

PRELIMINARY REPORT ON EXCAVATIONS AT AL-ḤUMAYMA, ANCIENT ḤAWARA, 2004 AND 2005

J.P. Oleson, M.B. Reeves, G.S. Baker, E. de Bruijn, Y. Gerber, M. Nikolic, A.N. Sherwood

Introduction

The excavations at al-Ḥumayma, a Nabataean through Umayyad period site in the Ḥismā desert midway between Petra and 'Aqaba, have focused in recent years on the Roman fort and the adjacent Nabataean and Roman period civilian settlement. For reports on previous campaigns, see Oleson *et al.* 1995, 1999, 2003. Between 2004 and 2006 Oleson, in collaboration with the Friends of Archaeology in Jordan, also directed the renovation of al-Ḥumayma exhibition rooms in the 'Aqaba Archaeological Museum, and the provision of a photographic and informational display in the Visitor's Centre built at the site by the Ministry of Tourism in 2005.¹ During this same period, under the direction of Sausan Fahkri and Manal Basyouni, the Department of Antiquities has undertaken several projects of clearing and stabilizing ancient structures around the site with the aim of tourism development.

Nabataean Town and Roman Vicus (E125, E128)

Although founded as a Nabataean town, past

excavations (in Fields E125 and E077) revealed that the structures of Nabataean Ḥawara were largely dismantled to build the Roman fort. Subsequently, a new civilian community (a Roman *vicus*) developed outside the fort on top of the levelled remains of the Nabataean town. Since 1998 Reeves has been exploring the nature and extent of this Roman period *vicus* as part of an on-going project to examine the relations between soldiers and civilians in a garrisoned town of the Roman Near East. During 2004 and 2005 excavations were completed on a large multifunctional complex (E125), a small mound was probed to reveal another mudbrick structure (E128), and the geophysical team surveyed outside the fort in an attempt to locate other *vicus* structures.

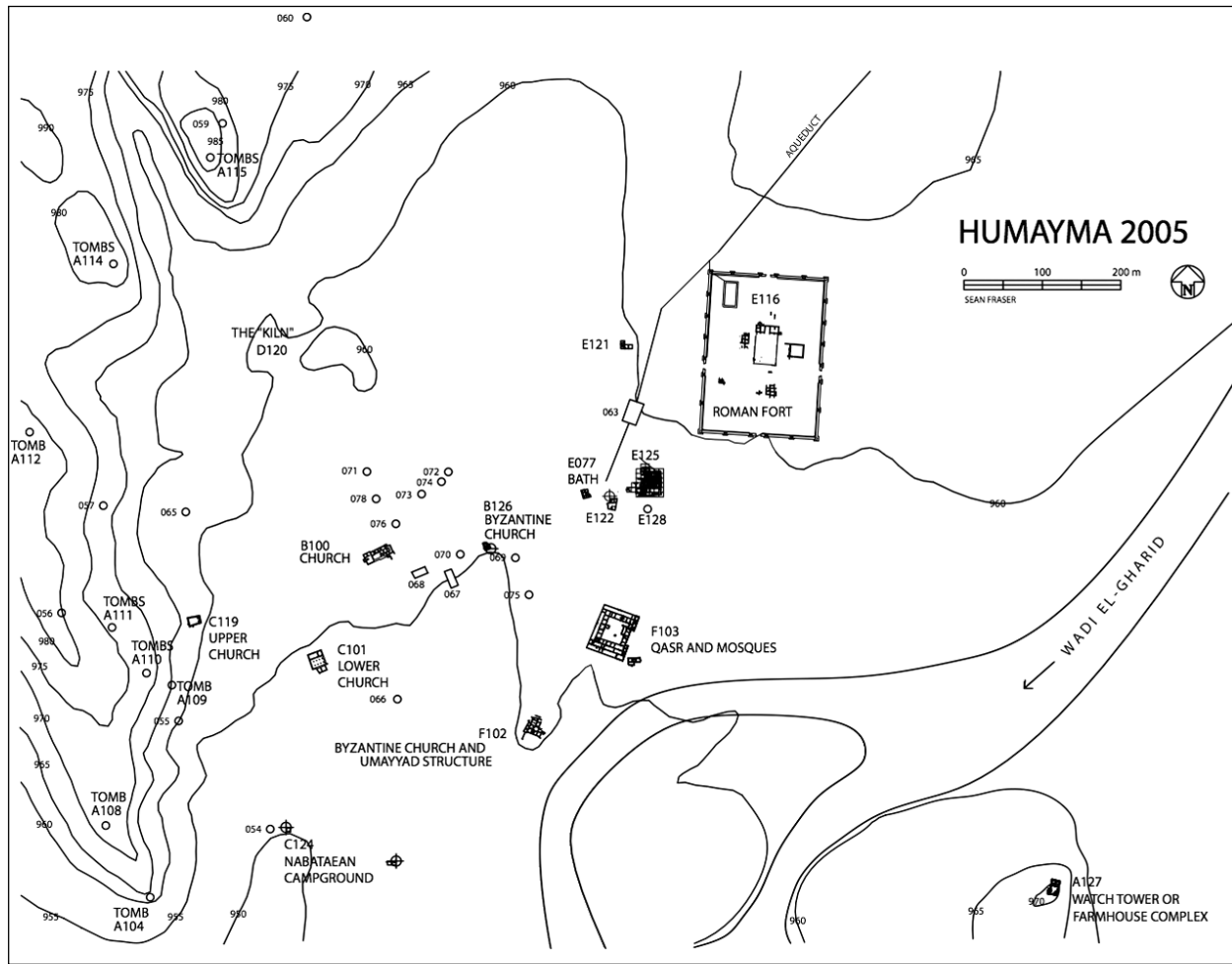
Roman Insula (E125)

Excavation in Field E125, located *ca.* 90m southwest of the southwest corner of the Roman fort, has been ongoing since 1996 under the direction of K. 'Amr (1996) and M. B. Reeves (1998, 2000, 2004, 2005) (**Fig. 1**). The goals of the 2004 and 2005 excavation seasons were to

1. The excavations, under the aegis of the University of Victoria, were once again generously funded by the Social Sciences and Humanities Research Council of Canada and the Taggart Foundation. Project director was John P. Oleson. Field supervisors were M. Barbara Reeves (E125, E128), Erik de Bruijn (E116, Field J, and Field I in 2005), Andrew Sherwood (E116, Fields N, O, and P), George Bevan (E116, Field I in 2004). The 2004 geophysical survey was funded by the National Science Foundation (Grant INT 0243524). Gregory S. Baker was director of the geophysical survey, assisted by Heather Thuman (née Ambrose) and Scott Gagliardi. Ms. Sausan Fahkri (2005) and Ms. Manal Basyouni (2004, 2005) served as Representatives of the Department of Antiquities. The Aqaba Museum renovation was funded initially by a grant from the Canada Fund in Jordan, with supplements from the Ministry of Tour-

ism. Robbyn Gordon and Caroline Riedel worked with Oleson to develop the exhibit concept, and Gordon and Miranda Angus guided the final installations at the museum and Visitor's Centre. Rebecca Foote assisted with preparation of the Visitor's Centre exhibition, which was funded by the Dean of Humanities, University of Victoria, and the Canada Fund in Jordan. A Harris Grant from ASOR funded computer reconstructions of the E125 shrine. As always, the assistance of the Director and staff of ACOR was indispensable.

Oleson and Reeves co-edited this report based on revised field reports submitted by the other authors. Baker was responsible for the geophysical survey, de Bruijn for the *Praetorium* and *Horreum*, Gerber for ceramics, Nikolic for hydraulic probes and Area Q, Reeves for E125 and E128, and Sherwood for Areas N, O, and P.



1. Plan of site with indication of ancient structures.

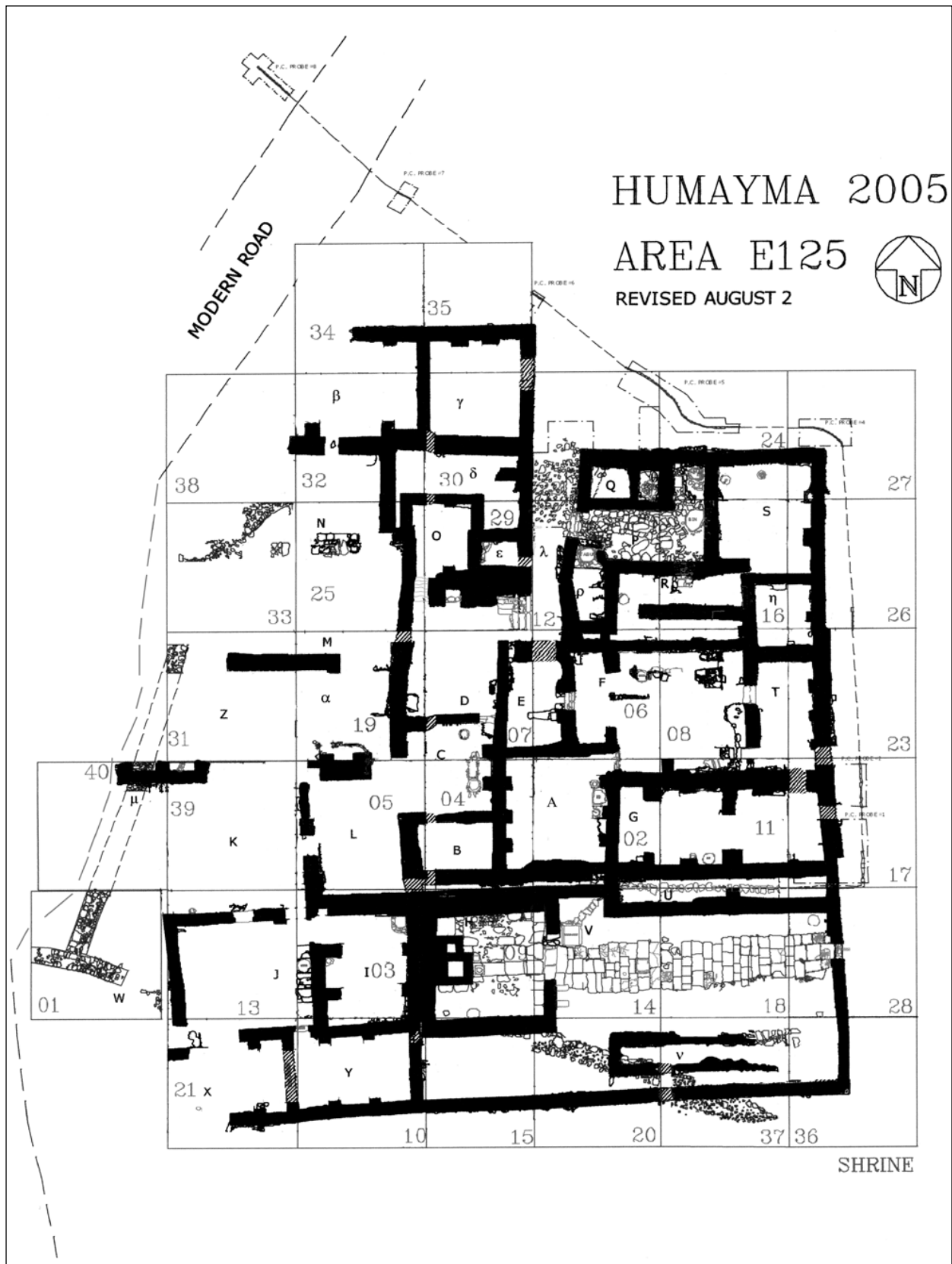
determine the overall plan of the complex including its exterior walls and entrance points, to determine whether the interior areas of the complex formed one unit or several units, to uncover the full extent and appearance of the shrine, and to finalize the phasing in all parts of the complex. Although analysis is not yet complete, the data necessary to achieve these goals have now been collected.

With the exception of the later, differently aligned walls running northeast over the structure from Square 01, all of the walls shown in Figure 2 existed during the Roman phases of the complex (see Phase 3 below). At that time the complex was organized along the lines of a Roman urban *insula*, or city block. Architecturally, the complex formed a single entity, but the interior space was divided into at least three discrete structures: a shrine in the southeast quadrant, a

domestic structure in the northeast quadrant, and one or more unclassifiable structures in the western half of the complex. All of these structures shared party walls but were inaccessible from each other and had their own exterior entrances. The *insula* was large, containing over 30 rooms and occupying over 1200 sq. m, yet the Roman period complex was inelegant compared to the Nabataean structures that preceded it. The Nabataean structures were built with ashlar blocks and mudbricks, and their interiors were decorated with frescoes. In contrast, the Roman period *insula* contained an eclectic mix of reused ruins, and *pisé* and mortared cobble walls faced with potsherds or cobbles.

E125 Phasing

The final definition of the complex phasing of E125 will not be possible until all the ceramics



2. Roman Insula (E125), Plan.

have been read. Preliminary readings and other chronological evidence suggest eight main phases for the structures in Field E125. This scheme supersedes that proposed in 1999 (Oleson *et al.* 1999: 421-26).

Phase 1 corresponds to the florescence of the Nabataean town (first century BC to early second century AD). During this phase, a cluster of buildings was carefully constructed out of fine sandstone blocks or neat mudbricks. Traces of such buildings have been found throughout Field E125, but the total number of Phase 1 structures is indeterminable. Significantly, however, two adjoining buildings (the square stone building enclosing Room H and the mudbrick building west of it in Square 03) did not share party walls, as was the norm in the Roman period. Instead each of these Nabataean structures had separate walls that abutted at the foundation level (**Fig. 3**). Since the stone building was probably a shrine, it is possible that the separation was maintained for religious reasons. The stone “shrine” (of which only lower courses



3. Abutting foundations of two Nabataean walls behind bins in Room H, E125.

survive) was constructed from large, freshly quarried ashlar blocks bearing the characteristic diagonal “Nabataean” trimming. Other Phase 1 structures (e.g. in Squares 02-05) were also constructed carefully, although at less expense, with mudbrick walls on multi-course cobble foundations. The cobble foundations were not dug into the surface soil, but sat at floor level. The floors consisted of hard packed soil in utilitarian areas and flagstones in more formal areas. Most rooms were roofed with stone arches that sprang from the side walls and carried either stone roofing slabs or plastered reeds. The walls, arches, and exposed ceiling slabs were all coated with wall plaster, which was sometimes left white and sometimes decorated with polychrome geometric designs and figural scenes applied by the true fresco method (Oleson *et al.* 1999: 422-23). Ceramic pipelines and hydraulic channels (e.g. running into Square 14) also seem to date to this period. It is impossible to know the full extent of the Phase 1 neighbourhood, as all the stone walls were levelled almost to their foundations, and all the extant architecture was renovated in the Roman period.

Phase 2 corresponds roughly with the Roman takeover of the Nabataean Kingdom in the early second century AD. The buildings in E125 (and the adjacent E077) were heavily damaged at that time, as exemplified by the robbing out of Room H’s stone walls down to the foundation courses. This quarrying of stone from extant structures to build the Roman fort meant the physical destruction of the Nabataean town.

Some decades after the Roman garrison had established itself, an *insula* was constructed in Field E125 that used the remains of the earlier buildings. Phase 3 (late second to mid-third century AD) represents the heyday of this Roman period complex. The standard of construction of this large, multi-component *insula* was considerably below that of the original Nabataean buildings. Whenever possible, extant walls, ceilings, and floors were incorporated into the new structure. Mudbrick walls whose surfaces had been damaged were repaired and faced with pottery or cobbles. Adjoining, undamaged sections of wall, where sections of Phase 1 fresco remained *in situ*, were at this time coated in whitewash, presumably to conceal the remnants of fresco and present a uniform appearance.

Other Phase 3 alterations consisted of replacing arches with walls, lifting paving stones, and blocking or opening doorways. New walls often incorporated recycled construction materials (both stone and mudbrick) in their lower courses, whereas their upper courses reflected a new construction method (*pisé*). Sometimes (but not always) large pieces of pottery or cobbles were attached to their faces, matching the technique on the repaired walls. Where they survived the Nabataean period, the stone slab ceilings supported on arches remained in use. Other rooms were roofed with reeds and plaster. Although the buildings in this period were not as fine as those whose shells were being reused, this Roman period *insula* complex was both large and functional, containing over 30 rooms subdivided into at least three discrete structures. The extant community shrine dates to this Roman phase (Fig. 4).

