

# THE BROWN UNIVERSITY 2001 PETRA GREAT TEMPLE EXCAVATIONS OFFER MORE SURPRISES

*Martha Sharp Joukowsky*

The ninth 10-week season of excavation by Brown University archaeologists at the Petra Great Temple took place from June until August 2001, and helped us clarify the architecture of the precinct. Eight trenches and two special projects were excavated with startling results. A revised site plan with the 2001 trenches is shown in **Fig. 1**, and an aerial photograph of the site at the conclusion of the 2001 season is shown in **Fig. 2**.<sup>1</sup>

## **Excavation Staff<sup>2</sup>**

The members of the 2001 Brown University team were Artemis A.W. Joukowsky, photographer; Deirdre G. Barrett, Brown Graduate Student and cataloger, Joseph J. Basile, Associate Director; Brian A. Brown, Assistant Director and surveyor; and John Philip Hagen, artist. In addition there was Sara Karz Reid, Small Temple supervisor, Brown University graduate student, who is writing her dissertation on the Small Temple excavations; Emma S. Libonati, senior archaeologist; and Monica Sylvester, and Donna D'Agostino database managers. I was fortunate to have five extraordinary Brown University undergraduate students who were indispensable for the recovery of the Great Temple architecture: Christian F. Cloke, Emily C. Egan, José I. Fusté, Amanda Henry and Darryl B. Sneag. Fresco and mortar samples were taken for analysis to provide us with their original chemical constituents by May Shaer and Stephan Simon of the GTZ (German Technical Research Institute). Dakhilallah Qublan, our expert foreman and Great Temple restorer, again served a crucial role in the success of these excavations. He oversaw the 50 workmen who aided us and continue to consolidate architectural features weakened by excavation. All small finds have been stored either at the site, in caves

cleared for storage, or in the Petra Museum. As in former years, this work has been conducted under my direction.

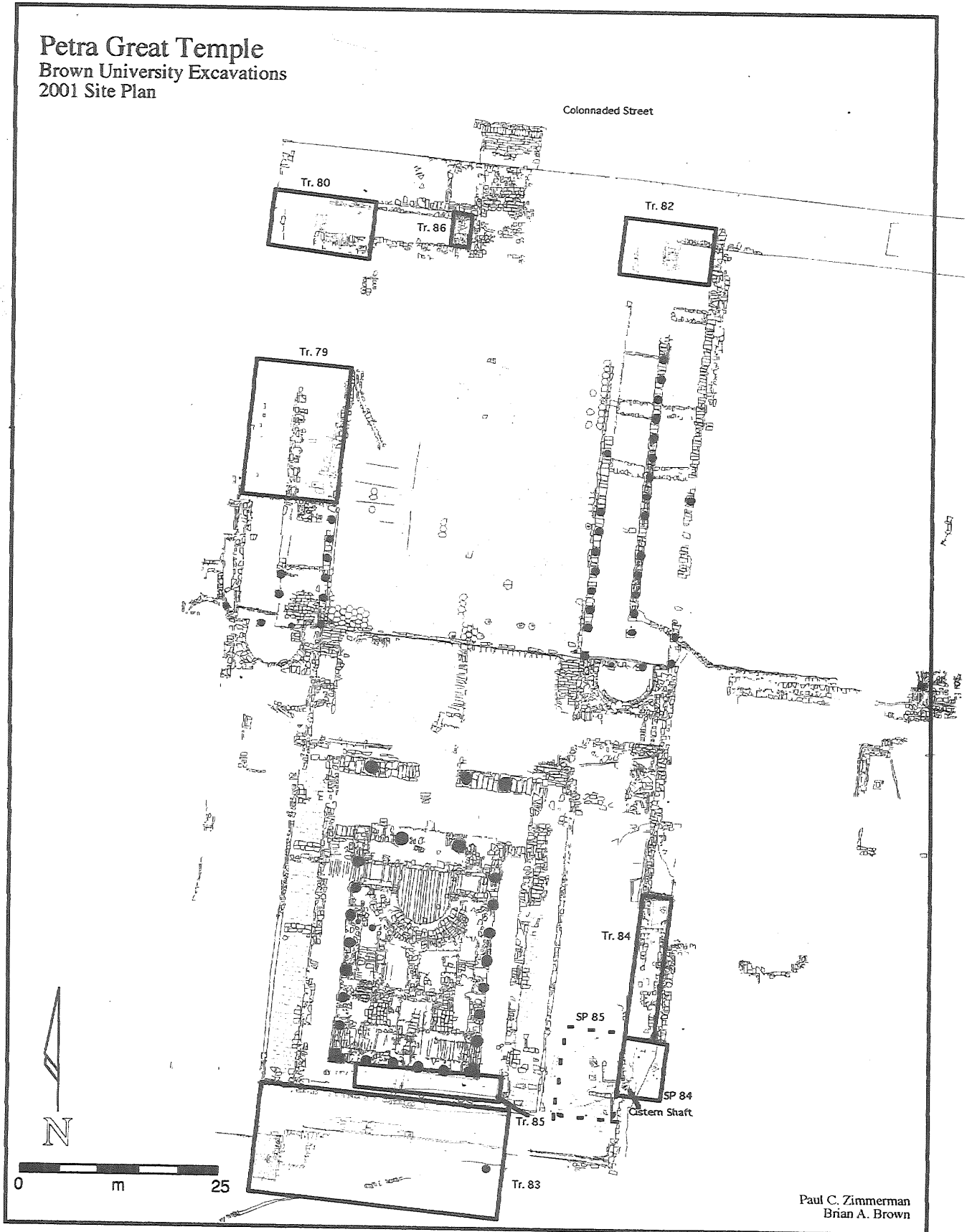
## **Sponsors**

I have been truly fortunate to receive the support of Brown University and the Brown University Undergraduate Teaching Assistantship program and many sponsors for the 2001 excavations. These include major funding from the Replogle Foundation, the Manchester Growth Fund, Donald E. Besser, Chairman, Julie Chrystie Webster, Claire J. Henderson with a matching grant from the CIGNA insurance company, and W. Chesley Worthington. The Joukowsky Family Foundation has most generously underwritten the expenses of site consolidation and restoration. H.E. Prince Ra'ad Bin Zeid helped provide us with helicopter support of the Seventh Squadron of the Royal Jordanian Air Force for aerial photographs. I owe all of these supporters a tremendous debt.

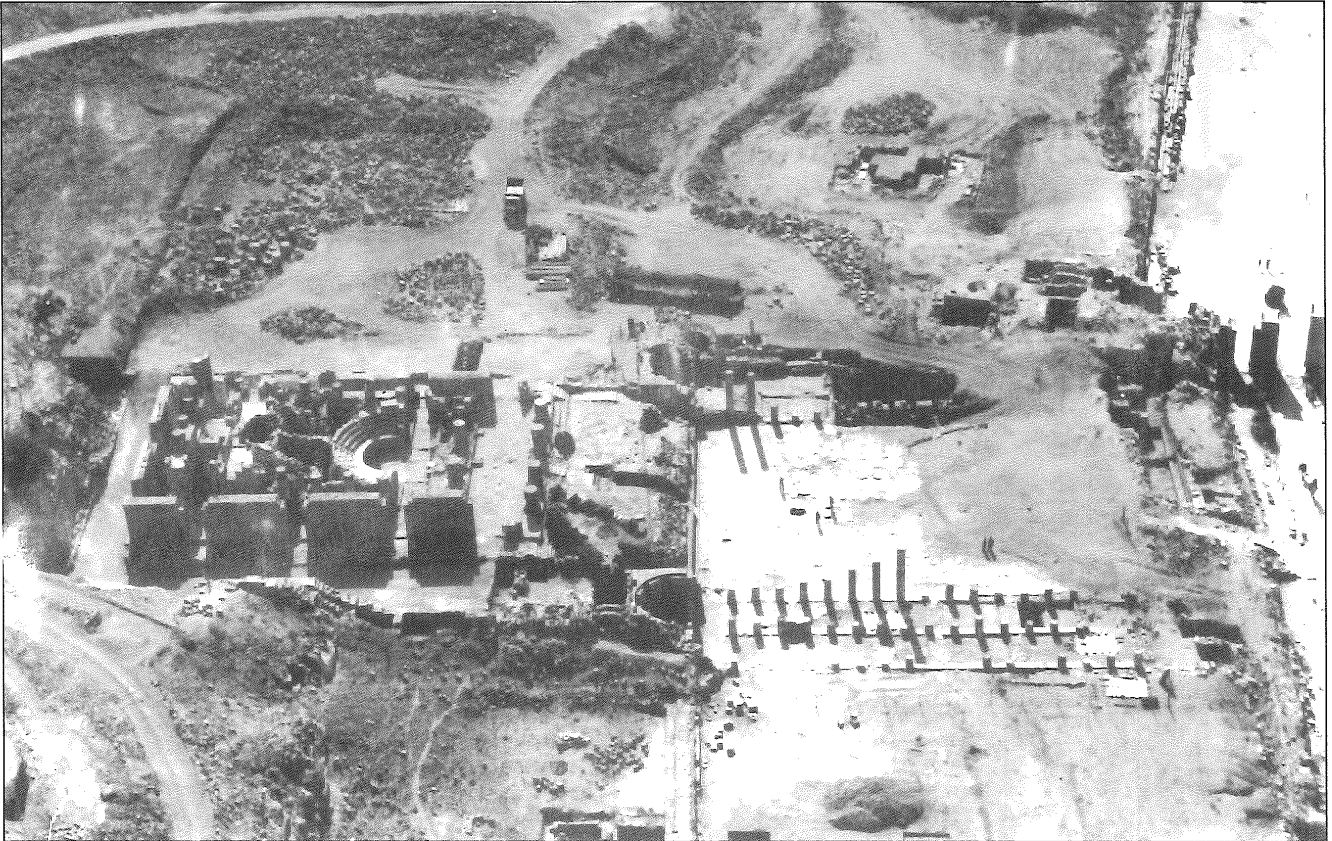
We are also indebted to the Jordanian Department of Antiquities of the Hashemite Kingdom of Jordan for their support in making the 2001 season a tremendous success, most particularly Fawwaz al-Kraysheh, Director-General. Assigned to us this year were Hani Falahat and Dia'eddin A. Tawalbeh as Representatives of the Department of Antiquities, but it is to Suleiman Farajat, Director of the Petra Archaeological Park, that we owe an enormous debt for his continued interest, logistical acumen and moral support. We also greatly appreciate the cooperation received from The American Center of Oriental Research, Pierre Bikai, Director, and all the members of the staff who so ably assisted us with logistical advice and negotiated formalities during the excavation.

