THE INTERNATIONAL UMM AL-BIYĀRA PROJECT (IUBP) PRELIMINARY REPORT ON THE 2010 SEASON

Stephan G. Schmid and Piotr Bienkowski

Acknowledgments

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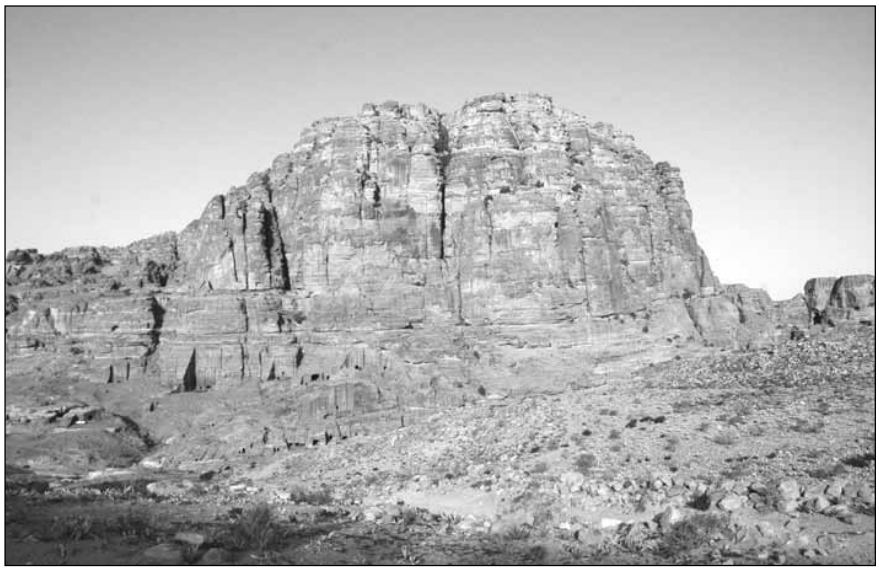
The following persons participated in the 2010 season of the IUBP: Piotr Bienkowski (co-director, Manchester), Stephan G. Schmid (co-director, Berlin), André Barmasse (Basel), Elzbieta Dubis (Krakow), Maxie M. Haufe (Berlin), Will Kennedy (Sheffield/Berlin) and Guido Teltsch (Berlin). The representative of the Department of Antiquities was Mohammed Zahran. During the team's sojourn at Nazzal's Camp in Petra, Suleiman Mohammed al-B'dool, Saher Mohammed al-B'dool, Aziza Suleiman al-B'dool, Dishwasher Rweij al-B'dool and Ali Khalaf al-B'dool were a very efficient and helpful camp team.

Introduction

Umm al-Biyāra, the huge rock massif dominating the centre of Petra (**Fig. 1**), can be considered the most important elevation connected to the city of Petra, irrespective of whether it is

