British Mission to Tell el-Amarna

Great Aten Temple
Report on Recent Work
(September 16th–November 4th, 2021)

View of the north-east corner of the Long Temple at the end of the autumn season, 2021. The modern cemetery of El-Tell stands beside it. View to the north-east.

Barry Kemp, Miriam Bertram, Juan Friedrichs, Anna Hodgkinson, Fabien Balestra, Sue Kelly and Andreas Mesli

November 28th, 2021
British Mission to Tell el-Amarna

Preliminary report on work done by the British Mission to Tell el-Amarna, September 16th–November 4th, 2021

The autumn season of work began on September 16th, 2021 and ended on November 4th. The mission comprised Barry Kemp (director), Miriam Bertram, Juan Friedrichs, Anna Hodgkinson and Fabien Balestra (archaeologists), Sue Kelly (registration) and Andreas Mesli (photographer). The representatives of the Ministry of Tourism and Antiquities were Ibrahim Saleh and Mariam Atef (Great Aten Temple) and Mohamed Abd el-Mohsen (antiquities magazine). The mission wishes to express thanks to the Permanent Committee of the Ministry of Tourism and Antiquities for permission to work at Amarna during 2021, and to the officials of Middle Egypt for assistance in the successful completion of the Autumn 2021 programme: Gamal Abu Bakr (general manager for Middle Egypt), Mahmoud Salah (general manager for South Minia), Fathy Awad (manager of the Mallawi sector) and Hamada Kellawy (chief inspector of Tell el-Amarna).

Work at the Great Aten Temple

The excavation and rebuilding work were located within the large enclosure of the Great Aten Temple (Figure 1). The main building within the enclosure is the Long Temple. It was originally built from blocks of limestone of the standard size of 1 cubit long (52 cm) by half a cubit wide and tall (talatat-blocks). Akhenaten’s builders had developed the technique of erecting stone buildings on a foundation layer of concrete, in which gypsum was used instead of lime cement. Some years after Akhenaten’s death, all stone buildings (including the Long Temple) were demolished and the stones taken away to be re-used for other projects (most importantly at El-Ashmunein). Fortunately for modern understanding, the removal of the stones commonly left behind large areas of the gypsum-concrete foundation layer. This layer preserves traces of where walls and other features had been. When these traces are recorded and studied it is possible to reconstruct the plan of the building.

The Long Temple in the Great Aten Temple enclosure was completely excavated by a British mission in 1932 (of the Egypt Exploration Society), directed by the archaeologist John Pendlebury. In the space of one month he exposed the entire extent of the gypsum-concrete foundations. These were then planned by his architect, Ralph Lavers, and included in a publication, The City of Akhenaten, volume III (London, Egypt Exploration Society 1951).

The current British mission began work at the temple in 2012. It has two aims. One is to clean areas of the temple and to plan them afresh. In the course of this many fragments of broken sculpture are found which Pendlebury’s workmen had thrown away. The other aim is to lay fresh limestone blocks along the ancient lines of the walls, though only to a height of one talatat-block above ground level.

In the spring of 2021 the cleaning of the gypsum concrete foundations reached the back of the temple (which has a width of 32 m) along the line of the north outer wall. The work of this autumn season was to continue to clean and to record more of this area across to the south outer wall (Figures 2 and 3). The foundation layer is covered with about 10 cm of wind-blown sand which becomes thicker at the edges. As we proceeded we used, for reference purposes, the small-scale plan made by Lavers in 1932. A fresh plan, at the scale of 1:25, was then made by Juan Friedrichs (Figures 4 and 9). It records traces of the builders’ original lines (marked in black ink or by lines cut with a chisel) and marks of damage made when the original limestone blocks were removed. From a study of all of the evidence it is possible to restore the original plan. The surface is also photographed, in part by a tiny remote-controlled camera on top of a long pole. Computer software can then create a mosaic aerial photograph covering large areas.
Figure 1. Plan of the enclosure of the Great Aten Temple. It shows the main features within the enclosure and the main areas of the 2021 season which are outlined in red (see Figure 2).
Figure 2. Plan of the rear part of the Long Temple showing the progress of the work of study and reconstruction achieved in 2021. The red letters A and B refer to the positions of the large offering-tables shown in the tombs of Meryra and Panehsy (Figures 6–8). The underlying plan is that of Ralph Lavers, made for the Egypt Exploration Society expedition of 1932 (City Of Akhenaten III, Pl. III).

