

1994 ARCHAEOLOGICAL EXCAVATIONS AND SURVEY OF THE SOUTHERN TEMPLE AT PETRA, JORDAN

by
Martha Sharp Joukowsky and Erika Schluntz

Introduction

This report presents the results for the second year of the Brown University archaeological survey and excavation of the Southern Temple at Petra in Jordan conducted under the auspices of the Jordanian Department of Antiquities as part of an ongoing research project.¹ These archaeological investigations were undertaken from June 15 to August 15, 1994 under the direction of Martha Sharp Joukowsky.²

The Southern Temple represents one of the major archaeological and architectural components of the city, as well as one of the largest temple structures to be found at Petra. The Southern Temple lies to the south of the Colonnaded Street and southeast of the Temenos Gate. It occupies a position of paramount importance. From north

to south the Petra Southern Temple is comprised of a Propylaea, with stairs ascending some seven-and-a-half meters to a sacred area or Lower Temenos. The large flat expanse of the Lower Temenos, measuring 55 x 55 m, ends in a monumental Grand Stairway, some 30 m in width, which is flanked by a 10 m wide Exedra on the west and perhaps the east as well. This in turn leads up some 6 m to the Upper Temenos, the sacred enclosure for the temple proper, which measures 55 x 55 m.

The Southern Temple was opened to exploratory research in 1993, and these investigations continued in 1994 with historic research, archaeological testing by the survey and excavation of several temple areas, such as the Propylaea and other *in situ* fea-

1. For a detailed discussion of the 1993 campaign, as well as a select bibliography of the site, see M. Joukowsky, "1993 Archaeological Excavations and Survey of the Southern Temple at Petra, Jordan," *ADAJ* 38, 1994.
2. The staff was comprised of A. W. Joukowsky, Administrator and Photographer; E. Schluntz, Assistant Director; D. Pitney, Engineer, Chief Architect-Surveyor; L. Traxler and P. Zimmerman Architect-Surveyors; G. Bilder, Computer Analyst; M. Slaughter, Photographic Recorder and Photo Development; Ceramic Analyst, L.-A. Bedal; K. Mallak and M. Parr, Finds Recording; K. Jacobsen, Draftsperson; P. Nalle, Mining Engineer; Senior Archaeologist, P. J. Parr, with E. Payne, G. J. Haigh-Austin, H. Beckman and A. R. Retzleff; and volunteers M. Nalle, K. Patrecci, F. Bennett, M. Greenleaf, M-K. Hunt and B. and Dr M. Alderman. Besides P. J. Parr, Southern Temple Consultants in 1994 included C. Augé numismatics, and P. Warnock botanical materials analysis. We want to thank the Department of Antiquities of the Hashemite Kingdom of Jordan and particularly Dr S. Tell then Director-General during our 1994 campaign, for his generous

cooperation and assistance. Assigned to us for the second year, was Sulieman Farajat as the local representative of the Department of Antiquities. Again, Mr Farajat was a pleasure to work with. We are grateful for his helpful suggestions and input on every phase of our work. We also wish to acknowledge the assistance and support of the Brown University, but most especially the administration at Brown University for aiding in the support of this project, particularly Vartan Gregorian, President. Once again the American Center for Oriental Research in Amman coordinated the logistical arrangements for our team, as well as the myriad of details involved with excavation supplies and report writing. I will always be indebted to my dearest colleagues and friends Dr Pierre Bikai, Director of the American Center for Oriental Research in Amman and Dr Patricia Bikai for their enthusiastic support of our work. And lastly, we wish to thank our team for their dedication to the recovery of the Petra Southern Temple. They have completely committed themselves to this project. 1994 was a most productive season!

tures in the Lower Temenos. Fieldwork also consisted of field reconnaissance and analysis of the ancient landscape and ancient and contemporary drainage problems. The goals of the 1994 season were to

- 1) clear the Southern Temple precinct of earthquake debris and to excavate and clarify its architectural plan;
- 2) investigate and assess the nature, extent and depth of the stratigraphy within the Canalization System, the Lower Temenos, the Exedra and the Lapidary West;
- 3) provide a working plan of the Southern Temple design by survey and excavation;
- 4) prepare the site for further research and excavation;
- 5) Interpret the Petra Southern Temple's phases of use and function(s).

Background³

The site-specific excavation strategy created in 1993 was further developed in 1994. This included the use of Electronic Distance Measurement (EDM) interfaced with the COMPASS program developed by MASCA of the University of Pennsylvania; and our site-specific computer data-base, with a consistent nomenclature.

Documentation⁴

As in 1993, we had an astonishing re-

3. J. Wilson and Eleanor Emlen Myers extensively documented the temple in the spring of 1993 by conducting an comprehensive aerial photographic survey of the site. Site datum and sub-datum points were established in 1993, both topographic and *in situ* positions of architectural components were acquired in relation to set points with absolute elevations.
- 4 All elevations were recorded by EDM and scaled plan drawings were made of all deposits and architectural features, and vertical balks were recorded by section drawings. Balks were also recorded with both black-and-white print and color slide photography. All field information was recorded on standardized field forms for computer entry, and analysis was made of the preserved ar-

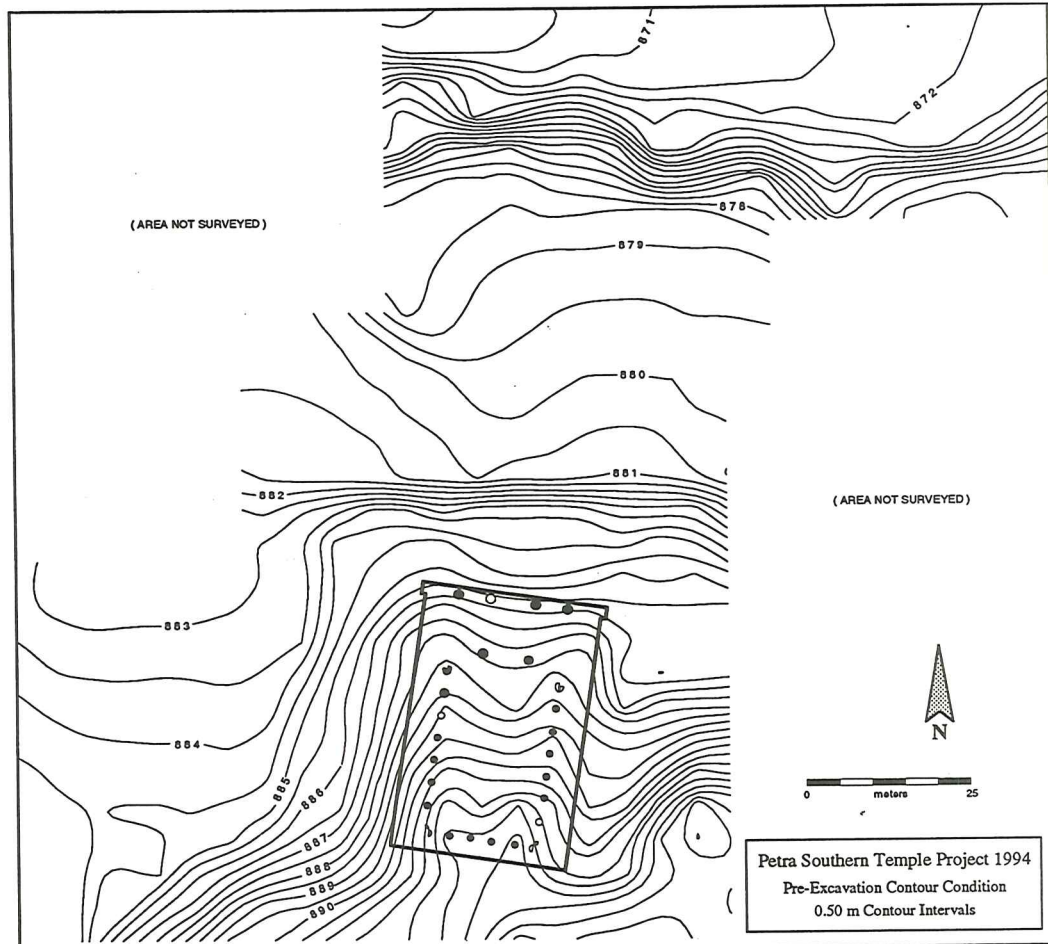
covery of an abundance of decorative architectural fragments used for the embellishments of capitals and entablatures. Elements of carefully carved floral capitals abounded with a rich and lively ornamentation of acanthus leaves interspersed with vegetal elements, including detailed renditions of pomegranates, pine cones, grape clusters, and other fruits with deeply incised ornamentation. The majority of these were in limestone, but there are also stucco-modelled architectural designs such as dentils that have been recorded and retained for study.

All recovered portable artifacts were removed to the field laboratory for processing and study; storage of our cataloged objects is in the state-of-the-art Petra Museum. The 1993 data-base computer program was used for their inventory to determine their artifact material, function, shape, and whenever possible, their date of manufacture. All cultural materials were retained for future study. The data-base allowed for the production of summary tables, study and graphs of the artifact assemblage.

Results

A detailed topographic map was completed (Fig.1), so that the relationship between the Southern Temple and its immediate surroundings could be ascertained. The 10 x 10 m site grid system had been es-

chitectural elements; the *in situ* positions of approximately 2200 components were recorded, numbered, cataloged, photographed and drawn, and those that had to be protected were, when possible, removed to the prepared lapidaries or reburied in Trench 7. All elements of temple construction — isodomic ashlar sandstone blocks with the oblique 45° surface dressing characteristic of Nabataean ashlar construction technique, sandstone column drums lying on the site, and a wealth of carved limestone decorative fragments have been documented and are in the site lapidaries. Several of the ashlars and drums that were registered bore Nabataean mason's marks which have been recorded and studied.



