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Rethinking Monument 468(the Burg-Berge Monument) on the Ad-Dayr/Ad-Deir Plateau, Petra, Jordan

Abstract

In June of 2018, the Ad-Dayr/Ad-Deir Monument and Plateau Project (AMPP) completed the first comprehensive GPS pedestrian survey of the Ad-Dayr/Ad-Deir Plateau linked with low altitude UAV-drone imagery. Special attention was given to Monument 468 (the Burg-Berge Monument) due to its proximity to the Ad-Dayr/Ad-Deir 'Monastery' Complex as well as this massive building's prominent position above the Great Circle Pool now being restored by AMPP. While Monument 468 has previously been briefly discussed in earlier German scholarship, with portions of it drawn by the famous artist David Roberts, there has never been a modern comprehensive study of the site despite its monumental size and precarious positioning on one of the highest peaks to the west of the Ad-Dayr/Ad-Deir façade. Significantly, Monument 468 may have been one of the Nabataean's greatest engineering feats, given its challenging position high on a rocky mountain saddle that gave it birds-eye views of both the Ad-Dayr/Ad-Deir Monument to the east as well as the Wādī 'Arabah escarpments and rift to the south, west, and north. Additionally, this massive multi-tiered building was supported by unique Nabataean substructural engineering as well as rock-cut caves that kept it supplied with water via a large underground cistern complex. This paper discusses the findings of the GPS mapping of Monument 468 and provides never before available on-site information concerning the functions, design, and potential purposes of one of the most important building structures in ancient Petra. This discussion will attempt to answer the question; was such a challenging engineering product the result of a 'culture in crisis,' or a civilization with other agendas?

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1. UAV/Drone (Orthomosaic) aerial image of the central region of the Ad-Dayr/Ad-Deir Plateau with the Ad-Dayr/Ad-Deir Monument in the center-right of the image including its courtyard. The Great Circle Pool lies to the west (left) and above the courtyard, thus topographically protecting the Ad-Dayr/Ad-Deir Monument from flood erosion, with Jebal At-Tanbour and the Burg-Berge Monument above all to the immediate southwest or center left in this photo (AMPP 2014).

Introduction: The Strategic Importance of the Burg-Berge Monument

Over 700 meters above ancient Petra's urban center and to the northwest looms the Ad-Dayr/Ad-Deir Plateau—one of the most militarily strategic and defensible locations in Petra other than the earlier Edomite and Nabataean sites on the massif of Umm al-Biyāra (Fig. 1). Despite its strategic importance, the Ad-Dayr/Ad-Deir Plateau has never been studied with this strategic aspect in mind within the regional contexts of Nabataean Petra. Additionally, situated almost in the very center of the Ad-Dayr/Ad-Deir Plateau is a high rugged mountain topped with the remains of one of the Nabataeans' most impressive engineering feats—the Burg-Berge Monument, one element of which is known as Room 468 (Fig. 2).[1] The mountain itself is shaped like

[1] This number was assigned to the large east facing rock-cut room on the Burg-Berge's lower terrace by Rudolf Ernst Brünnow and Alfred Domaszewski (1904: I 337) and reflects their on-the-ground

2. The Burg-Berge Monument on Jebel At-Tanbour including Room 468 looking from east to west with the excavations and restoration of the Great Circle Pool in the left foreground and excavations of the Ad-Dayr/Ad-Deir Monument's Northwest Temenos Slot Entrance in the very lower left corner of the photo (AMPP 2016).

a long-necked stringed instrument somewhat similar to a lyre or *oud* and called in Persian a *Setar* or *Dotar,* and in Turkish and Arabic a *Tambur,* thus the local name for this mountain escarpment is Jabal At-Tanbour.

Only three possible accesses to the Ad-Dayr/Ad-Deir Plateau itself, all through extremely challenging topographies, made this mountain plateau the ideal location for a Nabataean strategic stronghold and probable palace hidden and protected from Petra's more vulnerable urban center. From the top of the Burg-Berge Monument, whose elevation made communication possible with Jabal an-Nabī Hārūn to the southwest via fire signals, Nabataean defenders could monitor all traffic coming from the south, north, or west up or down the Wādī 'Arabah, as well as defend themselves against invaders who might have penetrated the lower city or the Bayḍa/Beidha Plain to the north. Access to the Ad-Dayr/Ad-Deir Plateau from the southwest is today almost impassable due to the rugged volcanic ridges and vertical cliffs on this side of the Plateau. Even finding the correct passages upward to the Ad-Dayr/Ad-Deir Plateau would have been problematic for invaders unfamiliar with Petra. Once found, the steep, rock-cut stairwells with numerous switchbacks (existing on both the Petra urban access upward from the southeast as well as within the Bayḍa/Beidha track

survey of Petra in 1897/98. Volume 1 of this three volume publication was the first official survey, study and cataloguing of the rock cut structures of Petra, including over 800+ buildings and miscellaneous other archaeological elements.

from the northwest), would have placed any invader at a distinct disadvantage and vulnerable to costly attacks from above, all along these two very narrow winding and steep routes. The only other possible access from the southeast via a branch of the Wādī Siyagh is also almost impassible due to sheer cliffs and an especially steep ascent that would have been challenging to any large company of combatants, and thus also easily defended by local inhabitants. In antiquity, the upper portion of this passage also hosted numerous Nabataean farming terraces and outposts whose residents could have also carefully monitored this ascent pathway.[2] Additionally, in antiquity a visitor to the Ad-Dayr/Ad-Deir Plateau did not use the same path up from the center of the ancient city of Petra that tourists utilize for their final ascent to the courtyard of the Ad-Dayr/Ad-Deir Monument today. In antiquity, this access was blocked at the top and controlled by a *temenos* wall that surrounded and protected the courtyard of the Ad-Dayr/Ad-Deir Monument on the south and southeast. Most of this colonnaded wall has now fallen into the *wādī* to the southeast, however, a few column drums exist on the platform floor on the southeast as visitors approach the Monument today.

The ancient access to the Ad-Dayr/Ad-Deir Plateau from Petra's urban center actually began about 100 m below the modern trail, and turned northwest up a beautifully carved rock-cut processional staircase that ended in a bridge that spanned the Wādī Ad-Dayr/Ad-Deir just to the southeast of the Ad-Dayr/Ad-Deir Monument courtyard. This bridge acted as the only easy access over this steep ravine, with the *wādī* itself serving somewhat like a moat and drawbridge with the entrance to the bridge carefully guarded. A wide-mouthed cave that probably served as a guardhouse still exists on the lost bridge's eastern access at the end of the ancient processional way coming up from Petra's urban center. The footings for this bridge on either side of the *wādī* can still be seen just southeast of the modern café and store owned by the Dak-il-Allah family.

If Petra were compared to a medieval castle, the Ad-Dayr/Ad-Deir Plateau was the higher defensible inner court with the mountain upon which the Burg-Berge Monument sat on Jabal At-Tanbour acting as the center, or castle keep—the place of potential last defense. In traditional Nabataean fashion, however, these brilliant ancient engineers utilized the natural topography of the Ad-Dayr/Ad-Deir Plateau for their castle walls whenever and wherever possible, rather than expend excess resources on curtain fortress walls when nature's walls and *wādī* moats were already available. This allowed the Nabataeans to focus more time, resources, and energy on developing complex water control and storage systems to supply the Ad-Dayr/Ad-Deir Plateau with almost unlimited water sources in multiple locations, and in multiple cistern types, in case of a siege, or for other daily needs. In addition to these strategic advantages, the Ad-Dayr/Deir Plateau is always about ten degrees cooler than the lower city in the summer, and also favored with a daily afternoon breeze that usually begins after the heat of midday.

Thus, it is not surprising that the ancient Nabataeans chose the heights of At-Tanbour on the Ad-Dayr/Ad-Deir Plateau as the location for the amazing structure that we now call the Burg-Berge Monument, a building complex which also encompasses Room 468. This unique building is the focus of this article, which is the first scholarly work to extensively discuss and accurately map the surface remains of the Burg-Berge Monument in detail utilizing aerial drone imagery at a very low height (300 m), linked with on-the-ground GPS survey

[2] Pedestrian and GPS survey was completed in this region by AMPP in 2017 and 2018.

equipment that is accurate to within 30 cm, as well as computer generated mapping and photogrammetry imaging made possible by PIX4D software.

The Discovery of the Ad-Dayr/Ad-Deir Plateau and the Burg-Berge Monument by Explorers and Scholars

Despite the Burge-Berge's impressive architectural remains perched precariously on a high mountain escarpment, it has never received adequate scholarly attention, mapping, publication, and discussion, nor much needed conservation. The first European explorer credited with rediscovering and identifying Petra in August of 1812, Johann Ludwig Burckhardt, was not able to travel beyond the urban center of the ancient city.[3] Additionally, his time in Petra was very short due to his concerns of being discovered as a non-Muslim Western traveler (1822: 421–31).[4]

In 1818, William John Bankes, traveling with the explorers Charles Irby and James Mangles, saw the Ad-Dayr/Ad-Deir Monument through a spyglass as the group visited the heights of Jabal an-Nabī Harūn to the southwest, but this expedition could not find a pathway to actually visit the Ad-Dayr/Ad-Deir Plateau (de Laborde 1830: 85). From their southern vantage point, they could not have clearly recognized the ruins on the At-Tambour heights later known as the Burg-Berge Monument. Another early European explorer by the name of Strangwais visited Petra in 1826 but did not publish his findings (de Laborde 1830: 85). In 1828, the 19-year-old Marquis Léon de Laborde and the 29 year old Louis Linant de Bellefonds (acting as draftsman) explored and mapped portions of Petra including aspects of the Ad-Dayr/Ad-Deir Plateau (1830: 187–8) which de Laborde published in 1830 in *Pétra Retrouvée: Voyage de l'Arabie Petrée*. Laborde and Linant are thus credited with being the first Westerners to set foot on the Ad-Dayr/Ad-Deir Plateau in 1828, and to note the ruins on Jabal At-Tanbour that Alois Musil, who is discussed below, would later call the Burg-Berge Monument. However, the sketch maps of Laborde and Linant are not detailed, comprehensive, nor often very accurate given the kinds of conditions and equipment that they had to work with in this remote location. On the Ad-Dayr/Ad-Deir Plateau, for example, they completely ignored the Great Circle lying between the Ad-Dayr/Ad-Deir Monument and the Burg-Berge Monument, a very visible archaeological site that has a very noticeable diameter (60 m+). In 1836, John Lloyd Stephens, an American lawyer, traveled to Petra after meeting Linant in Cairo. Stephens published his impressions of the ancient site in 1838 in *Incidents of Travel in Egypt, Arabia, Petraea, and the Holy Land*, but without much discussion of what would later be called the Burg-Berge Monument on the Ad-Dayr/Ad-Deir Plateau (Stephens 1970: xxxii–xxxiv). However, Stephens would later become one of the most important discoverers of ancient Mayan societies and ruins in Central America.

