le ceramiche medievali di Wadi Farasa a Petra: un contributo archeologico sui problemi della ceramica crociata* (first supervisor: Prof. Guido Vannini). The detailed analysis of the ceramic material was followed closely by myself as a second supervisor, in order to ensure that the basic classification method and data collection were consistent with the ones used previously to study the medieval pottery assemblages from Bayḍa and al-Wu'ayra.

(2) the upper fill of the big cistern on the upper terrace, (3) part of the fill of Tomb 11 from the Renaissance Tomb, and (4) four stratigraphic units from the upper fills of Tomb 7 in the small necropolis in the western corner of the complex⁶. It is important, therefore, to bear in mind that although archaeologically very significant, the seven contexts analysed here are only a small part of the pottery assemblage excavated to date and, since excavations are still in progress, they are an even smaller part of the total assemblage that will have been recovered by the end of the work⁷. However, it is possible to present some general data for a preliminary comparative analysis with the other sites.

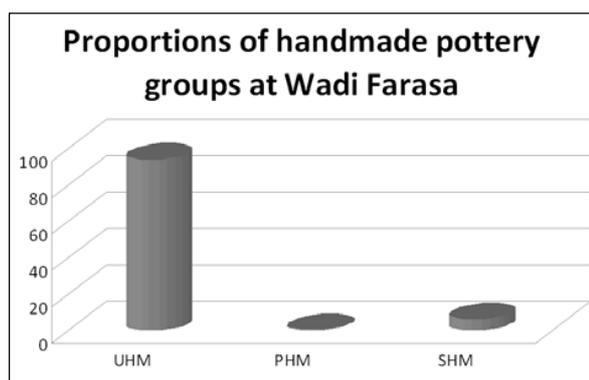
Chart 4 (Fig. 11) shows the general occurrence of the main pottery groups in the four analysed contexts from Wādī Farasa; handmade pottery (HM) is 100% of the assemblage; unglazed wheel-thrown pottery (UWT) and glazed wheel-thrown pottery are not represented⁸.

Chart 5 (Fig. 12) shows the proportions of the main surface treatments within the handmade pottery group: Unpainted Handmade Ware (UHM) is 93.5%, Painted Handmade Ware (PHM) is 0.5% and Slipped Handmade Ware (SHM) is 6% of the assemblage. It can be observed that the figures are closely comparable to the ones illustrated for the al-Bayḍa pottery (Figs. 2 and 3), both on account of the dominance of handmade pottery and because of the



11. Chart 4. Pottery from Wādī Farasa: proportions of the main pottery groups.

6. The total number of fragments belonging to the seven examined contexts is 850.
 7. A general idea of the characters and quantity of the material excavated to date has been possible thanks to a preliminary examination of the materials from the last campaign 2009, and to discussions with Prof. Schmid.
 8. The preliminary examination of the material from the



12. Chart 5. Pottery from Wādī Farasa: proportions of the handmade pottery groups.

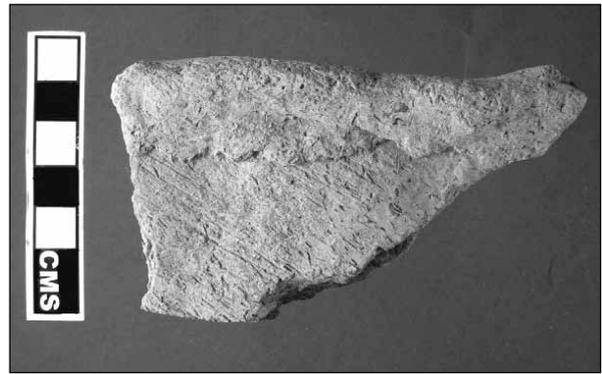
prevalence of undecorated surfaces. However, a difference can be noted in the surface treatment, since the proportions of slipped unpainted and painted decoration are reversed at the two sites. Painted sherds have been excavated from several contexts on the upper and lower terraces at Wādī Farasa; painted decoration is present either in red or brown (Schmid 2001: 348, fig. 11, 2002: 265-71, figs 28, 32, 2006: 56 and 59, figs 25, 31 and 32, colour pictures; Schmid and Studer 2003: 481-482, figs 27-28; Schmid and Barmasse 2004: 341, fig. 17). Fragments painted in a combination of red and brown are also present in the assemblage⁹. One of the best reconstructable examples in the excavated assemblage is a jug from a small cistern on the upper terrace; the context of the small cistern is relevant for dating purposes, since it is very likely to have been in use during the occupation phase represented by the structures in front of the Garden Triclinium (Fig. 13). The jug is decorated in red with geometric patterns on a slipped surface (Fig. 14. See Schmid 2006: 59, fig. 32). The jug, with a globular body and elongated neck, is decorated with a grid pattern on the neck and more elaborate geometric patterns on the body.

It is possible to make further observations about surface treatments within the Wādī Farasa assemblage. The slipped fragments are big enough to conclude that many of them do not simply belong to unpainted parts of slipped and

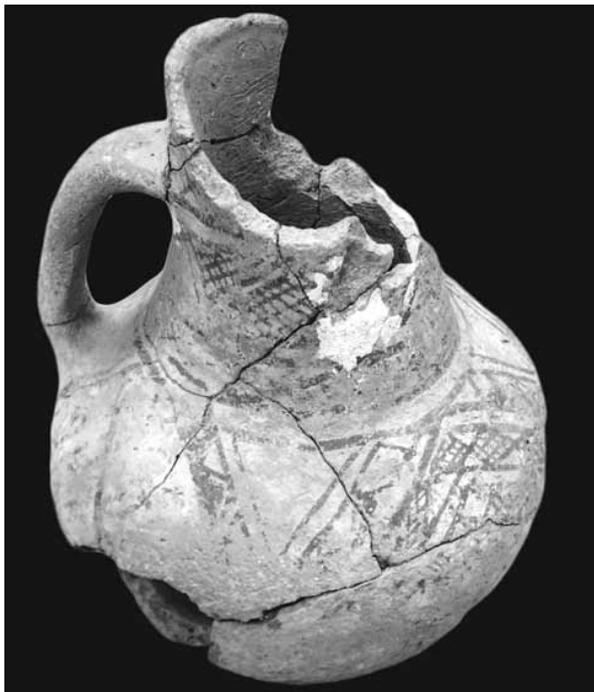
2009 campaign could confirm the almost exclusive presence of handmade pottery in the assemblage; however, a few fragments of wheel-thrown and glazed pottery are also included.
 9. Information from an examination of the material excavated in season 2009



13. Wādī Farasa, small cistern on the upper terrace (photo by S. Schmid).



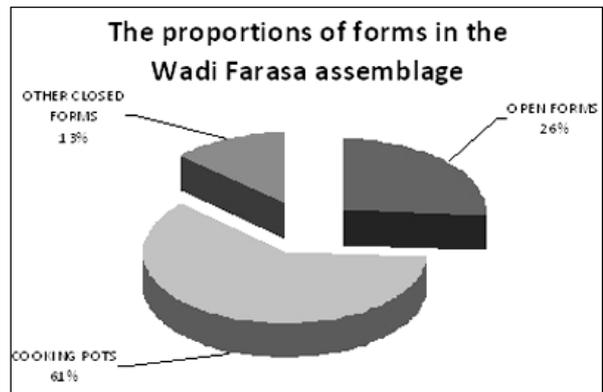
15. Fragment of open form from Renaissance Tomb, showing traces of smoothing tool (photo by M. Sinibaldi).



14. Jug from small cistern, stratigraphic Unit 53, upper terrace, Wādī Farasa: slipped, painted handmade ware (photo by M. Sinibaldi).

painted vessels; on the contrary, it is clear that slipping was used extensively, and in various colours, on the surface of ceramics without any further painted decoration; this is particularly evident in the finds from Tomb 7. In the Wādī Farasa assemblage, many fragments display clear traces of smoothing tools. **Fig. 15** shows an example, with parallel lines clearly marked in the clay of an open form.

Chart 6 (**Fig. 16**) illustrates the occurrence of closed and open forms. As shown in the chart,

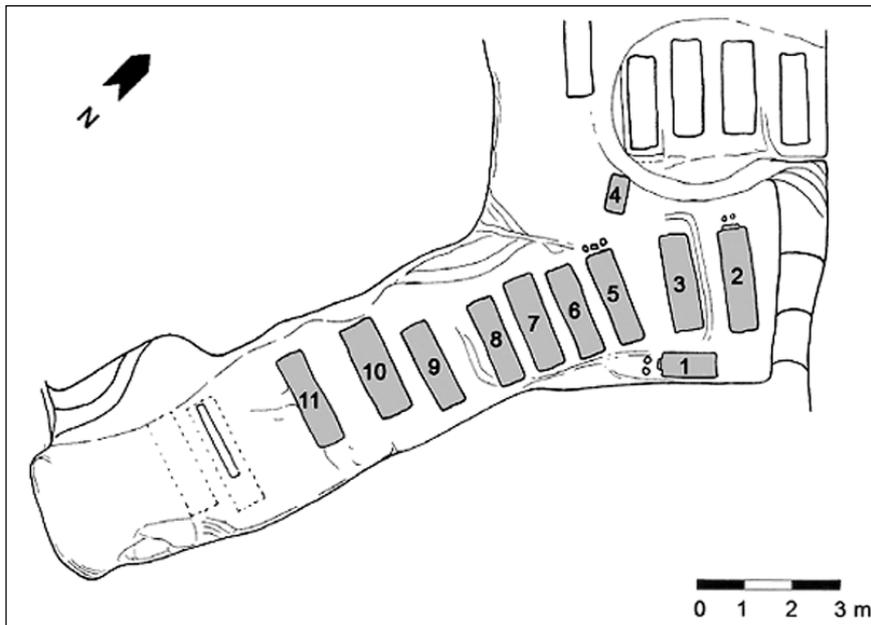


16. Chart 6. Pottery from Wādī Farasa: proportions of forms.

74% of the assemblage is composed of closed forms. Moreover, the proportion of cooking pots in the entire assemblage is 61%.

Cooking pots are present in all contexts analysed from the Wādī Farasa assemblage. One specific context, the fill from Tomb 7, is of particular interest for the preservation of forms, as well as for the high percentage of cooking pots (**Fig. 17**). The context yielded a very homogeneous assemblage in terms of form type and dimensions, which suggest the manufacture of an entire group by a professional workshop¹⁰. One example from this context is a cooking pot that has been partially reconstructed (**Fig. 18**; see Sinibaldi 2009: n. 40 for color picture). The cooking pot has a globular body and an out-curved rim. The handles, placed at the widest diameter of the body, have a horseshoe-shape; two decorative horseshoe-shaped clay decorations are applied to the body of the pot; the bottom is missing. Several horseshoe-shaped decorations

10. An analysis of the dimensions and types of cooking pots from this context has been carried out by A. Neri, op.cit



17. Wādī Farasa, area of the small necropolis (drawing by S. Schmid).



18. Cooking pot from stratigraphic Unit 278, Tomb 7, Wādī Farasa: unslipped, unpainted ware (photo: M. Sinibaldi).

are present in other cooking pots and fragments from the same tomb context, suggesting that

they can be considered a typical element in the production of these vessels.

The Ceramic Assemblage from al-Wu‘ayra: Preliminary Comparative Observations

The site of al-Wu‘ayra was excavated in 1987 by Robin Brown (Brown 1987), and since 1988 by *Petra Medievale* team led by the University of Florence and directed by Guido Vannini. In this section, the observations made regarding the assemblages of al-Bayḍa and Wādī Farasa will be compared to stratified pottery from Crusader-period phases at the site of al-Wu‘ayra (phases I-III) as excavated by the University of Florence¹¹. At al-Wu‘ayra, as described in preliminary reports (Vannini and Vanni Desideri 1995; Vannini and Tonghini 1997; Tonghini and Vanni Desideri 1998), several phases of occupation were recorded in the sondages, in addition to Nabataean and Byzantine occupation witnessed mainly by quantities of residual pottery and structures in secondary use. The main

11. I am very grateful to Prof. Guido Vannini, University of Florence, Director of the archaeological project *Petra Medievale*, for generously granting access to the important material from al-Wu‘ayra assemblage. I am also indebted for the precious opportunity he gave me, as a student at the University of Florence, to participate in several campaigns of excavations at al-Wu‘ayra castle, as well as in the complete cataloguing activity of the pottery from al-Wu‘ayra, together with ceramic supervisors Cristina Tonghini and Andrea Vanni Desideri.

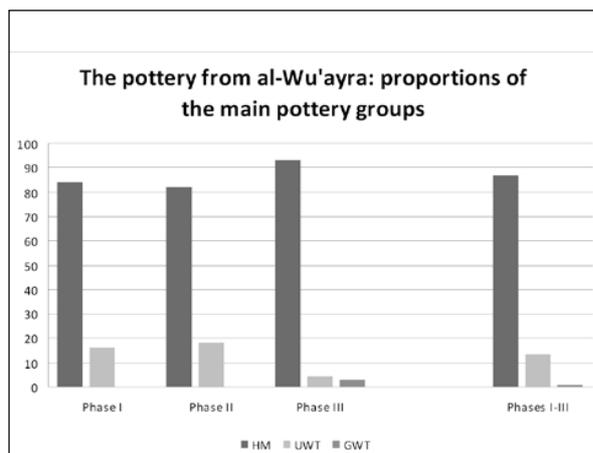
Because of the importance of the comparative material from al-Wu‘ayra for the study of 12th century pottery, all ceramic data recorded from al-Bayḍa and Wādī Farasa have been catalogued with the same method used for the al-Wu‘ayra material, by the use of a database designed by the University of Florence. The pottery typology of al-Wu‘ayra has been designed by Cristina Tonghini (Università di Ca’ Foscari, Venice) when she was a member of the mission *Petra Medievale*.

occupational phases, excluding a prehistoric settlement, include three Crusader phases (I: Crusader foundation; II: mid-12th century; III: mid-to late 12th century); one phase of Ayyubid reoccupation (phase IIIa); a final abandonment in the early 13th century (phase IV); a number of collapses and squatter occupations during the 13th-20th centuries (phases V-VIII) (Vannini and Tonghini 1997).

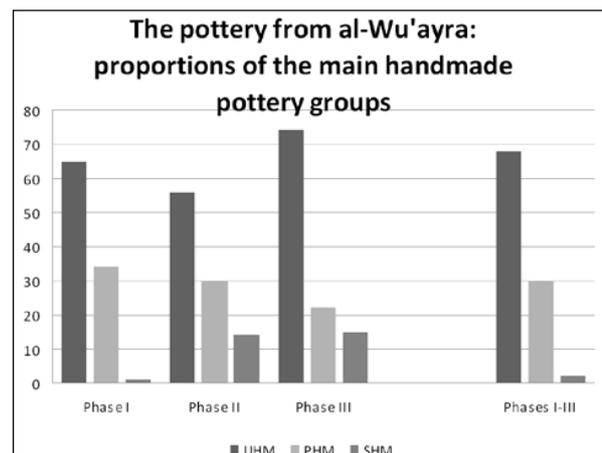
The first set of observations are based on pottery groups and their surface treatments. Chart 7 (Fig. 19) illustrates the occurrence of the main pottery groups at al-Wu‘ayra over the three Crusader phases at the site (Phases I, II and III), and for the three phases combined; the quantitative data include all stratified contexts on the site¹². The dominance of handmade pottery in all three phases is clear. Wheel-thrown glazed ware comprises 0.1% in Phase I, is absent in Phase II, and comprises just 3% in Phase III. Unglazed wheel-thrown pottery at al-Wu‘ayra, as pointed out in interim reports (Vannini and Tonghini 1997: 382), may well belong to the Crusader occupation, but could also be residual from previous phases, such as Byzantine or Early Islamic. This is because it was not possible to examine this pottery in the context of local pottery sequences when the assemblage was studied. Therefore, these data must be considered tentative and subject to change on further

study of the assemblage. An observation of the occurrence of surface decorations on the main pottery types (Chart 8, Fig. 20) shows that in all three Crusader phases at al-Wu‘ayra, the unpainted and unslipped ware is always dominant, and among the decorated groups, painted pottery is always more prevalent than slipped pottery. This trend is comparable to the one seen in the al-Bayḍa assemblage, but the proportion of the painted ware is lower at al-Bayḍa than at al-Wu‘ayra. As stated above, a comparison with Wādī Farasa is not possible at this moment since the analysed sample is small in this respect, and does not contain painted sherds. However, it is possible to highlight similarities in the generally very dominant proportion of unpainted and unslipped ware at all three sites. It can also be observed that clear use of smoothing tools on a high proportion of sherds from Wādī Farasa distinguishes this site from the other two.

At all three sites, the assemblage contains pottery painted in red or in brown, with linear and geometric patterns. As pointed out in previous reports, at al-Wu‘ayra it is not possible to discern significant variations over the different phases on the basis of decoration; this could also be the result of the rather fragmented nature of decorated pieces (Vannini and Tonghini 1997: 380). At al-Wu‘ayra, sherds decorated in both red and brown have been found in the



19. Chart 7. Pottery from al-Wu‘ayra: proportions of the main pottery groups.



20. Chart 8. Pottery from al-Wu‘ayra: proportions of the handmade pottery groups.

12. The quantification includes sondages 2, 3, 4, 5, 6, and 8. The number of fragments included in this quantitative analysis are 943 (phase I); 108 (phase II); 560 (phase III), for a total of 1611 stratified fragments on the site for the all three phases. The fragments includ-

ed in this analysis exclude all fragments clearly recognized as residual. For a quantitative analysis of sondages 3 and 6 at al-Wu‘ayra, see Vannini and Tonghini 1997; Tonghini and Vanni Desideri 1998.

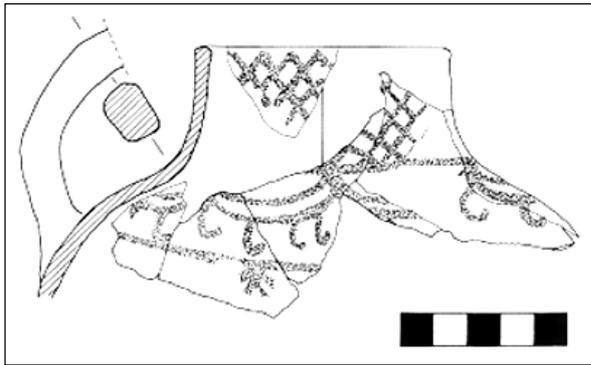
same stratigraphic units in all three phases. At al-Bayḍa, four out of seven stratified units with painted fragments contain both fragments decorated in red and fragments decorated in brown. This could support the hypothesis that the two types of decoration were in use at the same time on both sites. However, it is important to appreciate that although in some cases the difference between the two types of decoration is clear (i.e. it is possible to distinguish the use of brown paint from that of red paint), at al-Wu‘ayra some painted examples clearly show that the difference between the two colors could simply be the result of uneven firing. This also seems to be the case for the small cup from al-Bayḍa, where the colour of the paint varies from one part of the vessel to another (**Fig. 5**). The simple decorative pattern of the cup and its red, lightly applied geometric design can be compared with the decoration of a small jug from al-Wu‘ayra, dating to the first Crusader phase of occupation (Phase I: Tonghini and Vanni Desideri 1997: 712). The jug (**Fig. 21**; see Sinibaldi 2009: n. 41 for a color picture) is decorated on the neck, internally, and externally with a grid pattern, some curvy lines on the shoulder, and small hooks. This jug is a good example of local continuity in decorative patterning, as the decoration on the upper part of the jug is also found in much later contexts from southern Transjordan. More importantly, the jug is associated with the construction of the church at al-Wu‘ayra, dated to between 1127-31 and 1144, most likely around 1140 (Pringle 1998: vol. 2: 373-7). This kind of surface treatment (red on a self-slipped exterior) is comparable with some fragments described as Early Handmade Painted ware at Gharandal (Walmsley and Grey 2001: fig. 11), which first appeared before the 12th century. However, in this case, surface treatment seems more diagnostic than any of the decorative patterns, and this reinforces the importance of direct visual contact with this kind of pottery in order to observe parallels¹³. On the other hand, the jug from Wādī Farasa (**Fig. 14**), displays a different painting technique. The

red paint seems to be applied more thickly to the slipped surface and the geometric patterns are more complex. Combined, these elements might indicate a later date, closer in time to the more densely decorated pottery of the Ayyubid-Mamluk period. The jug from Wādī Farasa, which is most likely associated with the use of the fortified structures on the upper terrace, could be later than the small jug illustrated in **Fig. 20**. Parallels in Jordan for the jug from Wādī Farasa are unknown.

Finally, and at a very preliminary level, it is possible to make some comparative observations regarding form. A quantification of the open and closed forms at al-Wu‘ayra shows a clear prevalence of closed forms, which comprise 93% in Phase I, 90% in Phase II and 87% in Phase III¹⁴. A specific study of cooking pots and their frequency in the al-Wu‘ayra assemblage was not undertaken during the first phase of analysis, but would be interesting in the context of a comparative analysis with al-Bayḍa and Wādī Farasa. Large handmade cooking pots are ubiquitous across Jordan, and still difficult to date. For example, the form of the al-Bayḍa cooking pot discussed above (**Fig. 8**) is comparable with one from Khirbat an-Nawāfla that was discovered in an early Ottoman context, although the latter has two perforated handles (Amr *et al.* 2000: 253, fig. 26.2). This makes it necessary to exercise great caution in drawing chronological conclusions for this specific form, and certainly not to rely solely on descriptions of form, but to consider all additional information available, especially technology. A similar type is present at al-Wu‘ayra in several post-Crusader phases, as well as Phase I. Fragments of ledge handles and parts of identical rope decoration are also present in both Phase I and the later phases. This seems to suggest a long use of the type over time; unfortunately the average size of fragments in most cases does not allow close comparisons of complete cooking pot profiles. Similar cooking pot rims have also been recorded by Robin Brown at al-Wu‘ayra in Phase I (Crusader) (Brown 1987:

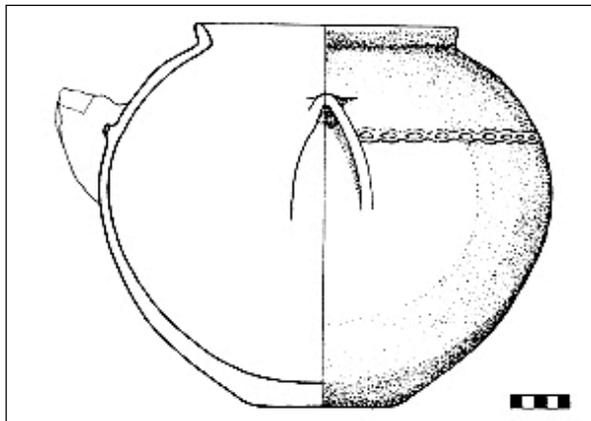
13. I am deeply indebted to Alan Walmsley, Director of Gharandal Archaeological Project, and Antony Grey, ceramics supervisor, for allowing access to the important ceramic assemblage from Gharandal as comparative material for my PhD thesis, and for all their precious scientific observations and suggestions.

14. The comparisons of quantifications between al-Wu‘ayra and the other sites needs to take into account the fact that at the castle the pottery is more fragmented, since it is more associated with occupational levels, rather than with rubbish pits.



21. Jug from stratigraphic Unit 23, al-Wu'ayra, Phase I: handmade painted pottery (drawing by C. Tonghini and A. Vanni Desideri. From Tonghini and Vanni Desideri 1998).

283, figs 9.17-18). Cooking pots from Wādī Farasa have parallels with some fragmentary rims from al-Wu'ayra, (e.g. Tonghini and Vanni Desideri 1998: 713, figs 7b and 10a). However, in terms of quality, it is also possible to compare the Wādī Farasa vessel illustrated in **Fig. 18** with a cooking pot from Phase III at al-Wu'ayra, the latter being one of the few completely reconstructable forms from the site (**Fig. 22**; see also Sinibaldi 2009, n. 38). The pot has a globular body, two horseshoe handles, applied rope decoration, an outcurved rim and a flat bottom. The two forms are dif-



22. Cooking pot from stratigraphic Unit 127, al-Wu'ayra, Phase III: handmade unpainted pottery (drawing by C. Tonghini and A. Vanni Desideri. From Vannini and Tonghini 1997).

ferent, but many elements, like the regularity of manufacture, the high degree of surface smoothing, and the quality of the decorative details suggest that both were the work of a professional potter, rather than domestically manufactured. These two types differ significantly in terms of quality from the type that is typical at al-Bayḍa, and from the fragments of cooking pots of the same type found in Phase I at al-Wu'ayra.

Concluding Remarks

The data from al-Bayḍa and Wādī Farasa are still preliminary, and the different nature of the two projects and of the stratification on the sites must be taken into account when trying to draw conclusions. However, it is possible to make some observations and discuss very briefly some of the many potential research directions. At the moment the ceramic evidence can support a Crusader-period presence on both sites; a clearer assessment of the situation will become feasible as research progresses. Data have highlighted both differences and similarities between the three analysed sites; future research might include working towards a better understanding of these patterns. Further research at 12th century sites, including al-Wu'ayra and ash-Shawbak¹⁵, might clarify the interesting question regarding the use of wheel-thrown pottery alongside handmade pottery. This might help us to gain a better understanding of the extent of the gap between Transjordan and other areas of the Latin Kingdom, which are characterised by the predominant use of wheel-thrown pottery. The pottery sequence at Gharandal, a site in southern Jordan (Walmsley and Grey 2001: 153), suggests the presence of wheel-made cooking pots during the 12th century. Cooking pots, because of their typically high frequency in stratified contexts, could be a useful point of reference to use for chronologies. In any event, thrown pottery seems not to have been used at al-Bayḍa and Wādī Farasa in significant quanti-

15. Ash-Shawbak castle is currently investigated by the archaeological mission Petra Medievale, University of Florence. I am grateful to prof. Guido Vannini for the opportunity he gave me to participate in several campaigns of excavations at ash-Shawbak castle and to work for the archaeological mission as ceramic supervisor in the years 2005-2008. During the first fieldwork seasons, large quantities of wheel-thrown

pottery have been excavated, probably from all periods of occupations at the castle. More in general, as a site with a very long and intense history of occupation, there is a high potential for the study of ceramic sequences, as well as for comparative studies with the assemblage of the site of al-Wu'ayra (see Sinibaldi 2007b).

ties; it would be interesting to see if the situation at the castles was any different.

Differences among pottery assemblages, like the different plastic decoration on cooking pots from al-Bayḍa, Wādī Farasa and al-Wu‘ayra, are not necessarily a sign of a chronological development, but may equally well be attributed to the presence of different workshops. However, the diffusion of a similar type at al-Bayḍa, through several Crusader and post-Crusader phases at al-Wu‘ayra, and into the Ottoman period at Khirbat an-Nawāfla in the Wādī Mūsā area, might represent non-specialised production over long periods of time and a wide geographical area. The difference noticed in the quality of manufacture in cooking pots is a point worthy of note. More specialized manufacture, e.g. the cooking pots from Wādī Farasa and al-Wu‘ayra, could be due to chronology, the presence of specialized workshops in a specific areas (such as Wādī Mūsā), or possibly the composition of the population, which may have created demand for a specific product. The presence of a specifically ‘Frankish product’ has not been demonstrated in previous studies at al-Wu‘ayra, but a comparative analysis with material from other sites could help in this respect. Surface treatments, as suggested by the character of the Wādī Farasa assemblage, also deserve further attention.