1. Petra Southern Temple: Topographic Map, 1994.

tablished across the Upper Temenos in 1993, but this year we were able to extend it to the Lower Temenos, the West Lapidary and the Propylaea Steps (Fig. 2). Excavations were conducted in accordance with the grid using computer-generated maps with scales of 1:100 and 1:50. Detailed archaeological site plans were compiled to include all visible features such as fallen columns and walls. This plan now encompasses the temple and its entire precinct, which covers some 7000 square meters. The Temple area alone measures 113 m north-south x 55.68 m east-west. To the five main areas established in 1993 — 1) the Propylaea Steps, 2) the Lower Temenos, 3) the Grand Stairway, and 4) the Upper Temenos with 5) the Southern Tem-

ple — was added a sixth area, the Lapidary West (a prepared field for the temporary storage of architectural fragments). All of these areas were documented by excavation in 1994. Beginning from the Propylaea Steps just south of the Colonnaded Street to the Southern Temple itself, the 1994 survey and excavations will be briefly described.

The Propylaea Steps

The Propylaea Steps had been partially documented in 1993. In 1994, however, the side walls and each block were surveyed (block-by-block — over 350 individual blocks), and further consolidation of the steps was undertaken (Fig. 3). It was clearly established that this entrance from the Colonnaded Street was in direct alignment



2. Petra Southern Temple Excavation Grid and Layout of Trenches 1994.



3. Petra Southern Temple Propylaea Steps, general view facing south.

with the Temple as can be seen in the site plan (Fig. 2).⁵

The Lower Temenos

In the Lower Temenos the column drums reused by the local farmers to divide the area were recorded and moved to the west of the area, and a 2 x 5 m sondage was excavated (Trench 6, see Fig. 2). The purpose of this trench was to determine the depth of deposit within this lower portion of the temple precinct as well as to investigate the northern route of the canalization system.

A limestone hexagonal pavement (composed of the largest Nabataean pavers known to date in Jordan) was found under a

ca 1.50 m deposit of fill. This pavement is reminiscent of the white limestone hexagonal pavement present in the Upper Temenos forecourt, but on a larger scale — the Lower Temenos pavers are 0.77 m in width, compared with the 0.36 m pavers above. Clearly these corresponding pavements reflect a concern for a coherent decorative program for the entire precinct area.

After the discovery of the Lower Temenos pavement, a larger 10 x 10 m trench (Trench 13, Fig. 4) was excavated four meters to the north of Trench 6, to ascertain the extent and state of preservation of the pavement. Generally, the limestone pavers uncovered were still *in situ*, under a ca. one meter depth of sandy fill, but some were

5. Survey results in this area also confirmed the 24.48m differential between the site datum point

and the Colonnaded Street.



4. Petra Southern Temple Lower Temenos, hexagonal pavement, facing south.

damaged or eroded, and a few were quite severely disturbed, particularly along the south balk of Trench 13. They may have been impacted by the underground canalization system that coursed north from beneath the core of the Temple, under its forecourt (Trench 1), the monumental stairway and into to the Lower Temenos.

The Subterranean Canalization System

On the final day of excavation during the 1993 field season, a small circular patch of loose soil located in the center of the Southern Temple forecourt was cleared to reveal the main junction area of four subterranean

water channels, leading to the north, south, east, and west (Fig. 5). Due to the potential risk of collapse, and because they were discovered at the close of the season, these passageways were only cursorily investigated, and then covered and sealed for the 1994 season's investigation.

Now, after a full season of exploration, much about this impressive drainage system is known.⁶ The walls of the passageways themselves were of a well-planned and well-executed construction, with uniform well-built corners, indicating that the entire system was constructed simultaneously.⁷ The tunnels' side walls were con-

6. For safety, this investigation was undertaken with the on-site advice of an experienced mining engineer, P. Nalle.

7. There is some evidence that the upper courses of the tunnel walls were repaired or rebuilt, chiefly at the junction area.

structed with roughly dressed sandstone ashlars, ca. 0.60 - 0.70 m in length and 0.30 - 0.40 m in width (Fig. 6). The five to seven wall courses were dry-laid and closely-fitted, however, in some instances small chinking or snecking stones were observed wedged between the blocks. The water that flowed through here must have had a high calcium content for there are thick lime deposits coating the walls. Excavation from the surface of a 2.5 x 3.0 m trench revealed repeated layers of large rock and rubble fill behind the tunnel walls, which clearly served as packing for support and stability.

Most of the tunnels' dressed monolithic ceiling blocks appear to be of limestone or fine white sandstone (length 0.75 m, width of 0.57 m, thickness 0.18 m). These ashlars were positioned to span the width of the tunnel; virtually all of these capstones have suffered some damage, and most are stress split in the center, in line with the axes of the tunnels. Sealing these capstones from above was a layer of sterile, densely packed wadi sand, covered over by the pebble-lade orange mortar bedding layers of the forecourt's surface of hexagonal pavers.

The major water conduit was the north-south channel, which emerged from beneath the temple core, proceeding at a shallow, 26 degree downward grade below the temple forecourt.⁸ To facilitate this season's excavation of this portion of the canalization system, five capstones, cracked but still *in situ*, were recorded and then removed, revealing the conduit below. This main passageway, which varied in width from 0.6 m - 0.7 m, was lined at its bottom with a fairly thick layer of mortar, as were the secondary passageways to the east and west. Shortly before it reached the northern limit of the Upper Temenos the tunnel descended sharply, passing below the Grand Stairway which leads down to the Lower

Temenos area. At this point the channel bottom was stepped, apparently to slow the speed of the water running through it, as well as to follow the contours established by the Temple Complex plan. The ceiling, which ranged 1.7 m -1.9 m in height, was similarly stepped.

Careful excavation of the 0.75 m uncapped portion of the north-south channel revealed two distinct layers of soil deposit. The 0.24 m thick lower layer consisted of fine, silty soil; the scant ceramic remains were Nabataean and Roman in date. The one datable lamp fragment is securely first century CE. Presumably this layer was deposited during the system's period of use. A second 0.36 m thick layer of loose topsoil-like fill and debris then accumulated, apparently after the Southern Temple was abandoned. Botanical materials analysis of the soil samples from the lower deposit revealed high concentrations of pollens from local flowering plants.⁹ This may indicate that whole flowers had been washed into the drainage system, presumably after some ritual use within the sanctuary.

Accumulated debris and the threat of collapse prevented any northward investigation of the passage interior beyond eleven meters, into the area below the Grand Stairway. Preliminary excavation below the hexagonal pavement of the Lower Temenos appears to have revealed the channel continuation, for it is in direct line with the north-south channel of the Upper Temenos. The Lower Temenos area should in the future reveal the further northern extent of the main channel, and what we suspect may be a cistern or catchment area for water conservation. This area will be a top priority during the 1995 field season.

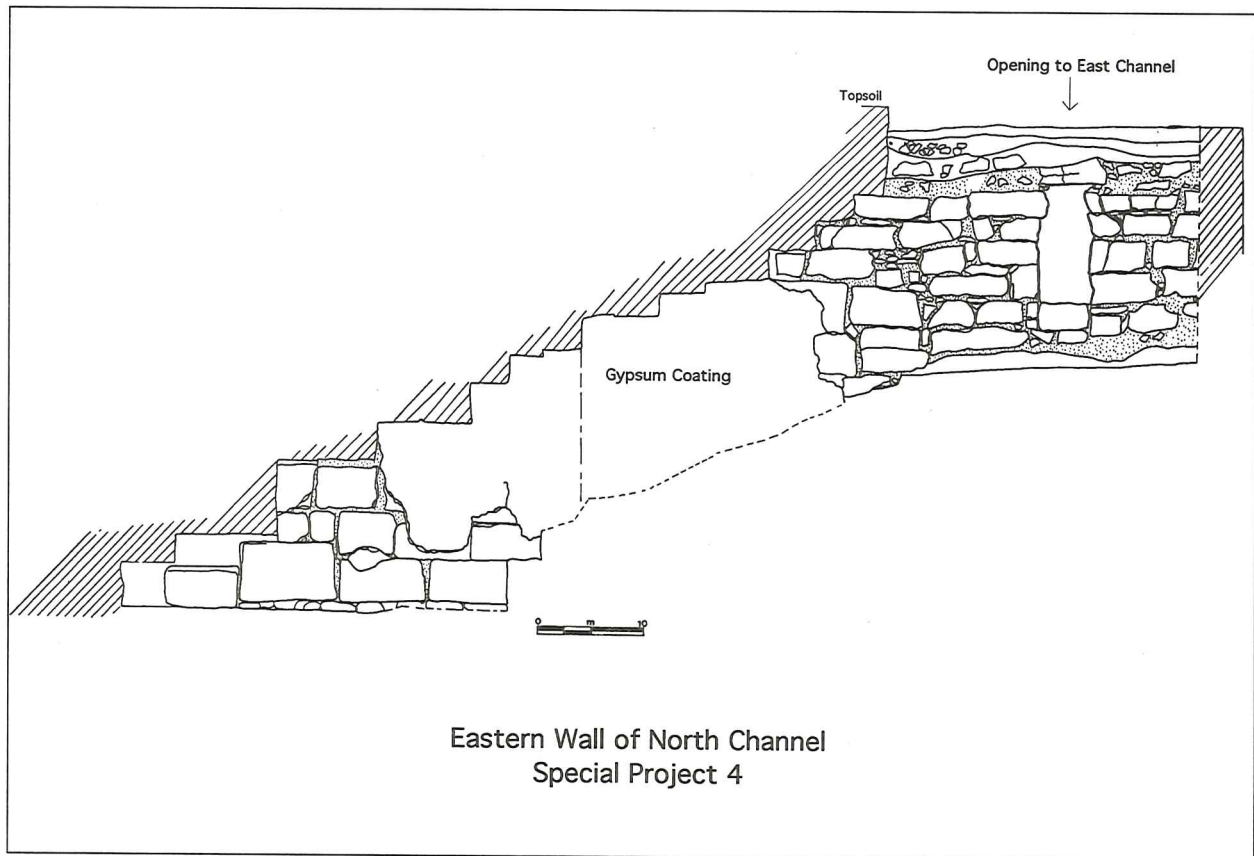
The east and west tunnel branches were slightly narrower than the north-south conduit, averaging 0.5 m in width. They were

8. The southern extent of this passage is uncertain, due to heavy collapse located below the area of the temple stylobate.

