THE 1996 BROWN UNIVERSITY ARCHAEOLOGICAL EXCAVATIONS AT THE 'GREAT' SOUTHERN TEMPLE AT PETRA

by

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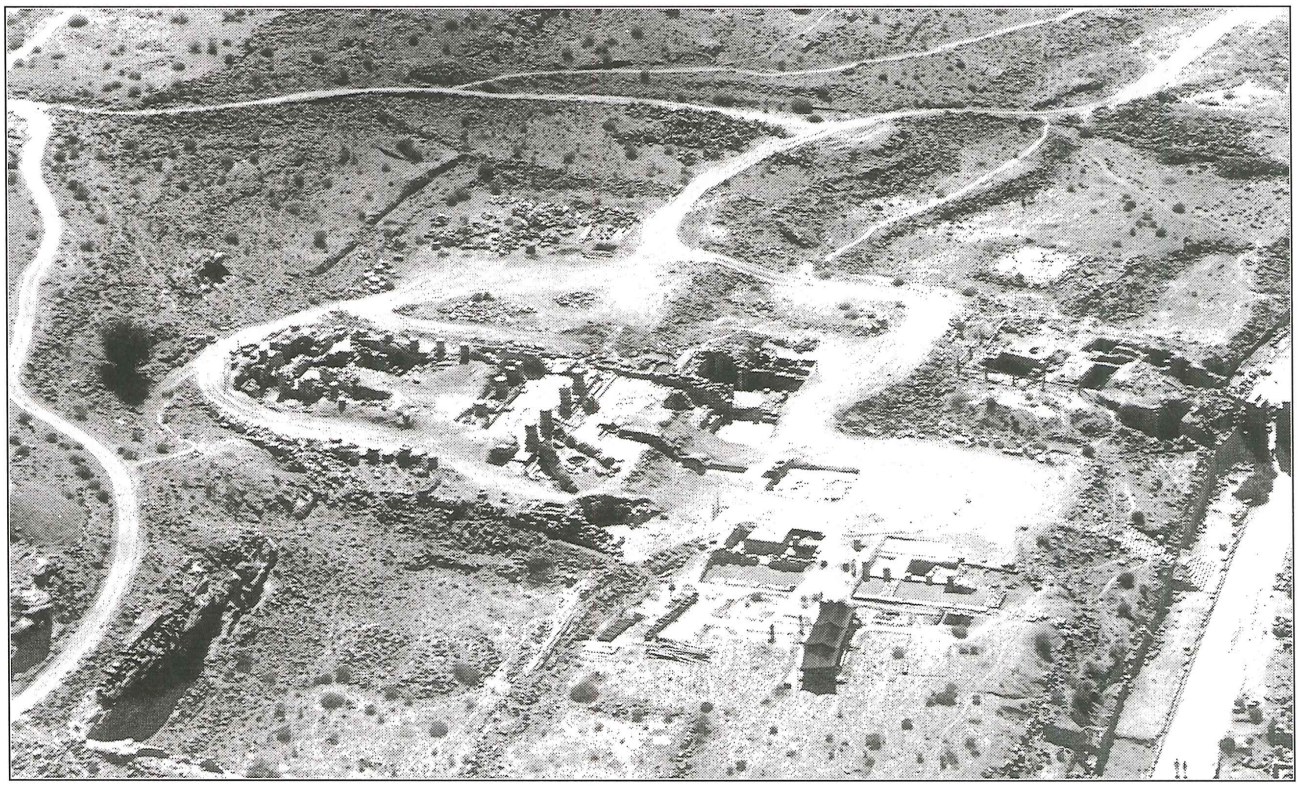
Identification

When we began our work in 1992, because of its location, the writer identified the project as the "Petra Southern Temple," — it seemed logical for the precinct was constructed to the south of the Colonnaded Street. In 1996, the structure was officially renamed the 'Great' Temple at the suggestion of many, including Dr Ghazi Bisheh, Director-General of the Jordanian Department of Antiquities. The adjective 'Great' was originally used by W. von Bachmann in 1921 who designated the area as the 'Great Temple'. In earlier publications the Brown University excavations have referred to either the "Southern Temple," or the "South Temple," however, the precinct is now to be designated as either the 'Great' Temple of Petra, or, the 'Great' Southern Temple of Petra. We beg the tolerance of the scholarly community, and hopefully no further confusion between names will take place. Fig. 1 shows a 1996 aerial view of the 'Great' Temple.

An Additional Note

During the excavations conducted over the years, 26 'Great' Temple columns and antae have been brought to light. Each column and anta has been assigned a locus number, by its trench or by its Special Project (SP) designation. Because there was no standard nomenclature that could easily be remembered by workers, staff, and visitors, confusion about their positions resulted not only in field descriptions, but in the field

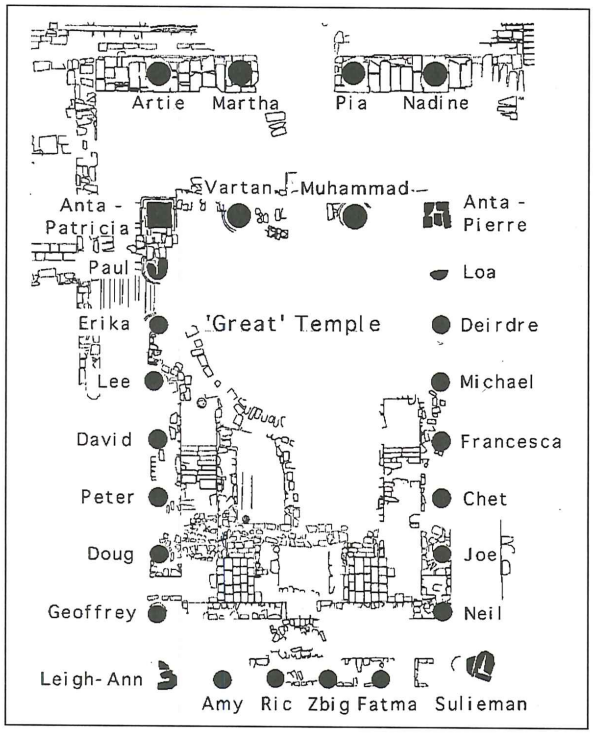


1. Aerial view of the Petra 'Great' Temple, looking west (Photo by A. A. W. Joukowsky).

notebooks. One of us might be describing a column's position as, "fourth column on the Temple East from the East Anta from the north," or the same column as, "the eastern fourth column from the south." Consequently, in 1994, it was decided to identify these elements by assigning them staff names. Fig.2 identifies the columns by their "names" and in the following text when describing an area, the "name" of the column or anta wall will be given in parenthesis.

The 1996 Excavations

1996 was the fourth year of two-month excavations by Brown University at the 'Great' Southern Temple (Fig. 1). These excavations are part of the Jordanian Department of Antiquities' initiatives to survey, inventory, and evaluate the cultural resources within the Petra central city. The temple covers an area of 7000 m^2 and includes numerous monumental features ranging from eastern and western triple colonnades and hexagonal pavement in the Lower Temenos, as well as exedrae on the east and west sides respectively. The proportions of the width and length of both the 'Great' Temple itself and the Lower Temenos are approximately 2:3. The massive columns on the tetrastyle in antis 'Great' Temple Porch originally stood to a height of approximately 19-20 m. Their drums were found to be covered in part with a red or white molded plaster-stucco decorative finish. Monumental stairways connected the various levels leading upwards to the 'Great' Southern Temple, and a unique subterranean multi-branched canalization system was constructed to extend throughout the precinct, from under the 'Great' Temple itself, down to the Lower Temenos, to the Propylaea and under the Colonnaded Street to empty into the Wādī Mūsā. These canalization systems may also have had some relationship to the baths located to the west of the precinct.



2. Named Temple Columns (P. Zimmerman, Reworked by B. H. Kleine).

Staff

The 1996 staff was comprised of M. S. Joukowsky, Director; A.W. Joukowsky, Administrator and Photographer; J. J. Basile, Associate Director; E. Payne, Assistant Director; Chief Architect-Surveyor, P. Zimmerman; M. Slaughter, Assistant Director; Photographic Recorder and Development; Ceramic Analyst, L.-A. Bedal; D. Barrett, Registrar; M. Sylvester, Computer Data Base; J. Blackburn, Draftsperson; and E. Schluntz, Sculptural Analysis. Archaeologists, L. Bestock, B. Brown, K. A. Butler, J. Gimon, D. Goldstein were joined by field excavators Z. Habboo, R. Takian and E. Wolf; and volunteers F. Bennett, C. Hisert, K. Hisert, G. A. Hisert, and F. Erickson-Gini. Besides 1996 'Great' Southern Temple Consultants included J. McKenzie, architectural historian; S. V. Tracy, Latin epigraphy; M. Shaer and Z. Aslan consolidation and preservation consultants as well as P. S. Fay; C. Augé and D. Smart assisted by A. Mannis, numismatics; S. Schmid, Nabataean fine wares analysis; Y. Gerber, plain wares analysis; P. Warnock,

botanical materials analysis; and T. Tullis, geologist.

Under the general supervision of Suleiman Farajat, the Department of Antiquities assigned Muhammad Abd al-Aziz al-Marahale as our Jordanian Department of Antiquities representative. Dakhlallah Qublan again served as our most competent Foreman.

From 1993-94, a "core staff" has been formed who are responsible for all aspects of the field work, and its is they who share in the final publication of the results. This core group continues to be at work for the publication of the five campaigns, 1993-1997, which is planned to be ready for publication in the spring of 1998.

1996 Goals

The goals of the 1996 season were to better define the features of the 'Great ' Temple Precinct. The Trench Plan can be seen in Fig. 3. In the Lower Temenos:

- to secure the interrelationship between the Lower Temenos and the Upper Temenos (Trench 18); - to understand the hexagonally paved Lower Temenos and its relationship to the monumental east-west Retaining Wall (Trenches 18 and 39);
- to locate the eastern peripheral wall of the Lower Temenos (Trench 25); and follow this wall up to the Upper Temenos (Trench 38) — so the dimensions and structural characteristics of the precinct would be better defined;
- to locate the East Exedra (Trench 37);
- to plot the East Colonnade of the Lower Temenos (Trenches 28, 30, 33, and 36);
- to complete the test trench and find the founding level of 1995 Trench 17; and
- to determine the character of the western extension of the West Exedra (Trench 31).