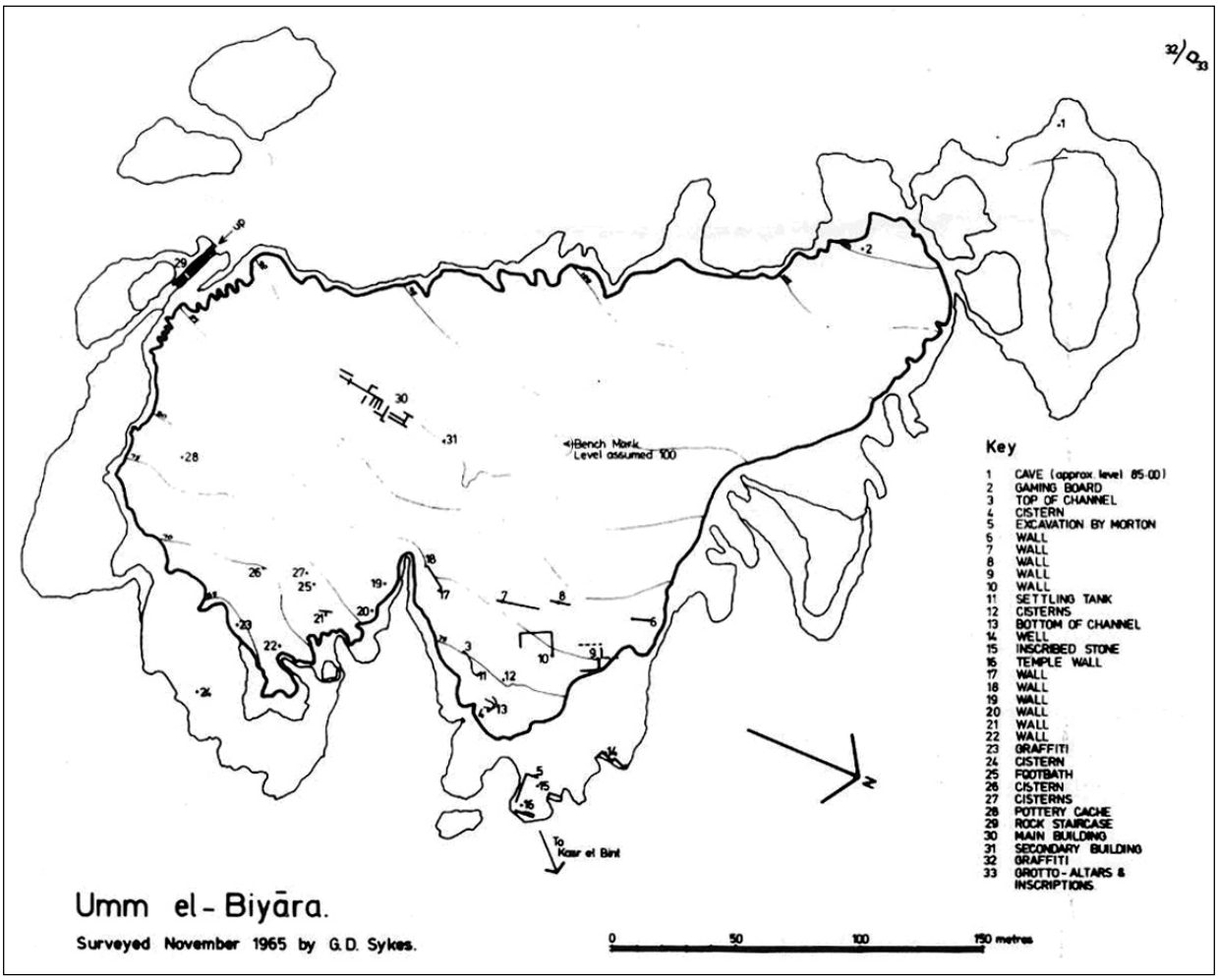


1. Umm al-Biyāra from W (Schmid).

to be identified with biblical Sela or with "the rock" referred to by Diodorus Siculus for the events of 312/11 BC (Diod., Geogr. 19, 94, 1 – 100, 3; for the text and a commentary see Hackl, Jenni and Schneider 2003: 439-453). Previous archaeological work at Umm al-Biyāra was undertaken in the 1950s and 1960s, preceded by some observations already in the 1930s. Most of these activities were focussed on Edomite structures. In general terms, Nabataean structures on top of Umm al-Biyāra received little attention before the mid-twentieth century. For example, Brünnow and von Domaszewski only consider rock-cut structures on the east flank of Umm al-Biyāra (Brünnow and von Domaszewski 1904: 295 nos. 355-357 [misleadingly named 'el Habis']). The same is true for G. Dalman who treats three "sanctuaries" below Umm al-Biyāra in a more detailed way, but, as is clearly indicated by the subtitle of the chapter and by the descriptions, these are structures on the terraces beneath the plateau and not on top of it (Dalman 1907: 226-229; these structures on the so-called northern terrace have been dealt with in detail by Lindner 1997: 293-303). It was with Nelson Glueck's visits to the site in the 1930s that the plateau of Umm al-Biyāra became more intensively dealt with, although not so much for the Nabataean remains but rather for the Iron Age pottery that was collected there (Glueck 1934-35: 82). From that moment on, the question of whether Umm al-Biyāra was the rock of Edom became a major issue mostly for Iron Age archaeologists (for detailed information see Bienkowski in press).

In 1955, an expedition organised by the American Schools of Oriental Research at Jerusalem conducted, among other activities, a detailed survey and a few soundings on top of Umm al-Biyāra (Morton 1956). William Morton was able to make some valuable observations regarding Nabataean structures on the site. For example, he observed that Nabataean pottery was mainly to be found on the north-eastern sector of the plateau and he already concluded that 'this is the area commanding the best view of the city enclosure below and in which are concentrated practically all of the foundation lines of Nabataean buildings' (Morton 1956: 29). Morton counted about 13 different buildings on several terraces in that specific area, that he considered being of Nabataean date (Morton 1956: 29). His attention was particularly caught by a huge rectangular structure on the very edge of the north-eastern promontory of the plateau (cf. **Fig. 2**) (Morton 1956: 30-31). He described three steps at the end of that building, obviously leading into nowhere right across the cliff (cf. ST 26 on **Fig. 3**), and proposed that the structure initially extended further in that direction, using foundational walls that had broken away in the meantime. A substantial block with architectural decoration led to the presumption of a richly decorated building going far beyond 'a temporary refuge for the aged and for women and children as reported in the account of Diodorus' (Morton 1956: 31). Finally, Morton suggested a date within the first century AD and a function as an 'officially staffed stronghold and observation post, perhaps with provision for ritual observance' (Morton 1956: 31).

From 1960 to 1965, Crystal-M. Bennett spent considerable time and energy in exploring the peak of Umm al-Biyāra (the final publication of these excavations has been prepared by Piotr Bienkowski, in press; on the life and career of Bennett see now Prag 2010). Although the Iron Age settlement was clearly her focus, on several occasions Nabataean remains are dealt with in preliminary reports. For instance, in an article in 1966, the huge structure described by Morton is illustrated and referred to as 'a building that may have been a small temple, but has been amputated from its fore part by a earthquake or some other catastrophe' (Bennett 1966, '[…], y compris un bâtiment qui peut avoir été un petit temple, mais qui a été amputé de son avant-corps par un tremblement de terre ou quelque autre catastrophe'; in the caption to her fig. 4, a picture of the rock-cut steps leading nowhere as described by Morton, the structure is called 'a Nabataean temple'). In 1980 Bennett published a short report on Nabataean Umm al-Biyāra, where the structures observed by Morton are published as ground plans (see here **Fig. 2**) and interpreted as connected with the Qaṣr al-Bint and, therefore, ascribing the building a religious function; 'Its dominating position, overlooking the main street of Petra and the Temenos of the Temple of the so-called Qaṣr al-Bint, suggest that it might have had some connection with the latter, which was the major Graeco-Nabataean

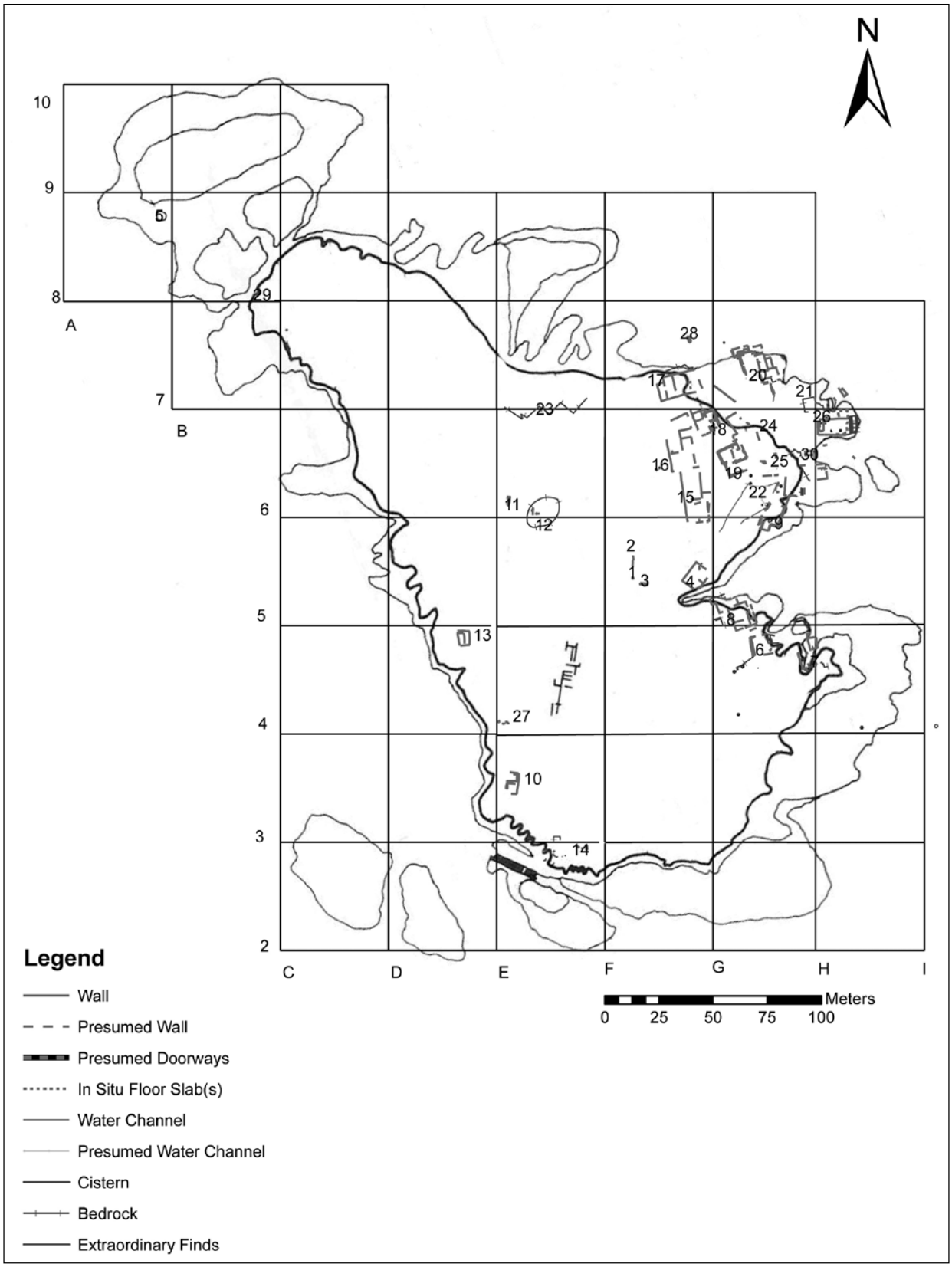


2. Umm al-Biyāra, British plan of 1965 (Sykes).

temple in Petra' (Bennett 1980: 211). In the caption to Bennett 1980, fig. 3, the building is called 'a possible important Nabataean temple'. Strangely, there is no mention of Morton's article although his trench is even indicated on the respective plan.