9. These were undertaken by Peter Warnock of the University of Missouri-Columbia.



5. Petra Southern Temple, Canalization System, north channel, east wall.



6. Petra Southern Temple, Canalization System, facing north.

also not as high, the east measuring 1.1 m, the west 0.6 m. The two tunnels did not join the main passageway at the same point — rather, they were staggered, with the west tunnel joining the north-south 0.75 m further to the south. Our mining engineer observed that this offsetting of the passages was probably intentional, in that one single capstone could not have securely spanned the area of a four-branch junction. At about 1.5 m from its join to the north-south channel, the east branch curved to the northeast, and at 3.5 m collapse was visible. The west tunnel extended to the west for approximately 1.5 m and then curved to the northwest, and beyond 5.0 m, this passage curved too abruptly to see where it goes. Both passageways sloped slightly north-to-south, so that they would have emptied their contents into the main north-south channel.

Much work still needs to be done on the water management system of the Southern Temple Complex. In addition to excavations in the Lower Temenos, continued investigations below the Upper Temenos courtyard area should provide further information on the system's construction and repair phases. What is clear so far is that the volume of water flowing through these channels must have been sizable, for this system was carefully planned, in the Nabataean fashion, to facilitate the management and conservation of a sizable quantity of this most precious resource.

The West Exedra

Yet another investigatory probe in the Lower Temenos was the excavation of one-half of the West Exedra (Trench 5, Fig. 7), which lies directly west of the Grand Stairway. This limited study enabled us to compare the orientation and axis of the Exedra

with other structures within the temple complex — resulting EDM analysis clearly demonstrated that the West Exedra is oriented along the same north-south axis as the Southern Temple itself, supporting the theory that it is an integral part of the sacred precinct.¹⁰

Excavation revealed that the original Exedra structure consists of a semi-circular wall, containing four¹¹ recessed niches (each 1.1 m in width) evenly-spaced within the interior face (Fig. 8). The north-facing entry measures 6.38 m in width. Composed of hewn sandstone blocks of variable dimensions, the Exedra wall is currently exposed to a height of 3.72 m, although excavation was halted before its founding level was reached. Apparently the blocks were dry-laid, though small patches of architectural stucco on the face of the wall suggest that its surface was at one time plastered.

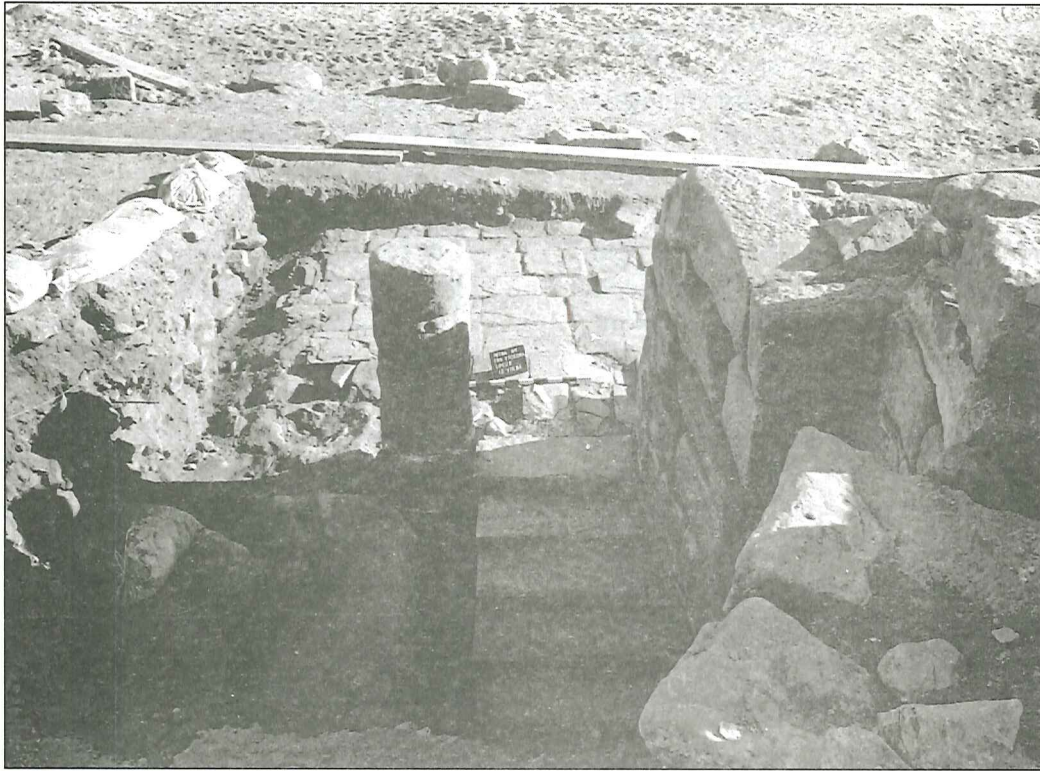
The Exedra entry was adorned with two slender sandstone columns (diam. 0.53 m), each situated one meter inward from the corners of the structure, and aligned with the east-west wall (Fig. 9). The exposed west column (six hewn column drums and carved limestone base) is preserved *in situ*, to a height of 2.49 m. Its base rests on a single sandstone slab, which is all that remains of the now robbed-out flooring within the building. Projecting eastward from the northeast edge of the Exedra, the fragmentary remains of another wall, which clearly was bonded to the wall of the Exedra, were also cleared. This wall appears to have been aligned with the heavily robbed-out Grand Stairway, however further excavations in this sector are needed to confirm this.

Four *in situ* sandstone drums of an engaged column were uncovered along the

10. There appears to be a twin East Exedra, flanking the east end of the Grand Stairway, which is in a relatively poorer state of preservation.

11. Because only the eastern half of the West Exedra

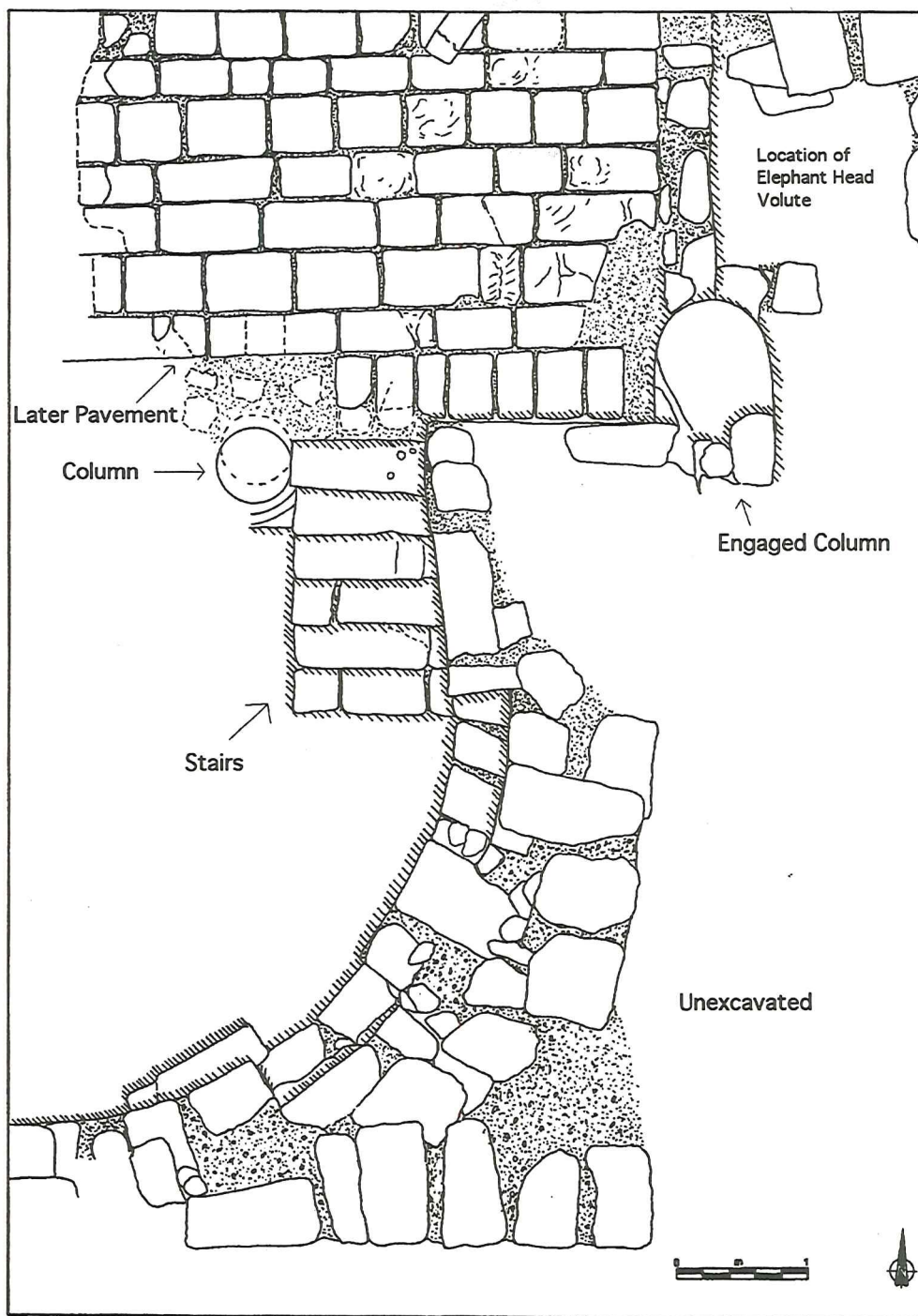
was studied, the two niches in the western (unexcavated) portion of the structure are at this time only presumed.