1. Annual overviews of these excavations have been published in *ADAJ* with briefer notes in the *AJA* and the *ACOR* Newsletter. The project web site can be found at <http://www.brown.edu/Departments/Anthropology/Petra>.

2. Special visitors to the Great Temple in 2001 included Jane Taylor, Hana Asfour, Lema and Hana Alireza and Nissa Ra'ad Al-Hussein, Stephanie Truesdell, Andrew Schwartz, Erika Schluntz (who wrote her 1999 Brown University dissertation on the Great Temple architecture) and Donna and Ron Henry. These along with Misha and Jane Joukowsky and Francesca Bennett volunteered their services to the excavation as did Barrett and Mary Hazeltine. Brown University Trustee Duncan MacMillan and his wife, Niven, also paid us a visit as did 13 intrepid Brown University Travelers. Professor Ehud Netzer of the Hebrew University, Jerusalem, made his annual visit to the excavations as did Ali Jabbari, artist. Filmmakers David and Michael Udris created a special documentary of Petra and the Great Temple site. We were interviewed by Quentin Cooper of the BBC's "The Material World," a program that aired on July 20. ART a NOVA affiliate who are producing a film on Petra were also on site to interview us.



1. Plan of the 2001 Petra Great Temple trenches (Paul. C. Zimmerman and Brian A. Brown).



2. Aerial photograph of the Petra Great Temple looking west (photograph by A.W. Joukowsky).

## EXCAVATION RESULTS

The 2001 season saw excavations continuing in the Propylaeum, the Lower and Temenoi and excavations in the Temple proper. These investigations will be described in that order with a concluding note about our consolidation program.

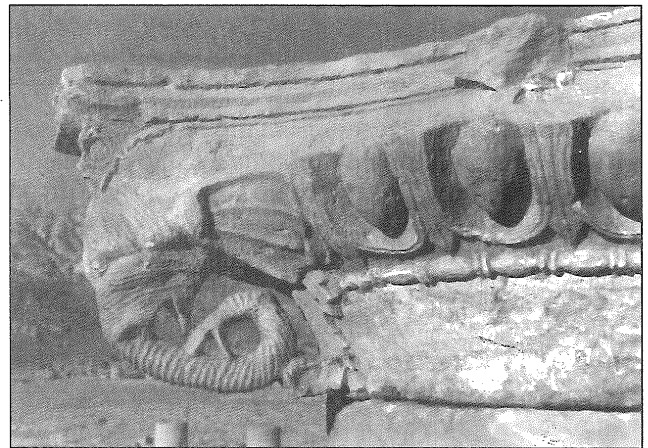
### Propylaeum West

The West Propylaeum today consists of three parallel east-west walls. The northernmost of these bordering the Colonnaded Street is P.J. Parr's "Portico Wall" (Parr 1970, hereafter, the Portico Wall). The Portico Wall separated the Great Temple precinct from the main thoroughfare of the central city. Approximately 3.00m south of this is Parr's Terrace "Wall K" (Parr 1970, hereafter Terrace Wall K), and 4.20m south of Wall K is what we have designated as the Great Temple's Lower Temenos retaining wall. For several seasons, the Great Temple excavations have taken place to the south between Wall K and the Lower Temenos retaining wall in Trench 51, 1998, Trenches 68 and 70 and Special Project 70 in 2000, and in Trenches 80 and 86 in 2001. Yet to be excavated in the Great Temple Propylaeum is the area between the Portico Wall and the Terrace Wall K.

Earlier excavations in the West Propylaeum, between Wall K and the Lower Temenos retaining

wall, had brought forth elephant headed capitals from the Propylaeum-Lower Temenos Triple Colonnade. During the 2001 season yet another, the best preserved of all was recovered — one side of an elephant headed engaged capital was completely preserved (*mirabile dictu*), which is shown in Fig. 3.

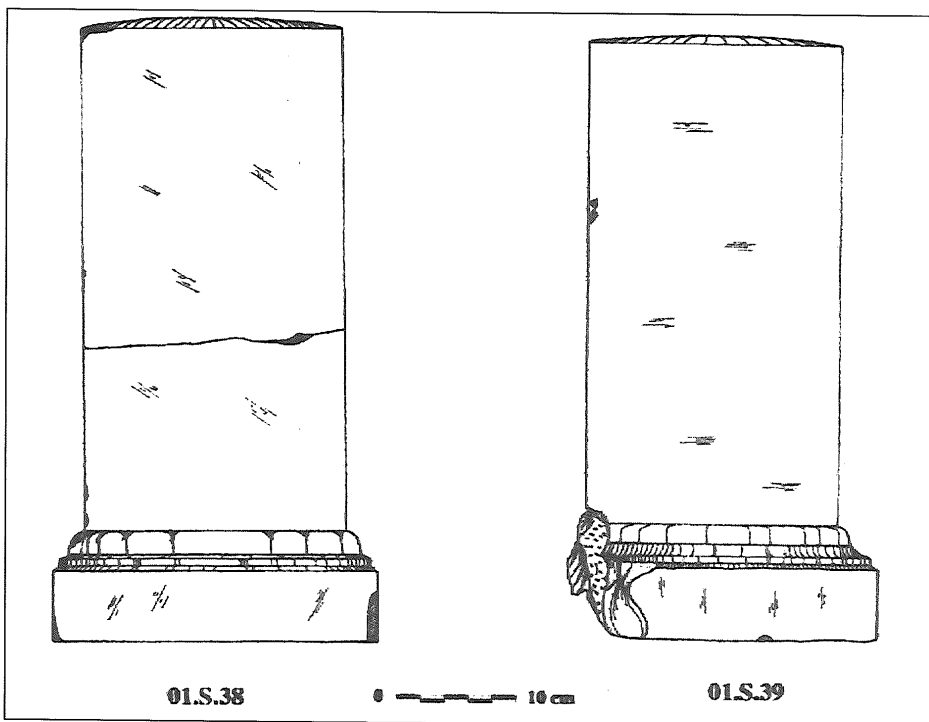
Continuing excavations under the supervision of Darryl B. Sneag in Trench 80 of the West Propylaeum also revealed unprecedented double limestone betyls attached into a niche with plaster. The niche measured 0.97m in width and is inset 0.69m. Shown *in situ* in Fig. 4 and by drawing in Fig. 5,



3. Complete elephant-headed capital excavated in 2001 (photograph by A.W. Joukowsky).



4. *Propylaeum west, betyls in situ*  
(photograph by A.W. Joukowsky).