More recently, scholars have mostly abstained from a too precise interpretation of the Nabataean structures on the north-eastern edge of Umm al-Biyāra. For example, Ian Browning remains cautious as to any identification of the aforementioned Nabataean ruins; 'It has been suggested that this was the site of a temple (…). Until the site has been excavated it would be vain to speculate on why these steps were so perilously sited' (Browning 1989: 185). Manfred Lindner, one of the most intimate connoisseurs of the topography of Petra, had in mind a temple or a palace when looking at the Nabataean structures on top of Umm al-Biyāra (Lindner 1997: 44). As a matter of fact, the only element that was mentioned in favour of the interpretation as a Nabataean temple was its presumed orientation towards the city's main sanctuary of Qaṣr al-Bint. Upon verification it turned out, however, that the Qaṣr al-Bint is not at all visible from the spot of the presumed temple, since the hill of al-Ḥabīs obstructs the view (for some preliminary arguments dealing with the issue cf. Schmid 2009, and in press). During the past five years, it became clear that both writers of the present report had similar questions and interests regarding Umm al-Biyāra and, as a result, the present project was born, aiming at a better overall understanding of the plateau of Umm al-Biyāra, mainly regarding the Nabataean period.

For the time being, two main objectives for that project can be formulated:



3. Umm al-Biyāra, new plan with structures surveyed in 2010 (G. Teltsch and W. Kennedy).

- finding out more about the exact plan, date and function of the Nabataean structure(s) observed by previous research and mostly concentrating on the north-eastern edge of the plateau;
- verifying whether there is continuity or not between the Iron Age occupation and the known Nabataean structures that seem to date no earlier than the later first century BC (see below).

For that purpose, in 2010 a first season of roughly three weeks was devoted to a survey of the summit of the mountain. Using the British plan of 1965 as a starting point (**Fig. 2**), one of the first tasks consisted in connecting the summit of Umm al-Biyāra to an existing and referenced mapping system of the Petra area. Therefore, we measured four points from the city centre to the eastern ridge of the plateau of Umm al-Biyāra using a Leica total station TS 02 power – 7. As reference we used the grid established by the Swiss surveyors in the late 1980s, which was itself referenced to the Palestine Grid (Glutz 1996, insisting that the Swiss system is in itself very accurate but the correspondence to the Palestine Grid is less accurate due to the lack of precision of previous mapping activities.). Using the four fixed points, the plateau was then subdivided into 50m square grids. Each corner of a grid being named by a letter and a number, the grids themselves are named according to the distance between all four corner points (for example C-D/6-7 or G-H/4-5 and so on). These were subsequently surveyed in two ways: first, the surveyors walked along the middle line of each grid in a W-E direction, picking up all surface pottery and other objects in their line. Second, all visible structures within every grid such as walls, cisterns, quarries etc. were reported and sketched on specific sheets. A mapping team using a Leica GNSS 09 satellite positioning system measured and mapped all the structures in order to determine the dimensions, extent and orientation of the built structures (cf. **Fig. 3**). Further, the most clearly visible and discernable structures were made the object of intensive surveys, picking up all diagnostic pottery in and around them. Last but not least, the trench dug by Morton, as well as one clearly visible illicit excavation, were cleaned in order to document the structures uncovered by them. We deliberately did not survey the area of the Edomite settlement excavated by Bennett, as well as the clearly visible dumps and potsherd deposits from that excavation, since these are covered by the final report (Bienkowski in press).

Although this was a survey season with a rather small team, a certain infrastructure was necessary in order to work efficiently on the summit of Umm al-Biyāra. A specially constructed solar collector transferring sunlight into electricity was necessary in order to charge the batteries of equipment such as the satellite measuring system, the outdoor notebooks, mobile phones and so on. As a base we used a rock cut structure on the E corner of the main plateau (no. 29 on **Fig. 3**). All of the infrastructure, as well as the daily necessary goods (water, food), were brought up by donkeys that also took down the collected pottery and other objects as well as the garbage. In general terms we tried to make use of the summit in the most responsible way, leaving no traces behind us.

First Results

General Observations

In terms of chronology one striking observation is the almost complete lack of evidence for any other periods than the Edomite (7th-6th century BC) and the Nabataean (1st century BC – 1st century AD) periods. While the city centre and surrounding areas have evidence for occupation and structures for the Roman, the Byzantine and the Medieval periods, no traces whatsoever of these periods were found on top of Umm al-Biyāra, with the exception of a very small number of African Red Slip wares and some Medieval sherds of the so-called Ayyubid-Mamluk type (on Medieval pottery from the Petra area see now the concise overview by Sinibaldi 2009). Also, there was no evidence of occupation in the period between *ca.* 500 BC and the 1st century BC (at Busayra, for example, the Iron Age occupation continued to *ca.* 300/200 BC, see Bienkowski 2002; but there is no such evidence of later Iron Age and early Hellenistic occupation on Umm al-Biyara so far). The survey further clearly revealed a concentration of activities during the Nabataean period focussed on the eastern ridge of the plateau, i.e. the part of the summit that offers the best view towards the

city centre while at the same time being the best visible from the surrounding area, especially the city centre. These are the sectors of the plateau densely occupied by monumental buildings (**Fig. 3**). However, the collected pottery shows that during the Nabataean period the areas towards the NW part of the plateau must also have seen some activities although no visible remains survived on the surface. Compared to the British survey of 1965 we were able to identify many more structures and to correct the position of some previously mapped structures (cf. **Fig. 2** with **Fig. 3**). In total 30 structures were reported and mapped, eight being cisterns and their connected water channels, 19 being substantial buildings. For the time being, until proper excavation is undertaken, it cannot be decided in all cases whether we are dealing with individual structures or whether some or even all of them belong to one overall structure. At the very least the common orientation of structures 17 to 20 or structures 15 and 16 etc. might indicate an overall building plan.

It is not the aim of this preliminary report to describe at length every structure. We will focus on some specific ones to provide an initial insight into the Nabataean occupation of Umm al-Biyāra.

A Watchtower?