Figure 3. Part of the gypsum-concrete foundation layer at the rear of the temple. Some areas were destroyed when the temple was demolished. Other areas preserve the marks of walls and offering-tables. View to the south-east.
Figure 4. Part of the new plan of the area of the temple foundations uncovered in the autumn of 2021, drawn by Juan Friedrichs. It covers a group of offering-tables. East is towards the top.

Figure 5. Traces of offering-table [19765], see Figure 4. East is towards the top.
Figure 6. The rear part of the temple as shown in the tomb of Meryra (Davies, Rock Tombs I, Pl. XXVIII). The red letters A and B identify the two main offering-tables (see Figure 2).

Figure 7. The rear part of the temple as shown in a second scene in the tomb of Meryra (Davies, Rock Tombs I, Pl. XI). The red letter A identifies one of the two main offering-tables (see Figure 2).
The entire temple was open to the sky. The rear part was, however, filled with walls which created many small rooms which contained offering-tables the foundations of which were built from limestone blocks. More offering-tables of the same kind filled the remaining spaces except for two rectangular areas on the temple axis which were occupied by larger offering-tables of more elaborate design. Pictures in the rock tombs of Meryra and Panehsy at Amarna show details of these two larger offering-tables (twice in the case of Meryra, Figures 6 and 7). With Meryra they appear to be not solid but of openwork construction, thus either of wood perhaps overlaid with gold leaf, or of metal (perhaps an alloy of gold with copper). In the tomb of Panehsy the two larger offering-tables (perhaps of openwork construction though stylised) appear to stand on solid bases crossed by a diagonal line (Figure 8). Is this detail trying to convey the sides of staircases?

On the 1932 plan, in the easternmost of the positions where we expect to find the two large offering-tables (B in Figure 2), the area of the gypsum-concrete layer has been entirely destroyed. In the westernmost, by contrast, most of the area is preserved and is filled with a series of five concentric rectangles (A in Figure 2). This season’s cleaning of the foundation layer has included both areas. The first, on the east, confirmed the outlines of the 1932 plan: the entire surface of the rectangular area has been destroyed so that only an empty space which exposes the underlying sand survives. The second, on the west, had survived fairly well. A plan is given here accompanied by the Lavers’ version (Figure 9). The traces that remain of the structure that stood here are difficult to interpret. Lavers saw some of them and resolved them into a set of five rectangles nested inside one another. One can understand why he did this, but the result is, nevertheless, not entirely faithful to what is there.
The traces on the foundation layer comprise:

1. Lines drawn in black ink and at least one cut into the surface with a chisel; also fainter lines cut or scraped into the surface.

2. Patches of gypsum mortar in which are impressed the undersides of talatat-blocks.

3. Linear spreads of fine gypsum mortar which have been pressed into the join between block and foundation layer by running the fingers along it.

4. Roughly cut, shallow circular holes which were made to hold levers at the moment that blocks were lifted up as the temple was demolished after the end of the Amarna Period. They spread unevenly over the gypsum-concrete surface (mostly on the north side), partly, one supposes, on account of the greater damage on the south side, and perhaps partly reflecting variations in the consistency of the concrete, more or less tenacious in its capacity to hold the blocks in place. It is a general rule that they are situated on the line of joins between blocks.

5. Also useful are the roughly circular patches of gypsum mortar which cover filled-in holes for thick wooden posts. The holes sometimes form pairs, with one of the pairs covered with gypsum of a poorer quality, as if two periods of post-erection and removal had taken place. Some of the post-holes belong to north–south walls and pylons. Were they to help in the placing of heavy stone cornices, for example?

In summary, one can say of the western main offering-table:

The various signs of construction centre on a rectangular area 4.52 m (N–S) x 3.94 m (E–W) which was defined by black ink lines. The southern part of the area is destroyed but the centre line is given by a black-ink line a little further to the west. To judge from the lever holes, together with a small patch of mortar with block mark and the filling of a post-hole (19790) the original rectangle was, before the scheme was finished, enlarged on the west (but not on the east), and on the north (and presumably on the south but the concrete surface does not survive here). Lever holes suggest that a second enlargement occurred on the west. The enlargements could represent a decision to incorporate steps into the design. A single lever hole further west might indicate a single small step.