The study of stratified deposits on sites with long sequences of occupation will be crucial in gaining a better understanding of the chronological development of certain ceramic characteristics, and might give more meaning to the similarities found across the three sites, whether revealed by quantitative or typological analysis. For example, analysis of Crusader and post-Crusader pottery in Sondage 3 at al-Wu‘ayra has shown chronological variation in decorated ware (Vannini and Tonghini 1997). The Gharandal project aimed, among other things, at gaining a better understanding the local ceramic sequence, and is an example of the type of results it is possible to obtain in this respect. In this way, factors such as chronological development of decorative patterns — a line of enquiry original-

ly developed by Robin Brown — might be better understood¹⁶. In this context, when analysing the 12th century, the stratified deposits from the sites of al-Wu‘ayra and ash-ash-Shawbak would be important chronological points of reference for comparative purposes. Also, any attempt to gain a better understanding of the characteristics of 12th century assemblages and their similarities and/or differences to earlier assemblages would require comparison with stratified sites in the south in which these earlier periods are represented, e.g. Khirbat an-Nawāfla and ‘Aqaba (Amr *et al.* 2001; Whitcomb 1988).

For the time being, handmade pottery is the focus of discussion among scholars studying the ceramics of the Crusader period in Transjordan. This comparative analysis of three sites suggests that great importance should be attached to technology because, on the one hand, the assemblages have a high proportion of undecorated pottery, and on the other, aspects of decoration patterning and even some morphological characteristics seem to have had remarkable longevity. The attention given to production processes that was started by Franken and Kalsbeek (1975) and, in particular, research on the petrography of handmade ceramics would appear to be among the more useful paths to pursue at this moment. If matched with careful examination of stratified deposits, this might provide information on multiple socio-economic facets of a given chronological horizon, e.g. the trade and manufacture of ceramics. Ultimately, some of the most interesting research questions are those about the kind of impact that the Franks had on the territory of Transjordan, and their interaction with local populations. An analysis of a specific type of vessel, e.g. cooking pots, from well-stratified deposits such as those at al-Bayḍa and Wādī Farasa, matched with analysis of local clays, could be the starting point for an assessment of their production in the Wādī Mūsā area, or elsewhere¹⁷.

It is hoped that research methods such as these, implemented on 12th century sites, will improve our understanding not only of local

16. See Brown 1987. Important stratified sites in the south are Khirbat Fāris and Khirbat an-Nawāfla.

17. This analysis is included in a programme of archaeological study, focused on petrographic and chemical analyses of clays from selected stratified depos-

its. The research, currently in progress for my PhD thesis, includes samples from the sites of al-Bayḍa, Wādī Farasa, Khirbat an-Nawāfla, and is supervised by Prof. Ian Freestone, Cardiff University.

pottery sequences, which is a critical gap in our knowledge of the archaeology of southern Transjordan, but also of Crusader period settlements that are not referred to in the written sources, which were an important element in the 12th century landscape of the region.

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THE EASTERN JAFR JOINT ARCHAEOLOGICAL PROJECT: THE 2001 AND 2006 SURVEYS IN WĀDĪ AS-SAHAB AL-ABYAḌ SOUTHEASTERN JORDAN

Hamzeh M. Mahasneh and Hans Georg K. Gebel

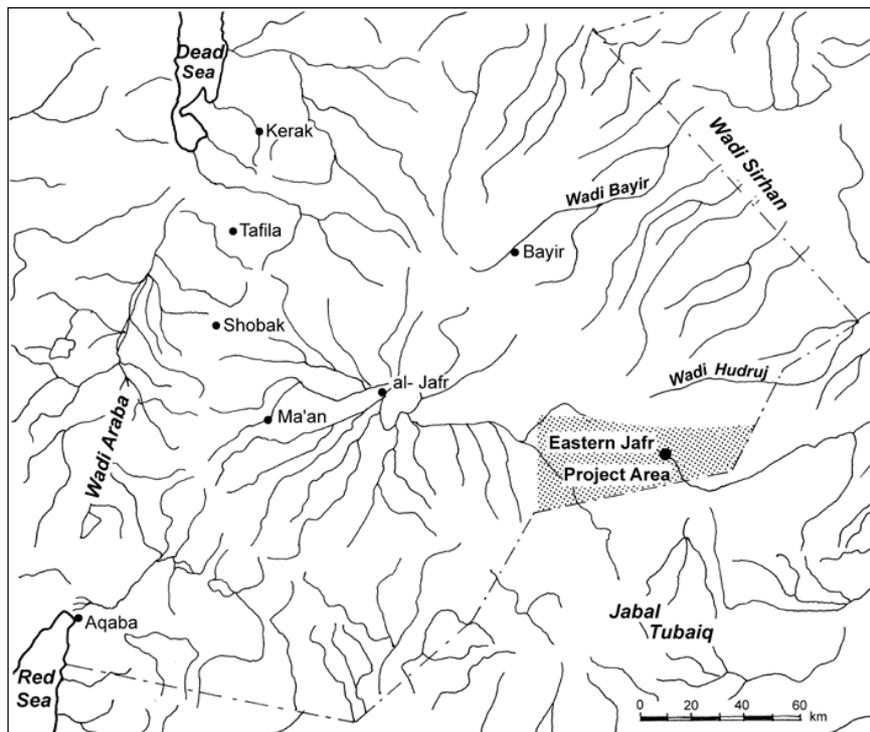
Research Frameworks and Survey Goals

In Holocene times, the southern *badia* desert adaptations could support or destabilize the economic and cultural developments of the favored regions to the west, without which some of their achievements or regressions cannot be understood. Often misunderstood as marginal, unproductive or irrelevant for the major socio-economic and political trajectories in the favored regions, these “deficit regions” allowed specialized economies the use of their biotic and abiotic resources that stabilized, promoted, or even interfered with developments in the Jordanian Highlands. Providing ores and other minerals, grasslands, long-distance route networks, etc., these vast arid lands could gain importance rapidly whenever needs and techniques occurred for their exploitation in the favored areas. Whenever hitherto “deficit” areas received impulses of growth, either by improvements of climate or hydrological situation (“green desert economies”, cf. Gebel and Mahasneh n.d.) or demands which they could satisfy (trade routes, flint, ores, salt, etc.), they may show obvious peaks of occupational activities for certain periods, while some other periods can hardly be traced archaeologically. Certainly we have to expect periods in which the arid and the semi-arid regions had little contact, and their societies co-existed without having much interaction.

A mixed hunting/pastoral economy may have exploited the Greater Jabal at-Tubayk Area from the early 7th millennium calBC: certainly Wādi Jilāt to the north witnessed such an economy at that time (Horwitz *et al.* 1999); Jabal at-Tubayk may even have served as the summer base for seasonal pastoralists during wetter parts of the millennium. The arid lands’ 6th and 5th millennium BC is somewhat difficult: characterized

by the aceramic “Arabian foliate/ slug horizon” stretching from the Omani Peninsula (Gebel 1982; Bergne and Copeland 1976) across the Arabian Peninsula as far west as Kilwa and Wādi ‘Araba (e.g. Abū Barqa near Gharandal), these two millennia may represent a rather uniform pastoralism with a highly variable contribution of hunting. For the Mid-Holocene, we expected to be confronted with an occupational complexity in the survey, while we were and are not expecting oasis cultures of the 3rd and 2nd millennium BC in our area.

However, arid lands and their adaptation potentials should never be understood as the mere management of deficits or as a conservative factor in historic development, but rather as slumbering potentials for new interaction spheres. With these basic research ideas in mind, in 2001 we chose the desert territories east of al-Jafr, south of the Wādi Ḥudruj/ Wādi as-Sahab al-AbyaḌ watershed, and north of the northern extensions of Jabal Tubayk in Saudi Arabia, as a future area of investigation (**Fig. 1**). With the support of the Department of Antiquities, two short field seasons were carried out in 2001 and 2006 as a joint project between Mu‘tah University and *ex oriente* at Free University of Berlin. The area of the greater Wādi as-Sahab al-AbyaḌ drainage system (also found on maps as Wādi ash-Shahab al-AbyaḌ) was approached in 2001 with several goals: 1) to test the archaeological potential and the logistics of a project devoted to understanding the southern *badia* desert adaptations in the Holocene periods, 2) to trace the northern extensions of the Kilwa cultures of Jabal at-Tubayq (Rhotert 1938), and 3) to understand the socioeconomic oscillations wet periods caused in the area. Of course, aside from these goals all human and paleontological evi-



1. Location of the Eastern Jafr Joint Archaeological Project survey area. (dot marks Qulbān Banī Murra).

dence were subjects of record. In 2006, goals concentrated on the understanding of the magnificent Late Chalcolithic/ Early Bronze Age sepulchral site of Qulbān Banī Murra (Gebel and Mahasneh, n.d.).

Compared to the research we have for the Negev (Avner 2002), little had been done in the southern Jordanian *badia*. Although Rhotert had presented exciting evidence as early as 1938, subsequent researchers showed little interest in the southern *badia* Neolithic and later desert cultures. The same is true for the outstandingly rich late Chalcolithic/EB occupations, known since early works were carried out at Qulbān Banī Murra (Kirkbride and Harding 1944) and Risqah (Kirkbride 1960, 1969). It was only just as we started our project, that Wasse and Rollef-

son (2005) became engaged in similar questions north of us (Wādī Ḥudruj); however, L. Quintero and P. Wilke (2002) as well as S. Fujii (e.g., 2004) with their al-Jafr Basin projects had already probed into several aspects of the questions before.

After two seasons¹, we are able to present the first results and our first thoughts on the research needs of a project in an area like ours. Apart from having the necessary skills for addressing chipped lithic industries in Holocene aceramic contexts, projects only make sense if the team is composed of various disciplines cooperating already in the field: epigraphy (e.g. Fig. 7), geology, geomorphology, pedology, hydrology, and paleontology. The area is also a candidate to search for remains of early man. The special

1. The surveys were made possible by the permit and assistance provided by the Department of Antiquities, 'Amman. It was carried out -including preparations and closing works- from 30th of Sep. to 11th of Oct. in 2001 and from 1-9 Sep., 2006. Co-directors of this joint project are Prof. Dr. Hamzeh M. al-Mahasneh, representing Mu'tah University, Karak, and Dr. Hans Georg K. Gebel, representing *ex oriente* at Free University of Berlin. While the principal funding of the 2001 survey came from al-Hussein bin Talal University, the 2006 season was financed jointly. The research area can be reached by GPS navigation, or with an experienced lo-

cal al-Howeitāt Bedouin from al-Jafr. The Wādī as-Sahab al-Abyaḍ is about 120-130km ESE of the al-Jafr; a ride to the area (c. 3 hours) is demanding in terms of vehicles. Careful planning of equipment and water supplies is necessary, and for security reasons a minimum of two 4x4 trucks have to be used, especially in view of tire damage caused by crossing extensive flint surfaces). There is a high risk of scorpion incidents. Work can be carried out only in the early mornings and late afternoons, due to extreme heat. While in 2001 some Bedouin had a tent in the survey area, nobody was in the area in 2006.

character of the landscape requires a lot of experience in deflated land archaeology, or in ḥammād prehistory: many remains are almost invisible heat-fractured stone structures embedded in the surface, often missed by those who follow what is everywhere and easy to identify: thousands of standing/ lying stones ...

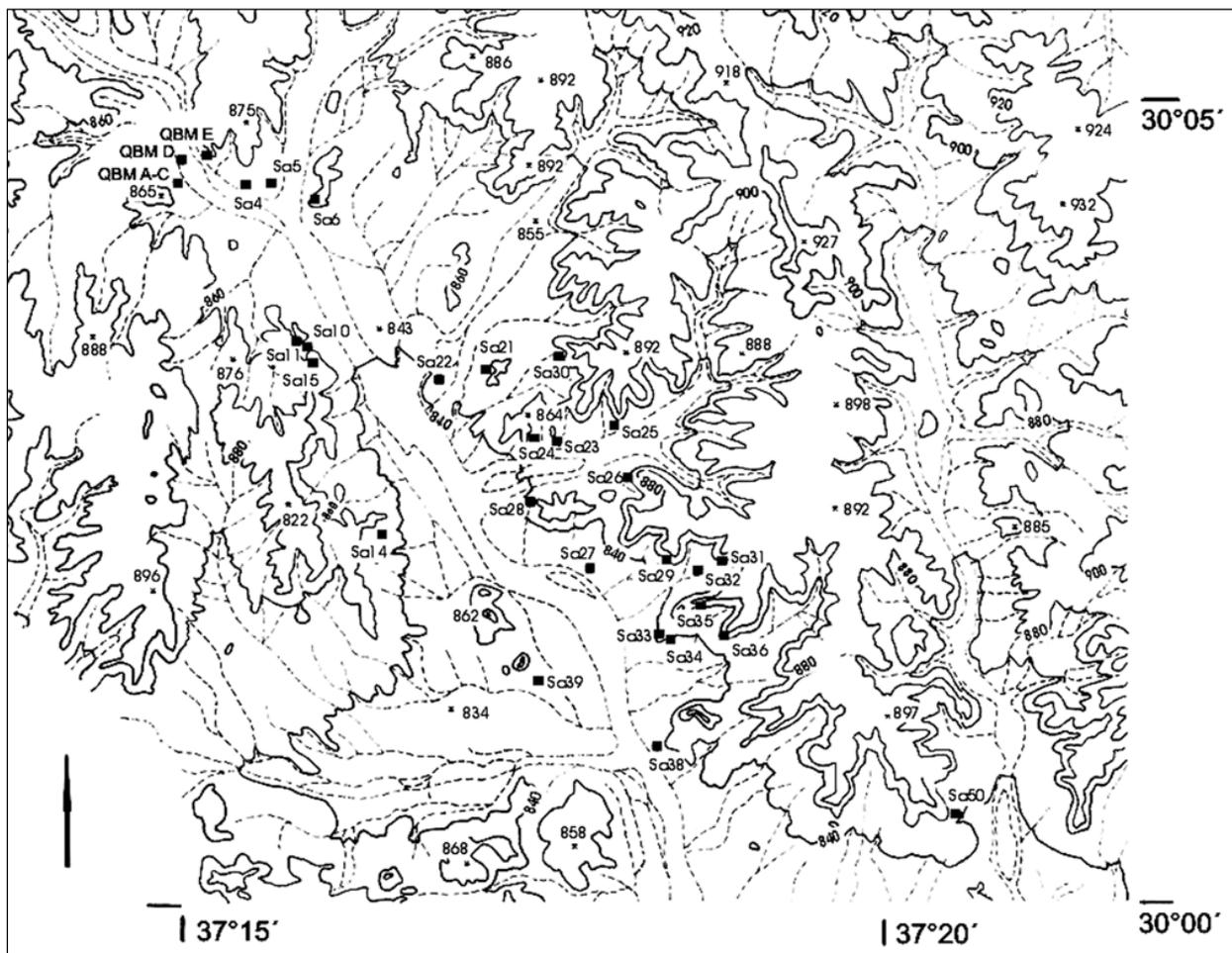
Survey Strategies

For the initial survey in 2001 (Fig. 2, Table 1), a systematic survey following a certain pattern was neglected in favor of getting meaningful insights on the occupational history during a short period. Sites were located by car (visiting promising physiographic settings such as prominent land marks, shelter/cave formations, the lower wadi slopes), which is not difficult for sites with surface structures. After locating them, they were intensively surveyed by means of walking at fixed intervals. It is of particu-

lar interest to mention the area’s characteristic feature, that chipped lithic artifacts cover all of the survey area; borders of a site are often difficult to determine; single finds or find spots can be located everywhere. The 2006 site survey at Qulbān Banī Murra focused on making a topographical site map (Gebel and Mahasneh, n.d.), locating on it all surface features, and the selected drawing and photographing of its major monuments.

Present Physiography, Climate and Land-Use

The greater Wādī as-Sahab al-Abyaḍ drainage system covers in Jordan more than 150-200 square km. Its central and lower parts are about 40-50km long, and drain into one of the basins (at 770m a.s.l.) between the northernmost outcrops of Jabal at-Tubayk. Its orientation of drainage is roughly NW- SE, as is also the case



2. Wādī as-Sahab al-Abyaḍ: Part of survey area of 2001 with site locations.

Table 1. List of major sites located in the 2001 survey, with preliminary information (only Wādi as-Sahab al-Abyad).

Site Name	Coordinates	Height a.s.l.	Short Description of Site & Setting	Surface Finds	Chronology & Interpretation (preliminary)
Qulban Beni Murra Areas A-E	N 30°04.203' - N 30°04.678', E 37°14.564' - E 37°15.136'		cf. text of contribution	large flake industry with fan scrapers, fragm. of hammerstone	Late Chalco / EB
W. as-Sahab al- Abyad 6	37 R 0332883 UTM 3327971		Large flat plateau with black colored <i>hammada</i> surface. Some stone structures at the E foot. Some flakes and blades could be found all over the plateau	blade with steep ret., projectile point with high triangular section	Neolithic ?
W. as-Sahab al- Abyad 7	37 R 0333656 UTM 3328039				
W. as-Sahab al- Abyad 10	N30°03.472' E37°15.963'	854 m	Extensive surface scatters in front of a wadi-side outcrop once hosting a rock shelter, now collapsed	blade I-IV industries with opposed and single platform blade cores, flake industry, burins, hammerstone, heavy- duty scraper, ret. large flakes, large eroded flakes with heavy patina	Early Neolithic (PPP MPPNB related?), Palaeolithic ?
W. as-Sahab al- Abyad 14A	below N30°02.363 E37°16.427	below 873 m	Foothill zone of ridge bordering the wadi		Late Chalco / EB, c: structures
W. as-Sahab al- Abyad 14B	N30°02.351 E37°16.433	872 m	Circular burial chamber on the deflated surface at the ridge's edge near the wadi border	none	Late Chalco / EB, bi chamber
W. as-Sahab al- Abyad 14C	N30°02.347 E37°16.461	869 m	Rectilinear burial chamber at the ridge's edge near the wadi border	none	Late Chalco / EB, bi chamber
W. as-Sahab al- Abyad 14D	N30°02.352 E37°16.468	869 m	Burial chamber at the ridge's edge near the wadi border	none	Late Chalco / EB, bi chamber
W. as-Sahab al- Abyad 14E	N30°02.346 E37°16.481	860 m	Circular grave with stone alignment around at the ridge's edge near the wadi border	none	Late Chalco / EB, bi chamber
W. as-Sahab al- Abyad 14F	below south of 37 R 0333653 UTM 3324358	below south of 862 m	Terraces / terrace walls with burial structures in a small valley deviding the ridge of SA14	none	Late Chalco / EB, bi ground
W. as-Sahab al- Abyad 14G	37 R 0333623 UTM 3324354	860	3 circular stone alignments on the summit of ridge	none	Late Chalco / EB, c: structures
W. as-Sahab al- Abyad 14H	below south of 37 R 0333682 UTM 3324312	below south of 868 m	At the foothill zone of ridge	flake and blade industry, ret. flakes and blades, many fan scrapers	Late Chalco / EB, habitational structur
W. as-Sahab al- Abyad 21	37 R 0334918 UTM 3326214		Slope located on the left side of the wadi. Site of one fragment of a retouched foliate. No other flaked material has been found	unfinished (?) foliate	Neolithic?
W. as-Sahab al- Abyad 22	37 R 0334326 UTM 3326205		Isolated hill situated in the wadi. Circular limestone structures. Largest with an approx. 5 m diam. Many blades and flakes were found.	flake industry incl. large flakes, ret. flakes, flakes with scraping edges, fan scrapers	Late Chalco / EB
W. as-Sahab al- Abyad 23	37 R 0335900 UTM 3325451		Site located at the spur of a hill mainly of sandstone and a shallow layer of limestone on the top. Many circular sandstone structures. Surface is partly covered with lumps of iron-sandstone minerals with a very high iron share. Much flaked material and many fan scrapers	flake industry, many fan scrapers, unfinished foliate fragm. (many iron minerals)	Late Chalco / EB
W. as-Sahab al- Abyad 24	37 R 0335532 UTM 3325325		Site situated at the top and on the slope of a hill. Surface covered with black colored limestone. Some flaked material	flake and large blade industries	
W. as-Sahab al- Abyad 25	37 R 0336311 UTM 3325498		Site like Abiad 23. Again iron-sandstone material, lot of flaked material and scrapers	flake industry with fan scrapers amd flakes with steep ret. edges	Late Chalco / EB
W. as-Sahab al- Abyad 29	37 R 0336880 UTM 3323754	872 m	Flaking ground with many flakes and blades and one core located on a terrace-like elevation on the foot of a spur	Blade III-IV industry	
W. as-Sahab al- Abyad 32	37 R 0337164 UTM 3323704	879 m	Find spot of a foliate fragment of the Kilwa?-type; also scrapers were found.	few fan scrapers, fragm. of large foliate	Late Chalco / EB
W. as-Sahab al- Abyad 33	37 R 0336767 UTM 3322984	880 m	Many Circular structures at the foot of a spur		
W. as-Sahab al- Abyad 34	37 R 0336850 UTM 3322937	872 m	Many circular sandstone structures, the largest with a approx. 18 m in diam. at the foot of spur. Some of the circular structures are inside the larger structures. Many fan scrapers and a large amount of flaked material	large flake industry with fan scrapers, one foliate	Late Chalco / EB
W. as-Sahab al- Abyad 37	37 R 0335269 UTM 3322662	844 m	Circular structures sandstones at the foot of a single outstanding. Some flints and scrapers	large blade ind., heavy duty side scraper, fan scrapers	Late Chalco / EB

W. as-Sahab al-Abyad 38	37 R 0336780 UTM 3321665	884 m	"Ibex Rock", in prominent position at the edge of a wadi "bay". Rock art: 1) pecked (wild) goat or gazelle with smaller animal (dog?) on a vertical rock surface (sandstone), flanked by two deeply engraved pairs of signs 2) 4-legged creature with "hook" and circular sign, and stylized ibex with drilled leg ends on a fallen rock	blade industry, flake industry, PPNB/PN burins, ret. blades and flakes, notched blades, few foliates	
W. as-Sahab al-Abyad 40	N29°59.472' E 37°18.350'	844 m	Circular sandstone structure at the foot of a sandstone formation. The formation eroded and exposed a stair-like structure in the rock.	some flakes and cores, undiag. industry	indet.
W. as-Sahab al-Abyad 43	37 R 0341164 UTM 3318813	882 m	Circular sandstone structures at the foot of a cone-shaped sandstone hill.	large blade and flake industry with many fan scrapers and ret. flakes	Late Chalco / EB
W. as-Sahab al-Abyad 44	37 R 0341164 UTM 3318813		Rock engravings (picking) on top of the cone-shaped sandstone hill (SA43).	none	?
W. as-Sahab al-Abyad 45	37 R 0344980 UTM 3319241	870 m	Circular limestone structures at the foot of a hill, isolated or in groups. The hill consists of limestone and sandstone.	large flake industry with fan scrapers and steeply ret. flakes	Late Chalco / EB
W. as-Sahab al-Abyad 46		868 m	Circular structures of very dark sandstones below and between two spurs of a hill.	undiag. industry, one lump of basalt	indet.
W. as-Sahab al-Abyad 48		882 m	Cone-shaped hill with circular structures on the slope.	large flake industry with fan scrapers and large thin flakes with cutting edges (ret.)	Late Chalco / EB
W. as-Sahab al-Abyad 49		852 m	Circular limestone structures at the foot of a sandstone hill.	large flake industry with fan scrapers and ret. blades III-IV	Late Chalco / EB
W. as-Sahab al-Abyad 50		877 m	Circular sandstone structure, partly covered by sand.	none	?
W. as-Sahab al-Abyad 51		884 m	Cone-shaped sandstone hill. At the foot are circular sandstone structures. Flaked material and fan scrapers were found. On top of the hill rock pecked engravings	large flake industry with fan scrapers and ret. blades III-IV	Late Chalco / EB
W. as-Sahab al-Abyad XX			Petrified forest ("Forest I)		Paleontological monument
W. as-Sahab al-Abyad XX			Fossil bones and shells exposed in a deposit, today forming the ceiling of a small shelter		Paleontological monument
abbreviations: <i>ret.</i> retouched, <i>Sa.</i> Wadi as-Sahab al-Abyad - explanations: <i>blades I</i> <25mm, <i>II</i> <50mm, <i>III</i> <80mm, <i>IV</i> >80mm					

for Wādi as-Sahab al-Asmar running parallel in the SW. The waterless and treeless landscape is characterized by a shallow undulating relief, in which one can listen during the day to the heat-pops of its flint pavements.

The area today is hyperarid (Emberger Classification: very arid - mild; Koppen: E B 4'db4') and receives 25-50mm rainfall in very wet years. The mean day temperatures are 14°C in January (32°C in July), the mean night temperatures are 4°C in January (24°C in July) (NAJ I). The landscape's slopes and summit surfaces are characterized by a large amount of flint debris and heat-fractured intact stone pavements (ḥammād) bearing desert varnish, by extensive gravel floors in the wadis, confined basins, hill-side sand accumulations, and dune areas. There exists almost no vegetation in the area except in the wadi courses.

It appears that the landscape today is not used by herders or any other sort of subsistence

economy (although a pair of lost sheep-shearing scissors were found, and camel herds may pass through the area); however, at night the area can become the ground for smugglers to/from Saudi-Arabia. The nearest police stations are Enab Station some 40km to the WSW and Bshash Station some 50km to the NE.

General Observations on the Geology, Paleontology, and Geomorphology

The general geological stratigraphy of the wadi ridges bordering Qulbān Banī Murra area and further south is characterized by top layers of quartzite sandstone bearing desert varnish, in which quartzite layers of thicknesses up to 30cm may occur. Whitish inclusions in this material are chalky particles less than 5-8mm. It is in here, where the fossil vertebrate (Wādi as-Sahab al-Abyad 11) was found. Below this hard cover of the area, beds of limestone separated by tabular and nodular flint occur. Locally, consolidated

sand is to be found beneath these limestone and flint layers (erosional products of aeolian deposits from the sandstone bedrock underneath?). Below this stratigraphy the sandstone formation starts. The origin of the fossil wood (silicified tree chunks of real forests) found below the ridges bordering the wadi at Wādī as-Sahab al-Abyaḍ remains to be understood.

Located Sites and Their Chronology

The more important sites located during 2001 are listed in **Table 1**; in this report, we can only describe some in a bit more detail. Our Survey area otherwise has countless locations with ancient, sub-recent (see **Fig. 19**) and modern rock art tribal marks, as well as innumerable pens with fan scrapers (see **Fig. 20**), or of just fan scraper scatters (see **Fig. 21**) of the late chalcolithic/Early Bronze Age with flint artifacts from other periods.

Description and Interpretation of Selected Sites and Surface Finds

Qulbān Banī Murra (Figs. 3-6, 8-10)

The ruins of *Qulbān Banī Murra* (also called *Biyar Beni Murra*, cf. JADIS 1994), respectively their core area, stretch over some 2 square km along the hilly flanks and the bed of central Wādī as-Sahab al-Abyaḍ. Its megalithic structures (cf. Gebel and Mahasneh, n.d.) made from the locally available tabular quartzitic sandstone are visible from afar and create impressive scenery in this barren and deflated environment. The site limits are unclear, since the summits and slopes to the N are covered by more burial grounds of



4. *Qulbān Banī Murra*, Area A: Row of circular structures on the right or southwestern wadi flanks / hilltops, from S. (photo: Eastern Jafr J.A.P.).