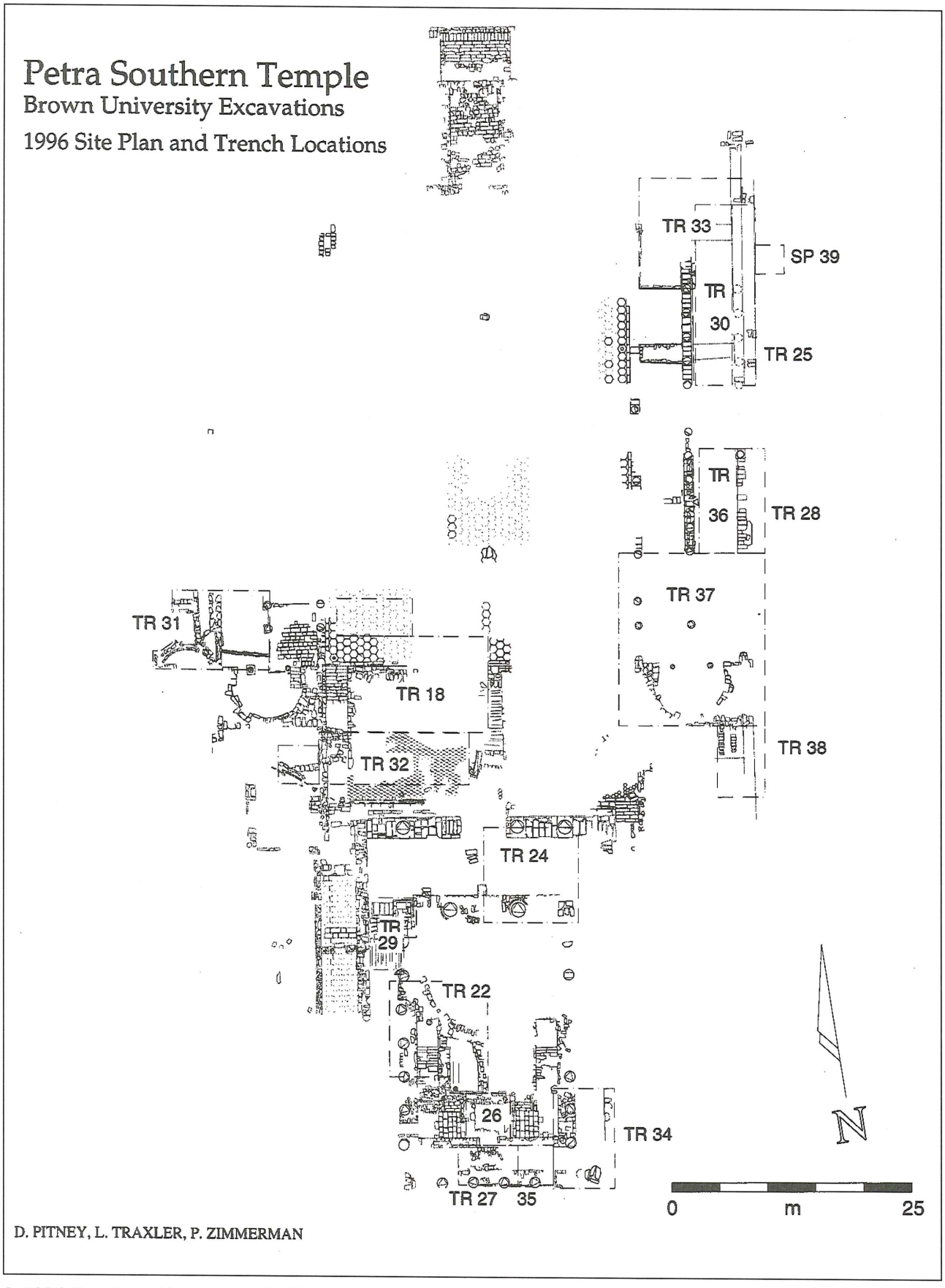
In the Upper Temenos and in the 'Great' Temple itself the initiatives were:

- to clean the hexagonal pavers of the Temple Forecourt from the column fall to the western walkway (Trench 32);
- to clear the overburden of the East Pronaos to the East Interior Anta Wall (Trench 24);
- to understand the architectural configuration of the West Interior Pronaos (Trench 29);
- to complete the excavations of the Adyton West Stairway and to continue the clearance of the vaulted interior room adjacent to it (Trench 22);
- to determine the character of the Temple South (Trench 35);
- to begin excavations of the central arch of the rear 'Adyton' (Trench 26) and to determine its interrelationship to the columnar rear of the structure (Trenches 27 and 35);
- to assess the east Temple column fall and locate the east exterior temple wall, and the southeast corridor, the southeast Temple Wall and its heart-shaped corner column (Trench 34).

We also reassessed the stratigraphic sequence and phases of use. For the most part, the 18 phases we had identified in 1995 remained applicable — but as this is a work-in-progress, they reflect our views based on the 1996 study and will be reviewed after the results are presented. Additionally, as in previous campaigns, consolidation of ashlars and architectural elements uncovered in earlier seasons, as well as 1996, had to be undertaken in all sectors of the precinct. Excavations as well as the winter rains were undermining our work and the preservation of the remains was in jeopardy.

Strategy

Our general approach to survey and its primary objectives are to automate and integrate the collection of field data. We use a series of programs to chart and document the site, and the systems we deploy have proven so successful that they have been used as the model for other archaeological field operations. We utilize software pack-



3. 1996 Site plan with trenches. (D. Pitney, L. Traxler, P. Zimmerman).

ages that include a CAD (computer-aided design) program, MiniCad 6, and the COMPASS program — a survey data acquisition package developed by the University of Pennsylvania. These software packages combined with our use of the laser transit, the TopCon, insure the continuity of all our data files. Our system, therefore, is a combination of computer hardware (Macintosh Desktop computer) and software that allows input, editing, storage, retrieval, and display of spatially referenced data. Our database includes the site's referenced tabular ralational data to which other digital data, such as scanned images, may be added. Daily field data processing produces maps of each trench's characteristics which then are documented the following day in the field.

These data also appear in tabular database files or they can be viewed as displays and print-outs according to the field researcher's needs. This program provides a means for accessing data sets from a variety of sources. Its capability renders it an excellent technology for the storage, retrieval, and interpretation of archaeological information. These surveys are the backbone of this excavation, for they have produced cumulative multidisciplinary data necessary for our research and long term management of the site. Data currently combined in this project include maps, datum and sub-datum points, topographic features, and trench map with loci. The location of each trench and locus allows us the flexibility to determine if the architecture was associated or not, and significant features have been recorded, measured, drawn and photographed. Copies of all of these maps have been turned over to the Department of Antiquities in Petra for their use as a reference tool. In 1996, our voluminous multi-year survey data files were converted to a new system — a most time-consuming undertaking — which involved the updating of the COMPASS program by its conversion into a new database. The new program, known as ForeSight, developed by Paul Zimmerman of the University of Pennsylvania, is more versatile, speeds up results, and is easier to manipulate.

For the field collection of pottery, bone, stone, shell, stucco, glass, and metal artifacts, we have created a system we call "Grosso Modo." Grosso Modo evolved from a predefined template that has been upgraded over the years. For software we have used FileMaker Pro and we have created a relational database. In our four years of excavation this database includes a total of 78,364 objects of which 62,827 (or 80%) are ceramics. At this writing, we are analyzing the distribution of fields by setting them against the stratigraphy and phasing of the excavations.

There was a wealth of finds, including 60 coins, a Latin inscription, some 72 Nabataean, Roman and Byzantine lamp fragments, and large amounts of ceramic assemblages including unguentaria and bowls. Additionally, 31 more fragments of our extraordinary elephant sculpture were unearthed, including fragments of facial features — expressive eyes, wrinkled trunk and face fragments. This brings the total number of elephant fragments to 77, including the elephant-headed capital excavated in 1994. Of particular interest is the recovery from the temple 'Adyton' area of a large brain coral, presumably brought to Petra's 'Great' Temple in antiquity from the Gulf of 'Aqaba. It was unearthed in association with several coins and the fragmented Latin inscription mentioned earlier.

There was continued study by Erika Schluntz of the 'Great' Temple sculptural program that includes richly adorned capitals embellished with fruits and vines. The number of small finds were inventoried in our database by Deirdre Barrett — fragmented glass bowls and several bone items included needles and a spatula. Bronze decorative pieces were found — a leaf, a petal and a bronze buckle. Additionally we were

fortunate to have the on-site ceramic analyses of Yvonne Gerber and Stephan Schmid of the az-Zanṭūr excavations of the University of Basle.

To better understand the chemical "fingerprint" for the different wares represented at the site, Neutron Activation Analysis has been undertaken by Leigh-Ann Bedal of the University of Pennsylvania at the Missouri University Research Reactor in Columbia, Missouri. Of the 149 samples that were tested, five different compositions were represented. These results are being prepared for publication.

In order to produce an intuitive way for researchers to access the archaeological record, Avi Mannis, Brown University 1997, created a Digital Archive Project taking the three-dimensional representation of the excavations in which the *in situ* positions of the excavated coins have been marked. Selecting the marker brings up a record of the coin with a color photograph, an analysis of its composition, cultural origins, its inscriptions and mint marks, and its conservation history. The user is also able to search the archive for specific characteristics — that is, all the Nabataean coins from the reign of Aretas IV. This effort has produced a working CD-ROM archive of the 'Great' Temple coins. While this archive is limited in scope, we hope in the future to be able to expand it to encompass the whole range of materials excavated from the site.

The 'Great' Temple excavations have engendered a great deal of interest. To make our investigations available to the public we created a Web Page in 1995, which in 1996 has been revised by Benjamin H. Kleine, Brown University 1996. It can be accessed at http://www.brown.edu/Departments/Old–World–Archaeology–and–Art/Petra/, and a more general statement can be found in the Web Page of the American Schools of Oriental Research: http://www.cobb.msstate.edu/asordigs/petra.html .

In the following pages, the 1996 excavation and study results will first be presented followed by a word about the artifact record, the phasing, and the consolidation program.

Overview of 1996 Results

1996 brought about more extraordinary revelations about Nabataean temple architecture. The most significant architectural features indicate a Nabataean-Roman penchant for formal symmetry with the discovery in the Lower Temenos of east and west *triple* colonnades (in 1995 we thought these to be only double colonnades) adorned with what we now posit to be a total of 96 or more columns — three rows of 16 (18, or as many as 21) columns to a row — 48 or more flanking each side of the Lower Temenos.

One of the season's most significant discoveries was that adjacent to the West Exedra we recovered a monumental flight of stairs leading from the west Lower Temenos to the Upper Temenos *area sacra*. These too were defined. In the east Lower Temenos, an elegant apsed East Exedra was excavated with interior buttresses and twin columns which match those of the already excavated West Exedra. Also below the stylobate of the Eastern Colonnade, the sondage excavated in the Lower Temenos in 1995 was re-entered and once the founding level was located, it was closed at a 6 m depth. Additionally on the east, the eastern peripheral wall of the precinct was defined in the Lower Temenos — this wall was followed to the Upper Temenos where the tops of twin arched passages were discovered opening into the 'Lower Market' to the east.

In the 'Great' Temple proper, the interior Pronaos was completely excavated in 1996, as was the northwestern interior anta wall (Patricia), and the founding levels of two of the eight western columns were delineated (Paul and Erika). The Attic base of the northwest engaged column (Paul) was found to extend to the south of the interior anta wall (Patricia). What was surprising

was that in its interior was a staircase.

'Adyton' features included the complete excavation of the east and west vaulted stairwells and the large west vaulted chamber to some 4 m in depth where a fragmented inscription was unearthed. Further, the central Adyton was explored on both the north and south sides of the central vault, and on the southeast temple, the outer east wall, the southeastern double-engaged corner column, and the Inter-columnar wall were defined. All of these factors combine to suggest the south temple to have been a three-storied structure. Of particular interest, however, is the discovery of the upper courses of a major eastwest semi-circular wall opening into the central cella. This wall may clearly define the rear Cella wall — it promises to be a major architectural component of the 'Great' Temple, and it will be explored in the future. Its exposed portion has been charted on the Temple plan in Fig. 2 and the site plan in Fig. 3.