7. Petra Southern Temple, Trench 5, West Exedra, facing north.



8. Petra Southern Temple, Trench 5, West Exedra, wall niches, facing south.



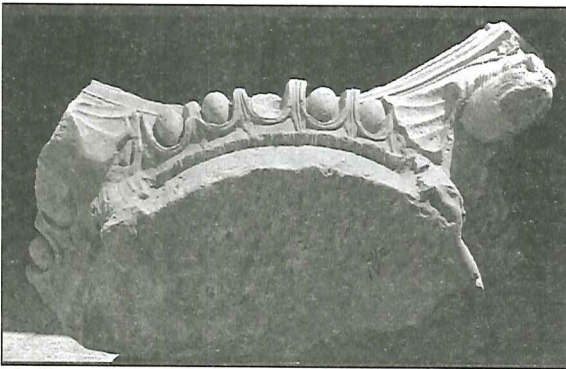
Top Plan of Trench 5

9. Petra Southern Temple, Trench 5, West Exedra, Plan.

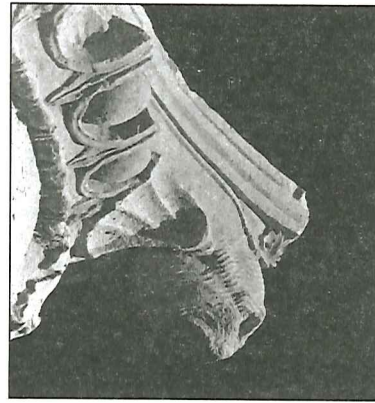
north face of the east-west wall, 1.8 m from the east Exedra corner. A patch of architectural stucco was found on a portion of the column's dressed surface, indicating that this column was also plastered. These drums (diam. 0.84 m) lie on a single sandstone paving stone, the only paver remaining *in situ* along the once-paved forecourt of the Exedra area.

In a debris level filled with carved architectural fragments, a limestone capital with elephant-headed volutes (Figs. 10 and 11) was found.¹² Most likely the capital originally adorned the Exedra structure, its 0.86 m width corresponding well with the engaged column's measurements. Several other carved limestone fragments including elephant ears, cheek-pieces, and trunks have also been identified and registered as having come from this area, which strongly suggests that this was the place of this decorative capital's origin.

A secondary use of the Exedra area was indicated by the construction of a later pavement, at an elevation of one meter above the original flooring level. This pavement, composed of white sandstone slabs now badly deteriorated, covered the excavated area to the north of the Exedra. From this pavement a set of six white sandstone steps, built along the east interior face



10. Petra Southern Temple, Trench 5, West Exedra, Capital with elephant-headed volute.



11. Petra Southern Temple, Trench 5, West Exedra, Capital with elephant-headed volute, detail.

of the Exedra, descended from the exterior pavement to the level of the interior flooring. Evidence for an abundance of charcoal-laden soil indicated the even later use of this structure as sheltered workshop for a small Late Roman glass kiln.

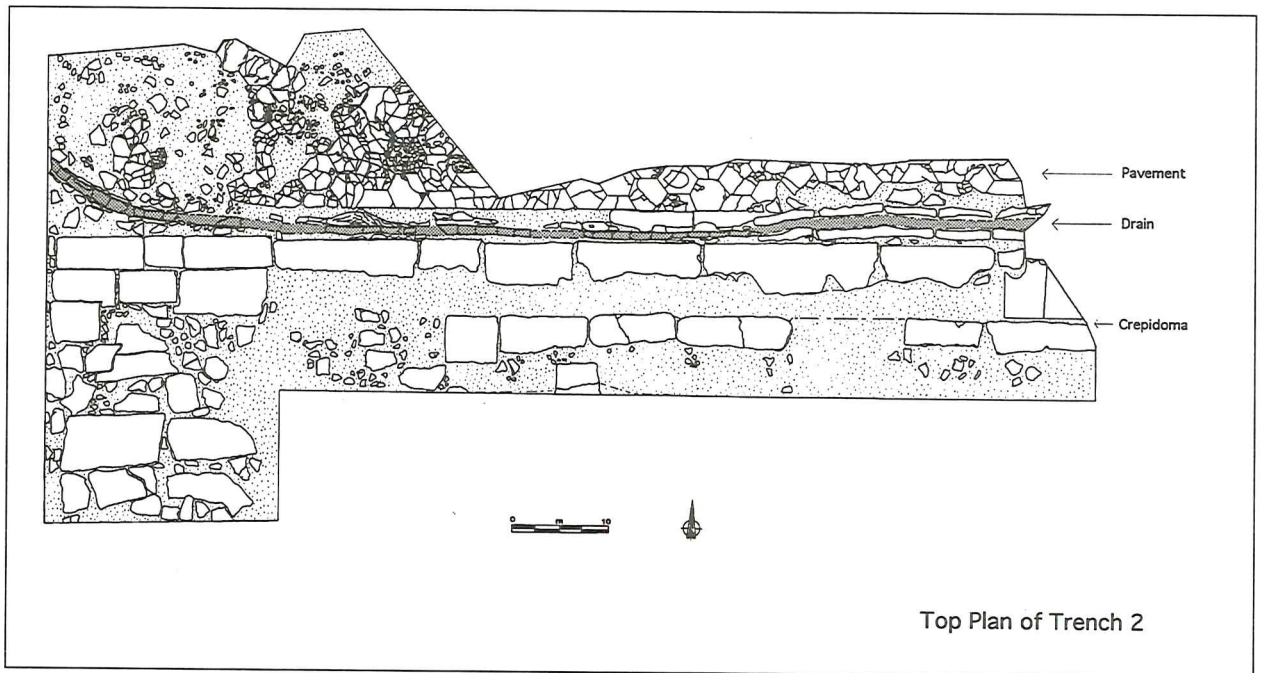
The Upper Temenos and the Southern Temple Exterior

A number of trenches were excavated within the Upper Temenos which shed new light on the architectural design and apparent later remodelling of the Southern Temple building. Continuing work begun during the previous season, Trench 2, encompassing the northwest corner of the temple stylobate, was reopened and expanded farther to the north and west than its 1993 limits, to include a larger portion of the northwest temple forecourt (Fig.12). The main objectives were to clear the temple crepidoma along the western portion of the front of the building, to clean the stylobate area sufficiently to allow for a block-by-block EDM mapping of the entire temple stylobate, and to recover the level of the temple courtyard immediately to the north. Excavation revealed evidence for a number of phases of temple use.

The lower portion of the temple crepidoma was stepped along the north front

12. We are grateful to Dr. P. J. Parr for his identification of this feature. See Thomas F. C. Blagg's

"Column Capitals with Elephant-Head Volute at Petra," *Levant* 22, 1990:131-137.



12. Petra Southern Temple, Trench 2, Plan.

of the temple. Each course was constructed of two layers of large limestone ashlars (Fig. 13). The top layer ashlars appeared to have been mostly robbed away. The lower ashlars, ranging anywhere from 0.40 m to 1.3 m in length, averaging 0.43 m in depth and 0.20 m in thickness, had what appeared to be a mix of sandy mortar and thin leveling stones on their surface; apparently this served to hold and support the (now missing) top ashlars in place. The crepidoma continued 1.25 m west beyond the northwest corner of the temple, and may have originally ringed the entire building. At some later period of the temple's use, however, the west side of the temple was provided with a broad north-south walkway (see below).

Also belonging to the temple was the abundance of carved limestone architectural fragments recovered from the destruction levels to the northwest (Figs. 14-16). These hundreds of artifacts will aid in the understanding of the decorative program of the temple façade. These elaborate floral and vegetal elements — thick curving vines



13. Petra Southern Temple, Trench 2, Temple stylobate and crepidoma, facing east.

ending in flowers bursting forth with pomgranates, pine cones, and bushy acanthus leaves — indicate an early first century date. Significant also was the large number of stucco architectural fragments which turned up in the destruction debris. The bulk of the fragments were flat, but a number were molded, either as very shallow curved elements, or as raised flat bands. These decorative elements probably served as string courses on the temple's entablature, and for covering the columns along the stylobate. Similar patches of vertical curving stucco with raised bands remained *in situ* on a few of the partially exposed columns of the interior cella colonnade. Of over 300 stucco fragments recovered in the forecourt area this season, only a few small flat pieces had paint preserved on their surface, which suggests that the temple exterior was predominantly white and unpainted.

Immediately to the north of the temple building, the west forecourt pavement was cleared, consisting of hexagonal white limestone pavers, measuring 0.20 m a side, 0.36 m in diameter, with an average thickness of 0.12 m. This is the continuation of the pavement uncovered in Trench 1 1993, located directly in front of the temple entryway. Although the pavement must have covered all of the forecourt, it is in poor condition. Until portions of it are removed and its bedding and substrata are investigated, it will remain uncertain whether or not this pavement is original to the Upper Temenos area, or was laid as a later refurbishment.