Structure 10 (ST 10) was identified on the western half of the plateau, more or less on the SW angle of the plateau (cf. **Fig. 3**). Its exposed situation on an outcropping rocky promontory, as well as its rectangular, almost square plan, might indicate that it was a watchtower. This would very well fit with its apparently carefully chosen position. The structure stands at a point with a perfect view all around the area, and especially towards all the springs supplying the long distance water supply of Petra: from ʻAyn Dibidba in the Bayḍā area to ʻAyn Brāq on the road to aṭ-Ṭaybah, including ʻAyn Mūsā and the ancient settlement of Iljī/ el-Ji (Gaïa). The view from that spot is even more extensive, including the prominent hill of Dilāgha at the very SE, itself occupied by a huge watchtower and giving access to the track leading to Gharandal, Jabal Hārūn to the SW and the Wādī ʻArabah to the W as well as Jabal Qārūn to the N. From some spots on the NW tip of Umm al-Biyāra one can even see Qaṣr Umm Rattām, a major guard post controlling the access to the region around Petra from Wādī ʻArabah (on Umm Rattām and its strategic importance see Lindner *et al*. 2000; Lindner *et al*. 2007). Although built directly on the visible rock surface, a certain amount of pottery was picked up on the surface in and around ST 10. With the exception of a very few Edomite sherds, the vast majority of pottery belongs to the Nabataean period, indicating a Nabataean date for ST 10. In general terms, the summit of Umm al-Biyāra offers an excellent strategic view around the area, being in a sense the key to the functioning and existence of Petra in the Nabataean period. As pointed out elsewhere (Schmid in preparation), the city centre of Petra is actually built in a very illogical and uncomfortable spot. There is absolutely no view from the city centre to the surrounding areas, which was a major strategic disadvantage. Further, there is no regular natural water supply for a substantial population. In other words, a more logical place for developing a settlement would seem to be the area along the above mentioned springs, allowing the supply of a bigger population, offering a good view and being in the vicinity of possible agricultural areas. In order to settle permanently and to develop a substantial population in the city centre of Petra, immense efforts in constructing an effective infrastructure are necessary. Water management was surely one of the main concerns (see for instance Bienert 2002; Bellwald 2008; Muheisen 2009; Schmid 2008). Therefore, the Nabataeans invested an extraordinary amount of time, energy and finance in the creation of dams, channels, cisterns etc., both for protecting the city from flash floods and bringing fresh water into it. While these efforts in terms of water management mainly concern a kind of a half circle towards the E of the city centre, in terms of strategic concerns one has to control a much wider area in order to be able to live sustainably at Petra. Since from the city centre no view and therefore no communication with the wider area is possible, the Nabataeans needed to make sure they controlled the surrounding hills. By far the best view towards all important strategic points and the city centre is offered by the plateau of Umm al-Biyāra, linking the city centre to the outer world. Not only is the view from Umm

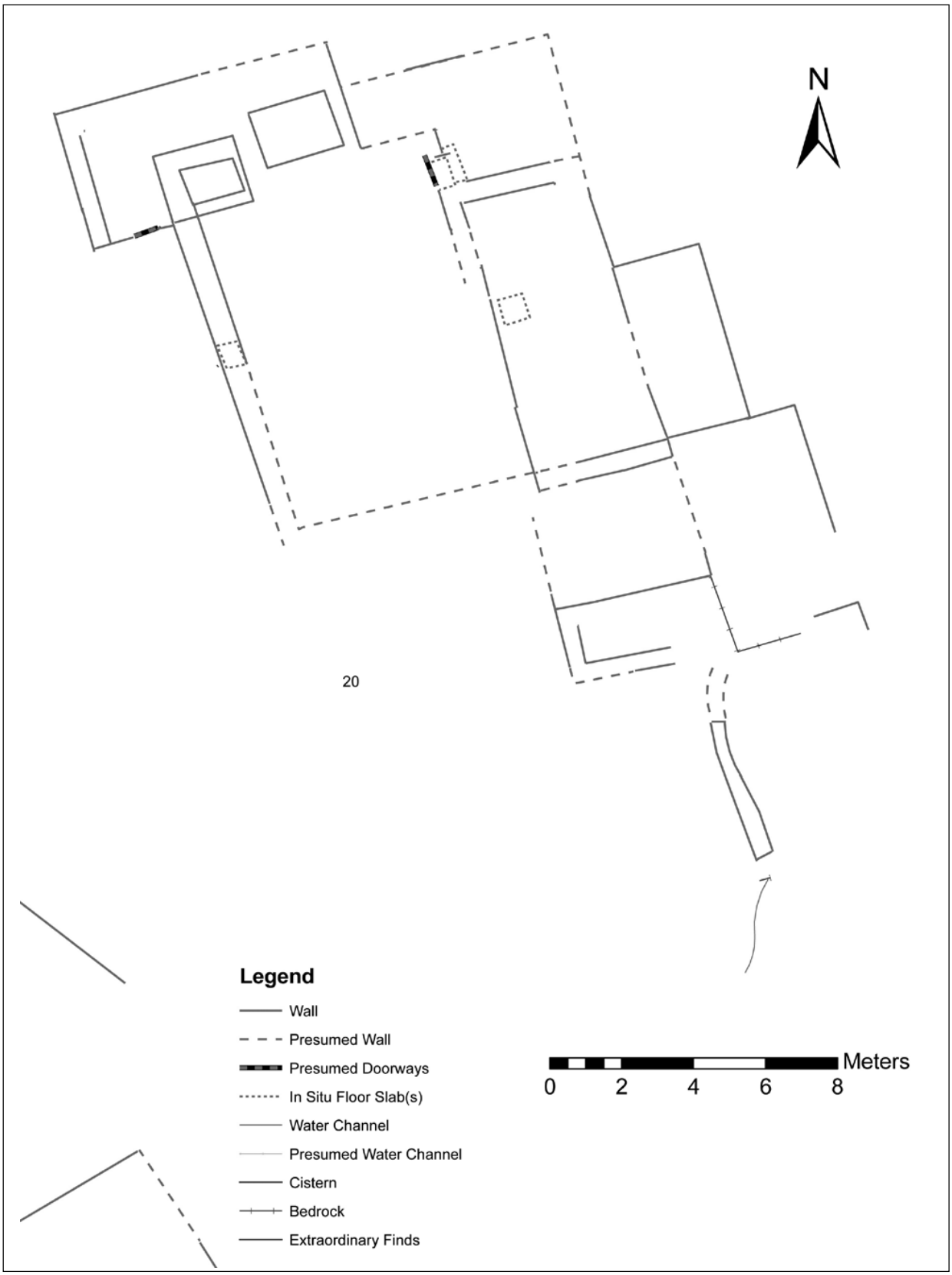
al-Biyāra imposing, also the acoustic connection to the surrounding area is truly impressive, as can still be verified today. For example, from the summit of Umm al-Biyāra donkeys can be heard from all over the city centre up to Umm Ṣayḥūn, cars can be heard from Umm Ṣayḥūn, Wādī Mūsā, and the road to aṭ-Ṭaybah as far as the hospital and even people shouting within the city centre can be heard.