The work of the spring season had drawn attention to a large rounded lump of granite which has stood close to area A since the time of Pendlebury (Figures 2 and 10). Several carved fragments of granite from the same general area might have come from it. It was suggested that the large offering-table which had stood in area A was actually made from granite of which the rounded lump is a remnant. This would imply that the tomb pictures are showing a stylised, hieroglyph-like representation rather than a picture of what actually stood in this place.

One further note can be added. Three large broken pieces of gypsum concrete lie on the ground (Figure 2). They bear the impressions of blocks. The largest measures 35 cm in thickness, significantly more than the general thickness of the gypsum-concrete foundation layer. Where the foundation layer is broken away, especially on the south side of area ‘A’, it could be seen that it was of standard thickness. An alternative explanation is that, in building up the foundations for the main offering-tables, a layer of concrete, surrounded by blocks, was placed over the main mass of limestone blocks and served as the bed beneath the large granite block.

The planning of the temple has revealed traces of how the builders proceeded. Along the outside of the temple wall a wide edge to the gypsum-concrete foundation platform was left. At irregular intervals circular holes had been cut and later filled again with gypsum. Our interpretation is that the holes were for vertical wooden posts to which horizontal posts or planks were attached by ropes to serve the men who decorated the walls. Such posts
Figure 9. Detail plan of the location of the western main offering-table (‘A’ on Figure 2). Original by Juan Friedrichs. At the top is the corresponding area in the 1932 plan of Ralph Lavers.
Figure 10. The rear part of the temple (using the Lavers plan of 1932). The reconstructed shapes of the main offering-tables are added in green; the locations of post-holes cut into the gypsum-concrete foundation layer within the interior of the temple are outlined in red.

Figure 11. Section through the fill (19648) of a post-hole in the gypsum-concrete foundation layer.
Figure 12. Surface of the gypsum-concrete foundation bed at the southern edge of the area of the western main offering-table. The circular hole is one of the cup-shaped lever holes used in the removal of talatat-blocks. The area of damage to the right has been caused by repeated blows with a bladed tool. East is towards the top.

Figure 13. Surface of the gypsum-concrete foundation bed at the southern end of wall [19649] showing how the ancient demolition process worked. The talatat-blocks have been removed along the length of the wall. The next stage was to cut away the foundation concrete from where the wall had run. This had been done by cutting narrow trenches from side to side (probably from left to right in this picture). A pair of unfinished trenches side by side <19769> is at the top of the picture. South is towards the top.
Figure 14. The 5 x 5 m excavation square located beside the south-east corner of the temple (Figure 10). View to the south. The underlying mud floor is visible beneath the metre scale. Part of the floor is covered with stone chippings which merge with a deposit of gypsum close to the edge of the foundation trench for the south wall of the temple.

Figure 15. Further work of rebuilding the north wall of the temple. The lower part of the foundations, of small local limestone blocks, was completed in the spring season. Now it is being capped with the final layer of fine Tura-limestone blocks. View to the south-west.
Figure 16. The stonework of the north wall of the temple at the end of the autumn 2021 season. A section in the middle still lacks the final course of Tura-limestone blocks. View to the west.

Figure 17. At the rear of the temple the first stage of rebuilding is to set out spacing blocks on a bed of sand. View to the north.
were probably less needed for the inside of the temple on account of the closeness of internal walls which could have supported wooden beams laid across, though more areas need to be exposed and studied to confirm this (or otherwise).

Similar, roughly circular fills of gypsum concrete, covered with a smooth capping of gypsum plaster, also occur in the centre of the foundation layer (Figures 9, 10). The greater number cluster around the space which, according to the tomb pictures, was occupied by the western large offering-table. Some of them are in pairs, and often the pairs give the impression that each of the pairs was made on a separate occasion. In two places where the holes are on a broken edge to the foundation layer it is possible to examine them in section. For one of them the underlying sand was so loose as to prevent the examination from proceeding far. For the other (19648), Figure 11) it was possible to probe to the bottom of the original hole, which was 50 cm deep (measured from the surface of the foundation platform). The hole had been filled with sand and stones when the pole had been removed, above which came gypsum concrete and a final layer of gypsum plaster. This confirmed that the circular patches on the surface do, indeed, mark the positions of post-holes, cut and then filled again before the laying of stone blocks took place.