On March 6, 1839, the Scottish stage set painter, David Roberts, sketched and utilized a new invention, the *camera lucida*, to capture images of the Ad-Dayr/Ad-Deir Monument and portions of the Lower Terrace Porch of what would later be called the Burg-Berge Monument. These initial

[3] It is important to note, however, that Burckhardt's notes were gathered and published after his death and thus without his personal edits or input. All indications are, however, that he was not able to explore areas of Petra beyond the main access from the south coming from the Wādī ʿArabah that then turns northeastward onto the ancient main *cardo* and exits to the east through the Sīq to Wādī Mūsā.

[4] Burckhardt had spent years perfecting his Arabic as well as his clothing disguises due to the previous murder of European explorer Ulrich Jasper Seetzen in 1809. Seetzen was also attempting to discover and identify ancient sites noted in Reland's work (1714) that included the first modern reference to the lost city of Petra.

3. David Roberts' lithograph of the Ad-Dayr/Ad-Deir Monument which he visited in 1839. In this image all distances are conflated and the Bedouin pictured are standing on the remains of the Burg-Berge's colonnaded Lower Terrace. The Great Circle has dropped out of this image and all the vistas surrounding the Ad-Dayr/Deir Monument are incorrect (from Roberts 1846: III pl. 90).

sketches and proto-photographs provided the backdrops for Roberts' later lithographs of the site published in six volumes in *The Holy Land, Syria, Idumea, Arabia, Egypt, and Nubia* in 1846–1849 (Fig. 3).[5] While these lithographs are valuable visual historical documents, we must remind ourselves that Roberts was only able to reside in Petra approximately two days due to local Bedouin hostilities toward Roberts' expedition. His later lithographs are done from memory, quick sketches, and the shadow outlines of edifices captured by the *camera lucida* that were then later trolleyed together with the eye of a former stage set artist who emphasized the dramatic, but often ignored other archaeological evidences in his works, and even distorted accurate distances between architectural remains for visual effect. However, after Robert's publications and stunning visual lithographic images became known, numerous Western visitors began to attempt the arduous and dangerous trip to Petra. Some of these included Formy (visited in 1840), E. Robinson and E. Smith (published in 1841), and Harriet Martineau (visited in 1848) who was the first person to notice the Great Circle lying between the Ad-Dayr/Ad-Deir Monument and the Burg-Berge Monument (Stanley 1866: 47–

[5] For the Ad-Dayr/Ad-Deir Monument and a portion of the colonnaded porch of the Burg-Berge Monument, see Roberts 1846: III pl. 90.

92). These intrepid travelers were followed by over 33 other explorers including Sir Arthur Penrhyn Stanley who published his journeys in 1866. A number of these travelers mention the ruins on Jabal At-Tanbour, but do not name it nor understand its architectural elements or functions.

The first Western explorer credited with naming the archaeological ruins situated on the apex of Jabal At-Tanbour was the Moravian (Czechoslovakian) explorer and priest Alois Musil who reached the Ad-Dayr/Ad-Deir Plateau and Petra in 1896 (Brünnow and Domaszewski 1904: xi, 338). At this time, Moravia was part of Germany and before and during World War I, Alois Musil served Germany in the Near East as the counterpart to their English adversary and British spy, T.E. Lawrence. Musil's explorations, discoveries, and exploits were so famous that his portrait currently appears on Czech currency. Before the First World War, the orientalist, explorer, and later spy, Musil, subsequently gave lectures in Vienna in 1899, 1901, and 1902 concerning his discoveries (which included Qaṣr ʿAmra in Jordan), and named the archaeological remains on Jabal At-Tanbour on the Ad-Dayr/Ad-Deir Plateau the 'Burg-Berge Monument.' However, Musil did not include it, nor the Great Circle, in his two volume publication of maps, *Arabia Petraea, Vols. I & II, Edom*, which appeared in 1907 and 1908.[6] In German, 'burg-berge' has multiple meanings including, 'palace,' 'castle,' and 'fortress mountain' which all seem to suit the archaeological surface remains of At-Tanbour quite adequately as the buildings on its summit may have served all of these functions in Nabataean contexts over time. After World War I, Musil eventually taught at Charles University in Prague. In an ironic twist of history, in 2016, AMPP and Brigham Young University geology specialists co-partnered with Czech geologists from Charles University who specialized in sandstone in order to properly clean the second story of the Ad-Dayr/Ad-Deir Monument of erosion debris and foliage, and to assess its geologic condition for conservation efforts. At that time, we did not realize the historic connection of Charles University to Alois Musil and to Musil's early explorations of the Ad-Dayr/Ad-Deir Plateau and the Burg-Berge Monument. The research for this paper thus uncovered this delightful historic link that brings Musil's explorations full circle and underscores his connections to this great Czechoslovakian university.

By the late 1800s/early 1900s, and especially after World War I, the exploration and mapping of the Petra Region began to be more systematic. In 1897–1898, the German-American orientalist and philologist Rudolf Ernst Brünnow (who eventually taught at Princeton University) teamed up with the Austrian-Polish Scholar Albert Domaszewski (who eventually taught at the University of Heidelberg) to explore and map the major edifices of Petra. Published in 1904, *Die Provincia Arabia* was the first systematic study of the Petra Region that endeavored to map and number major building and tomb structures as well as other significant archaeological elements. In all, Brünnow and Domasewski identified over 800 edifices and elements, and their numbering system is still referred to today by scholars studying Nabataean tombs and rock-cut structures. For example, the Ad-Dayr/Ad-Deir Monument is Tomb No. 462 in their numbering system. Brünnow and Domasewski credit Alois Musil with naming the Burg-Berge Monument even though Musil's publications were not available until 1908, fully four years after the release of *Die Provincia Arabia* (Brünnow and Domasewski 1904: xi, 338). We must therefore assume that being in the German and Austrian circle of scholars, Brünnow and Domasewski must have heard some of Musil's lectures given in Vienna in 1899, 1901, and 1902 and/or

[6] See Musil 1907 and 1908: I 139–50 figs. 103–118, 148.

been in correspondence with him. Despite their more systematic approach to mapping Petra and the Ad-Dayr/Ad-Deir Plateau, the maps created by Brünnow and Domasewski are still very problematic. While they note both the Ad-Dayr/Ad-Deir Monument and the basic location of the Burg-Berge ruins, they call the Burg-Berge, 'the Ad-Dayr,' (probably misidentifying the Ad-Dayr/Ad-Deir Mountain rather than this mountain's local name of At-Tanbour versus Jabal Ad-Dayr/Ad-Deir to the east), and inaccurately place and/or misidentify many of the other archaeological elements and geological formations on the Plateau including the Great Circle (Brünnow and Domaszewski 1904: Taf. XIV.S.336). Again, we must be sympathetic to the constraints these early explorers were under given the traveling conditions, issues of personal safety, and types of surveying equipment that were available to them in portable form under the worst of geological and environmental conditions.

The next important scholar to publish information on the Burg-Berge Monument from on-site observations was the German Lutheran theologian and pioneer in Aramaic Studies, Gustav Dalman. His work, *Petra und Seine Felsheiligtümer*, was published in 1908, and cites both the previous explorations of Alois Musil as well as Brünnow and Domaszewski (Dalman 1908: 263, 271, 278–7). Dalman was the first to suggest that the large rock-cut cultic room (Room 468) of the Burg-Berge Monument may be cardinally oriented in relation to the sun during certain times of the year, and thus allowed for the illumination of the shrine at the very back of the structure on these celestial occasions (Dalman 1908: 207, 212). This theory, however, seems questionable given the fact that the entire front of Room 468 was surrounded by a very large columned terrace that was roofed in antiquity. Both the roofing of the terrace as well as the heights of the mountain of the Jabal Ad-Dayr/Ad-Deir to the Burg-Berge's east would have made any cardinal alignment with the sun, solstices, and the interior shrine of Room 468 problematic, if not impossible, at the Lower Terrace level. However, it must be noted that our AMPP project has not yet tested Dalman's hypothesis during the winter solstice. The extreme height of the rock-cut entrance to Room 468, whose upper doorway section may have been higher than the Lower Terrace roof structure and open to both wind and light, might be of significance with relation to Dalman's claim. The entrance opening is higher and larger than any ancient doors could have enclosed. The question thus remains, why did the Nabataeans carve such a high entrance to Room 468 if it could not be enclosed, especially if the room was related to burials and/or had additional cultic significance? Was the height of the doorway related to the position of sunlight entering the room, or did such a high door act as a breeze collector to cool both the room and the terrace in front of it, becoming a Nabataean rock-cut version of a Persian *iwan*? More research needs to be conducted at the site in order to answer these questions.

After Dalman's work of 1908, it was not until 1991 that the Jordanian scholars Fawzi Zayadine and Suleyman Farajat published a brief description of the Ad-Dayr/Ad-Deir Monument as part of an initial Jordanian survey of the Ad-Dayr/Ad-Deir Plateau, but with no significant attention to the Burg-Berge Monument (Zayadine and Farajat 1991: 282–4). The Burg-Berge Monument remained largely ignored and unnoticed within Nabataean scholarship for almost 75 years until another German scholar, Manfred Lindner, began to publish more research on the Ad-Dayr/Ad-Deir Plateau with specific descriptions of the Burg-Berge Monument (Lindner *et al.* 1984: 163–70; Lindner 2001: 393–4). Lindner relied heavily upon the previous publications of Brünnow and Domaszewski as well as Musil.

Lindner's works often contain inaccuracies both in the naming history of the Burg-Berge Monument as well as in his maps and sketches of the archaeological remains on the Ad-Dayr/Ad-Deir Plateau, including the Monument itself. He did, however, note, photograph, and sketch some of the basic elements of the Burg-Berge Monument, including the foundations or supports for two small mysterious *tholoi*-like structures above the second terrace, as well as noting the mosaic floor on the apex of the mountain. Lindner also initially utilized other sources to attempt to date the Burg-Berge based on column capital styles and suggested that elements of the building were associated with the late 1st c. BC (Lindner *et al.* 1984: 168). However, Lindner later incorrectly followed F. Zayadine in associating the earliest horned Nabataean capital with the era of the Nabataean king Rabbel II (*ca.* AD 75–106; Zayadine 1980: 244; Lindner *et al.* 1984: 168). Thus, in his initial analysis, Lindner stated:

> *The 'Burgberg' opposite the rock temple (The Ad-Deir Monument) shows no definite traces of a fortification or a castle. There are, however, impressive signs of its former role as a splendid sanctuary* (Lindner *et al.* 1984: 180).