To judge by the coins on the floor and the other objects found within the shrine's *naos* (Room H), this shrine remained in use until at least the mid-third century. Sometime after that, the shrine was abandoned (Phase 4). The *naos* may have been cleared out at the beginning of this abandonment, because almost no valuable or reusable objects were found *in situ*, only a betyl and an altar with Latin inscription. The subsequent abandonment lasted approximately twenty to fifty years, during which time 20-30cm of soil built up over the floor of the *naos*, and soil and ash accumulated in other parts of the *insula* (e.g. in Rooms B, C, and F). It is

tempting to link the abandonment of a community shrine patronized by Hawara's garrison with a time of military crisis when the garrison had to be redeployed elsewhere. Zenobia's uprising (270-272; cf. Graf 1989) provides a likely context, although further analysis of the pottery will be necessary before we can date the abandonment precisely. Whatever the reason, the departure of a 500 person garrison was a profound change for a small community, in which, during the previous century, the soldiers had probably formed over half of the resident population (Oleson 1997: 177). The families of the soldiers presumably followed the redeployed garrison. Those merchants whose livelihoods depended on the soldiers' business might have followed the garrison as well, leaving no one to take care of the shrine.

During this period of abandonment, many of the arches and ceilings in the E125 complex collapsed (Phase 5). In the shrine's *naos* the collapse broke both the betyl and the altar and also created a thick layer of tumbled stones that preserved the contents of the room. The pottery suggests this collapse occurred in the late third century. No earthquake is known to have occurred in the region at this time, so it is possible that the combination of the abandonment and the poor repairs of a century before had undermined the complex's structural stability.

The final ancient phase of occupation is characterized by limited and sporadic reuse (Phase 6). Squatters apparently moved in and reused parts of the rooms. They lifted some of the tum-



4. Roman period *naos* with betyl, legionary altar, and inscribed column fragment in place (Computer reconstruction by Chrysanthos Kanelopoulos and Platon Konstandopoulos).

ble and piled it elsewhere. In the cleared areas they installed domestic equipment such as basins, millstones, *ṭābūns*, and pottery bins. For example, in Room A the voussoirs of the northern and central arches were removed from the northeast corner of the room, while the voussoirs in the northwestern corner and all those of the southern arch were left where they had fallen. A kitchen area was set up in the cleared space, consisting of a *ṭābūn*, a storage bin, and a millstone.

The squatter occupation ended with the final collapse of the walls still standing (Phase 7). In many areas, *in situ* domestic assemblages were trapped beneath the debris. For example, the mudbrick wall along the north side of Room F collapsed and crushed the pottery in an adjacent bin. This collapse, which occurred in the late third or early fourth century, marked the end of habitation in the complex. No one apparently even attempted to rebuild in this area in the fourth century, when the return of the garrison, reoccupation of the fort, and renovation of the bath house (E077) signalled the return of some prosperity to the town and to the *vicus* region.

After the final collapse of the walls, the ruins of the E125 complex and the objects trapped within seem to have been largely ignored. Over the subsequent millennium and a half there was some sporadic activity within Field E125, which sometimes coincidentally affected the buried ruins (Phase 8). During this period, ancient walls were dismantled, new walls were built over top (Squares 01, 03, 15, 20, 31, 37, and 40), and a burial was dug into earlier occupation debris (Square 19).

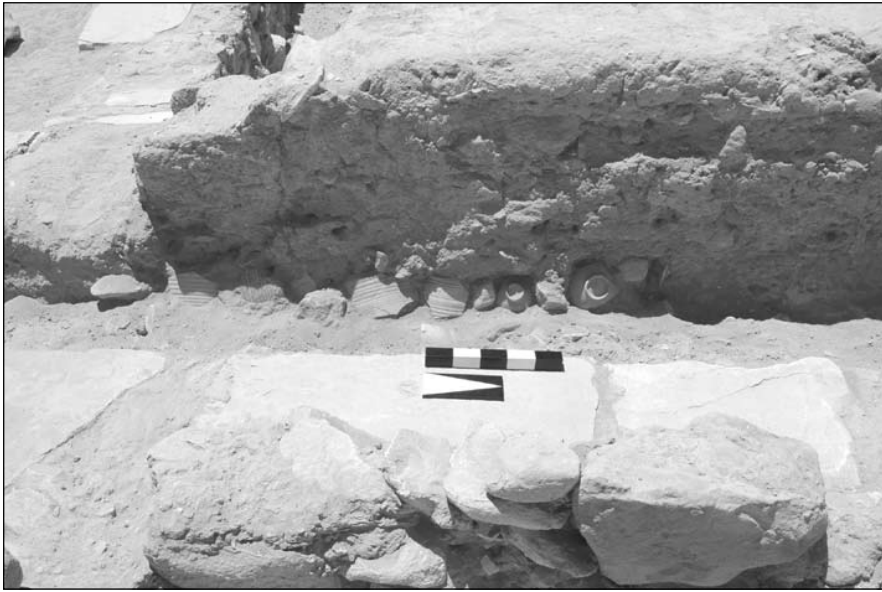
Roman-Period Community Shrine

One of the most important discoveries of the 2000 excavation season was the presence of a one-room shrine located on the southern side of the E125 complex, in which the soldiers and civilians of Roman Ḥawara had come together to worship the guardian deities of their settlement (Room H, **Fig. 4**). A large betyl, probably representing the town's patron deity, was found in the centre of this shrine, facing east. Next to it stood an altar with Latin inscription dedicated by the soldiers of the *Legio III Cyrenaica* to Jupiter Ammon, their regimental deity, and adjacent to that a truncated column dedicated by a private

individual to Zeus Serapis (Oleson *et al.* 2002, 2003). Other votive objects found in the E125 complex (in reused contexts) included a faience ram's head amulet (showing Jupiter Ammon) and a mother-of-pearl or alabaster figurine of a goddess (Reeves, in preparation). These objects suggested much about the nature of the deities worshipped in Roman Ḥawara, but, at the end of the 2000 excavation season, the plan of Room H, the location of the entrance, and the relation between the shrine and the rest of the E125 complex remained unclear. The 2004 and 2005 excavation seasons resolved these questions.

Where the shrine room is currently located there once stood an impressive Nabataean building, the finely constructed stone walls of which can be seen running through Squares 09, 15, and 14 to form a square. Given that Nabataean shrines frequently contain a square *naos* housing the cult statue (Netzer 2003: 67-110), and given the presence and orientation of a Roman period community shrine on top of this structure, we believe the original building was probably the *naos* of a Nabataean shrine. This shrine, like the other Nabataean civic buildings, was damaged around the time of the Roman annexation, and all but the lowermost courses of its stone walls were taken for construction of the fort. Sometime later, the shrine was rebuilt, probably (given the presence of both a Nabataean betyl and an altar with Latin dedication by the legion) in an attempt to foster feelings of solidarity between the soldiers and civilians in this garrisoned town. The Roman period *naos* was undoubtedly less carefully built than the original Nabataean structure, yet more care seems to have been taken in restoring this room than in building the rest of the Roman period *insula*.

In the Roman period only the eastern arch of the *naos* was still standing, and the western wall of the room was levelled off and left to serve as a votive shelf. The mudbrick wall of the separate Nabataean building to the west was now converted into the rear wall of the shrine, and at least the lowermost section of this wall was coated with large pieces of pottery (**Fig. 5**). Hundreds of fragments of polychrome fresco in a variety of designs suggest that other parts of the room were again elegantly decorated. This fresco coated the mortared cobble walls that were erected over the foundations of the ashlar walls on the south,



5. Roman period naos with original west wall leveled and pottery attached to face of new west wall.

east, and north sides of the room. Mudbrick bins seem to have been constructed at the same time, directly on the Roman period floor. A wall stub, which on the basis of its construction technique should date to the Nabataean period, formed the back of both the small and large bin. The front of the stub-wall had been decorated with a frescoed design showing faux columns and marble veining (Oleson *et al.* 2003: fig. 12). This Nabataean phase fresco survived *in situ* through being sealed within the small Roman period bin which, like the large bin, abutted the stub-wall. The front and side walls of the two Roman bins were constructed out of mudbricks faced with wall plaster, possibly recycled from the previous structure. The three flagstones leading up to the

betyl and the flagstones comprising the processional way through the courtyard also appear to have been recycled for use in the Roman period shrine.

Given the extensive recycling of building materials throughout the Roman period shrine, as well as the incorporation of walls from more than one structure, it is difficult to draw firm conclusions about the appearance of the Nabataean religious structure. In contrast, the appearance of the Roman period sanctuary is much clearer (Figs. 2, 6, 7). The Roman community shrine constituted a distinct religious precinct, organized hierarchically as a box within a box within a box. The innermost box, centred at the back of Room H, was a large bin for the stor-



6. E125 shrine precinct, overview facing west from courtyard door.



7. Roman period shrine precinct (Computer reconstruction by Chrysanthos Kanellopoulos and Platon Konstandopoulos).

age of religious paraphernalia. Centred in front of it stood the cult statue (betyl) in a position matching that of the cult statues at Khirbat at-Tannūr (McKenzie 2003: fig. 179). This central cult nucleus was then enclosed by the square walls of the *naos* (cf. Netzer 2003). The *naos*, in turn, was enclosed within a rectangular open-air walled courtyard (the *temenos*), in whose north-western corner the *naos* was situated. The main axis of the shrine ran east-west from the door of the courtyard (in Square 28), along a narrow, 20m long paved processional way, through an external built-in altar (of which only the base now survives), through the door of the *naos*, and along a line of three complete large pavers which ended at the cult statue and the large bin. This east-west axis was visually reinforced by the symmetrical arrangement of two long planters (once filled with flowers or shrubs) that flanked the northern and southern sides of the processional way. In addition, the door of the *naos* was framed by a pipe-fed water basin on its north and a bench (or bin) on its south.

The Roman period *naos* comprised a square enclosure (Room H) roofed only on the east, with the result that the western half was open to the sky (Fig. 4). Two bins and a votive shelf lined the western wall. The betyl and all the votives had been placed along the western side of the room facing east. The votives included the inscribed legionary altar and column fragment (Oleson *et al.* 2002: 112-19, 2003: 47-49), an intact ceramic lamp, many lamp fragments, a

terracotta grape leaf (Fig. 8), a Roman coin with a hole drilled through its centre, and some Greek *ostraka* (as yet unread).

The Northeast Domestic Structure

In addition to the shrine precinct, there is one other identifiable discrete unit within the E125 complex. This second unit occupied the entire northeastern quadrant of the complex and was accessed via an external corridor (λ) located



8. Terracotta leaf from votive shelf in *naos*.

in the centre of the northern side of the *insula* (Squares 22 and 12). The door between Corridor λ and the northeastern structure could be locked, thus ensuring privacy for the residents of the unit within. This unit, which included Rooms A, E, F, G, P, Q, R, S, T, ζ , η , θ , and ρ , took the form of a large courtyard house comprising a central courtyard (Area F) ringed by rooms on all sides. This house, like the rest of the *insula*, was built in the Roman period over the remains of one or more Nabataean structures. Also like the rest of the *insula*, it continued in use through several phases of collapse and reuse. The patterns of use within the structure over time are still being analyzed. There are a great many finds from this structure, including many crushed domestic assemblages, which will assist with the final interpretation.

Western Half of the E125 Complex

As the plan of E125 shows, the western half of the complex is not as well defined as the eastern half. This is unfortunate, because the western half of the *insula* must have contained one or more self-contained units. Unfortunately, the total number of units, their function, and even the access routes between many rooms can no longer be determined. In contrast to the eastern portions of the complex (which remained relatively untouched since the fourth century), the western regions were greatly disturbed over the subsequent centuries. A burial was dug through a mudbrick wall in Square 19, and walls were built of robbed-out stones over the ruins in the Ottoman period. The worst damage, however, resulted from the presence of the modern road through the site. This damage penetrated to the foundations of the complex and completely obliterated mudbrick walls and sub-floor pipelines. For example, the western extent of the southern wall in Square 21 has completely vanished, even though a pot, which seems to have been embedded in the floor in front of it, remained *in situ*. Similarly the east-west walls in Squares 34 and 38 now come to an abrupt end, associated with piles of cobblestones.

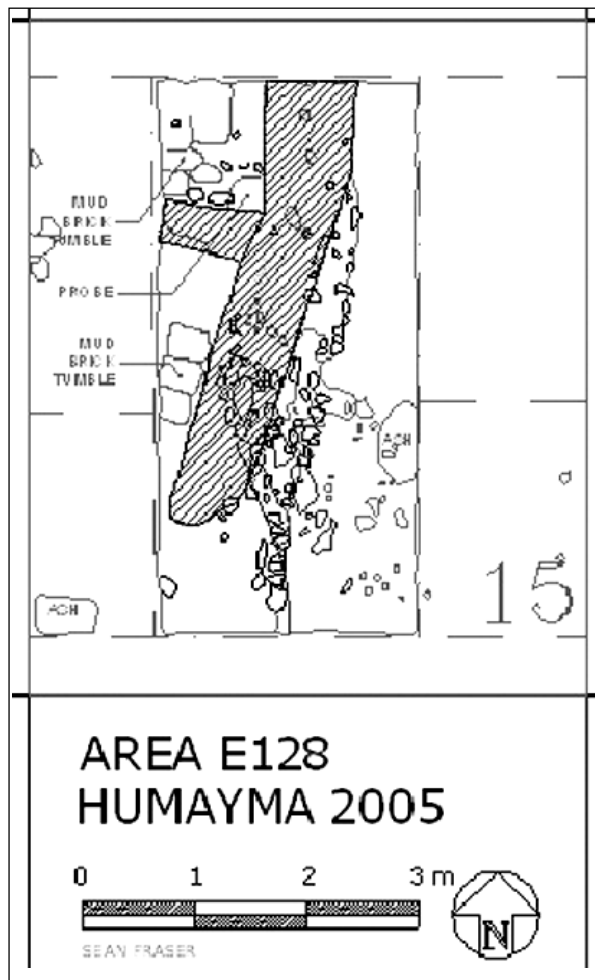
The modern dirt road is shown in Figure 2, as is the Nabataean period pipeline that provided water for the shrine. Since the Nabataean pipeline dives under the modern road just north of the E125 complex, we believe an ancient road

was located in approximately the same place. Over the subsequent centuries, the path of this road has probably shifted closer to, and in places over (e.g. Square 40), the remains of the E125 complex, a hypothesis tentatively supported by the geophysics data (Oleson *et al.* 2003: 53, fig. 14). The encroachment of this major trackway through the site has probably led to the destruction of many of the features on the west side of E125. The seemingly random piles of cobbles in some of the areas adjoining the road most likely represent the remnants of the bulldozed cobble foundations of mudbrick walls. Since this dirt road has been regularly used by residents, tourist companies and the Jordanian army, it is likely that multiple attempts have been made to level the road bed, to the detriment of the ruins.

The damage to the western side of E125 makes it impossible to determine the plan of this section of the *insula*, but given the available space, it is likely that there were multiple units on this side of the structure. Moreover, given the hypothesized presence of the Roman period road, it is quite likely that the missing units would have included shops and taverns for which road frontage would have been highly desirable. As yet, no such businesses are known at al-Humayma, which highlights the urgent need to excavate the site's buried mudbrick structures before any more are lost.

Mudbrick Structure (E128)

Directly south of E125 lies a small mound. No wall lines or large stones were visible on the surface, but, given the use of earthen construction in E125 and the proximity of the mound to the Nabataean and Roman structures in Fields E125 and E122, it seemed likely that the mound contained another earthen structure. A test probe, laid out over the highest point in the mound, confirmed the presence of a mudbrick building that seems to date to the Nabataean period of the site (**Fig. 9**). Two walls of this building were exposed, each constructed similarly to the Nabataean phase walls in Field E125 with mudbricks laid on cobblestone foundations. Moreover, since the walls abut and differ in width, there is likely more than one Nabataean phase to this building. Later floor levels suggest post-Nabataean reuse as well (in several phases). Given that the walls were preserved to a height of approximately 1m,



9. Mudbrick walls in Field E128, Plan.

preservation of much of the structure within the mound is likely. Full excavation (to be carried out next season) should clarify the phasing of this structure and, in conjunction with the work on adjacent areas, will enhance our understanding of the character and fate of the Nabataean town and of the Roman *vicus* that succeeded it.