5. *Drawing of Propylaeum betyls*  
(drawing by Emily C. Egan).

these sacred aniconic representations of Nabataean deities are in remarkably pristine condition, measuring approximately 0.50m in height x 0.21m in width — their tops are approximately 0.09m in thickness.<sup>3</sup>

A limited test trench, Trench 86, in the West Propylaeum was carefully excavated by Brian A. Brown. The trench, located at the eastern end of the

West Propylaeum, was originally bounded to the north by a bench set against Wall K, the north terrace wall, to the east by the later Propylaeum staircase north-south wall, and to the south by the Lower Temenos retaining wall. The purpose of this sondage was to collect data relevant to the sequence of construction in the Propylaeum and Lower Temenos areas. Present thus far in our exca-

3. The betyls are in remarkably good condition considering the huge collapse/destruction that ransacked the rest of the Great Temple; however, the north betyl, Cat. No. 01.S.38, is fragmented into two pieces and the back left edge of the south betyl, Cat. No. 01.S.39, has a small chip. Unlike those

found throughout as-Siq, most of which are carved out of the sandstone bedrock and are badly weathered, these free standing betyls are carved out of a high-grade limestone, their edges remain well-articulated, and their faces are flush.

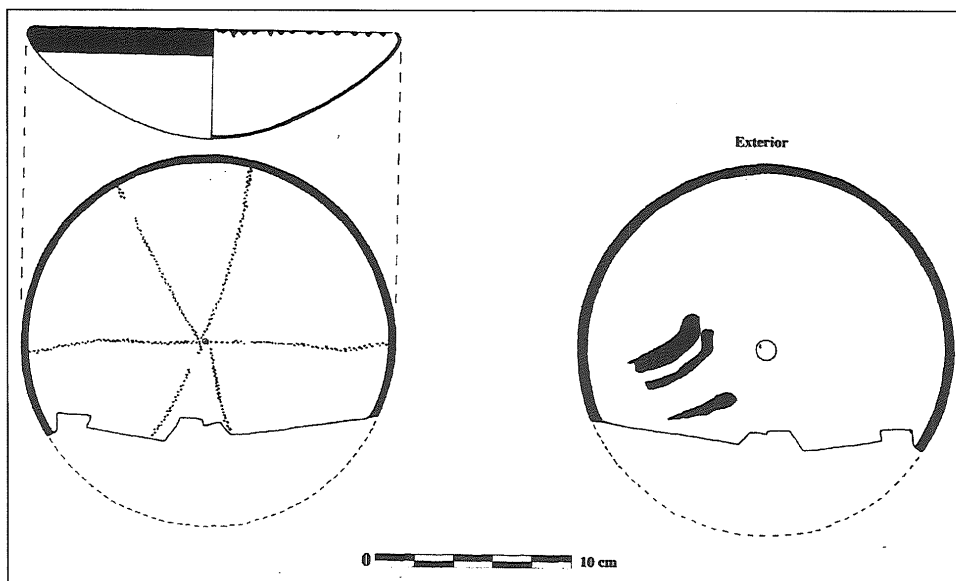
vations of the Propylaeum, the earliest construction was Wall K, the east-west north terrace wall (Parr 1970: 351, 362). As for Wall K, Parr (*op. cit.*) notes, "In other words, it is from this time ([his] Phase IX) that the layout of this part of Petra, as we see it today, originally dates".

Wall K in a later phase was abutted on its south face by the construction of an oddly aligned sandstone pavement.<sup>4</sup> Just below this pavement is a layer of floor bedding. In a yet later phase, ten courses of the south Lower Temenos terrace wall were constructed, and in a pocket associated with the south Lower Temenos wall was a Nabataean bowl (Fig. 6) recovered from a sealed context in the floor bedding. The unpainted areas on the bowl suggest an early date for its manufacture with its best parallel found in Stephan Schmidt's (2000: Abb. 81) Phase 2a, dated from approximately 30 BC to the first decade of the first century AD.<sup>5</sup> The bowl provides a convenient *terminus ante quem* for the construction of the Lower Temenos platform, the oddly aligned stone pavement, the lowest floor, and the Wall K north terrace wall as well as also a *terminus post quem* for the construction of other features in the area.

Thereafter successive Lower Temenos construction took place and the Lower Temenos retaining

wall was re-built and the east-west Cryptoporticus then was installed with its arches and roofing, and a second floor bedding was laid. For some reason thereafter (earthquake?) the cryptoporticus was blocked and what we see today as the north-south Propylaeum staircase retaining wall was constructed, a bench was built against Wall K, and the third floor bedding was laid. Thereafter was the abandonment and robbing of the flooring, and, finally, the area fell out of use. This test trench revealed new components about the stratigraphy of this area and confirmed that the earliest walls of the Propylaeum were the Portico Wall and Wall K.

Excavations in Trench 82 of the *East Propylaeum*, undertaken by Joseph J. Basile, confirmed that the East Propylaeum was constructed in a similar phase as that of the West Propylaeum. Some minor architectural modifications were due to differing destruction patterns with a subsequent complicated series of wall constructions. The trench, located in the southeast corner of the Propylaeum, encompassed the easternmost portion of the southern Propylaeum cryptoporticus. Its measurements were 6.20m north-south x 12.00m east-west. Evidence suggests that the east cryptoporticus may have been accessed from an as yet unexcavated doorway from the Colonnaded Street. More work will be done in



6. West Propylaeum bowl (drawing by Emily C. Egan).

4. This installation did not abut the south terrace wall but fell short of it. It is not clear to us if this pavement is the same as the well preserved stone paving that Parr (1970: 360) mentions, which he dates to ca. 100 BC from a coin of Aretas II and places in his Phase VII. What is clear is that this stone paving is on an entirely different alignment than either the north Wall K or the south Lower Temenos retaining terrace wall. Could there have been a predecessor wall here on a different alignment?

5. The bowl has an even core and is of a light red (Munsell 10R 7/6) ware with a self-same slip. The interior design consists of six evenly spaced lines of small, dark red (Mun-

sell 2.5YR 4/8) dots. These lines extend from the incurved rim, which is decorated with small, dark red (Munsell 2.5YR 4/8) triangles, and intersect at the base. The exterior is undecorated except for three streaks of the same hue of dark red paint as the interior decoration, possibly from the fingers of the potter. The exterior of the rim is painted with the same hue of dark red paint described above. Although there are no exact parallels in Schmidt's typology, the incurved rim and the design of relatively small, closely spaced triangles on the interior of the rim, and open, largely undecorated spaces on the bowl suggest an early date for its manufacture.

subsequent seasons to answer this question.

### Lower Temenos

The structural backbone of the West Triple Colonnade is the West Cryptoporticus. Only after the West Cryptoporticus was constructed could the West Triple Colonnade have been built above it.<sup>6</sup> Excavations under the Lower Temenos' West Triple Colonnade were undertaken in Trench 79 by Martha Sharp Joukowsky to recover the double cryptoporticus constructed under it (Fig. 7). Extending from the east-west retaining wall in the south to the north, this double arched system consisted of parallel west and east sectors.

Now with the all but complete excavations of a 13.00m north-south x 12.50m east-west portion the West Cryptoporticus can we begin to interpret its plan on surer grounds. There must have been an entry (not as yet found, but possibly in the Propylaeum) leading into two long subterranean arched galleries. Oriented to the north these two galleries were constructed of well-cut masonry joined with mortar and covered with plaster, some of which is colorfully painted with elegant designs.

As we were excavating both sectors of the cryptoporticus interior, we recovered collapse from the

elephant headed capitals and column drums of the West Triple Colonnade. Their collapse in antiquity had triggered the subsequent devastation of the West Cryptoporticus itself. A small portable altar of yellow limestone with four facets was found measuring 0.22m in height, 0.175m in width, and 0.14m in thickness.<sup>7</sup>

During the early excavation stages the west wall architecture in the west sector of the West Cryptoporticus was uncovered, the middle pier wall (Piers 1-6), and the east sector of the West Cryptoporticus wall. All three walls were constructed with arch springers extending from them. As the excavation moved deeper in depth it was found that under the piers in the Middle Wall, a large ashlar wall supported the piers, and a now disintegrated wooden beam was found in the lower courses of the west wall. The close of the excavation in this area was triumphed with the discovery of an excellently-preserved limestone flooring found in both cryptoporticus sectors. Uncovered in a superb state of preservation at a depth of 4.77m below the building level of the West Triple Colonnade, approximately 6.00m north-south x 3.73m east-west flooring was cleared in the east sector, whereas 1.50m north-south x 4.18m was excavated in the west sector. Excavations also brought to light benches built against the east-west retaining wall in the east sector of the West Cryptoporticus, and one abutting the east wall of the West Cryptoporticus east. More excavation needs to be undertaken to better define these floors and their associated benches.