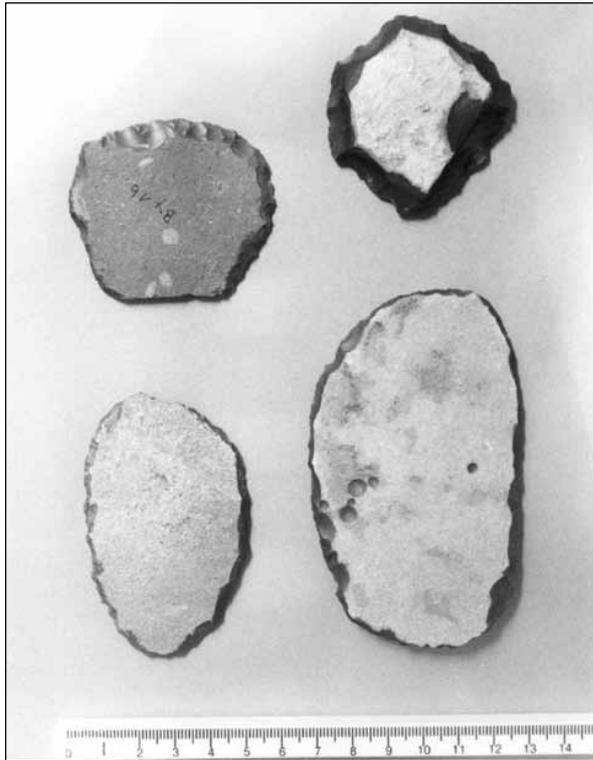
5. *Qulbān Banī Murra*, Area C: Looted chamber grave on the hilltops south of *Qulbān Banī Murra* Area A. (photo: Eastern Jafr J.A.P.).

the *Qulbān Banī Murra* types (not surveyed yet).

The topographical units and areas of investigation with their predominant structures include Areas A-C on the southwestern wadi slopes,



3. *Qulbān Banī Murra*, Area E: Burial structures on the left or northeastern wadi flanks / hilltops, from SW. (photo: Eastern Jafr J.A.P.).



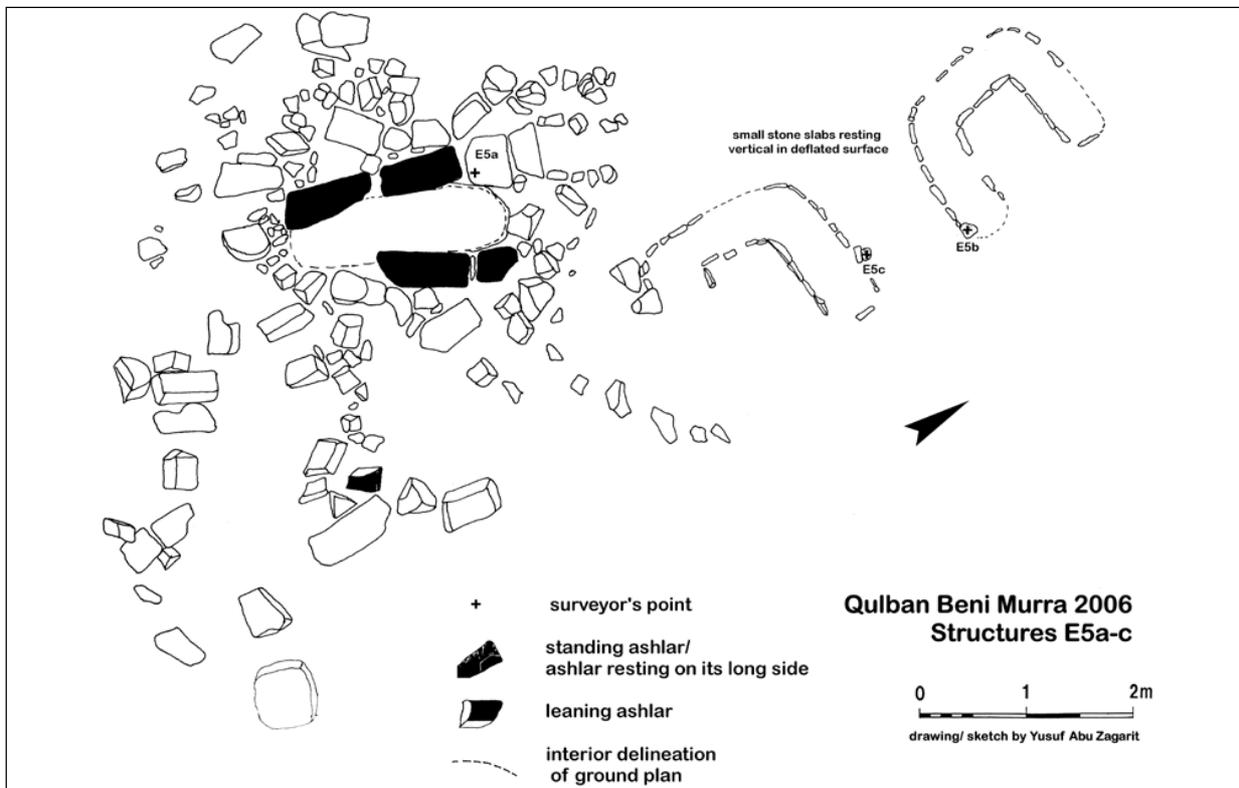
6. *Qulbān Banī Murra 1B*: Chipped lithic artifacts (surface finds). (photo: Eastern Jafr J.A.P.).



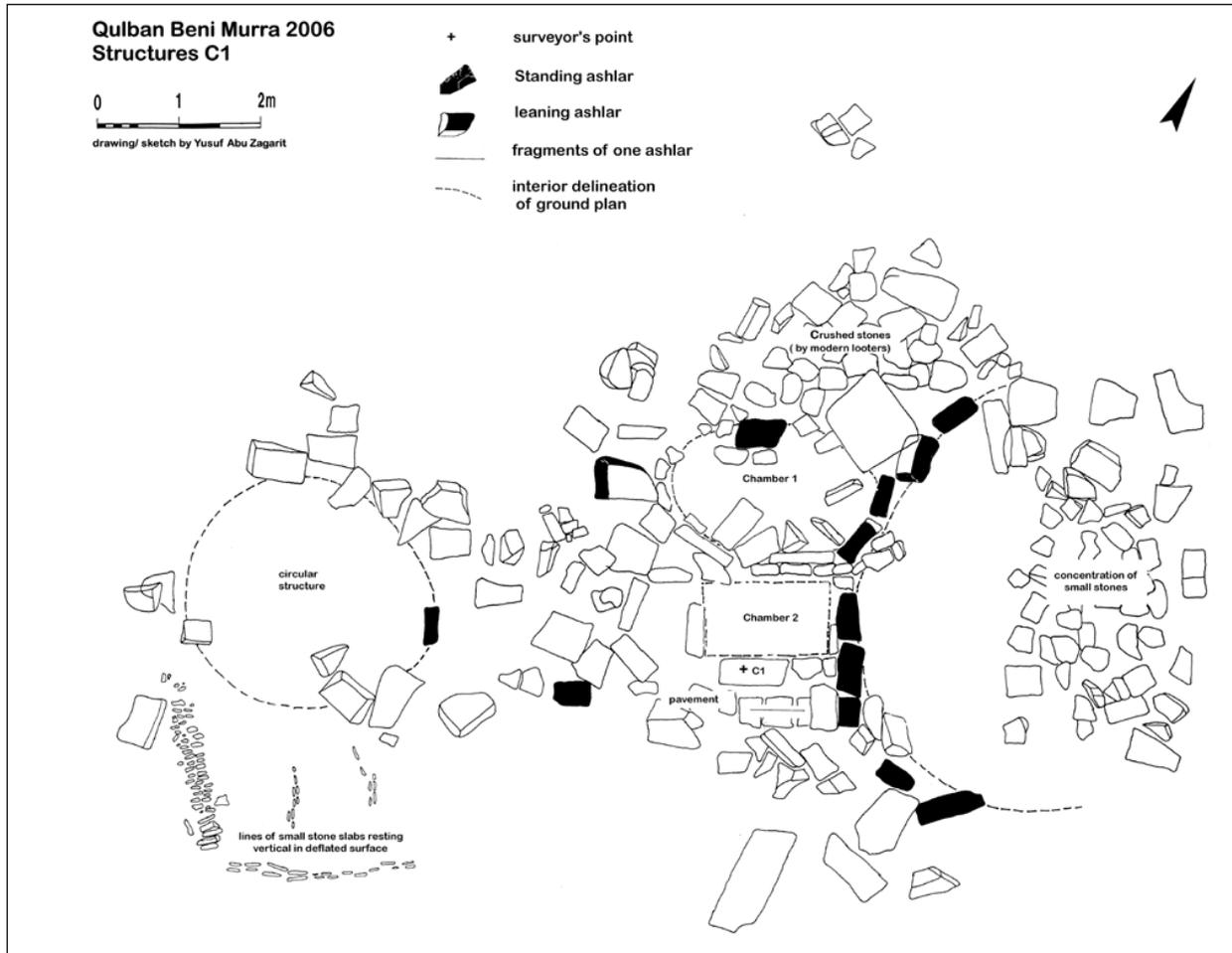
7. *Upper Wādī as-Sahab al-Abyaḍ*: Thamudic inscription on portable rock. (photo: Eastern Jafr J.A.P.).

separated by a runnel (A/B) and a small wadi (B/C):

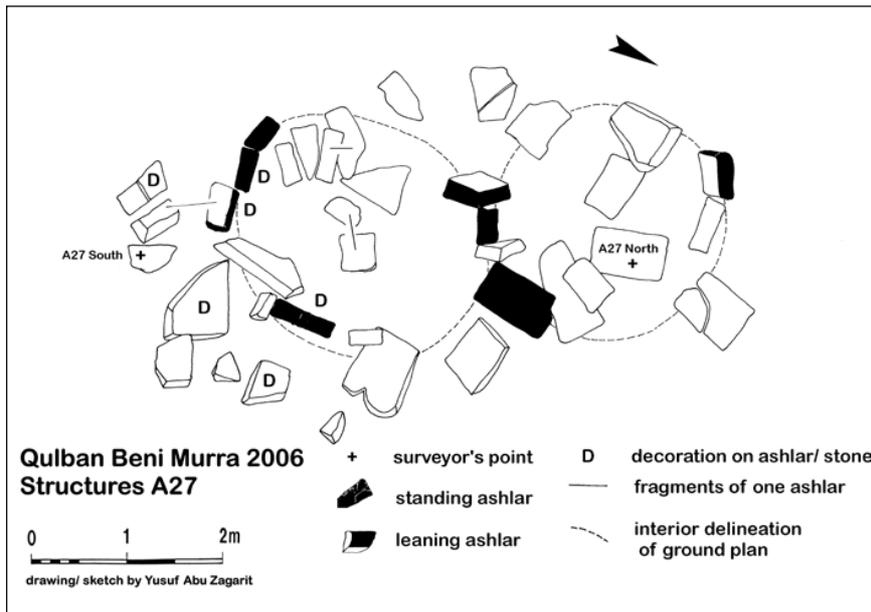
- Area A: a chain of circular megalithic structures, composed of room clusters (ca. 8 clusters with ca. 29 rooms) and ca. 8 isolated room structures; isolated megalithic circular room structures; megalithic cairn graves;
- Area B: mainly isolated megalithic cairn graves; ashlar field between Areas A and B;
- Area C: chain of isolated megalithic chamber



8. *Qulbān Banī Murra Area E*: Chamber grave and two embedded horseshoe-shaped structures (Structures E5a-c). (drawing: Y. Abu Zagrit, Eastern Jafr J.A.P.).



9. Qulbān Banī Murra, Area C: Chamber graves and associated structures (Structure C1). (drawing: Y. Abu Zagrit, Eastern Jafr J.A.P.).



10. Qulbān Banī Murra, Area A: Circular Structure A27. (drawing: Y. Abu Zagrit, Eastern Jafr J.A.P.).

graves and remains of a camp area.

Area D in the wadi floor is characterized by large isolated multi-roomed structures with central depressions (the so-called well structures) and isolated megalithic chamber graves.

Area E on the northwestern wadi slopes has many isolated megalithic chamber and cairn graves, ashlar fields and quarries, and Bedouin-type graveyards.

Area F (not yet surveyed) to the south of Area E seems to represent the same nature and burial types as Area E.

The areas' general characteristics differ considerably from each other, in terms of structure types, organization of space, image inventories, and surface finds, among others. The question whether we deal with a single occupation with different groups represented by different ceremonial manifestations, or if we deal with several reoccupations during the Late Chalcolithic - Early Bronze Age periods represented by different styles and finds, is unresolved yet. A preliminary summary description of the Late Chalcolithic - Early Bronze Age remains is presented in the following (for more details cf. Gebel and Mahasneh, n.d.):

Area A is dominated by a long row of single and clustered circular rooms, dispersed cairn graves and circular rooms, and a large space east of Structures A15-31 is structured by ashlar settings.

Area B is characterized by large isolated cairn graves with ashlar marking interior and exterior spaces, showing many signs of additive burials with added peripheral pavements or pavement terraces; rows of subsequent cairns resulted in huge stone accumulations, but single cairns also occurred. Very often an isolated group of two or three ashlar was erected in the southeastern part of these structures, as well as obvious fields of stone debris. Ashlar fields are found between Areas A and B. Except for a figurative decoration on the standing ashlar of Structure B39, no other stone pecking was found in Area B.

Area C witnesses a chain of isolated megalithic single and double chamber graves (most looted in recent times) and the remains of a larger camp area; no figurative or other stone-pecked decorations were found in Area C. More burials exist on the hilltops east and southeast of Area C. It appears that many of the chamber

graves had annex structures. The human remains exposed by the illicit digging appear to be in a rather good state of preservation.

Area D is typified by the remains of some nine multiroomed structures on small mounds along the western margins of the present-day "active" wadi bottom, and chamber graves on the ḥammād surfaces of the wadi floor. The small mounds rest ca. 0.5m above the surrounding ḥammād and wadi gravel flats; the present runnels also cut through these ḥammād surfaces. The ground plan of the multiroomed structures is outlined by single row, single course walls or "wall-ettes", with clusters of curvilinear, polygonal, oblong, and sub-oval rooms sharing walls. Each building has between 12 and 24 rooms and a central or almost central depression reached by two or more oblong corridor or passage-like rooms with lengths between 1.5 and 5m; each structure has one to three rooms with interior stone piles. The surfaces of the circular or oval depressions (diameters 2-8m) are ca. 0.5 to 1.0m deep and filled with sand; reportedly representing well shafts, we call these buildings "well structures". Located along the major wadi course, these shafts are expected to have tapped the aquifers. Little figurative and petroglyph material is found in Area D, and mostly they represent tribal tags.

Area E shows a high degree of structural variability in its isolated megalithic chamber and cairn burials. In addition, ashlar fields related to "runnel quarries", and Bedouin graveyards associated with various campsite remains from different periods were found in the northwestern parts of Area E's slope. Two horseshoe-shaped structures (each ca. 2 x 2m) of unknown date, outlined by a double-row of small stone slabs (ca. 20cm) set upright into the surface, are characteristic and unique features of the site.

The deflated surfaces of the site are littered with fan scrapers and undiagnostic flake industries with some blade elements.

As a preliminary interpretation we offer the following site understanding. The huge site of Qulbān Banī Murra (about 2 square km), which has no equivalent yet in Jordan, seems to represent the burial place of hitherto unknown late Chalcolithic/EB cultures of Jordan. Risqah near 'Aqaba and Rajajil near Sakaka in Saudi Arabia may represent a similar culture. The herdsman

of these basically aceramic cultures gathered in sites like Qulbān Banī Murra to bury their dead and practice ancestral traditions. The 2006 reconnaissance recorded over 200 structures. The megalithic character of the site comes from these ashlar walls and standing stone groups connected with the cairn. Some of the circular structures and ashlar walls of the cairns carry decorations like ibexes and unknown signs. The “well structures” of Qulbān Banī Murra in the bed of Wādī as-Sahab al-Abyaḍ may date back as early as the Late Chalcolithic/EB burial grounds, since they are littered with the diagnostic fan scrapers as well. They must have been used in a climatic optimum of the Mid-Holocene times when most desert areas of the Arabian Peninsula were covered by seasonal lakes and vast pastures, also bringing life to dry and remote areas like Qulbān Banī Murra.

Wādī as-Sahab al-Abyaḍ 10

This site is a collapsed rock shelter (**Fig. 11**) once opening towards Wādī as-Sahab al-Abyaḍ of dimensions we were unable to reconstruct. On the banks of the wadi and upwards towards the previous rockshelter, and between its fallen debris, PPN blades occur in quite good numbers, struck from bidirectional non-naviform and single platform cores; burins are attested also. Large wind-worn and heavily patinated scrapers and flakes seem to represent Paleolithic use(s) of the shelter. Large vertebrates (**Fig. 12**) are exposed by fractured bedrock close to the site.



11. *Wādī as-Sahab al-Abyaḍ 10: Site of the PPN(A?) rock shelter. (photo: Eastern Jafr J.A.P.).*



12. *Wādī as-Sahab al-Abyaḍ 10: Fossil vertebrate in the bedrock. (photo: Eastern Jafr J.A.P.).*

Wādī as-Sahab al-Abyaḍ 14

SA14 is a unique site for the area, in terms of its Late Chalcolithic/EB structural variability. Aside from the common animal circular enclosures in the sandy foot zones of the wadi side (e.g. **Fig. 13**, terraces in a drainage leading to



13. *Wādī as-Sahab al-Abyaḍ 14: Late Chalcolithic-Early Bronze Age camp site on the wadi terrace. (photo: Eastern Jafr J.A.P.).*



14. *Wādī as-Sahab al-Abyaḍ 14: Late Chalcolithic-Early Bronze Age terraces of the burial ground. (photo: Eastern Jafr J.A.P.).*



15. *Wādī as-Sahab al-Abyaḍ 14: Late Chalcolithic-Early Bronze Age circular structure in the burial ground area on the hilltop. (photo: Eastern Jafr J.A.P.).*

Wādī as-Sahab al-Abyaḍ bear a graveyard with very different types of grave structures, among which a circular one is on the hilltop (Figs. 14-15). On the summit of the wadi side to the N the remains of two tower-like graves are present.

Wādī as-Sahab al-Abyaḍ 38 (“Ibex Rock”)

A rather prominent but smaller hill (Fig. 16, right) bears large sandstone rocks/ blocks with several ibexes on two vertical or slightly inclining rock surfaces in the upper part of the small conical mountain. This point provides an excellent view over the Wādī as-Sahab al-Abyaḍ.

The northwestern part of the conical moun-

tain is in shadow during forenoons and has a small flattish area that is bordered by more fallen rocks creating a room-like situation. One of these rocks, on a surface towards the “room”, bears multiple depictions of ibexes (Fig. 17). The other depiction is on a vertical rock facing W (Fig. 18) and is oriented towards the wadi. Both images are on the highest part of the conical mountain.

All representations of the ibexes and nearby motifs are pecked. The repertoire of motifs exclusively involve the ibex except for the two scenes facing the southeast, showing a human and a human with an animal led by a rope. The

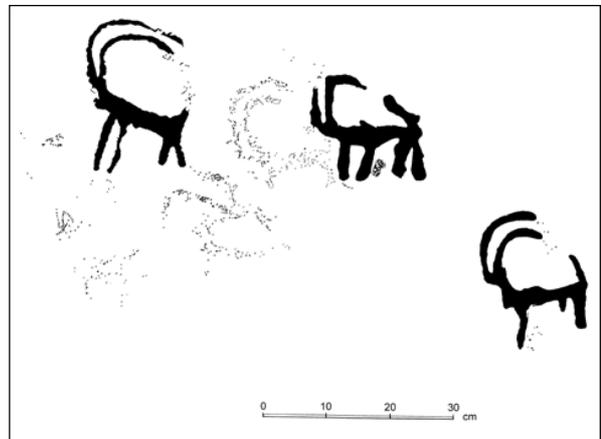


16. *Wādī as-Sahab al-Abyaḍ 38: View of the site from SW (photo: Eastern Jafr J.A.P.).*

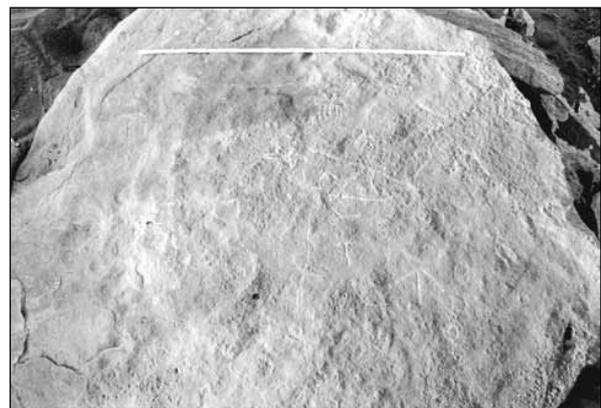


17. *Wādī as-Sahab al-Abyaḍ 38: Rock art on the south-eastern rock face (drawing: H.G.K. Gebel, Eastern Jafr J.A.P.).*

field of representations on the rock facing the northeast only has two ibexes deeply pecked in to the rock, while a third is executed less deeply, and a fourth only is outlined by a more fresh pecking. Other pecked areas show that the compositions might not have been finished or that



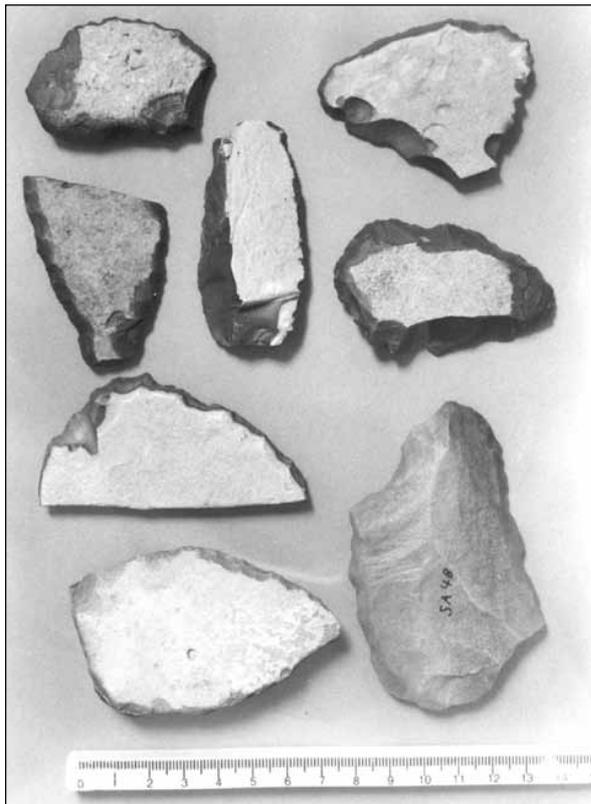
18. *Wādī as-Sahab al-Abyaḍ 38: Rock art on the western rock face (drawing: H.G.K. Gebel, Eastern Jafr J.A.P.).*



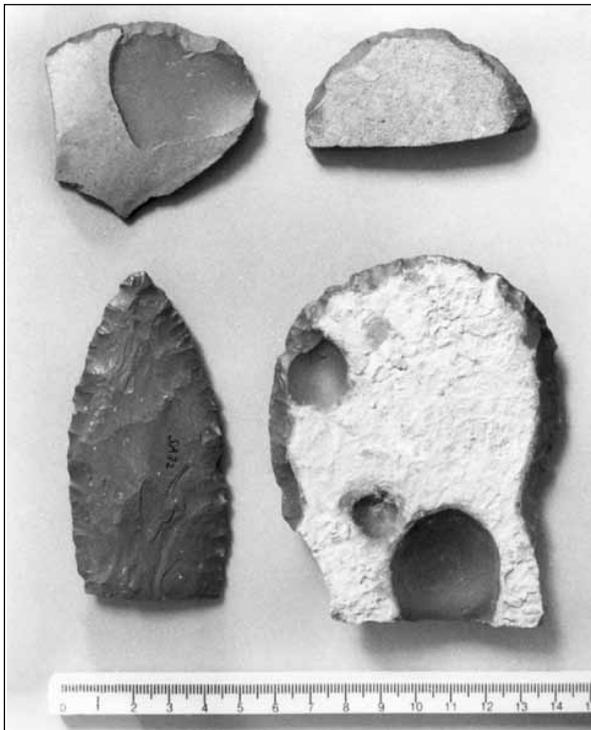
19. *Upper Wādī as-Sahab al-Abyaḍ: Sub-recent narrative scenes on flat bedrock. (photo: Eastern Jafr J.A.P.).*

more motifs were to be added. The rock is a porous and hard sandstone with quartzitic inclusions and veins; it bears desert varnish.

At the foot of the rock a large amount of PPN



20. Wādī as-Sahab al-Abyaḍ 48: Chipped lithic artifacts (surface finds). (photo: Eastern Jafr J.A.P.).

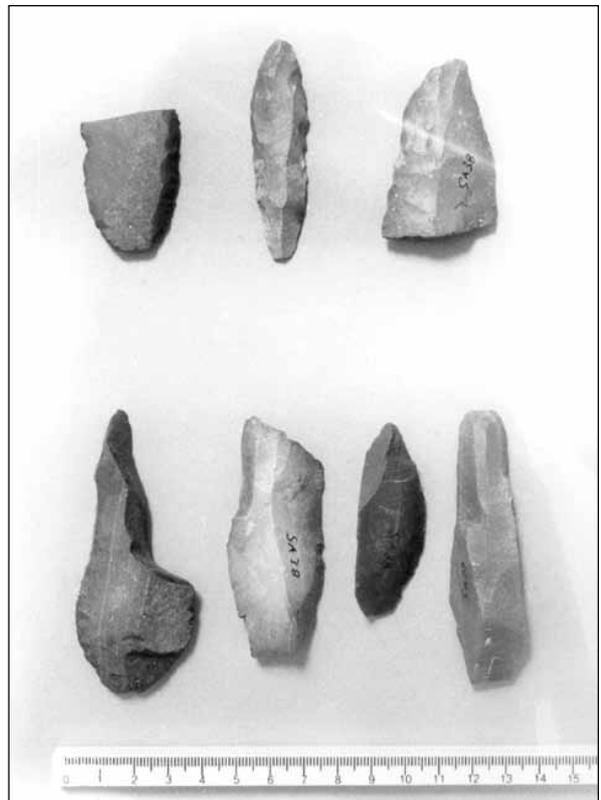


21. Wādī as-Sahab al-Abyaḍ 32: Chipped lithic artifacts (surface finds). (photo: Eastern Jafr J.A.P.).

flaked material was found including foliates, burins and cores (Fig. 22).

Brief Summary

This report is preliminary in the sense that we have not yet found many parallels for our findings. The area of survey turned out to be extraordinarily promising with an extremely high research potential for many disciplines. Unexpected and unknown were the very rich aceramic Late Chalcolithic/Early Bronze Age occupations with their large variety of circular and rectilinear structures, serving pastoral, domestic, sepulchral and unknown ritual purposes. Much rarer, but clearly present, is the PPN in the area, while the Paleolithic and Epipaleolithic periods are almost absent, or not in the locations where we have so far concentrated our research, or they are buried in local stratigraphies. The collapsed PPN rock-shelter of Wādī as-Sahab al-Abyaḍ 10 so far is among the very first PPN evidence in far southeastern Jordan. We expected that a PPNB/PN Kilwa-type of occupation would have occurred more densely



22. Wādī as-Sahab al-Abyaḍ 38: Chipped lithic artifacts (surface finds). (photo: Eastern Jafr J.A.P.).

in the area; future research has to investigate why it appears so limited in Wādī as-Sahab al-Abyāḍ. The marvelous findings of fossil forests and bones in the bedrock open a new field of research to paleontologists who have to join the future investigations of the area. At the moment, the findings are under study and deserve a very basic discussion, since our project has entered and encountered completely new evidence from many periods. It is planned to publish full reports in the near future: one will focus on the Neolithic occupational history of the area, one on the palaeoenvironmental aspects of the Early-Mid Holocene, and one devoted to the densely distributed Late Chalcolithic/EB camp sites and burial fields.