Geophysical Survey of the *Vicus*

A detailed discussion of the geophysical results is presented below. Although the survey did point to a few promising areas for future excavation, the techniques were not able to produce a clear map of the *vicus*, as had originally been hoped. Presumably the *vicus* contains additional mudbrick and *pisé* structures similar to the two already discovered. Unfortunately the very nature of such ruins (mud architecture surrounded by dissolved and rehardened mud) does not produce readily identifiable signals for the

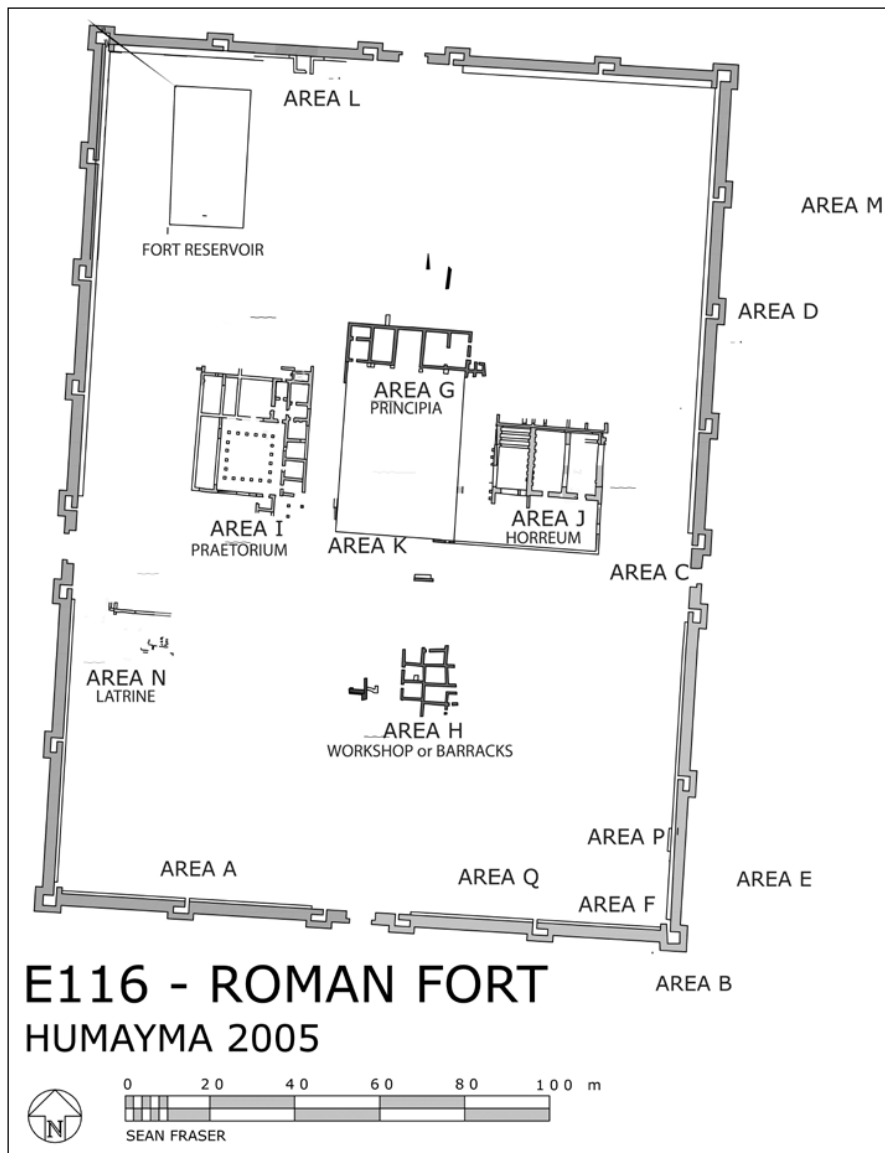
geophysical devices. Future work on mapping the *vicus* will therefore rely on more traditional survey techniques.

Field E116: The Roman Fort

The goals of the 2004 and 2005 excavation seasons in the fort were definition of the plans of the *Praetorium* (Area I) and *Horreum* (Area J), investigation of a major structure in the southwest quadrant (Area N), and further exploration of the road and water-supply systems (Fig. 10). Although some architectural sub-phases were identified in individual buildings, the overall phasing of the fort complex is uniform. Phase 1 (soon after 107) saw construction of the fortification walls and abutting parapet walk, and all interior structures, including the road system, pipelines, and drains, on largely unoccupied ground. Phase 2 begins with the partial destruction of the fort sometime in the second half of the third century, possibly by the forces of Queen Zenobia, followed by a period of abandonment. During this phase some roofs and walls collapsed, and debris accumulated in and around the structures. Diocletian's reworking of the system of frontier defence may have resulted in redeployment of the Havarra detachment at this time. Phase 3 begins with renovation and re-occupation of the fort early in the reign of Constantine. Some rooms were cleared of debris, which was dumped either outside the structures or into Phase 1 rooms that were not needed. Floors and walls were renovated, and storage bins were installed in rooms used for habitation. At least some parts of the fortification and internal road system were renovated at this time, as well. Phase 3 ends with the final abandonment of the fort in the late fourth century.

E116 Area I: *Praetorium*

In 2000 excavation began on Area I, located in the northwest quadrant of the Roman fort, south of the reservoir and west of the *Principia*. Based on the location and plan of the structure (Johnson 1983: 135, 139; Webster 1998: 215-22, 224-25), the presence of extensive fresco decoration, and the use of mosaic flooring, so far unparalleled elsewhere at the site or in the *Hismā*, the building was identified as the *Praetorium*, the residence of the commanding officer of the fort's garrison (Fig. 11). Excavation during the



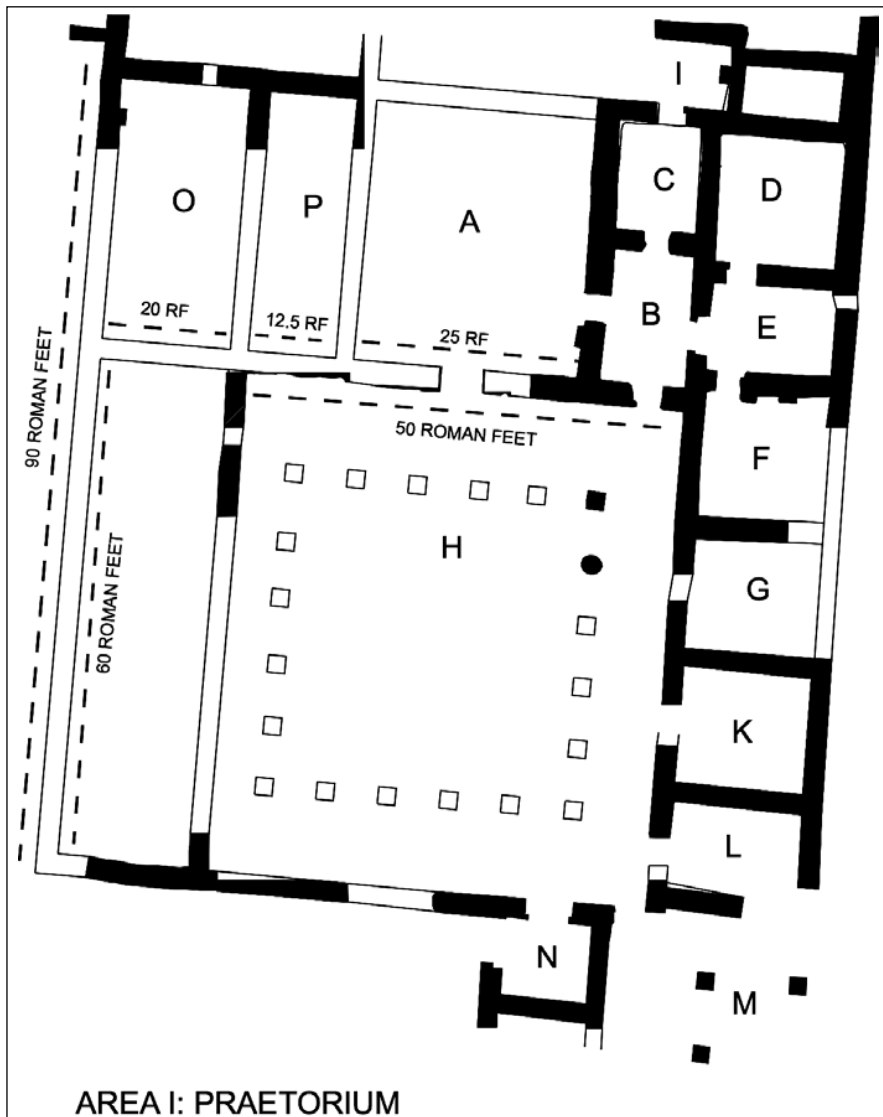
10. Roman fort, plan.

2004 and 2005 seasons focused on complete exposure of the mosaic flooring and the principal rooms in the *Praetorium*, and recovery of the plan of the entire structure.

Although a few ambiguities remain, the plan of the *Praetorium* is now well established. Since the excavation squares overlap the various rooms and lie at a slightly different orientation, this presentation will rely on room designations. With the exception of Rooms I and J (see below), where a small room with hypocaust floor was installed, the archaeological strata are remarkably uniform throughout the building. The rooms are filled with wall and roof debris mixed with ceramics, for the most part fragmentary and incomplete, that date from the later first century

to the mid-fourth century. The occasional coins show the same chronological range, and there is a constant scatter of iron nails in poor condition. Clearly the structure was cleared out prior to Phase 3 reoccupation, and possibly at the time of its final abandonment. The remarkably thorough fragmentation, scatter, and chronological mixing of potsherds in structures of various periods across the site of al-Ḥumayma probably are a result of the constant traffic of sharp-hoofed, inquisitive ovicaprids through every corner of the site both during its occupation and after its abandonment.

Like all the other original (Phase 1) structures in the fort, built immediately after the conquest of the Nabataean kingdom by the Romans



11. *Praetorium*, plan of excavated sections, with indication of dimensions in Roman feet.

in 106, the *Praetorium* is a rectilinear structure oriented 4 degrees east of N. Now that the plan is known, the original design process can be deduced with a high degree of probability by applying the Roman Foot (*pes monetalis*, henceforth “RF”, 0.296m) to the metric dimensions of the remains (Fig. 11). A square was laid out at the appropriate orientation, 90 RF on a side; an east-west line was then laid out across the square, 60 RF north of the south side. Two further lines were then laid out north-south, 20 RF in from the east and west sides. These lines defined a central courtyard 60 RF long north to S, and 50 RF wide. The long rectangles framing the east and west sides of the courtyard were then each divided into rooms theoretically 15 RF wide and 20 RF deep. Five long, rectangular rooms were

laid out across the northern third of the structure, all 30 RF long, oriented north-south: two outside rooms 20 RF wide (possibly subdivided in length); two at the northeast and northwest corners of the courtyard, 12.5 RF wide; a grand central room 25 RF wide. The present measurements of the structure vary slightly from these ideals, depending on whether the walls were constructed with their outer or inner face on the surveyed line, or the medial line of the wall itself. The walls in the *Praetorium* – built for the most part of rubble set in mud, with occasional use of blocks at corners and doorways -- range in thickness from 0.64-0.70m (2.16-2.36 RF), but the design width was probably 2 RF. As built, the outside, north-south dimensions of the *Praetorium* are just over 93 RF (27.16m), sug-

gesting that one east-west wall was built outside the surveyed line, and the other straddling it. Similarly, the courtyard is just over 50 RF wide (14.88m), but only 58 RF long (17.16m). In this case, the north-south walls and one east-west wall were built outside the survey line, but the other east-west wall was built inside it. The arrangement of doors in the original plan is probably that seen in Phase I (described below); as built, the doors range around 5 RF wide. This type of planning can be documented for most of the other structures in the fort.

Engaged piers for arches to support the roof so far have been found only in Room A and Room P, and possibly in Room K, although the blocks forming other piers only abutting the wall may have been robbed out. The recovery of ceiling plaster and large stone roofing slabs from soil *loci* within the structure, and the minimal appearance of roof tile fragments, suggests that the *Praetorium* had a flat roof supported by arches. It is also possible that some of the smaller rooms were roofed with poles and palm thatch covered with an impermeable roof plaster. The recovered roof plaster is often multi-layered, indicative of periodic repair and refurbishment. Nevertheless, the possibility of a pitched, tiled roof cannot be ruled out completely, especially for Phase 1 of the building.

Phase 1 of the *Praetorium* was built as part of the initial construction of the fort. The walls rest on undisturbed soil, and Nabataean finewares of the late first to early second century appear in some foundation deposits and beneath some paving slabs. Furthermore, the structure fits into the overall scheme of orientation, function, and the road system within the fort. Parallels with other Principate period *praetoria* make it likely that the main entrance door was in the centre of the south wall, leading directly into the courtyard, and on line with a central fountain and basin, and with the entrance to the central room in the north wing of the building. Unfortunately, this portion of the wall has been lost to stone robbing.

There is an entrance to the building through Room N, part of a small structure (*ca.* 4.40m sq; 15 RF) projecting from the façade of the building near the southeast corner of the courtyard (Fig. 11). The entrance door faces west, onto the paved area in front of the *Praetorium*, and

leads by means of a descending step to a room paved with neat sandstone slabs. There is a low bench along the east wall, constructed for the most part with reused Nabataean blocks and a moulded architrave. A high, massive sandstone threshold on the north with two large pivots for inward opening door leaves provides access to the courtyard. The centre of the threshold is worn from use. The room has the appearance of a sentry booth, where visitors to the *Praetorium* could be examined, and perhaps detained until called inside. A small room inside the entrance to the fourth-century *praetorium* at South Shields has been identified as a room for a “doorkeeper” (Hodgson 1993: 3, no. 22). Unfortunately, damage to the walls has removed evidence of the phasing of this structure. Given the tendency towards entrances on the centreline, this feature should belong to a remodelling within Phase 1 or to Phase 3. It is equally difficult to date the doorway in the southeast corner of the courtyard, and associated paved area. Three sandstone bases suggest the presence of some sort of portico at this point, perhaps to shelter mounts arriving at the headquarters.

The courtyard seems to have been surrounded by a portico carried on columns of an unknown material that rested on square sandstone bases (0.59 x 0.58m; 2 x 2 RF) placed 2.9m out from the east wall of the court 3.7 from the north wall. The two bases so far excavated are 2.25m apart, centre to centre. At this spacing, there is exactly enough room for five columns across the north and south sides of the courtyard, and slightly more than enough (*ca.* 0.76m left over) for five along the north and south sides (counting corner columns twice). It could be that the northern wing of the portico was wider than the rest, to accommodate individuals waiting admittance to the central room or adjacent offices. Longer blocks in the sandstone paving of the court and portico follow the line of columns. A probe in the centre of the court revealed an unpaved area of packed earth and pebbles, 0.20m lower than the paved area; a damaged terracotta pipeline entering the area from the west disappears at nearly the exact centre of the court. Although no curb has yet been excavated, there may have been a basin here, or a basin with a water fountain, fed by the terracotta pipeline that enters the *Praetorium* near its northwest corner (see

below). Although the pipeline passed below the paving in Room P, it is not possible to determine whether this water system belongs to Phase 1a of the *Praetorium*, or to a later sub-phase. Since the pipeline enters the structure at a level too low to have served the room with hypocaust, it may well belong to the original construction period of the *Praetorium*.

Since only about half the structure has been excavated, the arrangement of doors in Phase 1a remains in part conjectural. If the unexcavated rooms resemble those excavated, the southernmost three rooms on the east and west sides of the court opened directly on the portico. Doors have been documented leading from the courtyard into the three rooms to the north (Rooms B, A, and P). Doors connect Rooms B and P with both the central Room A and with the two long rooms east of Room B (Room D/E) and west of Room P (Room O). Doors in the south walls of Rooms E and O provide the only access to Rooms F and S. These last rooms are slightly larger (4.5 x 4.2m; 15 x 14 RF) than the six rooms that open on the court (*ca.* 4.2m sq; slightly more than 14 RF), because their north wall was set to the north of the east-west survey line defining the north edge of the court. The long space in the northeast corner of the *Praetorium* was divided into Rooms E and D by a cross wall with a door near its west end. Since this cross wall bonds with the other walls, it should belong to Phase 1a, and it is likely that Room O in the northwest corner was divided in the same fashion. The long narrow room between the central Room A and Room D/E was a single space in Phase 1a.

