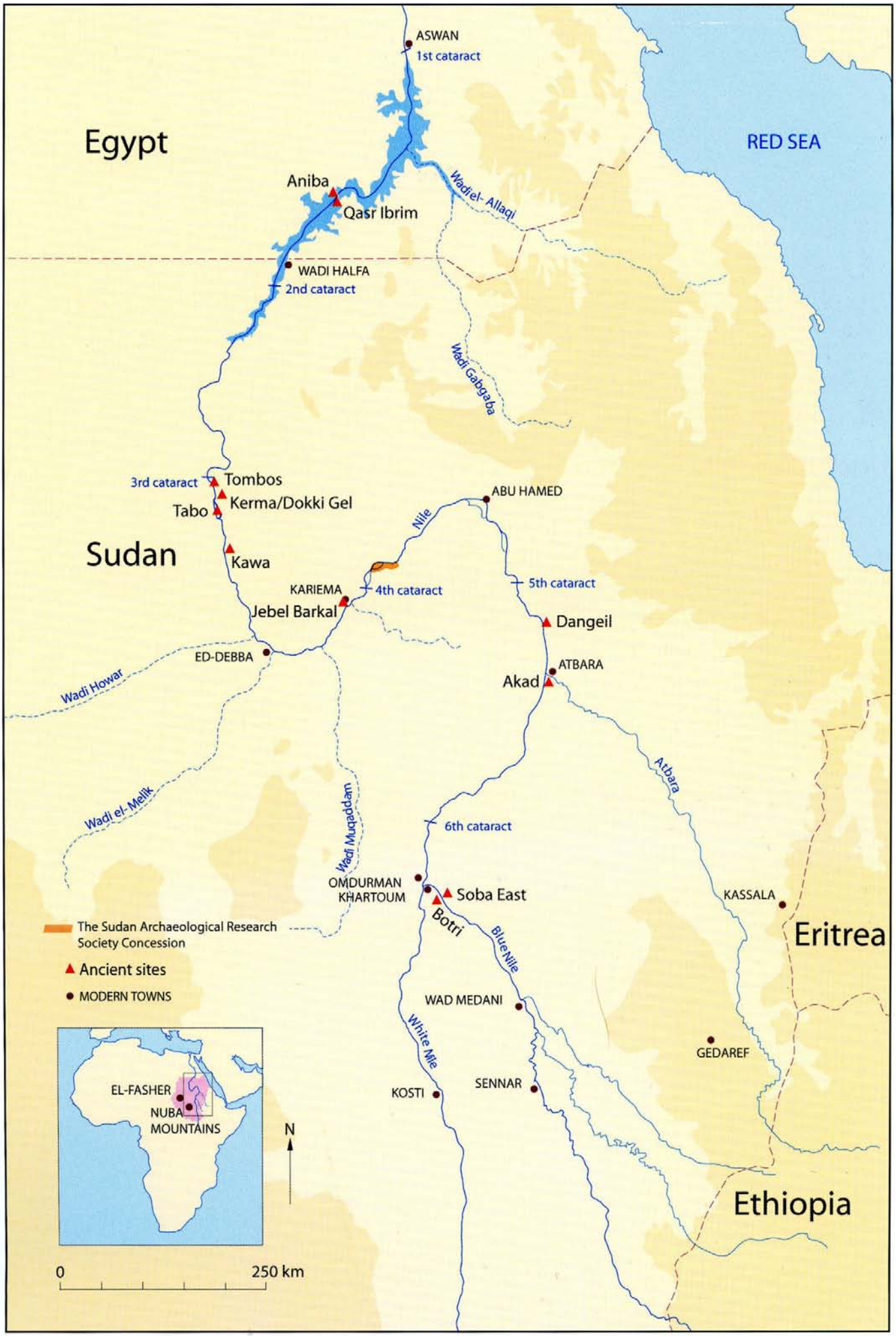
SUDAN & NUBIA

The Sudan Archaeological Research Society

Bulletin No. 11 *2007*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1st cataract
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Jebel Barkal
Dangeil
ED-DEBBA
ATBARA
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Wadi Muqaddam
6th cataract
OMDURMAN
KHARTOUM
Soba East
KASSALA
Botri
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Blue Nile
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Ancient sites
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Contents

Front cover: Village on the Island of Dirbi in the SARS concession above the Fourth Nile Cataract (photo: D. A. Welsby).