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كنيسة الكاهن "جيونيسيوس" في جرش نتائج أعمال الصيانة والترميم

كاترينا الحمارة وعبد المجيد مجلي

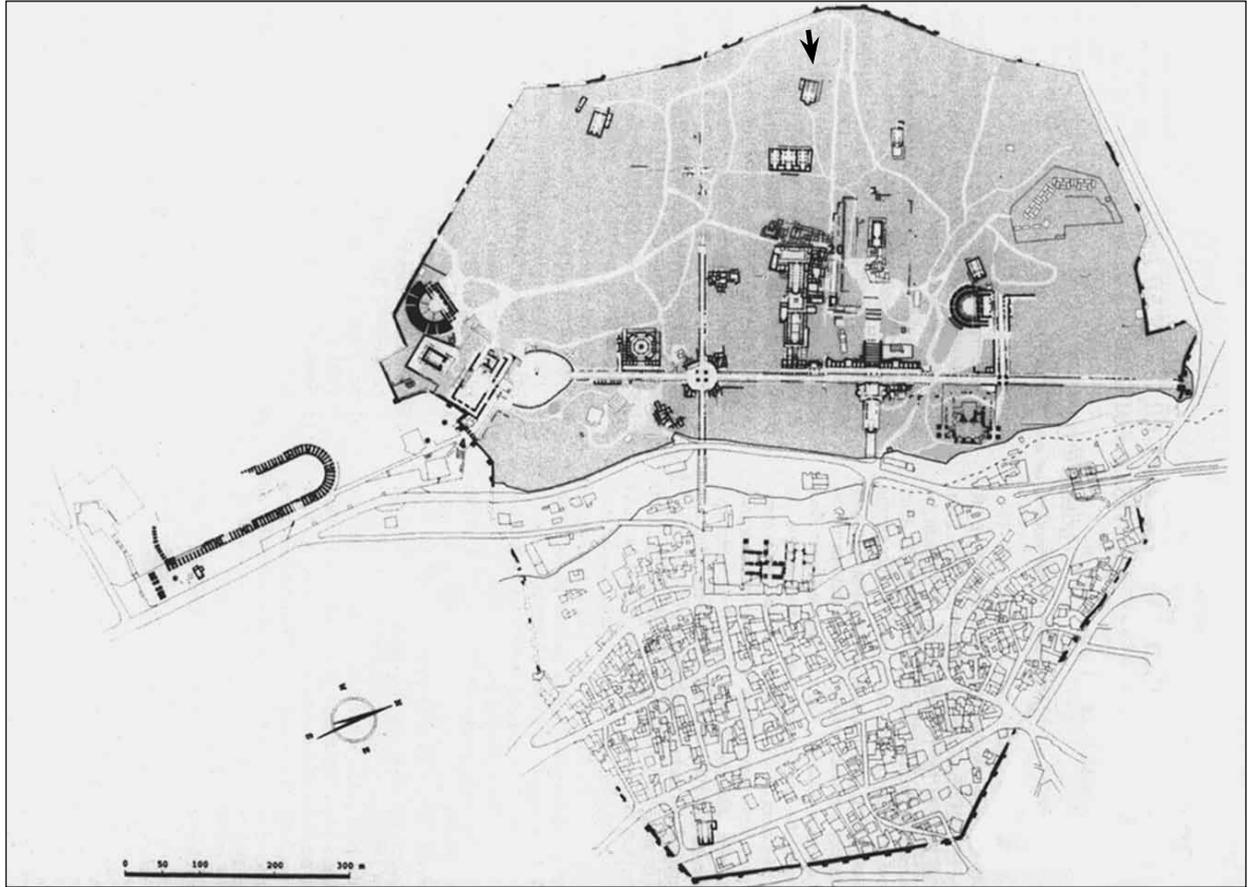
المقدمة

تكشف تحولات فريدة في المجتمع خلال القرن السابع الميلادي في جوانبه الإقتصادية والروحانية والمعمارية.

تبنت دائرة الآثار العامة في العام (٢٠٠٥) مشروع جديد تمثل في توثيق الأرضيات الفسيفسائية في محافظة جرش^١، تمّ خلالها الكشف عن المواقع ذات الفسيفساء وإجراء أعمال الصيانة والترميم اللازمة قبل إعادة طمرها للحفاظ عليها. خلال هذا المشروع تم العمل على كشف أرضية كنيسة الكاهن «جيونيسيوس»، وتبين من خلال أعمال التنظيف والتدعيم للأرضيات الفسيفسائية وجود مميزات معمارية وفنية لهذه الكنيسة تستحق إعادة دراستها كونها

الموقع

تقع كنيسة الكاهن «جيونيسيوس» في المنطقة الغربية الوسطى من المدينة الأثرية، وتبعد عن مجمع كنائس «يوحنا المعمدان» حوالي (٥٩م)، في حين تبعد عن السور الغربي الأثري حوالي (٧٤م) إلى الشرق (الشكل ١).



١. مخطط مدينة جرش.

١. للمزيد أنظر Hamarneh et al 2008: 146-139.

نبذة تاريخية عن التنقيبات المبكرة

جاء اكتشاف الكنيسة في الثلاثينيات من القرن الماضي خلال أعمال التنقيبات المشتركة ما بين جامعة «بيبل» الأمريكية والمدرسة البريطانية للآثار (Horsfield 1930: 21). وصف «كروفت» – المشرف على أعمال التنقيب في حينها – أعمال التنقيب التي تمت بعدم الانتظام، حيث وزعت مربعات الحفر بطريقة عشوائية غير منتظمة، كانت الغاية منها الكشف عن الموقع وتحديد طراز البناء (Crowfoot 1938: 249).

ترك الموقع دون أي تدخل حتى الخمسينيات من القرن الماضي، حين حصل إنهيار في جزء من الجدار الشمالي بتأثير مياه الأمطار وإنحدار المنطقة الترابية خلف الجدار الشمالي، بالإضافة لزيادة حجم التراكم الترابي بتأثير مياه الأمطار مما ترتب عليه إزدياد الأحمال على الجدار، وفي السبعينيات من القرن الماضي إنهار جزء بسيط من الجدار نفسه، مما حدى بالمشروع السياحي الكشف عن جزء من الموقع لرفع الحجارة المنهارة، وتسوية المنطقة العلوية وتحويل مجرى المياه عن الجدار الشمالي.

تمّ مجدداً الكشف عن الموقع خلال العام (٢٠٠٦/٢٠٠٧)، وضمن مشروع توثيق الأرضيات الفسيفسائية في محافظة جرش الذي أطلقته دائرة الآثار العامة خلال العام (٢٠٠٥)، حيث تمّ إزالة الطم المتراكم من داخل الكنيسة بهدف إعادة توثيقها وصيانتها وإعادة تأهيلها (الشكل ٢).

الوصف المعماري

بنيت الكنيسة على نظام المخطط البازيليكي المتأخر الذي إعتد خلال فترة حكم الأمبراطور «جوستين الثاني» (٥٦٥-٥٧٨م)

(Davis 1952: 91-92). تتألف من الكنيسة الرئيسية ويحف بها ومن الجانبين الشمالي والجنوبي مصليان بنيا على مخطط كنيسة القاعة (ذات الردهة الواحدة) (الشكلان ٣ و ٤).

كنيسة الكاهن «جيونيسيوس»

دعيت بهذا الإسم بناء على كتابة الإهداء التي تذكر بنائها أثناء أسقفية الكاهن «جيونيسيوس». وتتألف الكنيسة من الأجزاء المعمارية التالية:

الحنية

تتألف منطقة الحنية من المحراب والخورس (المنطقة الأمامية لحاجز الهيكل). جاء المحراب نصف دائري وبارز عن جسم الكنيسة ومنفرد، أي لا تحف به على الجانبين غرف الخدمة. يبلغ قطره (٢٥،٤م)، و يرتفع بمقدار درجتين عن مستوى الخورس، يتوسط الحنية أربعة صفوف بشكل درج أقيم فوقها مقعد الأسقف، و تحف بالمقعد من الجانبين مقاعد جانبية ذات مستوى أدنى أستعملت لجلوس باقي الأكليروس (الكهنة).

بلطت أرضية المحراب ببلاط حجري ذي قياسات كبيرة، تراوح طول البلاطة ما بين (٦٠، ٩٠-٠، ٩٠م)، وعرضها (٦٠، ٦٠م).

بنيت جدران الحنية من الحجارة الكلسية المشذبة، وغطيت بطبقة من القصارة، لا تزال آثارها ماثلة في الأجزاء الداخلية من الجدار. كما ظهرت في الجدار ثقب وجد فيها آثار لمسامير برونزية ربما استخدمت لتثبيت الألواح الرخامية التي كانت تكسو الجدران.

أما الخورس، وهي المنطقة المحصورة ما بين المحراب وحاجز الهيكل، فبلغت أبعادها (٨،٩٠ X ٤،٠٥م)، يفصلها عن أروقة

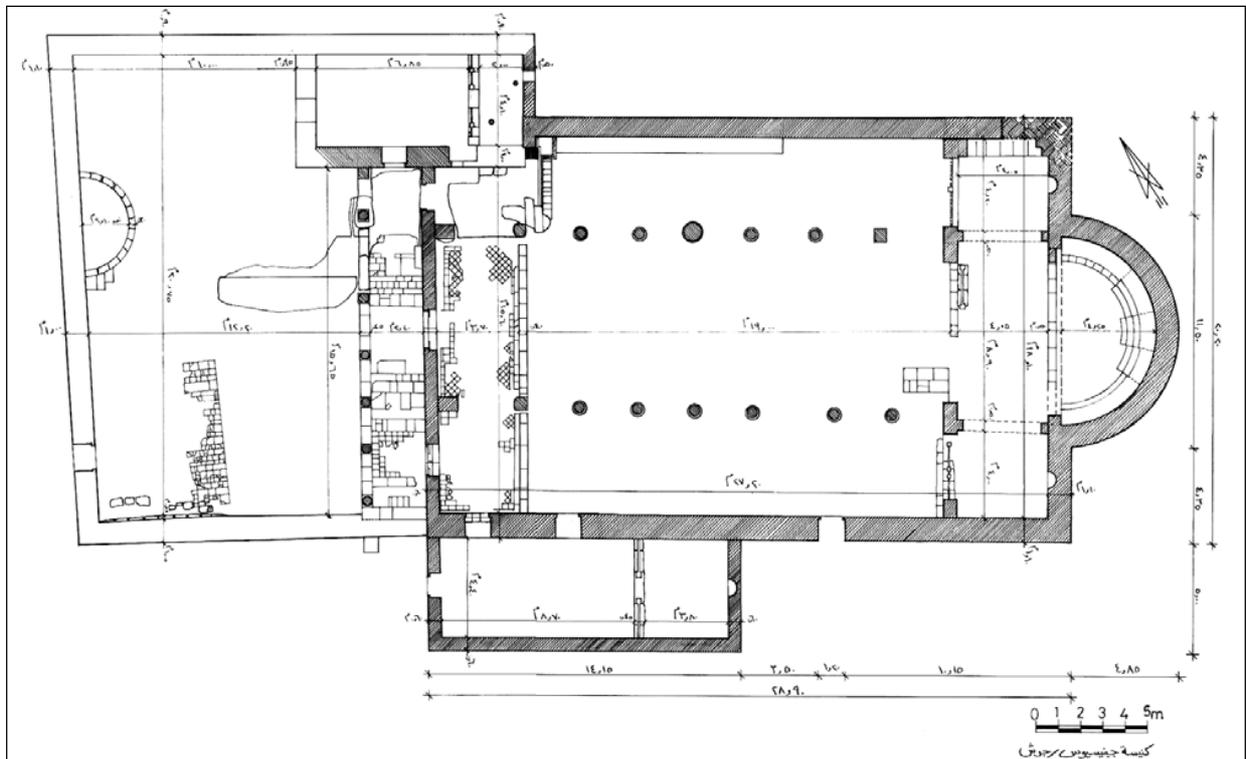


٢. الموقع قبل الكشف عنه.

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٣. موقع الكنيسة بعد كشفها.



٤. مخطط الكنيسة.

أثناء أعمال التنقيبات المبكرة. تيجان الأعمدة أيونية، أبعادها (٠,٦٣ × ٠,٦٣ × ٠,٣٧ م)، وقد أجريت عليها تعديلات حيث أزيلت الزخارف وثقبت لغايات تلبسها بألواح رخامية، في حين ظهرت تاجيتا أعمدة الركينزين مختلفتين بالحجم، إذ يبدو إنهما كانتا من الطراز الكورنثي، وبلغت أبعادها (٠,٦٣ × ٠,٦٣ × ٠,٦٥ م)، شذبت لإزالة كافة الزخارف منها وثقبت لتثبيت الألواح الرخامية الجديدة.

الرواق الجنوبي

يبلغ طول الرواق الجنوبي (١٩,٣٠ م) وعرضه (٤,٥٠ م). رصف الرواق بأرضية فسيفسائية، تألفت من إطار زخرفي ملاصق للجدار زخرف بمعينات هندسية مكونة من مكعبات زجاجية في أرضية من المكعبات الكلسية البيضاء، يليه إطار زخرفي تألف من مربعات متتالية، صورت فيه أشكال هندسية للصليب المعقوف، وأشكال المربعات ذات الأبعاد الثلاثية المتداخلة، تتعاقب مع مربعات زخرفت فيها أشكال نباتية لثمار كالعنب والرمان و أوراق شجر وداخل الإطار رصفت أشكال حرشفية بيضاء في مركز كل منها رصف شكل الورد البيزنطية.

تعرضت هذه الأرضية للتدهور ظهر على شكل فجوات واسعة وعمق (٠,١٥-٠,٢٠ م) تراكمت فيها الأتربة التي أدت لنمو النباتات. أثناء أعمال الصيانة التي تمت لإزالة الأتربة والنباتات وتثبيت الحواف ظهرت معالم لأرضية أقدم ممتدة أسفل الأرضية الأولى ومن المعاينة تبين إنها رصفت باستخدام مكعبات فسيفسائية أكبر حجماً (< اسم ٣) ملونة (أحمر، أصفر، أسود، وردي وأبيض) كانت تشكل، على الأغلب، أشكالاً هندسية بسيطة من خطوط ومعينات ومكعبات (الشكل ٦).

الرواق الشمالي

يبلغ طول الرواق الشمالي (١٧,٩٠ م) و عرضه (٤,٠٠ م).

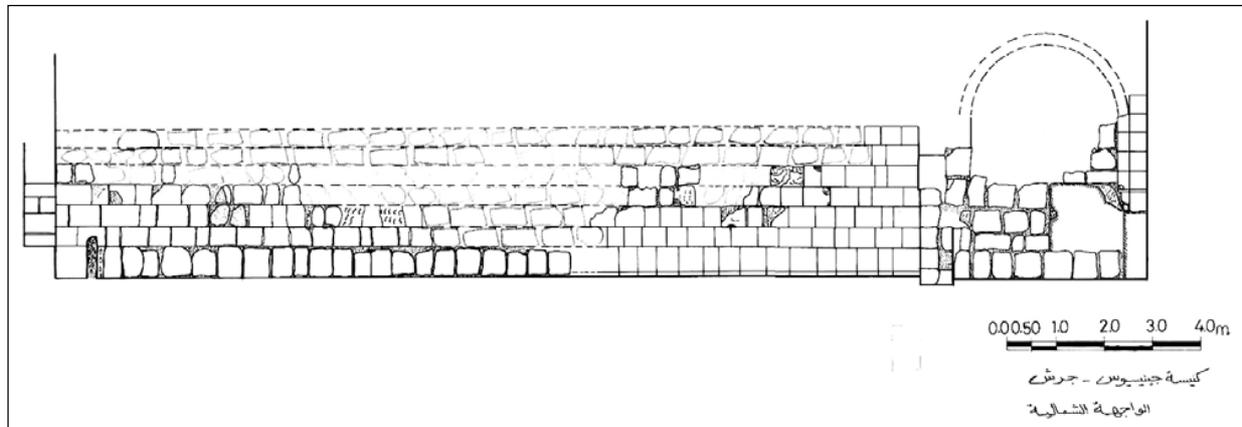
الكنيسة أربع ركائز حجرية حملت أقواس السقف، أقيم بينها الحاجز الإيقوني، الذي أصبح سائداً في الكنائس الأورثوذكسية، وقد ثبت على قواعد رخامية ملونة نقلت على الغالب من أحد المعابد القريبة. بلطت أرضية الخورس ببلاط حجري صغير الحجم بلغت قياس البلاطة (٠,٢٥ × ٠,٢٥ م) لتشكل أشكالاً هندسية.

أنشأت في الجدار الشرقي للكنيسة المحاذي لمنطقة الخورس، كوتان، أبعاد الكوة الشمالية (١,١٠ × ٠,٧٥ × ٠,٤٠ م)، فيما لم يتبق من الكوة الجانبية إلا القاعدة. غطيت الكوات بطبقة من القصاره لا تزال بعض أجزائها ماثلة، في حين ظهرت على بعض أجزائها آثار للسجاج مما يعتقد بأنها كانت تستخدم لمصاييح الزيت المقدس.

أقيم في الجدار الشمالي المتعامد مع الجدار الشرقي قوس بلغت أبعاده (٨,٥٠ × ٣,١٠ × ٠,٨٥ م) يرجح استخدامه كخزانة لحفظ مستلزمات الكنيسة، حفر الجزء الأسفل منه بالصخر حتى إرتفاع (١,٨٠-١,٤٠ م)، في حين استكمل الجزء المتبقي بالحجارة، وغطي بطبقة من القصاره (الشكل ٥).

الرواق الأوسط

يبلغ طول الرواق الأوسط (١٩,٣٠ م) وعرضه (٧,٤٠ م)، بلطت أرضيته ببلاط حجري ذي قياسات كبيرة، بلغت أبعاد البلاطة (١,٠٠ × ٠,٦٠ م)، ولم يتبق من البلاط إلا أجزاء بسيطة مكسورة، في حين بقيت آثارها ماثلة في الملاط، ويفصل الرواق الأوسط عن الأروقة الجانبية صفان من الأعمدة، بلغ عددها سبعة أعمدة على كل جانب وركيزتان عند مدخل منطقة المحراب، ويتكوّن كل عامود من أربع قطع، ما عدا العامودين اللذين يحقان بمدخل الكنيسة من الغرب إذ تألفا من قطعتين. وعلى جميع الأعمدة آثار التشذيب والتنقيب، داخل الثقوب آثار لقطع رصاصية، استعملت لتثبيت قطع نحاسية استخدمت لتلبس الأعمدة بألواح رخامية. وقد وجدت كافة الأعمدة ساقطة عن محورها داخل منطقة الرواق الأوسط نتيجة زلزال، وبقي بعضها في مكانه، في حين ظهرت بعضها متجمعة معا يبدو إنها نقلت



٥. مخطط الواجهة الشمالية من الكنيسة.

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٦. فجوة يظهر من خلالها طبقتي الفسيفساء.



٧. تفاصيل من أرضية الرواق الشمالي الفسيفسائية.

أما المنطقة الغربية من أرضية الرواق تراكمت عليها الأتربة بسبب إنهيار الجدار الشمالي نتيجة الأمطار، وعند رفع وإزالة التراكمات ظهرت طبقة من القصاراة الكلسية فوق كامل الأرضية الفسيفسائية، تظهر أن أعمال التحضير لمونة أعمال البناء المتلاحقة قد تمت فوق الأرضية الفسيفسائية. وقد دفع وجود هذه الطبقة الكلسية البيضاء «كروفت» للاعتقاد أثناء أعمال التنقيب بأن هذا الجزء يخلو من الفسيفساء، إذ إعتبر القصاراة السطحية بأنها طبقة ملاط الأساس وبأن الأرضية الفسيفسائية قد فقدت (Horsfield 1930: 20; Crowfoot 1931: 27) (الشكل ٩).

كشفت أعمال التنظيف، ورفع الحجارة المنهارة، عن أرضية فسيفسائية ملونة لأشكال طيور نفذت بالمعربات الزجاجية الملونة وأشكال هندسية تتبع تشكيلة الإطار الزخرفي.

جاءت أبعاده مختلفة عن أبعاد الأروقة الأخرى نظراً لما أجري عليه من تعديلات خلال الفترات المتلاحقة لإستخدام الكنيسة. أولى هذه التعديلات تتمثل في توسعة منطقة الحاجز الإيقوني الذي غطت قاعدته جزء من كتابة الإهداء الفسيفسائية وأما التعديل الثاني فتمثل في الجدار الشمالي، الذي أعيد بناؤه، وأضيفت إليه مقاعد حجرية بطول (١٠,٢٠م)، بلغ إرتفاعها (٦٠سم) وبعمق (٦٥سم)، فوق الأرضية الفسيفسائية للرواق، تتسع لجلوس (١٨-٢٠) شخصاً، وربما تكون هذه الإضافة قد تمت خلال الفترة الأموية المبكرة بتاريخ النقود التي وجدت بين المداميك أثناء أعمال التنظيف. والتعديل الثالث الذي جرى على الأرضية فتمثل في الزاوية الشمالية الغربية من الرواق، إذ أنشأ حوض مائي بلغت قياساته من الداخل (٦٨,٠ × ٨٠,٨٠ × ٥٥,٥٠م)، يزود بالماء عن طريق الأنابيب الفخارية ويرتبط بالبئر المقام داخل الكنيسة.

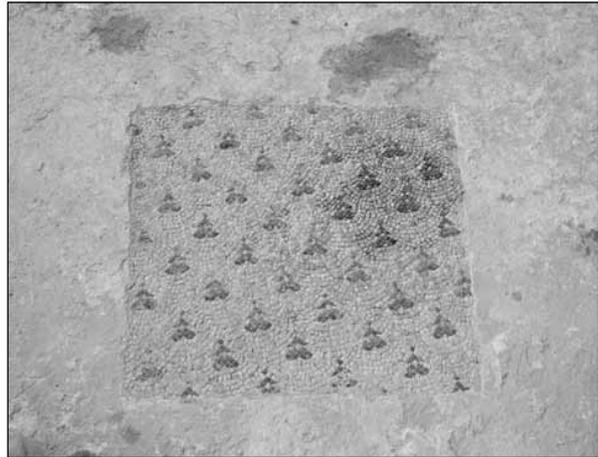
رصف الرواق بأرضية فسيفسائية مشابهة في التصميم لأرضية الرواق الجنوبي، حيث تألفت من إطار زخرفي مؤلف من مربعات متتابعة، صورت فيها أشكال هندسية مثل الصليب المعقوف، مربعات متداخلة ثلاثية الأبعاد بالتبادل مع تصوير لطيور نفذت بمكعبات زجاجية (الشكل ٧). أما داخل الإطار فرصفت أشكال حرشفية بيضاء في مركز كل منها شكل الوردة البيزنطية. يتقدم الأرضية كتابة الإهداء (أنظر الكتابات اليونانية ضمن المكتشفات الأثرية)، رصفت في المنطقة المحاذية لحاجز الهيكل وتعرضت الكتابة للتدهور بفعل الإنهيار في حجارة مداميك الجدار الشمالي، حيث ظهرت عليها آثار للصيانة تمت خلال أعمال ترميم المشروع السياحي، حيث ثبتت أطرافها بالإسمنت (الشكل ٨).



٨. الكتابة وآثار التصليح ماثلة فيها.

المجاز

يقع المجاز في المنطقة المحصورة ما بين الكنيسة الرئيسية والباحة، يبلغ طول المجاز (١٥,٦٠م) وعرضه (٢,٤٠م)، مبلط ببلاط حجري ملون متفاوت الأبعاد، إذ قسّمت الأرضية إلى خمس مجموعات متساوية حددت بواسطة بلاطات كبيرة، في حين بلطت المساحات المحصورة بينها ببلاط صغير أبعاده (٠,٢٠ X ٠,٢٠م)، أما جزؤه الشمالي فتم تسوية المقطع الصخري وتشذيبه بمستوى أرضية الباحة. يحد المجاز من الناحية الغربية ست قواعد أعمدة موزعة على مسافات غير متساوية مرفوعة فوق مدمام حجري، كانت تحمل فوقها مع جدار الكنيسة الغربي السقف، ويؤدي من الناحية الشمالية عبر باب إلى المصلى الشمالي الذي يرتفع مستواه بمقدار درجتين. يجدر بالذكر أنه كان للكنيسة سابقا مجاز آخر بلغ طوله (١٥,٦٠م) وعرضه (٣,٧٠م)، يرتفع بمقدار درجة واحدة عن جسم الكنيسة، بلطت أرضيته ببلاط حجري ملون بألوان: بيضاء وسوداء وحمراء ووردية لتشكل زخرفة هندسية بأشكال مختلفة مربعة ومثلثة ومستطيلة، حفر جزؤه الشمالي في الصخر، و أنشئ فيه بئر للماء. و يبدو أنه أثناء أعمال التوسعة التي حصلت للكنيسة عدل المجاز ليصبح جزءاً من الكنيسة، ورفع جداره الغربي وفتح فيه ثلاث مداخل رئيسية، وزخرف قمت الباب الرئيسي الأوسط بحجر كلسي مستطيل بأبعاد (١,٥٦ X ٠,٦٦ X ٠,٢٩م)، حفر فيه مثلث، بداخله دائرة حفر داخلها صليب، فيما حفت به من الجانبين زخارف لوردة أحدها بالحفر النافر والاخرى بالغاثر. وأضيف على إثر ذلك للكنيسة المجاز الجديد. وقد عثر في منطقة المجاز على كتابات إسلامية محفورة على البلاطات الحجرية (أنظر الكتابات الكوفية ضمن المكتشفات الأثرية).



٩. الطبقة الكلسية التي كانت تغطي الأرضية.

السقف

يتضح من دراسة العناصر المعمارية إن الكنيسة كانت تحوي على عقود في الرواقين الشمالي والجنوبي محملة على الجدارين والأعمدة بدلالة وجود أحجار الأقواس المشدبة منهاره في تلك المناطق، كما توجد في نهاية الجدار الشمالي ركيزة لا يزال أحد حجارة العقد ماثلة فيها.

وجد في المصلى كسر من ألواح فخارية أطوالها (٦٠ X ٤٠سم)، يبدو إنها كانت لقرميد السقف، جمعت أثناء الحفريات السابقة ووضعت في الزاوية الشمالية الشرقية، كما ووجدت بعض هذه القطع في المصلى الشمالي في الزاوية الجنوبية الغربية، كما وجدت كسر متناثرة منها في الباحة الأمامية، مما يدعو للاعتقاد أن سقف الكنيسة كان مغطى بالقرميد، وأنه إنهار أثناء وقوع زلزال.