Given this statement, it is obvious that Lindner did not look at the Burg-Berge Monument in a regional context with relation to topography and relative location. In 2001, however, Lindner revisited an assessment of the Burg-Berg Monument in a second article published in *ADAJ* (Lindner 2001: 393–4). The two *tholoi*-like structures were again discussed, and Lindner labels at least one as a '*monopteros*,' *i.e.,* a *tholos* without sidewalls. By AD 2000, however, fully one-half of one of these small circular structures had already disappeared, but Lindner dated the remaining *tholos* to the Herodian Perod (*ca.* 74/73 BC to 4 BC).[7] In his very final assessment Lindner states:

> *It seems to me that ad-Dayr and the structure of the 'Burgberg,' including the results of previous examinations (Dalman, 1908, 1912; Lindner, 1984; Zayadine and Farajat, 1991) should be reassessed as a highly important ensemble. The top of the 'Burgberg' deserves thorough investigation, excavation, and consolidation, not only for scientific purposes but also for furthering the tourist trade. The on-going destruction of the 'Burgberg' top opposite the impressive façade of ad-Dayr should not be tolerated* (Lindner 2001: 394).

Lindner's appeals for the importance and tragic condition of the Burg-Berge Monument remained unheeded as the development of Petra for tourism from the late 1970s through today has focused mainly on the excavation of ancient buildings in the city's urban center, *i.e.,* the clearance of the Siq, the excavation of portions of the Temple of the Winged Lions, the Roman-era Theater, the Byzantine churches, and the so-called Great Temple and adjacent Garden Pool Areas. Thus, the Burg-Berge has remained basically ignored by scholarship and abandoned to deterioration and vandalism until the Ad-Dayr/Ad-Deir Monument and Plateau Project began its mapping on the Plateau with a special focus on the Burg-Berge Monument in 2017 and 2018. Within our mapping system, the Burg-Berge is recorded as Element 129

[7] It should be noted, however, that these dates reflect the birth and death dates of Herod the Great. The Herodian building period could not have begun until Herod the Great, as an adult, solidified his political power over Judea after 41 BC.

and Element 130, as well as Element 459 with sub-elements noted as either 130.1 or 459.1 respectively depending on their location and survey date. The sub-elements associated with Elements 129 and 130 in our survey designate archaeological elements around the lower base of Jabal At-Tanbour that were mapped in 2013. Sub-elements associated with Element 459 (459.1, 459.2, etc.) document all visible archaeological remains on the upper mountain and building site itself that were mapped in 2017 and 2018. In order to understand some of the complexities of this massive edifice as well as its importance within Nabataean engineering, we must begin our description of this amazing building from its substructures, and then climb upward via its only access on the northeastern side of the mountain and onto its numerous terraces to the final apex of the mountain of At-Tanbour.

Substructures of the Burg-Berge Monument

One can only approach the Burg-Berge Monument with the intent of a pseudo-easy ascent from the northeast side. Without modern climbing ropes and equipment, the Burg-Berge is relatively inaccessible from any other direction due to massive sheer cliff walls, and thus we assume that the modern access to the First Lower Terrace of the Burg-Berge follows somewhat the same route of the ancient Nabataean stairs. Upon approaching the base of the mountain from this side, two structural elements are quickly observed. First, beneath Jabal At-Tanbour and the Burg-Berge Monument lies a massive dog-leg-shaped cistern now filled with erosion debris and garbage (to the visitor's lower left as one begins the ascent). This is AMPP Element 129 that was surveyed in 2013.[8] This cistern measures 12.90 m on its South Wall, by 5.47 m on its North Wall by 10.31 m on the North dog-leg wall, by 13.52 m on the East. The other sides of this rock cut cistern are now penetrated by eroded openings in its rock wall surfaces. Without archaeological excavation, it is impossible to accurately estimate this cistern's original water containment volume, but given the ongoing AMPP excavations of Cliff Cistern B across the valley to the northeast under the skirts of Jabal Ad-Dayr/Ad-Deir, we can make a guestimate. Given the known dimensions of Cistern B after excavation, we estimate that at capacity it could have held 500–550 m^3 of water. Significantly, given its horizontal dimensions, the massive cistern carved at the base of Jabal At-Tanbour and under the Burg-Berge Monument may be just over two times the size of Cistern B, if depths are similar. This was thus a huge cistern complex serving the Burg-Berge with a potential holding capacity of 1,000 to 1,100 m^3 of water.

Additionally, extremely large rock cut water channels feeding into this cistern, as well as another probable unexposed cistern on the southeastern underbelly of the mountain, can still be identified by the careful observer. As a visitor climbs the lower rock wall substructure levels up to the first and largest terrace of the Burg-Berge, one large vertical rock-cut channel can be seen to the left coming straight down from the upper mountain and toward the cistern noted previously (this is AMPP Element 459.36). Another rock-cut channel, wide enough to walk in, runs from below the Upper First Terrace of the Burg-Berge Monument and winds around the east and southeastern cliff face beneath the terrace itself to a probable second cistern complex at the base of the eastern and southeastern side of the mountain. This cistern complex has been completely filled in with erosion

[8] All AMPP archaeological element numbers for the Ad-Dayr/Ad-Deir Plateau are recorded as part of the MEGA (Middle Eastern Geo-Database for Antiquities) System that includes comprehensive descriptions of each element as well as its conservation status.

and could not be measured during our survey in 2013. It should also be noted that the lower skirts of Jabal At-Tanbour also host numerous cultic niches. In addition, many of the column drums and column capitals from the First Lower Terrance of the Burg-Berge Monument have fallen and rolled down the Eastern Cliff face of Jabal At-Tanbour and are now located in the *wādī* to the east which is subject to intense flash floods during the winter and early spring rainy seasons. Our survey team attempted to measure and document as many of these architectural elements as possible in this *wādī* for future retrieval, but many more may lie beneath the present surface and have been buried by water erosion over time as well as many that may have been washed further down the *wādī* and are now also buried (Fig. 4).

Secondly, above these cistern complexes and on the east face of Jabal At-Tanbour, the amazing engineered supports for the First Lower Terrace of the Burg-Berge Monument can be seen. Utilizing both natural crevices in the cliff face as well as man-made cuttings, the Nabataeans inserted limestone support blocks to create massive piers to support the built structures above (Fig. 5). The natural bedrock of the cliff on either side of each crevice gave the piers extra strength and countered the downward pressures of the weight of the large colonnaded terrace above by disbursing these pressures throughout the bedrock cliff face itself. The Nabataean use of natural geological features as integral

4. Column drums from the Burg-Berge Monument that have fallen into the wādī to the east and southeast of Jebel At-Tanbour. These probably originated from the Lower Terrace (AMPP 2019).

5. The east face of Jebel At-Tanbour where Nabataean engineers utilized faults and vertical crevices in the mountain in which to construct built stone support piers for the Lower Colonnaded Terrace of the Burg-Berge Monument (AMPP 2018).

parts of their engineering programs is not unique to the Burg-Berge Monument. When excavating the remains of a Nabataean water control system in the West Temenos Slot Entrance to the Ad-Dayr/Ad-Deir Monument Courtyard, it became clear to the AMPP team that the Nabataeans inserted the base support blocks for this dam into rock notches in the natural cliff sides of the dam on the water side of the structure. The pressure of the water thus pushed the support stones into the natural cliff face and increased the holding capacity of the dam itself by disbursing these pressures into the natural bedrock sidewalls. When carefully observing other extant Nabataean dam structures throughout the Petra Park, it is interesting to note how often these brilliant ancient engineers utilized this same technique to control potentially powerful and damaging flash flooding, and in turn were able to collect and store massive amounts of seasonal rain water and snow melt. This is a technological water engineering system that needs to be restored and maintained not only to create fresh water resources for the Park and region, but to also control the damaging flood erosion that destroys much within the Park each year.

The current ascent to the Lower First Terrace of the Burg-Berge Monument lies adjacent to the base of the Northeastern side of Jabal At-Tanbour, and is a scramble over fallen architectural debris. The support walls of the Lower First Terrace are situated to the left of the climber and dog-leg to the east over the bedrock of the mountain itself, with the lowest wall coursings of the terrace exhibiting the typical Hellenistic masonry block pattern of header-stretcher-header. The second visible coursing is laid with off-center stretchers, and the third visible coursing returns to the Hellenistic wall pattern. Coursings above these

initially visible lower ones utilize a more sporadic pattern of headers and stretchers characterized by other similar Nabataean walled structures, such as those seen in the walls of the possible cultic center of the High Place of Sacrifice. Given the ashlar patterns noted above, the Burg-Berge may have been started in the Late Hellenistic Period (*ca*. 100 BC or before) with its upper terrace walls completed by the end of the 1st c. AD when more sporadic stone ashlar placements became popularized from the mid-1st c. BC onward.