If we accept that the offering-table itself was a large block of granite then we perhaps have an explanation for the holes. They were for thick, wooden posts (often c. 30 cm in diameter) around which ropes were passed to help in manoeuvring the granite block into position, and presumably in raising it to stand on a low platform.

Egypt already had a long history of placing foundation deposits in pits within or around temples. Could some of the many pits in the gypsum-concrete foundation layer marked by gypsum covers have held foundation deposits? The gypsum concrete is a hard, tenacious material and to investigate most of the pits further would be a destructive act. The fact that the Pendlebury excavations (and our own re-excavation of some of his spoil heaps) have not brought to light objects that resemble the contents of foundation deposits of the period is a discouragement to pursue this line of investigation further, as is the negative evidence of the two post-holes that we have been able to examine in section.

The close examination of the gypsum-concrete layer in the middle of the excavated area also brought to attention further evidence for the plan to destroy the temple after the end of the Amarna Period. The first step in destruction was the thorough removal of the talatat-blocks. For the final, lowest course this regularly involved the cutting of cup-shaped holes into the concrete to assist in the use of levers to jerk the blocks free from their mortar beds. An intended second step was to cut out the full thickness of the concrete quite carefully along the edges of where the blocks had been laid so that nothing remained to mark where walls had been apart from gaps in the concrete. This intention did not extend to small offering-tables, however. In the case of the foundations for the eastern main offering-table the plan was realised so that nothing survives of the foundation concrete where it had stood (apart from a tiny area at the north-east corner). In the case of the western main offering-table, the breaking up of the foundations began along a strip on the southern side but was then abandoned although marks made by a heavy bladed implement remain further within the area of the offering-table (Figure 12). A particularly revealing example of the process lies a short distance further west, along the line of wall (19649) (Figure 13). Most of the underlying concrete foundation has been removed, leaving a gap with scalloped edges, at least along the eastern side. Where it stops on the south, there remain the beginnings of a pair of rough trenches in the concrete, running east–west, which seem to be the start of a cutting which, if it had been continued, would have removed the concrete down to the underlying sand and added to the scalloped appearance of the eastern edge.

The plan of Ralph Lavers captures the essence of the process of destruction. It was evidently carried out by many groups of workers who, in the central parts of the foundations, had a tendency to start from the south and to work northwards (visible in Figure 10). Fortunately for us, they frequently abandoned the task before finishing,
Figure 18. Reconstructed plan of the rear part of the Long Temple. The area currently being rebuilt to the height of a single course of El-Tura blocks is outlined in red.

Figure 19. The rear of the temple at the end of the autumn season. View to the east. The area marked 'B' is the location of the main eastern offering-table (see Figures 6, 8 and 10). Most of the planned stonework has not yet been laid.
most notably in the large courts where the offering-tables had been concentrated. The intention remains clear, however. It was to obliterate any remains which showed what the temple had looked like.

The cleaning of the gypsum-concrete foundation layer also revealed patches of pigment (red, orange, blue, black and occasionally green) on the floor and sometimes covered with a thin layer of cemented gypsum, probably accidentally present. A particular concentration lay in a space in the south-east corner of the temple. We cannot say whether any tools or equipment (e.g. pottery pigment containers) had also been present since the 1932 excavations had carried out a thorough sweeping of the surface before photography. We must remember that the surface served as a floor only for the time before the ground level was raised with sand, and a second layer of gypsum concrete and the real floor of limestone slabs was laid over the top. The mixing of pigments must have occurred because the carving and painting of the wall decoration began at the earliest possible moment, perhaps when only a few courses of stone blocks had been laid and well before a wall had been fully built. One patch lay beside the western main offering-table (Figure 9).