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المصلى الشمالي

بني على نمط كنائس القاعة، تبلغ أبعاده (٨,٨٥ × ٤,١٠ م)، ويقع في الزاوية الشمالية الغربية من كنيسة «جيونيسيوس» ويرتفع عنها بمقدار درجتين ويتصل مع الكنيسة عبر بابين أنشأ في الجدار الجنوبي للمصلى، أحدهما يتصل بالمجاز القديم، والآخر مع المجاز الأحدث، في حين فتح في الجدار الغربي باب يؤدي إلى خارج الكنيسة. يتألف المصلى من حنية مستطيلة، تبلغ أبعادها (٤,١٠ × ٢,٠٠ م)، ترتفع عن صحن الكنيسة بمقدار درجة ويفصلها عنه حاجز الهيكل الحجري، وجدت فيه قوائم أعمدة مربعة الشكل استخدمت لتثبيت ألواح حاجز الهيكل الرخامية. ورصفت أرضية الحنية بالفسيفساء من مكعبات حجرية كبيرة الحجم ملونة، شكلت زخارف هندسية من مربعات ومعينات تتداخل إطاراتها على شكل الصليب المعقوف وثبت داخل الأرضية ثلاثة أعمدة رخامية ملونة أخذت شكل مثلث رأسه نحو الشرق، بلغ قطر العمود الواحد منها (٢٠,٢٠ م)، ربما كان يثبت فوقها المذبح (الشكل ١١).

أقيم في الجدار الشرقي حنية أشبه ما تكون بالفتحة المستطيلة، أبعادها (٠,٥٢ × ٠,٧٦ م × ٠,٥٦ م)، صحن المصلى مستطيلاً (٦,٨٥ × ٤,١٠ م)، حفر جزء منه بالصخر، كانت أرضيته مبلطة ببلاط رخامي بأشكال هندسية، لم يتبق منها إلا جزء بسيط في منطقة الوسط، وقد عثر في هذا الجزء على منكوش يعود لبداية القرن العشرين.

بني جدران المصلى بمداميك غير متساوية، خاصة بين الجدارين الشمالي والشرقي، وغطيت الجدران بطبقة سميكة من القصار، أما المونة بين المداميك فكانت من التربة الحمراء المخلوطة مع الشيد، ولوحظ استخدام بعض الحجارة ذات الزخارف الإسلامية خاصة عند الداخل، كما وعثر بين مداميك الحجارة على كسر فخارية أرخت للفترة الأموية مما يرجح بناء المصلى المتأخر.

النظام المائي

كانت الكنيسة تزود بالمياه من البركة الصخرية الواقعة أعلى الكنيسة من الناحية الشمالية بواسطة أنابيب فخارية، كانت تمر بشكل انسيابي في الجزء الغربي لجدار الكنيسة الشمالي بطول (٢,٦٠ م) لتؤدي إلى الحوض المائي المكتشف في الزاوية الشمالية الغربية من الرواق الشمالي وبلغت أبعاده من الخارج (٠,٨٥ × ١,٠٠ × ٠,٥٥ م)، وقد غطي من الداخل والخارج بطبقة من القصار، ويخرج منه أنبوب فخاري آخر يتصل بالبئر المحفور بالصخر، كما وجد أنبوب فخاري آخر معامد للأول يعتقد بأنه كان ممتداً على طول الجدار الشمالي ومتصلاً بسقف الكنيسة بهدف جمع مياه الأمطار وتحويلها للبئر، بلغ طوله داخل الكنيسة (١,٨٠ م) بامتداد شمال جنوب، ومتصلاً بالبئر الداخلي. وأن إمتداد هذه الأنابيب الفخارية فوق المقاعد الحجرية في اجدار الشمالي يدعو للإعتقاد بأنها كانت إضافات في فترة لاحقة لبناء الكنيسة (الشكل ١٢).

المصلى الجنوبي

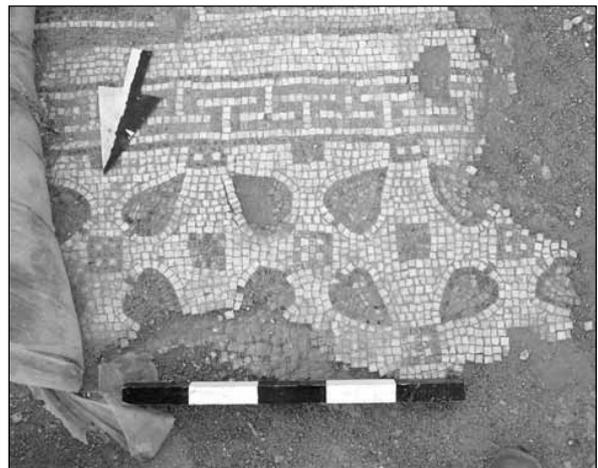
بني المصلى على مخطط كنائس القاعة وجد في الزاوية الجنوبية الغربية لمبنى الكنيسة، ويتصل مع الكنيسة الرئيسية عبر بابين وجدوا في الجدار الشمالي كما وفتح باب في الجدار الغربي من المصلى يؤدي لخارج الكنيسة، جاء مستوى المصلى أدنى من مستوى الكنيسة بمقدار درجتين.

بلغت أبعاد المصلى (١٤,١٥ × ٥,٠٠ م)، بنيت جدرانه من حجارة كلسية سمكها (٠,٦٠ م). يتألف المصلى من الحنية التي جاءت مستطيلة ومرتفعة عن الردهة بمقدار درجة واحدة، يفصلها عن الردهة حاجز بنيت قاعدته من الحجر الكلسي، تثبت فيه أعمدة رخامية وألواح من الرخام المستورد ذي الجودة العالية.

بلغت أبعاد الحنية (٣,٨٠ × ٥,٠٠ م) ويتوسط جدارها الشرقي كوة بنيت من مداميك ثبت فوقها غطاء حجري منحوت على شكل صدفة، بلغت أبعاد الكوة (١,٦٠ × ٠,٧٥ × ٠,٣٠ م). أما أرضية الحنية فرصفت بفسيفسائية ذات إطار، وقسمت الأرضية بواسطة صف من الحجارة الفسيفسائية الملونة إلى معينات متساوية زخرف في كل منها شكل نباتي لأوراق لوزية نفذت بمكعبات فسيفسائية زجاجية ملونة (الشكل ١٠).

أما الردهة فكانت مستطيلة الشكل أبعادها (٨,٧٠ × ٥,٠٠ م)، كانت تحتوي على أرضية فسيفسائية مزخرفة بإطار على شكل أمواج نفذت بحجارة حمراء، كان الإطار يضم أرضية من أوراق العنب لم يتبق منها إلا جزء صغير في الزاوية الشمالية الشرقية، ولا تزال أجزاء من الرصفة الحجرية والملاط باقياً فيها.

تمت توسعة المصلى بفترة مترامنة مع توسعة الكنيسة من الناحية الغربية، حيث أُلغى باب من الناحية الشمالية الغربية، وفتح باب آخر على بعد ٣,١٠ م، كما نقل الجدار الغربي ليتوافق في مستواه مع جدار الكنيسة الغربي، في حين بقي أساسه ظاهراً في أرضية المصلى.



١٠. أرضية حنية المصلى الجنوبي.



١١. المصلي الشمالي.

كانا يغذيان البئر بمياه الأمطار. حفر البئر في المقطع الصخري الممتد طبيعياً في داخل موقع الكنيسة (الشكل ١٣).

الباحة الخارجية

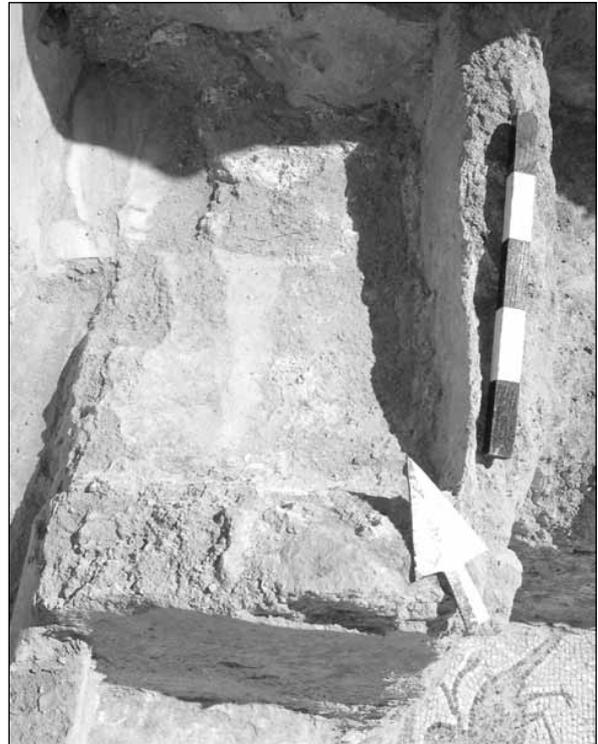
تتقدم كنيسة "جيونيسيوس" باحة تضم جزء من المصلي الشمالي. تبلغ أبعادها (٢٠,٧٥ X ١٢,٢٠م)، ويحيط بها سور حجري بلغ سمكه (١,٠٠-١,١٠م)، يتخلله في الزاوية الجنوبية الغربية باب يؤدي إلى شارع فرعي. رصفت الأجزاء الشرقية من الباحة بأرضية فسيفسائية، نفذت بمكعبات حجرية كبيرة الحجم ملونة وأشكال هندسية لمعينات متداخلة، جاءت في وسط الأرضية ومن الجهتين الشمالية والجنوبية، دائرتان رصفت فيهما كتابة الإهداء قد فقدت أجزاء كبيرة من الجهة الجنوبية، في حين لم يتبق



١٣. فوهة البئر.

البئر

تم العثور على بئر للمياه في الزاوية الجنوبية الغربية للرواق الشمالي للكنيسة، جاء فتحة البئر الرئيسية دائرية قطرها (٣٢,٠م)، فيما جاءت خرزة البئر دائرية قطرها (٢٥سم)، أما حجر البئر فقد جاء مستطيلاً أبعاده (٦٨ X ٠,٦٨م)، يتصل به أنبوبان فخاريان



١٢. الحوض المائي.

كاترينا حمارنة وعبد المجيد مجلي: كنيسة الكاهن «جيونيسيوس» في جرش

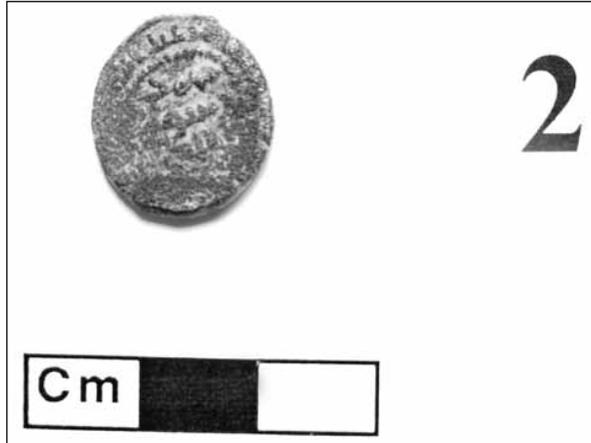


١٥. فلس نحاسي أموي رقم ١ - الظهر.

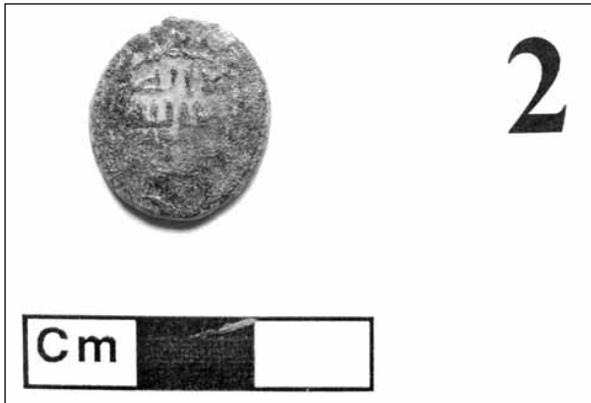
القطر: ١٧ ملم، الوزن ٣,١٧ غم
للمقارنة:

القسوس ٢٠٠٤: ٤١٢، مسكوكة رقم ٥٢٢.
Walker 1956: ANS 42, p 270

فلس نحاسي أموي، يرجح ضرب طبرية سنة ٩١هـ (الشكلان ١٦ و ١٧) بالمقارنة بالطرز الموجودة على قطع مشابهة عند (القسوس ٢٠٠٤: ٤٠٩-٤١٢)



١٦. فلس نحاسي أموي ضرب طبرية - الوجه.



١٧. فلس نحاسي أموي ضرب طبرية - الظهر.

من الشمالية إلا الإطار. ويفصل ما بين الجزأين الشمالي و الجنوبي مقطع صخري شذب ليتوافق مع مستوى الأرضية. أما الجزء الغربي من الأرضية فقد رصف ببلاط حجري صغير الحجم.

كما عثر في حفرة بطول (٣م) ملاصقة للجدار الجنوبي من الداخل باتجاه شرق غرب على أجزاء من أعمدة رخامية صغيرة من المحتمل إنها كانت قواعد للمذبح في أحد المصليات، يبدو إنها نقلت إلى هذه الحفرة أثناء أعمال التنقيبات التي تمت في الثلاثينيات من القرن الماضي وتركت هناك، كما وجد في داخل الحفرة منجل حديث للحصاد مصنع محلياً.

أثناء أعمال التنظيف ظهر في الجزء الشمالي الغربي من الباحة بناء بشكل نصف دائري، يبلغ قطره (٢,٤٠م)، يرتفع عن أرضية الباحة مدماكين، ويوجد على جانبه وملاصقاً للجدار الغربي ثلاث درجات تستعمل للصعود، بلط سطح هذا الجزء بفسيفساء كبيرة الحجم ملونة، وعثر فيه على منكوش يعود لبداية القرن الماضي.

المكتشفات الأثرية

أثناء أعمال التنظيف والصيانة والترميم التي تمت في أرجاء الكنيسة تم العثور على المكتشفات التالية:

النقود

وجدت خمسة فلوس أموية نحاسية في مواقع مختلفة ما بين المونة في الكنيسة، وهي:
فلس نحاسي أموي، ضرب طبرية، السنة غير واضحة يرجح إنها ما بعد ٧٤هـ/ ٦٩٤م (الشكلان ١٤ و ١٥).

الوجه	الظهر
لا إله	محمد
إلا الله	رسول
وحده	الله

المدار: ... بطبرية سنة المدار: المؤمنين ...
(أمير المؤمنين بالوفا)



١٤. فلس نحاسي أموي رقم ١ - الوجه.

حولية دائرة الآثار العامة ٥٣ (٢٠٠٩)

فلس نحاسي أموي يرجح أنه ضرب حمص (الشكلان ٢٠ و ٢١)

الوجه	الظهر
لا إله	الظهر
إلا الله	نجمة خماسية (شبه مثلثات)
وحده	دخل دائرة
المدار: غير واضح	وحده

المدار: ممسوح

القطر: ١٨ ملم، الوزن: ٥٨، ٥ غم.

إن شكل النجمة ذات المثلثات هي في العادة ضرب حمص لذا يرجح أن يكون هذا الفلس قد ضرب هناك.

للمقارنة:

(القسوس ٢٠٠٤: ٣٧١، مسكوكة رقم ٤٢٣).

فلس نحاسي بيزنطي - عربي، طراز الإمبراطور واقفاً، ضرب

طبرية (الشكلان ٢٢ و ٢٣)

الوجه	الظهر
هرقل وولديه	الإمبراطور (هرقل) واقفاً
القطر: ١٨ ملم، الوزن: ٤٣، ٢ غم.	زخرفة الثوب تشبه ورق النخيل
الفيلوس التي وردت عليها عبارة قطري وعلى ظهر الفيلس أسفل حرف M ضربت في طبرية، ويرجح أنها ضربت قبل ٧٤هـ والقطر هو النحاس الذائب، قال تعالى "وأسلنا له عين القطر" (سورة سبأ، الآية ١٢).	لله
للمقارنة:	(الوفا لله)

القطر: ٢٠ ملم، الوزن: ٩١، ٣ غم.



٢٠. فلس نحاسي أموي ضرب حمص - الوجه.



١٨. فلس نحاسي بيزنطي أموي - الظهر.

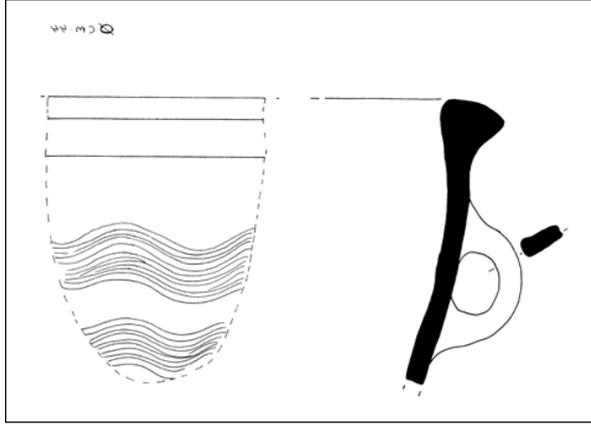


٢١. فلس نحاسي أموي ضرب حمص - الظهر.



١٩. فلس نحاسي بيزنطي أموي - الظهر.

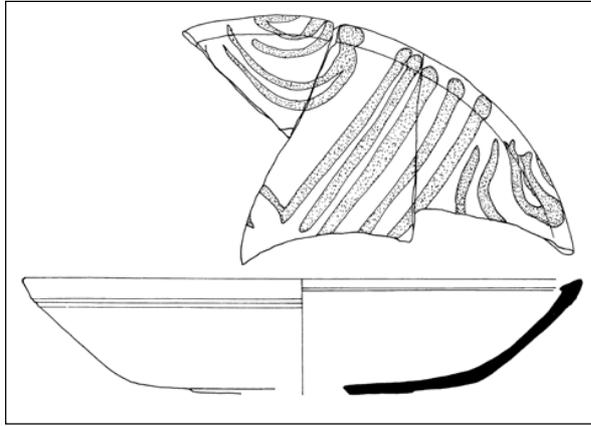
كاترينا حمارنة وعبد المجيد مجلي: كنيسة الكاهن «جيو نيسيوس» في جرش



٢٤. رسم لكسر أنية فخارية.



٢٢. فلس نحاسي بيزنطي أموي - الوجه.



٢٥. رسم لكسر صحن فخاري أموي أسود اللون وعليه زخارف بالطلاء الأبيض.



٢٣. فلس نحاسي بيزنطي أموي - الظهر.

تعود الفلوس المضروبة على الطراز البيزنطي للفترة ما بين ٦٠ هـ - ٧٤ هـ / ٦٨٠-٦٩٤ م (أنظر القسوس ٢٠٠٤: ١١٢).

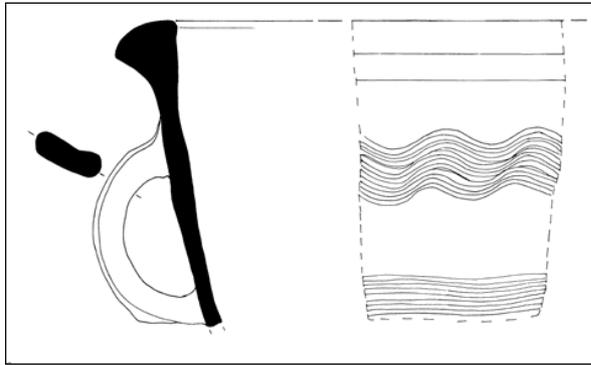
الفخار

وجدت كسر لأواني فخارية في عدة أماكن وخاصة في المنطقة الواقعة ما بين الطبقات الفسيفسائية. كما وجدت عدة كسر فخارية في الزاوية الجنوبية الغربية من المصلى الشمالي تحت الكتل الحجرية المنهارة.

ينتمي الفخار للفترة الأموية (القرن السابع الميلادي)، وهو عبارة عن فخار أسود اللون وعليه زخارف بالطلاء الأبيض، وكسر لفخار أواني وصحون متنوعة ذات لون أحمر (الأشكال ٢٤-٢٨). وجميع هذه الكسر تنتمي لنمط الفخار التقليدي المصنوع ضمن أفران فخار جرش خلال الفترة الأموية.

الزجاج

وجدت كسر زجاجية مهشمة متفرقة في الجزء الشمالي الغربي من المصلى الشمالي، على الأغلب إنها أجزاء لأواني وصحون وأنية



٢٦. رسم لكسر أنية فخارية.

عميقة. كما وجدت قاعدة لمصابيح إضاءة الزيت (Polycandella) (الشكل ٢٩).

المكتشفات المعدنية

جاءت معظم المكتشفات المعدنية على شكل مسامير معدنية (حديدية)، جاء أحدها مزخرفاً بإضافات، كما وجدت مسامير ذات رؤوس كبيرة مستطيلة، بالإضافة لقضبان برونزية مسطحة

ومضلعة الرأس أستخدمت لتثبيت الحجارة الزخرفية على المعالم المعمارية.

كما وجدت بعض الأدوات المعدنية الحديثة كقفل باب معدني، منجل حصاد ومنكوش معدني (الشكل ٣٠).

الزخارف الحجرية

وجدت معالم زخرفية مختلفة مبعثرة في أرجاء الكنيسة، كانت تشكل جزء من البناء المعماري للكنيسة، نقلت على الأغلب من المباني المعمارية الرومانية القريبة.

حجر كلسي أبعاده (٠,٦٥ X ٠,٦٠ X ٠,٣٥ م)، زخرف عليه بالنحت النافر وردة مع ورق نبات ودالية، فوقها صف كامل من حبات الزرد. وجد في الباحة (الشكل ٣١).

حجر كلسي أبعاده (٠,٤٠ X ٠,٤٠ X ٠,٤٢ م) زخرفت عليه وردة من ست بتلات بحفر نافر داخل دائرة، كما وجدت قطعة أخرى مشابهة لها مكسورة لم يتبق منها إلا جزء بسيط (الشكل ٣٢).

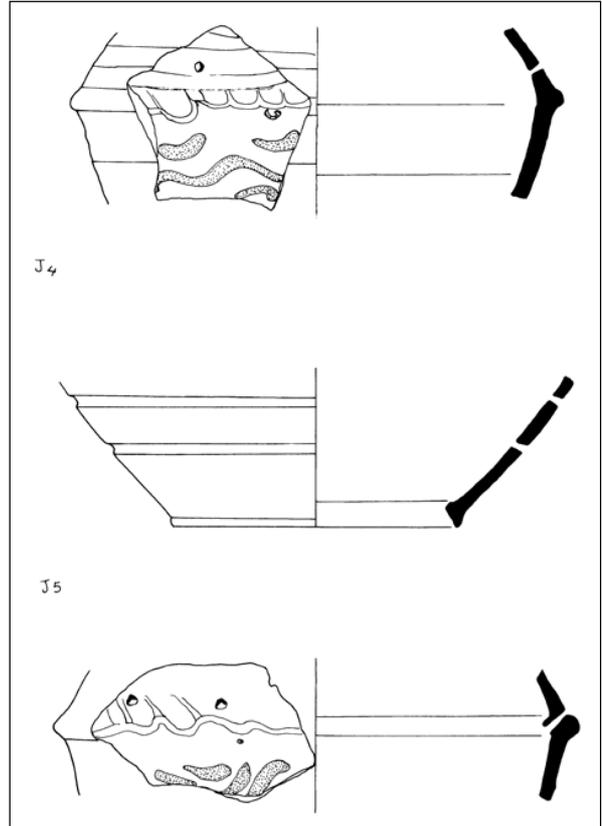
حجر كلسي مستطيل أبعاده (٠,٣٠ X ٠,٢٣ X ٠,١٥ م)، حفر



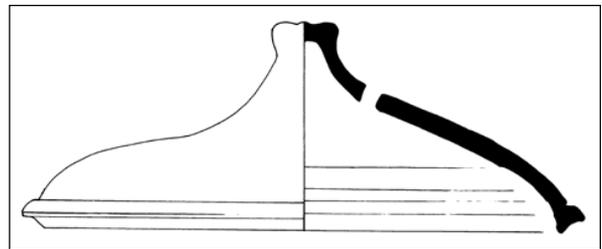
٣٠. القطع المعدنية.



٣١. حجر نحت عليه زخرفة عليّة بالنحت النافر وردة مع ورق نبات ودالية.



٢٧. رسم لكسر أواني فخارية مزخرفة من الفخار الأحمر لمصاييح.



٢٨. رسم لغطاء أنية طيخ فخاري.



٢٩. الكسر الزجاجية المكتشفة.

كاترينا حمارنة وعبد المجيد مجلي: كنيسة الكاهن «جيو نيسيوس» في جرش

عتبة الكنيسة، ومن الممكن أنها نقلت من مكان آخر أو أن الذي قام بوضع النقش لا يعرف اللغة العربية وإلا ما وضعها عتبة للباب وفيها لفظ الجلالة.

يوجد نقش بالخط الكوفي على بلاطة حجرية ضمن منطقة المجاز.

القراءة المقترحة للنقش:

يرحمنا

لله يعلم

يدين؟ سنة (سبط)

.....

المهد

من له حسنة

مما يتضح إن هذه القراءة لا تشكل نصا واضحا ومفهوما (الشكل ٣٤).

الكتابات اليونانية

كتابة نقش الإهداء الرواق الشمالي

وصف النقش: وجد في المنطقة المحاذية لحاجز الهيكل الإيقوني نقش يوناني، مرصوف ضمن الأرضية الفسيفسائية في مستطيل، فيما يعرف بـ "Tabula Ansata"، بلغت أبعادها (١,٩٣ × ٠,٦٨ م) تحف به من الجانبين مثلثان تزينها زخارف نباتية مؤلفة من خمسة سطور كتبت باللغة اليونانية، جاءت أحرفه ببيضاوية وبطول الحرف (٩سم)، وفاصل (١سم) ما بين الأحرف غير منقط، رصفت بحجارة بيضاء على خلفية حمراء. تعرضت الكتابة للتخريب أدى



٣٤. الكتابة الكوفية.



٣٢. حجر منحوت عليه وردة من ست بتلات.

عليه بالحفر شكلي (X) متتاليان، وجد في الزاوية الشمالية الشرقية من المصلي الشمالي (الشكل ٣٣).

الكتابات

الكتابة الكوفية

تم الكشف عن نقش مؤلف من ستة أسطر غير مستوية ضمن العتبة المؤدية لصحن الكنيسة، النقش الذي جاء بالنحت الغائر على بلاطة من الحجر الملكي القاسي، يبلغ طوله (١,٠٥ م) وعرضه (٠,٣٧ م). بدت الحروف مهترئة وغير واضحة للتمكن من قرائتها بشكل سليم. نحتها رديئاً والخط لا يمثل الخط الكوفي النموذجي إذ جاء مشوشاً مما يستدل إن الخطاط لا يتقن اللغة. كما تأثر الحجر بفعل التعرية التي شوهت النقش، ولا يمكن قراءة بعض الكلمات من النقش، والمقروء منها يحتمل عدة قراءات نظرا لسوء صناعة الخط وعدم إلتزامه بالأشكال السليمة للحروف وعدم انتظام الأسطر، والتي تتداخل مع بعضها البعض نزولاً وصعوداً، ونقص بعض الكلمات وعدم الإلتزام بشكل الحرف السليم نجد إن كل كلمة تحتمل أكثر من قراءة، لذلك يصعب الإستدلال على ما نقش على الحجر والغاية من النقش، كما يصعب تفسير وجودها في أرضية



٣٣. حجر نحت عليه شكل حرف X.

لفقدان أجزاء كبيرة من الجهة الشمالية (الشكل ٣٥).