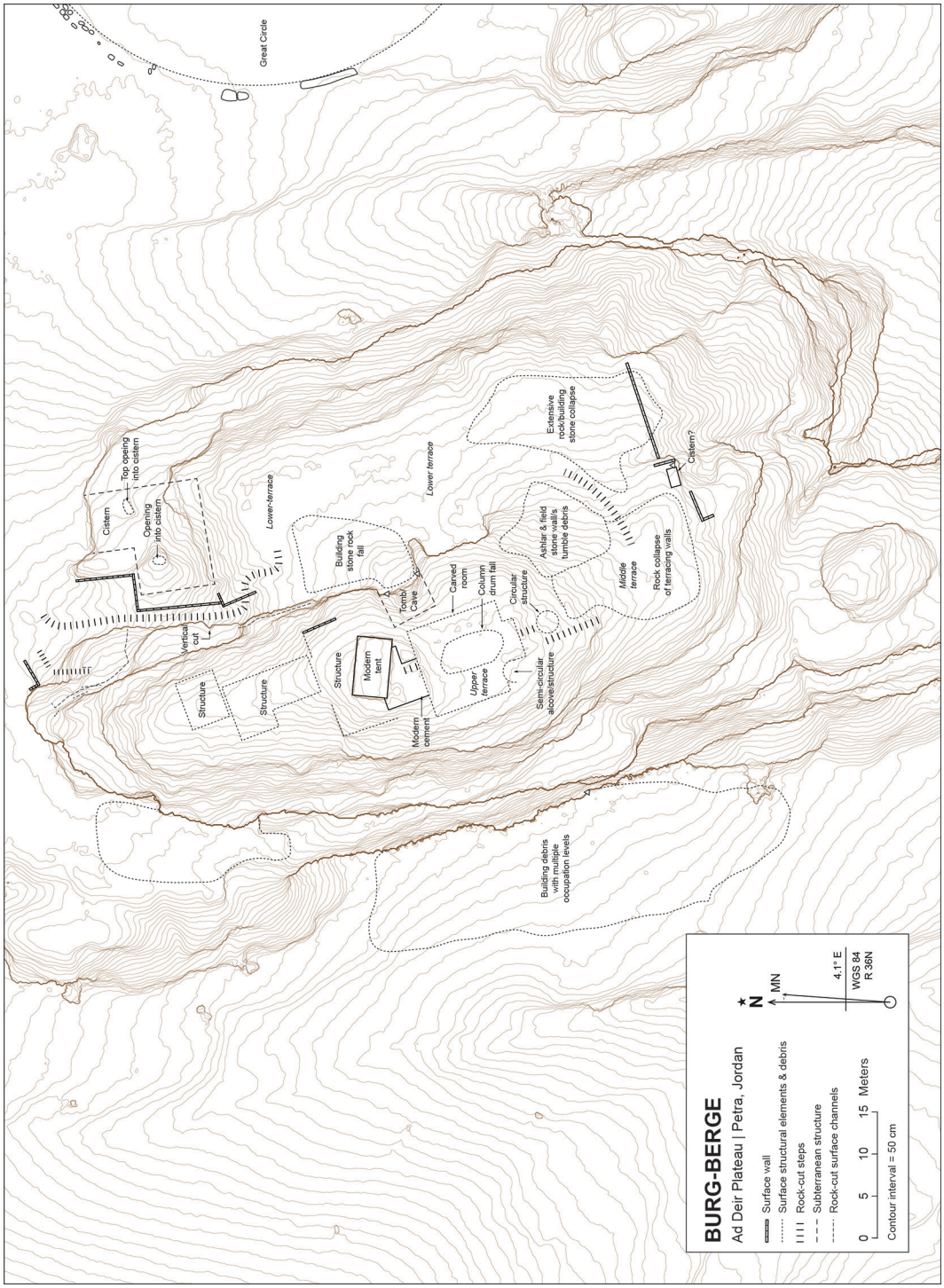
These last remaining in-situ terrace support walls to the viewer's left (as one climbs up to the Lower First Terrace) also support the last vestiges of the northeast corner of the beautifully laid ashlar limestone terrace floor. On this last remaining corner also sits one of the last of ten in-situ column bases for the Lower First Terrace colonnade. This corner edge is currently hanging over the cliff edge and will soon be destroyed by ongoing neglect and yearly erosion forces. Other damaged parallel foundations for additional terrace support walls resting on bedrock just to the northwest are also evident, but were too dangerous to measure or map with GPS given their crumbling position on the northwest cliff edge.

The Lower First Terrace (AMPP Element 459.29)

The Lower First Terrace of the Burg-Berge Monument was its largest and most visible structure in antiquity with an estimated original length of almost 55 m from northwest to southeast along the first terrace ridge of the east face of Jabal At-Tanbour. Its current extant remains along this building line are 46.063 m in length with the majority of its colonnade and some of its support flooring fallen to the *wādī* below on the east (see Figs. 3–6). The total width of the Lower First Terrace was approximately 15 m depending on where one measures given the current fallen building debris. Given current visible remains, this Lower First Terrace supported three rows of columns with the longest colonnade on the eastern edge of the cliff overlooking the Great Circle Pool and the Ad-Dayr/Ad-Deir Monument (Fig. 6). Currently 10 column bases for this colonnade can still be found along the outer line of the terrace (Fig. 6). Lindner and colleagues (1984: 167 fig. 3) record 11 bases with three of these inclusive of column clusters, especially on either end of the colonnade, and in the last three column supports on the northwest. Two additional rows of columns, located closer together, adorned the Lower Terrace just to the northwest and were located in front of the large rock-cut room known as Room 468 (Figs. 6–8a–c).

The arrangement of the columns brings up questions as to the actual structural nature of the colonnade or colonnades on the Lower Terrace of the Monument. The distance between the outer eastern colonnade and the next closest potential colonnade to its west is a little less than 10 m, which is quite a distance to span for ancient stone roofing systems in Petra. How was this accomplished? Cedar beams were seemingly more practical than stone for such an endeavor given the lack of any known support structures between these two extant column rows. But was the roof flat or pitched given that weather events on the Ad-Dayr/Ad-Deir Plateau can include both heavy rain and snow in the winter and early spring? Was the roof tiled with kiln baked clay tiles or covered with some other material such as bronze or copper as was seemingly done for the roofing of Qaṣr al-bint Pharaon in the center of the ancient city?[9] These

[9] Excavations of the foundations of Qaṣr al-bint Pharaon were undertaken by the author in 1978 under the direction of Dr. Phillip Hammond for the subsequent UNESCO restoration efforts of the temple. At the bottom of our test trench on the east side of the temple we discovered a roofing plate of bronze with a high copper content.


BURG-BERGE
Ad Deir Plateau | Petra, Jordan
Surface wall
Surface structural elements & debris
Rock-cut steps
Subterranean structure
Rock-cut surface channels
0 5 10 15 Meters
Contour interval = 50 cm
N
MN
4.1° E
WGS 84
R 36N
Great Circle
Cistern
Top opening into cistern
Opening into cistern
Lower terrace
Vertical cut
Structure
Structure
Structure
Modern tent
Modern cement
Building stone rock fall
Tomb Cave
Carved room
Column drum fall
Upper terrace
Circular structure
Semi-circular alcove/structure
Ashlar & field stone walls tumble debris
Middle terrace
Rock collapse of terracing walls
Extensive rock/building stone collapse
Cistern?
Building debris with multiple occupation levels

6. (Opposite page.) AMPP topographic map of the Burg-Berge Monument with all major extant surface elements labeled and outlined. The map was generated from a photogrammetric model created from aerial imagery captured by a UAV flown over the Plateau. The features were verified using a pedestrian survey and GPS mapping. While the major archaeological elements can be seen on this aerial view, it is also difficult to get a 3-D perspective of the height relationships between the multiple and complex terrace structures of the Monument. The First Lower Terrace can be seen to the lower right with the visible remnants of its three colonnades noted with current column drum and base placements (AMPP: S. Ure 2019).

7. Room 468 on the west side of the First Lower Terrace of the Burg-Berge Monument with its back wall cultic niche and monumental doorway (AMPP: J. Newbold 2018).

questions cannot be answered without scientific archaeological excavations of the site and careful restoration, however some surface remains may give us clues as will be noted below. Additionally, did the second set of columns, which lie closer together on the west, run the full length of the Lower Terrace or just a short distance on either side of Room 468 as part of an entrance? How did this colonnade tie into the larger roofing structures of the Lower Terrace itself, and how did it relate to the very high rock-cut doorway for Room 468? Again, without scientific archaeological excavation, these questions cannot be answered entirely by only extant surface remains that are covered by building collapses of the Lower Terrace and the structures above it that fell down the upper mountainside to this area on the east side of Jabal At-Tanbour. The current visible remains of all existing column bases, however, suggest an alignment between the placements of the outer eastern colonnade with the two inner ones (Fig. 6). The diameters of all existing columns range from 55/56 cm in diameter to 59/60 cm with the largest diameter being 61 cm. Distances between the columns averaged to about 2.90 m on the inner colonnades with a slightly wider distance variance between the columns on the furthest eastern terrace overlooking the drop into the *wādī*. This slight variation may have been due to the geological nature of the cliff edge that supported the terrace floor and the subsequent outer colonnade alignment.

The Lower Terrace is also the home of the huge rock-cut room known as Room 468 in Brünnow and Domasewski's

a

b

c

8. a) Close-up of the back wall cultic niche in Room 468 of the Burg-Berge Monument (AMPP: C. Finlayson 2018).

   b) The carved figure on the left side corner of the second fascia of the cultic niche of Room 468 (AMPP: C. Finlayson 2018).

   c) The carved figure on the right side corner of the second fascia of the cultic niche of Room 468 (AMPP: C. Finlayson 2018).

survey number system (AMPP Element 459.23; see Figs. 6–8a–c). The questions associated with the gigantic size of the rock-cut doorway to this room have already been noted. It is this enormous rock-cut entrance that is visible from just about any location on the southeastern side of the entire Ad-Dayr/Ad-Deir Plateau, thus, it was the first visual marker that drew early explorers to Jabal At-Tanbour. This rock-cut room faces east toward the Eastern Cliffs of Jabal Ad-Dayr/Ad-Deir and the Ad-Dayr/Ad-Deir Monument, with the Great Circle Pool lying below it just beyond a *wādī* at the eastern base of Jabal At-Tanbour (see Fig. 2). When filled with seasonal water, the Great Circle Pool must have been a beautiful reflective surface between the Burg-Berge Monument and the façade of the Ad-Dayr/Ad-Deir Monument. Room 468 measures roughly 5 m x 6 m in size horizontally, however, the floor is unevenly filled with erosion debris and goat dung. Without archaeological excavation, it cannot be determined if the room originally functioned as a tomb, a memorial chapel, a triclinium, or even possibly all three functions all at once, or individually over time. Remnants of column

drums at the front of the room hint at its once grand entrance decoration that was somehow associated with the western most colonnade on the Lower Terrace. In the far back wall (within its own carved rectangular alcove) is hewn a very large pedimented cultic niche in the shape of the façade of a Classical temple (Fig. 8a–c). The outer side columns of the niche are chamfered (*i.e.,* square in shape) and rest on column plinth bases that are undecorated. The lower first third of each of the square outer columns is also undecorated. The upper two-thirds of the columns on both sides of the niche are carved with multiple squares (six on each column) that stand out due to the relief carving around each. Additionally, each of these outer columns is topped by a Nabataean horned capital that supports an upper architrave divided into two fasciae. Significantly, more than one fascia is characteristic of both the Ionic and Corinthian Classical Orders, architectural paradigms that the Nabataeans loved to play with while inventing their own capital styles and design combinations. The playful characteristics of Nabataean architectural design and embellishments thus make secure dating of these elements problematic if stylistic analysis is the only methodological approach utilized to create a chronology.[10] At either corner of the uppermost fascia are carved single figures with their upper torsos contained within a square cut frame. The top of the fascia also hosts a line of dentition that separates the fascia from the upper triangular pediment. This dentition molding is repeated in the upper triangle of the pediment itself. At the top of this pediment, situated at its apex, is a rectangular-shaped platform with a flared bottom that may have contained or supported another decorative element that is now missing. Additional acroteria figures may have sat on the upper corners of the pediment but are now gone.