In conclusion, whoever wanted to dwell in the city centre of Petra on a permanent basis needed to be in control of Umm al-Biyāra. This premise is important when it comes to interpreting the structures from the plateau belonging to the Nabataean period. That in general terms such reflections as to strategic views and long distance communication played an important role for the Nabataeans is confirmed by Diodorus Siculus who, when reporting on the events of 312/11 BC, indicates that the Nabataeans had guard posts on elevated spots controlling the routes towards Arabia which communicated with each other using signal fires until the message reached "the rock" (Petra) (Diod. 19, 96, 3. 97, 1). It is likely that this kind of strategic and spatial organisation was still in use some years later, though in a more developed way. This may be concluded from an episode dating to about 27 AD when the daughter of Aretas IV, who was married to Herod Antipas, fled to Petra, travelling from one Nabataean *strategos* to the next (Jos., Ant. 18, 112).

A luxurious Bathing Installation

Some of the structures identified so far can be interpreted in a more precise way, always bearing in mind that these are the results of a survey, without any excavation. Such is the case, for example, with structure 20, standing on the NE edge of the plateau, prominently overlooking the city centre (**Figs. 4, 5**). The structure consists of several clearly visible rooms: more are most probably buried under substantial amounts of rubble and debris. From the S end of the building, a partially rock-cut and partially built water channel brings in water to the structure (**Fig. 6**; on the water management of Umm al-Biyāra, see below). The water is collected in a substantial basin, identified thanks to the greyish hydraulic mortar containing charcoal fragments which improved its waterproofing qualities (on Nabataean hydraulic mortars see Shaer 2004). On a slightly lower level, but on the same alignment within the building, is a huge room from which come a large number of hypocaust and *tubuli* fragments (**Figs. 7a, 7b**), distributed all across its extent. Since no such fragments have been found elsewhere in the area, we can assume that it was precisely this room that was equipped with a complex floor and wall heating system. This is confirmed by the modest but clearly visible remains of two hypocaust pillars still *in situ* (**Fig. 8**). Since the entire installation is built on the very edge of the cliff, erosion and slippage have exposed and destroyed the easternmost parts of it, and thus at some spots even the floor levels are visible without any additional cleaning. We can therefore identify a room with floor and wall heating systems directly connected to a water tank. In other words, we can interpret at least part of this structure as a bathing complex on top of Umm al-Biyāra!

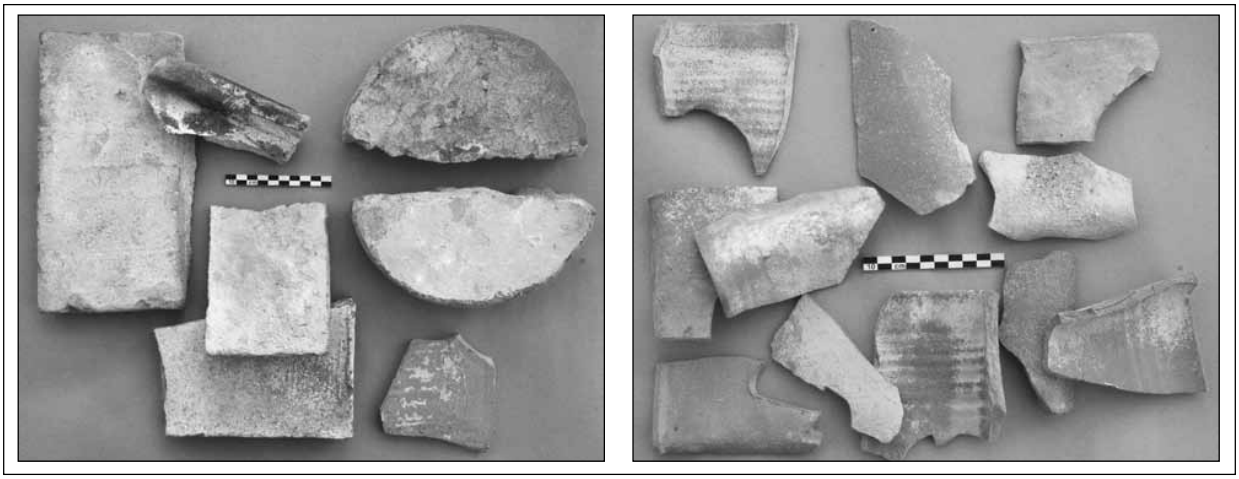
Further elements are likely to confirm this view. At the N end of the building, two rectangular structures measuring 90 x 140cm and 160 x 220 cm respectively were clearly visible on the surface (cf. **Fig. 4**). The smaller one showed signs of previous excavation, so we decided to clean it and indeed, numerous fragments of plastic bottles were found all the way to its base. Within the structure, several fragments of huge slabs belonging either to a roof or to a floor were found. These had partially destroyed the inner walls of the structure, which consisted of very thin vertically placed sandstone slabs (**Fig. 9**). These were bedded into a layer of the same greyish hydraulic mortar (**Fig. 10**) mentioned above in connection with the water tank, indicating that this structure must have contained water. This hypothesis was confirmed by an outflow at the bottom of the structure as well as a fragment of a very fine water pipe made of clay (**Figs. 11, 12**). This belongs to the same type of water pipe as used for the distribution of water within Nabataean houses, for example in the huge Nabataean mansion of az-Zanṭūr. The two structures, therefore, can be identified as bathtubs, the smaller one probably for one person, the bigger one offering space for several persons. In the same area small fragments of alabaster decoration and marble slabs were collected, indicating that the structure was lavishly decorated inside (**Fig. 13**). To the W of the smaller bathtub is a



4. Umm al-Biyāra, detail of plan showing ST 20 (G. Teltsch and W. Kennedy).

5. Umm al-Biyāra, overall view of ST 20 with Wādī ʻArabah on centre right (Schmid).

6. Water channel bringing water into ST 20 (Schmid).



7a, b. Fragments of hypocausts (left) and tubuli (right) from ST 20 (Schmid).

8. Hypocaust pillars in situ in ST 20 (Schmid).

9. Small bathtub within ST 20 with dumped floor or roofing slabs (Schmid).

10. Hydraulic mortar from small bathtub (Schmid).

11. Small bathtub within ST 20 after cleaning with outflow (Schmid).

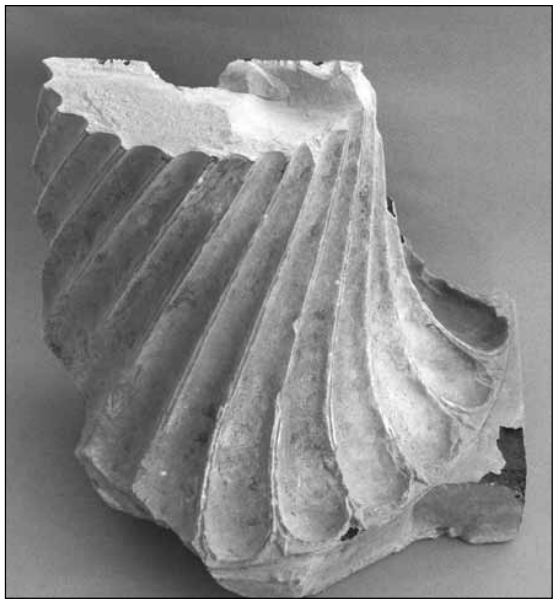
12. Fragments of clay water pipes from small bathtub (left) and hypocaust room (right) (Schmid).