The Taharqo wall painting rescue project

Eric Miller, Pamela Rose and David Singleton

The background to the project

The small temple of Taharqo at Qasr Ibrim in Egyptian Nubia was uncovered during the 1972 and 1974 excavation seasons (Plumley and Adams 1974, 228-236; Plumley 1975, 19-20). It lies in the southernmost part of the site (Figure 1). It was built of mud brick, and had inscribed stone door jambs and lintels; none remained *in situ* but many fragments from them have been found, reused, in later buildings across the site. The temple consisted of a court containing four inscribed stone columns, a sanctuary, and flanking chambers around the sanctuary, including one with a well-preserved wooden staircase (Figure 2). Within the sanctuary, wall paintings were preserved on the north-east (Plumley and Adams 1974, pl. XLIX.1) and north-west (Plumley 1975, pl. XII) walls, both of which showed the king, identified in the accompanying inscriptions, before a god. A number of reused stone slabs showing Taharqo before gods, some of which were exposed during robbing activity on the site in 1995 and others which had been found reused in earlier excavations, suggest that the temple was originally larger and included an outer stone-lined gateway, or kiosk. The three surviving scenes show the king before Amun-Re, a ram-headed Amun, and Horus of Mi'am (Colour plates XXVIII-XXIX). Another slab shows a Hapi-figure, and suggests a frieze of such figures would have formed the lowest register.

The Taharqo temple had a long life. Although apparently abandoned sometime after the 25th dynasty, it was reused in the Meroitic period probably as a side-chapel to the large Meroitic temple in the southern part of the site. The Meroitic reuse saw mud-plaster repairs to the sanctuary walls, which were by that time badly damaged by rodent and insect activity, the effects of weathering and possibly larger scale deliberate attacks. After these repairs, the walls were coated with two layers of white paint, covering the paintings. Soon after the coming of Christianity to Nubia, the building was converted into a church. The church apse was inserted into the sanctuary, and the area behind it was infilled with debris. This effectively sealed off the paintings and ensured their preservation.

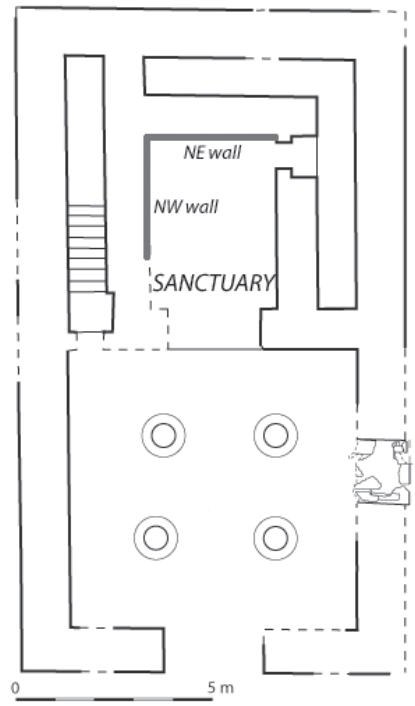

Figure 2. Plan of the Taharqo Temple.