### Upper Temenos

The Upper Temenos excavations concentrated on the East and South Perimeter Walls and the South Passageway where more of the chiseled away bedrock escarpment and a massive cistern came to light. First I will describe the South Passageway and then the cistern, and finally I will detail the excavations of the East Perimeter Wall.

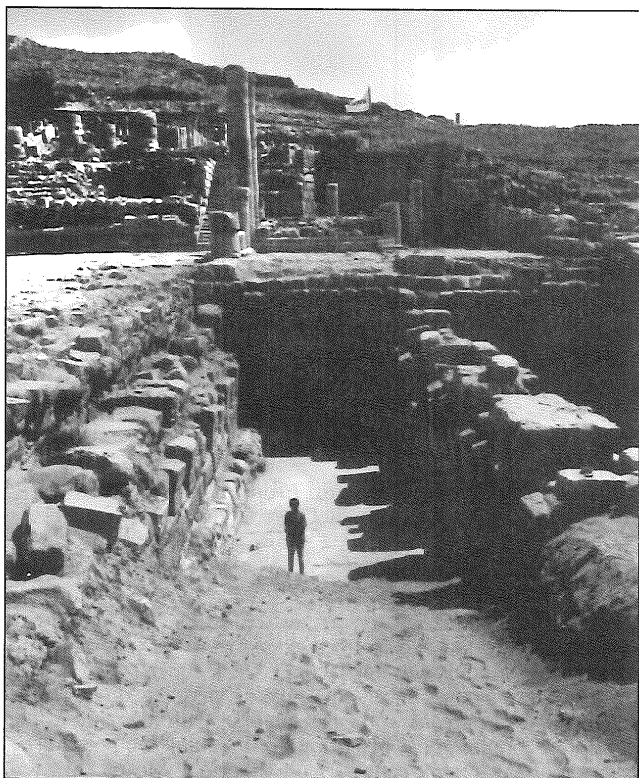
#### *South Passageway and Chapel*

Trench 83 is located in the extreme south of the Upper Temenos and stretches 31.20m in east-west length x 6.45m in width in the east, and 12.21m in width in the west. The substantial clearance of the south passageway, excavated by Emma S. Libonati, began with the cleaning and removal of debris in the southwest. Fig. 8 shows the South Corridor freed from debris.

Excavated to an average depth of 5.30m, this project was undertaken to protect the Great Temple

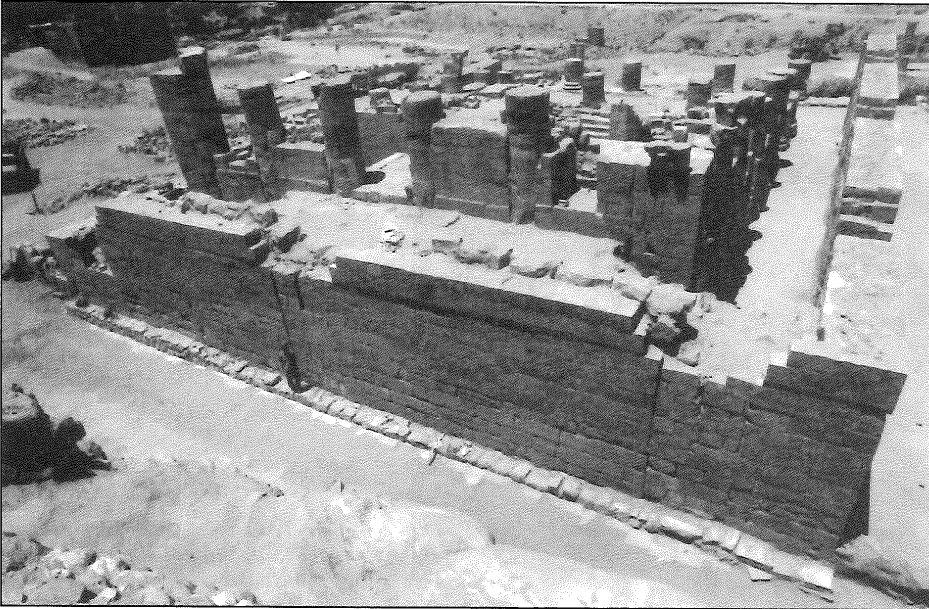
standing of the sweep of this architectural design.

7. The altar had a depression on top of 0.085m in diameter and 0.04m in depth.



7. West Cryptoporticus looking south (photograph by A.W. Joukowsky).

6. We had identified this rather puzzling cryptoporticus structure under the East Colonnade in the early stages of our excavation, but later built cross walls interrupted our under-



8. Upper Temenos South passageway  
(photograph by A.W. Joukowsky).

perimeter from further erosion and collapse from the surrounding areas, including the 12.00m high escarpment behind the passageway which required protective consolidation against the onslaught of winter rains. The composition of this extensive deposit represents fill and fluvial wash down from a multitude of periods from the hillside above. As the excavation progressed, the south passageway showed evidence of a cataclysmic collapse, however the fall pattern suggests that the damage was sustained from the hillside above rather than the Great Temple itself. A clear exception to this was an enormous accumulation of roof tiles tumbling down in the earliest violent collapse against the south facade wall. Although it may be possible that the south passageway was partially roofed, these deposits are more likely the result of the Great Temple roof collapse when it fell prey to seismic events.

The south retaining wall of the passageway is in poor condition — only small sections of the original facade wall remain intact, usually only two or three courses in height. In the east central section of the trench, six courses remain intact but dramatically slump into the passageway in a northwesterly direction at a precipitous angle of approximately 30 degrees. This remaining section of the facade wall shows the violent force and pressure of the weight of the terraces behind. In antiquity, this wall would have been constructed at least to the 12.00m height of the surrounding bedrock escarpments. It would have made a dramatic statement for the Upper Temenos south.

Portions of the original south passageway pavement were recovered in fairly good condition, stretching from the east to the west in an uninter-

rupted line for 23.80m, and extending north-south at its widest point to 1.73m (the average length for a paver is 1.07m while the average width is 0.52m). In the east, most of the pavement was robbed, and in the west, a major portion of the pavement was also missing. The south passageway has slab covered water passage system abutting the south and southeast Perimeter Walls — the conduit is 0.30m wide x 0.73m depth and the channel is lined with hydraulic cement. At some later point in time, additional water channels cut into the south pavement bedrock provided supplementary water. This indicates that the pre-existing water systems were for some reason inadequate and additional surface canalization needed to be added to bring or receive water to or from the west. Certainly, this system and its relationship with the Upper Temenos systems in the east plaza need to be more carefully examined.

In the removal of dangerous fallen blocks from the southwest terraces, we recovered the remains of an anteroom and chapel with frescoed walls, a hexagonal pavement and an empty cult niche. Shown in Fig. 9, this enigmatic chapel measured 2.07m north-south and its partially excavated east-west south wall was 3.02m in length. The original construction of the north wall is seen only in its foundation, and the west wall remains under the west balk. The chapel walls are comprised of well-hewn diagonally dressed ashlar — the east wall is composed of five to eight ashlar courses measuring 3.22m in height whereas the east-west south wall is composed of ten courses and measures 4.00m in height. *In situ* decorative plaster in the southeast corner of the chapel adheres to the wall to a 2.09m height. This decoration consists of a purple border



9. Upper Temenos South passageway chapel and anteroom (photograph by A.W. Joukowsky).

surrounding a red painted panel.

In the chapel south wall, 1.32m above the floor level, was a niche with a preserved height of 1.02m. Both the east and west niche walls were comprised of one large ashlar block, 0.38-0.44m in height, carved at the top in an arc with two courses of ashlar below. A 0.31-0.34m recessed platform was carved to provide a prepared surface for a sacred object, most likely, a statue or a betyl. A slight oval depression has been hollowed out in its center and several dowel impressions indicate that there was a purposeful method employed for affixing what was placed there.

The flooring of the chapel is comprised of wet-laid small limestone hexagonal pavers that mirror those found in the forecourt of the Upper Temenos. The pavers average 0.35m diameter (from point to point) and remain in excellent condition. Near the walls the pavement does not retain its hexagonal shape but is cut flush to abut the bottom of the room's walls disregarding the aesthetic schema in favor of practicality. The extreme care and effort taken to set and place this floor in an area not only with the possibility of being sealed off from the public at large further suggests that it had a ceremonial or special purpose. We are undertaking the consolidation of the frescoed walls and will continue the chapel's excavation to the west so that its overall dimensions and other features might be determined.