At some point in the temple complex's later history, a new drainage system was installed in the forecourt, placed directly on top of the hexagonal pavers (Fig.12). Par-

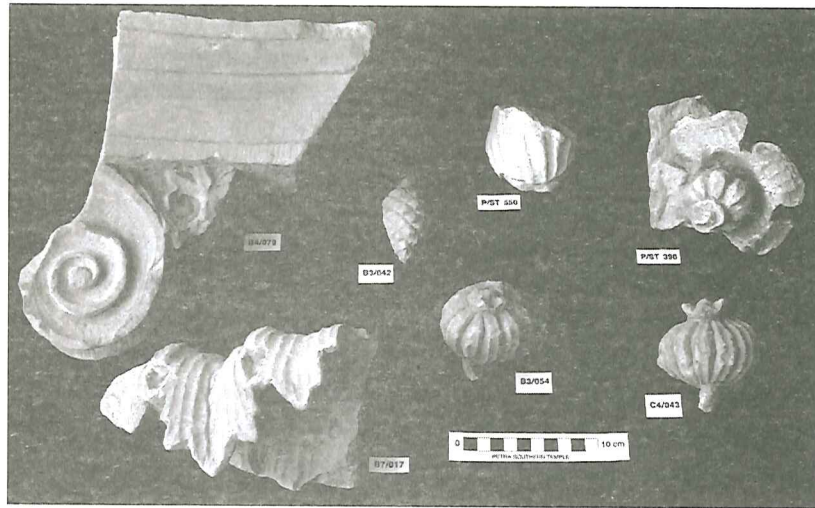
tially uncovered in 1993, this drain, which runs east-west abutting the north face of the temple crepidoma, was constructed of two types of material. Directly in front of the temple steps, and continuing westward roughly four meters, the drain consisted of an open stone channel, composed of reused limestone blocks laid as stretchers, 0.40-0.50 m in length, 0.36 m in width, with a roughly hewn inner channel (0.16 m in width). The well-preserved blocks were joined with a waterproof plaster, much of which is still intact. As the drain continues to the west, it was composed of ceramic pipe (now very damaged), ca. 0.10 m in diameter, held in place with earth and pebbles.

From the northwest corner of the temple crepidoma, the pipe turns to the northwest, is laid underground (the hexagonal pavement is completely missing from this area, apparently due to the burial of the pipe), and empties into a stone catchment drain 2.50 m from the corner of the temple. This drain consists of two limestone blocks — a donut-shaped hewn upper block with an interior diameter of 0.26 m, an exterior diameter of 0.66 m; the larger block below, which has a circular hewn interior, with an interior diameter of 0.47 m. Water entered the catchment drain from the southeast and evidently exited through a channel pipe leading off toward the northwest. The purpose of the catchment drain was to filter the incoming water of its sand and debris. Functioning as a settlement tank, the sediment settled to the bottom, while the cleaner water flowed out through the northwest pipe to a yet unknown destination. Unfortunately, little pottery, and only a few plaster fragments turned up in the drain, however, soil was collected for analysis.¹³

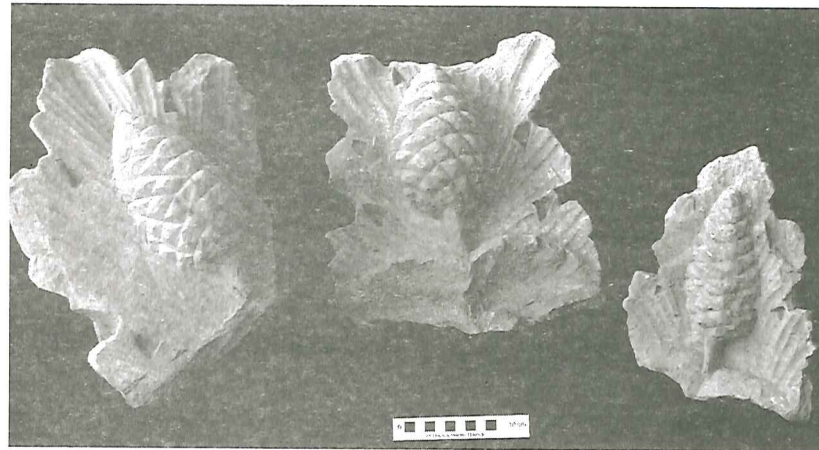
13. The change in construction material of the water conduit from limestone blocks to ceramic pipe possibly signifies two phases for this secondary drainage system, original and later repair. It seems more likely however that the two types of construction were contemporary, the builders

simply using the finer but more costly limestone channel near the entrance to the temple, the pipe farther out. During the 1993 excavation of a portion of this drain east of the temple steps, pipe again is used in lieu of limestone.

14



15



16



14, 15, and 16. Petra Southern Temple, Trench 2. Carved architectural fragments.

In addition to these excavations in the area of the temple forecourt, the Upper Temenos was also investigated in a series of trenches opened along the west side of the temple building. The excavation of Trenches 8, 10, and 12 revealed a 24 m long portion the western (outer) face of the western temple exterior wall, a broad paved walkway which ran along the length of the exposed wall, and two doorways which led from the walkway into the temple proper (Figs. 17 and 18). As in other excavated areas of the Southern Temple Complex, evidence was found for a number of construction phases.

The west wall of the temple, preserved up to a height of 3.98 m, was found to be composed of diagonally dressed sandstone ashlar blocks, set as headers and stretchers. This well-built wall, measuring 1.35 m thick, seems to have been laid without mortar. Small amounts of white plaster were found adhering to its east face. The walkway which lines this wall is a broad, rather elegant passageway, paved with large square and rectangular pavers, ranging in size from 0.55 x 0.55 m to 1.2 by 0.55 m. These sandstone pavers are generally in poor condition, due to earthquake damage and exfoliation. Access to the walkway must have been gained by means of a low staircase from the temple forecourt area, although severe earthquake damage, and the evident robbing-out of materials, make this only a hypothesis.¹⁴

The current width of the west walkway is 4.30 m, although it is unclear if this is its original width. The low, shabby north-south wall which now forms the walkway's western limit is clearly not of the same construction phase as either the walkway or the temple wall. Predominantly composed of roughly hewn stones (with a few apparently

re-used ashlar) and many chinking stones, this wall is preserved to a height of 1.4 m, and varied in thickness from 0.52 - 0.71 m. That it is of a later period of the building's occupation can also be seen by the fact that the sandstone pavers along the very west of the walkway have all been crudely cut or broken off, so that this new wall could be set into the founding levels of the walkway.

A doorway, leading from the west walkway into the broad temple pronaos, pierced the west temple wall approximately six meters from the front of the temple, although severely damaged by earthquake activity, the width of the doorway was ascertained to be approximately 1.5 m. Traces of a thin, gritty white plaster were preserved on the fragmentary door jamb blocks. There is some evidence of later repair of this portion of the temple wall, although the very poor condition of the stones in this area made such determinations difficult.¹⁵

Another doorway, situated farther to the south, also gave access to the temple from the west walkway. This doorway, better preserved than that to the north, presumably opened into the cella itself, although because only its eastern (outer) face was exposed, and its fill of earthquake collapse and debris left unexcavated, this must remain a matter of conjecture. At a later period in the history of the Southern Temple, this doorway was partially filled in, narrowing its width from the original 1.9 m down to a tight 0.7 m. This later blockage is of comparatively poor construction, composed of rough hewn blocks, with sandy mortar and many small chinking stones, and may belong to the period of construction of the later, low walkway wall to the west.

Possibly also dating to this late phase is a low cross-wall running east-west across the

14. A broad walkway similar to that of the Southern Temple can be found along the east wall of the temple's near neighbor, the Qasr al Bint.

15. Because of their extremely precarious situation,

a few of the doorway blocks were removed, to be reinstalled into the wall more securely at a later date.



17. Petra Southern Temple Trenches 8,10,11 West Walkway, facing south.

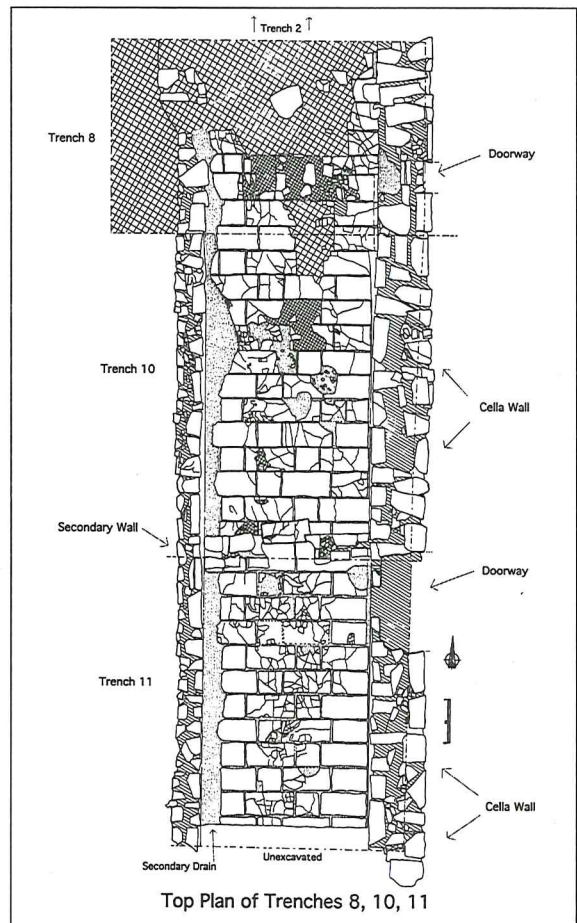
walkway, just north of the second doorway. Preserved to just under a meter in height, it is similar in construction to the later walkway wall, although the two do not bond.

The depth of deposit which overlay the west walkway and the west temple wall, consisting mainly of large ashlar blocks and block fragments fallen during the temple's collapse, was considerable, and its removal was difficult and slow. The Department of Antiquities's generous loan of a flatbed-mounted crane greatly facilitated both the removal of these stones, and their orderly deposit in our prepared lapidary.

Collapsed construction materials and destruction debris surrounding the doorway leading from the walkway into the pronaos contained a great many carved architectural fragments, of the type and style unearthed in the temple forecourt area. Here were found a series of carved limestone faces, two-thirds to slightly over life-size (Figs.

16. See Judith S. McKenzie's "The Development of Nabataean Sculpture at Petra and Khirbet Tanur," *PEQ* 120, 1988:81-107, for a discussion on the relative dating of the architectural sculpture of Petra.