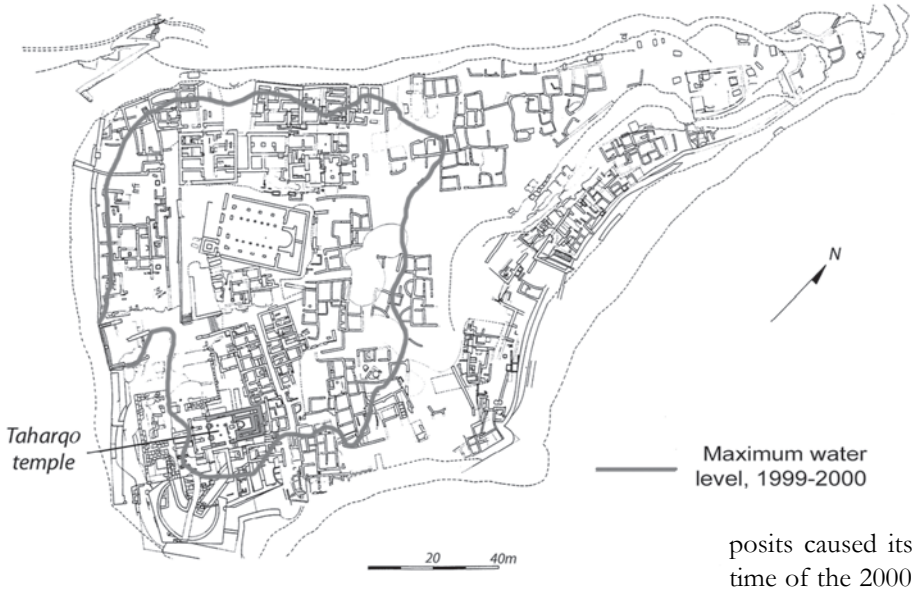

Figure 1. Map of Qasr Ibrim.

On their discovery in the 1970s, the Meroitic paint layer over them was partly taken off, and the paintings were copied, although the one on the north-west wall could not be fully recorded since the church apse was not removed. Then, the area behind the sanctuary was refilled with loose dirt to protect the paintings and no further work was undertaken. The paintings remained fully-covered and hidden from view, until a dramatic rise in the water level of Lake Nasser in 1999-2000 (Figure 1), which had a devastating effect upon the site. Although the water never actually touched the temple, percolation through the soft, underlying deposits caused its mud-brick walls to dissolve, and by the time of the 2000 excavation season, all that was left standing was part of the church apse, the north-west wall of the

sanctuary, a small fragment of the north-east wall, and the staircase chamber. Apart from the standing remnant of the north-east wall, the only evidence for the existence of the painting on it consisted of a few coloured fragments of plaster lying on the ground, badly damaged by contact with the damp soil. Most had disappeared.

At that point, the north-west wall was cleared of the remaining backfill covering it to examine its condition, and the painting was recopied at full size. We found that water was already percolating up the wall, and that the lowest 500mm were now damp and discoloured. Given the uncertainty of the lake level in future years, we decided that the only way to guarantee the preservation of the painting was its removal from the temple, and started to plan accordingly.

The Wall Paintings

The painting on the north-east wall

A copy of the leftmost part of the painting on the rear, north-east wall of the temple sanctuary was published soon after its discovery in 1972 (Plumley and Adams 1974, pl. XLIX.1) and the rest of the scene was copied by Stefan Jakobielski in 1974. The full scene has never been published and there are a number of discrepancies between the two drawings, particularly with regard to the colours used. Since there are no adequate colour photographs showing the complete scene, it is only from the small remnant of the wall still standing in 2003 (indicated on Colour plate XXX) and by extrapolation from the painting on the north-west wall that some of them can be verified. Colour plate XXX is a 'best guess' composite from the sources.

The scene shows two figures: a god to the left, facing the king to the right. The god's figure survives, in parts, to chin level, whilst the king is preserved to the upper arm. The scene is edged by a chequered border, of repeating squares of red, green, yellow and white, each between thick bars of black. According to one of the drawings, the 'white' squares may originally have been coloured blue. To the right of the border are two columns of large, brightly-coloured hieroglyphs. In front of them stands the god (originally identified as the king in Plumley and Adams 1974, 229). His right arm hangs behind him and he grasps an *ankh*; there is no indication of his left arm, which must have been extended at shoulder level. This is an unusual posture, but a similar stance is held by Amun on the east wall of the forecourt of Kawa Temple T (Macadam 1955, pl. XI). Here the king smites a group of enemies before the god; only one of the god's arms is shown, and since the body is preserved to chest level, the other arm must have been extended at a higher level. The extended arm may have held a scimitar.