The identities of the two anthropomorphic figures in the upper fascia of this niche are highly debated by modern scholars with relationship to their gender and potential mythological associations in Nabataean contexts. Each holds a single cornucopia (the left figure with the cornucopia over its right shoulder, and the right figure with the cornucopia over its left shoulder if the viewer is facing the niche; Fig. 8b–c). At first glance, the damaged nature of the niche makes it difficult to determine if the figures are females with breast lines, or males with overdeveloped chest muscles. The shoulders and torso of the figure on the viewer's left (Fig. 8b) are fully covered by a modified Greek-style himation that seemingly drapes over both shoulders and the chest, rather than just over the left shoulder as in the Classical Greek style for males, thus possibly indicating that the figure on the left fascia is female. Similar himation-like garments are also seen in the funerary portraits of Palmyra, Syria representing an Arab-Aramaean ethnic group similar to the Nabataeans, and one also subject to the synthesis of clothing styles that developed in the East since the Persian period when aspects of East Greek and Persian clothing styles were merged even before the conquests of Alexander the Great. Significantly, both figures in the second fascia of AMPP Element 459.23 have been defaced by iconoclasts over time, but their sculptural remnants indicate that both had long hair possibly rolled into shoulder-length curls with elaborate headdresses.

[10] J. Mckenzie's (1990) attempts to date Nabataean structures utilizing stylistic analysis by comparing some with tombs at Mad'in Salah was only based on a relatively few tombs close to the center of urban Petra, and did not rely on an adequate number of examples, nor tomb types from all regions of Petra in order to establish a reliable dating system based on architectural styles. A new categorization has currently been developed by one of my graduate students, Josie Newbold, who has visited and data-based over 300 Nabataean rock-cut structures ranging over the entire area of Petra (Newbold 2020).

Although Robert Wenning has suggested that both sculptural figures represent male tychai (*i.e.,* male figures of good fortune), I disagree for the following reasons.[11] Close on-site examination and the magnification of the photos taken of these figures suggest that both were intended to be female. The figure on the viewer's left has already been discussed, and a magnification of this figure's photo clearly indicates a breast protrusion under the woman's garment just to the right of the figure's right hand—the hand that clutches the base of her cornucopia. The figure on the viewer's right is more complicated. This figure has the himation draped over its left shoulder, but instead of the chest being bare as in the Greek male style, this figure is wearing a tunic/thob or chiton underneath the himation, with the right breast clearly discerned creating a protrusion underneath the chiton (though it is slightly defaced). This figure also possibly hosts a decorative band around her right arm (commonly also seen in female Palmyrene funerary portraits) and the figure may be clutching a grain sheaf or sheaves along with the base of a cornucopia in the left hand. In fairness, however, it should be mentioned that in the East, Greek style clothing was often modified and lost its gendered associations, with both males and females often wearing items of clothing or clothing styles that breached earlier Classical Greek cultural gendered paradigms. For example, at Palmyra both women and men wore a himation-like garment over both shoulders, and women often wore male Persian style riding pants and boots under their long tunic style dresses, or thobs, in funerary portraiture (Finlayson 2004). Possibly more important than gender identity with relation to the Nabataean figures under discussion is the fact that both figures also hold a cornucopia, a Hellenized symbol that was commonly associated with female figures of fertility, abundance, and nourishment, especially in the Eastern Mediterranean region. The association with nourishment is especially important to highlight if the cultic niche (in which these Nabataean figures were carved) was perceived by its patrons to be associated with the continual nourishment of a deceased loved one/or ones in the Afterlife.[12] While there are exceptions to the exclusive gendered usage of the cornucopia with female figures (including goddesses and spirits of fortune especially in Greek and Roman art and artifacts), male spirits or deities holding the cornucopia, or associated with it, are very rare (see n. 12). Of those male exceptions, Dionysus, Serapis, and Hades are pertinent to note given the potential for this cultic niche to be associated with the honored dead of the shrine's patron, and the roles of these deities and their possible Nabataean avatars with relation to the Afterlife and rejuvenation. Additionally, cornucopiae were popularized

[11] Personal discussion with Dr. Robert Wenning at the Florence Conference in January 2019.

[12] One of the Greek myths of the origin of the cornucopia is linked with the nourishment of the infant god Zeus by the divine caretakers who kept him hidden from his father Cronos in a cave on Mt. Ida on Crete. Some sources say that when the powerful god-child Zeus inadvertently broke off one of the horns of the milk-giver Amaltheia (a goat goddess), the horn obtained the power to provide for unending nourishment. For a summary of these myths, and Amaltheia commemorated by Zeus as the constellation Capricorn, see Graves 1988: 39–40. By the Roman period, the cornucopia was predominantly associated with female goddesses and spirits of Fortune, Harvest, and Prosperity or Abundance of Spirituality. There were only a few male personifications that were also at times associated with the cornucopia in art. These included Dionysus, Plutus (god of riches and the son of the grain goddess Demeter), Hades (who in the mystery cults of the age was associated as a benefactor of agriculture and mineral and spiritual wealth), and the Greco-Egyptian Priapus who was associated with fecundity (Cooper 1978: 43). Significantly, the constellation Capricorn (the Goat) was symbolic of life-giving principles and could also be represented by the dolphin as well as associations with the winter solstice (Cooper 1978: 43, 198–200).

throughout the Hellenized Near East as symbols of prosperity and fecundity by both the Ptolemies and the Seleucids as well as copied and utilized by local kingdoms on both sides of the Jordan River including the Hasmoneans, and eventually even Herod the Great.[13] The cornucopia or double cornucopiae also symbolized the promise of nourishment to the populace by a ruling body, and became a popular symbol of Eastern dynasts including the Nabataean kings. The cornucopia, via its mythological origins in the Hellenized world, also associated rulers with the divine kingship of Zeus and/or local pagan avatars.[14] Given the figures carved on the niche within Room 468 discussed above, it is thus significant to note that the first use of the single cornucopia in the iconography of Nabataean coinage occurred with the reign of the Nabataean king, Malichus I (*r.* 59–30 BC) with the double cornucopiae introduced on Nabataean coinage by Obodas III (*r.* 30–9 BC), the progenitors of Aretas IV Philopatris (9/8 BC to AD 39/40; Meshorer 1975: 88–93 pl. 2). We can thus tentatively assume, given the horned capitals of the niche and the use of the cornucopia by both figural elements, that the niche may date to *ca.* 59–30 BC, but no later than AD 106 with the Roman annexation of Petra to the Roman Empire.

The second smaller niche carved within the larger outer one also hosts two square columns topped by Nabataean horned capitals (Fig. 8a–c). The architrave hosts two fasciae capped with horizontal molding. The upper-most fascia is decorated with a pseudo-Greek Doric decoration of metopes and triglyphs. Each metope hosts a circle carved in relief with a total of six extant circles. The inner niche or aedicule may have hosted either a figural sculpture or an aniconic betyl, but neither of these potential sculptural options have survived. The entire shrine is heavily damaged and continues to be defaced by extensive modern graffiti.

As a visitor leaves this Lower Terrace and turns upward to the right to ascend the only access to the southern stairs of the Burg-Berge Monument, the foundations and walls of numerous rooms perched on the southern-most terrace and cliff of Jabal At-Tanbour to the right and left on the Middle Terrace are still visible (see Fig. 6). These appear to have been rooms meant for habitation with finely constructed ashlar walls. This type of solid wall construction on this particular side of the mountain makes perfect sense given the weather patterns that move across the heights of Jabal At-Tanbour and the Burg-Berge Monument. Most major storms arrive from the south up the Wādī ʿArabah from the Red Sea, thus situating these massive walled rooms on the southern side of the Monument provided needed protection for the colonnaded Lower Terrace and the building's residents, as well as cooling breezes through probable south facing windows in the summer. Remains of collapsed wall structures are everywhere and include large amounts of red terracotta coarse ware roofing tiles that may indicate that the whole monument was roofed in such a manner. This also indicates that the roofing supports may have been cedar timbers rather than stone beams. Among this debris, the AMPP survey team

[13] See Marshak 2015: 68–72 for examples and discussion of the cornucopia or double cornucopiae in Hellenistic and Early Roman coinage of dynasts in the East including Cleopatra Thea and John Hyrcanus I with the impact of dynastic iconography on the Idumaean Herod the Great and Nabataean king Obodas III. See also Marshak 2015: 126–36 for the cornucopiae in Herod the Great's coinage and a history of this symbol's use in Ptolemaic contexts; also Marshak 2015: 165–73 for Roman influences on Herodian coinage.

[14] See Marshak 2015: 38–42 for the concept of divine kingship in the Hellenistic and Early Roman Period and its associations with Zeus, as well as other types of iconography utilized by the Seleucids (*i.e.,* the anchor reflecting a birthmark on the thigh of Seleucus I that enhanced Seleucid claims of a divine heritage and descent from Apollo Didymus).