Now we turn to the results of specific areas investigated — from the Propylaea Steps to the Lower Temenos, the Upper Temenos, and finally to the "Great" Temple proper.

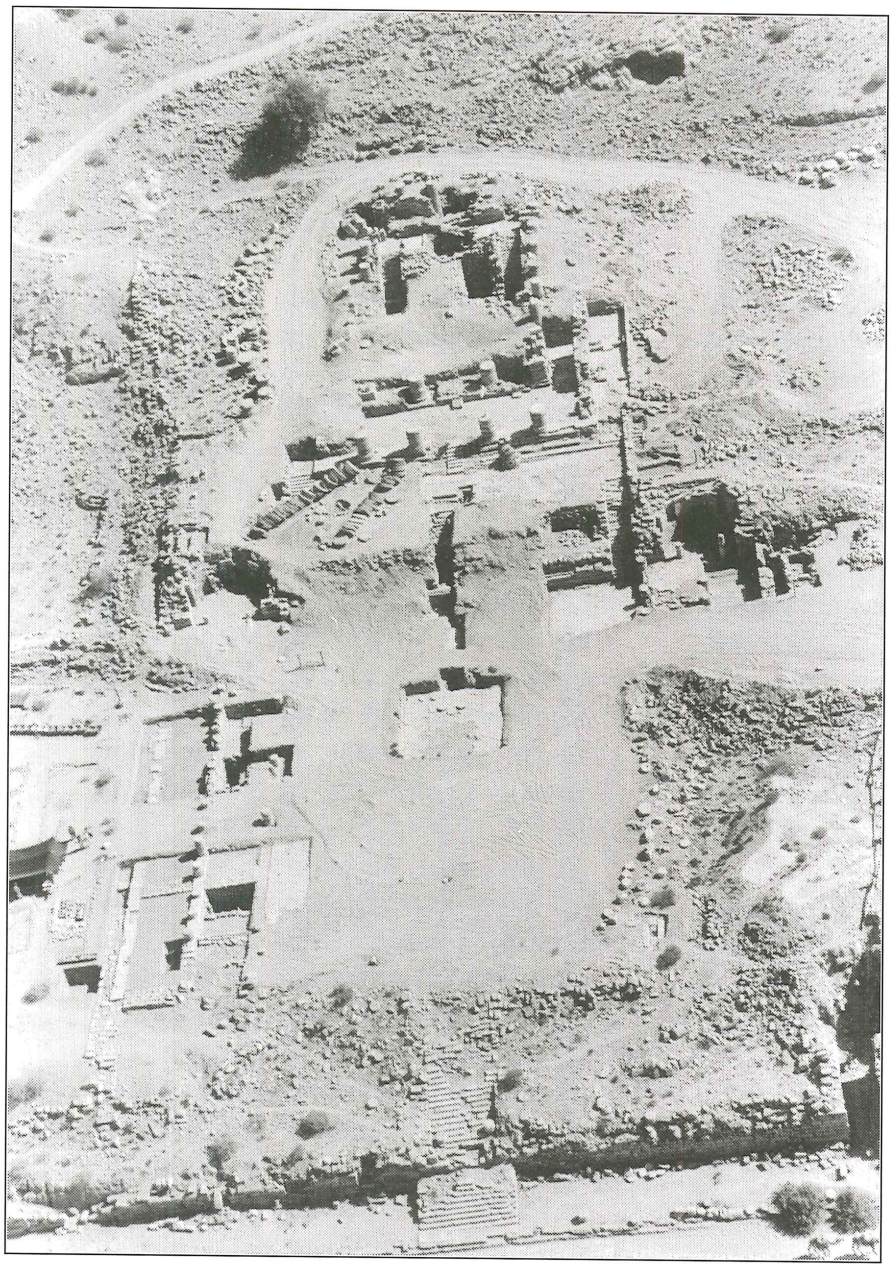
The Propylaea Steps

No work was undertaken in this area during the 1996 season, except for continued consolidation efforts to facilitate visitor-tourist access from the Colonnaded Street to the 'Great' Temple Lower Temenos.

Lower Temenos — East

Of great interest, discovered in the 1996 season within the eastern Lower Temenos, was a *third* colonnade constructed parallel to the double colonnade discovered in 1995. Exposed to the east of the double colonnade were the remains of the third stylobate of the colonnade lying to the east and parallel to the double colonnades unearthed in 1995. This stylobate is identical to its two counterparts in dimensions and construction — thus the three colonnades appear to have been built at the same time after the Lower Temenos had been filled-in and prepared for reconstruction. Fig. 4 is an aerial view of the 'Great' Temple precinct and shows the relationship between the three stylobates of the East Colonnade. The total preserved length of this colonnade is some 42 m. The intercolumniation of the columns is 2.50 m, and their diameters average 0.78 - 0.80 m. The colonnade stylobates are constructed of large limestone or white sandstone pavers averaging 0.52 m x 0.96 m, which are separated by square limestone slabs, 0.96 m x 0.96 m — these were prepared to support the columns and served as their bases. Although few of the baseless columns were found *in situ*, column placement could be reconstructed by studying the limestone square paver slabs. As mentioned previously, in each line of the colonnade were 16, 18, or perhaps as many as 21 columns. (At this time we are not sure if there were 48, 54, or as many as 63 in each flank of the Lower Temenos.) Fig. 5 shows the 1996 excavation team posing as East Colonnade columns. Between the colonnades are walkways, approximately 4.40 m in width. For the most part these walkways are not well-preserved — their blocks have disappeared. The evidence suggests that these colonnades were roofed, for part of the fallen debris is comprised of prolific amounts of roof tiles.

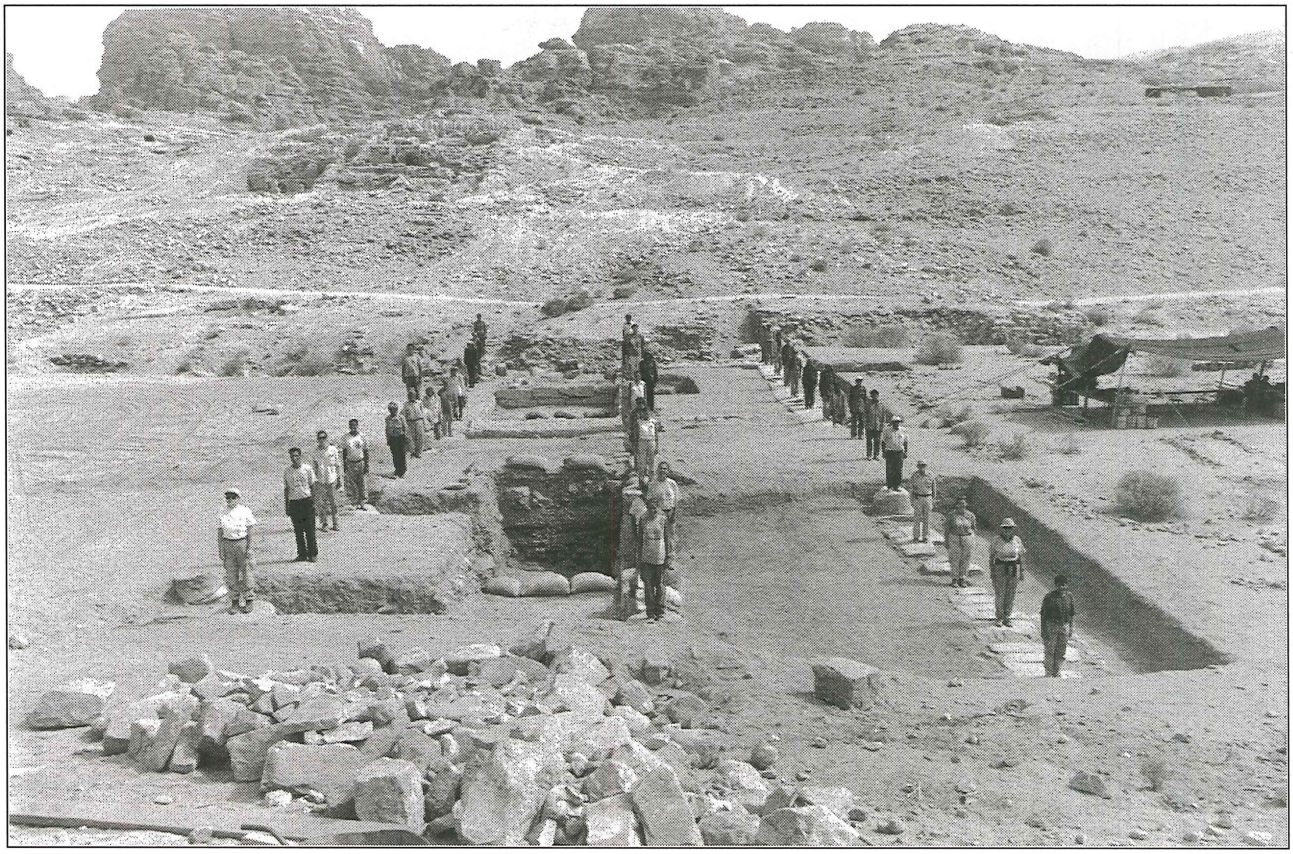
At least two distinct phases of building activity can be identified in the Lower Temenos East. The first stage was distinguished in 1995 in the area where the walkways would have been originally placed. In 1995 and most particularly in the Special Project probe in Trench 17, a north-south wall with arch springers was recovered approximately 0.94 m below the stylobate of the colonnade. This SP 25 probe was reopened in 1996, and a beaten-earth floor was found at an elevation of 873.22 m, approximately 6 m below the stylobate (and just 1.77 m above the 871.45 m



4. Aerial view of the 'Great' Temple Precinct, looking south (Photo by A. A. W. Joukowsky).

elevation of the Colonnaded Street). As the latest material in the fill was dated to the mid-second century CE, it appears that this new refurbishment of the Lower Temenos with the triple colonnade plan was designed and executed as an integrated plan at that time.