The god in the Ibrim painting wears a brown tunic (on one copy this is shown as dark brown, of more or less the same shade as the king's flesh, but on the other it is a light orange-brown) with a green girdle, like the one worn by Amun on the north-west wall painting; traces of detailing in black show the knot of one of the shoulder straps. A collar is shown in the same colour, as are a band on the right wrist, and another at the top of the arm. A red streamer hangs down from the crown. The figure was human-headed, and the lower part of the god's beard is preserved. A tail, in red and black, hangs behind the kilt. The legs and arms of the figure were preserved in many areas only in outline, having lost their colouring, but where parts of the legs survive they are the same colour as both the king's flesh and the god's dress. A short column of inscription is placed in front of the god. No text survives naming the god, but he is almost certainly a form of Amun.

Opposite the god is the king, facing left. His flesh is brown and he wears a kilt reaching to just above the knee. It is decorated with green and blue stripes and has a yellow belt with pendant *uraei*. A black tail with a red tip hangs behind the kilt. His left arm hangs down and the hand (now lost) may have held a horizontal staff, painted in black, traces of which are just visible between the area where the hand should have been and the back of the kilt. There is another, red, object, visible at a slightly lower level. The king's right arm extends outward to hold a staff. The somewhat strange arrangement of what seems to be another hand (?) on the staff held by the king is puzzling and cannot be resolved. There is a wide space between the king's figure and the eastern corner of the room, which appears white in the few photographs of the area. This is probably the Meroitic paint coating left *in situ*; it is likely that it covered a further two columns of inscriptions and a chequered border at the left end of the scene.

The base line of the scene is composed of three contiguous bands, the outer ones red and the central one yellow. They are outlined in black or, perhaps, blue; the use of colour here is inconsistent in the copies. These bands continue onto the adjacent northwest wall and form the baseline for the painting there.

The painting on the north-west wall

A slightly truncated image of this painting was published soon after its discovery (Plumley 1975, pl. XII) and the surviving portion of it was recopied in 2000 by Adrian England (Colour plate XXXI). It is very similar in composition to that on the north-east wall, with identical chequered border and base lines. A single column of hieroglyphs lies to the left of the border.

In front of the column of inscription, the figure of a god stands facing left. He holds a staff in his right hand and an *ankh* in his left. When originally found, there were traces of a striped lappet wig over the left shoulder, but this part of the wall has since disappeared. The god wears a yellow tunic, with a green knotted girdle and yellow bands at the wrists and, originally, on the upper arms (now lost). A tail, in black with a yellow tip, hangs behind the kilt. His arms and

legs are coloured blue, although much of the infilling of these areas is missing. The use of blue for the flesh suggests the god is Amun, and the wig suggests that the figure had a ram's head.

Facing the god is Taharqo, in an elaborate crown with double *uraei*, cap and decorated collar. He wears a yellow and white kilt with a green belt. The recent close examination of the painted surface, described below, has also identified part of the tail hanging behind the kilt, and of the king's legs. A short column of inscription lies between the king and the god's staff. Cartouches above the head and to the right of the crown, of which only the bottom edges are preserved, would have named him. Behind the king's figure, a single column of hieroglyphs separates this scene from another, similar scene, of which only traces of the god's figure survive. He also faced left and presumably was paired with another figure of the king. The god wears the double crown (traces of which are visible in Colour plate XXXI) and a striped wig over his shoulder, uncovered during the most recent conservation work described below. The same work has also identified part of the tail hanging from the god's kilt. His flesh is coloured red. Whilst his identification is uncertain, it is very possible that the god in question is Horus of Mi'am.

Two final points are of interest. One is that the three gods represented in the stone slabs found outside the temple can each be plausibly identified in the wall paintings within the sanctuary, and suggest that the slabs do indeed come from a demolished part of the temple, and that the temple was dedicated to the three deities. The inscriptions themselves are also of interest. Although brief, those on both walls make prominent, although generalised, mention of *sed* festivals. There is no explicit evidence that Taharqo celebrated such a festival (Hornung and Staehelin 1974, 47-48) – his latest known regnal year is year 26 – and the significance, if any, of their occurrence in the Qasr Ibrim temple sanctuary remains to be explained.