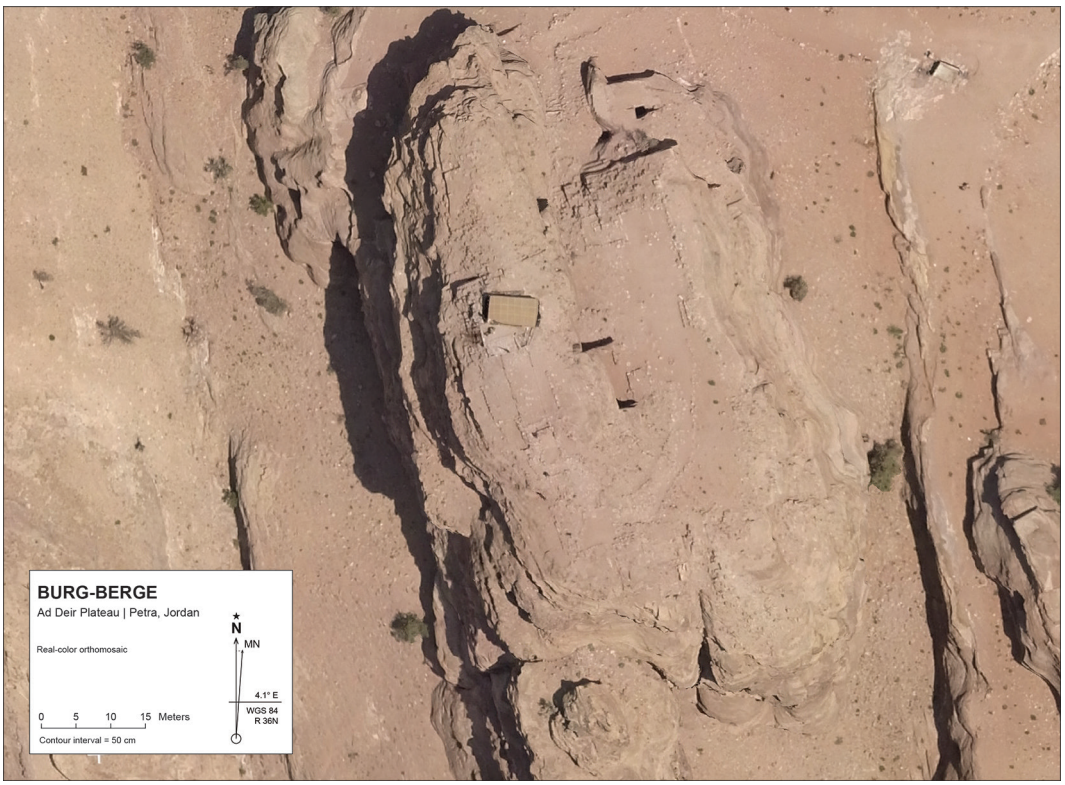
also observed a molded plaster wall piece with extant sea green and earth red paint potentially indicating the painted plaster decorations of some of the building elements within these structures. An especially large building collapse on the southeast side of this level of the mountain may indicate that an additional terrace existed anciently on the southeast flank of the mid-section of the Burg-Berge Monument (AMPP Element 459.21). Large ashlars and fieldstone from previously built upper walls on the southwest side of the mountain have also fallen downward and can also be seen on this flank of the building site. Many of these remnants of stone walls have tumbled down the southwest and west side of the Burg-Berge Monument and are resting within the debris on the narrow plateau below. AMPP also included these archaeological elements where observable in their GPS database of all archaeological elements on the Ad-Dayr/Ad-Deir Plateau.

Finely laid and rock-cut stairs eventually bring the visitor upward to just below the Upper Terrace Portico where the remains of two mysterious circular structures reside (see Fig. 6). The most complete small circular structure sits at the juncture of two stairwells that dog-leg to the east and then to the north and upward to the Upper Terrace Portico (AMPP Element 459.18; see Fig. 6). This small circular structure has a diameter of roughly 3.12 m and at its outer base contains the remnants of three J-shaped engaged column bases or footing supports. The second, and less complete, circular structure (now really only a semi-circle due to erosion damage) sits slightly to the northwest of the first and below the western side of the Upper Terrace Portico support wall (AMPP Element 459.6) (See Fig. 6). Its diameter is roughly 2.73 m. If one looks at the AMPP GPS mapping of the Burg-Berge Monument (Fig. 6) it is evident that both circular structures are located exactly parallel to each other on the southwestern side of the mountain and are facing toward the Wādī ʻArabah and Jabal an-Nabī Harūn (both observed by Lindner *et al*. 1984: 168–9; Lindner 1986: 91 Abb. 3). Significantly, AMPP Element 469.6 is lined with thin, fired, red terracotta tiles, some of which are embedded with melted iron fragments. Thus, one possible solution to the uses of these small circular structures, especially given their location on a high mountain plateau and facing south by southwest toward Jabal an-Nabi Harūn, might be that they are the remains of ground level base supports for fire signals and/or beacons.[15] In antiquity, these structures were usually about the height of a man and capable of holding up to five lit torches at a time. Other possible fire containers requiring base supports might have consisted of an iron tripod with an upper cauldron. These possible uses need to be tested via archaeological excavation and further study of these structures.

The Upper Terrace Portico

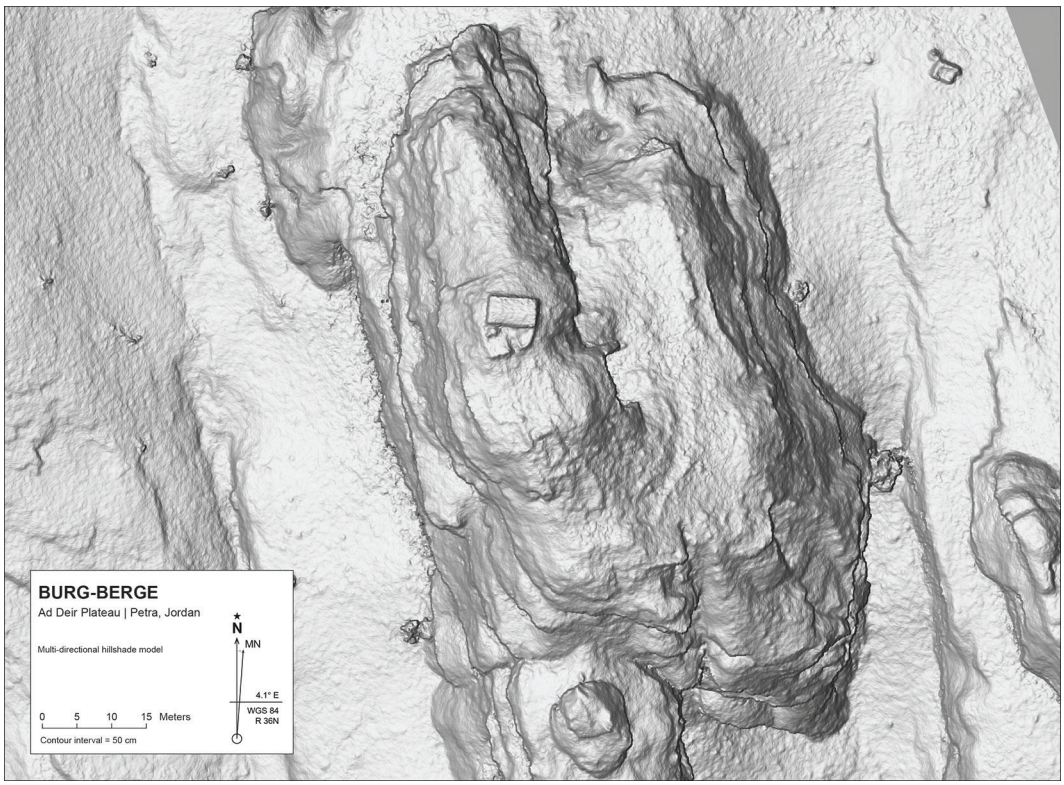
The dog-legged shaped stairs noted above move the visitor upward and slightly to the northwest in order to access what must have been a very beautiful columned portico just below the very apex of the mountain's top (AMPP Element 459.4; Figs. 6 and 9). This Upper Terrace Portico measures 12.55 m x 9.50 m in size and its carefully constructed stone floor is strewn with the collapse of multiple column drums that are clustered toward the center of the

[15] See Polybius *Histories* 10.45–7 for ancient examples and descriptions of communication systems utilizing fire beacons between strategically chosen mountains in antiquity. According to Hellenistic Greek tradition, the inventors of such a long distance signaling system (up to 100 km between beacons) were Kleoxenos and Dimokleitos in the 3rd c. BC. However, in Aeschyles' *Agamemnon*, the playwright notes that Pallamedes used fire beacons to announce the fall of Troy to the city of Mycenae on Crete. If this is accurate and not just a much later Classical gloss, such means of long distance signaling can be traced to at least the Bronze Age.



9. Aerial view of the Northern Section of the Burg-Berge Monument on Jebel At-Tanbour looking from south to north. The colonnaded portico with rows of collapsed columns can be seen just below the roof the Bedouin tent at the apex of the mountain. Room 468 is to the lower right of the tent on the First Lower Terrace (the cliff face was carved back to create the porch entrance to the cultic niche). Numerous building walls and wall collapses can be seen in all areas including the eastern most colonnade line on the edge of the First Lower Terrace just above the mountain's Eastern cliff face. The wādīs on both the east and the west contain much of the architectural remains that have fallen off the building over time (AMPP: S. Ure 2019).

terrace itself. There seem to have been two parallel rows of columns with four to five columns on each side, but the erosion fill in this area may cover further architectural evidences critical for fully understanding the design of this space. All the columns seem to have fallen from northwest to southeast indicating that their collapse was probably due to an earthquake event originating close to the Dead Sea. A number of significant earthquake events are noted in antiquity to have affected the Petra region even before the infamous earthquake of May 19, AD 363 that is credited with damaging large areas of the city, as well as its water infrastructure. For example, Josephus noted a very major tectonic event in 31 BC (the same year as the Battle of Actium) that originated from around the Dead Sea Region and impacted large areas of Judea as well as the regions close to the Dead Sea itself (Josephus *Antiquities of the Jews* 15.5.2–5). Thus, this earthquake event would have also impacted Petra. However, without further archaeological excavation of the Burg-Berge, it is impossible to determine if



10. Multi-directional Hillshade Model generated from the photogrammetric imagery captured by the 2013 UAV flight over the Ad-Dayr/Ad-Deir Plateau (AMPP: S. Ure 2019).

the 31 BC earthquake was the event which destroyed this portico, or if it fell during one of the numerous earthquakes that struck the Near East both in AD 363 and during the Christian Byzantine Period.[16]

[16] For a discussion of the 31 BC earthquake as well as others that subsequently affected the region, see Amiran 1996; Zohar *et al.* 2017. The 31 BC earthquake is believed to have struck in early spring and was a 6.7 magnitude event, the same magnitude as the later AD 363 earthquake that destroyed much of Petra at that later time. This may also help explain the Nabataean reluctance to assist Cleopatra VII with her escape from Octavian/Augustus (*i.e.,* their weakened situation made them reluctant to engage either side of the war).