النص باللغة اليونانية:

((ΠΙHC ΨΦΗΩCEΩC OT EPITTEΠEC
ENXONOPIC ...ΨΛΓ..T...HMΩN EΠICK
.....COXOOY KAI
ΣΑΩΛA KO HCCAMCIOYC TΩ ΓOX .E.TE...
MHNOC CEΠ...EMBMON A XPO IEINO.....))



٣٦. نقش الباحة.

ترجمة النص: ” اللهم إقبل تقدمه ...“

التحاليل المخبرية

أجريت دراسة على إحدى عشرة عينة من عينات مونة البناء من الملاط والقصارة من أماكن متفرقة بهدف تحديد التغيرات المعمارية مع الزمن وسبع عينات من العناصر المعمارية الحجرية، تمت تحليلها في مختبرات سلطة المصادر الطبيعية.



٣٥. نقش الإهداء اليوناني.

ترجمة النص:

«تمّ الرصف بالفسيفساء في عهد أسقفنا الورع «جيونيسيوس» وبتقدمة من الصانع يوحنا وشاؤول ابن كونيسامينيس سنة ٦٧٣ الأول من شهر أيلول، الإنديكتي الخامس عشرية» (Welles 1938: 486-487)، وهو ما يوافق تاريخ (٦١٠/٦١١م)، وعلى الرغم من أن النقش قد جاء باللغة اليونانية إلا أن التأثر باللغة اللاتينية يبدو واضحاً في استخدام أسماء الشهور، حيث يذكر شهر «أيلول» September صريحاً في النقش عوضاً عن الاسم المقدوني اليوناني (Goriaios/ Hyperberetaios) الذي كان متعارفاً عليه في الكتابات الأقدم (Bieber 1938: 333).

– كتابات نقش الباحة الدائري

وصف النقش: نقش فسيفساء جاء في ميدالية الإهداء يحيط بها إطار دائري من المكعبات الفسيفسائية الحمراء. رصف النقش بمكعبات حمراء على خلفية بيضاء، طول الحرف (٩سم) ذو استدارة وفاصل ما بين الأحرف (١سم)، بقي من النقش ثلاث سطور فقد من السطر الثالث أحرف بدايته ونهايته (الشكل ٣٦).

النص باللغة اليونانية:

KYPIEOΘ EOΘ
MωNIPOCΔC
...NIIPC..

١- دراسة عينات المونة والقصارة

تمت الدراسة باستخدام جهاز تألق الأشعة السينية (X-Ray Fluorescence).
توزع العينات: أخذت عينات متفرقة من مونة الجدران وملاط الأرضيات توزعت على النحو التالي

عدد	وصف العينة	موقع العينة
٢	مونة بيضاء رمادية	مونة جدران الكنيسة الداخلية
٢	قصارة بيضاء متماسكة	ملاط كسوة الجدران
١	مونة طينية حمراء مع حجارة صغيرة	مونة جدران المصلى الشمالي
١	مونة رمادية	مونة جدران المصلى الجنوبي
١	قصارة بيضاء	قصارة الحوض
١	ترسبات كلسية بيضاء	طبقة القصارة فوق فسيفساء الرواق الشمالي
٣	متعدد	الملاط أسفل الطبقات الفسيفسائية

النتائج

تظهر نتائج التحاليل وجود التراكيب التالية للمونة:
– مونة جدران الكنيسة الداخلية: مونة هيدروليكية عالية الجودة، تكونت من الجير الهيدروليكي و الرمل بنسبة (١:١)

كاترينا حمارنة وعبد المجيد مجلي: كنيسة الكاهن «جيونيسيوس» في جرش

والكلس، والمصلى الجنوبي تألفت من ملاط هيدروليكي لكن من نوع أفضل وجدران الكنيسة الرئيسية مكونة من الكلس والرمل والرماد ذو جودة عالية.

إحتوت مونة الجدران على نسب عالية من الجير، ربما لخصائص الجير الهيدروليكي العازلة للرطوبة وبذات الوقت المانعة للحشرات. استخدم الفخار المطحون كمكوّن أساسي في مونة الأرضيات الفسيفسائية كمادة مالئة وعازلة للرطوبة.

بيّنت التحاليل ان مصدر الجير كان من المواد المحلية حيث استخدم الحجر الكلسي الدولوميتي لتكوين الجير بديل وجود نسب عالية جداً من المعادن الطينية والمغنيسيوم في التركيب المعدني. جاءت المكونات العضوية المستخدمة من الجير من حرق بقايا عضوية مثل عظام الحيوانات والنباتات الذي استخدم كمصدر للفحم.

٢- دراسة العينات الحجرية

أخذت سبع عينات حجرية لأهم المعالم المعمارية، تمت الدراسة باستخدام المجهر المستقطب في مختبرات سلطة المصادر الطبيعية. توزّع العينات: أخذت عينات من عناصر معمارية متفرقة توزعت على النحو التالي:

موقع العينة	وصف العينة	عددها
منطقة الحنية	حجر كلسي أحمر قاسي	١
الجدار الشمالي للكنيسة	حجر جيرى أبيض	١
الجدار الجنوبي للكنيسة	حجر جيرى أبيض	١
الجدار الغربي الداخلي للكنيسة	حجر جيرى أبيض	١
بلاطة من المجاز الأول	حجر كلسي أصفر	١
حجر من الجدار الشمالي للمصلى الشمالي	حجر أبيض طباشيري	١
بلاطة من المجاز الأول	رمادي (صخر زيتي)	١

- مع نسبة ضئيلة جداً من المواد العضوية (تقريباً ٠,٥٠٪).
- مونة القصار على الجدران: قسارة جيرية، ويتضح إن الجير استخرج من مصادر محلية حيث جاءت نسبة المغنيسيوم والكالسيوم عالية، مع نسبة ضئيلة جداً من الرمل (نسبة الجير إلى الرمل هي ١:٦).
- مونة جدران المصلى الشمالي: تكونت من خليط من الطين، وهو تراب المنطقة نفسه تمّ تنخله، مع نسبة من الجير النقي والرمل بنسبة (١:٢).
- مونة جدران المصلى الجنوبي: مونة جيرية هيدروليكية أحتوت على نسبة عالية من المغنيسيوم، بها نسبة من الرمل والمواد العضوية نسبها التقريبية (١:٣).
- الملاط أسفل الأرضيات الفسيفسائية: تكونت هذه المونة من خليط من الجير الهيدروليكي، رمل وكسر فخار مطحون بنسب (١:٢)، إذ احتوت على نسب عالية من أكاسيد الألمنيوم، المغنيسيوم والحديد، في حين إحتوت طبقة ملاط الأرضية الأقدم على نسبة عالية من المواد العضوية، إذ تكون تركيبها من : جير هيدروليكي، مواد عضوية (ذات مصدر حيواني لكون محتوى $P2O5 \leq 2\%$) ورمل، بنسبة (٢:٥٠:١٠٠).
- قسارة الحوض: شكلت عينة قسارة الحوض من (٥٠٪) من الجير النقي، مع نسبة ضئيلة جداً من الشوائب.
- طبقة القسارة فوق الفسيفساء: تألفت من نسبة عالية جداً من الجير النقي (<٥٠٪).

الاستنتاجات

تبين من دراسة التحاليل وجود إختلافات في نوعية الملاط والقسارة المستخدمة في نفس البناء مرده: وجود إختلاف متعمد في نوعية الملاط (المونة) بناءً على مكان الإستخدام، ووجود تنوع مرتبط بالزمن في فترة رصف هذه المونة، إذ كانت مونة جدران المصلى الشمالي من أسوأ التراكيب مكونة من الطين

النتائج

موقع العينة	وصف العينة	نوعها
منطقة الحنية	حجر كلسي أحمر قاسي	يتكون من معدني الكالسايت والدولومايت شبه المتبلور المشبع بمعادن الحديد المتأكسد (Hematite).
الجدار الشمالي للكنيسة	حجر جيرى أبيض	يتكون من معدن الكالسايت المحاط بالسباريكالسايت
الجدار الجنوبي للكنيسة	حجر جيرى أبيض	حجر جيرى يحتوي على مستحاثات الفورامانيفيرا (Adams et al. 1984: 48)
الجدار الغربي الداخلي للكنيسة	حجر جيرى أبيض	حجر جيرى عضوي
بلاطة من المجاز الأول	حجر كلسي أصفر	حجر جيرى طيني يحتوي على نسبة من أكاسيد الحديد
حجر من الجدار الشمالي للمصلى الشمالي	حجر أبيض طباشيري	حجر كلسي طباشيري حصلت له تجوية وتعرية شديدة
بلاطة من المجاز الأول	رمادي (صخر زيتي)	صخر رسوبي غضاري، مكونة من الكوارتز والمسكوفاييت و غني بالبايرايت والحديد والمواد العضوية

- تنظيف سطح الفسيفساء تنظيف رطب باستخدام الماء المقطر والإسفنج.
- عمل ملاط حواف لتدعيم جوانب الأرضية الضعيفة، تكوّن الملاط الجديد من الرمل والجير الهيدروليكي بنسبة (٢:١) (الشكل ٣٨).
- معالجة الفجوات الصغيرة (> ٢٠ مكعب) باستخدام الملاط الجيري.
- تثبيت الحجارة المتخلخة باستخدام الملاط الجيري.
- إجراء التنظيف الميكانيكي لإزالة الترسبات السطحية بواسطة الماء المقطر والمشارط.

النتائج

تركزت معظم كنائس في المنطقة الغربية من المدينة، واستمر



٣٨. أعمال الترميم.

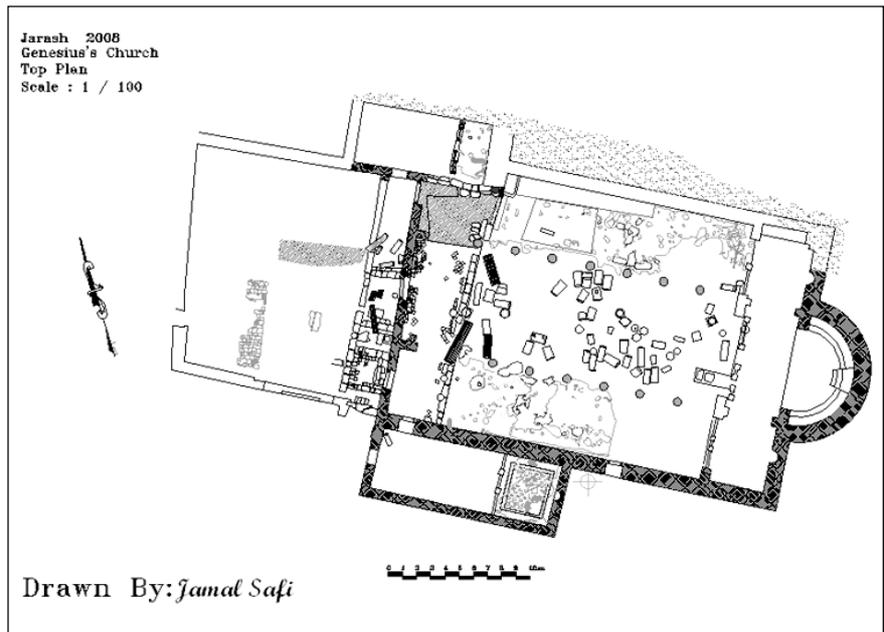
تبيّن من الدراسة إن جميع عينات الحجر المستخدم قد جلبت من توضع الصخور المتكشفة حول مدينة جرش الأثرية، بخاصة من تكاوين: أم الرجام، وادي السير وتكوين البرج الدولوميتي (Ab- 23-5: 1995 delhamed). يستدل من وجود عينة مجوأة أنّه قد تمّ استخراجها من السطح أو استخدام حجارة منهارة أو ساقطة من المناطق الصخرية على خلاف عادة الرومان في إختيار الصخور للبناء من المقاطع الصخرية الداخلية.

أعمال الصيانة والترميم

وجد على الأرضية الفسيفسائية دلائل لأعمال ترميم قديمة تركزت على معالجة الفجوات التي حصلت خلال فترة لاحقة لرصف الأرضية، ولا يمكن تأريخها على وجه الدقة. تمثلت أولى هذه الترميمات باستخدام مكعبات فسيفسائية بيضاء كبيرة الحجم (< اسم ٣)، حيث تمركزت في الرواقين الشمالي والجنوبي. التدخل الثاني تمثل باستخدام ملاط ذي لون برتقالي محمر لمعالجة الفجوات التي حصلت كذلك في أرضية الرواقين. كما وأجريت أعمال الصيانة والترميم لكتابة الإهداء خلال فترة المشروع السياحي، حيث تمّ تثبيت أطراف الكتابة بالإسمنت

(Kalayan 1978: Registration Card).

- أما في المرحلة الحالية، فقد تم أثناء توثيق الأرضية الفسيفسائية إجراء أعمال صيانة و ترميم التالية (الشكل ٣٧):
- إجراء التنظيف الجاف باستخدام الفراشي والمكانس الناعمة لإزالة التراكبات عن سطح الفسيفساء والفجوات.
- إزالة جذور النباتات باستخدام المشارط من بين الطبقات ومداميك الحجارة للجدران ومن بين الفجوات في الأرضية الفسيفسائية.



٣٧. مخطط التدخلات.

كاترينا حمارنة وعبد المجيد مجلي: كنيسة الكاهن «جيونيسيوس» في جرش

الشعائر الدينية داخل حرم الكنيسة.

جاء بناء المصلين الشمالي والجنوبي لغايات الصلوات الدينية الخاصة بالإكليروس، ويعتقد إن المصلى الجنوبي كان يستخدم للتقدمة حيث كانت توضع التبرعات المادية على المذبح، لتنتقل أفضلها إلى الكنيسة الرئيسية (Crowfoot 1931: 27)، في حين تفترض قاقيش إن وجود المصليات الجانبية كان مرده رغبة أقارب أحد المتوفين إقامة مصليات خاصة عن روح المتوفي (قاقيش ٢٠٠٧: ١٢٦)، لكن لعدم وجود كتابات الإهداء في المصلين يتعذر تأكيد هذا الرأي.

المكتشفات الأثرية تؤكد استمرارية استخدام الكنيسة خلال الفترة الأموية، مما يدل على عمق التسامح الديني والتوافق ما بين المجتمع المسيحي والمسلم في المدينة. وتبين كذلك أن المكتشفات الفخارية تنتمي لنمط فخار جرش الأموي التقليدي وكذلك الأواني الزجاجية مما يدل على نشاط حرفي متميز في المدينة ووجود عدد كاف من الحرفيين لتلبية احتياجات السكان المختلفة المدنية والدينية. يتبين من وجود إصلاحات ضمن الأرضية الفسيفسائية باستخدام المكعبات الفسيفسائية كبيرة الحجم تراجع حرفة رصف الأرضيات الفسيفسائية واقتصارها على أعمال بدائية مثل تكسير الحجارة ورصفها دون القدرة على استكمال الأشكال بطرق فنية ماهرة، ربما لتراجع هذه المهنة في فترة الربع الأول من القرن السابع الميلادي.

أعمال الصيانة والترميم تؤكد استمرارية استخدام الموقع، وإن لم يستدل إن كانت مراحل استعماله اللاحقة لأغراض دينية أم مدنية، لكن من المؤكد إن الموقع قد هجر تماماً على أثر الزلزال الذي دمر المدينة بتاريخ كانون ثاني (٧٤٨م) (Russell 1985: 47)، حيث وجدت آثار للأعمدة منهارة والسقف متهدم، كما لم توجد أية آثار لمكتشفات أثرية تعود لفترات لاحقة للفترة الأموية.

الشكر والتقدير

يتقدم معدا التقرير بالشكر والتقدير إلى عطوفة مدير عام دائرة الآثار لتفضله بالموافقة على المشروع، للزملاء هالة السيوف لإعدادها رسوم المكتشفات الفخارية، جمال صافي وحاتم العويصي لإعداد المخططات، عايذة نفوي لقراءة العملة ود. باسم حمارنة لقراءة النقوش اليونانية ود. نايف القسوس لقراءته النقش الكوفي.

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استعمالها حتى الفترة الأموية. مرّت الكنيسة بمراحل بناء متعددة، مرجح أن أولها كان في القرن السادس الميلادي، تألف بناؤها من بناء الكنيسة الرئيسي، حينها رصفت بأرضية فسيفسائية بسيطة بأشكال هندسية، لتعرض لاحقاً لكارثة طبيعية (حريق؟) على أثر زلزال (٥٥١م) يؤدي لتدميرها، والذي دمر معظم مباني جرش (Russell 1985: 45)، على أثر ذلك يتخذ قرار بإعادة بناء الكنيسة في بداية القرن السابع ضمن مخطط جديد أكبر مساحة ليضم الكنيسة وبناء المصلى الجنوبي.

تعطي كتابة الإهداء دليلاً على بروز تحولات إقتصادية على المجتمع إذ يتقدم الصائغ «يوحنا» بتقدمة جزيلة لرصف الأرضية بالفسيفساء، مما يدل على بروز طبقة اجتماعية مقتدرة من الحرفيين، في هذه الحالة من الصاعقة، تبدأ بتمويل بناء الكنائس بهدف تأكيد موقعها الاجتماعي والحصول على مكتسبات جديدة.

الحرص على رفد الكنيسة بأفضل المعالم الزخرفية التي أخذت من المعابد الرومانية وإعادة استخدامها في البناء، بالإضافة إلى استخدام المكعبات الفسيفسائية الزجاجية في رصف الأرضيات مما أضفى عليها جمالاً وغناء زخرفي. كما تنوعت طبيعة وجودة المواد المستخدمة في البناء، حيث جاءت معظم المواد من مصادر محلية.

جاءت الأرضية الفسيفسائية بسيطة في تشكيلاتها الفنية، حيث تتباعد عن الزخارف السائدة في القرنين الخامس والسادس في جرش، فلا تظهر عليها الأشكال الأدمية، بل تركز على التصاوير النباتية المستوحاة من البيئة المحلية مثل: الرمان والتين والعنب وغيرها. أما الطيور فتمثل الطيور المهاجرة والمستقرة في المنطقة، مع الإبقاء على دلائل الارتباط بمدرسة جرش الفسيفسائية الفنية، كاستخدام الزخارف الهندسية المعقدة مثل المتاهة الرومانية والمعينات المتداخلة والمزهريات التي تخرج منها دالية العنب.

إن التفاور في أحجام المكعبات الفسيفسائية، ودرجات ألوانها، وتعقيد رصفها ليرتبط بوجود: الحرفيين المهرة، المواد والتكاليف المادية التي خصصت لرصف الأرضيات. حيث يظهر التذبذب في أرضيات الكنيسة، فجاءت الأرضية الأولى المبكرة بملاط عالي الجودة لكن بحجارة كبيرة ورسوم بسيطة ذات ألوان محدودة، أما الأرضية الأحدث فكانت منفذة بدقة عالية، مكعبات صغيرة وألوان أكثر بفضل استخدام المكعبات الزجاجية مما يدل على اختلاف الظروف الإقتصادية خلال فترتي رصف الأرضيتين.

أثناء مرحلة البناء الثانية تمت توسعة الكنيسة: المصلى الجنوبي وبناء الكنيسة بخاصة: منطقة الحنية، وبناء الحاجز الإيقوني وإضافة مقاعد الإكليروس، والمقاعد الجانبية مما يدعو للإعتقاد باستخدام الكنائس للإجتماعات الدينية والمدنية لإدارة الرعية، خاصة مع التحولات السياسية التي طالت المجتمع في القرن السابع. كما تم توسعة المجاز الجديد وبناء باحة خارجية جديدة مسورة وإضافة المصلى الشمالي وبناء الباحة الخارجية ربما جاء لإقامة

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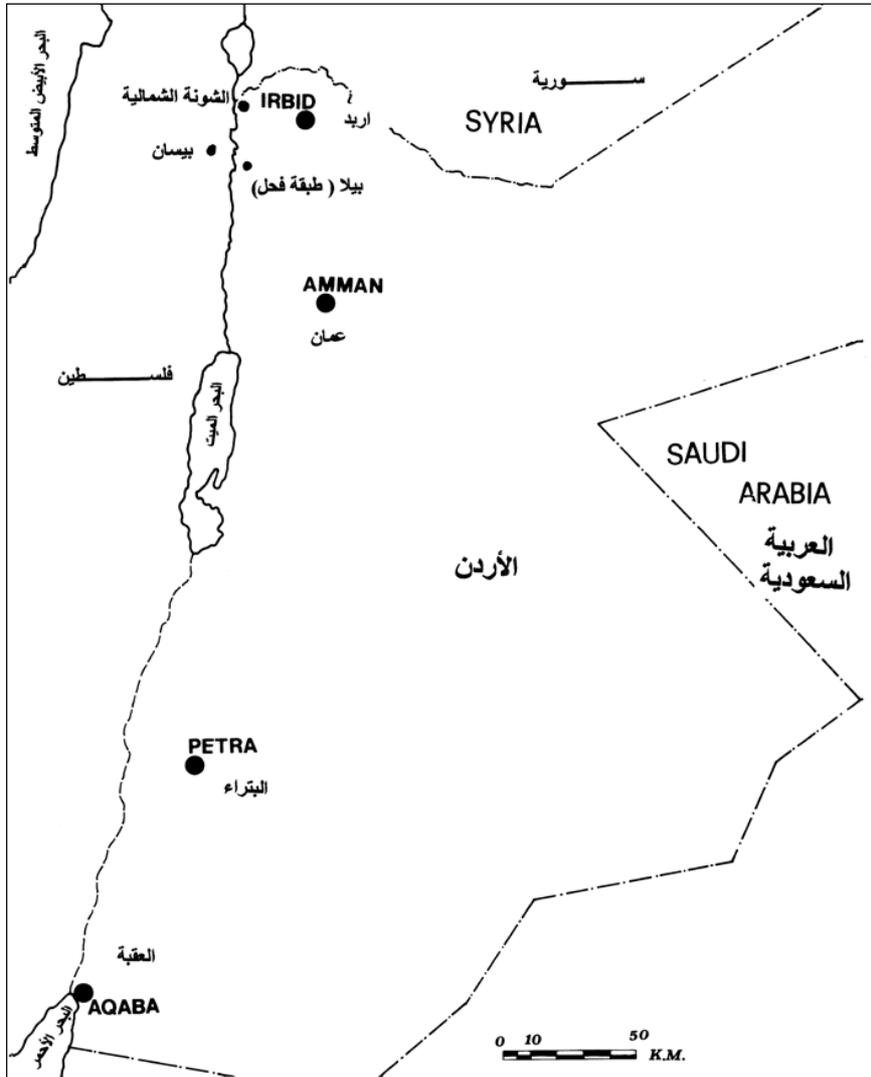
النتائج الأولية للتنقيبات الأثرية في طبقة فحل ٢٠٠٧-٢٠٠٨م (الكنيسة الغربية والمدرج)

إسماعيل ملحم

موقع طبقة فحل

الينابيع على مدار العام (الشكل ١).
ويبرز في الموقع معبد من العصر البرونزي ومدرج روماني
وثلاث كنائس بيزنطية وتجمعات سكنية رومانية وبيزنطية وأموية
وعباسية ومدافن من فترات مختلفة.
تجري في الموقع التنقيبات الأثرية منذ عام ١٩٥٨م، وما زالت

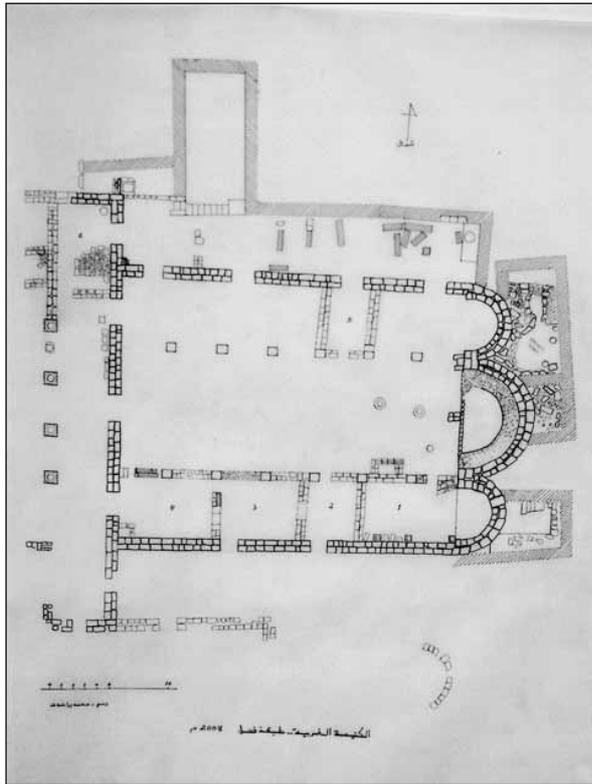
تقع بلدة طبقة فحل (بيلا) في الغور الشمالي لوادي نهر الأردن
شرقي بلدة المشارع بحوالي ٢ كم، وتنخفض عن سطح البحر حوالي
٣١م، وقد شهد موقعها استمرارا حضاريا ابتداء من العصور
الحجرية وحتى الآن، ساعد في ذلك موقعها الجغرافي الممتاز وتدفق



١. خريطة تبين موقع طبقة فحل الجغرافي.

فوزية حسين وتمام المجفف وثروة محمد مشرفات مربعات ومحمد رواشدة رساما في الموسم الثاني (الشكل ٢، ٣).

وقد أظهرت التنقيبات مخطط الكنيسة التي تتخذ شكلا بازليكيًا مساحتها ٣٦م X ٢٥م، وتتكون من ثلاثة أوقه بثلاث حنيات، وقد زودت أرضيات الرواقين الشمالي والجنوبي ببلاط ملون بالأبيض والبرتقالي المحمر والأسود والرمادي، ورتب البلاط بأشكال هندسية متناسقة أما الرواق الأوسط فقد رصفت أجزاء من أرضيته بالرخام المصقول، وأجزاء أخرى بالفسيفساء الملونة المزدانة بالأشكال الهندسية والحيوانية، وقد عثر على أجزاء قليلة من الأرضيات الفسيفسائية، في حين فقد معظمها للأسف، ولم يبق سوى رصفه الأساس وهي عبارة عن حجارة صغيرة، وهذا مؤشر على أن الأرضيات الفسيفسائية قد أزيلت بشكل متعمد منذ استخدام الكنيسة للسكن في القرن الثامن الميلادي. وقد ضمت الأشكال المكتشفة على الفسيفساء بعضًا من أشكال الحيوانات كالماعز وثور وأنواع من الطيور، وأشكال هندسية، وتعطينا هذه الأجزاء المتبقية فكرة حسنة عن التقنية الرفيعة في عمل الأرضيات الفسيفسائية ودخول الفسيفساء المزججة كعنصر أساسي في تشكيل هذه الأرضيات (الشكلان ٤، ٥).



٢. مخطط الكنيسة الغربية/ طبقة فحل.

مستمرة حتى هذا التاريخ، أسهم فيها البعثات الأمريكية والاسترالية بشكل رئيسي^١، إضافة إلى مشاريع دائرة الآثار العامة، ويحتاج الموقع إلى مزيد من الحفريات وأعمال الترميم، كما يشهد حركة سياحية نشطة في فصل الربيع.

الكنيسة الغربية

تقع الكنيسة الغربية في الجزء الغربي من موقع طبقة فحل الأثري، وقد لفت موقعها أنظار الرحالة والمستكشفين منذ بداية القرن التاسع عشر الميلادي، حيث تعرضوا لها بالوصف والتوثيق أمثال أيربي ومانجليز ١٨١٨م وادوارد رينسون ١٨٥٢م، وشوماخر ١٨٨٧ وريشموند ١٩٢٣م^٢.