13. Fragments of suspensurae, mortar, alabaster and marble from ST 20 and ST 26 (top right) (Schmid).

narrow room showing one identifiable doorway *in situ*. Next to this doorway, the fragment of a twisted column of very fine craftsmanship was collected, made of hard dark gray, almost black limestone and showing traces of fine whitish plaster (**Figs. 14a, 14b**). In the middle of the column a vertical rounded hole goes through the entire preserved length of it, posing problems of interpretation but maybe also offering a possible solution. Given the specific context, one could imagine the object not as a column but as a stand of a table or a basin (in general terms on basin stands see Pimpl 1997, although that author does not list any twisted basin stand nor stands with holes). In that case, the round hole would have been used to pump water from the bottom into the basin, simply using pressure provided by gravity flow; all that is needed is a water tank on a slightly higher level than the basin. That in general terms basin stands in the shape of small columns were a common feature by the 1st century AD can be shown by several such objects from Pompeii, although there too no twisted stands seem to be known (Pernice 1932: 38-54). Also from several Pompeian examples comes the confirmation that spectacular water installations such as fountains and pools belonged to the usual features for decorating gardens and thermal installations of the contemporary upper class (see some examples in Farrar 1998, 64-96). Finally, in the Casa del Camillo at Pompeii, a table shaped fountain on a column stand is used in exactly such a way, forcing the water through a central hole of the column stand (cf. Andersson 1990: 234f. with fig. 19).

A Room with a View

Another structure that attracted our attention

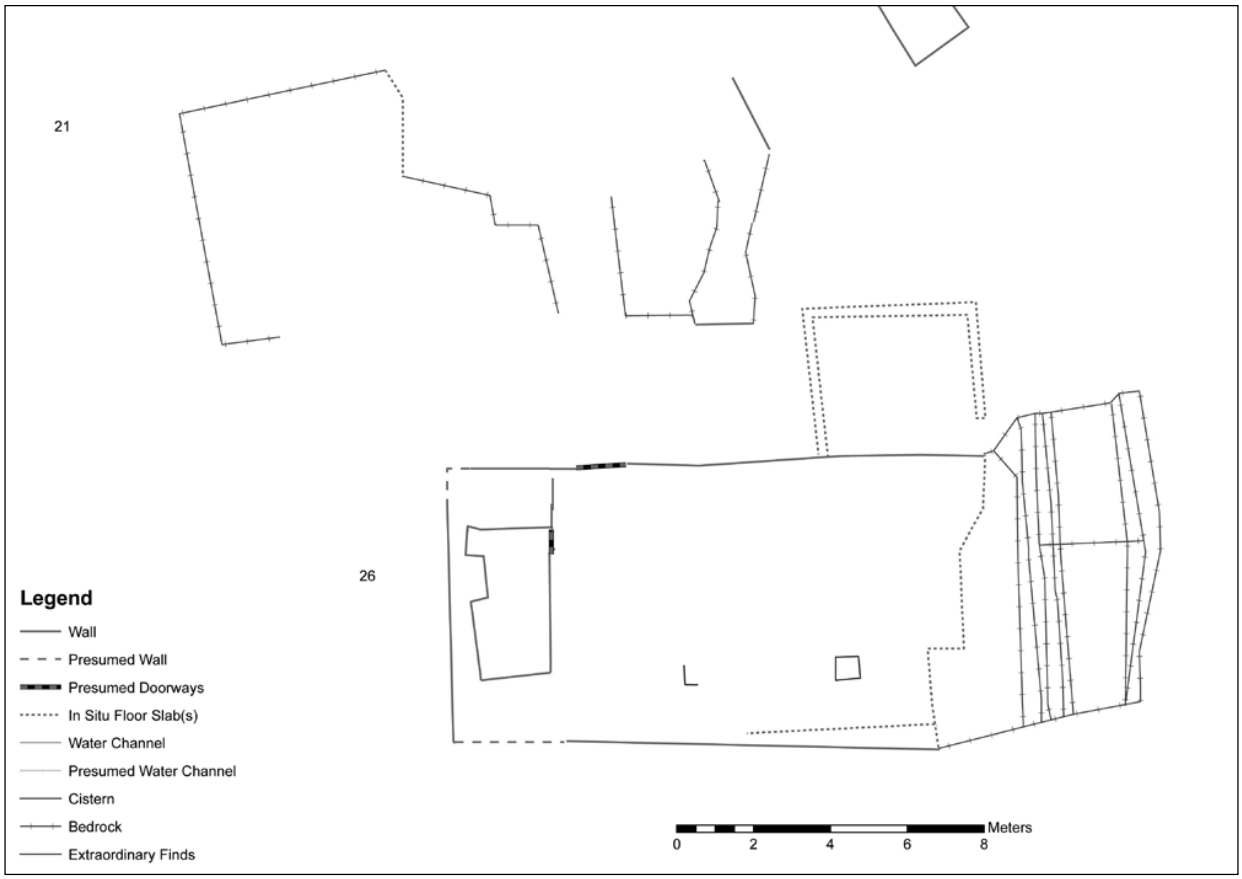


14a, b. Twisted base of a stand from ST 20 (Schmid).

was ST 26, built at the very edge of a promontory protruding towards the city centre (**Figs. 15, 16**). This is the structure that was partially excavated by Morton in the early 1950s and, therefore, the same that had been interpreted by Bennett as being a Nabataean temple. After verification it turned out that the rectangular structure previously recorded is only part of a more substantial building, continuing on at least three sides (N, S, W), while towards the E the steep cliff made a further extension impossible. However, the regularly cut off rock that was previously interpreted as steps suggests instead the positioning of a major wall, using the classical Nabataean technique of a zigzag-like contact between the built and the rock-cut parts of walls. Within the main structure, i.e. the one already mapped by the British in 1965, parts of the original floor slabs still are visible *in situ*. In the SE part of that room, a rectangular structure built of two ashlars and measuring 66 x 80 cm stands directly on the floor slabs (**Fig. 17**). This structure is likely to be the lowest layer of a rectangular pillar. Perfectly aligned to it but a few metres to the W stands an ashlar of a similar construction. Within this structure several fragments of Nabataean horned pilaster capitals were found; another one of the same type and with the same dimensions (21cm of height) was collected from the rubble of the same building sloping down the cliff on the S side (**Fig. 18**). The pilaster capitals are likely to have decorated the back walls of the supposed courtyard. It would be very interesting to know whether this courtyard was left open towards the city centre (E), and, therefore, making it a terrace with a truly spectacular view, or whether it was surrounded on all four sides with walls. Needless to say, this kind of structure has nothing whatsoever to do with a Nabataean temple. Like the previously discussed structure 20, from ST 26 too come some hints regarding its ancient interior decoration. Several fragments of a yellowish limestone with small shell inclusions were found, belonging to very carefully cut slabs (**Fig. 19a**). These slabs are of excellent quality and show a nice natural decoration pattern once they are wet, due to the shell inclusions. From the area of Morton's trench several fragments of marble slabs were collected (**Figs. 19a**, **19b**), belonging to different white and coloured marbles, indicating a luxurious interior decoration for ST 26 as well.