After the as yet functionally unknown system with arch springers was put out of commission, there then followed the building of substantial 19 - 20 course crosswalls which measure 4.50 m in width x 2.10 m in length, and 5.40 m in depth. Laid perpendicular to the well-dressed, mortared and plastered limestone arch springer walls, these crosswalls served as a supportive brace between them. (The arch springers measure 0.56 m in width and there is 0.80 m between arches.) These crosswalls abut the arch springer walls and restrain the artificial fill that was then put in place for the building-up of the Lower Temenos. After the crosswalls had been constructed and massive amounts of fill had been put in place, we enter the second stage of Lower Temenos reconstruction with the erection of



5. Lower Temenos East Colonnade, looking north, with staff posing as columns (Photo by A. A. W. Joukowsky).

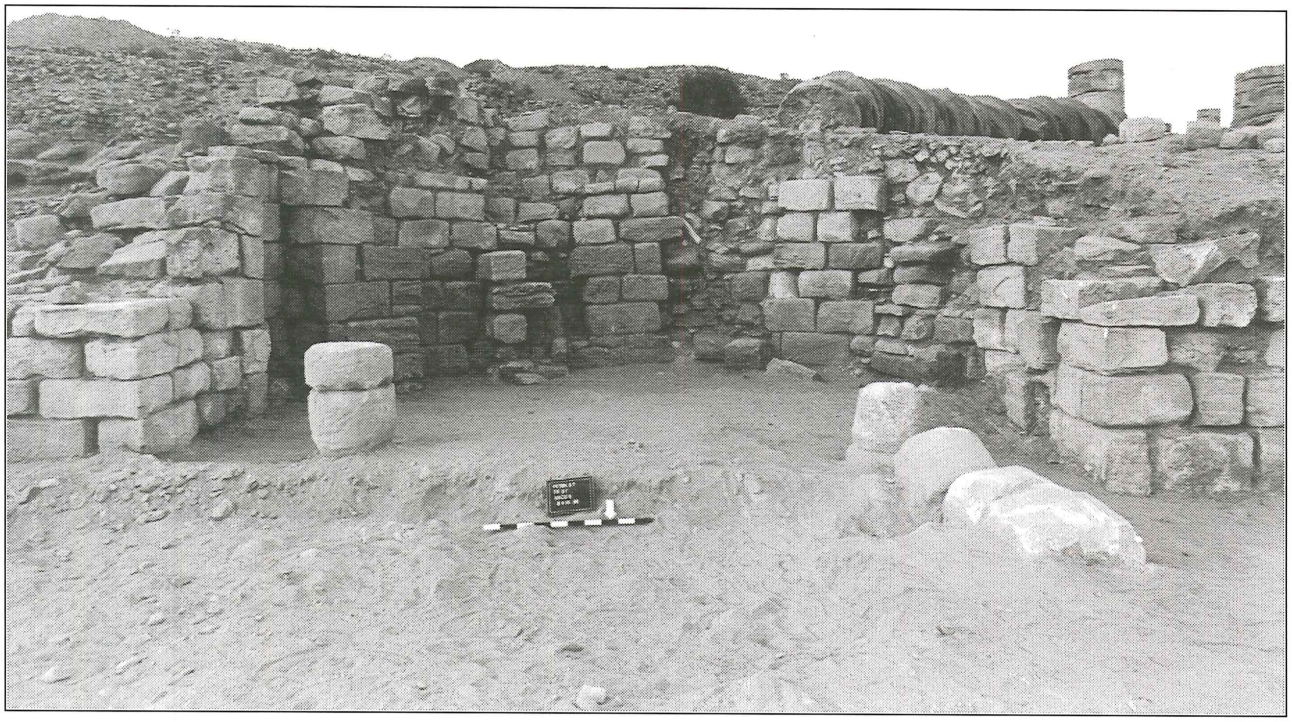
the triple stylobates, their columns, walkways, and as a finishing touch, the large limestone hexagonal pavers which were placed on top of the combined fill and crosswalls.

As can be seen in the plan in Fig. 3, this eastern colonnade defines the eastern end of the Lower Temenos by extending its excavated length. In the south it flows into the open entry of the newly recovered East Exedra (Fig. 6). In 1996, this East Exedra was located and excavated to a 4 m depth. Buttressed and niched just like its twin, the West Exedra excavated in 1994-1995, this apsidal structure measures approximately 10 m in exterior width, 7.5 m in interior width, and is 6 m from front to back. Like the West Exedra it too has twin columns located at its entrance. Although excavated to a 4 m depth, the floor level of the East Exedra has yet to be recovered. Nine ashlar courses of this structure were revealed; it is anticipated that its excavation will be completed in 1997.

An additional 1996 trench in the Lower Temenos, Trench 33, was placed over the northern end of the East Colonnade, for we reasoned that in antiquity the triple colonnade may have extended to a possible Propylaea structure. Here it was hoped that we would be able to trace the final blocks of the colonnade and its associated structures. If this trench marked the limit of the East Colonnade is, at this point, inconclusive — in all probability, the colonnade did not extend much beyond this point. There has been heavy collapse from this northern perimeter of the Lower Temenos down the sharp drop of 7.5 m to the north towards the Colonnaded Street. Due to the possibility of dangerous collapse onto the tourist thoroughfare, the excavation of this area was postponed.

Lower Temenos — West

There were continued investigations of the lowest deposits of the West Exedra (a

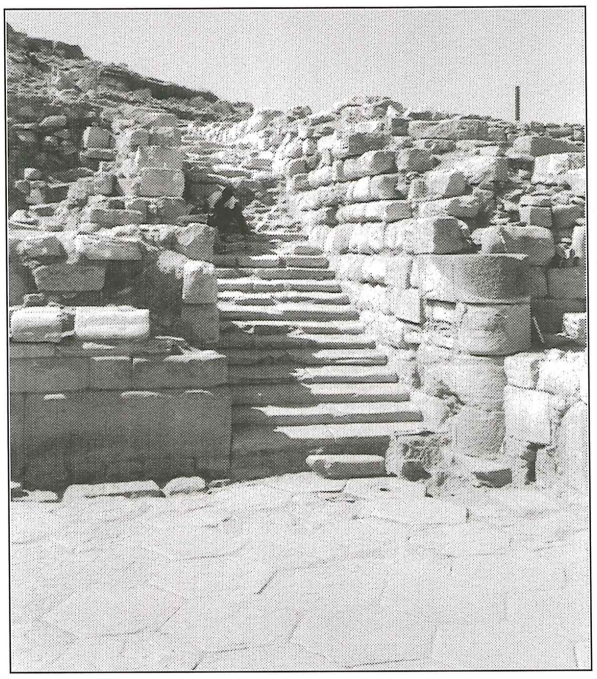


6. East Exedra, looking south (Photo by A. A. W. Joukowsky).

continuation of 1995, Trench 16), and the area lying further to the west beyond the West Exedra (Trench 31). In our past investigations of the West Exedra, it was obvious that we needed to clear the area lying beyond the apsidal structure if we were to answer questions about the symmetrical layout of the Lower Temenos. In fact we were anticipating the location of the west triple colonnade and wished to better delineate the function of the area. Instead we found a series of structures that had been dug into and post-dated the colonnade — they appeared to be coeval to and associated with the massive burning found in the later deposits of the West Exedra. Although the form and function of most of the structures were identifiable — there was part of a curvilinear structure and a well — an explanation of this later use phase of the West Exedra remains tentative. At present, we suggest this area may have served as part of a bath or perhaps an industrial complex that was constructed on and into the triple stylobates of the West Colonnade. Further excavation will elucidate the function of this area.

One of the most striking features of the 'Great' Temple landscape is the rise that constitutes the southern terminus of the Lower Temenos. This rise forms the end of the Lower Temenos as it dramatically slopes up to the northern end of the Upper Temenos and the 'Great' Temple Forecourt. To the east of the West Exedra, a trench, Trench 18, was set into the 6 m high east-west ridge which slopes south-to-north from where the terrace of the Upper Temenos plunges to meet the plaza of the Lower Temenos. Here the West Stairway was recovered, as well as an additional portion of the east-west crosswall that traverses the Lower Temenos. The interrelationship between these structures and the hexagonal pavement of the precinct was defined — they can be seen in Fig. 7.

Adjacent to the West Exedra and linking the Lower Temenos to the Upper Temenos and the Temple Forecourt are the remains of a lateral West Stairway composed of 12 steps with limestone treads 0.12 m high x 0.35 m in depth. Overall the West Staircase measures approximately 10 m in length x 0.60 m in width. The stairwell's east and west northsouth retaining walls were pre-



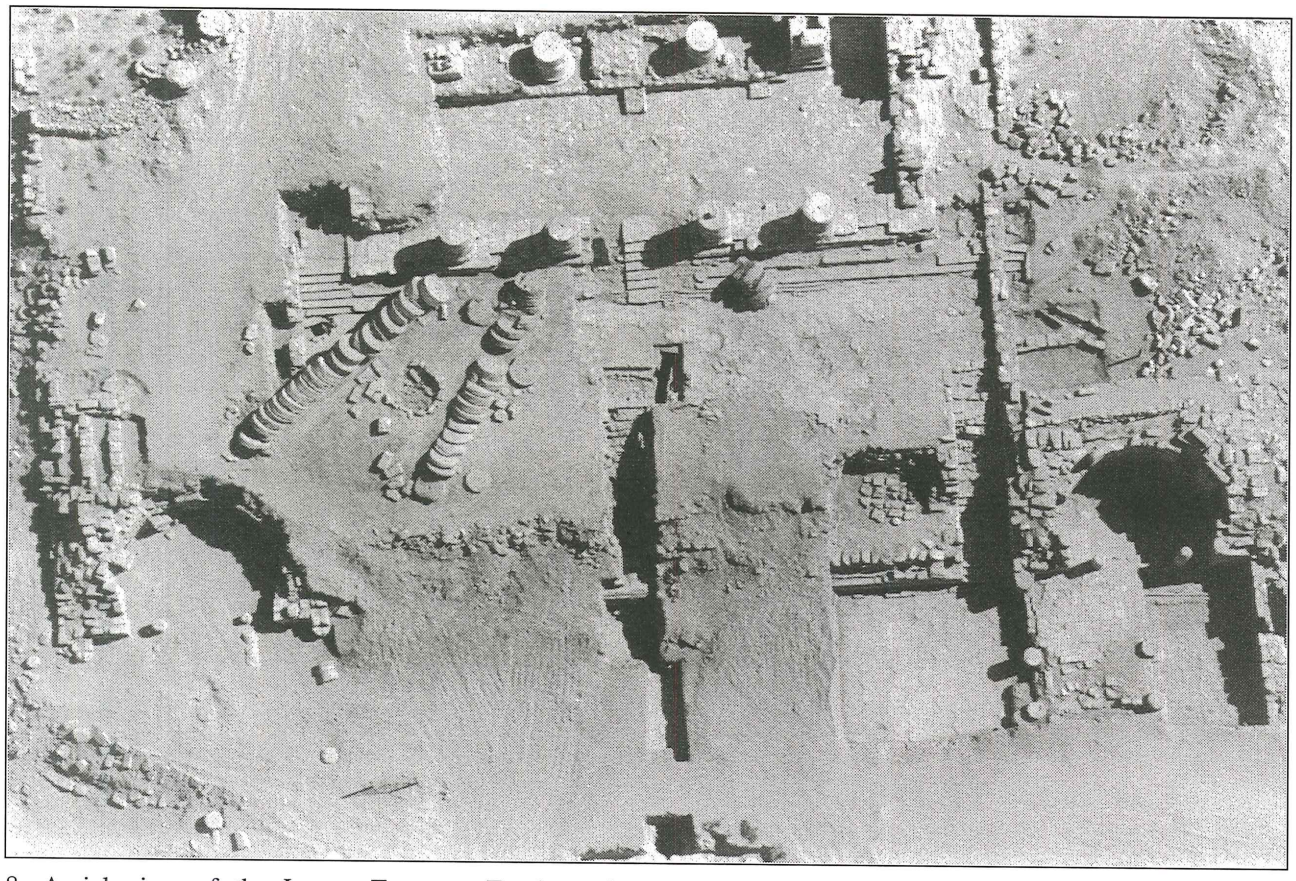
7. West Stairway, looking south (Photo by A. A. W. Joukowsky).

served to a height of 6 m above the Hexagonal Pavement. Although less well-preserved than the East Wall, the West Wall was embellished with an engaged column near the position where the elephant-headed capital was recovered in 1994. To be noted in the plan, Fig. 3, is that the upper courses of the West Wall are well-aligned with the West Walkway of the 'Great' Temple.