أجريت الحفريات الأثرية في موقع الكنيسة الغربية لأول مرة في عام ١٩٦٧م من قبل كلية وستر الأمريكية بإشراف روبرت سمث، وعاودت أعمال التنقيبات والترميم الجزئي في عامي ١٩٧٩م و١٩٨٠م ثم توقفت بعد ذلك^٣.

في عامي ٢٠٠٧م و٢٠٠٨م أجرت دائرة الآثار العامة موسمين من التنقيبات الأثرية في موقع الكنيسة الغربية استكمالاً لإعمال التنقيبات السابقة وحفاظاً على المعالم الأثرية المكتشفة، واستكشاف بقية أجزائها، حيث تشكل مجعاً معمارياً مهماً يحتاج إلى استكشاف وترميم، فهي واحدة من أكبر مجمعات الكنائس البيزنطية المشيدة في شمال الأردن.

يغلب أن بناءها حدث في مرحلته الأولى في ولاية الإمبراطور جوستينيان الأول ٥٢٧-٥٦٥م حيث زودت الكنيسة بأرضيات فسيفسائية وتزويق داخلي استخدم فيه الحجارة الملونة في الأرضيات والفسيفساء، وعلى الأغلب أن الغزو الفارسي للمنطقة في حوالي سنة ٦١٠م تسبب في دمار أجزاء من الكنيسة جرى إعادة ترميمه لاحقاً، كما أدخلت إصلاحات وترميمات على الكنيسة في الفترة ٦٦٠م-٧١٣م في أعقاب زلزال حدث عام ٦٥٨م، وأضرت الزلازل التي حدثت في حوالي ٧١٧م بالكنيسة وأحدثت دمار كبيراً نتج عنه توقف عملها ككنيسة، حيث أعيد استخدامها لاحقاً لغايات سكنية حتى عام ٧٤٧م إلى أن ضرب المنطقة زلزال قوي آخر دمر المباني وظهرت آثاره جلية في طبقة فحل حيث هجر الموقع الأثري والكنيسة تماماً^٤.

ركزت تنقيبات دائرة الآثار العامة في موسميها الأول ٢٠٠٧م والثاني ٢٠٠٨م على استكمال استكشاف حنيات الكنيسة الثلاثة وأروقفتها، حيث وضع مخطط شبكي قسم منطقة العمل إلى جزأين على معظم مساحة قطعة الأرض المقدره بحوالي ٥ دونمات، وقد تكون فريق العمل من تمام المجفف وثروة محمد وخالد دلالة مشرفو مربعات وغزالة حسين رسامة في الموسم الأول، ومن:

1. Homes – Fredricq and Hennessy 1989: 406-441.
2. Smith 1973: 2-14.

3. Smith 1973: 137.
4. Smith 1973: 164-167.

إسماعيل ملحم: طبقة فحل



٣. منظر عام للكنيسة الغربية بعد التنقيب.



٤. جزء من الأرضيات الفسيفسائية عليها شكل ثور وأشكال هندسية.

من الملاحظات الجديرة بالانتباه أن الحنية الشمالية في الكنيسة قد وجد فيها خلال تنقيبات عام ١٩٦٧م تابوت حجري حوى هيكلًا عظيمًا بشرياً لكهل يعود تاريخه لحوالي ٦٥٥م اعتماداً على دراسة الراديو كربون، وربما كان عائداً لأحد رجالات الدين في الكنيسة أو شخصية ذات اعتبار ديني، وقد نقل من مكانه بعد أعمال التنقيبات. ويتوسط واجهة هذه الحنية والحنيات الوسطى والجنوبية نحت نافر لخطوط شعاعيه تمثل الشمس على الأغلب (الشكل ٦).

روعي في تصميم هذه الكنيسة اتساعها لأكثر عدد ممكن من المصلين ووجود تسعة مداخل في الجهات الثلاثة: الغربية والجنوبية والشمالية سهلت على المصلين الدخول والمغادرة بدون تزاخم. من ناحية أخرى فقد زودت الأروقة خارج الكنيسة بالأعمدة كالرواق الأمامي (بقي منه أربعة أعمدة تم إعادة نصبها)، أما الأعمدة في



٥. جزء من الأرضية المبلطة في أروقة الكنيسة.



٨. طابون (فرن خبز)، الرواق الشمالي الخارجي.



٦. الحنية الشمالية للكنيسة.



٩. مبخرة حجرية أموية.



١٠. جرة فخارية أموية.

الرواق الشمالي الخارجي فقد وجدت منهارة أثر الهزات الزلزالية (الأشكال ٢، ٣، ٧) ومن المرافق الأخرى المكتشفة خزان مياه ضخ يقع شمال الكنيسة مساحته ١١م X ٥م بعمق ٥م، وهو مزود بدرج جانبي وسقف أسطواني دمر لاحقاً، ويشير حجم هذا الخزان إلى حرص القائمين على رعاية الكنيسة على تجميع المياه للاستخدامات المختلفة لقاطنيها من الرهبان ورجال الدين أو مستخدميها من المصلين والتلاميذ (الشكلان ٢، ٣٣).

أما المكتشفات المعمارية اللاحقة من القرن الثامن الميلادي فقد اشتملت على أربع حجرات متجاورة بنيت في الرواق الجنوبي للكنيسة، وواحدة في الرواق الشمالي وحجرة في الرواق الأمامي الخارجي. بنيت جدرانها بشكل بسيط وغير متقن، واستعمل فيه حجارة الكنيسة وأجزاء الأعمدة والقواعد الحجرية (الشكل ٢)، وقد استخدمت هذه الحجرات لغايات السكن بدليل العثور على بقايا طابونين للخبز في الجهة الشمالية خارج الكنيسة (الشكل ٨)، وتؤرخ من خلال كسر فخارية وقطع عملة وأدوات شملت منجل حديدي، ومروود كحل، وجرار فخارية للفترة الأموية، وقد هجرت هذه المساكن في أعقاب زلزال عام ٧٤٧م، ووجدت آثار التدمير الزلزالي واضحة في سقوط الأعمدة، وحددت قوة دفع الزلزال باتجاه الشرق. (الأشكال ٩، ١٠، ١١، ١٢، ١٣).



٧. الرواق الشمالي الخارجي وتظهر الأعمدة المنهارة.

إسماعيل ملحم: طبقة فحل



١٣. مرود كحل أموي.

ويذكر أن هذه الفترة الأموية المبكرة وما سبقها استخدمت فيها أيضا عملات بيزنطية ورومانية ضمن التداول النقدي اليومي مثل ما عثر عليه في الكنيسة الغربية من قطعة عملة برونزية رومانية في المربع (٤٨) في الشاهد الأثري ٠٠١، وهي بقطر ٢ سم ووزن ٣,٧١ غم، وحالتها العامة حسنة باستثناء اختفاء بعض الحروف المنقوشة عليها وتؤرخ للقرن الثالث الميلادي في عهد الإمبراطور ماركوس بروبيوس (٢٧٦م-٢٨٢م)، ويمكن قراءتها كالتالي^١:

(١) الوجه

النطاق: PROBVS AVRMC IMP
AVG PF

(هذه الكتابة تذكر الإمبراطور بروبيوس، وتم الرمز للإمبراطور بالأحرف IMP ولقبه الآخر (قيصر) بالحرف C)

المركز:

صورة نصفية للإمبراطور بروبيوس وعلى رأسه التاج ويتجه بنظره نحو اليمين، كما يرتدي درعا.

(٢) الظهر

النطاق: BIS OR RESTITVT
أسفل النطاق EA

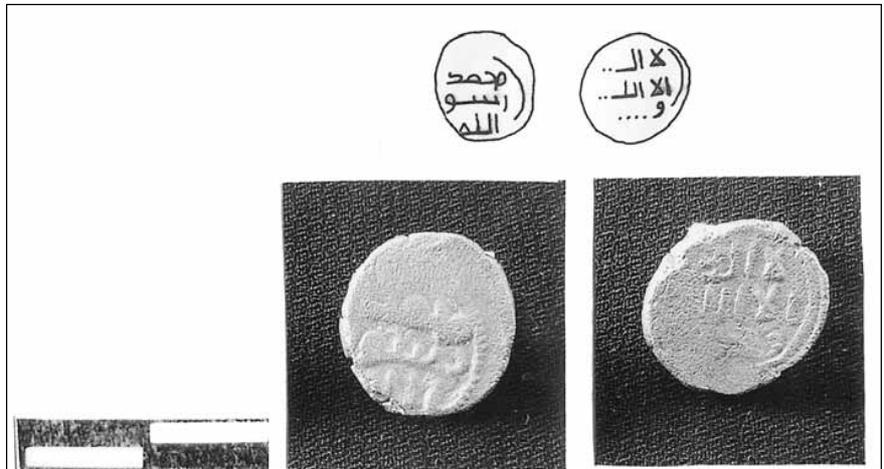


١١. جرة فخارية أموية.



١٢. منجل حديدي أموي.

كما عثر على قطعة عملة برونزية أموية وجدت في المربع (٥٧) الشاهد الأثري ٠٠٢، قطرها ١,٦ سم ووزنها حوالي ٤,٢٨ غم كتب على وجهها عبارة (لا اله إلا الله وحده) وعلى الظهر عبارة (محمد رسول الله) وهي متضررة في الحواف، أما فنتها فهي من الفلوس وسكت على الأغلب في عصر الخليفة عبد الملك بن مروان (٦٨٤-٧٠٥م) مع بداية تعريب العملة^٥ (الشكل ١٤).



١٤. عملة برونزية أموية.

6. Robertson 1982: 199-201.

٥. للمقارنة أنظر: القسوس والطراونه ١٩٩١: ٤٧-٥٧.

المركز:

موازية للحنية الوسطى بعرض حوالي ١٥٠ سم وارتفاع حوالي ٦٠ سم عملت في فترة الأشغال السكني الأموي، وربما كان الهدف منها عمل رصفة للجلوس أو لوضع حاجيات البيت، كما لا يوجد مؤشرات معمارية لوجود مأذنة (الشكل ١٦).

صورة الإمبراطور بزيه العسكري يقدم كرة لامرأة أمامه بينما تعطيه أكليلا من الورد، وربما هي زوجته الملكة نظرا لوجود تاج على رأسها (الشكل ١٥).

أما دار الضرب فهي على الأغلب أنطاكيا.

من ناحية أخرى فإن ما أشار إليه المنقبون بأن (المسلمين حولوا النصف الجنوبي من هيكل الكنيسة إلى محراب أو مؤذنة بسيطة)^٧، لم يثبت خلال التنقيبات وجود هذه الظاهرة، ولم يعثر على أي محراب أو مؤذنة، وكل ما عثر عليه عبارة عن رصفه داخلية

المدرج (الاولديون)

يقع مدرج طبقة فحل (الاولديون) في مجرى وادي الجرم الذي يتوسط الموقع الأثري، وهو أحد المعالم الرئيسية في طبقة فحل التي تعود للفترة الرومانية في موقع المجمع المدني الذي كان يضم



١٥. عملة برونزية من عهد الإمبراطور بروبوس.



١٦. الحنية الوسطى للكنيسة.

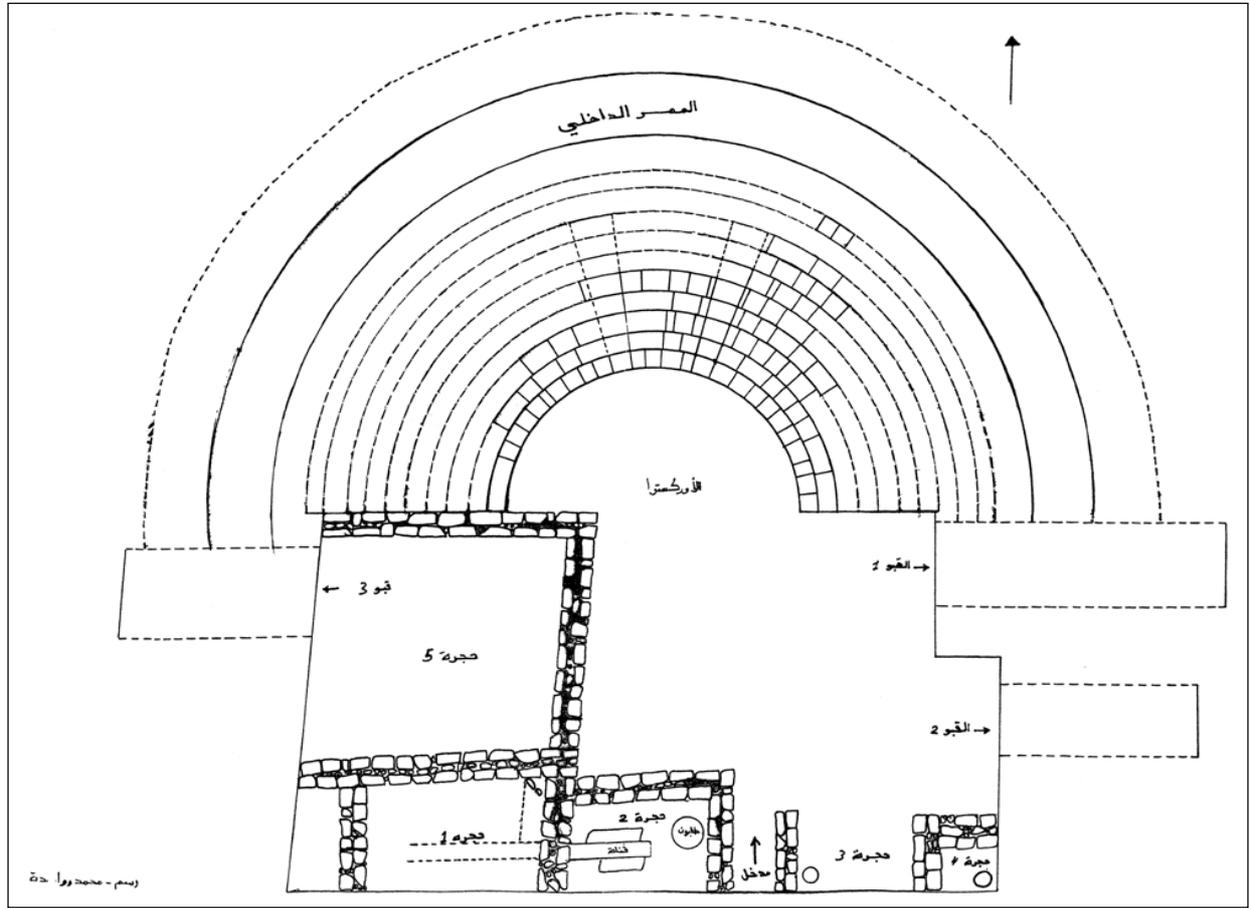
إسماعيل ملحم: طبقة فحل

والمداخل الجانبية التي احتفظ أحدها بكامل سقفه البرميلي، وقد أُرخ المدرج وفقا لنتائج التنقيب لنهاية القرن الأول الميلادي، وتعرض للإهمال منذ أواخر القرن السادس إلى بداية القرن السابع الميلادي^٩ (الأشكال ١٧، ١٨، ١٩، ٢٠).

أُجرت دائرة الآثار العامة وبالتعاون مع وزارة التخطيط والتعاون الدولي حفريات أثرية في صيف وخريف عام ٢٠٠٨م، بإشراف د. إسماعيل ملحم وفريق مكون من فوزية عبد الله، تمام خالد، ثروة عواد وعمر ربابعة مشرفي مربعات ومحمد رواشدة رسام وحوالي ٥٠ عاملا محليا، استمرت أعمال التنقيب خلال الفترة من آب إلى كانون أول ٢٠٠٨م. وتركز الهدف الرئيسي للمشروع على استكمال كشف المدرج بهدف إعادة ترميمه مستقبلا. تم الاعتماد على مخطط شبكي لموقع المدرج لغايات التنقيب المنهجي وذلك بعد تثبيت المحورين الأفقي والعمودي، وقسمت

بالإضافة للمدرج معبدا أو قاعة اجتماعات عامة (بازليكا) - تحولت في العصر البيزنطي إلى كنيسة^٨ إضافة إلى وجود بقايا حمام، ويمتاز هذا المدرج بصغر حجمه قياسا إلى المدرجات والمسارح في المواقع الأثرية الأخرى كأم قيس وجرش وعمان وبصري. وقد فقدت كمية من حجارة المدرج نتيجة نقلها لاستخدامها لإغراض مختلفة.

أُجريت التنقيبات الأثرية في المدرج لأول مرة عام ١٩٧٩م من قبل البعثة الأثرية الأمريكية التابعة لكلية وستر برئاسة روبرت سمث وتبعها موسمان في العامين ١٩٨٠م و١٩٨١م، وقد تم التنقيب في حينه رغم وجود مياه الينابيع المتدفقة التي كانت تغمر أجزاء من الموقع، وقد أظهرت الحفريات الأثرية الشكل العام للمدرج رغم تضرره وفقدان أجزاء منه، حيث يتخذ شكلا نصف دائري، كما بقيت الجدران الرئيسية التي كانت تقوم عليها درجات المدرج



١٧. المخطط العام لمدرج طبقة فحل.

الرومانية، وأن الجدار الجنوبي الذي يؤسس لبناء الكنيسة هو ذو طراز روماني من نوع الحجر النافر، وقد تم الكشف عنه في حفريات دائرة الآثار العامة سنة ١٩٩٩م بإشراف يوشع العمري مما يستدعي إعادة النظر في الاستنتاجات السابقة لمزيد من الاطلاع راجع (Smith 1973: 34) (الشكل ١٩، ٢٠، ٢٢). 9. McNicoll et al. 1982: 78-82; Smith and Day 1989: 20-23.

٨. إن موضوع تحول البازليكا الرومانية أو المعبد إلى كنيسة في العصر البيزنطي موضوع خلاف، حيث ذكر المنقبون الأمريكيون بأن العناصر المعمارية الرومانية المستخدمة في عمارة الكنيسة كالأعمدة وجدران الكنيسة مثلا وغيرها ما هي (إلا آثار سرقها البناءون وأضافوها لبناء الكنيسة) غير أن هذا الافتراض محل نقد باعتبار أن البازليكا أو المعبد هما من العناصر الرئيسية في تخطيط المدينة

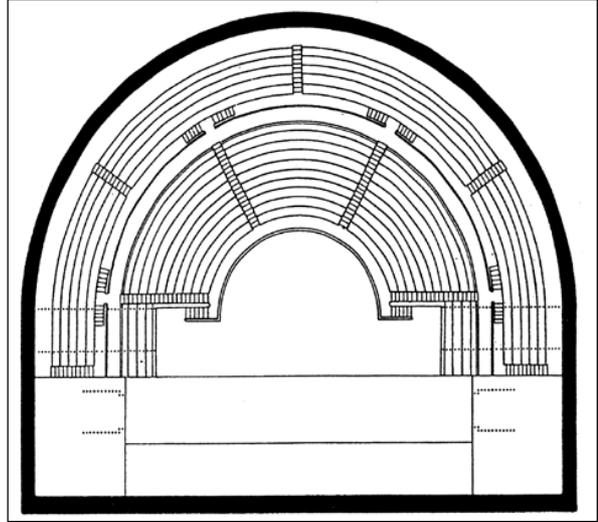
يبلغ قياس المقاعد المستخدمة كالتالي: عرض الدعسة ٧٠سم، أما ارتفاع الدرجة الأخرى حوالي ٢٥سم وهي ما تمكن الشخص المتفرج من الجلوس بشكل مريح، وترتفع درجات الجلوس بزوايا ٤٥° تقريبا (الشكل ١٧).

كما عثر على بقايا لممرين بين المقاعد لتسهيل حركة المتفرجين، ووجدت دلائل على وجود صف مقاعد حجرية كانت تحيط بالدرجة الأولى العلوية من المدرج بقي منها مقعدان في مكانهما، إضافة إلى العثور على العديد من المقاعد الحجرية المتناثرة. كما يتوقع أن منصة العرض (خشبة المسرح) واقعة في الجهة الجنوبية من المدرج، وكان يؤدي عليها فقرات التمثيل والموسيقي والرقص وغير ذلك، ونظرا لأن تنقيبات الموسم الأخير ٢٠٠٨م لم تستكمل فلم يتم الكشف عن معالم هذه المنصة.

فترات الإشغال السكني في المدرج

تم الكشف من خلال التنقيبات عن أساسات جدران لحجرات استخدمت في نهاية العصر البيزنطي والعصر الأموي من بداية القرن السابع الميلادي حتى منتصف القرن الثامن الميلادي، بنيت غالبيتها من حجارة غير مشذبة، كما استخدمت فيها بعض حجارة المدرج، وتتكون على الأقل من ثلاثة حجرات وما يعتقد أنه مرافق أخرى كمطبخ وممر وحجرة تخزين وساحة سماوية، وعثر على كسر فخارية وقطع عملة برونزية وجرة تخزين شبه كاملة وأسورة برونزية مجدولة وخاتم برونزي، وقد هجرت هذه المساكن بعد زلزال عام ٧٤٧م -- على الأغلب -- إذ يتضح حجم الدمار والانهيئات في الموقع والحجارة والأعمدة المنهارة (الاشكال ٢، ٢٥، ٢٦، ٢٧، ٢٨).

ظهر من خلال حفريات موسم ٢٠٠٨م أن فترة هجران المدرج



١٨. مخطط المدرج / إعادة تصور نقلا عن (Smith and Day 1989: fig 5)

مناطق العمل إلى منطقتين شرقي المحور العمودي ومنطقة غربي المحور العمودي وتركزت الحفريات في وسط المدرج.

يتخذ المدرج شكلا نصف دائري بطول (٣٨,٥٠م) شرق-غرب وطول (٣١,٢٠م) شمال-جنوب، ويتكون هذا المدرج من جدار خارجي وممر داخلي (دهليز) وجدار داخلي ومقاعد وساحة (الاوركسترا) أو (حلبة المدرج) وأربعة مداخل جانبية اسطوانية الشكل ومنصة العرض (خشبة المسرح) غير مكتشفة إلى الآن (الشكلان ١٧، ١٨).

تركزت المقاعد في منتصف المدرج بشكل نصف دائري، تتكون من عشرة درجات، ما بقي منها بشكل جزئي واضح هو ثمانية، واستخدم في تشكيلها حجارة كلسية مشذبة بقياسات كبيرة نسبيا (الاشكال ٢١، ٢٢، ٢٣، ٢٤).

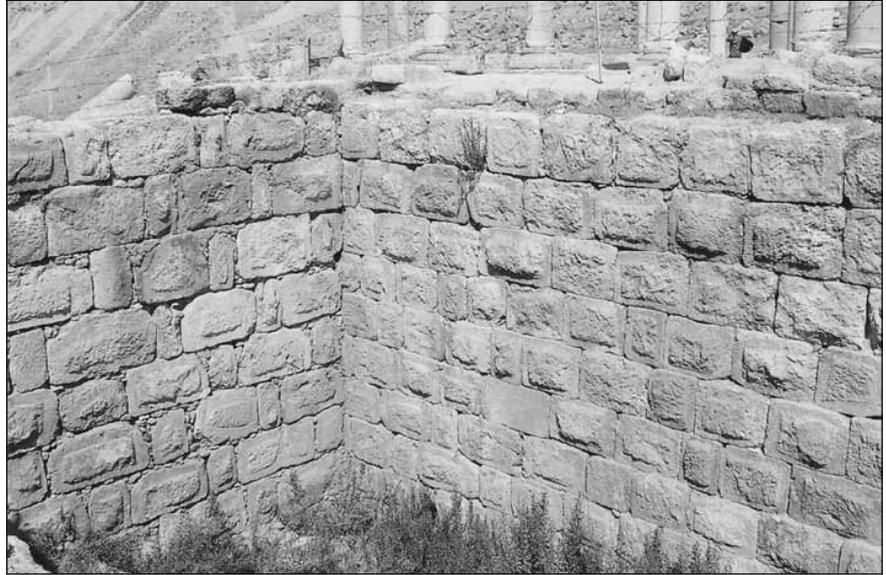


١٩. صورة للمدرج قبل التنقيب.

إسماعيل ملحم: طبقة فحل



٢٠. صورة للمدرج بعد التنقيب.



٢١. صورة للجدران التي تأسست عليها الكنيسة الوسطى.

وإهماله تماما امتدت لحوالي نصف قرن من نهاية القرن السادس الميلادي إلى بداية القرن السابع الميلادي ولم تتجاوز ذلك، حيث يعتقد ان المدرج استخدم مكبا للنفايات حتى منتصف القرن الثامن الميلادي^{١٠}، ولكن المكتشفات الاثريه اكدت بأن المدرج قد اشغل سكنيا في أواخر العصر البيزنطي والعصر الأموي، وهجر في أعقاب زلزال عام ٧٤٧م، وبقي مهملًا بعد ذلك حتى القرن الرابع عشر أو الخامس عشر الميلادي، حيث أشغل جزء منه بشكل حجرات بسيطة دلائلها جدران ازيلت لظروف التنقيب المتسلسل^{١١} وعثر من آثار هذه الفترة الأخيرة (بداية العثمانية) على غليون فخاري (الشكل ٢٩).



٢٢. صورة عامة للمدرج بعد التنقيب تتضح فيه الدرجات والقبو الشرقي.

10. McNicoll *et al.* 1982: 78-82.

11. Smith and Day 1989: 9.



٢٤. جدار الاوركسترا.

القطع النقدية البرونزية وواحدة فضية، ورغم أن غالبيتها متآكل إلا أن تنوعها من حيث التاريخ الزمني يشير إلى فترات الإشغال التي شهدها هذا المدرج والمنطقة المجاورة باعتبار أن عددا من القطع النقدية ربما جاءت بفعل جريان مياه السيول نظرا لوقوع المدرج في مجرى وادي الجرم، وتعود هذه القطع إلى الفترات الهلينستية، الرومانية، البيزنطية والأموية. ومن أبرز هذه القطع قطعتان أحدهما فضية والأخرى برونزية مطلية بالفضة، القطعة الفضية من طراز العملات اليونانية السلوقية وظهر على وجهها صورة الملك ملتحيا بينما على الوجه الآخر صورة نسر فاردا جناحيه وواقف على قدميه وفي فمه إكليل وهي من ضرب مدينة أنطاكيا، وتعود لعهد الملك انطيوخوس الرابع الملقب ابيفانوس (المتجلي) حوالي ٢١٥-١٦٣ ق م^{١٢}، وهي من فئة التترادراخما (أربعة دراهمات) التي مثلت الوحدة الأساسية في التداول المحلي^{١٣} (الشكلان ٣٠، ٣١). وتعد هذه القطعة من العملات نادرة الاكتشاف في الأردن،



٢٣. درجات المدرج وجزء من أرضية الاوركسترا.

القطع النقدية المكتشفة في المدرج

تم العثور خلال موسم التنقيب ٢٠٠٨م في المدرج على عدد من



٢٥. الجدران اللاحقة في المدرج.

١٢. العابد ١٩٩٣: ١٢٠، ٢٥٥، ٢٤٧، ٣٦٥.

١٢. قام الزميل عبد القادر الحصان من مكتب آثار المفرق مشكورا بالمساعدة في قراءة قطعة العملة.