At the time of construction, most of the spaces within the *Praetorium*, like those in the *Principia*, were paved with rectangular sandstone slabs, varying in size, but presenting a regular appearance. The courtyard was paved in the same manner, although some of the slabs may have been salvaged from the centre of the courtyard to re-pave other rooms in Phase 3. An area at least 4 m wide was paved in the same manner south of the south wall of the *Praetorium*, most likely extending as far as the *Via principalis dextra*. Room K, facing on the courtyard, was

paved with rough, irregular stones, while the adjacent Room L had only an earth floor. The presence of a bin along the back wall of Room K, typical of the fourth-century reoccupation phase elsewhere in the fort, indicates that these rooms were reworked during Phase 3.

The four rooms in the northeast corner of the building were exceptional in that they were paved with polychrome mosaics with geometric designs and decorated with frescoes (Oleson *et al.* 2003: 44-5).² The most common fresco motif consisted of a square or rectangular panel defined by thick red lines on the white background, usually framing a *faux* marble panel of yellow or red background with sinuous strokes of orange, yellow, or green to simulate the veining of decorative stone veneers. The mosaics were laid on a thin bedding of puddled mud and bits of lime (Th 0.02m), on a levelling course of sandy soil with bits of lime and chunks of stone, probably the levelling course for the whole *Praetorium*. There is no trace of any previous pavement of stone slabs, and the mosaics extend up to the walls and below the plaster, suggesting that the mosaics were laid as part of Phase 1. The mosaics nearly filled Rooms B/C, E, and D, each with a single, repeated geometric pattern contained within frames of red tesserae, each frame surrounded by a field of white tesserae extending to the walls. One large fragment of a plaster moulding was found, painted with a black dentil frieze, with red, yellow, and black detailing. The mosaic flooring, frescoes, and plaster moulding recall the elaborate decoration of the luxurious villa az-Zanṭūr at Petra, which may have housed the governor of the province (Kolb, Keller and Gerber 1998: 263; Kolb 2001). Room D, the largest and most elaborate, may have served as the dining room for the commander of Havarra.

At some point, probably at the beginning of Phase 2, the mosaics suffered heavy damage, particularly the eastern halves in Room D and E and the southern end of Room B/C. Large areas of mosaic have disappeared, and there are burn marks on the surviving portions. This damage was later repaired (at the beginning of Phase 3, early in the fourth century?) by filling in the gaps with irregular flagstones set in a poor, ashy

2. Derek Klapecki of the University of Victoria is writing his M.A. thesis about these mosaics and will prepare a

full publication.

mortar, and covering the entire floor area with a white plaster. The rough wall and door that subdivides Room B/C, built on top of the mosaic floor, probably belongs to this phase as well.

The *Praetorium* was extended 3m (10 RF) to the north in Phase 1b, perhaps not long after the initial construction phase. The walls of the extension do not bond with the original north wall of the *Praetorium*. Only a small portion of the north wall of the extension has been cleared, but it must have extended across the whole width of the structure, since there are doors in the north walls of Rooms O and B/C. Nothing is known about the western and central rooms, but Room J (4.2 x 1.6m) was provided with a suspended hypocaust floor (*suspensura*), heated by fuel inserted beneath the floor through a small brick arch (*praefurnium*; W 0.50m, H 0.87m) in Room I. The *suspensura* was supported 0.81m above the floor by piers of small rectangular bricks along the walls and by two rows of circular bricks (D 0.195m, Th 0.07m) in line with the piers down the length of the room (Fig. 12). An offset along the walls also helped support the floor. Only one set of supports was revealed, 0.60m (2 RF) apart centre to centre. This is precisely the interval recommended by Vitruvius (*De architectura* 10.2). The suspended floor was destroyed at the beginning of Phase 2, but the sub-floor, constructed of tightly fitting sandstone slabs, survives nearly intact. Recovered fragments of the bridging tiles that rested on the supports show signs of intense heat on their lower surfaces and construction mortar on the upper surface. Recesses (0.13 x 0.08m) were built into the northeast and southeast corners of the room for the installation of chimney pipes to provide a draft for the fire at the opposite end of the hypocaust.

The absence of a separate furnace (*hypocaustis*) and placement of the fire directly beneath the suspended floor of Room J is atypical in Roman baths. The arrangement may have been a response to a need to conserve fuel in the arid desert environment, but it also may indicate that the heated room was used for dining rather than bathing (cf. the heated *triclinium* in the *Praetorium* at South Shields; Hodgson 1993: 133). Restriction of the hypocaust to a single room might also suggest this function, but large chunks of hydraulic mortar were found in the destruction



12. View of hypocaust.

debris. Only a small amount of ash was recovered from Room I, indicating that the hypocaust and *praefurnium* were regularly cleaned out until the heating system ceased to operate. The layered deposit of ash and clay beaten into the lowest levels of the earth floor outside the arch contained only Middle Nabataean and Roman ceramics from the first and second centuries. These ceramics, and the use of circular *pila* bricks – as seen in the early, possibly Nabataean, phase of Bath E077 adjacent to the *vicus* – connect the heated room and extension of the *Praetorium* in general to the first century of the fort's existence. Doors were built into the original north walls of Rooms C and D to provide access to the *praefurnium* room and the hot room, respectively.

The hypocaust structure was intentionally destroyed, either in the general destruction of Phase 2, or at the time of the reoccupation, the beginning of Phase 3, and the access doors to Rooms I and J were filled in again. Given the

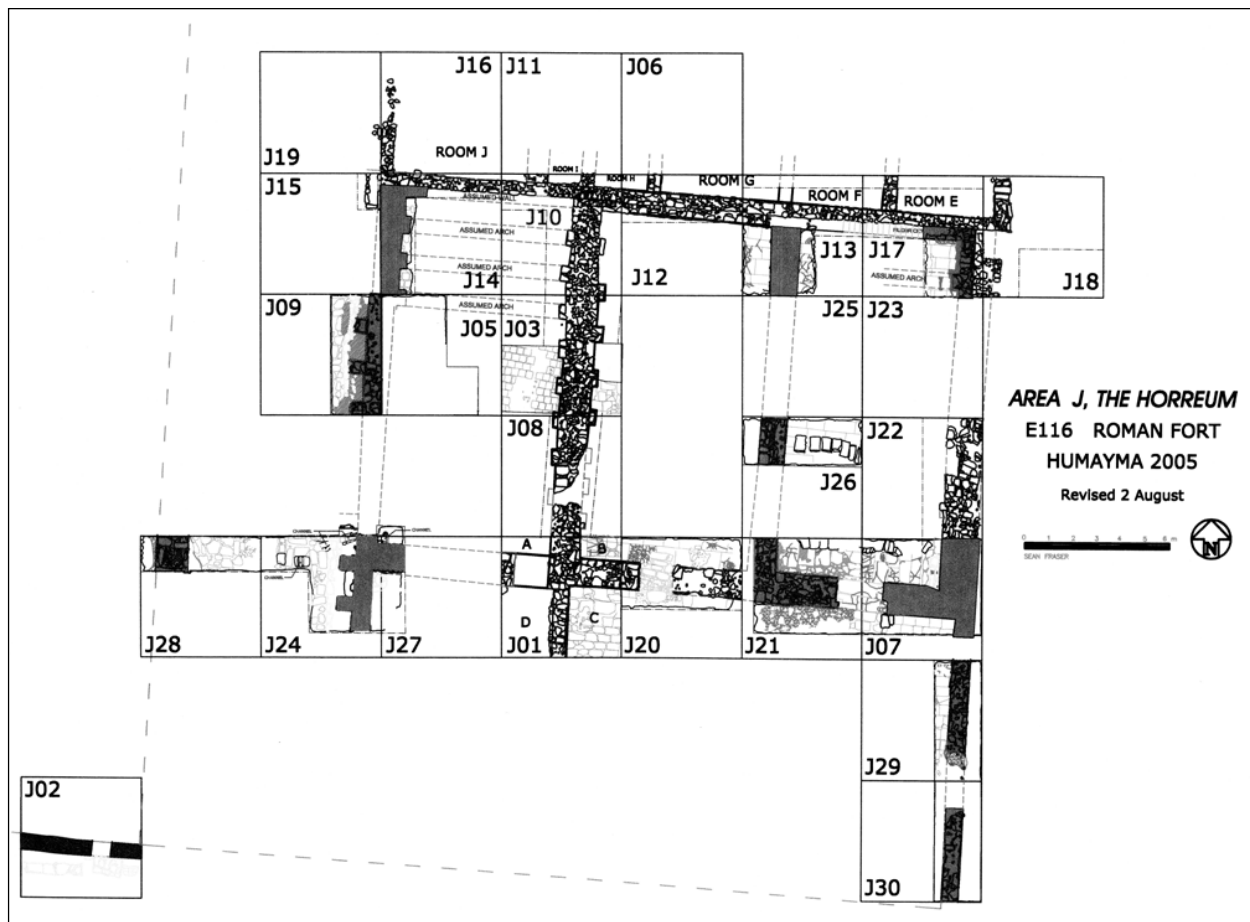
difficulty of completely destroying a thick masonry floor, its final removal may have occurred at the beginning of Phase 3, to create more room for the dumping of debris left over from the destruction. Material collected from the dump included second and possibly third-century ceramics (including a small amount of Nile “mud ware”), ceramic pipe fragments, hydraulic mortar, window glass, mosaic tesserae, and a large quantity of mammal and fish bones and seashell. Two silver washed antoniniani of Probus were also identified, dating from 276-282, providing a *terminus post quem* for the deposit of the fill. Numerous pipe fragments recovered from the fill may have been used in the hypocaust room itself to channel water to a basin, or may have formed part of the pipe system that served the water feature in the courtyard. A stone water conduit found near the surface soil several metres north of the bath may also have had some role in supplying it with water (see below). The numerous

fragments of hydraulic mortar scattered through the fill may have formed part of a basin in the room. Window glass, hydraulic mortar, and terracotta pipes were also found in Roman Bath E077 (Oleson 1990; Reeves 1996).

E116 Area J: Horreum

Excavation in Area J to the east of the *Principia*'s courtyard during 2000 had exposed central and southern sections of a substantial structure, tentatively identified as a *Horreum* (granary). A very similar, early fourth-century structure at al-Lajjūn was identified as a *horreum* (Crawford in Parker 2006: 235-40). Excavation during the 2004 and 2005 seasons focused primarily on locating the exterior and interior walls of the *Horreum*, defining its plan and dimensions, and identifying any modules of Roman feet used in its construction (Fig. 13).

The core of the original structure was laid out by the Roman surveyors as three rooms, each



13. *Horreum*, plan.

25 RF wide by 50 RF long (7.5 x 14.88m), with a wide (5 RF) door in the middle of the south wall. Since the walls, built of substantial blocks with rubble and clay cores, are ca. 3.5-4 RF thick (1.10-1.20m), the outside dimensions of the structure are ca. 85 x 55 RF (25.2 x 16.4m). The planning of this structure from the inside out, so to speak, indicates a focus on the interior spaces that reinforces the identification as a granary, a structure critical to the garrison's survival in the meagre desert environment.

The careful execution of the interior dimensions was also required by the design of the roof, which consisted of large stone slabs carried on arches springing from piers (2 RF wide x 1 RF thick) bonded into the north-south walls. The arches, built of heavy stone voussoirs, were spaced from 3 to 4 RF apart (0.90-1.22m), eight arches in each room. Buttresses were built up the outside east and west walls of the building to counteract the thrust of these arches. Since these buttresses abut, rather than bond with the west wall, they may be later additions that were installed when the west wall, built on sloping ground, became unstable as a result of the lateral thrust from the arches carrying the roof and needed reinforcement. A curb separates the buttresses from a wide, paved street, which extends westward as far as the east wall of the *Principia*. There was a narrow north-south drain beneath the pavement.

The interior of the rooms was carefully finished (Fig. 14). The walls were faced with several layers of a hard, sandy white wall plaster, which in most areas extended over the intersection of the wall and pavement, ensuring a tight seal between walls and floors (an important consideration in a granary). Room A was paved with



14. *Horreum*, interior.

large square terracotta tiles (0.30 x 0.30m sq; 1 RF), a procedure not seen elsewhere at the site, and the door (1.50m, 5 RF wide) was built into the east end rather than the centre of the south wall. Rooms B1 and B2 were paved with large, carefully laid sandstone slabs. A sturdy drain was built into the southwest corner of Room A, leading from the *Horreum* out to a north-south drain below the paved street adjacent to its west wall. The branch leading out from the *Horreum* contained a large cache of broken glassware and ceramics, mostly cups and serving wares, dating from the second and third centuries, with possibly some early fourth-century material. The special door arrangement and flooring of Room A, along with the presence of a drain, indicate that this room was intended for the storage of different goods than those in Rooms B1 and B2, possibly liquids such as olive oil and wine.

Seven narrower spur walls extend north from the north wall of the core of the *Horreum*. They are less heavily built than the walls forming the storage rooms, and are spaced at irregular intervals. Further excavation is required to confirm the function and arrangement of these rooms, but finds of occasional jamb blocks in the rubble spill indicate the probable presence of interconnecting doorways or doorways on the north. No doorways, however, connect the rooms north of the north wall of the *Horreum* core with Rooms A, B1, and B2 in the central section of the *Horreum*, indicative either of the need to limit access to the main granary rooms, or of a different function for the northern section.

The area south of the three storage rooms was paved with neat sandstone slabs. Several spur walls extend across the paving, but it does not appear that this area could have been roofed. It may instead have been a reception area for delivered goods, or for distribution of rations to the garrison. Occasional ash lenses and deposits of refuse on this paving indicate the presence of occupants in the fourth century. A bin or platform was built into the southeast corner of Room B2 at this same time, and a large amount of pottery and other rubbish was dumped on the east side of the wall framing the paving on the east.

The location, plan and design of this structure confirm its identification as the fort's *Horreum*. Granaries are commonly located in the central range on one side or the other of the *Principia*'s

courtyard, where easy access is provided from the *Via Principalis*. They often incorporate several rooms side by side (Johnson 1983: 144-45), and they normally have external buttresses. The *Horreum* at al-Lajjūn also has three rooms, and is nearly identical to the Havarra *Horreum* in length (25.6m), but slightly wider (25.66m) (Crawford in Parker 2006: 235-40). The dimensions of the module of the *Horreum*'s central section fit within the known range of Roman military granary sizes elsewhere as well.

Not all granaries had raised floors, and stone-built granaries can have floors laid directly on the ground without provision for ventilation (Johnson 1983: 149), such as the plaster floors at al-Lajjūn. Columella (1.6.9) describes a vaulted granary with plastered walls and a floor consisting of packed earth mixed with oil lees and covered with tiles set in a lime mortar mixed with oil lees, a description that can be applied to Room A. Carefully mortared stone or tile floors and plastered thick stone walls would help to keep grain cool and free from insect infestation, as well as providing a hospitable environment for the storage of other foodstuffs

Stratigraphy within the central section of the *Horreum* shows homogeneous tumble mixed with rubble from wall cores, mud packing, and wind or water deposited soil. So far, evidence for occupation of the structure in the fourth century has been found only in Room B2 and the paved area in front of it. It may not be a coincidence that fallen arch voussoirs have been found only in Room B2; they were salvaged from the other large storage rooms and have disappeared. Perhaps the roof of Room B2 survived the event that damaged the rest of the *Horreum* and attracted reoccupation. The rest of the structure remained accessible long enough to be cleared out at some point in the second half of the third century, but was then left to collapse. Relatively little pottery was found in the course of excavation as compared to finds in other structures. Ceramic chronology in the areas excavated to depth ranges from Roman/Middle Nabataean to Byzantine, with dates ranging from the early second to the fourth century. Types include fine wares, coarse wares, and storage wares.

E116 Area N: Industrial Area and Latrine

Area N, in the southwest quadrant of the fort,

was selected for excavation in 2004 because its distinct rise above the surrounding area, combined with the presence of significant amounts of mortar and wall plaster and several large blocks embedded on the surface indicated the presence of buried structures. The location close to the junction of the *Via principalis* and the *Via praetoria* suggested that the buildings had significant importance, and given the location of tribunes' houses in early imperial forts (Johnson 1983: 32-3, 267), it seemed likely that officers' quarters might be located in this quadrant. Finally, the fact that the southwest quadrant of the fort was almost untouched by excavation made investigation in the area a high priority. Excavation in 2004 of the central area of the mound revealed a latrine and basins for some sort of workshop. In 2005 the excavation was expanded to include the surrounding roads and their relation to the fortification wall (**Fig. 15**).