To the east of the stairway extends the east-west slope. Along its base there are extant remains of an eastwest neatly dressed limestone crosswall, a Retaining Wall, that rests on the limestone hexagonal pavement of the Lower Temenos. This Retaining Wall breaks the flow from the Lower Temenos to the Upper Temenos; its dual purpose may also have been to stabilize and add structural support to the Upper Temenos. Five segments of this wall were exposed to well over 5 m length. In Fig. 8, this Retaining Wall can be seen to continue to the east to the central Lower Temenos uncovered in 1995. We discovered that the eastwest Retaining Wall also blocked the earlier central staircase that served as an earlier link between the Lower Temenos and the Upper Temenos. Whether the area behind the Retaining Wall served a specific functional purpose or was purely decorative is uncertain. Although most of the features behind this wall are badly eroded, a considerable amount of evidence remains, for here was recovered a cache of pottery which has been dated by our ceramic advisors, Stephan Schmid and Yvonne Gerber of the University of Basle, to the mid-first century BCE.

Laid in four now-visible courses, the Retaining Wall rests on a foundation of several courses of flat undressed stones. The wall blocks are mortar-cemented in three courses, which are well-preserved to a maximum height of 7 m. Composed of white sandstone ashlars, dressed on their outer surface, these blocks measure an average of 2 m x 0.70 m in height. The lower courses are comprised of white sandstone blocks set as headers and stretchers — some of the stretchers are over 2 m in length. The two middle courses are also set with headers and stretchers that are not as large as those in the bottom course. What remains of the upper course is a fragmented molding course that appears to serve as a reverse cornice. Along the base of this wall is an open, low curb which probably served as a water channel constructed of sandstone stretchers. This curbing may have been original to the wall, or it may have been a later addition in its use sequence.

The earlier Central Staircase located in 1995 along the center axis of the 'Great' Temple, we assume, was the main access to the 'Great' Temple during its earliest Nabataean building phase. It was supplanted by two lateral staircases when the Temple precinct was reconstructed in the Nabataean-Roman period. This is when the Retaining Wall was put in place, and the central staircase was filled-in with rubble and debris to form the terrace of the 'Great' Temple Forecourt. The eastern wall of the East Staircase bonds with the Retaining Wall, so it is clear



8. Aerial view of the Lower Temenos Exedrae, the Temple Forecourt, Porch, and Pronaos, looking south (Photo by A. A. W. Joukowsky).

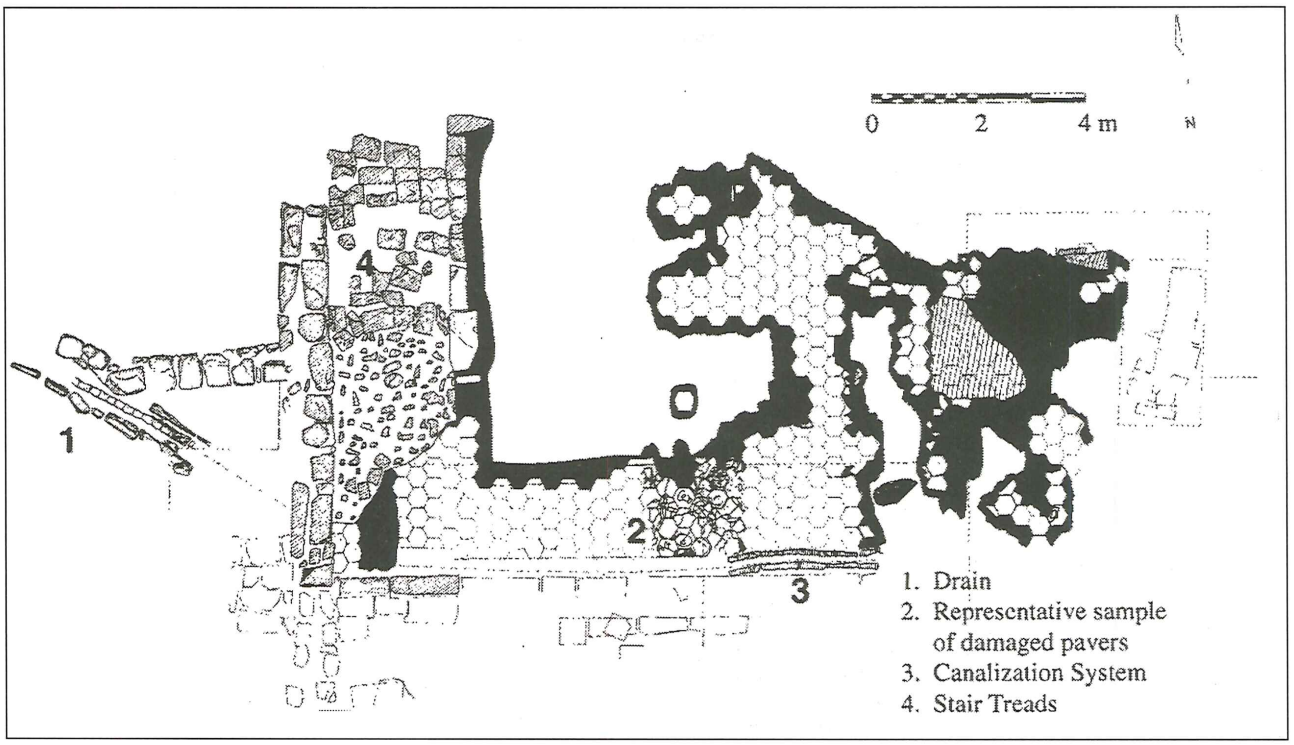
that they were constructed at the same time.

The Upper Temenos

The purpose of work in this area was to clean the Temple Forecourt west of the subterranean canalization system recovered in 1993 and to better understand the relationship between the Forecourt and the West Stairway. This goal was achieved, for excluding the column fall to the east, the paved Temple Forecourt was cleared of fallen debris (Trench 32) and was charted as can be seen in Fig. 9. The hexagonal pavers appear to have covered the entire terrace of the Temple Forecourt, for where the pavers are missing, there are the remains of the hard, pebbly, yellowish red foundation mortar (Munsell 5YR5/6). The pavers measure 0.19-0.20 m to a side and 0.40 m from corner to corner. They are in a poor state of preservation due to the collapse of column drums and other architectural components from the 'Great' Temple façade. There was, however, an attempted repair of the pavement in one area by the use of roof tiles as a paving element. Column drums and uneven amounts of debris-fill on the west was minimal, whereas on the east 1.0 m of fill-debris has accumulated over the drums. There several lines of indentations or shallow craters that have been formed by the falling drums. Both the soil and the fallen drums were removed from the center and the west Forecourt during the 1996 season, leaving the drums that fell to the east *in situ*. This evidence may suggest that the columns may have fallen at different times.

The 'Great' Temple

The extant structures excavated in 1996 in the 'Great' Temple itself included the re-erection of columns on the Temple façade, the East Pronaos (Trench 24, Pierre), the northwest Temple interior (Trench 29), the



9. Plan of the Temple Forecourt (Field Drawing by Brian Brown and Paul Zimmerman, Drafted by A. H. Bedewy and M. S. Joukowsky).

West 'Adyton' rooms (Trench 22), and the rear of the structure (Trenches 26, 27 and 35). Additional excavations in the 'Great' Temple's southeast included the Temple Colonnade and East Corridor (Trench 34). These features can be found on the plan in Fig. 3, and will be discussed in that order.

The Temple Façade and East Pronaos

On the Temple façade, the porch columns, which had undergone severe weathering, had their eroded drums removed and replaced with column drums which now stand to average heights of 2.40 m.

In Trench 24, an 11.60 m eastwest exposure, or one-half of the East Pronaos, was excavated. This completed the clearance of the 'Great' Temple Pronaos from its center to the interior East Anta wall (Pierre). Like the West Pronaos excavated in 1995, here too there was an absence of a real floor, however, the floor bedding was exposed throughout the area, and there are indications that below this bedding were manholes that accessed the subterranean canalization system. Secondary wall construction dating to the Byzantine period was again found to extend between the distyle Pronaos columns (Vartan and Muhammad). Metal, glass, some 1000 tesserae and a complete Byzantine cup were found associated with this wall.

The Northwest Temple Interior

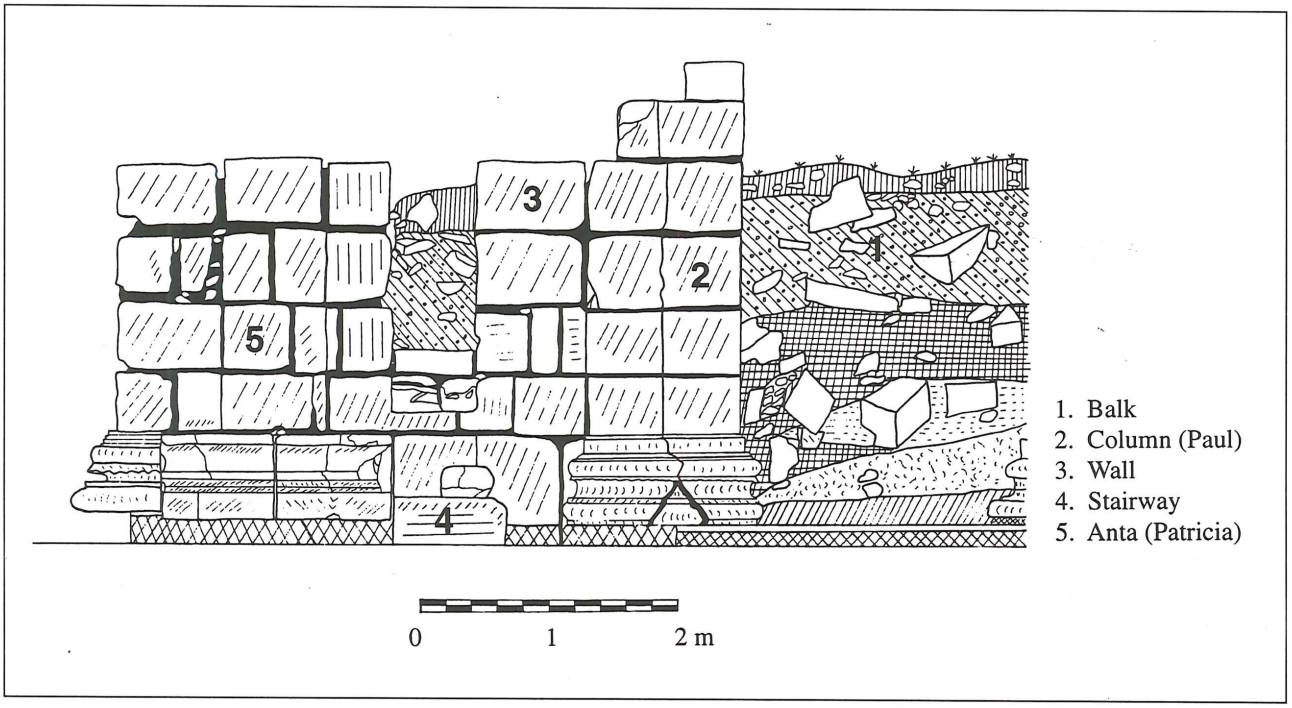
The 'Great' Temple interior West Corridor was opened in Trench 29, measuring 8.25 x 3.36 m. This excavation revealed the east face of the west Temple wall which was heavily plastered and painted, the Interior West Anta pier (Patricia) with its wall extending to an engaged column (Paul) — as well as the second of the eight plastered northsouth columns of the west Temple with their Attic bases (Erika). Extending to the south of the West Anta pier (Patricia — 2.1m long x 1.24m wide x 3.21m in height), was an elegant ashlar wall built up to the first of the eight west columns (Paul). In this wall was a small stairway 1.24 0.68 m. The northernmost, or first, of the northwest