17. Published by G. R. H. Wright in "Recent Dis-



18. Petra Southern Temple Trenches 8,10,11, West Walkway, Plan.

19-22). These finely-carved faces are mask-like in appearance, with open mouths and staring eyes. The outlined irises of these eyes curiously protrude, a sculptural technique peculiar to earlier Nabataean art.¹⁶ In style and quality they most resemble the assemblage of architectural sculpture known as the "1967 Group of Sculptures".¹⁷ No paint was preserved on these or any other carved fragments.

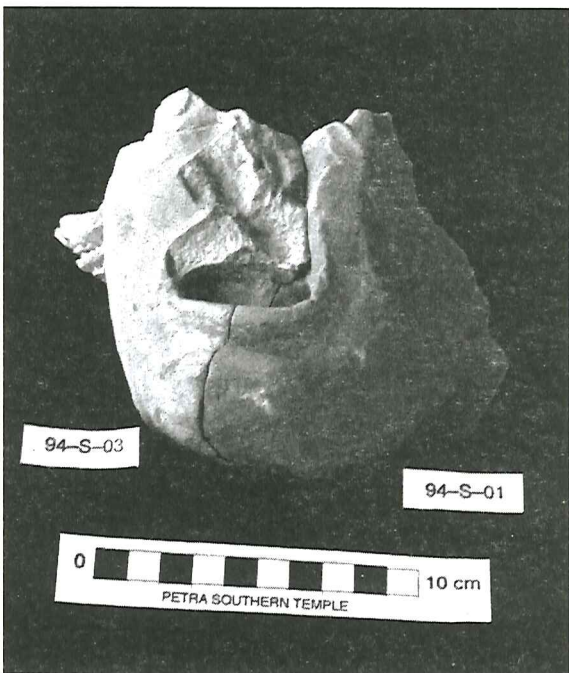
Temple Interior

Investigations within the Southern Temple building itself this season were intended to ascertain the overall layout of this im-

coveries in the Sanctuary of the Qasr Bint Far'un at Petra: Some Aspects Concerning the Architecture and Sculpture," *ADAJ* 12-13, 1967-67: 20-29, and dated by McKenzie (1988: 87) to the beginning of the first century CE.



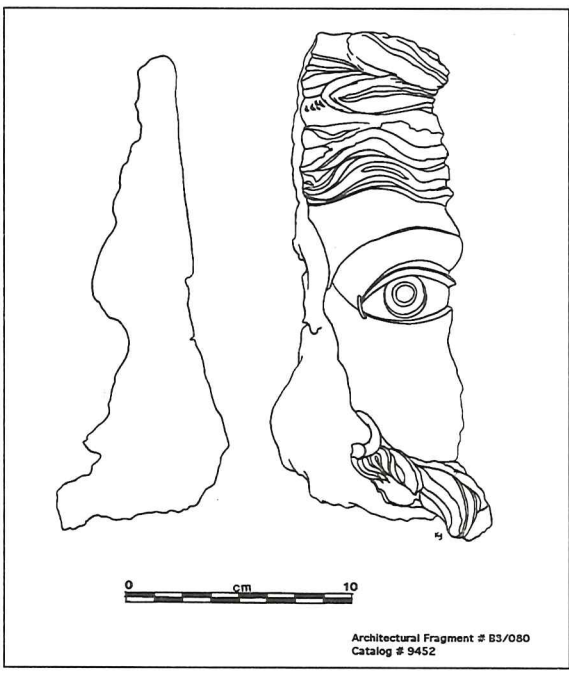
19



20



21



22

19 - 22. Petra Southern Temple, Trench 12, Carved facial architectural fragments.

posing edifice, resulting in a revised temple plan (Fig. 2). Study included survey and comprehensive clean-up of the entire temple area,¹⁸ as well as excavations within the Pronaos, and the complex Adyton area.

Through extensive survey and a number of small clearing projects, we were able to confirm that the temple measures 28 m east-west, and is some 40 m in length. From the temple forecourt a stairway approaches a broad, deep tetrastyle in antis pronaos, which in turn leads up and into the naos or cella. The cella is some 29 m north-south by 18 m east-west. The cella entry is marked by two columns which are the same diameter (1.50 m) as those at the temple entrance, but are larger than either the eight columns flanking the cella walls or the six at the temple rear, which have diameters of 1.10 m. Of these 22 columns which decorated the cella, we were able to confirm this season that 20 remain *in situ*. Moreover, it was discovered that these columns, like those which lined the stylobate, were faced with decorative stucco; unlike their larger counterparts, however, the columns of the intenal colonnade carried a deep red stucco as well as the more ubiquitous white.

Encompassing the northwest corner of the temple pronaos from the stylobate south, Trench 12, measuring 6 x 10 m, was opened. After the removal of fallen architectural debris, an inner monumental anta wall was unearthed inside the main outer western wall of the temple (Fig. 23). This wall, composed of well-dressed sandstone ashlar, rests upon a finely carved limestone Attic base; the profile of this elegant anta base mirrors the profile found on the collared limestone column bases which line the temple stylobate.

The earliest excavated deposit comprised a strip of hard-packed sub-flooring footing of small/medium pebbles, set in yellow mortar, which extended from the north stylobate south to the trench perimeter. This deposit was not excavated, only the surface was cleared along a strip 0.80 m wide along the western side of the inner west temple wall to the stylobate, against which the footing also abuts. It appears to run beneath this wall and probably corresponds with the footing found beneath the paving in the west walkway (*supra*). The stylobate, western wall and footing thus appear to be part of a single contemporary construction plan. This footing served as a sub-flooring, providing a stable basis for the paved floor of the Pronaos which must have originally existed but which has been removed. No evidence for this footing was found beneath



23. Petra Southern Temple, Trench 12, Temple Interior, Attic based Anta, facing south.

18. The accumulated overburden within the temple area is daunting; not only do we have an extraordinary amount of destruction debris from the collapse phases of the temple, but we are also faced with a considerable amount of run-off

from the steep al Katutah slope immediately to the south of the temple. The clearing of this material continues to be a difficult and time-consuming project.

the base of the anta wall which, in a very small probe, appeared to be resting on clean sand. Although the Southern Temple plan suggests that the anta wall is contemporary with the other structural features, this difference in construction requires further investigation, and the anta wall may, in fact, be earlier. At some point in the temple's later history this portion of the temple was quarried, and the paving stones which lay upon the footing were removed. Perhaps shortly thereafter (there is little accumulation of abandonment debris) the temple building collapsed.

The later debris which overlay the temple remains in this portion of the Upper Temenos can be grouped into two distinct layers — an earlier destruction layer and later accumulated debris. As excavated evidence from all over Petra has shown, the earthquakes of 363 and 551 CE had devastating effects. The Southern Temple was no exception; it would seem that much of the major destruction of the temple is attributable to earthquake action. The 0.35 m layer of debris had a distinct soil consistency and color, clearly identifiable in the balks of the excavated trench, and lay directly above the hexagonal pavement level, and the temple crepidoma. This destruction level consists of an abundance of fallen masonry debris (sandstone ashlars, limestone decorative pieces, brown soil and decayed sandstone from the core material of the walls). There is no stratigraphic evidence for more than one major destruction, apart from the fact that no column drums were found deep in this fill,¹⁹ these all being on the surface of the site. This might suggest that capitals and entablatures toppled first, and columns later, though whether after a short or long interval cannot be said. The destruction debris contained very little pottery, and the main category of ar-

tifact other than architectural pieces comprised a plethora of decorative stucco fragments. The uppermost level contained less concentrated debris and fill accumulated over the centuries, with the additional architectural elements of the unsteady temple finally succumbing to collapse.