Leading into the chapel is an anteroom measuring 3.44m north-south x 3.20m east-west. A large

regularly carved ashlar serves as the threshold, 1.08m x 0.41m, between the anteroom and the South Passageway. The east wall of the anteroom is composed of seven courses of scavenged building material — some of the blocks contain marginal drafts, however others are small snecking stones set between irregular blocks.<sup>8</sup> The preserved height of the wall is 3.12m. The northern blocks of the facade wall and the eastern wall have been removed to the foundation course making it impossible to determine if these features bond. The floor of the anteroom has been left relatively unexcavated to show the *in situ* position of roof tiles that fell flat onto the surface. Portions of the excavated floor indicate it to have been of rough plaster and mortar — its pavement probably was robbed in antiquity. At a later point in time, and we presume this to be *before* the Great Temple was transformed by the addition of the *theatron*, there was a blockage of the doorway accessing the chapel. This blockage was composed of tightly laid, approximately 0.21m square, diagonally dressed limestone blocks. Great care was exercised to lay these blocks flush to the doorway and the high quality of the material indicated this area was intentionally blocked off. The blockage height was preserved to only 0.48m, suggesting that salvageable blocks in this area were removed in antiquity to be used elsewhere. This blockage suggests the chapel was blocked off and no longer in use while its anteroom may still have remained in use.

In the area of the chapel, the South Perimeter

8. It is not clear if this wall was built at a later point in antiquity to construct an anteroom for the chapel, or if the original

wall collapsed because of the stress of the terraces it abuts.



Wall in the west served as the north walls for the anteroom and the chapel. In the west, this wall except for its foundation course which remains intact, was entirely robbed out near the chapel and the anteroom. It is likely, as the rooms fell out of use the western portion of the wall did not provide either the structural or aesthetic protection from the terraced area above.<sup>9</sup>

Here, however, there are some deviations from the standard Great Temple phasing, owing to the fact it seems probable the chapel was abandoned without reoccupation earlier than other subsequent reuses of the Great Temple itself, such as the construction of the Theater. The south passageway at the rear of the Great Temple proved to deliver the surprising architectural peculiarities we have all come to know when excavating the Great Temple. The two western rooms and their possible phasing lie at the nexus of these problems; their discovery highlighted the possibility of heretofore-unexpected structures around the outer perimeter of the site, and created more questions than answers concerning the uses and reuses of this area.

#### *Southeast Plaza and Cistern*

Shown in Fig. 10 in the Upper Temenos southeast, was the astonishing discovery of a subterranean cistern, which extended under the southeast plaza bedrock floor. This cistern was part of the overall planned scheme of the Great Temple water management with various canalization systems



10. Upper Temenos east cistern opening (photograph by A.W. Joukowsky).

within the precinct evidently varying in function. Known as Special Project 85 excavated by Christian F. Cloke, this feature was discovered below a round opening along the southeast escarpment. A test trench in the interior, 2.50m north-south x 1.50m east-west, helped us recover its original bedrock floor. While it is likely that the floor is uneven throughout the cistern, perhaps deeper in the center, we were able to get a rough metric estimation of its water-holding capacity. Estimating by the measurements of the cistern room itself (excluding the shaft, and assuming that the cistern was filled to capacity), we arrive at a figure of almost 390 cubic meters, for the structure measures 8.50m in north-south length x 7.80m in east-west width x 5.88m in depth. Although this is hardly an exact computation (as it does not make allowances for the diminishment of the area by columns and other features), it gives us a rough idea of the storage capabilities of this massive structure. In its interior were the remains of two built arches spanning the east and a centrally located massive support column carved out of bedrock.<sup>10</sup>

As for the architectural components of the cistern and their sequencing, while not wholly apparent at this point, as the entire extent of most features cannot be seen, some preliminary hypotheses can be made. It appears that the initial building phase involved the cutting of cistern shaft, followed by the quarrying of the cistern in its original form, which was probably a simple rectangular room furnished with an east bedrock column and a short support wall to the southwest of cistern shaft. These features appear to be the most thoroughly incorporated into the cistern's fabric, and the most sturdily and carefully constructed, so they have been assigned to this early building phase. Following initial building the entirety of the cistern was sealed with a coat of waterproof plaster.

Constructed also at this time was the canalization on the west of the Upper Temenos East Plaza, which fed the cistern via an opening in the cistern's southwest ceiling. The shaft and this opening in the southwest were presumably the two main original sources of cistern water. The small channel piping water into the shaft would have sent the water flowing in a cascade against the northeast side of the shaft walls where it would have landed on the ledge transecting the shaft. After there it would have then streamed more slowly into the cistern, so as not to unnecessarily stir up any impurities. These two large systems would have provided a

9. As we have mentioned, there was the abandonment of the chapel and a modification of the east anteroom wall — a wall was built to block access between the chapel and the anteroom and the east wall of the anteroom was reconstructed or modified in design.

10. In the 2001 consolidation efforts of this area, a winter rain uncovered an arched feature and another water canalization or entry in the west Upper Temenos plaza. This will be documented during the 2002 excavation season.

significant influx of water.

The following phase of the cistern's building seems to have taken place not long after this initial phase of construction. The ceiling of the cistern's southwest corner is noticeably and significantly lacking in strength and higher than the bedrock in the other parts of the cistern. This weakness must have occurred during or shortly after the cistern's construction, necessitating the addition of support elements to this room area. There was then the addition of a small north-south wall plus the cistern's south wall with its incorporated arches which lent support to the cistern south. These elements were also heavily plastered to prevent extensive water seepage and possible structural weakening.

Even these elements, however, were apparently deemed insufficient for the support of this area, and another southwest pillar then was added. This stone pillar is somewhat shoddy in construction, and appears to have been a final attempt at stabilizing the ceiling in this critical area. This has been deemed the latest addition because of the poor aesthetics of its orientation and the fact that its position would have left little space for the construction of the south arched wall.

Several courses from the top of the east face near the pillar's northeast corner, the excavators discovered an exfoliating partial lamp, which was determined to be Nabataean, probably from the first century AD, although there is the possibility that it could come from the second. As for the fill inside the cistern, the area in which the test trench was excavated in the southeast was predominantly comprised of soil with some stone inclusions. This suggests that the cistern was filled, at least partially, by debris washing down through the entry shafts. Because the remaining upper cistern fill, from around the bedrock column to the west wall consisted of large stones, it would appear that this was an intentional fill. The wash down probably only reached its greatest height in the southeast, and for some reason, perhaps for support, it was necessary to intentionally fill in the rest of the cistern with large stones particularly in the north and west. These stones could not have dropped in naturally by chance, and are not fallout from the ceiling, as this remains entirely intact and plastered. These stones must have been thrown in intentionally from the southwest opening through the shaft. This would have served to stabilize the architectural features of the room, and prevented the collapse of the bedrock ceiling upon which the Upper Temenos East Plaza was constructed. When the cistern was no longer filled with water, its structural integrity could have been very precarious, and the stability of the ceiling would have been immeasurably de-