The latrine was part of a larger structure, on the same orientation as the other structures in the fort, with thick (0.53-0.67m) walls constructed of heavy blocks and boulders facing a core of rubble set in mud packing. Many of the blocks show Nabataean trimming and clearly were salvaged from pre-Roman structures at Hawara. The wall foundations were laid on sterile soil, and the earliest deposits contain Nabataean ceramics of the early second century. Most of the walls to the west and south of the latrine and associated basins have been lost to stone robbing. What remains are two large rooms sharing a party wall but no connecting door in a structure 8.33 x 4.85m; the north wall gradually tapers to nothing 3.75m west of the core structure, the west wall disappears 2.6m to the south. To the east is a jumble of robbed walls, tumbled blocks,



15. Latrine and bins, view.

and a fallen arch. Two narrow walls were built out from the north wall of the structure, across the adjacent road, during the last phase of occupation. The fill around the core structure has been very badly disturbed, and contained a mix of rubbish consisting of ceramics, glass, metal, and coins dating from the early second through the fourth century.

The latrine occupied the northern two-thirds of a room with regular, well-finished walls (inside dimensions 4.22 x 2.00m; 14 x 6.5 RF); there are traces of a door in the east wall. When excavated, a rectangular area of sandstone paving 1m wide was found, extending 2m south of the north wall of the room (**Fig. 15**). This paved area was surrounded by a U-shaped trench *ca.* 0.50m wide, sloping gently from 0.70m below the pavement at the northwest corner of the room to 0.86m below the pavement at the northeast corner of the room, at which point there was a block-built drain through the wall. A wide, carefully formed terracotta pipe (rim D 0.077 and 0.12m) was built into the wall immediately above the trench at the northwest corner of the room, oriented downward to the south at a 45 degree angle. Narrow offsets on the inside faces of the east and west walls of the room supported four slabs that bridged the trench near the north end and at the south end of the paving. A row of blocks marked off an earth platform, at the same level as the paving that occupied the southernmost 1.25m of the room.

The combination of water supply, sloping U-shaped trench, and drain leave little doubt that this installation was a latrine, a facility that would have been essential in a fort occupied by approximately 500 men. The seating, if it existed, was probably constructed of wood and has been lost. If a cosy 0.50m is allowed for each occupant, the facility could have accommodated at the most 10 individuals simultaneously, 12 if the southwest and southeast corners are used. Clearly several other latrines, probably around the barracks in the southeast quadrant, would have been needed in the fort to serve the conjectured population.

The method of supplying water to the flush pipe remains problematic. The pipe enters the north face of the wall approximately 0.50m above the paving of the road to the north, too

high to have been served by a subterranean pipeline. Either an elevated conduit originating at the reservoir served this and other high areas in the fort, or — more likely — water bags carried by men or animals were emptied into the pipe from outside at regular intervals to wash away the waste. It is also possible, although less likely, that the bins or tanks in the adjacent room on the west were used as the water source (see below). The fill above floor level in the latrine contained ceramics and glass dating from the early second through the fourth century, and included coins as late as the House of Constantine. The fill within the latrine trench, however, contained only a small amount of early second century ceramics, possibly indicating it was out of use in Phase 3.

The western portion of the structure containing the latrine is a roughly square room (3.5 x 3.79m) containing five plaster-lined bins or basins (**Fig. 15**). Two large bins were built up against the north wall of the room (2.25 x 1.89m; 1.94 x 1.76m, all dimensions north-south by east-west), and three smaller bins along the south wall (1.40 x 1.36m; 1.35 x 1.05m; 0.75 x 1.25m), using the adjacent structure walls where possible, and separated from one another by narrow, irregular party walls built of mud and rubble. The floors of the bins are thick and sturdy, but the interior separator walls, which were at least 0.49m high, are quite fragile. The white plaster is hard and sandy, with no obvious pozzolanic or ceramic additive to give it hydraulic characteristics. No water source has been preserved, and none of the basins has a drain. There is no visible door sill or jamb in the excavated remains, although the lost section of wall near the southwest corner of the room would be an obvious location for an entrance. If the walls were no more than 0.60m high, individuals making use of the tanks could have stepped from one to another over the party walls. A probe beneath the bin in the northeast corner yielded a few sherds of Nabataean painted ware of the early second century, suggesting the bins were built at the time the fort was constructed.

A series of tanks of graduated size is characteristic of several types of industrial installation in the Roman world: pottery, fulling establishment, dye works, tannery, and fish-sauce factory. Production of fish sauce is extremely un-

likely, and textile dyeing would have left traces of dye on the plaster. Although appropriate to a military installation, and often making use of faeces and urine in their processes, both tanning and fulling require large amounts of water. Although the proximity of a latrine is appropriate, one would expect drains to be present in the tanks, and some obvious water-supply system. There is no evidence for the possible local production of pottery at Havarra, and in any case it is unlikely that the clay washing tanks and kiln would have been located within the fort. The bins would be suitable for storing grain or dried legumes, but the *Horreum* more likely served that function. The actual function of these bins or tanks remains uncertain.

The latrine and bin or tank complex remains somewhat isolated archaeologically as a result of the stone robbing in its vicinity. Traces of walls to the east, west, and south indicated that it was quite a large structure, with heavy door sills and jambs, and at least one room roofed with a cross arch carrying heavy roof slabs. The tumbled fill south of the complex yielded fragments of painted wall plaster bearing faux marble motifs, human figures, and fragmentary painted inscriptions. There were also fragments of thin-walled alabaster vessels finished on a lathe, resembling cosmetic or medical pyxides. All of these details suggest the presence of officers' quarters in this area.

Excavation immediately north of the complex revealed a paved east-west road 4.10m (ca. 14 RF) wide. An extension of the excavation to the west and over the fort wall revealed in addition the paved *intervallum*, the strategically important peripheral road just inside the fortification: 7.98m (27 RF) wide. A probe at the face of the wall revealed an unanticipated second road pavement 0.70-0.85m below the first. Ceramic and numismatic material recovered from between the two pavements dates the upper pavement to the fourth century, while the lower pavement dates to the early second century. This discovery strongly suggests that a major renovation of at least some portions of the fort was carried out during the period of reoccupation in the fourth century by an organized military unit, as opposed to the more haphazard reuse of structures such as the *Praetorium* and *Horreum*.

E116 Area P: Ballista Platform

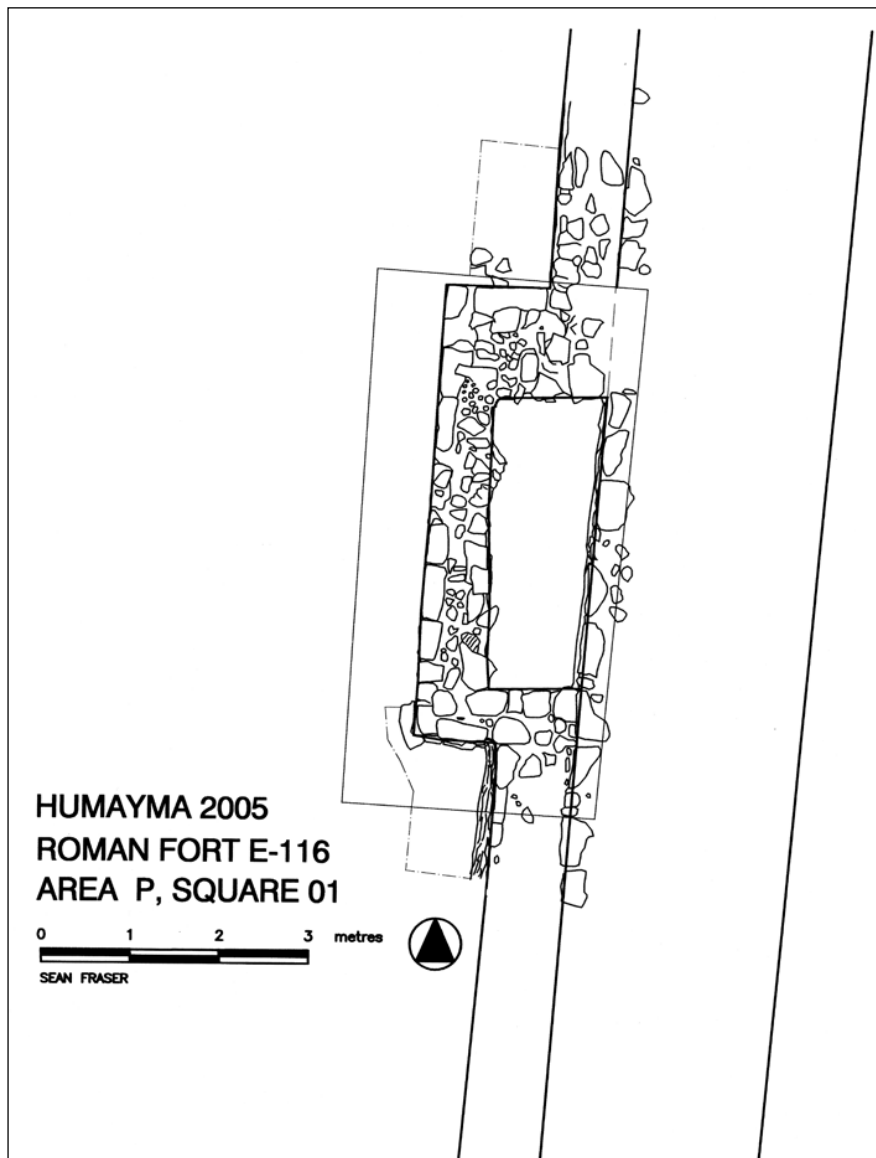
The clearing of the upper surface of the fort wall and definition of the surviving upper portions of its exterior and interior faces by the Department of Antiquities in 2005 revealed long stretches of ashlar blocks and unshaped stones that formed the original facing. At one point along the east wall, 18.25m (probably 60 RF) north of the interior face of the south wall, the clearing revealed a long, narrow platform built up against the inside face of the wall with ashlar blocks (4.43/4.83m north-south x 1.65-1.80m east-west) (Fig. 16). Further surface clearing revealed a similar construction just to the north of the fort's east gate. Similar platforms may lie hidden below the surface at other points around the fort's interior.

The parapet walk was removed in the spot where the platform was to be constructed, the platform was built into the gap with heavy ashlar blocks containing a sandy fill with rubble, and paved with stone slabs; access was provided by five stone steps on the north. This feature is either an *ascensus* providing access to the parapet of the fort wall, or an artillery platform, neither of which had been noted at the fort before. The earthen fill of the platform and careful ashlar construction would have been suitable for absorbing the recoil from artillery (Johnson 1983: 65-6). It could be that this feature served both as an access stair and as an artillery platform. Pseudo-Hyginus, a military engineer probably operating in the East during the reign of Trajan, juxtaposes these two functions (*On the fortification of camps* 58): "In hostile country one should remember to make double access stairs (*ascensus duplices*) to the rampart and to build platforms for ballistae (*tormentis tribunalia*) around the gates, at the corners, and in place of towers".

No artefacts were found in the fill inside the platform, but a probe beneath the foundation yielded a rich variety of ceramics dating from the second to the fourth century. This renovation of the fortifications, along with the renewal of paving seen in Area N, indicate that significant efforts were being made to improve the condition of the fort in the fourth century.

E116 Area O: Probe beneath Via principalis dextra

A 2.0 x 1.0m probe was excavated in 2004



16. Platform, plan.

through the *Via principalis dextra*, 20m inside the west gate of the fort, to investigate GPR readings suggesting the presence of several structures beneath the Roman road. Most intriguing was a U-shaped feature opening to the northwest defined by slices at depths from 2.68-2.83m, since the depth and orientation made it likely to have been a pre-Roman structure. The probe was positioned to bisect the bottom of the U at a right angle. The presence of well-preserved paving stones from the Roman roadbed reduced the excavation area, but it was possible to continue excavation to a depth of 1.40m. The last 0.85m of fill consisted of a compact brown-grey soil with lime inclusions, devoid of artefacts. This type

of soil is a natural deposit in the region around al-Ḥumayma and can be seen, for example, in cuttings along the modern Desert Highway. The GPR readings must have recorded some natural feature in the undisturbed soil.

Nevertheless, the sounding provided interesting data concerning the main east-west road in the fort, including the possible presence of two layers of paving. The upper pavement consisted of sandstone pavers of very uniform thickness (0.065-0.080m), carefully fitted together and cushioned by a layer of soil and pebbles *ca.* 0.12m thick. This stratum yielded several very small potsherds, one of Nabataean unpainted fineware, probably early second century in

date. Another layer of flat stones, very similar to the upper layer of paving stones, appeared beneath this bedding, laid on a similar bedding. It is unclear whether this represents an earlier phase of the road paving, packing for the upper paving, or cover slabs for the pipeline found immediately below. The soil below it also yielded a few small sherds of Nabataean unpainted fineware. Beneath this was a section of pipeline, consisting of a typical Nabataean sandstone aqueduct conduit block, liberally smeared with lime mortar, which retained the impression of a terracotta pipe, now lost. The insertion of a lead or terracotta pipe in a Nabataean stone conduit is a sign a Roman re-use; see, for example, in the water supply serving the Roman bath E077 (Oleson 1990: 305-6). The conduit was oriented WNW-ESE, crossing the line of the road at an angle. The conduit had been set into the limey red soil, and partly covered with the spoil from the excavation. The soil below this level was sterile.

Several interpretations are possible. Perhaps the open conduit was Nabataean in origin and preceded the construction of the fort. Alternatively, the pipeline was laid out in the early stages of the construction of the fort within reused Nabataean conduit blocks, then salvaged before the paving was laid down as plans for the water-supply system changed. Alternatively, the pipeline functioned for some time beneath the street, but then was removed — perhaps during repair efforts that were ultimately abandoned — the original roofing slabs were thrown back over it (to be misinterpreted as an early paving), and the paving slabs for the road were put back in place. Finally, it is possible that the pipeline functioned beneath an initial road level for some time, but both were damaged during the destruction in the second half of the third century. The pipes were then removed and portions of the early pavement salvaged for reuse during the renovation of the fort in the early fourth century. The discovery that the *intervallum* road in Area N was rebuilt in the early fourth century makes the last explanation most likely.

Fort Reservoir and Probes of Water-Supply System

The water-supply system inside the Roman

fort depended on a reservoir (29.40 x 14.20 x 3.05m; 100 x 50 x 10 RF) located in the northwest corner, at the highest elevation inside the walls (*ca.* 963.00m asl). Eight probes executed in 1987 and 1989 revealed the design of the reservoir, the depth at its northwest corner, and the presence of the branch that brought water to it from the Nabataean aqueduct. Soundings were carried out in and around the reservoir, and elsewhere in the fort, in 2004 and 2005 in order to determine the method by which the water was removed from the reservoir and distributed around the fort. Pipelines found *in situ* in the fort — in front of the *Principia*, filling a basin or fountain in the *Praetorium*, and possibly serving the latrine — can only have been served by the reservoir, either through a direct drain in the wall, or by means of a water-lifting device serving free-surface flow channels, a free-surface flow or pressurized pipeline, or a mixed system. Since the reservoir was continuously supplied with fresh water by an aqueduct, some arrangement must have existed to allow both a continuous outflow of surplus water and access for lifting water or simply diverting it to the closed system or systems.