A separate area of excavation was begun, against the southern side of the south temple wall, at the south-east corner (Figures 10, 14). This was to check if a second row of wooden posts had been erected behind and parallel to the first row and also to find out where the surface of the ground was outside the temple in the time of Akhenaten. There was not sufficient time to complete the work. What was revealed was that the original desert surface had been covered with a mud floor which sloped slightly upwards away from the temple. Part of this had been covered with a layer of stone chippings and fragments of worked stone which merged with powdery gypsum as it approached the edge of the shallow foundation trench for the temple wall at the south-east corner of the temple. A number of small, rough, rectangular limestone slabs lay scattered on the adjacent floor. An interpretation is that we are seeing an area where the gypsum concrete for the temple foundation layer was being prepared, the stone slabs being seats for the workmen involved.

The foundation trench for the temple wall had survived fairly well, so that we have the opportunity to see what the ground was like immediately outside the temple. The mud floor which covered the desert surface seems to be part of a widespread covering which had been laid down during the earlier building phase, the surface on which, for example, the mud-brick offering-tables further to the west had been built. When the time came to construct the large all-stone temple the builders in this part simply used it as the surface on which to prepare and mix the material for the gypsum-concrete foundation layer. When they had finished, they did not clear away the debris. Instead it became covered with a layer of sand and gravel, though whether deliberately or not we cannot yet say.

**Rebuilding the temple walls**

The second aim of the work, to rebuild the walls to a low height to enable people to see the plan of the temple, was also carried out at the same time as the excavation. The builders were the same team from the nearby village of El-Till who have been doing this work since the temple project began. The rebuilding is done in two stages. A lower foundation is made, using small local limestone blocks (Figure 17), which rises to a level which approximates to the current ground level (which is roughly the same as the ancient floor level of the temple). For the second stage (Figures 15, 16), limestone blocks cut to the talatat-size are bought from quarries at El-Tura, near Cairo. These are laid on top of the lower foundation wall, in patterns which are the same as those used by the ancient builders.

A delivery of 700 Tura blocks reached the site in the early summer. This number represents half of what was needed to complete the northern wall. The builders began by laying them from the eastern end of the temple and for a distance of about 64 m (Figure 16). They then moved to the front of the temple and continued to lay the remaining blocks in an eastward direction. The completion of the wall, filling the intervening space, is planned
for the future. With what time remained, the builders resumed the building of the foundation walls of small blocks along the back of the temple, laying the blocks on a bed of protective sand. The full excavated area extends for nearly 30 m westwards from this rear wall. It is divided roughly in half by a long north–south wall which widens for much of its length to signify the presence of a pylon. This was taken to mark the limit of the season’s reconstruction work (Figures 18, 19). To the west the excavated area was, for the moment, left covered with a layer of clean sand. To the east, the builders laid a single course of small local limestone blocks along the lines of walls and offering-tables, though temporarily leaving the area where the eastern large offering-table had stood without new stonework until the design of this area is settled. Before closing the site and after photography, the new stonework was also covered with sand.

The reconstruction of this part brings home how congested the rear of the temple must have been. In order to reach the area of the eastern main offering-table one crossed a space between a small pylon and a screen wall (in Figure 18 pierced with two doorways) which was only 87 cm wide. Yet this was the route to reach 13 small rooms each containing one or more offering-tables plus 42 unenclosed offering-tables in adjacent spaces. Was there not a regular (even daily?) need for priests and temple servants to service the total of 61 offering-tables that lay beyond this narrow space, and before that to navigate a way through the identical layout of the western main offering-table area?

Any reconstruction, either as a drawing or as laid stone blocks, has to be based on decisions when the excavated evidence offers more than one possibility. One example is the shape of the gateways that gave access, within the temple, from one major court to another. The gateways were evidently in the centre of the walls that crossed the temple from north to south. The central portion was thicker, implying the presence of a pair of pylons, but a second thickness was added on the inner (eastern) side, giving rise to reconstructions (starting with those of Ralph Lavers) which gave an L-shaped plan and perhaps extra height to the inner sections of the ‘L’. In Figure 20

Figure 20. The rear of the Long Temple. Left: section of the plan by Ralph Lavers. Right: three reconstructions of the dividing walls by Paul Docherty. Furthest: simple restoration which preserves a traditional pylon form but also provides a base for statues facing sunrise; nearest: as restored by Ralph Lavers; middle: an intermediate design.
the reconstruction of one of the three gateways has been made simpler, by keeping to a pair of rectangular pylons. This leaves the deep paved space on the east side without a clear function, however, although statues could have been set up on the north and south walls facing inwards towards the temple axis or even eastwards towards the sunrise (as in Figure 20, the furthest doorway).