Water Management

What may seem surprising, at least at first sight, is the presence of installations making use of channelled water, such as the above described bathing installation (ST 20). Further work indicates that ST 20 is not the only building on the summit of Umm al-Biyāra that is supplied by channelled water. For instance ST 7, built on a protruding rocky promontory on the south-



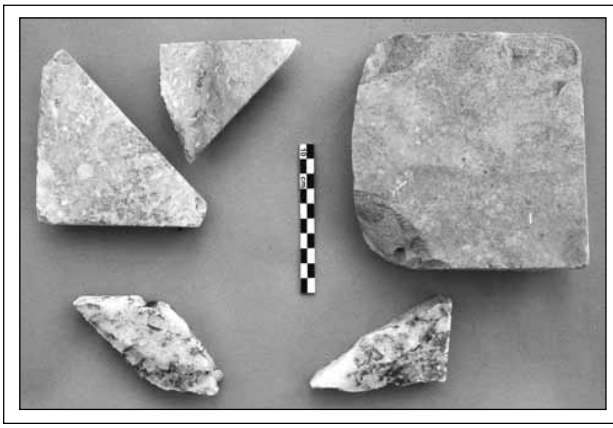
15. Umm al-Biyāra, detail of plan showing ST 26 (G. Teltsch and W. Kennedy).

16. Overall view of ST 26 (bottom) with view over Petra and Wādī Mūsā (Schmid).

ern part of the eastern ridge and offering again a splendid view over the city centre (**Fig. 20**), was most probably also connected to a water channel. This is suggested by the presence of a fragment of a stone cut water channel (**Fig. 21**). Although a surface find and not *in situ*, this item most likely was connected to ST 7. In the case of the above described ST 26, the supposed temple of Morton and Bennett, it is a rock-cut water channel (**Fig. 22**) that brings water into the area,

17. Floor slabs with pillar in ST 26 (Schmid).

18. Nabataean horned pilaster capital from ST 26 (Schmid).



19a, b. Lime stone and marble slab fragments from ST 26 (Schmid).

20. Overall view of ST 7 (Schmid).

so that we can suppose a rather luxurious water supply for that building as well.

All of these water channels, as well as others, are connected to the system of cisterns on top of Umm al-Biyāra which give it its Arabic name. With the exception of one cistern, situated on a much lower terrace on which so far no structures have been identified, all other seven cisterns on the plateau are part of a thoroughly sophisticated water management system. Ev-

21. Stone cut water channel from ST 7 (Schmid).

22. Rock-cut water channel SW of ST 26 (Schmid).

ery cistern is supplied by at least two incoming channels, sometimes as many as six. From every cistern at least two channels bring the overflow either to another cistern or lead into rock-cut or built channels which take water to the above mentioned structures. This system of multiple connections clearly reminds one of the Nabataean water management attested all over the city of Petra. The cistern system and its close connection to the clearly Nabataean buildings on the eastern ridge of the plateau makes it very likely that it should be dated to the Nabataean period. Diodorus Siculus describes typical Nabataean cisterns as '(…) big holes with small mounds; in depth they enlarge the shaft continuously until it reaches one *plethron* at every side' (Diod. 19, 94, 7), a description that fits rather well the eight piriform cisterns of Umm al-Biyāra. However, dating the eight cisterns exclusively to the Nabataean period creates problems in explaining where the Edomite settlement got its water from. In the final report on the excavations of the Edomite settlement, Bienkowski (in press) admits that the cisterns cannot be convincingly dated to either the Edomite or Nabaatean period. In the current state of knowledge, it cannot be excluded that the cisterns are originally Edomite in date and reused during the Nabataean period. How efficient that ancient system of water collection still is could be observed during two days of rainfall during our 2010 spring campaign. After only five minutes of rain, water started gushing into the cisterns, although only a very small percentage of the water collecting system is still extant and it is working at a vastly reduced capacity.

Parallels and Interpretation

Although we can describe and explain how water reached the different buildings, it still remains surprising that somebody could have built an entire bathing installation on top of the most prominent and isolated elevation of the area. An identification as a public bath can presumably be excluded by its location, very difficult to access for just a short bathing experience. If we try to sum up some of the known characteristics of this installation, it becomes clear that it must have been an outstanding one in several respects. It is situated not only at one of the most prominent spots of the hill, offering a splendid view over the city centre of Petra, but it must also have been visible from all over Petra. Further, it is at the most distant point of the entire plateau in relation to the steps giving access to it. Irrespective of whether there were other paths leading up Umm al-Biyāra, the one followed by the modern steps, which are a restoration of the Nabataean steps, surely was the most "official"

access to the plateau during the Nabataean period. Therefore, the bathing installation is both very prominent and at the same time very private, since access to it was strongly reduced and controlled. Since the installation made not only use of water, already a luxury item in this specific location, but also of wood or other fuel needed to heat the floor and wall heating systems described above, we are facing an almost provocative display of wealth and luxury. Despite the fact that heated rooms *per se* were not necessarily considered a specific luxury item by the time of their construction, the fact that they are situated on top of the highest elevation in the region makes them outstanding, since every single twig that was burned in their *praefurnia* needed to be carried up the hill.

That this has to be a building out of the ordinary is further suggested by the general geostrategic situation of Umm al-Biyāra as described above. It is irrelevant whether Umm al-Biyāra is the "rock" of the Nabataeans reported for the year 312/11 BC by Diodorus: by the late 1st century BC and the 1st century AD, Umm al-Biyāra must have been sufficiently important that not everybody was allowed to build there. It is precisely this combination of strategic importance and ostentatious demonstration of wealth that places these Nabataean buildings in close relationship with some of Herod the Great's hilltop palaces. In Masada, Herodeion, Kypros and Machaerus (Machairous), heated rooms, usually as part of Roman style *thermae*, are an outstanding characteristic (on the hilltop palaces of Masada, Herodeion, Kypros and Machaerus, see Japp 2000; Lichtenberger 1999; Nielsen 1994: 181-208; Netzer 2001b; Roller 1998; and especially on their bathing installations see Netzer 1999). Beside the pools etc. of major bathing installations, individual bathtubs are common to most of the mentioned Hasmonean and Herodian structures (cf. Netzer 1999) however, no bathtubs for two or three persons such as the one mentioned above in ST 20 seem to be attested from Herodian buildings.