The Uppermost Structure of the Burg-Berge Monument

Five or six steps up and to the northwest of the Upper Terrace Portico takes the visitor to the very last Uppermost Structure of the Burg-Berge Monument, some of whose remains are now covered by a Bedul Bedouin Tent utilized as a tourist view area, *i.e.,* 'Top of the World Café' (Figs. 6, 9, and 10). This very top tier of the mountain once contained a monumental building structure situated on a NW to SE building line with amazing views of the Wādī 'Arabah both to the north and south but especially to the northwest. The current Bedouin tent is situated with its longest backside wall facing

almost directly north, and with this tent wall running from west to east. The shorter sidewalls of the tent run north to south. An AMPP Multidirectional Hillshade Model (Fig. 10) generated from our aerial drone flight gives us a better understanding of the size and shape of the ancient building that rests under the present Bedouin tent structure. The visible wall line structure of the ancient building was approximately (10 m x 5 m) in size with an opening to the southeast and a possible altar structure at the front of the building to the southwest. Multiple small Classical size tesserae as well as larger Byzantine era floor tesserae litter the area. While the Bedouin tent is an unwanted intrusion on this archaeological site, it is currently serving the purpose of preserving a large area of the tessellated floor of the ancient building/s underneath from weather erosion. Additionally, the Bedouin have also added modern concrete floor and terrace support structures to the area that overlay the ancient building. However, much of the probable multiple levels of the ancient historic flooring of this mountain top edifice are still being destroyed in areas not covered by the modern tent due to yearly seasonal water erosion and visitor foot traffic.

Below and slightly to the north and northwest of the Uppermost Structure of the Burg-Berge Monument are indications of other building remains strung along the northernmost ridge line of Jabal At-Tanbour, but the access to them is extremely steep and precarious from the northeast side of the apex of the mountain (Figs. 9–10). Some of the outlines of these buildings could be picked up by both the aerial photographs and the resulting Multidirectional Hillshade Model derived from them, but without excavation and clearance, not much could be discerned about their style and purposes other than they were also seemingly associated with multiple tesserae remains (Figs. 9–10).

Summary and Analysis

It is obvious from the above detailed survey and mapping of the Burg-Berge Monument that this building represents one of the most important engineering feats of the ancient Nabataeans in Petra, and greatly deserves excavation clearances and conservation efforts. The building seems to have been multi-functional over time with surface remains potentially indicating that it was begun before 59 BC and utilized into at least the Byzantine period in some fashion. Ancient coins retrieved by AMPP from the Ad-Dayr/Ad-Deir Plateau indicate that the use of the strategic heights and ruins of the Burg-Berge Monument may also have been revitalized in the Byzantine period during the reign of Constantius II during his campaigns in the East against the Persians.[17] Various elements of the building's remains indicate that it was appropriately named by Alois Musil as the Burg-Berge, a 'palace, castle, fortress,' but it also included at least one cultic element represented by Room 468 that may have served as either a triclinium, a burial site, or other type of Nabataean memorial structure (or all three functions over time) given its present remains. Only archaeological excavation and restoration of

[17] During each spring/summer excavation season, AMPP usually has five sites open—three on the Great Circle on the southwestern side of the most culturally dense area of the Plateau, one at Eastern Cistern B across the Plateau to the northeast, and one in the North Temenos Slot Entrance to the Ad-Dayr/Ad-Deir Monument's courtyard which is also on the eastern side of the Plateau. The excavations are thus recovering ancient coins from both the eastern and western sides of the most densely concentrated archaeological sites on the Plateau itself. Over 800 ancient coins have been retrieved from these sites with the majority coming from the erosion wash area in the North Temenos Slot, however, of the few Byzantine era coins retrieved from all sites, all of these coins have come from the period of Constantius II (AD 337–361) who was in constant warfare in the East with the Sassanians. It is thus postulated that the Ad-Dayr/Ad-Deir Plateau was again utilized during this era given its strategic military advantages.

this room may reveal its true identity and dating sequence but it may represent a cultic use that predates later areas of the structures around it.

With relation to the overall building chronology of the Burg-Berge itself, it is of interest to note this structure's similarity with the fortress palaces of Herod the Great (*r.* 37/36 BC to 4 BC), especially those at Masada and Machaerus that are so geographically close in proximity to Petra. According to Josephus, Herod's desert palaces were often built over previous strategic installations constructed by the Hasmonean king of Judea, Alexander Jannaeus (*r.* 103–76 BC) whose rule was characterized by continuous conflicts, some of which embroiled the Nabataeans, especially under the rule of their kings Obodas I (*r.* 96–85 BC) and Aretas III (*r.* 87–62 BC; Josephus *Wars of the Jews* 1.8.9; Marshak 2015: 117–24 fn. 8). Thus, it is logical to postulate that the first Nabataean strategic buildings on Jebel At-Tanbour may have been the result of Nabataean concerns for the more intensified threats from their Judaean Hasmonean neighbors who were also closely linked to Ptolemaic Egyptian support at this time. It is possible that Room 468 already existed (given its high

a

b

11. a) The Burg-Berge Monument and Room 468 on Jebel At-Tanbour with clearances of the Great Circle Pool below it looking from the east to the west.

b) The escarpment of the two Masada palaces built by Herod the Great between 37 and 31 BC. According to Josephus, Herod's structures were built over earlier Hasmonean fortifications built by Alexander Jannaeus earlier in the 1st c. BC (Photo: Dr. Robert Cargill, University of Iowa).

doorway that seems out of scale with the rest of the Burg-Berge building complex), and thus, the additional 1st c. BC building programs were built around it. It is also significant to note that Herod the Great (b. 74/73 BC) may have spent some of his youth at Petra. His mother, Cypros, was a Nabataean of possible noble connections in Petra, and his father, Antipater/Antipas (d. 43 BC), was an Idumaean—the Hellenistic name for Edomite, the earlier biblical-era inhabitants of southern Jordan and Petra itself (Josephus *Antiquities* 4.1.3–4, 4.7.3; Marshak 2015: 110–1). During the turbulent eras in which Herod's father was politically embroiled with the Hasmonean rulers of Judea and their squabbles over kingship (which also often included Nabataean involvements), the young Herod may have been sent to Petra under the protection of his mother's family, however, we do know that he is also documented as having visited the city at least twice in adulthood.[18]

With relation to the construction of strategic desert palace fortresses, it is important to emphasize that these were very turbulent times. Not only was Judea racked with battles over multiple claimants to the throne as well as the position of high priest, but this was also the era of Rome's initial military presence in the Levant (Pompey 64/63 BC) and the final decline of the Ptolemaic and Seleucid Dynasties in the Near East. The eventual assassination of Julius Caesar in Rome plunged the emerging Roman Empire into another civil war with the last Ptolemaic dynast, Cleopatra VII and her lover/husband Mark Antony's bid for power in the East drawing all the Levant into the carnage including Judea and Nabataea. This conflict culminated in the Battle of Actium (31 BC) and eventually Octavian/Augustus' conquest of Egypt and solidification of the remains of Ptolemaic and Seleucid political spheres under Roman control. It is thus a very strong possibility, given Herod's family connections to Petra, that the building of Nabataean strategic structures such as the Burg-Berge Monument, especially during the early 1st c. BC wars with the Hasmoneans, were the initial inspirations for Herod's later mountain fortresses on either side of the Dead Sea, many of which were built over previous Hasmonean remains.[19]

When one compares images of the site of the Burg-Berge Monument in Petra with that of Masada in modern-day Israel or Machaerus in Jordan, for example, the similarities of topographical setting and architectural elements in terracing down steep escarpment slopes are very striking (Figs. 11a–b). It is also possible that Herod the Great may have utilized Nabataean engineers in his desert palace building projects, especially with relation to the development of water systems. Most scholars agree that Masada was built between *ca.* 37–33 BC, after Herod solidified his power in *ca.* 37/36 BC. Alternatively, Josephus notes that a Hasmonean structure, built by Alexander Jannaeus (*r.* Judaea 103–76 BC) earlier in the first century BC, lay under Herod's additions, however archaeologists have not been able to confirm this fact (Josephus *Wars of the Jews* 1.8.9; Marshak 2015: 117–24 fn. 8). The palace fortress at Machaerus to the north of Petra and on the Jordan side of the Dead Sea may also have had an earlier Hasmonean structure built by Alexander Jannaeus in 90 BC that was later remodeled by Herod the Great in *ca.* 30 BC. Therefore, one hypothesis to be tested is that the Burg-Berge at Petra was begun during the beginning of the 1st c. BC at about the same time that Alexander Jannaeus was also fortifying desert palace retreats—

[18] The close relationship of Herod's father, Antipater, with the kings of Petra (see Josephus *Wars of the Jews* 1.4.1; *Antiquities* 14.13.8–9) as well as the origins of Herod's mother, suggest that Herod the Great was not unfamiliar with Petra itself, the Nabataean capital city.

[19] For a discussion of Herod the Great's desert fortresses, see Marshak 2015.

retreats that also played strategic military as well as caravan route control roles. So let us look at the relevant rulers listed on the most commonly accepted Nabataean king list to try to discuss more deeply the Nabataean rulers most likely to have been involved in the Burg-Berge's birth as well as its subsequent development:

Rabbel I	? (some say late 2nd c. BC, but see below)
Aretas II	*ca*. 103–96 BC
Obodas I	*ca*. 96–86/85 BC
Rabbel I	? 85/84 BC (some say as early as 2nd c. BC, some say the successor to Aretas II?)
Aretas III	86/84–62/60/59 BC
Obodas II?	62/61–60/59 BC
Malichus I	59–30 BC
Obodas III	30–9 BC
Aretas IV	9/8 BC to AD 39/40
Malichus II	AD 40–70
Rabbel II	AD 70–106

The very existence and aspects of the rule of Rabbel I and Aretas II are controversial. The rule of Obodas I may be more critical to this discussion. After his death, the Nabataean king Obodas I (*r. ca*. 96–86/85 BC) was deified by his people, probably due to his numerous victories over the Hasmonean rulers of Judea and especially his victory at a battle in 93 BC on the Golan Heights. Obodas I was a special enemy of the Hasmonean Judean king, Alexander Jannaeus, whom he trapped near Gadara (Umm Qays) and attacked with camel cavalry, thus leveraging the return of areas east of the Dead Sea to the Nabataeans. Obodas I was also victorious over the Seleucid ruler, Antiochus XII Dionysus, thus saving Petra and Nabataea from direct Seleucid rule. Given the military needs of these times, it is thus likely that the Ad-Dayr/Ad-Deir Plateau and Jabal At-Tanbour were strategically important, and that the Burg-Berge fortress/palace may have been begun by either Aretas II or more likely Obsodas I as a reaction to the rise of more threatening Hasmonean incursions in southern Jordan. It may thus also be possible that Room 468 within the Burg-Berge complex is a memorial chapel and possible triclinium associated with Obodas I since his actual burial is linked with a site in the Negev renamed Avdat, and not a currently known burial site in Petra.