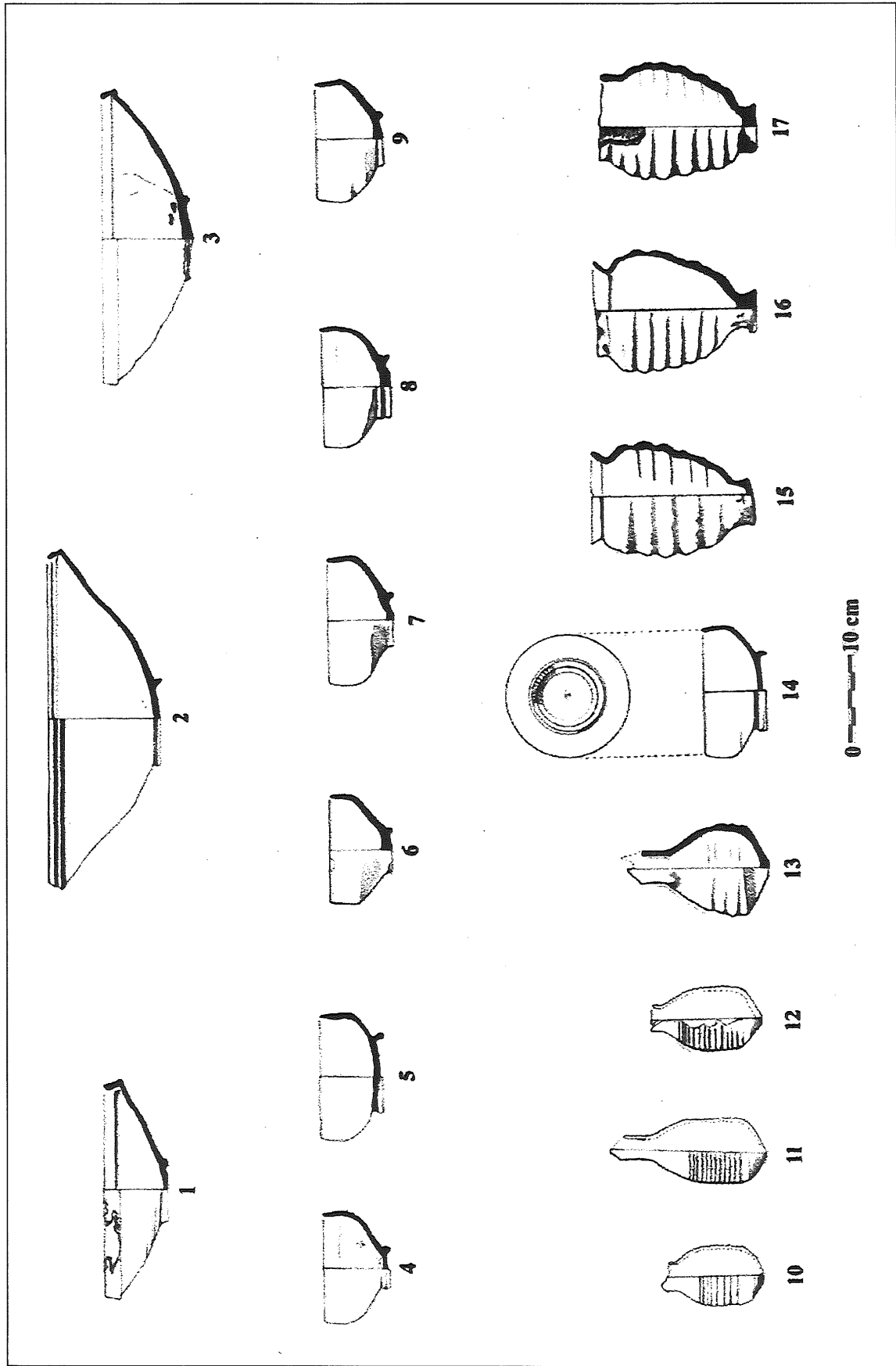
creased.

In the east bedrock escarpment, 2.85m above the opening of the cistern, was a bedrock chamber with what appears to have been a domestic installation, appointed with a chiseled out bedrock basin and an oven. The excavation of this deposit, known as SP 84, was also under the supervision of Christian F. Cloke. There were considerable amounts of Nabataean ceramics found associated with these features. Shown in **Fig. 11**, theoretically, these vessels constitute a homogeneous group. Located to the south and associated via a filled-in stairwell, this hollowed out bedrock chamber demonstrates several phases of use including that of its initial purpose, relating to the temple precinct, and a later re-use as a residential capacity, and then its final destruction and covering. There is a very real possibility that this installation was purposefully created to serve the cistern below it, and we assume that room and cistern are coeval.

The overall area of this room installation was roughly 6.00m north-south x 5.60m east-west when measured from the far east wall of the bedrock room to the western extent of the fill that obscured features on the ground (such as the cistern cut into the bedrock). In the earliest site phase, there was the quarrying of cuts in the bedrock for the cistern and its feeder channels — the canalization beneath the pavement and the cuts in the bedrock creating a room and a well niche. In a later phase there was the construction of a well and the East Perimeter Wall. Included in this phase were the plastering of the well, the walls, threshold and doorway in the bedrock room, and the addition of a basin. In a penultimate phase there was the partial destruction of the room and habitation represented by the accumulation of fill, the covering of the basin and the addition of an oven. The last and latest phase is represented by the destruction and abandonment of the room, and the accumulation of washed down debris from the hillside above.

#### *The East Perimeter Wall Rooms*

The purpose of excavating Trench 84, measuring 19.60m x 5.80m, was to continue the work of the excavation seasons of 1999 and 2000, in order to better understand the function and design of the East Perimeter Wall architectural elements. We also wanted to find out more about the relationships between the parallel interior and exterior East Perimeter Walls, both of which can be seen in **Fig. 12**. After having recorded, dismantled and moved the partially collapsed vaulted arch which crowned the exterior section of the East Perimeter Wall, the area was deemed stabilized enough for excavation to continue below. Trench 84 was excavated by José I.



11. Pottery from the rock-cut room over the Cistern (drawing by Christian Cloke).



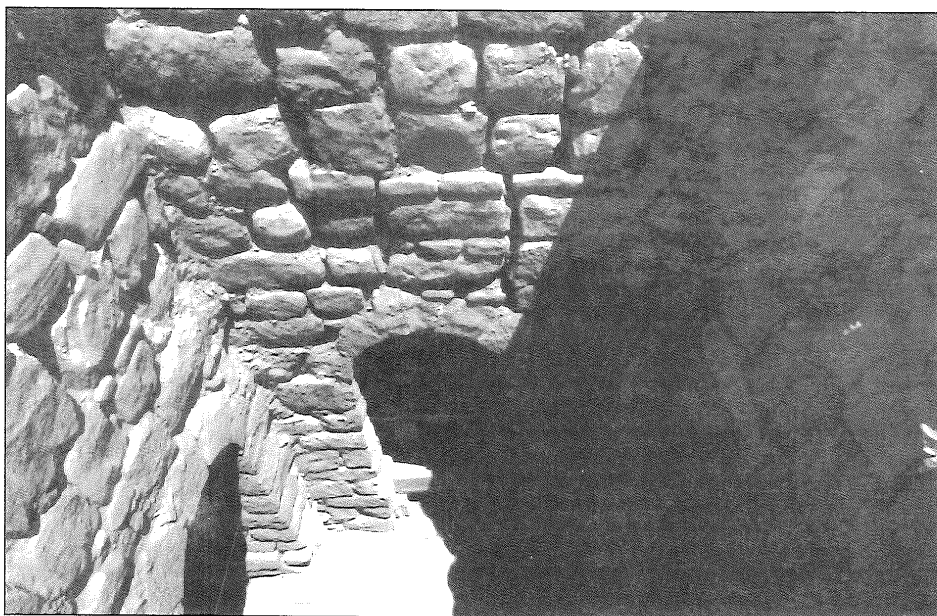
12. Upper Temenos East Perimeter Walls with doorway (photograph by A.W. Joukowsky).

Fusté, who first targeted the area inside the flat lintel doorway, discovered in 1999, of the interior East Perimeter Wall. Here was a small square room, Room A, with high arched niches, and the later installation of an oven and a trough shown in Fig. 13. Also excavated was a north-south long, narrow rectilinear room, Room B, to the south of the water reservoir discovered in the 1999 excavations.

The phasing for both rooms is the same in the earliest phase consisting of the manipulation of bedrock and the initial wall construction. The Nabataean masons cut the bedrock and leveled out the bedrock floors. The phasing of these deposits in a second phase consists of the construction of walls directly on the bedrock and the placement of stone floor-pavers inside both Rooms A and B. The next

phase saw the domestic reuse of both rooms with the removal of the floor-pavers, and following that was a second domestic reuse of arched Room A inside the East Perimeter Wall. And, finally, the latest phase was represented by the abandonment of the structures and the accumulation of a fluvial erosion deposits covering both rooms. I will discuss the particulars of Room A to be followed by Room B.