![Image of a sandal fragment](image.png)

**Figure 21. Part of an almost lifesize quartzite statue: base with fragment of sandal (S-16093). Length 18 cm.**

**FINDS OF THE AUTUMN SEASON 2021**

by Miriam BERTRAM

The autumn season at the Great Aten Temple concentrated on the rear part of the Long Temple, and an additional excavation was carried out at the East Gate at the far eastern end of the temple precinct, which produced mainly pottery (7 trays), some faience beads as well as organic material, charcoal and incense (2 trays). (Each tray measures 60 x 40 x 15 cm.)

The clearing of the c. 10 cm-thick overburden of sand at the gypsum-concrete foundation of the Long Temple in preparation for its re-planning and re-building with fresh stonework produced altogether 14 trays of stone fragments, namely: 10 trays of limestone fragments, 1 tray of quartzite fragments, including the sandal from a statue (Figure 21), inlays of various stone and one faience tile with a papyrus plant motive (Figure 22), 2 trays of granite/granodiorite fragments and 1 tray containing sandstone, indurated limestone and alabaster fragments. Another tray contained small finds and gypsum fillers as well as a sample of splashes of paint on gypsum taken from the foundation surface.

The statue fragment of a sandal (fragment S-16093, Figure 21) (all trace of the actual foot having been carefully removed), was recovered from within the sand close to the side of the place where the eastern main offering-table
Figure 22. Obj. 43720. Faience tile with papyrus motif.

Figure 23. Fragments of limestone relief showing some of the different styles of Aten rays.
had stood (pit <19551), all traces of the foundations for the offering-table having been destroyed in the aftermath of the Amarna Period. The fragment is likely to have lain below the level reached by Pendlebury’s workmen and so could have come from a statue that had stood close by.

In contrast to the first four courts of the Long Temple, which contained rows of limestone offering-tables only, the last two contained also a number of small chambers with either a single offering-table or a maximum of three. They were surrounded by walls which were 1.5 *talatat*-blocks wide (Figures 2, 10). This season and the spring season of this year, which concentrated on the northern wall of the Long Temple in this area, produced numerous limestone fragments with Aten rays that differ in size, width, spacing and colour (Figure 23) and many gypsum patches made to fill gaps between blocks, as if the interior walls were decorated by different artists, which seems likely if one takes the short period of time into account in which the Long Temple was built. Since the entire layout of the Great Aten Temple was open to the sky, the reliefs inside the chambers would have been visible all day, especially at mid-day, without additional lighting, each crowned by an individual scene of the Aten and its downreaching rays.

The two eastern courts were each dominated by a raised, central offering-platform, which was framed by rows of free-standing offering-tables to the north and south. The foundation of the western platform has survived and shows the impressions of *talatat* blocks as well as builder’s ink lines and the circular marks of levers which were later used to remove the blocks (Figure 9), whilst the foundation of the eastern one is completely gone. Since we do not know how many layers of limestone blocks were used it is difficult to reconstruct the height, and the appearance of the structure also remains uncertain. But a strong foundation like this indicates that a heavy structure was placed on top, of which granite pieces from the area are perhaps the remains. In contrast to the front part of the temple, few sandstone and alabaster fragments were found, and almost no faience. It appears as if the last courts were mainly decorated with painted relief scenes carved in limestone and probably ornamented with shrines or offering-tables made of hard stone such as granite or quartzite.

Part of the season’s work was devoted to further organisation and recording of the large collection of finds of various kinds stored in the site magazine. Sue Kelly continued her revisions to data files which cover the contents of the magazine. Photographer Andreas Mesli concentrated on photography of pieces of statuary intended for a major publication (by Marsha Hill and Kristin Thompson) which is now well advanced. The building also began of a major extension to the magazine itself, following the granting of a permit by the Ministry of Tourism and Antiquities (Figures 24, 25).
Figure 24. The new magazine extension under construction. View to the south.

Figure 25. The new magazine extension as partly built. View to the west.