10. West Anta Wall (Patricia) and column (Paul), looking northeast (Photo by A. A. W. Joukowsky).

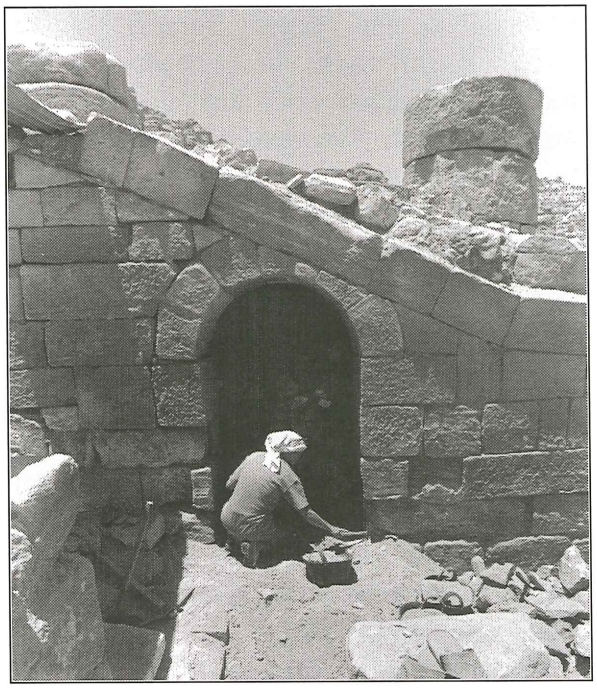
Temple columns (Paul) is engaged and connected to the Anta pier by the aforementioned wall which can be seen in Figs. 10 and 11. The second column, 3.16 m in height and 1.12 m in diameter, gave us a good idea of the inner ambulatory corridor. An additional doorway, connecting the west side of the inner cella with the west walkway of the Temple was opened. Originally, it measured 1.7 m in width, but in antiquity it was narrowed to 1.1 m. Originally, a sandstone paving set in long strips decorated the floor. Although many pavers were found missing, enough remained to gain an idea of the original design.

West Adyton Rooms

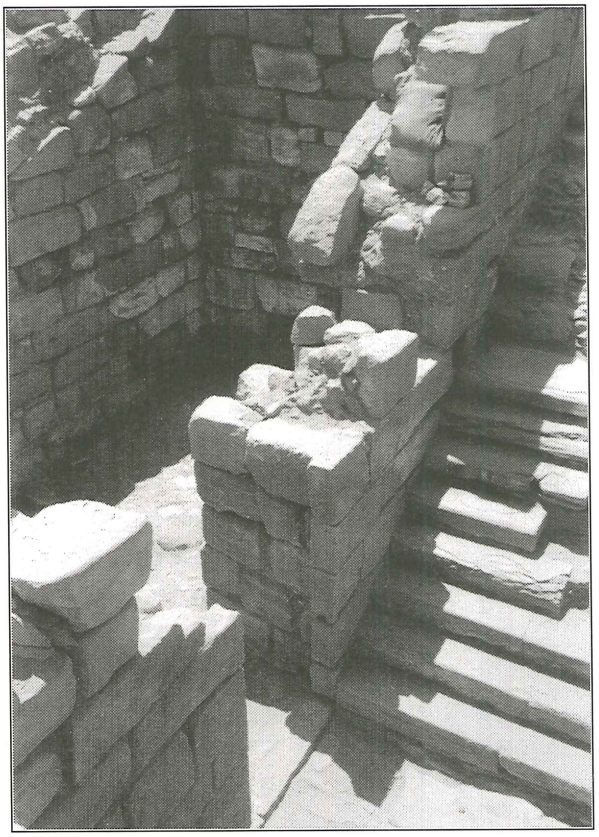
In 1996 the excavations begun in the West Adyton in 1994, were finally completed in Trench 22 (Fig. 12). The West Staircase, like its twin on the east, has two vaulted windows which admitted light, wall niches, and an arched doorway at its lower landing which is aligned with a 1.0 m wide entry door giving access into a vaulted room which can be seen in Fig. 13. The vaulted



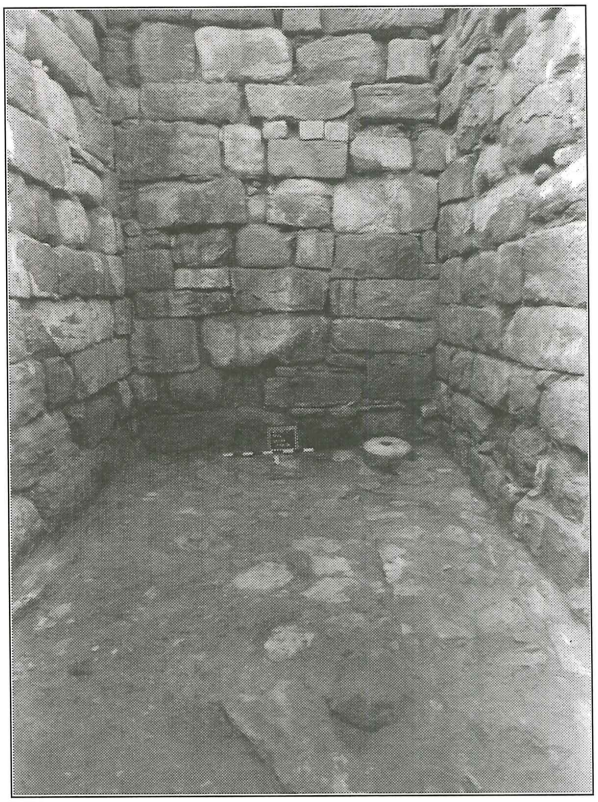
11. West Anta Wall (Patricia) with stairway and column (Paul) (Field drawing by M. Slaughter, Drafted by A. H. Bedewy).



12. West 'Adyton' Arched window in the West Stairway under excavation by L-A. Bedal, looking west. Note columns (Peter and David) in the background (Photo by A. A. W. Joukowsky).



13. West 'Adyton' West Stairway and Adjacent Room (Photo by A. A. W. Joukowsky).



14. West 'Adyton' Room, looking south (Photo by A. A. W. Joukowsky).

West Staircase, which measures 6.5 m in length, 2.2 m in width and 4.6 m in height, shares its eastern wall with this adjacent vaulted room shown in Fig. 14. This room measures approximately 5.50 m in length x 3.50 m in width, and its walls are preserved to an approximate height of 4 m. There is a well-preserved 11-course wall on its east and a 13-course wall on its west. This apparently was the period of most intensive use of the 'Great' Temple. In the West Adyton the jumbled fill all but inhibited excavation because of the large number of ashlars, as well as channeled and notched blocks interspersed with columns and capital elements that had fallen from the west. Here an elephant head fragment was recovered, of a smaller scale than those previously discovered from the Lower Temenos area. Associated finds were six coins, metal wire, nails, pins and hooks, a silver tear drop pendant, glass objects including an annular bead, plaster and numerous stucco remains from columns and walls, tesserae, a flint blade and mixed ceram-

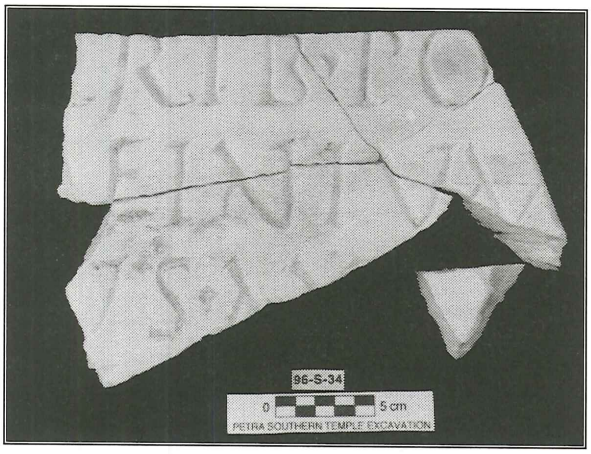
ics.

In the fill lying immediately above the floor bedding of this room were a number of interesting artifacts including a bone handle, two ivory needles, an ivory spatula, several coins, metal ornaments and a large brain coral, tesserae, broken ceramics, and a five-part fragmented Latin inscription incised into white marble (Fig. 15). This inscription is at present undergoing study by Stephan V. Tracy, Mellon Visiting Professor at the Institute of Advanced Study, Princeton NJ who has dated it to (?) 112 to 114 CE. In the center of the room was a large burnt area, and in the southwest was an enigmatic stone ring 0.46 m diameter x 0.20 m in height with a 0.11 m center perforation, which can be viewed in Fig. 14.

Spanning the interior width of the 'Great' Temple there was the discovery of the remains of an apsidal wall which appears to have formed the rear cella wall. This arched east-west wall is open to the Temple front, and it traverses the south end of the Temple Cella just in front, or north, of the Adyton rooms described above. Only the uppermost ashlar course was revealed when the excavator was leveling out the West Adyton. The west half of this wall is charted on the plans in Figs. 2 and 3.

South 'Adyton'

Excavated in Trench 26 in the South 'Adyton' of the 'Great' Temple was the large central vault. In antiquity, a now robbed out paved floor had been built on top of the arch. Two trenches were laid out to explore this structure — Trench 26 from the north, and Trench 27 from the south. Nine of the hypothetical 15 drums comprising the shaft of the central rear column (Ric) were uncovered in the south balk. Although the inter-columnar wall of the Temple rear was found to be partially robbed out between the columns (Ric and Zbig), this wall was well-preserved in its easternmost stretch and contained an arched doorway that has yet to be excavated. In the west, six courses of these wall ashlars were found preserved.



15. Fragments of the Latin inscription (Photo by A. A. W. Joukowsky).

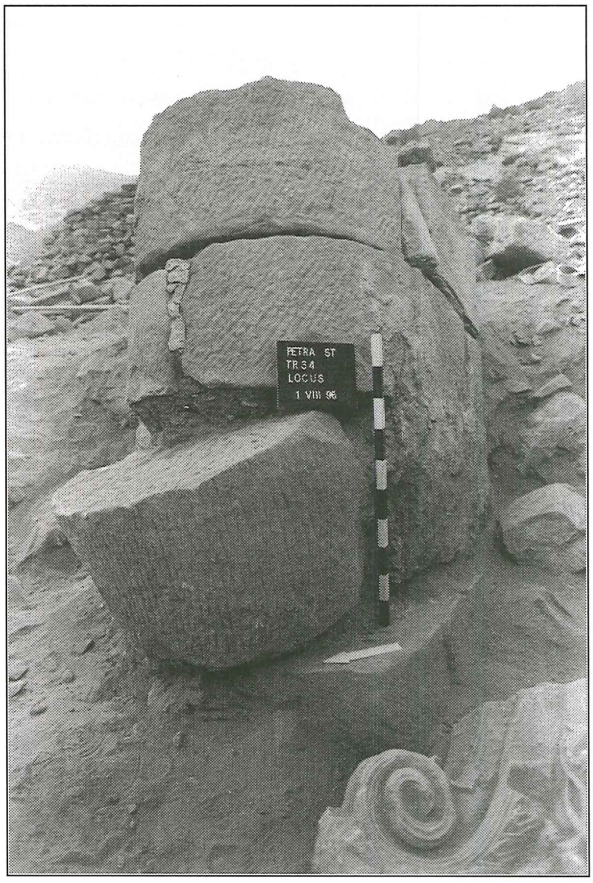
Sometime after the inter-columnar wall had been constructed and destroyed in the Temple rear, it was repaired. Particularly noted in the repairs was the use of decorative elements of capital fragments. Based on the elevations, we assume the rear columns rest at the same elevation as those on the Temple porch, so the Temple as originally built was a one-level structure.