After the bedrock was prepared there was the creation of the East Perimeter Wall with its exterior vaulted arch, extant to a 9.29m height, surmounting the most eastern section of the East Perimeter Wall and extending over the west section of the wall. In the building of the west section of the East Perimeter Wall, Room A, measuring approximately 2.50m square was constructed behind



13. Upper Temenos East Perimeter Wall Room A interior (photograph by A.W. Joukowsky).

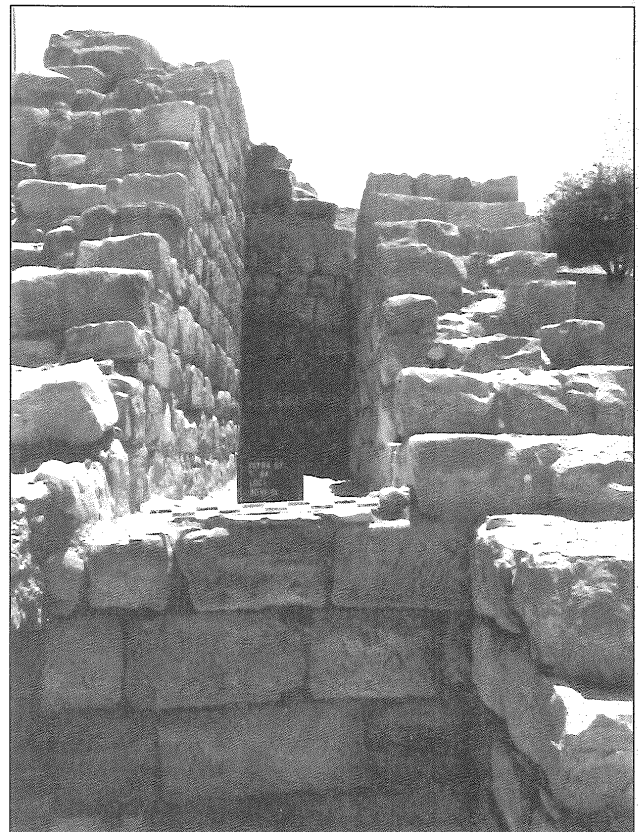
the west wall between the interior and exterior East Perimeter Wall, facing the East Plaza. Room A walls stand to a 7.71m height — and the north and east walls are embellished with very high, 3.40m in height finely crafted niches surmounted by arches. Based on the stratigraphy and the ceramics, it is posited that these two beautifully arched niches ceased to serve their primary function during the first century BC. A later phase saw the removal of deteriorated stucco on the walls and the construction of a plastered water basin set into the east arch niche. A hearth surrounded by rocks was also installed inside of the north arch niche, which left soot-marks on the arch niche, as well as on the bed-rock floor and the fill directly above it. Thus at this point in time, Room A functioned as a kitchen with large amounts of cooking pots and a hearth. After enough dirt mixed with ash accumulated, the hearth fell out of use and an oven (*tābūn*) was dug into the floor in the southeast corner. This furthers the point supported by other evidence found in the Great Temple indicating that at some time in the building's existence its layout and purpose changed.

In a later phase the doorway from the East Plaza leading into Room A was partially blocked directly above the threshold. There was also the addition of a thick floor packing layer on top of the occupational debris, but the water basin in east arch niche continued in use. During this phase, however, the *tābūn* fell into disuse and was instead converted into a storage pit for fine Nabataean pottery, including fine rouletted cups, red slipped jugs with twisted handles and a Nabataean pilgrim bottle (Fig. 14). There was also the addition of a stone shelf over the *tābūn* of reused floor-pavers. At some later point in this phase or perhaps in a later phase, the water basin inside the east niche was reused as a trough. Three tethering holes were bored into several ashlar, which is an indicator that at this time the room served to keep animals. It is difficult to establish the chronology for this room in its later phases, for these deposits represent the most recent surviving events before the destruction debris accumulated.

The excavation of Room B (Fig. 15) allowed us to be certain that the interior East Perimeter Wall bonds with the most east exterior Perimeter Wall lying parallel to it. Therefore, it was confirmed that these double walls were constructed at the same time. In Room B two small niches were installed on both the east and west interior walls of this long rectangular room. Additionally there was the filling of the room with a raised floor bedding on top of accumulated fill, and the creation of a low retention wall to retain the fill and support the new floor bedding. There was also the construction of the water



14. Nabataean pilgrim bottle found in the Room A deposit (photograph by A.W. Joukowsky).



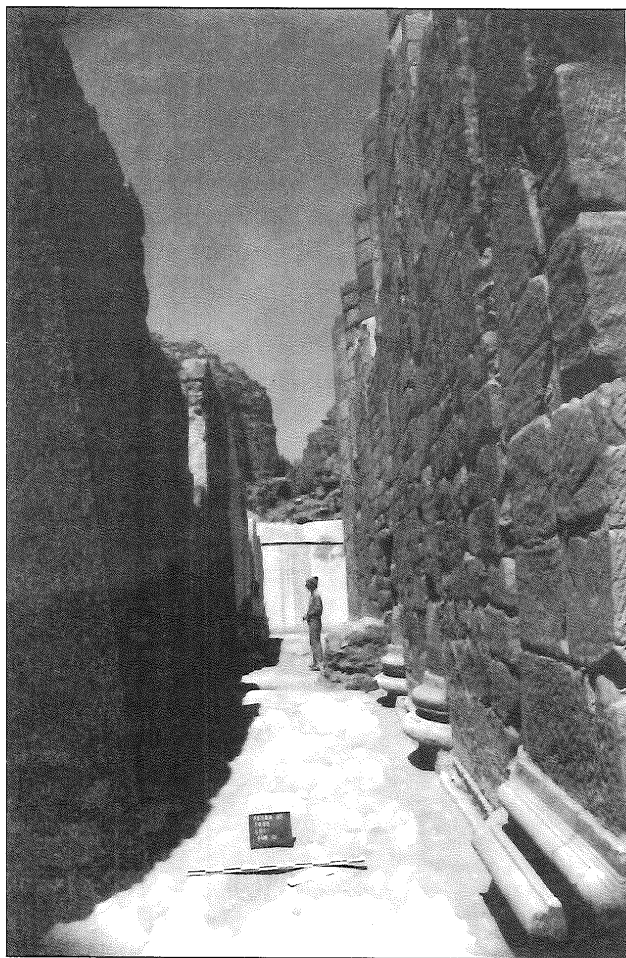
15. Upper Temenos East Perimeter Wall Room B (photograph by A.W. Joukowsky).

reservoir outside to the north of Room B, including

its southern wall. Finally, at some later point in time, an infant jar burial was placed on top of the floor bedding. This burial was removed *en bloc* with its jar and awaits the analysis of a physical anthropologist and ceramic specialist. Above the jar burial was a thick deposit of debris from the collapse of the East Perimeter Walls.

### Temple — South Corridor

The only large project remaining to be undertaken in the Great Temple during the 2001 season (it has now been completely excavated) was to clear the South Corridor of collapsed debris. Shown in Fig. 16, this project, supervised by Emily C. Egan and Emma S. Libonati, revealed the South Corridor wall in its entirety with exquisitely stucco-embellished walls. The trench is located at the rear of the Great Temple itself and measures 2.73m north-south x 17.27m east-west. In the north, Trench 85 is bounded by the temple's southernmost east-west colonnade and its inter-columnar wall system. Between the six rear columns, the inter-columnar wall (2.39m in width) now stands to an average 6.43m height — with some 24 courses of diagonally chiseled ashlar set between the col-

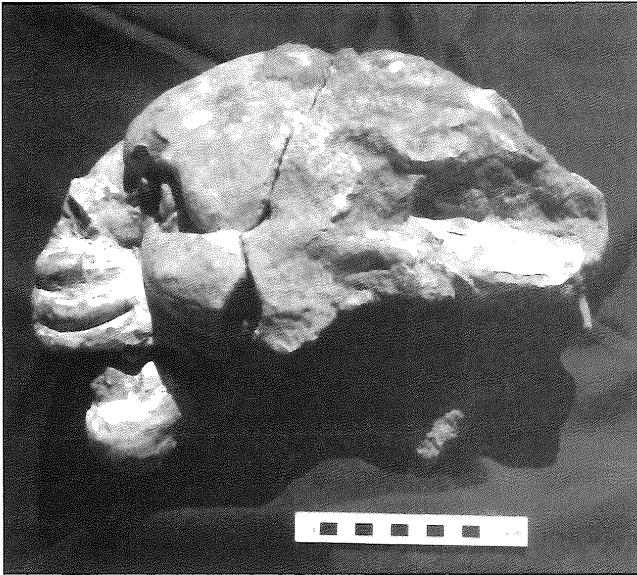


16. Temple South Corridor (photograph by A.W. Joukowsky).

umns. The southern boundary of the trench is the south wall of the Great Temple, and the eastern boundary is the Great Temple East Corridor. In the west, a portion of the South Corridor had been excavated in conjunction with the southern half of the West Corridor (Trench 59) in 1998. Between the south wall segments are three doorways leading into the structure from the South Passageway, which had been blocked with ashlar in antiquity. There are also interior passageways leading into the east and west corridors, and an additional narrow central doorway (2.04m in height x 0.67m) accessing the Great Temple's Central Arch. The canalization system under the Great Temple was also found to continue under the flooring of the South Corridor, but does not as yet seem to connect with the canalization found in the Central Arch.