We can assume that these Herodian installations were not only known to the Nabataean upper class (cf. Schmid 2009) but especially the palace at Machaerus, situated on the eastern shore of the Dead Sea, must have been in many ways a sort of provocation for the Nabataeans. It seems, therefore, perfectly appropriate to suggest that the building on top of Umm al-Biyāra consisted of something like the Nabataean response to the Herodian hilltop palaces. Probably the best overall comparison is offered, for the time being, by the Herodian palaces at Masada (specifically on Masada see Netzer 1991). The general situation is the same, i.e. the Herodian buildings are displayed all over the plateau of the massif rock elevation that is Masada, and, as on Umm al-Biyāra, there is no common orientation for all buildings, rather they form smaller groups according to their successive date of construction. There, too, the most luxurious and at the same time the most private structures, the ones known as the North palace, are placed at the spot opposite to the main access to the hill. As at Umm al-Biyāra these Herodian structures are playing with visibility, incorporating the splendid panoramic view into the architectural display, as is especially true for the three levels of the northern palace. Likewise, they feature lavishly decorated bathing installations.

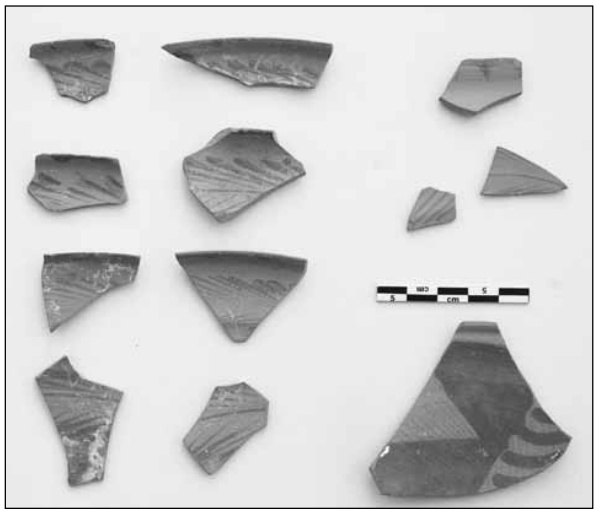
Despite the fact that Masada offers the best overall comparisons to our structures from Umm al-Biyāra, in details most of the other Herodian residences can be compared as well. For instance, the deliberate playing with visibility and the view is very prominent within Herod's third palace at Jericho (Netzer 2001: 231-286). The triclinium B70 (Netzer 2001: 239) and the courtyard B55 (Netzer 2001: 251-254) from Jericho can be compared to our ST 26 with its extreme position built literally over the cliff. Since the southern wall of courtyard B55 in Jericho fell into the Wadi Qelt and cannot be reconstructed securely, as is the case with the eastern wall of our ST 20, in both cases a direct opening to the natural view would be possible.

In terms of chronology we can already make a few observations. Of course, a precise chronology and dating of the structures referred to above will only be possible after systematic stratigraphic excavation. For the time being the earliest Nabataean element consists of one single painted rim sherd of a drinking bowl dating to *ca*. 50-25 BC (phase 2a after Schmid 2000) (**Fig. 23** top left). It was found on ST 12 (cf. **Fig. 3**), being the highest elevation on the plateau consisting of an outcropping rock that was incorporated into a built structure, as is attested

by a few remaining stone blocks from a wall, as well as by the carefully carved stone "steps" onto which the walls were set. A few metres to the W of the rock a built wall is visible, indicating that the structure was probably bigger than just the part built on the rock. The rest of the pottery related to ST 12 consists of several sherds belonging to the last quarter of the 1st century BC (**Fig. 23** bottom) and others belonging to the 1st century AD. The last quarter of the 1st century BC (phase 2c of Nabataean pottery according to Schmid 2000) is the earliest date present within most areas, except of course the Edomite pottery. The latest pottery that is present to some extent in most areas belongs to phase 3c of Nabataean pottery (according to Schmid 2000) and dates, therefore, to the early 2nd century AD. Within the major Nabataean structures sometimes a difference in chronology seems to occur. For instance, on the steep slopes immediately to the N of ST 26 a large amount of very well preserved, although broken Nabataean pottery was found. Beside a few fragments of coarse ware, most of that pottery consisted of Nabataean fine ware and especially of fragments of painted bowls. Within these, phases 2b and 2c (last quarter 1st century BC and first quarter 1st century AD) are the most prominently represented, followed by phase 3a (second and third quarter of the 1st century AD). Phase 3b (last quarter 1st century AD) is very discreetly represented, phase 3c (early 2nd century AD) completely absent. Quite different is the picture in and around ST 20, the bathing installation pointed out above. There, painted pottery strays from phases 2b (last quarter of 1st century BC) to 3c (early 2nd century AD), the most prominent group being the one of phase 3b (last quarter of the 1st century AD). Although one should not come to hasty conclusions, it would seem, then, that the major phase of occupation of ST 26 should date to the turning of the eras, while ST 20 probably saw its apogee in the late 1st century AD. The latter would also fit well both with the greyish hydraulic mortar using charcoal additive (on the chronology of the different hydraulic mortars see Graf *et al*. 2007: 225-227) as well as with the *tubuli* introduced to the Nabataean realm towards the end of the 1st century AD. (on this see Kolb and Keller 2001: 2000). Maybe there is even a way for a more precise dating of the heated room within ST 20. In the area of the above mentioned hypocaust construction, several fragments of hydraulic mortar were found, showing the reddish variant using crushed pottery additions on one side, the greyish variant with charcoal fragments on the other side (**Fig. 24**). While the reddish variant was in use from the 1st century BC onwards, the greyish one was introduced towards the end of the 1st century AD; therefore, the combination of both would indicate a date at the very beginning of the use of the greyish variant.

Conclusions and Perspectives

The Nabataean structures on Umm al-Biyāra



23. Painted Nabataean sherds from ST 26 (left), ST 12 (top right) and ST 20 (bottom right) repectively (Schmid).

24. Mortar fragments from hypocaust room in ST 20 (Schmid).

occupy the most extreme locations on the very edges of the summit overlooking the city of Petra, positioned so as to both maximise the view over Petra and the visibility of the buildings from Petra. There are clear indications of luxury within the buildings, such as water supply, heated rooms, baths, alabaster and marble slabs, decorative capitals and other architectural ornaments. Other structures on the summit suggest that a comprehensive view over all routes into Petra was a concern. Moreover, the best parallels to the positioning and layout of the buildings are to be found in the Herodian hill-top palaces. All these considerations suggest that we are dealing here with royal or elite installations, whose function was both control over the hinterland of Petra and routes into it, and an ostentatious display of wealth and domination.

Nevertheless, only actual excavation can reveal further details of these intriguing buildings. The preliminary season of survey work has provided some indication of the nature and date of these structures, as well as highlighted the logistical issues to be overcome in undertaking more extensive fieldwork on Umm al-Biyāra. The authors are now planning a campaign of several seasons of excavation, with the objective of determining the precise nature, date and function of the Nabataean structures, and their role in the geo-politics of Petra and in the Nabataean realm.

Prof. Dr Stephan G. Schmid
Winckelmann-Institut
Humboldt-Universität zu Berlin
Unter den Linden 6
10099 Berlin, GERMANY
stephan.g.schmid@culture.hu-berlin.de

Prof. Dr Piotr Bienkowski
School of Arts, Histories and Cultures
University of Manchester
Oxford Road
Manchester M13 9PL, ENGLAND
piotr.a.bienkowski@manchester.ac.uk

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