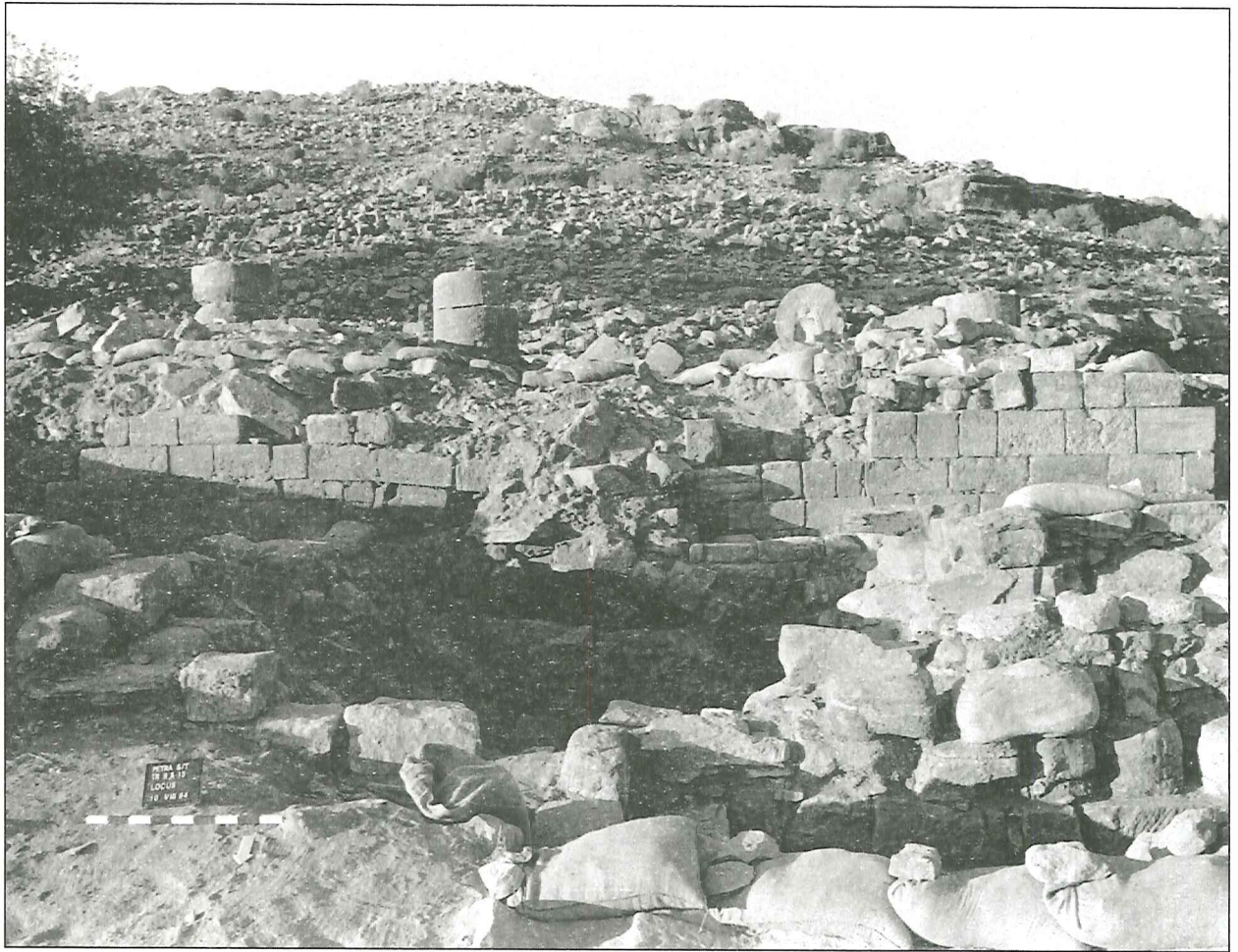
Cella Colonnade

The internal cella colonnade represents a distinct phase of the temple's history. Constructed of hewn sandstone circular drums measuring 1.10 m diam., the columns were originally covered with decorative (fluted) red and white plaster and topped by now-fragmentary limestone Corinthian capitals. The fact that decorative plaster (preserved up to 0.11 m thick, comprised of several layers) was found over portions of the entire surface of the columns suggests that the columns were originally intended to be free-standing and viewed from all directions.

The Adyton, or south portion of the temple interior was excavated in Trenches 9 and 15 (Fig. 24). The main objective was to define the southern cella area, including the interior walls, stairways, and the large central vaulted area. With the exception of the earliest cella colonnade, most of the construction that is described below can be assigned to a later, large-scale building program which added at least one, and probably two upper stories to the Adyton portion of the building. When this ambitious building program took place is not known, but both phases have Nabataean characteristics (diagonally dressed ashlar blocks set with mortar, the plastering of all architectural features, arches and vaulted ceilings, and limestone capitals carved with acanthus leaves).

In this later phase, the inner colonnade of the cella evinced the construction of par-

19. The exception is one drum unearthed within the Adyton, resting upon the west stairwill.



24. Petra Southern Temple, Adyton, central vaulted structure with Trench 15 (left), and Trench 9 (right), facing south.

allel casemate-type walls built around the columns, covering at least the lower portion of the columns' decorative plaster. This was a three-part process of construction: 1) a shell of parallel-set sandstone ashlar blocks was constructed linking the columns;²⁰ 2) large unhewn stones were placed within the shell, around the columns for additional support; and 3) the interior of the wall was filled in with small stone rubble. We posit that these walls may have served to support the columns and the structural integrity of the Temple.

Evidence suggests that the Adyton spanned the cella width, and was subdivided, along the north-south axis, into

three roughly equal sections. This subdivision was achieved by two north-south walls, which helped to bear the central Vaulted Structure. Both to the east and west of the Vaulted Structure, it appears that stairways rose to what we have called the "Mezzanine" level (Fig. 25). This tripartite adyton plan is also found in the Southern Temple's neighbor, the Qaṣr al Bint, as well as other Nabataean temples, such as the "early" temple in Wādī Rumm. The Qaṣr al-Bint also clearly shows evidence of both a tripartite subdivision of its main level, and a mezzanine level above. In the Southern Temple, the Mezzanine level is also divided into three areas: two landings

20. Each column's exterior side (that is, the side of the column facing the sella wall) was left protruding from the plane of the wall.

truding from the plane of the wall.



25. Petra Southern Temple, Trench 9, Adyton, Mezzanine landing and stairways.

on the east and west, and a central room over the Vaulted Structure.

Vaulted Structure

In the center of and now dominating the Adyton area is a large vaulted structure, constructed without a keystone in the typical Nabataean fashion, which originally extended over the length of the Adyton, although only a five meter extension remains intact, at the rear (south) end of the Adyton. It is not clear if this structure was originally intended to be part of a lower basement story; or if it was a visible component of the main cella level of the Adyton. In an at-

tempt to stabilize this structure for future exploration, consolidation of the stone blocks was undertaken, but the excavation of its interior must await the removal of debris from above.²¹ Above the vaulted structure is a major east-west wall (prominent in Fig. 24), built of sandstone ashlar blocks, mostly dressed (some internal ones only hewn), 0.30-0.55 m long, 0.30-0.50 m wide. The wall is two to three blocks thick (total 0.9-1.0 m), with mortar visible between most of the ashlar.

The Adyton portion of the cella was limited to the north by a rather wide cross-wall, extending east-west through the area

21. Excavation to the south of the east-west wall has

not yet been conducted.

in front of the Vaulted Structure. Composed of large (up to 0.90 m) sandstone blocks, a few dressed, a few unhewn, it is ca. 1.4 m thick, but unfortunately not very well preserved.

Western Stairway

In the west, the Mezzanine level was accessed from below by a broad stairway, 2.25 m wide, flanking the west intercolumnar wall (Fig. 26).²² The staircase is a single flight of 14 steps rising from a lower landing. The original stair pavers were robbed out in antiquity, along with the pavers of the Mezzanine floor, leaving only a bedding of unhewn stones and hard-packed yellow earth. The only evidence for the original paving is two hewn rectangular sandstone pavers, found *in situ* on the lowest two steps. The average height of each step/riser is 0.19 m.

All that has been revealed of the lower landing is a single rectangular sandstone paver at the base of this broad flight of steps, but its east end disappears under a collapsed drum. This landing is most likely to have served simply as an intermediary landing between the lower and upper levels of the temple. Further excavations should reveal an additional flight of stairs leading from this landing down to the floor level of the cella. An arched opening, perhaps a doorway, is built into the western wall of the stairway. The fill of earth and small stones inside this opening has yet to be excavated. That the staircase was covered by a vaulted ceiling is suggested by the top two extant courses of the east face of west intercolumnar wall, consisting of a course of ashlar blocks with an arched east face set over of a course of triangular shaped blocks which create a slope equal to the angle of the staircase. Also found in both walls were niches, which probably housed oil lamps, as

a means to light the staircase.

Mezzanine

The west stairway leads up from the main lower level to a small room, or landing, at the mezzanine level. An identical landing is present at this level on the east side of the Adyton. These areas, Measuring 3.85x2.90 m, were elegantly floored with large light gray rectangular sandstone pavers, varying in length from 0.45-1.10 m, with widths 0.40-0.60 m. A thin sandy mortar was occasionally visible between the slabs; the slabs were set upon sand mixed with this mortar. The pavers are only partially preserved in both the east and west rooms, more than half were either robbed out, or destroyed by the dampness of the soil which has caused much exfoliation to occur.

Matching doorways, 1.23 m in width, lead off each of these landings to the south, where they are bounded by the east-west wall. The areas south of these doorways have not been sufficiently explored to hypothesize about this space, except to say that the final southern limit of this story and the temple itself was probably the east-west intercolumnar wall which is visible on the surface, in patches, farther to the south. The doorway's slightly raised sandstone threshold stones (of a rich reddish-purple) have also suffered much disintegration.

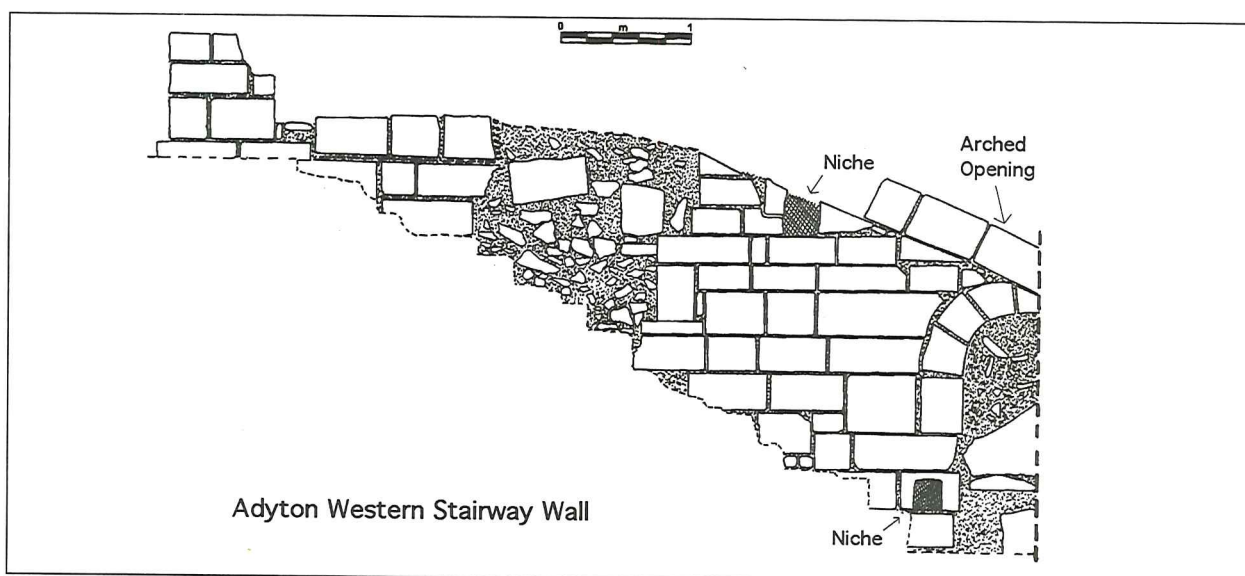
The space over the central Vaulted Structure²³ probably also constituted a "room," for there exist thresholds leading from the paved landings into this space. This floor level however, apparently situated over the central vaulted space, has collapsed with the vaulting.