Southeast Temple Colonnade and Interior Corridor

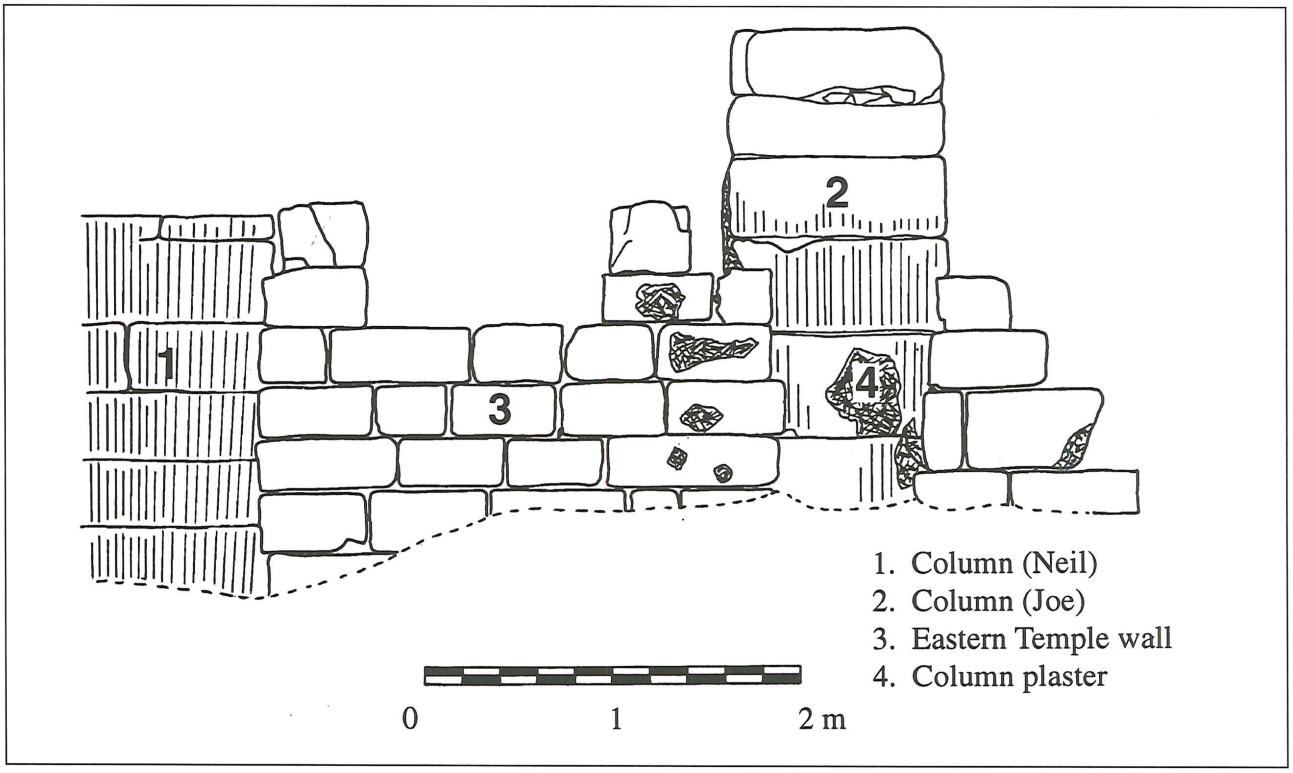
In the southeast Temple, a 14 x 5 m trench, Trench 34, was excavated to clarify, identify, and delineate the southeastern columnar wall of the 'Great' Temple, as well as the remains of columns that had been knocked off their bases and fallen to the east. With the exception of the heart-shaped rear corner columns (Leigh-Ann and Suleiman), these Temple columns have average diameters ranging from 1.10 - 1.20 m, and their intercolumniations (center interaxial spaces) are 3.50 m. Excavation here included the clearance of a window, measuring 1.23 m in width and 1.78 m in height. Located between the eastern staircase and the east Temple wall, the window was positioned to look out over the east Corridor, between the second and third columns from

the south — the Neil and Joe columns. A portion of this wall with the columns can be seen in Fig. 16. Also unearthed was the second column from the south (Joe) with a diameter of 1.10 m and an excavated height of 2 m, and the third column from the south (Chet) located 3.50 m north of the Joe column. There was the partial six drum re-erection of the Neil column to an excavated height of 3.22 m, and the clear identification of the origin of the double-engaged heart-shaped corner southeast column (Suleiman). This massive heart-shaped column had been thrown and slumped some 4 m to the east bursting through a support wall constructed around it, as can be seen in Fig. 17. Locating its *in situ* horizontal base was complicated, for it was obscured by tumble, architectural rubble and sand. This column's *in situ* position was finally located 3.54 m below the upper course of its supporting inter-columnar wall.

There was also the recovery of the East Temple Corridor which is approximately 3.50 m in width. The East Interior Corridor



17. South Corner Column (Suleiman), looking east (Photo by A. A. W. Joukowsky).



16. Drawing of the Trench 34, Locus 14 (Field drawing by L. D. Bestock, Drafted by A. H. Bedewy).

of the Temple was found to continue to the South Temple — it is approximately 3.5 m in width and was partially excavated to a 2.36 m depth. Because of the fragility of this outer Temple wall, it was temporarily backfilled for protection. Little pottery was associated with this deposit, however, over 100 fragmented but well-preserved carved capital fragments were registered from this area. A re-erected column (Joe) with the typical 'Great' Temple sculptural program is shown in Fig. 18.

Discussion

The sequence of refurbishment in subsequent stages of rebuilding seems to indicate two main stages of 'Great' Temple construction. The earliest phase is represented by an earlier distyle in antis Temple complex with the construction of the two Pronaos columns (Vartan and Muhammad, 1.5 m in diameter) framed by eight smaller remaining temple columns (1.10-1.20 m in diameter). These were covered with a decorative fluted plaster and topped with limestone capitals — a two-part lower order of acanthus leaves and a four-part upper order of deeply carved hibiscus flowers blossoming forth with pomegranates, pine-cones and other fruits. Corner volutes and expertly-carved decorative pine-cone bosses complete the decorative vocabulary of these 'Great' Temple capitals. The evidence of their finely fluted decorative plaster covering suggests these columns were originally intended to be free-standing and viewed from all directions.

18. Re-erected Column (Joe) with fragments of capitals (Photo by A. A. W. Joukowsky).

Stage 1 — During the initial period of construction the main lines of the Temple were laid out. At this time there was a structure with arch springers in the Lower Temenos, and the Temple was accessed by a Central Stairway. The unity of this construction is proven by the arrangement of the ashlars and its dating rests primarily upon the preservation of the pottery which has been dated to the first century BCE.

Stage 2 — The second period was the appropriate moment for the inauguration of a large-scale construction project and landscaping. The Temple was enlarged with the addition of the Pronaos, the four porch columns, the Lower Temenos with its grand West and East Exedrae, and East and West lateral Stairways were laid out (the Center Stairway was covered over), the Lower Temenos Retaining Wall was built, and probably the Propylaea Steps as well. It is at this time that four new porch columns of the same diameter as those of the present day Pronaos were added to front the newly constructed broad Pronaos. Thus at this time, an enlarged tetrastyle in antis 'Great' Temple was constructed. Exterior walls were added beyond the columns providing interior corridors with doorways to the then constructed walkways. The Temple columns were covered by the construction of exterior Intercolumnar casemate-type walls with their

interstices filled with mortar. In antiquity, this support wall encased all of the columns but those faces that could be viewed from the Temple interior. And as part of this building program, the interior cella walls, the interior staircases and the central vault were built. It is clear that these structures were constructed at the same time, for their wall ashlars are bonded together. Furthermore, a close analysis of the structures themselves including the alterations in design gives us evidence for a clearer sequence of construction for the 'Great' Temple and its precinct. Thus, the evidence suggests, and it seems probable, that the temple is considerably older than had previously been hypothesized. We can say with some degree of certainty that the earliest temple in Stage 1 was constructed by the Nabataeans in the first century BCE. This included the Upper Temenos in its original form and the wall and arch system in the Lower Temenos, as well as an early stage of the subterranean canalization system. This date is well supported by the ceramic evidence.

A reasonable date for Stage 2 would be the mid-second century CE, which we designate as the Nabataean-Roman period— this date is reinforced by the homogeneous ceramics and fill found under the hexagonal pavement of the Lower Temenos.

Following these events there are at least two instances of major destruction before the 'Great' Temple went out of use, and these, based on the ceramics, can be roughly dated to the late fourth - early fifth centuries CE. The ceramic evidence also supports an earlier date for the general abandonment of the site; there is little pottery found from later than the early fifth century CE, which is when we have dated our latest pre-modern deposits.

Phasing the Deposits - Dating

While the evidence for absolute chronology for the 'Great' Temple and its precinct is limited, there are 18 phases of use which can be roughly divided into four main periods: Nabataean — Phases I - IV, Va - Vb; Nabataean- Roman — Phases Vc-Ve; Late Roman — Phases VIa -VIc -VIIa-VIIc ; and Byzantine- Modern — Phases VIId, VIII, IX. These have clearly emerged from a combined study of the historical sources, the artifact repertoire, geological factors, and architectural construction and decorative schemes.

We now present a revised review of the relative chronology of the 18 phases reviewed last year with some minor revisions and additions resulting from the 1996 excavations. The phasing of each of the temple area trenches is set forth so that the interrelationship between areas and their architecture can be demonstrated.

PERIOD 1 **— pre-106 CE - Nabataean Period**

Phase I — Last half of the first century BCE.
Propylaea: east retaining wall; Lower Temenos: East wall with arch springers:
Nabataean Temple, distyle in antis constructed. The present Interior Antae with double engaged columns — in toto — eight side columns and six rear columns erected;

Phases II - III — 50 BCE to the turn of the millennium.

Phase IV — 1-80 CE
Site reconfiguration — use and intentional fill build-up;

Phase Va — Central 'Grand' Stairway from the Lower to Upper Temenos;

Phase Vb — Canalization System;

PERIOD II **— Nabataean-Roman Period**

Phase Vc — Filling in of the Lower Temenos prior to rebuilding.