Probe 9 (W 2m, L 1.5m) was excavated at the centre of the inside face of the southern reservoir wall where it was hypothesized that an outflow drain through the wall might have delivered water under pressure to other parts of the fort. The probe, cut through extremely hard, compact silt, found no outflow pipe or other water delivery system, but revealed unexpected features of the reservoir floor. From a point 2.40m below the top of the wall, the hard cement wall slopes outward, meeting the flat reservoir floor at an angle of 24 degrees and a depth of 2.76m. A probe in the southeast corner of the reservoir revealed the same arrangement: vertical walls, then a downward slope on both the east and south to the level floor at 959.74m. At some point after the reservoir had been lined with its tough hydraulic plaster, the southeast corner was filled in with a solidly constructed masonry platform, triangular in plan, extending 2.5m out from the corner to north and west, its level upper surface at 1.95m above the lowest reservoir floor (**Fig. 17**). A similar platform, badly damaged, was subsequently discovered in the southwest corner of the reservoir at the same level (Probe 14),



17. Reservoir, view of southeast corner.

but none existed at the northeast corner (Probe 19). The purpose of these platforms is unclear. Since none was built at the northwest corner, where water flowed into the reservoir, or at the northeast corner, which is far from the water-consuming areas of the fort, they may have had something to do with removal of water. They may have functioned as platforms for individuals working *shadufs* (counter-weighted tip beams with buckets) that lifted water to troughs on the reservoir wall. The corners may have been chosen because they help brace the installation, but it is possible that other platforms exist along the walls of the reservoir. Since the reservoir floor is horizontal at the northwest corner and meets the vertical walls with a simple quarter-round moulding, the slope seen in Probes 9 and 11 may indicate the presence of a sump for sediment along the south wall.

Probe 10 (W 1.5m, L 1.5m) was located outside the southwest corner of the reservoir, contiguous to the south face of the south wall (Locus 10) and the east face of an extension of the west wall (Locus 11) of the reservoir, to determine whether the extension of the west wall beyond the south edge of the reservoir was linked to some water-lifting installation. The excavation revealed traces of crumbly stone and mudbrick walls *ca.* 1m below the Roman level. These structures, possibly Nabataean, probably predate the construction of the reservoir. Probe 10 showed no obvious connection of the south extension of the west wall of the reservoir to any water extraction installation. Several further probes were made at the centre and along the exterior face of the south wall, also without result. The basins and troughs, like the water-

lifting devices that filled them, may have been made of wood, and in consequence have been lost.

The discovery of the terracotta pipeline entering Room P through the northern extension of the *Praetorium* and the open conduit block north of the room with hypocaust, presented an opportunity to investigate the water distribution system at the Roman reservoir by following these two conduits back to their origin. The pipeline, which probably served the water feature in the centre of the courtyard, was traced for 3.12m north of the north wall of the *Praetorium* before being lost to ploughing or other surface disturbance. The pipeline was picked up again 9-10m farther north on the same line, in Probe 18, along with the continuation of the stone conduit revealed at the northeast corner of the *Praetorium*. The remains have been disturbed, but the two water lines originally intersected. Either there was a small basin here to distribute the water between the pipeline and the trough conduit, or the trough represents a first phase of distribution, later interrupted and superseded by the pipeline.

E116 Area Q: Stable (?) and Basin

One goal of the 2005 excavation season was to establish the location of the fort's stables. The southeast quadrant seemed a likely location because it is downhill and usually downwind from the rest of the fort. A probe was excavated around two perpendicular lines of hydraulic plaster projecting through the surface in this area (Area Q). Excavation revealed a small basin (interior *ca.* 0.67 x 1.02m) built of mortared rubble walls (Th 0.15m) and lined with a plaster heavily tempered with pebbles and crushed ceramics (**Fig. 18**). The angle between the floor (at 960.405m asl) and walls of the basin was reinforced with a quarter-round plaster seam, typical of Roman hydraulic installations. The walls survive to a maximum height of 0.37m, but given their thickness, the walls could not have been much taller than 0.40m. There was no sign of an intake for water, but a drain had been built into the northwest corner to empty the contents on a pavement of large sandstone slabs. The basin was built into the southeast corner of a substantial structure with solid stone walls 0.88m (3 RF) thick, which can be traced on the surface



18. Basin, view.

for several metres to the west and north. Given the 2.5m drop from the reservoir, this area could easily have been serviced by a pipeline.

The location of this low basin at floor level rather than a height convenient for human use suggests that it was intended for animals, and that the structure housing it may have been a stable. Ceramics indicate that the basin in Area Q was constructed during the original occupation at the beginning of the second century. The ceramics in its fill date from the second to the fourth century.

Geophysical Survey

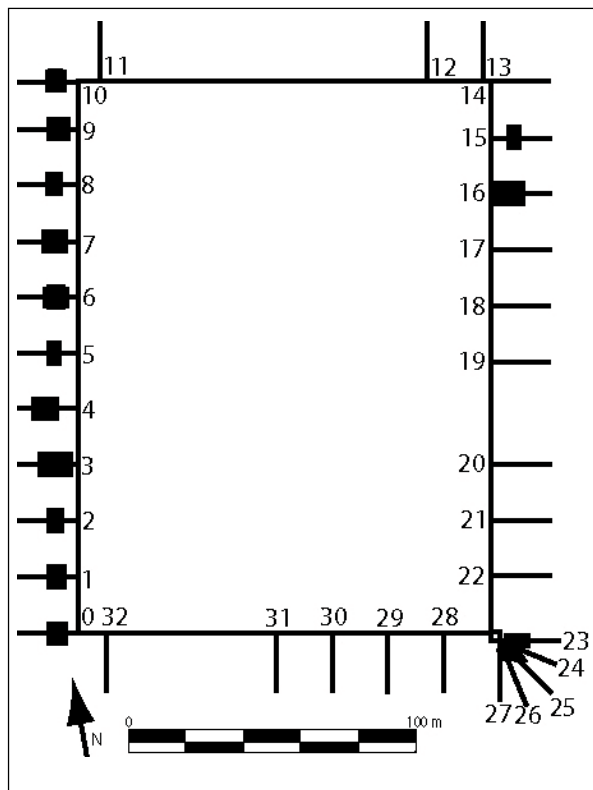
A second season of geophysical survey was carried out at al-Ḥumayma in 2004 under the direction of G. S. Baker. The overall goals of the project were the same as in 2002 (cf. Oleson *et al.* 2003: 50-4): to identify buried structures, to determine the strengths and weaknesses of various geophysical techniques, and to develop innovative methods for synthesizing and displaying geophysical survey data. The tools used in 2004 included ground penetrating radar (GPR) and magnetic gradiometry. Data were collected from four specific areas of the site: the Roman fort (E116), the *vicus* outside the fort, the Qaşr (F103), and a suspected kiln site (D120) (Fig. 1).

A Geometrics Inc. G-858 MagMapper cesium-vapor gradiometer attached to a non-magnetic cart was used for the magnetic survey. The vertical separation of the magnetometers was 0.75m for all zones and the lower sensor was 0.30m above the ground surface. Data were collected every second while moving the cart along the profile line, resulting in one data point

roughly every 0.5m along the profiles. A Sensors & Software Inc., Noggin Plus 250 GPR unit was used for the GPR survey. The unit has 250 MHz antennas housed in a small case below the cart frame. The antenna orientation is fixed with a broadside EH polarization. An odometer wheel controlled the rate of data collection. Data points were collected every 0.25m along the profile lines. The magnetic and GPR data were pre-processed and processed using standard techniques that will not be described in detail. No unique filtering, amplitude scaling, or display methods were used on initial data.

Within the Roman fort geophysical data were collected to search for suspected pipelines, to look for the continuations of known buildings, and to search for possible deep pre-Roman structures. These investigations met with mixed results. As discussed above, pre-Roman structures posited by the geophysics to lie beneath the *Via principalis dextra* were not found. In contrast, the GPR survey conducted around the fort walls produced excellent documentation of an external ditch system. Thirty-two profiles were taken around the perimeter of the fort to determine the location and geometry of the ditch, including five profiles radiating out from the southeast corner of the fort. After analyzing all of the profile lines collected, it was observed that the majority of detectable ditches were on the west side of the fort while the remaining sides of the fort showed little evidence of the ditch. No evidence was seen on the profiles from the north and south walls, and only two profiles showed the ditch on the east side of the fort. Of the five profiles collected on the southeast corner, three showed evidence of the ditch system. Figure 19 shows the location of detected ditch sections, with the approximate width of the ditch indicated by the thickness of the line.

GPR data were collected from two zones in the Roman *vicus*. The first zone was located within Field E125 up against the north and west edges of the area excavated prior to 2004 (Squares 01-29). The goal was to speed excavation by identifying the plan of the western side of the complex and the location of the north-west corner. The second zone was located on the northeast side of Complex E125, between E125 and the Roman fort. This region was surveyed to identify other possible *vicus* structures



19. Schematic drawing of ditch locations outside of the fort walls as predicted by GPR. The width of the line indicates the approximate width of the ditch at that location.

for future excavation. The surveys in both zones succeeded in suggesting the presence of some walls. Between E125 and the fort, for example, three possible buildings were identified. On the north and west side of the previously excavated regions of E125, only the east-west walls running through Squares 34 and 35 and the north-south walls running through Squares 30 and 35 and Squares 32 and 34 were identified. Although these results seemed too meagre at first for an area that should have contained many rooms, excavation later revealed that most of the walls were robbed out. Significantly the GPR had even correctly suggested that the western extension of the wall in Room 34 would not be found. The GPR did however apparently miss the east-west stone walls in Squares 30, 32, 39 and 40, the mudbrick wall in Square 31, and some of the features. Now that we have a better idea of the plan of this area, further refining of the data may suggest why these elements were missed.

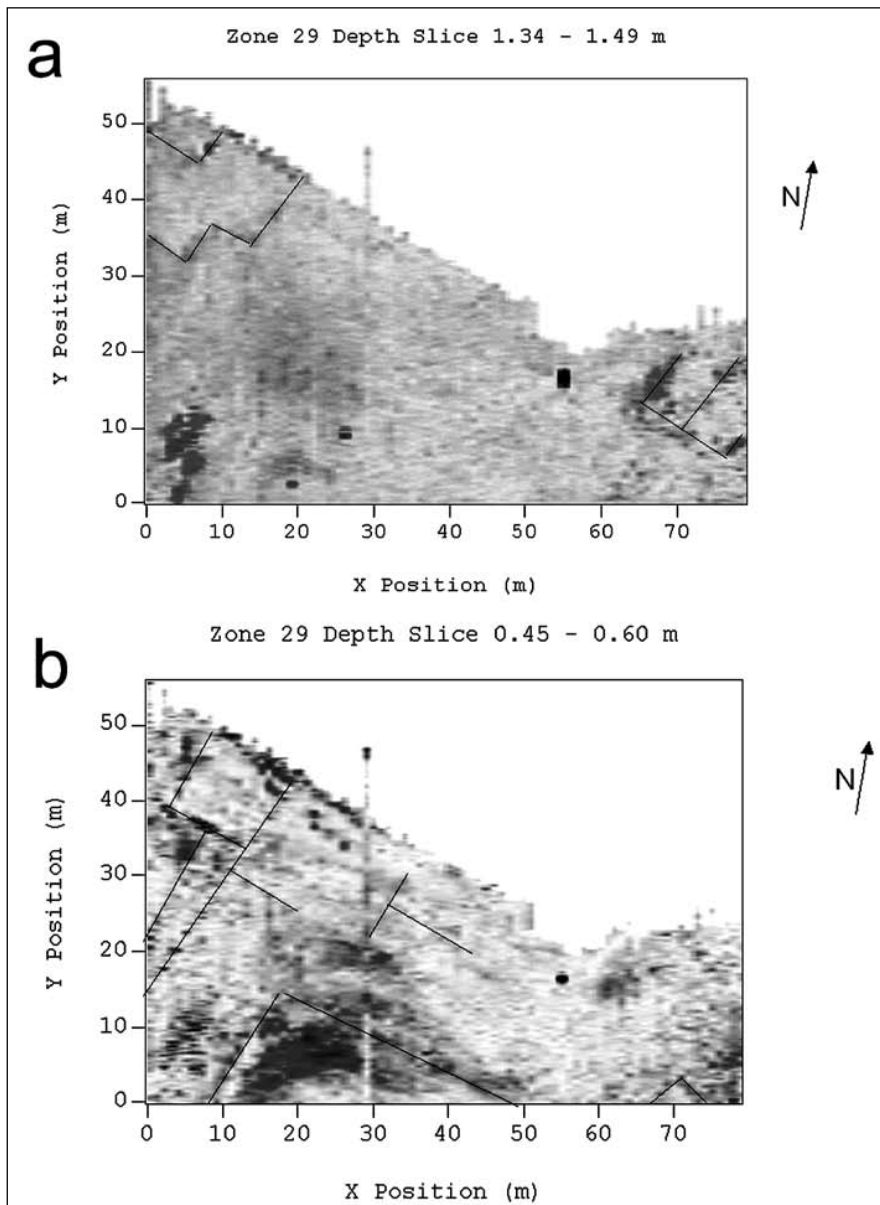
After excavations in 1998 and 2002 discovered pre-Islamic period walls beneath the south

and west regions of the Abbasid Qaşr (Oleson *et al.* 1999: 436-8, 2003: 59-60), it was decided to collect GPR data to the Qaşr's south and west, looking for continuations of this pre-Islamic architecture. The data from the west side is still undergoing processing, but the data from the south side has already produced promising results. In a slice from 1.34-1.49m (**Fig. 20a**) there are several coherent linear features. In the northeast there are three north-south trending walls and an east-west trending wall. In the northwest region of the zone there are six north-south and east-west line segments that outline a large polygon. A slice 0.45-0.60m (**Fig. 20b**) revealed two long parallel north-south walls on west side of zone with a possible structure just to the north, and a highly reflective feature in south-central area bounded by east-west and north-south structures (perhaps flooring). These findings are yet to be "truthed" by excavation.

Earlier reconnaissance by our team members had suggested that one or more kilns may be located in Area D128, on the slopes approximately 740m west of the Roman fort. This hypothesis was based on the profusion of potsherds, possible slag, burnt pottery, and brick pieces. As no previous excavation had been carried out in this area, it was decided to collect magnetic gradiometry data. This technique was chosen both because of its proven ability to locate kilns and fired objects and because the gradiometer did not need to contact the ground, making it easier to use on rocky terrain than the GPR.

After the data had been cleaned (e.g. to remove large spikes caused by metallic debris at the surface), two distinct types of subsurface features were apparent. First, there are numerous linear features that are observed to trend generally east-west and north-south (**Fig. 21a**). Some of these features, especially in the south side of the zone, suggest a closely-spaced series of rectilinear structures. Others, such as the prominent feature that trends east-west through the centre of the zone, may be terrace walls or natural features.

The second noticeable feature observed in the magnetic gradiometry data are the 19 roughly circular anomalies located throughout the zone (**Fig. 21b**). These features are representative of discreet objects or closely-spaced collections of objects. Given the number of anomalies, the



20. GPR slices south of F103 at depths of a) 1.34-1.49m and b) 0.45-0.60m.

fact that many of them are topped by piles of stones suggestive of graves, that broken tombstones have been found in the same general area (Oleson *et al.* 2003: 54-5), and that the surface scatter is consistent with disturbed funerary offerings, we now suggest this area was a cemetery.