As previously mentioned, the existence and regnal dates for Rabbel I are still debated, but if his dates of 85/84 BC are accepted, he did not rule long enough to impact structures on the Ad-Dayr/Ad-Deir Plateau. Aretas III (*r*. 86/84–62/60/59 BC or some sources say *r*. 87–62 BC) was the probable sibling of Obodas I and ruled for approximately 24 or 25 years, thus long enough to continue the fortifications and embellishments of the structures on the Ad-Dayr/Ad-Deir Plateau, potentially including the Burg-Berge Monument. Room 468 as a cultic room to the memory of his brother, the deified Obodas I, thus would have been important to this Nabataean king as well as any possible larger memorial structures on the Plateau itself including that of the Ad-Dayr/Ad-Deir Monument and the Great Circle Pool which may have been begun under his reign given his familial association with Obodas I. Certainly, Aretas III had both the motives and the wealth to do so. During his reign, Nabataea extended beyond southern Jordan and encompassed also most of what is northern Jordan, southern Syria including the Hauran, and parts of modern-day northern Saudi Arabia, thus reaching Nabataea's greatest size geographically. However, this expansion put the Nabataeans into direct conflict with Hasmonean aspirations for a Greater Judea. In addition, Aretas III plucked the ancient trade center of Damascus from the weakened Seleucids in *ca*. 85 BC and took over its mints and famous metal foundries as well as administered trade ventures

emanating from this city to as far as possibly modern-day Afghanistan and India. Aretas III is thus famous for striking the first identifiable Nabataean silver coinage from Damascus that is Hellenistic in style and iconography, as well as labeled in Greek rather than Nabataean. It is at this point that the adoption of Hellenistic iconography within Nabataean coinage begins and it may have been the point at which the fasciae of the cultic niche in Room 468 may have been embellished with its figures, each holding a cornucopia. Additionally, AMPP excavations of the Great Circle Pool now point to the existence and use of the pool before the great earthquake of 31 BC. If the façade of the Ad-Dayr/Ad-Deir Monument was begun by Aretas III, the Great Circle must have been begun at the same time given the topography of the Ad-Dayr/Ad-Deir Plateau and the necessary role of the Great Circle Pool to protect both the façade and courtyard of the Ad-Dayr/Ad-Deir Monument from seasonal flash flooding and destruction. Indeed, we now think that the bedrock floor and inner ring wall was damaged by the 31 BC earthquake given a fracture that exists in these locations on the southwest side of the pool as well as other archaeological artifacts found in context.

By *ca.* 67 BC, Aretas III also became embroiled in the conflicts surrounding the Hasmonean succession for king and high priest in Judea when Aristobulus II began a rebellion against his older brother Hyrcanus II in Jerusalem and Judea. Hyrcanus fled to Petra and in exchange for the promise of the return of certain towns to the Nabataeans, Hyrcanus received support from Aretas III. Significantly, Hyrcanus' chief advisor was Antipater the Idumaean, who was the father of Herod the Great and marriage partner of a woman from Petra, Herod's mother. Political machinations by Aristobulus, however, brought the newly powerful Romans in the Near East into the fray resulting eventually in the defeat of Aretas III who subsequently retained his rule, but became a vassal king of the expanding Roman Empire in a similar manner to the rise of the Herodians in Judea following the ascent of Antipater and his sons including Herod the Great. This event may have made Nabataean rulers more cautious about becoming engaged in the ongoing political intrigues of Antipas' son, Herod.

The existence and dates of Obodas II (? *r.* 62/61 to 60/59 BC) have been debated by modern scholars. In any case, his rule may have been too brief to make any great impact on the structures on the Ad-Dayr/Ad-Deir Plateau including the Burg-Berge Monument. His successor, Malichus I (59–30 BC), may have been more critically active at the site. Some scholars have speculated that he was a cousin of Herod the Great given Herod's Nabataean mother and Herod's flight to Petra in 40 BC following the rise of the Hasmonean claimant, Antigonus II Mattathias, who had imprisoned Herod's brother, Phaseal. Malichus I, however, did not support Herod's plea for support, which caused Herod to seek support from Cleopatra VII. When her second lover/husband, Mark Antony, began to confiscate properties traditionally controlled by Herod and the Nabataeans to turn them over to Cleopatra, relationships declined between Cleopatra's Egypt and both Judea and Nabataea with the result that neither entity heeded Cleopatra's demands for assistance following her defeat at the Battle of Actium in 31 BC, and Octavian/Augustus' subsequent invasion of Egypt. In fact, the Nabataeans under Malichus I burned Cleopatra's boats stationed on the Red Sea and thus destroyed any avenue for her escape to the East (Dio Cassius 51.6.2–7). Given the political instabilities of the times, it is logical to assume that the Ad-Dayr/Ad-Deir Plateau and the Burg-Berge Monument remained important strategic locations for the residents of Petra, particularly the Nabataean royal family.

Little is known about the personality of the Nabataean king Obodas III (*r*. 30–9 BC) beyond his need to deal with an attempted Roman conquest of Nabataea and takeover of the caravan routes. Towards the end of his reign, the controversial political figure, Syllaeus, emerges as a minister to the king and powerful political player. He is often credited with outsmarting the Roman expedition sent out in *ca*.25/24 BC by the prefect of Egypt, Aelius Gallus, by leading them in the desert until many died from thirst and disease. Syllaeus may have also attempted to usurp the Nabataean throne as he is shown on the obverse of Nabataean coinage along with the reverse hosting Aretas IV, the young boy successor to his father, Obodas III. Indeed, it may have been Aretas IV's probable mother (some scholars say wife), Hulda, who actively maneuvered her son into sole power in Nabataea despite Syllaeus' political agendas. Syllaeus is also reported to have alienated Herod the Great after falling in love with Herod's sister. Eventually, Syllaeus' political machinations found him in Rome where he was finally executed.

This now brings us to Aretas IV (*r*. 9/8 BC to AD 39/40) whose presence and energized activity on the Ad-Dayr/Ad-Deir Plateau has been confirmed by AMPP excavations not only on the Great Circle but also via the over 800 ancient coins recovered from all five AMPP sites related to the excavation and restoration of Nabataean structures whose original purpose was to protect the Ad-Dayr/Ad-Deir Monument. Over 88% of the coins retrieved from all five excavation sites currently being worked on by AMPP are the mints of Aretas IV. While this is not unusual for Nabataean sites, it is unusual to find complete series of the mints of this king from in-situ excavations. Indeed, we have a few of the known mints hosting Syllaeus and a very young Aretas IV, as well as all of those mints of a later and older Aretas IV with the exception of coins that he minted with his mother (or first wife) Hulda. In particular, we have numerous batches of Aretas IV on the obverse as a cuirassed solder and with his wife Shuqailat on the reverse as priestess—possibly high priestess. Additionally, pottery remains confirm an increased activity on the Plateau under Aretas IV.

The above may be explained by the fact that Aretas IV was often at war with Judea. His daughter was married to Herod's son, Herod Antipas, who subsequently spurned her in order to illegally cohabit and eventually marry his brother's wife, Herodias. This is the famous event that brought John the Baptist's condemnation of the royal Herodian couple, probably not only on moral grounds, but also on political ones, since it destroyed the marriage alliance between Nabataea and Judea that was critical in keeping absolute Roman power at arm's length in both kingdoms. Aretas' daughter fled to her father rather than be murdered in the infamous Herodian court, and Aretas IV subsequently launched a major attack against Herod Antipas who then had to call in Roman assistance. This was the beginning of the end for the sovereign powers of both the Judeaen and Nabataean kings, and the second major step in the eventual formal annexation of Nabataea by Rome in AD 106 by Trajan.

Given the events noted above, it is not at all surprising that the Ad-Dayr/Ad-Deir Plateau and the Burg-Berg Monument became increasingly important to the strategic plans of Aretas IV. The Plateau may have even served as a storage area for his coinage during wartime given its secure position in contrast to the more vulnerable urban center of the city of Petra below. Significantly, use of the Plateau seemingly declines with Aretas' successors, Malichus II (AD 40–70) and Rabbel II (AD 70–106), with only a few of their coins extant from AMPP excavations. Following the Roman annexation of Nabataea in AD

106 and the probable disempowerment of the Nabataean royal family under direct Roman rule, the use of the Ad-Dayr/Ad-Deir Plateau and the Burg-Berge Monument seemingly declines significantly. It is logical to assume that the Burg-Berge Monument may have been abandoned or occupied by numerous settlers at this time given the disappearance of royal patrons to maintain its water systems and structural integrity. As previously mentioned, archaeological evidence at this point seems to indicate that the Ad-Dayr/Ad-Deir Plateau does not receive noticeable later Early Christian or Byzantine occupation until the reign of Constantius II and his campaigns against the Sassanians.

The Burg-Berge Monument thus hints to us that it was built by a Nabataean culture with an established and effective kingship of the early 1st c. BC that was very much aware of the political dangers surrounding it, especially those posed by their neighbors in Hasmonean Judea, and at times even Ptolemaic Egypt and Seleucid Greater Syria. However, the Nabataeans also mixed their preparations for crisis with the construction of strategic desert palaces that also enhanced personal comfort and safety by mastering the exploitation of their local geology and seasonal weather patterns to manipulate and control the power of water and geology in desert environments. This paper thus presents a number of hypotheses to be tested given a careful mapping of current surface remains including a proposed chronology. The first hypothesis is that the Nabataean Burg-Burge Monument was initiated during the beginning of the 1st c. BC. Second, that this monument (and its possible sister strategic palaces) combined with similar structures, especially those built by Alexander Jannaeus in the early 1st c. BC, were the inspirations for the later desert palaces and strategic structures of Herod the Great given his father's connections to Petra and Herod's ongoing family connections (via his mother) and personal visits to Petra itself. Third, the height of the Nabataean strategic use of the Burg-Berge occurs during the reign of Aretas IV given his particularly hostile relationship with Judaea due to the adulterous actions of Herod Antipas that particularly impacted Aretas IV's daughter and destroyed an important political alliance between Judaea and Nabataea that would have dire political consequences for both nations.

Thus, given its importance in the histories of both Arab/Aramaean Nabataea and Idumaean Judea, the Burg-Berge Monument desperately requires immediate consolidation and conservation efforts. This incredible building has much to teach us. It reveals a Nabataean culture concerned with the regional political crises surrounding it, as well as a civilization that could also still maintain sites of cultic importance and creature comforts in one of the most challenging natural and political environments in the history of the Near East.

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