As for the phasing of this trench from earliest to latest deposits, the earliest phase included the quarrying of bedrock, construction of builders' trenches, and installation of the water channel system. The second phase saw major construction with the building of the southernmost east-west colonnade, the south wall (with open doorways), the east wall, and the decorative plastering of the columns and the north face of the south wall. In the third phase was the redesign of the Great Temple with large scale architectural modifications, including the building of the inter-columnar walls and the south doorway to Central Arch between the columns of the southern east-west colonnade, and the blocking of the central doorway in the south wall. A later phase is represented by the restriction of access and/or fortification with the ashlar blocking of the doorways in the south wall. The penultimate phase is represented with a deposit of fluvial material and a brief domestic occupation, and the latest phase is represented with the debris from the major AD 363 collapse and destruction.

Well-preserved painted plaster with extraordinarily fine molded cornices was found along the north face of the south wall to the east and west of the central doorway. The excellent preservation of this plaster can be largely attributed to the blocking of the doorway, protecting the plaster from falling debris at the time of the Great Temple's collapse. Most surprising here was the recovery in the collapse of two massive sculpted stucco lions which must have been positioned opposite each other above the central doorway leading into the South Corridor. Additionally these sculptures can be associated with the doorway in this wall. One lion, thought to be a male, faced westward and appears to be snarling. The second lion, the female, shown in Fig. 17, faced eastward and looks to be smiling. Both lions have open mouths with exposed teeth



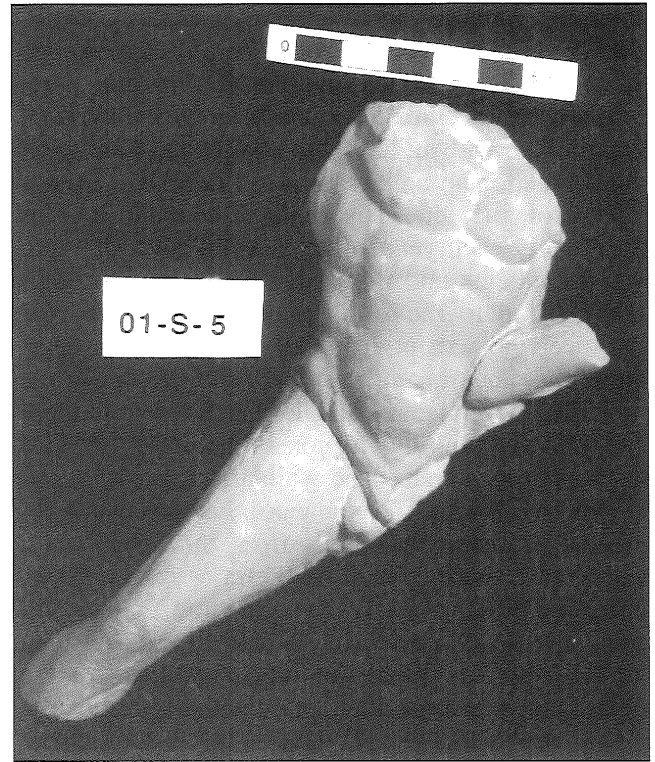
17. Lion from the Great Temple South Corridor (photograph by A.W. Joukowsky).

and a red painted tongue is visible on the lower jaw of the eastward facing lion. Due to their location and massive size, it is thought that the two lions flanked the upper part of the doorway. Further detailed analyses of this decoration has been undertaken by Emily C. Egan, who will report on the excavation and design of these walls, their sculptures and the attendant wall paintings in a separate study.

The South Corridor excavations highlighted a number of architectural problems that perhaps will be resolved now that there has been complete clearance of the structure. Outstanding issues include the bedrock canalization systems and how they interconnected with the system under the Central Arch. Yet another problem addresses the corridor roofing. It may be presumed that the temple corridors were roofed, but how did this roofing work — was it flat or vaulted? Although we have found arch springers in the collapse, no arch springers have been found *in situ* built into the extant walls. It is not altogether clear if the Temple may have had an upper story that rose above the extant walling, or if the roof would have been just above the height of the column capitals.

### Artifacts

Besides the artifacts mentioned, recovered were 26 coins, 10 cataloged lamps, 42 additional elephant head components, 14 bone pins and one bone spatula. The stunning small limestone sculpture of a youthful male athlete (15.84cm in height) with his torso, right leg, and part of his left forearm was



18. Limestone sculpture of a male youth (photograph by A.W. Joukowsky).

unearthed in the West Propylaeum (Fig. 18). Another sculpture consists of a marble base from a small statue with a booted foot trimmed with a panther head. In the stucco catalog were 11 fragments with graffiti or with gold overlay. Our databases accumulated over nine years of excavation continue to swell with architectural fragments bringing the total up to 9000, and considerable amounts of cultural materials, 275,156, are recorded in our Grosso Modo database.<sup>11</sup>

### Small Temple

This 2001 season also saw continued excavations of the Small Temple under the supervision of Sara Karz Reid who recovered approximately 500 marble fragments inscribed in Greek, Latin and Nabataean. The dimensions of this edifice were also redefined. Tentatively it would appear that this small building might have served as a Roman Imperial cult building or hieron. Additional excavations will complete the definition of this structure and are programmed for 2002, and study of the recovered inscriptions is currently underway.

### Consolidation 2001-2002

With the beginning of our excavations we quickly realized that the architectural integrity of

11. Sara Karz Reid sampled various marble artifacts and architectural elements for testing their isotope analysis to deter-

mine their origins — these are to be reported on in her submission.

the Great Temple was in jeopardy and that consolidation measures would have to be undertaken each year between field seasons. As the amount of recovered architectural data has been overwhelming, Dakhilallah Qublan has been challenged to employ great artistic and architectural skills for the preservation of the site. His team has spent months throughout each year in the consolidation of excavated elements and they have made an enormous contribution to the site's preservation. This year has been no exception as the following projects have been undertaken.

In the Propylaeum and Lower Temenos, there has been the pointing and consolidation of the West Cryptoporticus arches and walls in the West Propylaeum, and the East Propylaeum. For safety we decided to remove the betyls from the Propylaeum and to turn them over to the Petra Museum. However, one of our objectives was to show their *in situ* excavated position, so we decided to replace them with facsimiles so that the public would be aware of their archaeological and architectural presence.

As for the Lower Temenos Triple Colonnade we continued the reconstruction of the columns with the resurrection of the Elephant headed capital on the East Exedra. There was also the consolidation and build-up of the West Exedra engaged column with one of the elephant-headed capitals placed on top. Here too the walls to the west of the west stairway leading up to the Temple Forecourt needed to be reinforced by pointing.

The Upper Temenos had a number of necessary measures undertaken. In the Upper Temenos South we had to undertake the anastylosis of the south wall of the South Passageway, due to the fact it was slumped out of position. Also in the Upper Temenos southwest, the Chapel walls had to be pointed, particularly in the area of the niche and the wall paintings had to be reinforced so that excavation might continue. The south extension of the East Perimeter Wall required pointing; the dismantled East Arch had to be restored and put back into its original position. Also in the East Perimeter Wall Room A's walls required stabilization as well as their arch niches. To the east and south of the cistern originally there had been a double wall of which two courses remained. Thus a supporting double wall had to be erected around the perimeter of the east from the area above the cistern and the south to be approximately 2m in height. And as far as the cistern itself was concerned, a cover had to be constructed to prevent the winter rain water from draining into the cistern.

As for the Great Temple, a number of pointing projects were completed including the north face of the South Corridor South Wall and the South Corri-

dor Wall south face to be pointed from where the pointing stopped in 2001 (ninth course to the floor). The flat lintel of the South Corridor doorway leading into the Central Arch was found to have been in a state of collapse. As it was the support for the upper courses of the inter-columnar wall ashlar above it, it had either to be replaced or to be reinforced. The latter remedy was elected, and it is now hoped that this wall's structural integrity has been achieved. In yet another area of concern was the consolidation of the wall plaster of the north face of the South Corridor Wall. If this fragmented plaster was left unattended it would surely fall, so it has been reinforced.

These considerations highlight a number of outstanding architectural problems that have been resolved through our consolidation efforts, not only for the preservation of the site but also for the safety of those who visit it.

### In Conclusion

The completion of the massive Great Temple has now revealed the edifice in its entirety. Understanding the dynamics of the structure on a theoretical level has been continuing as well, but it is most difficult to define certain cultural traits that appear to reflect particular concepts evident in this structure. A considerable level of acculturation must be assumed, but there is a cultural clarity of evidence here: the Petra Great Temple with and in spite of the processes of cultural contact, diffusion and assimilation of architectural ideas, offers its own eclectic Nabataean statement. We will continue to examine the ways in which its architects confronted and challenged this religious edifice.

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