إسماعيل ملحم: طبقة فحل



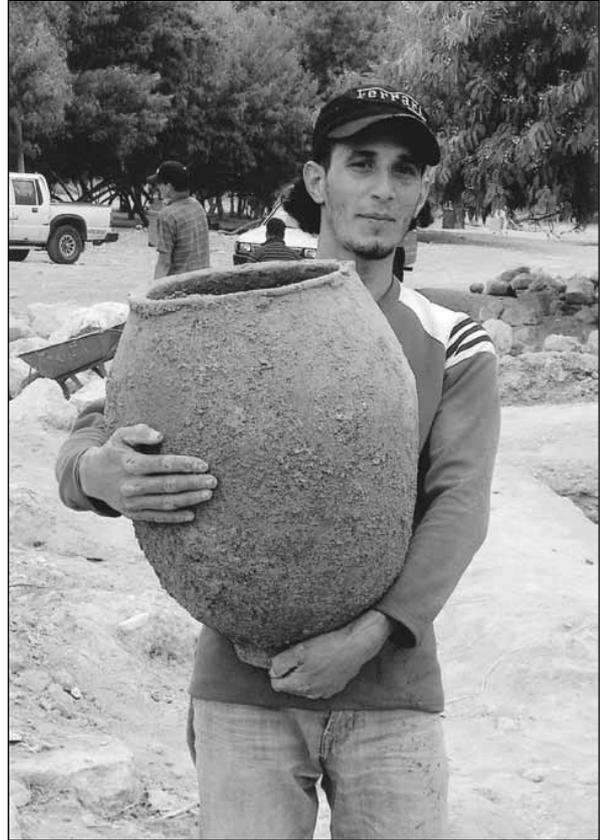
٢٦. الجرة المكتشفة في أرضية الحجر رقم ٤.



٢٨. اسواره برونزية مجدولة وخاتم برونزي.



٢٩. غليون فخاري عثماني وصليب فخاري بيزنطي متأخر.



٢٧. الجرة المكتشفة في أرضية الحجر رقم ٤ بعد استخراجها.

المؤله، كما ظهر رمزاً أسفل اسم مدينة الضرب أنطاكيا ربما يشير إلى ورشة التصنيع أنطاكيا أو إلى مديري الورشة. من ناحية أخرى فإن العثور على هذه القطعة في طبقة فحل يشير إلى فترة سياسية حساسة وانتقالية في العصر الهلينستي وهي بداية

وتتميز بشكل النسور الذي جاء على الطراز المصري فاردا جناحيه، على عكس غالبية العملات اليونانية التي يكون فيها النسور ضاماً جناحيه، بالإضافة إلى ظهور ألقاب الملك مثل (ايفانس) بمعنى المتجلي أو الظاهر و(تيمارخوس) بمعنى الحاكم و(ثيوس) بمعنى



٣٢. قطعة عملة برونزية رومانية مطلية بالفضة من عهد جالينوس.



٣٣. خزان المياه في الكنيسة الغربية.

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٣٠. قطعة عملة فضية يونانية من عهد انتيخوس الرابع / وجه العملة.



٣١. قطعة عملة فضية يونانية من عهد انتيخوس الرابع / ظهر العملة.

وقوع بيلا تحت النفوذ السلوقي وزوال الحكم البطلمي عنها. أما القطعة البرونزية المطلية بالفضة فهي من عهد الإمبراطور الروماني جالينوس (٣٥٣-٢٦٨م) وهي تمثل ديناراً من النحاس المطلي بالفضة، حيث أصبح الدينار في عهد هذا الإمبراطور يسك من النحاس المطلي بطلاء خفيف من الفضة، وهو ما يعكس حالة اقتصادية غير مستقرة^{١٤} (الشكل ٣٢).

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نتائج التنقيب في مدفن من العصر البرونزي المبكر تل الري الشمالي / الشونة الشمالية ٢٠٠٩

إسماعيل ملحم

الموقع والأهمية الأثرية

يقع تل الري في الجهة الشرقية من بلدة الشونة الشمالية التي تنخفض عن سطح البحر حوالي ١٠٠ متر، وهي منطقة خصبة رغم ارتفاع حرارة الطقس فيها صيفا، وتغذيها عدة مصادر مائية بشكل يبابيع، كما يبعد عنها نهر الأردن غربا حوالي ٤ كم، ونهر اليرموك شمالا حوالي ٦ كم (الشكل ١).

وقد دلت التنقيبات الأثرية من عدة مواقع في الشونة الشمالية على الإستقرار فيها منذ العصر الحجري الحديث (الألف الخامسة قبل الميلاد) كما في تل الشونة الشمالي، إضافة إلى الكشف عن مراحل حضارية أخرى في هذا التل من العصر الحجري النحاسي، والعصر البرونزي المبكر، والعصر الهلينستي والعصر الأيوبي (كريم ١٩٩٥: ٨٩).

كما أجرت دائرة الآثار العامة في عامي ٢٠٠١م و٢٠٠٢م تنقيبات أثرية في تل الساخنة كشفت عن عدد كبير من المدافن الجماعية المنحوتة في الصخر يقدر عددها بسبعين مدفنا والتي تعود غالبيتها للعصر البرونزي المبكر (هنداوي ٢٠٠٢ تقرير أولي) (هارون ٢٠٠٥: ١١-١٤)١.

وقد أشارت المسوحات الأثرية في وادي الأردن أن تل الري الشمالي وجدت به دلائل أثرية على استقرار من العصور: الحجري النحاسي، البرونزي المبكر، البرونزي المتوسط، الحديدي، البيزنطي، الأموي، الأيوبي ويشار إلى أن موقع مدفن تل الري يجاور موقع ذراع الخان الذي شملته المسوحات وأظهرت به دلائل من العصور: الأيوبي والملوكي والعثماني (Ibrahim and Sauer and Yassine 1976: 41-66).

سير العمل

ظهر المدفن نتيجة قيام أحد المواطنين ببناء منزل في طرف التل، وقد قام بإبلاغ مكتب الآثار بذلك، شكل المكتب على أثرها فريقا من مكتب آثار الأغوار الشمالية بإشراف الدكتور اسماعيل ملحم

للتنقيب في المدفن الأثري، وقد تبين انه مدفن جماعي بشكل كهف منحوت في الصخر الرملي هدم جزء كبير من سقفه نتيجة أعمال التجريف، وتبلغ أبعاده حوالي (٢٦٥ سم X ٢٠٠ سم)، نحتت في زاويته الجنوبية الغربية حجرة صغيرة بقياس (١٦٠ سم X ٨٠ سم بإرتفاع ١١٠ سم)، كما رصفت أرضيته بحجارة كلسية مسطحة ذات أشكال غير منتظمة، ووجدت عظام بشرية مبعثرة وأوان فخارية معظمها فوق مستوى سطح هذه الأرضية، مما يدل على استخدام الكهف لغايات الدفن الجماعي، وتؤرخ الأواني الفخارية للعصر البرونزي المبكر/المرحلة المبكرة (الشكل ٢، ٣، ٤).

وقد وجدت الأواني الفخارية والعظام البشرية مبعثرة، بعضها أسفل حجارة الرصفة الحجرية، ولعل هذا حدث في عصور لاحقة للعصر البرونزي نتيجة العبث بمحتويات المدفن، ومن المحتمل أن العبث قد وقع في أواخر العصر البيزنطي لوجود كسر فخار ومكعبات فسيفسائية بالقرب من المدفن تؤرخ لهذه الفترة.

المعثورات

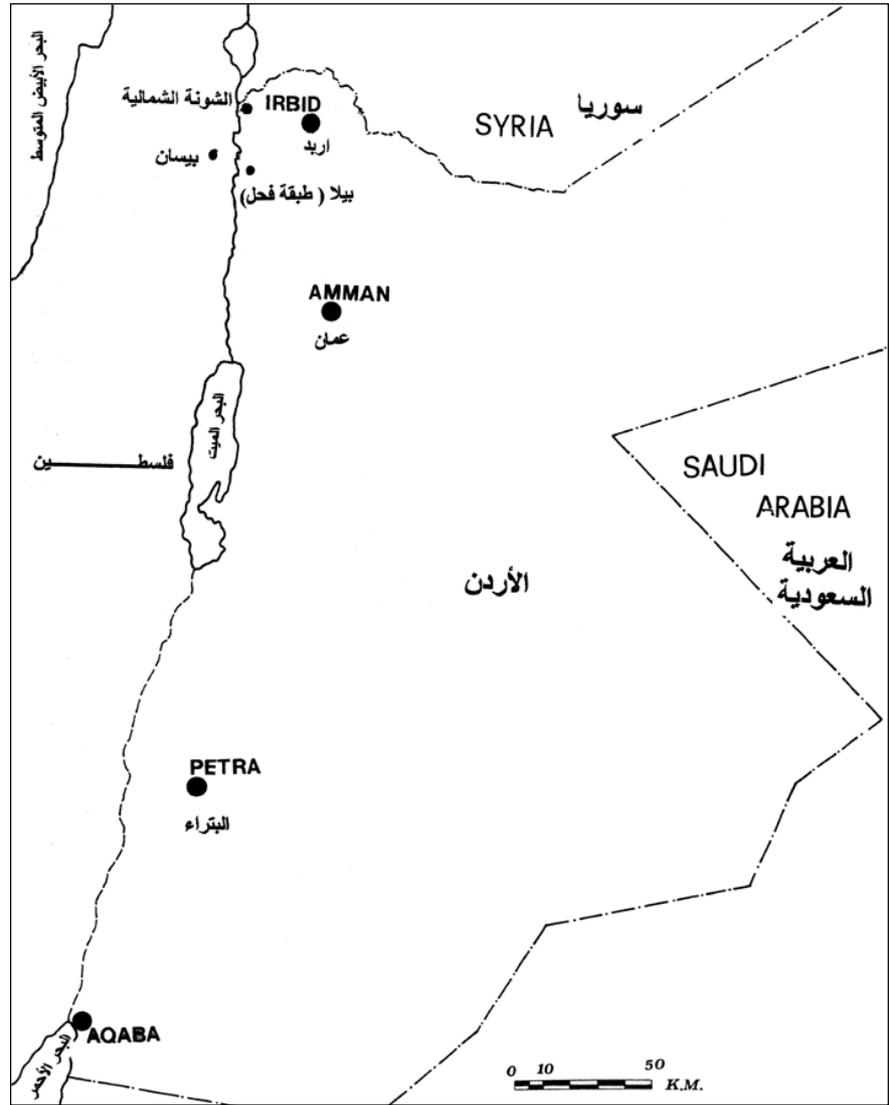
عثر في المدفن على عدد من الأواني الفخارية السليمة وعددها ٣٥ قطعة إضافة إلى كسر فخارية مختلفة، وعدد قليل جدا من الأدوات الصوانية المشغولة، وجزء من حجر طحن بازلي، وفتات لكسر عظمية بشرية، وجزء من جرن بازلي صغير ومدق بازلي. كما عثر في الموقع على جرنين احدهما بازلي والآخر كلسي صلب جزء منه مكسور ومفقود (الشكل ٥).

الأباريق الفخارية الصغيرة

غالبية هذه الأباريق الصغيرة (وهي من نمط الأكواب) ظليت باللون البني المحمر، لها يد واحدة حلقيه تربط فوهة الإبريق بنهاية البدن وقاعدة دائرية مستوية، وبعض هذه الأباريق جاء بفوهة صغيرة بقطر حوالي ٣,٥-٥ سم، وبفوهات أكبر حوالي ٥,٥-٦,٥ سم، ويبلغ عددها ١٧ أبريقا، وتتميز بتنوع حجمها، كما

١. اشكر السيد / هاني بني صخر على تعاونه مع دائرة الآثار العامة في الحفاظ على موقع الاكتشاف الأثري في تل الري، كما اشكر الأجهزة الأمنية في الشونة الشمالية على حسن تعاونها وحماية موقع التنقيب. كما اشكر الرسام أسامة الحموري من مكتب آثار اربد على قيامه برسم عدد من الأواني الفخارية المكتشفة.

١. اشكر السيد / هاني بني صخر على تعاونه مع دائرة الآثار العامة في الحفاظ على موقع الاكتشاف الأثري في تل الري، كما اشكر الأجهزة الأمنية في الشونة الشمالية على حسن تعاونها وحماية موقع التنقيب. كما اشكر الرسام أسامة الحموري من مكتب آثار اربد على قيامه برسم عدد من الأواني الفخارية المكتشفة.

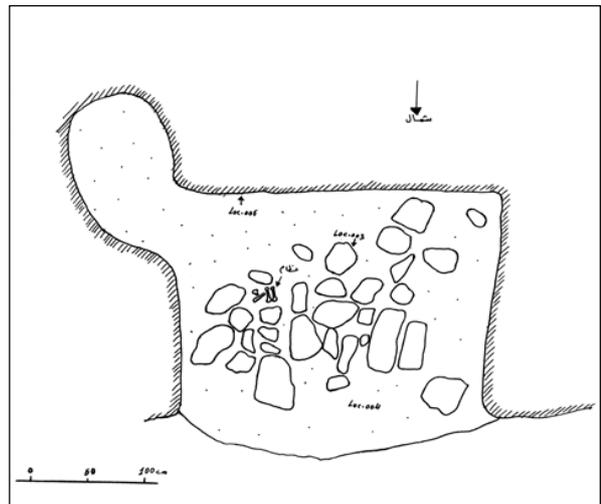


١. خريطة الأردن وعليها موقع الشونة الشمالية.

تعد من الفخاريات المميزة للعصر البرونزي المبكر/المرحلة الأولى للمقارنة انظر أباريق من مواقع الفارعة الشمالي وأساور في فلسطين (Amiran 1969: 41-45) (الشكلان ٦، ٧)، (الاشكال ٣: ١، ٢، ٣: ٥).

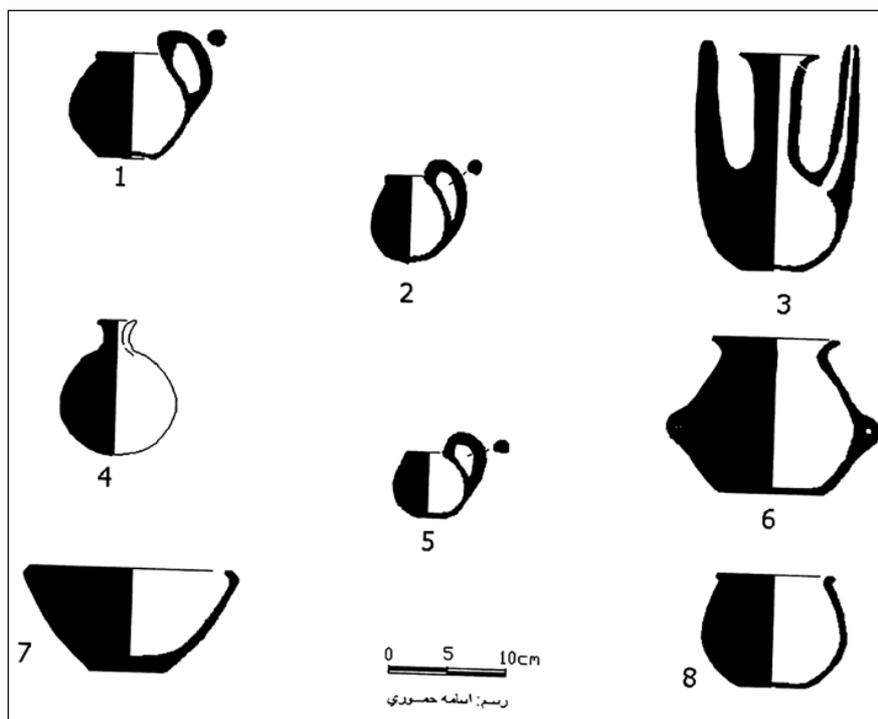
إبريق ذو فوهة وعنق طويل وثلاث مصبات

عثر على إبريق واحد كامل من هذا النوع ارتفاعه حوالي ٢٠ سم تتوزع في بدنه ثلاث مصبات، ارتفاع كل واحدة ١٢ سم، في فوهته خمسة ثقوب وثلاثة مقابض بارزة قليلا في بدنه، قاعدته دائرية مستوية، لونه بني محمر (الشكل ٣: ٣، والأشكال ٨، ٩، ١٠، ١١). وقد عثر على أباريق مشابهة له في تل الساخنة الواقع جنوب الشونة الشمالية في القبر T58، والقبر EB18، وفي وادي زقلاب الموقع ١٣٠ وتؤرخ جميعها للعصر البرونزي المبكر/المرحلة الأولى، للمقارنة انظر

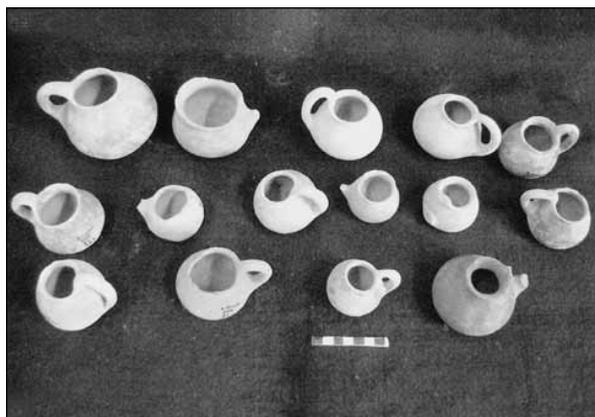


٢. مسقط أفقي للمدفن، تل الري-الشونة الشمالية.

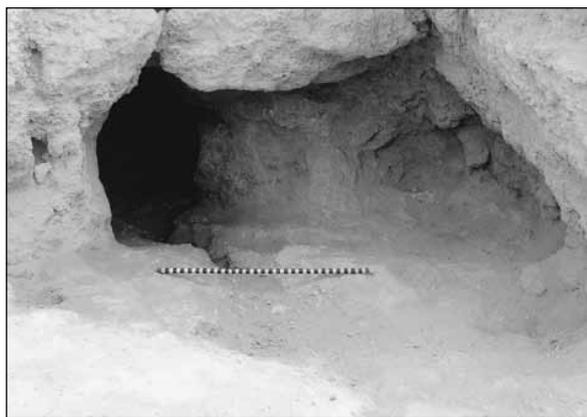
إسماعيل ملحم: تل الري الشمالي/الشونة الشمالية



٣. رسم لعدد من الأواني الفخارية المكتشفة في مدفن تل الري.



٦. مجموعة الأباريق الفخارية المعثور عليها في المدفن.



٤. كهف المدفن بعد انتهاء أعمال التنقيب.



٧. إبريقان فخاريان من المدفن.



٥. جرن حجري بازلتي من موقع المدفن.



١٠. إبريق بثلاث مصبات، منظر جانبي.



٩. إبريق بثلاث صبابات، مدفن تل الري.



٩. إبريق بثلاث مصبات، صورة أفقية علوية.

(Banning and Harun and Klassen 2008 : 1-11)

الزبادي والصحون

أ- خمس زبادي عميقة، ويبلغ قطر الفوهه ٨-٩سم والعمق ٨سم (الشكل ١٢).

ب- أربع زبادي بفوهة واسعة (صحن)، ويبلغ قطر الفوهه ١٥-١٧سم، والعمق ٧-٨سم، ذات قواعد مستوية (الشكل ٣: ٧، والشكلان ١٣، ١٤).

ج- صحنان صغيران، بقطر ٩-١٠سم، وعمق ٢سم والقاعده مستوية (الشكل ١٥).

د- زبديتان صغيرتان، قطر الفوهه ٧سم-٨،٦سم والعمق حوالي ٤سم (الشكل ٣: ٨).

لون الزبادي والصحون: الكريمي، البني المحمر، الأسود.

الجرار

أ- جرة فخارية صغيرة كروية الشكل: قطر الفوهه ٣سم يتوسطها



١١. الإبريق ذو الثلاث مصبات قبل الترميم.

إسماعيل ملحم: تل الري الشمالي/الشونة الشمالية



١٥. صحنان صغيران أحدهما مرمم.



١٢. زبدية عميقة.

(الشكل ٦: ٣ والشكل ١٦).

ج- جرة فخارية صغيرة لها مقبضان وفوهة حلقيّة وقاعدة مستوية، ذات شكل كمثري، ارتفاعها ١٨ سم، طليت باللون البني المحمر (الشكل ١٧).

تأريخ المدفن

يتميز فخار مدفن تل الري بأنه من نمط فخار العصر البرونزي المبكر المرحلة الأولى، وهي ذات الفترة التي أرخت لها مدافن تل



١٦. جرة فخارية صغيرة مرممة لها مقبضان مثقوبان.



١٧. جرة فخارية صغيرة مرممة لها مقبضان.



١٣. زبدية واسعة (صحن).



١٤. مجموعة زياد واسعة (صحن).

فتحة بقطر ١ سم، ويبلغ ارتفاع عنقها ٢ سم، أما ارتفاع الجرة حوالي ١٢ سم لونها كريمي، وقاعدتها مستوية (الشكل ٣: ٤).
ب- جرة فخارية صغيرة لها مقبضان مثقوبان للتعليق، القاعدة مستوية والفوهة حلقيّة بقطر ٧ سم، ارتفاع الجرة ١٢ سم

٨٥-١٢٨. جامعة دمشق.

هارون، جهاد

٢٠٠٥ تل الساخنة، الأغوار الشمالية ٢/١٢-٢٠/٩/٢٠٠١ م.

حولية دائرة الآثار العامة ٤٩: ١١-١٤.

هنداوي، نضال

٢٠٠٢ تقرير أولي عن حفرة الساخنة ٢٠٠٢ م (غير منشور).

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Ibrahim, M., Sauer, J. and Yassine, K.

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الساخنة الواقعة على بعد كيلو متر واحد جنوب شرق موقع تل الري، وتمثل هذه المدافن نمط ثقافي ساد في تلك الحقبة الزمنية بوضع المرفقات الجنائزية مع الأموات. كما تدل الأواني والأدوات المعثور عليها على تطور الصناعات المحلية الفخارية باستخدام الدولاب وبتحسن نوعية الأفران التي كانت تحرق بها عجينة الفخار، أضف إلى أن الأدوات الحجرية القليلة التي عثر عليها في الموقع تشير إلى ممارسة السكان المحليين لطحن الحبوب بواسطة الأجران والمدقات، وإلى اتقانهم دهان الأواني بتغطيسها بالألوان. من ناحية أخرى فإن الدراسة المقارنة تشير إلى أن مواقع تل الري وتل الساخنة ووادي زقلاب ومواقع العصر البرونزي المبكر/المرحلة الأولى الأخرى في الأردن وفلسطين تميزت بتشابه الفخار المستخدم، وخاصة ما تم العثور عليه من أنية مميزة، وهي إبريق فخاري بثلاثة مصبات.

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المملكة الأردنية الهاشمية

حولية دائرة الآثار العامة

المجلد (٥٣)

عمّان

٢٠٠٩

حولية دائرة الآثار العامة

تصدر عن دائرة الآثار العامة، ص.ب. ٨٨، عمان ١١١١٨ - المملكة الأردنية الهاشمية

رئيس التحرير

د. فواز الخريشه

هيئة التحرير

د. رافع حراحشه

سحر النسور

هنادي الطاهر

سامية الخوري

قام بمراجعة النصوص الانجليزية

الكسندر واس

الاشتراك السنوي:

٢٠ دينار أردني (داخل المملكة الأردنية الهاشمية)

٦٥ دولار أمريكي (خارج المملكة شاملاً البريد)

الآراء المطروحة في المقالات لا تمثل رأي دائرة الآثار العامة بالضرورة

تقبل المقالات حتى ٣١ أيار من كل عام حسب التعليمات الواردة في هذا المجلد وتُرسل على العنوان التالي:

حولية دائرة الآثار العامة

ص.ب: ٨٨

عمان ١١١١٨ - الأردن

فاكس: ٤٦١٥٨٤٨ - ٦ - ٩٦٢ +

تعليمات نشر البحوث في حولية دائرة الآثار العامة

تعني حولية دائرة الآثار العامة بالبحوث المختصة بالتراث الحضاري للأردن والمناطق المجاورة، بما في ذلك تقارير التنقيبات الأثرية ونتائجها.

ترسل البحوث في موعد أقصاه ٣١ أيار (مايو) من كل عام للنشر في مجلد العام نفسه إلى العنوان التالي: حولية دائرة الآثار العامة، ص.ب. ٨٨، عمان ١١١١٨ - الأردن (هاتف ٤٦٤٤٣٣٦).

ويمكن الاستفسار عن طريق الفاكس رقم ٤٦٥٨٤٨-٦-٩٦٢) أو البريد الإلكتروني
Publication.doa@nic.net.jo

- لغة البحث: العربية أو الإنجليزية.

- **مسودات البحوث:** يجب ألا تتجاوز مسودة البحث ١٥,٠٠٠ كلمة (٣٠ صفحة تقريباً) ولا يشمل هذا قائمة المراجع، والمواد التوضيحية (الأشكال). ويرجى تضمين اسم الباحث (أو الباحثين) وعنوانه في نهاية المسودة، ويكون ترتيبها كالاتي:

- ١- عنوان البحث واسم الباحث (الباحثين).
- ٢- النص الكامل للبحث.
- ٣- عنوان الباحث (الباحثين).
- ٤- قائمة المراجع.
- ٥- الهوامش إن وجدت.
- ٦- قائمة شروحات الأشكال.

- **تسليم النصوص:** يُسلم النص على قرص حاسوب، إضافة إلى نسخة مطبوعة تباعد الأسطر فيها مزدوجاً، والرجاء إضافة نسخة محفوظة على شكل Rich Text Format على قرص الحاسوب. كما يجب أن تكون المسودة بشكلها النهائي دون إجراء تغييرات كبيرة لاحقاً.

- **الصور والرسومات والمخططات:** يجب أن ترفق مع النسخة الأصلية عند التقديم. ويجب الإشارة إلى جميع المواد التوضيحية سواء كانت صوراً أم رسومات أم مخططات باستخدام مصطلح (الشكل) في متن النص، وترقيمها حسب تسلسل ورودها في النص (الشكل ١، الشكل ٢، ... الخ). ويجب ألا يزيد حجم الشكل عن ٢٢×١٧ سم. وبالإمكان تقديم الأشكال إلكترونياً jpg (ولا تقبل الأشكال المحمولة على Word)، بحيث تكون حجمها 250 pixels/in للصور الفوتوغرافية و 600 pixels/in للرسومات والمخططات.

- **الهوامش:** يفضل الابتعاد عن الهوامش قدر الإمكان. وتوضع مصادر البيبلوغرافيا بين قوسين ضمن المتن، مثلاً (الفلاحات ٢٠٠١: ٦٥-٦٧) أو (Brown 1989: 32-35) للمراجع الأجنبية.

- **قائمة المراجع:** يجب أن تكون ضمن جدول في نهاية البحث وحسب التسلسل الأبجدي. واتباع النموذج الآتي:

١- في حالة المقالات المنشورة في دوريات:

النوافلة، سامي

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٢٠٠١ فترات التاريخ العربي، نظرة شاملة. ص ٤٣-٥٩ في أبحاث ودراسات في التاريخ العربي، مهداة إلى ذكرى مصطفى الحياياري ١٩٣٦-١٩٩٨. تحرير صالح الحمارنه. عمان: الجامعة الأردنية.

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الفهرس

٧	نتائج التنقيب في مدفن من العصر البرونزي المبكر تل الري الشمالي / الشونة الشمالية ٢٠٠٩ إسماعيل ملحم
١٣	النتائج الأولية للتنقيبات الأثرية في طبقة فحل ٢٠٠٧-٢٠٠٨ إسماعيل ملحم
٢٥	كنيسة الكاهن «جيونيسيوس» في جرش / نتائج أعمال الصيانة والترميم كاترينا الحمارنة وعبد المجيد مجلي