Phase Vd — Post 106 CE
Lower Temenos: filled in; Stylobate construction for triple colonnades;

Hexagonal pavement laid with east-west Retaining Wall delimiting the south end of the Lower Temenos; East and West Exedrae constructed as well as West and East(?) Stairways accessing the Temple Forecourt. (Central Stairway has been filled-in and is now out of use.)

Temple: Podium, Stylobate, Pronaos, and four exterior porch columns erected. Cella walls constructed;

Phase Ve — *Propylaea Steps; Lower Temenos:* West Exedra wall repair; Upper *Temenos:* East and West Walkways; Temple: Forecourt paved with small hexagonal pavers. Adyton walls, Stairways and Intercolumnar Walls constructed;

PERIOD III — **Late Roman Period — Late Second Century - Early Third CE**

Phase VIa — Destruction - (partial?) late second century CE; abandonment Lower Temenos; Temple Forecourt above ground drainage;

Phase VIb — Canalization repair; *Temple* Forecourt: hexagonal pavement repair;

Phase VIc — *Lower Temenos:* West Exedra compacted earth floor; Temple Forecourt repair and releveling of hexagonal pavers; Pronaos east-west wall and platform; West walkway bench;

Phase VIIa — *Lower Temenos:* compacted earth floor; east Intercolumnar wall; West Exedra platform and stairs leading down into the Exedra;

Upper Temenos: Forecourt east and west surface canalization; Temple west cachment drain; paver damage to West Walkway, Pronaos door blocked, flooring added;

Phase VIIb — Third century CE Abandonment. Temple: Adyton and Pronaos refuse; east wall rebuilt;

Phase VIIc — *Temple*: Adyton column collapse. Destruction particularly noted in South Temple South — probably the result of the earthquake of May 19, 363 CE.

PERIOD IV — **Byzantine Fourth - Early Fifth Centuries CE - Modern**

Phase VIId — *Lower Temenos:* East Colonnade lime production; West Exedra, kiln.

Temple: Adyton stair and floor robbing; Pronaos abandoned.

Phase VIII — Collapse and abandonment (ca. late fourth /early fifth centuries CE).

Phase IX — Reuse of the area for farming activities.

In order to make inferences from the archaeological record, we must take into account a variety of processes that have had an impact on the evidence. Our assessment of the 'Great' Temple evidence has undergone many corrections. Our "correct" reading and interpretation of the observed associations presented above we consider to be highly dynamic — with our continued investigations, it may yet undergo changes.

1996 - Preliminary Conservation and Consolidation (September-October 1996)

Archaeological investigations of ancient structures of any kind are important in increasing our knowledge of the past, however they also produce serious side effects by exposing structures to the elements and vastly increasing the rate of decay. In order to slow this process, we have employed certain measures simultaneously with the excavation. With this in mind, a preliminary conservation survey of the excavated portions of the Temple has, at present, been carried out with a view to preserving and restoring various architectural features. From the beginning, the fundamental philosophy

of the Petra 'Great' Temple excavations has been the consolidation of the site and the re-erection of columns while the excavations are in progress. Exposure of the architectural features has been of serious concern, for the site is susceptible to heavy rains and earth tremors. This was acknowledged by the incorporation of several additional consolidation procedures which have become part of our research design.

An application was made to the World Monuments Fund who granted us an award expressly for site preservation, conservation and consolidation. The 'Great' Southern Temple Consolidation Project was made possible in part by a grant from the Samuel H. Kress Foundation through World Monuments Watch, a program of the World Monu-ments Fund. Briefly described, budget constraints forced us to be selective of what we could undertake. While portable artifacts were photographed *in situ*, architectural components have been removed to the lapidary to the west of the site, and all the small finds were taken to the J. L. Burckhardt Center for detailed recording and analysis. After these artifacts had been fully documented, the artifacts for the catalog were deposited with the Department of Antiquities in Petra, and the remaining artifacts and smaller architectural fragments were replaced on the site and reburied.

Now that all the Temple columns have been located, we have undertaken their reversible re-erection. Using a tested mortar which in composition is similar to the original Nabataean mortar, we have consolidated architectural elements that have been imperiled both from 2000 years of erosion as well as by recent excavations. The protective fencing that was placed around the temple in 1995 had to be extended for the site's protection in 1996. In addition, continuous excavation requires that certain trenches be left opened for investigative purposes from season to season, creating safety hazards for the numerous visitors to a site such as Petra. In order to insure their safety, we thought it essential to partition off opened trenches and stairwells.

I gained the approval of the Department of Antiquities of the Hashemite Kingdom of Jordan to carry out this consolidation. Dr Ghazi Bisheh, Director-General of the Department of Antiquities, was also anxious to have this work undertaken as soon as possible. An experienced architect, May Shaer, and experienced conservators, Zaki Aslan and Paul S. Fay supervised the plan for the consolidation of the 'Great' Temple architecture, which has been carried out under the expert guidance of Dakhilallah Qublan and some 20 local workmen. Their workmanship has been fully supported by the Jordanian Department of Antiquities. This consolidation work was carried out in the fall 1996 before the site was threatened by an earthquake and winter rains.

The following abbreviated listing includes measures we undertook for the preservation, restoration and safety considerations, beginning with the Propylaea Steps in the north.

Propylaea Steps

- The step foundations have been partially consolidated by using mud mortar and small field stones prior to the restoration of the steps using new ashlar blocks.
- Vegetation located on the steps (and along the Colonnaded Street) has been removed in order to prevent damage by roots to surrounding structures.

Lower Temenos

1. *West Exedra*

- Gaps along the eastern portion of the walls have been filled with mud mortar and small stone wedges.
- The face of the walls has been treated by pointing with mud mortar and stone wedges.
- Gaps occurring between the column drums have been treated either by re

moving and replacing the drums or by injecting mud mortar (grouting) between them.

- The drainage channel in front of the West Exedra has been covered with sand and has been backfilled.

2. *Western Staircase Between the Lower Temenos and the Temple Forecourt*

- East and West Staircase Walls have been treated with pointing and missing ashlars have been replaced with new blocks.
- The staircase foundation has been treated by the filling of missing sections with mud mortar and small field stones prior to the stair restoration with the original ashlars uncovered in the excavation.

3. *Lower Temenos South — Hexagonal Pavement*

- Hexagonal pavement tiles may be replaced after refilling the space between the cap-stones and the pavement level, however, further investigation of the Lower Te-menos substructure is required in order to determine the type and weight of the fill.

Upper Temenos

1. *Temple Forecourt*

- Exposed ceramic drainage pipes have already been covered with sand and backfilled.
- The damaged hexagonal pavement in the forecourt has been covered with a thin layer of sand until such time as the pavement can be consolidated and restored. Further excavation is required in order to determine how to proceed with the consolidation of the pavement and its subsurface. (The use of geo-technic cloth to cover this area was precluded by our budget.)
- The central staircase foundation has been consolidated by using mud mortar and large pebbles. A safety barrier has been erected at the top the staircase.
- Exposed sections of the canalization system underlying the Forecourt and the extreme eastern side of the Forecourt have undergone consolidation of their crumbling edges by the use of mud and lime mortars. These exposed sections have also required safety barriers.

2. *Western Exterior Walkway*

- Gaps in the eastern walls have been replaced with worked field stones bonded with mud mortar and pointing has reinforced the walls.

The 'Great' Temple

1. *West Corridor*

- Re-placement of the fallen ashlars recovered in the excavation to their original positions in the north-western wall.
- The north-western section of the central wall has been treated by pointing in order to reinforce the wall, and to close large gaps between the ashlars.
- Safety barriers have been erected around the exposed section.

2.*West Adyton Stairwell*

- In order to insure safe access to the West Adyton room a partial restoration of the stairs has been undertaken by the completion of the foundation level using mud mortar and small field stones, and the placement of stair runners found in the lapidary from previous excavation seasons.

3. *West Adyton Room*

- Gaps between stones in these walls have been filled with a combination of mud mortar, stone wedges and small field stones (pointing). The niche has been completed by placing flat core fill stones and mortar in order to reinforce the surrounding wall.
- Reinforcement of the remaining vault stones on the eastern side of the room, by their removal and replacement with a local mud mortar.

Other projects include:

4. *Southeast Cella Corridor*

- Northern Wall of the heart shaped column (Suleiman) support niche. A) Ashlars have been numbered, removed and have been replaced in their original positions.
- The gaps above the designated ashlars have been cleared of debris and new ashlars have been inserted.
- A drainage trench has been constructed parallel to the southern wall of the Temple, north of the column niche to divert water.

5. *Adyton Arch*

- The preservation of this arch required simultaneous work by both excavators and conservators in order to clear out debris and repair damage prior to further excavation of adjoining areas. Further study of the construction of the arch is still required by conservators along with architectural historians in order to proceed.

6. *Eastern Adyton Stairwell*

- Restoration of the first two rows of the vaulted ceiling was required before the consolidation of the lower section of the surrounding walls was undertaken.
- A safety barrier has been put in place to limit public access to the stairwell.

7. *Pronaos*

- Remnants of plaster stucco decoration on the exterior south-western column (Vartan) have been treated professionally with sealants and interior injection in order to forestall deterioration.
- Column drums have been removed and subsequently re-erected in their original positions and mud mortar has been injected between the drums.

8. *The Pronaos and the Temple Forecourt*

The foundations have been consolidated by using mud mortar and small field stones. This preceded the restoration of the stairs using existing worked stones.

Conservation involves the analysis, treatment, and preservation of the 'Great' Temple. It is hoped that we have helped to preserve this monument, for we have routinely maintained records of both the condition and treatment of the various sectors of this site that we have participated in recovering.

In Conclusion

Questions still abound about the 'Great' Temple which we hope will be answered as our work progresses. What is the relationship of the centrally vaulted structure to the Temple Adyton — is it the Adyton itself, or is it a supporting structure for an elevated Adyton? What is the relationship of the recently discovered semi-circular apsed wall in the rear of the cella to the layout of the structure? Is the true Adyton apse-shaped, and is this its rear wall? Why does this Temple seem to be remarkably different in architectural plan than the traditionally established architectural canon of the classical concept of the temple?

Our understanding of the stratigraphy of the temple site itself has been hampered by the lack of dateable materials. Thus our conclusions must remain tentative until they can be supported by sealed archaeological contexts. On the basis of the stylistics of the elaborate floral decoration, especially of the limestone capitals and elements of the entablature, the Petra Southern Temple iconography appears to be similar to that of the Temple of the Winged Lions and the al-Khaznah. Tentatively the evidence suggests the temple was constructed sometime at the end of the first century BCE by the Nabataeans who combined their native traditions with the classical spirit. What is clear is that the temple structure was devastated by one or another of the earthquakes that rocked the area, or perhaps by the lack of its own structural integrity, which brought about its subsequent ruin and abandonment.

For all its history as being one of the most important archaeological finds at Petra, for all the excitement about the beauty of Nabataean Petra, the 'Great' Temple is still very much a work-in-progress. The little we now know about the architecture, the culture, the socio-religious organization, and the economic influences among other things, serve to bring up more questions about how things worked at the 'Great' Temple. We still have little idea who was worshipped here and how, and how the religious order was integrated into society. What was the 'Great' Temple's role at Petra — what kind of relationship did it have with the city as a whole? From where did this religious architecture come and originally develop? These and many other questions cannot be fully answered until more data has been gathered and we have a more complete picture of the entire site.

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