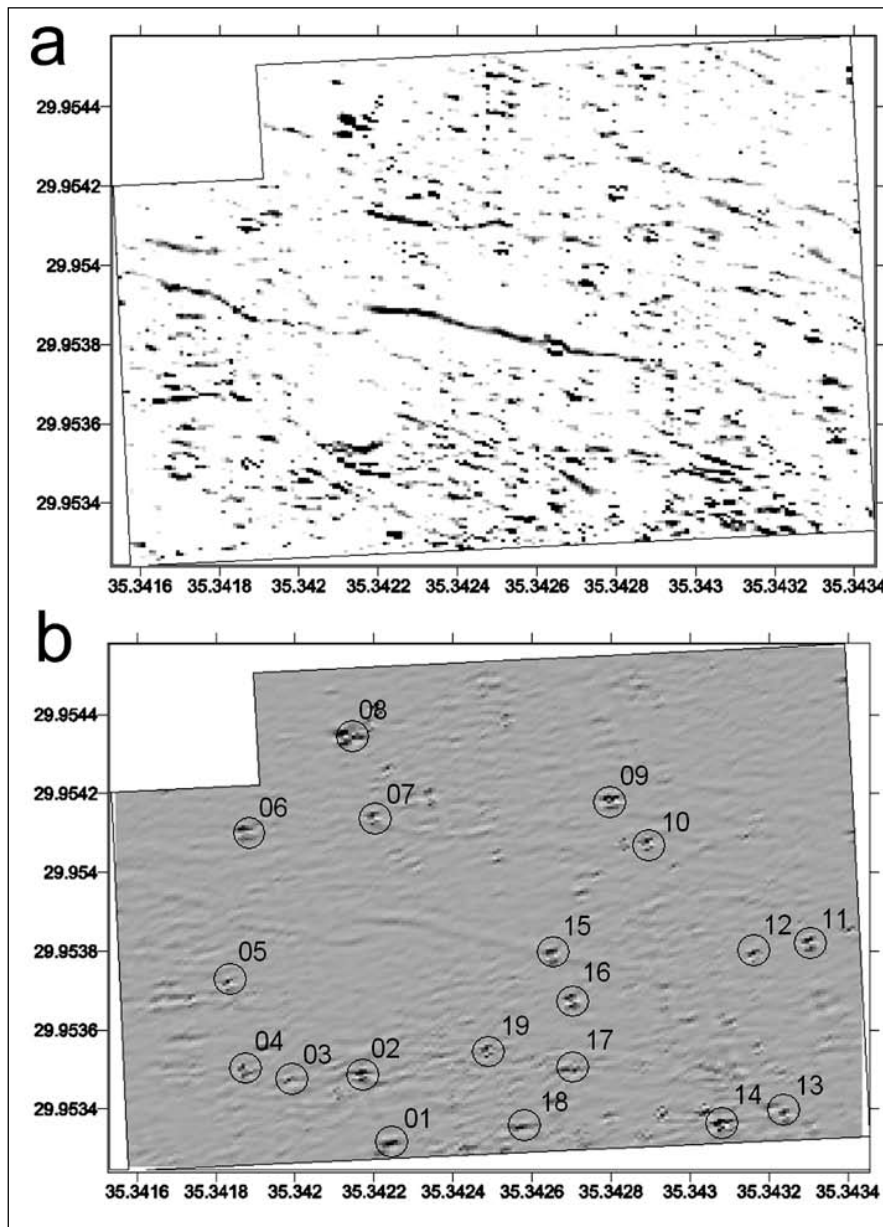
Conclusions from the Geophysical Survey

From an archaeological perspective, the value of the geophysical results obtained in 2004 is mixed. Geophysics provided a quick, non-invasive method for delimiting the ditch around the Roman fort, and geophysics has also suggested

the location of several new structures. Future excavation will confirm or disprove the veracity of these predictions. Excavations already completed in the Roman fort and E125 complex on the basis of geophysical suggestions have shown that sometimes the proposed targets are real, and sometimes they are not. Moreover, many features (including earthen walls) have been completely missed by geophysical survey.

Preliminary Characterization of al-Ḥumayma Ceramics

Only the most “critical” loci from the 1998, 2000, 2004 and 2005 campaigns, including the



21. Magnetic gradiometry data from D128 showing a) linear and b) circular anomalies.

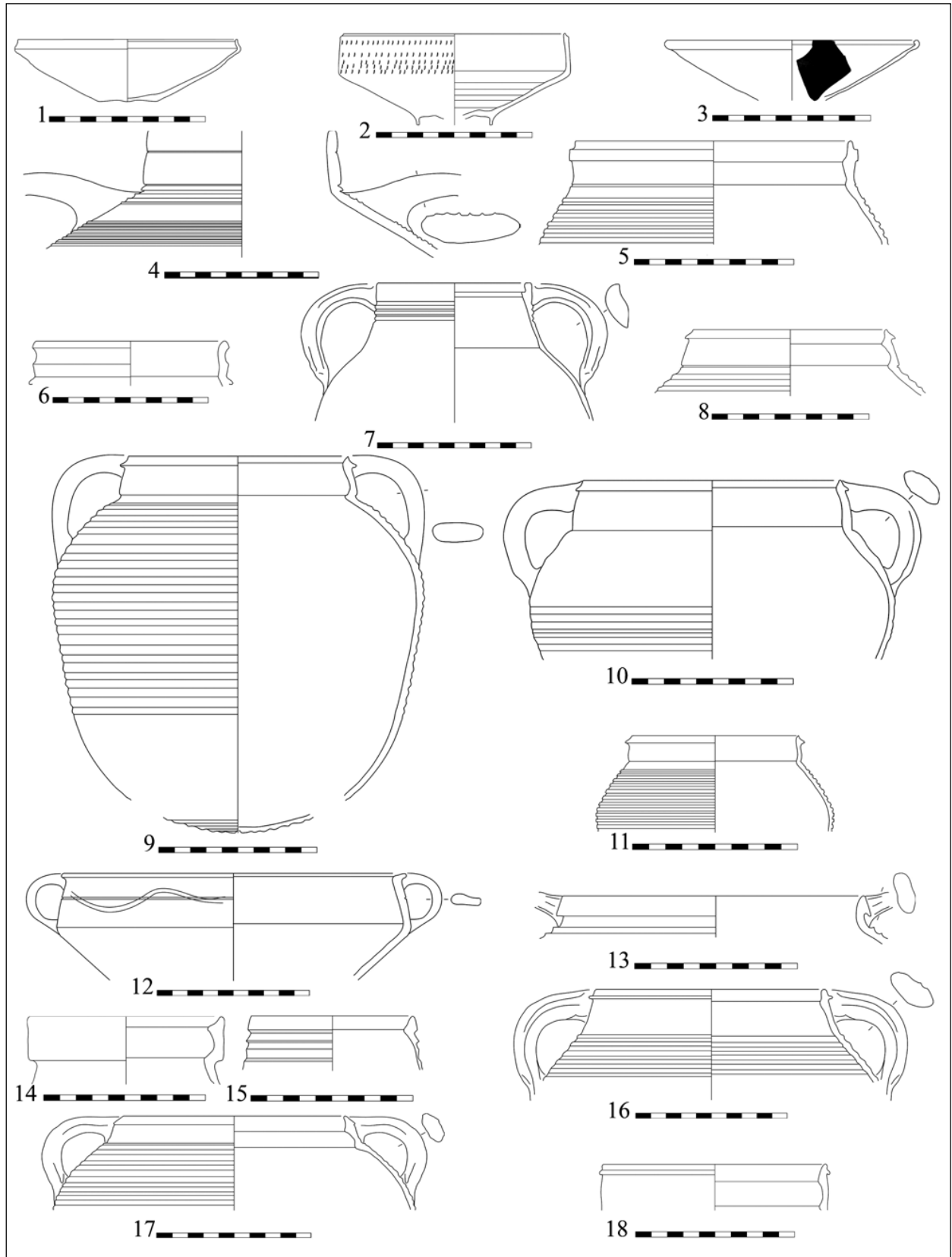
excavation areas A127, E116, E122 and E125, have been analyzed by the author so far, and they form the basis for these preliminary observations.³ The following statements are not definitive, since continued study of the ceramics could contradict or supplement the present conclusions. The ceramics from the campaigns prior to 1998 are being studied by K. ‘Amr and have not been considered here.

Early Nabataean pottery (first century BC

-early first century AD), as found at Petra in the habitation quarters on az-Zanṭūr (Gerber 1994: 288, fig. 15) or in the early loci from the so-called “Southern Temple” (not yet published), is not present in the material from al-Ḥumayma studied so far. The earliest evidence of Nabataean pottery begins in the second half of the first century AD with both fine ware, painted and unpainted, and common ware, all imported from pottery workshops at Petra. So-called Aqaba ware (defined in

3. Although Gerber joined the project as ceramicist in 1998, other commitments have kept her from the field.

Preliminary field dating of the ceramics (used elsewhere in this report) has been carried out by J.P. Oleson.



22. Ceramic vessels nos. 1-18.

Dolinka 2003) is also present in al-Ḥumayma but accounts for less than 5 percent of the material studied. In addition, a few fragments of Eastern Terra Sigillata ware occur, along with so-called “green or cream ware” (‘Amr 1992; Schneider 1996: 138, 148, figs. 579-91), whose production centre is not yet determined, and imported amphoras. These, too, account for less than 5 percent of the total. Local pottery production is not attested for this period.

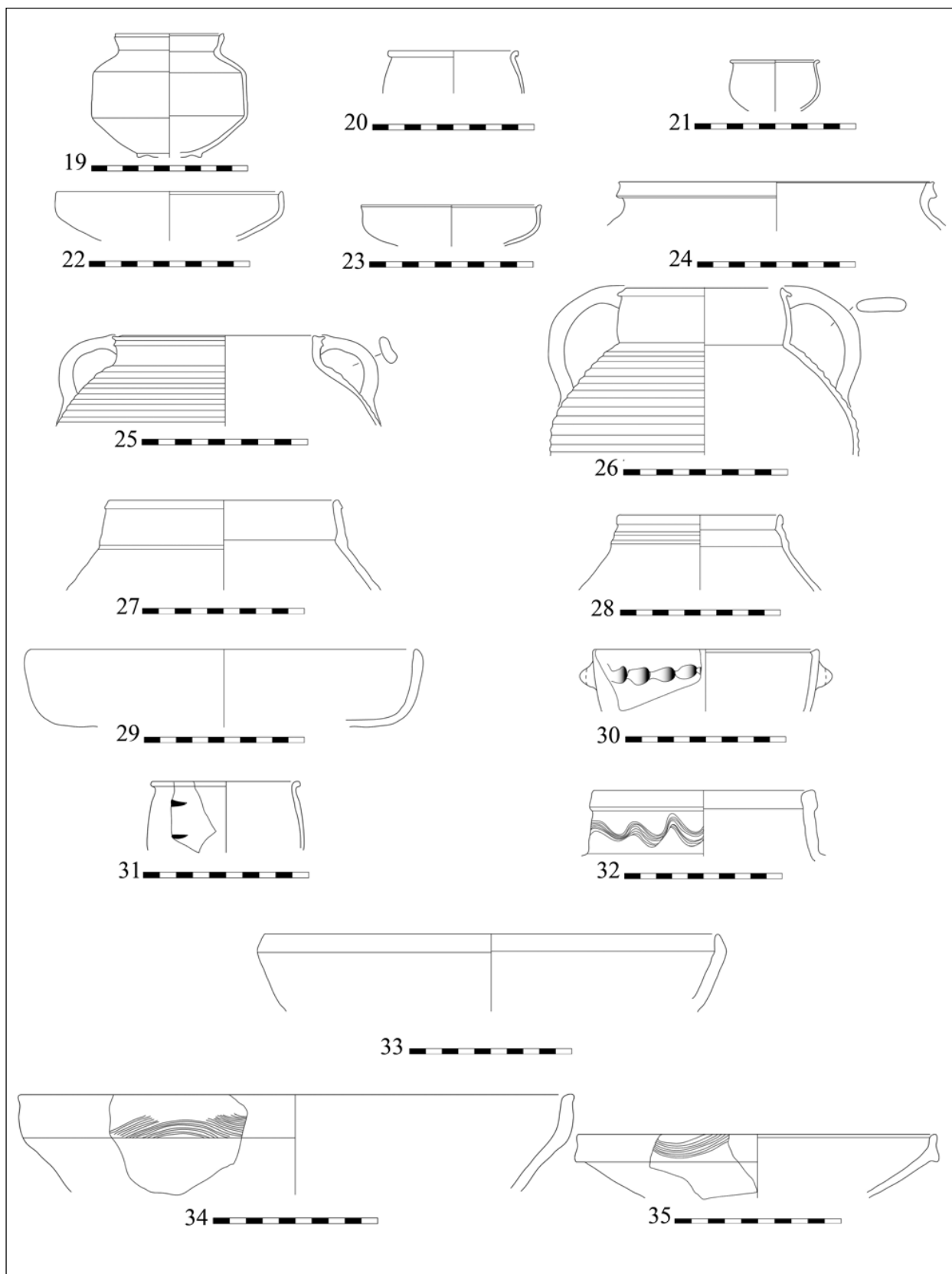
Typical examples of the second half of the first century and first half of the second century are Nabataean fine ware bowls (**Fig. 22, nos. 1-3**), Nabataean storage jars, jars, cooking pots and bowls (**Fig. 22, nos. 4-12**). Some of the forms of the ceramic nos. 13-18 may be later in date than their equivalents at az-Zanṭūr, possibly as late as the second century to first half of the third century (Gerber 1994, 1997). The contexts in Petra can be confirmed to date from the second half of the first century to the first half of the second century AD (Gerber 1994, 1997). Until al-Ḥumayma pottery has been studied and published in its full stratigraphic context, the matter must rest. There is also the question of the homogeneity of al-Ḥumayma loci.

Some al-Ḥumayma vessels similar to nos. 13-18 may differ somewhat in fabric from Petra parallels in late first-early second century contexts. The different fabric does not call into question the Petra provenance; early types associated with greyish fabric simply are not usual in the known Petra assemblages. Could this indicate a later date for al-Ḥumayma specimens? Conceivably, rim types of the early second century may have remained common for quite a while, while the well-fired, light-red, barely tempered, thin-walled specimens may gradually have been replaced by items with the same rim forms but with greyish or light-grey fabric. This kind of “intermediate” phase of pottery development seems to be missing in Petra due to the absence of well-stratified second or third century contexts. One of the rare Late Roman contexts is represented by structures in the northeast section of the “Lower Terrace” on az-Zanṭūr (EZ III). That pottery dates very roughly to the second or third century, pending a more detailed study (Gerber 2001, 2005). At al-Ḥumayma, until the pottery has been studied and published in its full stratigraphic context, the matter must

rest. To sum up: all vessel types numbered 4-23 are gathered in the catalogue under the early date heading (late first to early second century), whereas in the catalogue entries a possible later date of some al-Ḥumayma specimens (nos. 13-23) is considered. No further clarification is possible right now.

Complex E125 yielded a remarkable collection of “Nabataean” pottery of the second to third century, some of which was discussed above. Besides these first century derivatives there is a group of rather small, thin-walled vessels (**Fig. 23, nos. 19-23**) that do not find many equivalents in Petra assemblages. They represent a kind of “fine” ware with a new repertoire of forms and shapes that “bypasses” the hitherto usual painted and unpainted Nabataean fine ware bowl types. The new forms and shapes are not a “break” in the Nabataean pottery tradition; rather they show a “logical” development of the first and early second century fine and coarse ware forms (in combination), a kind of re-design. Interestingly, one of the pottery kilns, documented by ‘Amr during the Archaeological Survey of the Wadi Musa Water Supply and Wastewater Project, yielded pottery forms and fabric equivalent to those just described (lecture by K. ‘Amr, held during the table ronde of “Coarse Ware Pottery in Jordan [Hellenistic-Byzantine periods]”, in August 1999, at IFAPO, Amman, Jordan).

Generally the second to third-century al-Ḥumayma pottery (**Fig. 23, nos. 24-30**), especially from the Area E125, but likewise from the earlier layers from the fort (E116), shows a wider variety of forms and fabrics than attested in Petra. A small bowl with simple painting on its exterior (no. 31) recalls the shape of no. 20, but its light-red fabric is coarser. Many comparable samples, painted and unpainted, are known from Petra. On az-Zanṭūr this specific painting pattern on vessels of the very same form, and indeed of others, is known from mainly later second-third century contexts. The same kind of pattern is known from other sites in Petra, e.g. Area I Household excavation (excavated by K. Russell) and az-Zurraba (excavated by K. ‘Amr) — neither pottery assemblage has yet been published. Their suggested dates are both much later than second-third century. No precise chronological framework for the pottery of



23. Ceramic vessels nos. 19-35.

the second-third century period in Southern Jordan exists yet. It is hoped the stratigraphy of al-Ḥumayma excavation will help to establish it.

The Byzantine pottery fragments (nos. 32-33) I have studied from al-Ḥumayma are small and lack the rich repertoire and variety seen at Petra. The single rim types can be roughly compared to the Petra types. There are no indications that the Byzantine pottery from these areas was locally manufactured. A large quantity of Early Islamic pottery is attested for the Qaṣr at al-Ḥumayma (Field F103), but that pottery is outside the scope of this report. Among the very few other samples from outside of Area F103 appear two fragments of the so-called Mashash ware (nos. 34-35). Rim type, decoration, and fabric are comparable to those published by Whitcomb (1989) and date to the Early Abbasid period.

Catalogue of ceramics (Colour according to *Munsell Soil Color Charts*, rev. ed. 1994. All dates AD See **Figs. 22-23**)

Nabataean Fine Ware:

No. 1: bowl, undecorated, with slightly concave base; D 14.0cm; 2.5YR 6/6 (light red). Parallels: Schmid 2000: fig. 53, type E 1c 8 (group 7), phase 3 (20/30-first quarter 2nd C). [E125, Square 04 Room A, Locus 19, drawing no. 145].