Narrow matching stairways, 1.7-1.8 m wide, lead up from the paved Mezzanine level, south-to-north. Four steps of each of these stairways are preserved. These are

22 The existence of east stairway, although very probable, must remain conjectural — this portion of Trench 15 was not excavated, due to

time constraints.

23 Shared by Trenches 9 and 15.



26. Petra Southern Temple, Trench 9, Adyton, western stairway wall, east face.

well-constructed and are composed of mortared limestone risers. Each step, with risers roughly 0.21 m high, consists of three limestone blocks across, 0.28-0.30 m in width, varying in length 0.20-0.95 m

Recovered from the destruction levels which accumulated over the Adyton area were a number of rectangular sandstone ashlar blocks which had one face (on the long axis) with a concave surface. These blocks (complete examples averaging either *ca.* 0.80 x 0.35 x 0.30 m, or 0.45 x 0.35 x 0.30 m) evidently were used in constructing arched ceilings, such as the still extant vaulted structure. There is similar evidence for arches spanning the large stairways leading up to the Mezzanine level, and given the number of arched blocks which turned up in the fill over the landing area, some of the other Mezzanine story walls may also have supported arched ceilings.

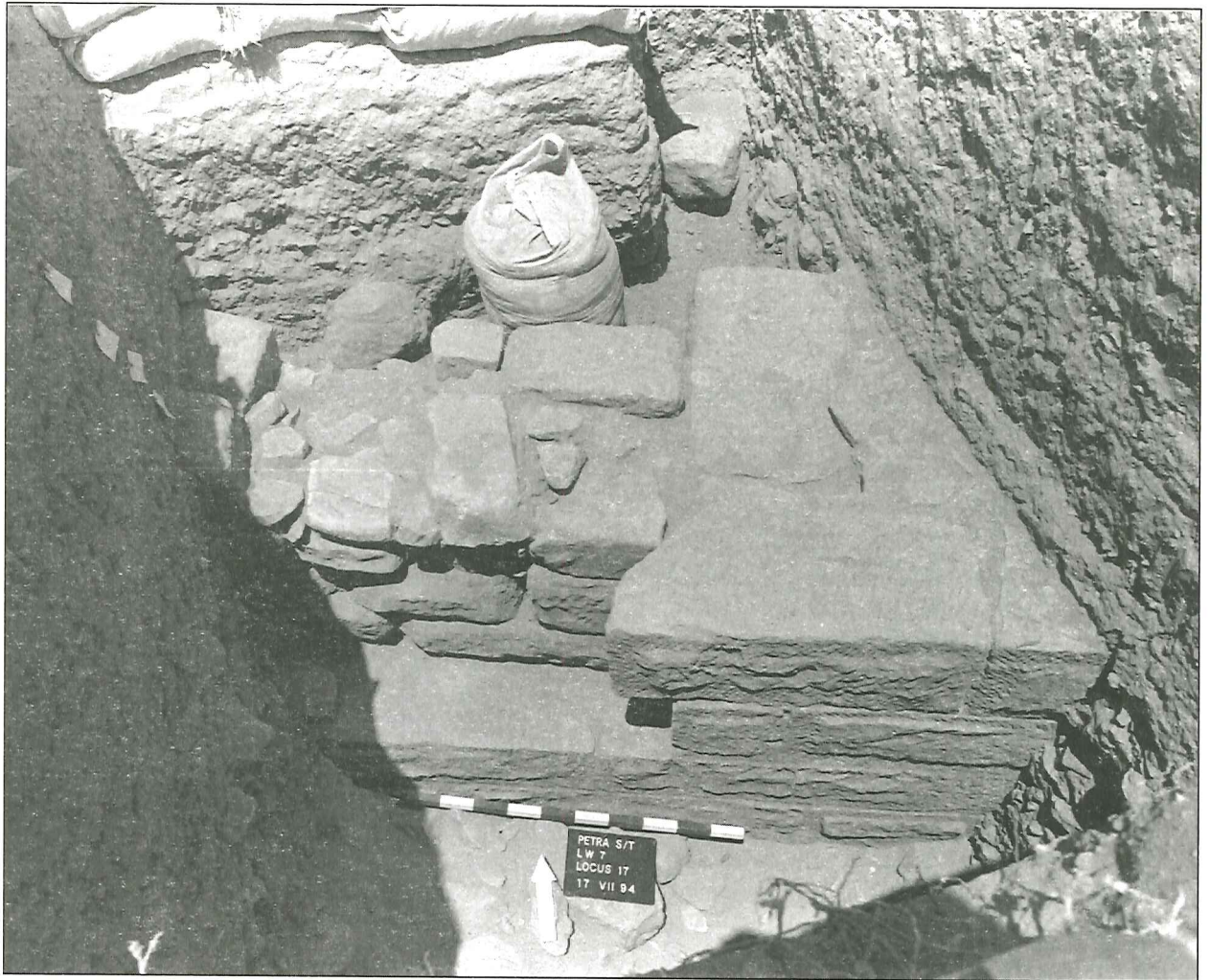
The third phase visible in the Temple South is one of abandonment and partial dismantling. This phase consists of one *ca.* 0.25 m layer of debris, which accumulated over most of the exposed surfaces before the onset of the collapse of the temple structure. There was not enough refuse to qualify it as habitation / squatter debris; it

seems rather just to have been casual accumulation. Apparently this is the period during which the stones of the Southern Temple were quarried for use elsewhere.

The final phase was that of temple collapse. The layers of fill associated with this phase all contained a great many architectural fragments mostly arched blocks and ashlar, lying together, at all angles and pitches. The soil was very loose, fine sand, with little pottery, and some roof tiles.

Lapidary West

Before being encumbered with architectural fragments to be used in temple reconstruction, the Lapidary West was investigated by a 2 x 3 meter sondage to ascertain whether this area, which displayed no evidence of architectural features above the surface, might contain structures preserved at a lower elevation (Trench 7, Fig. 27). Several deep Nabataean fill levels were located, with a wealth of Nabataean pottery. Below these, at a depth of over three meters, a large, well-constructed ashlar wall with marginally dressed blocks was uncovered, demonstrating that at least one significant architectural feature lies beneath the area encompassing the Lapidary West.



27. Petra Southern Temple, Trench 7, Lapidary West, Nabataean walls, facing south.

This wall, composed of limestone headers and stretchers, runs obliquely east-west, toward the area to the rear of the Southern Temple. Over 100 of the pottery fragments from this area were drawn and described, and samples have been sent for petrographic and neutron activation testing to the Applied Science Center of the University of Pennsylvania Museum.

Phasing

The building and use phases of each area were arranged in chronological sequence, and the inter-relationships between architectural components were tentatively established. Based on the 1994 excavations, the general sequence or phases of the

Southern Temple precinct can be seen in chart form in Table 1.

Field Conservation

After final recording of the excavated areas was completed, the trenches were protected with aluminum roofing and paved areas were backfilled to reduce the effects of winter erosion on sensitive exposed features. Also, the water diversion ditch which served us so well during the winter rains of 1993 was reconstructed on the slope east of the Temple to channel away run-off from the hill south of the Upper Temenos.

Catalog

The catalog of more than 150 items has

Table 1. Petra Southern Temple, Phasing Chart of architectural components, 1994.

Period	Phase	TR7	TR12	SP4	SP9 to SP12, SP16	TR8/10/11	Outer W wall	TR9/15	TR1	TR2	TR3	TR13	TR6	TR5	Propylaea
Nabataean pre-106	I	Wall													
	II	L12													
	III	Wall repair													
	IV	L9													
	Va		Fill	Fill											
	Vb			Canalization											
	Vc		Ante, stylobate	Steps?	Column construction		Wall construction?	Columns, S wall				Pavers?	Pavers?	Excedra construction	Stairway construction?
	Vd					Corridor?		Interior walls, 2nd storey	Pavers	Pavers	Pavers				
Roman post-106															
363 Earthquake	Via					Paver damage									
	Vib					W wall reconstr									
	Vic					Wall 15, L8, L16									
Late Roman	Vila														
	VIib													Platform construction	Kiln construction & use
551 Earthquake								Column collapse							

been prepared for the Department of Antiquities at the Petra Museum, and all registered artifacts are in storage there. Recovered were some 36 coins (Fig. 28), six limestone facial frieze elements, 47 lamps, most of which were fragmented, a delicate Roman glass head vase, and some 49 ceramics which included a figurine fragment with sandalled feet, two Nabataean bowls and several complete small cups, juglets and bowls.

Conclusion

Petra's Southern Temple encapsulated Nabataean faith, devotion and religious myth. What is clear is that the Southern Temple stressed a consciously constructed urban form tempered by the qualities of the Nabataean human experience, including the use of Hellenistic influences as they were absorbed by the local culture. Within the institutional fabric of the city's life, the Southern Temple represented a powerful architectural statement for the Nabataean world — in itself it was a statement of centralization and power — a mesh of local culture as a testimony to the city's glorious political power. Some of the larger questions yet to be explored involve not only



28. Petra Southern Temple, Trench 9, Coin of Aretas IV, Catalogue no. 94-C-3.

what the relationships were between the Southern Temple and the city itself, but also what went on within the gracious interior of this edifice.

M. Sharp Joukowsky
E. Shluntz

Brown University
Box 1837
Providence RI 02912
U.S.A.