No. 2: bowl, rouletted on its exterior, with ring-base; D 14.0cm; 2.5YR 6/6 (light red). Parallels: Schmid 2000: fig. 63, type E 8a 95 (group 9), phase 3 (20/30-first quarter 2nd C). [E125, Sq. 08, L. 11, no. 05].

No. 3: bowl, painted; D 16.0cm; body 2.5YR 6/6 (light red), decor 10R 4/4 (weak red). Parallels: Schmid 2000: fig. 92, type E 1b 10, decor phase 3c (first quarter 2nd C). [E125, Sq. 11, L. 10, no. 334].

Nabataean Common Ware (second half 1st-first half 2nd C):

No. 4: storage jar with two (or more?) handles, thick straight rim and horizontal lip, two grooves on the rim; D 12.0cm; body 10R 6/6 (light red), slip 10YR 8/2 (white). Parallels: 'Amr *et al.* 1998: 542, fig. 30.7, 2nd C; Gerber 1994: 290, fig. 16.D; Gerber 2001: 11, fig. 2.L, late 1st-first half 2nd C. [E125, Sq. 11, L. 12, no. 345].

No. 5: storage jar, with thick straight rim and

thinned lip, angular large rib on its exterior, two large grooves on its interior; D 16.0cm; body 10R 6/6 (light red), slip 5YR 5/1 (grey). Parallels: Gerber 1994: 290, fig. 16.A, late 1st-first half 2nd C. [E125, Sq. 11, L. 08, no. 33].

No. 6: storage jar, with slightly convex, profiled rim and bevelled lip; D 12.0cm; body 10R 6/6 (light red), slip 5YR 6/1 (grey). [E125, Sq. 06, L. 05, no. 317].

No. 7: jar with two handles, slightly inverted rim and inwardly grooved lip, several ribs on its exterior; D 9.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). [E125, Sq. 05, L. 15, no. 123].

No. 8: cooking pot, rim with bevelled lip, two large grooves on the interior of the rim; D 12.0cm; body 2.5YR 6/8 (light red), slip 2.5YR 5/6 (red). Parallels: 'Amr *et al.* 1998: 509, fig. 4.12; 535, fig. 22.2, both 2nd C; Gerber 1994: 290, fig. 16.B, late 1st-first half 2nd C; Oleson *et al.* 1995: 339, fig. 19.9, early 2nd C. [E125, Sq. 11, L. 08, no. 331].

No. 9: cooking pot with two handles, slightly convex rim and bevelled lip, round base; D 14.0cm; body 2.5YR 5/6 (red), slip 5YR 5/1-6/1 (grey). Parallels: Gerber 1997: 409, fig. 4.A, second half 1st C. [E125, Sq. 11, L. 11, no. 337].

No. 10: cooking pot with two handles, slightly convex rim and bevelled lip; D 16.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). Parallels: Gerber 1997: 410, fig. 7; Gerber 2001: 11, fig. 2.A, second half 1st-early 2nd C. [E125, Sq. 06, L. 43, no. 112].

No. 11: small cooking pot, with slightly convex rim and bevelled lip; D 10.0cm; body 10R 6/8 (light red), slip 5YR 6/1 (grey). [E125, Sq. 11, L. 32, no. 347].

No. 12: bowl with two handles, everted rim and rounded lip, a fine, incised, slightly wavy line on the exterior of the body; D 22.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). Parallels: Gerber 1994: 290, fig. 16.I; Gerber 1997: 410, fig. 8, late 1st-first half 2nd C. [E125, Sq. 11, L. 08, no. 332]. Nabataean Common Ware (in Petra, second half 1st-first half 2nd C; in al-Ḥumayma may come from later contexts).

- No. 13: storage jar with two handles, short, concave rim and bevelled lip; D 18.0 cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). [E125, Sq. 08, L. 01, no. 87].
- No. 14: jar, with outwardly straight and inwardly convex rim with inwardly grooved lip; D 12.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). [E125, Sq. 08, L. 01, no. 80].
- No. 15: jar, with profiled rim and inwardly grooved lip; D 10.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). Parallels: Gerber 1994: 290, fig. 16,G, late 1st-early 2nd C. [E125, Sq. 05, L. 09, no. 83].
- No. 16: storage jar with two handles, inverted rim, outwardly bevelled and inwardly grooved lip; D 15.0cm; body 2.5YR 6/8 (light red), slip 2.5YR 6/4 (light reddish brown). [E125, Sq. 04 Room A, L. 19, no. 144].
- No. 17: cooking pot with two handles, inverted rim and bevelled lip, two grooves on its interior; D 14.0cm; body 10R 6/6 (light red), slip 10YR 8/3 (very pale brown). [E125, Sq. 05, L. 11, no. 124].
- No. 18: cooking pot, with straight rim and bevelled lip, one groove on its interior; D 14.0cm; body 10R 6/8 (light red), slip 5YR 5.5/1 (grey). Parallels: Gerber 1994: 290, fig. 16.B, late 1st-early 2nd C. [E125, Sq. 06, L. 20, no. 105].
"Fine Ware" (2nd C to probably first half 3rd C).
- No. 19: small pot, with everted rim and inwardly grooved lip, angular shoulder, ring-base; D 7.2cm; 2.5YR 6/6 (light red). [E125, Sq. 06, L. 12, no. 14].
- No. 20: small bowl, with slightly thickened rim; D 8.0cm; 2.5YR 6/8 (light red). Parallels: Fellmann Brogli 1996: 263, figs. 815-16, 4th C. [E125, Sq. 08, L. 03, no. 85].
- No. 21: small bowl, with short everted rim and rounded lip; D 5.6cm; 2.5YR 6/6 (light red). [E125, Sq. 07, L. 09, no. 169].
- No. 22: bowl, with straight rim and inward-slanting lip; D 14.0cm; 2.5YR 6/6 (light red). Possible parallels: Oleson *et al.* 1995: 339, fig. 19.8, early 2nd C. [E125, Sq. 06, L. 19, no. 98].
- No. 23: bowl, with outcurving rim and rounded lip; D 11.0cm; 10R 6/6 (light red). [E125, Sq. 07, L. 11, no. 170].
"Nabataean" Common Ware (roughly 2nd/3rd C):
- No. 24: jar, with outcurving rim and thickened, grooved lip; D 18.0cm; body 2.5YR 6/6 (light red), slip 10YR 4/6 (red). [E125, Sq. 05, L. 03, no. 204].
- No. 25: jar with two handles, straight rim and grooved lip, two ribs on its exterior; D 12.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). Parallels: Gerber 2001: 11, fig. 2.C-D; Gerber 2005: 731, fig. 1.2, 2nd-3rd C. [E125, Sq. 08, L. 03, no. 56].
- No. 26: jar with two handles, long, slightly convex rim and bevelled lip; D 10.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). [E125, Sq. 11, L. 08, no. 333].
- No. 27: cooking pot, with inverted rim and bevelled lip; D 10.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). [E125, Sq. 07, L. 09, no. 165].
- No. 28: jar, with inverted rim and bevelled lip, two grooves on its interior; D 10.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). [E125, Sq. 08, L. 05, no. 82].
- No. 29: baking bowl, with straight rim and rounded, thinned lip; D 24.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). Parallels: Gerber 2005: 731, fig. 2.5, 2nd-3rd C. [E125, Sq. 07, L. 04, no. 146].
- No. 30: casserole, with slightly everted rim and inward-slanting lip, clay strip with finger impressions on its exterior; D 14.0cm; body 2.5YR 5.5/6 (light red), slip 10YR 6/1 (grey). [E125, Sq. 06, L. 31, no. 89].
- No. 31: small bowl, with slightly thickened rim, painted on its exterior; D 9.0 cm; body 2.5YR 6/6 (light red), slip 10R 5/6 (red), decor: N5/ (grey). [E116, Sq. G76, L. 05, no. 361].
Byzantine Coarse Ware:
- No. 32: jar, with inverted rim and thickened, inward-slanting lip, incised wavy lines on the rim; D 14.0cm; body 7.5YR 7/4 (pink), slip 2.5Y 7.5/2 (light grey-white). [E125, Sq. 05, L. 11, no. 210].
- No. 33: bowl, with short, slightly inverted rim and thinned lip; D 28.0cm; body 2.5YR 6/6 (light red), slip 10YR 8/2 (white). [E122, Sq. 02, L. 05, no. 61].
Early Islamic Pottery:

- No. 34: bowl, with short, slightly everted rim and rounded lip, incised wavy lines on the rim; D 34.0cm; body 10YR 7/1 (light grey), exterior 2.5Y 8/2 (white), interior 2.5Y 7.5/2 (light grey-white). Possible parallels: Oleson *et al.* 1995: 345, figs. 25.2; 25.4, mid-8th C; Whitcomb 1989: 279, fig. 2.C, second half 8th C. [E122, Sq. 01, L. 03, no. 324].
- No. 35: bowl, with short, straight, under-cut rim and rounded lip, incised wavy lines on the rim; D 22.0cm; body 10YR 7/3 (very pale brown), exterior: 2.5Y 8/2 (white); possible parallels: Whitcomb 1989: 279, figs. 2.c; 2.g; 2.i; 280, fig. 3.a, second half 8th C. [E122, Sq. 06, L. 01, no. 326].

Conclusions and Future Plans

The site of al-Ḥumayma continues to surprise and delight its excavators. The civilian centre and shrine have provided important new information about the history of the site and the transition from Nabataean to Roman rule, and about cult activities. It has become increasingly clear that the fort was an early and culturally very characteristic projection of Roman authority into this isolated but important region of the Provincia Arabia. Excavations will continue at the site under the direction of M. Barbara Reeves.

J. P. Oleson,
Greek and Roman Studies,
University of Victoria,
Victoria BC, Canada.

M. B. Reeves,
Classics, Queen's University,
Kingston ON, Canada.

G. S. Baker,
Earth and Planetary Sciences,
University of Tennessee,
Knoxville TN, USA.

E. de Bruijn,
Department of Religion and
Classical Studies, University of British
Columbia, Vancouver BC, Canada.

Y. Gerber,
Archäologisches Seminar,

University of Basel, Basel,
Switzerland.

M. Nikolic.
Classics, Mt. Allison University,
Sackville NB, Canada.

A. N. Sherwood,
Language and Literature,
University of Guelph,
Guelph ON, Canada.

Bibliography

- ‘Amr, K.
1992 Islamic or Nabataean? The Case of a First to Early Second Century AD Cream Ware. *SHAJ* 4: 221-25.
- ‘Amr, K., al-Momani, A., Farajat, S. and Falahat, H.
1998 The Petra National Trust Site Projects. Archaeological Survey of the Wadi Musa Water Supply and Wastewater Project Area. *ADAJ* 42: 503-48.
- Dolinka, B.J.
2003 *Nabataean Aila (Aqaba, Jordan) from a Ceramic Perspective*. BAR Intl. Series S1116. Oxford: Archaeopress.
- Fellmann Brogli, R.
1996 Die Keramik aus den spätrömischen Bauten. Pp. 219-81 in A. Bignasca *et al.* (eds.), *Petra Ez Zantur I*. Terra Archaeologica II. Mainz: Philipp von Zabern.
- Gerber, Y.
1994 Nabataean Coarse Ware Pottery. Pp. 286-292 in R.A. Stucky *et al.* (eds.), *Swiss-Liechtenstein Excavations at ez-Zantur in Petra 1993. The Fifth Campaign*. *ADAJ* 38: 271-92.
- 1997 The Nabataean Coarse Ware Pottery: A Sequence From the End of the Second Century BC to the Beginning of the Second Century AD. *SHAJ* 6: 407-11.
- 2001 A Glimpse of the Recent Excavations on ez-Zantur/Petra: The Late Roman Pottery and its Prototypes in the 2nd and 3rd Centuries AD. Pp. 7-12 in E. Villeneuve and P.M. Watson (eds.), *La céramique byzantine et proto-islamique en Syrie-Jordanie (IV^e-VIII^e siècles apr. J.-C.)*. Actes du colloque tenue à Amman les 3, 4 et 5 décembre 1994. Bibliothèque Archéologique et Historique 159. Beirut: Institut Français d'Archéologie du Proche-Orient.
- 2005 Late Roman Coarse Ware From Petra, Jordan: Changes in Typology and Chemical Composition. Pp. 725-36 in J.M. Gurt i Esparraguera, J. Buxeda i Garrigos and M.A. Cau Ontiveroseds (eds.), *Late Roman Coarse Wares, Cooking*

- Wares and Amphorae in the Mediterranean. Archaeology and Archaeometry.* BAR Intl. Series S1340. Oxford: Archaeopress.
- Graf, D.
1989 "Zenobia and the Arabs." Pp. 143-67 in D. French, C.S Lightfoot (eds.), *The Eastern Frontier of the Roman Empire. British Archaeological Reports.* Intl. Series S553. Oxford: BAR.
- Hodgson, N.
1993 Arbeia Roman fort, South Shields. *Current Archaeology* 12.1: 3-7.
- Johnson, A.
1983 *Roman Forts of the 1st and 2nd centuries AD in Britain and the German Provinces.* London: Adam & Charles Black.
- Kolb, B.
2001 A Nabataean Mansion at Petra: Some Reflections on its Architecture and Interior Decoration. *SHAJ* 7: 437-45.
- Kolb, B., Keller, D. and Gerber, Y.
1998 Swiss-Liechtenstein Excavations at az-Zantur in Petra 1997. *ADAJ* 42: 259-77.
- McKenzie, J.S.
2003 Carvings in the Desert: The Sculpture of Petra and Khirbet et-Tannur. Pp. 165-92 in G. Markoe (ed.), *Petra Rediscovered: The Lost City of the Nabataeans.* NY: Harry N. Abrams, Inc.
- Netzer, E.
2003 *Nabatäische Architektur, Insbesondere Gräber und Temple.* Mainz: von Zabern.
- Oleson, J.P.
1990 The Humeima Hydraulic Survey: Preliminary Report of the 1989 Season. *ADAJ* 34: 285-312.
1997 Landscape and Cityscape in the Hisma: The Resources of Ancient al-Humayma. *SHAJ* 6: 175-88.
- Oleson, J.P., 'Amr, K., Foote, R. and Schick, R.
1995 Preliminary Report of the Humeima Excavation Project, 1993. *ADAJ* 39: 317-54.
- Oleson, J.P., 'Amr, K., Foote, R., Logan, J., Reeves, M.B., Schick, R.
1999 Preliminary Report of the al-Humayma Excavation Project, 1995, 1996, 1998. *ADAJ* 43: 411-50.
- Oleson, J.P., Baker, G.S., De Bruijn, E., Foote, R.M., Logan, J., Reeves, M.B., Sherwood, A.N.
2003 Preliminary Report of the al-Humayma Excavation Project, 2000, 2002. *ADAJ* 47: 37-64.
- Oleson, J.P., Reeves, M.B., Fisher, B.
2002 New Dedicatory Inscriptions from Humayma (Ancient Hawara), Jordan. *ZPE* 140: 103-21.
- Parker, S.T. (ed.)
2006 *The Roman Frontier in Central Jordan: Final Report on the Limes Arabicus Project, 1980-1989.* 2 vols. Washington D.C.: Dumbarton Oaks.
- Reeves, M.B.
1996 The Roman Bath-house at Humeima in its Architectural and Social Context. M.A. Thesis, University of Victoria.
In preparation Concordia Hawarenorum: a community shrine in a garrisoned town of the Roman Near East.
- Schmid, S.G.
2000 Die Feinkeramik der Nabatäer. Typologie, Chronologie und kulturhistorische Hintergründe. Pp. 1-199 in S.G. Schmid, B. Kolb (eds.), *Petra—ez Zantur II: Ergebnisse der Schweizerisch-Liechtensteinischen Ausgrabung. Teil 1.* Terra Archaeologica IV. Mainz: Philipp von Zabern.
- Schneider, C.
1996 Die Importkeramik. Pp. 129-149 in A. Bignasca et al. (eds.), *Petra ez-Zantur I.* Terra Archaeologica II. Mainz: Philipp von Zabern.
- Webster, G.
1998 *Roman Imperial Army.* 3rd ed. Norman: University of Oklahoma Press.
- Whitcomb, D.
1989 Mahesh Ware: Evidence of Early Abbasid Occupation from Southern Jordan. *ADAJ* 33: 269-85.