The Rescue – February 2003

An exploratory visit was made to Qasr Ibrim in 2001 and some of the backfill was temporarily removed to investigate the condition of the painting and to take measurements (Colour plate XXXII). The paint layer and the fine plaster layer on which it was executed appeared to be in good condition. Only the top edge of the coarse mud-plaster layer applied to the wall that supported the fine layer was visible; it was crumbly and it was decided not to include it as part of the rescue. The painting's dimensions were approximated and later accurately measured as 2.72m from the apse to the end, and 2.08m at its highest point. In the course of the following year, Eric Miller consulted Hans Hangleiter regarding the use of cyclododecane and his method for removing wall paintings (Hangleiter 2000), before drawing up a detailed plan for the rescue. Equipment and materials to be sent to Egypt were accumulated and packed ready for shipment for a 2002 rescue, but the events of 9/11 delayed these plans until February 2003.

The rescue team in 2003 was formed by the authors, Alan Clapham, an SCA Inspector, Osama Abdel Latif and an SCA conservator, Hassan Abdel Moneim Mohammed, together with two workmen. The materials and equipment for the project, including a large amount of timber and an electricity generator for running power tools, travelled separately in a lorry. Additionally, two personnel from Pan Arab Tours came in their own vehicle with camping equipment for the team and enough food and water to cater for everyone for eight days. The convoy of three vehicles travelled from Aswan to Toshka, where the civil engineering contractor Skanska Cementation International Ltd (at the time engaged in fitting out the Mubarak Pumping Station) boarded the team and its equipment on a tugboat, with its own Hiab crane, for Qasr Ibrim. Conscious of the need to limit disturbance of the site's archaeology, a street next to the 8th century cathedral was selected for the camp and a work area was set up by the west end of the temple.

The ground in front of the painting had to be cleared and flattened to accommodate the frame that would later support it, and this involved dismantling the church apse and clearing the backfill.

Removal of the apse unexpectedly revealed more painted plaster, protected by the end of the apse, but it was regrettably not possible to include this newly discovered part in the rescue, since precise calculations of materials needed were based on the 2001 measurements. Accordingly, a vertical cut had to be made through the plaster 2.72m from the end, to isolate the section for detachment. The remaining fragment was covered over and awaits removal at a future date (Plate 1).

Plate 1. Clearing the backfill. More of the painting was revealed when the apse was dismantled.

Water was found to be still present in the bottom section of the plaster, which could have impeded consolidation had it not been driven off by the heat of the sun in the follow-

ing morning. Consolidation was needed to harden the painting and protect it during the detachment process. The consolidant selected to perform this function was cyclododecane. Cyclododecane (CDD) is a cyclic alkane ($C_{12}H_{24}$) which sublimes at room temperature. It is a hard, white solid that readily dissolves in a range of non-polar solvents, including petroleum spirit and its absorption into porous structures is assisted by heating it above its melting range of 58-60° C. A double boiler was used at Qasr Ibrim,

Plate 2. David Singleton heating CDD and petroleum spirit in a double boiler.

for safety purposes (Plate 2), and solutions of equal quantities by weight of CDD in petroleum spirit (boiling range 100-120° C) were heated to 80° C to allow a margin of cooling time, while it found its way into the plaster. Wind has a strong cooling effect on the process and the mixing and heating operation was enclosed within a canvas wind-break and a wind-break was also erected to maintain still air at the wall painting surface. Two-and-a-half litres per square meter were applied to the surface by brush,[1] 14 litres in total, calculated to consolidate the 3mm fine plaster layer on which the painting was executed; this is a light brown layer which contains clay, fine sand and a variety of chopped vegetable matter.

A period of 12 hours was allowed for the petroleum spirit to evaporate and by the next day the painting was found to be concrete hard. More CDD was added, this time to create a protective layer over the surface. For this application nine parts of CDD were heated to 80° C with one part of petroleum spirit. At this concentration the CDD rapidly solidified to produce a dense white film on the surface. In a second application using the same proportions, gauze bandage was incorporated to cover holes in the plaster. The protective layer was intended to keep a polyurethane foam (PUF) facing, to be applied later, off the painting (Plate 3).

Plate 3.Gauze was used as a scrim over holes in the plaster.

Plate 4. A frame was set in place and anchored to the ground.

A frame was constructed using 100mm by 50mm timber (Plate 4). It was made to the precise overall dimensions of the painting, enlarged by 20mm, all round, to allow for a mould (required later) to be constructed on the back. Two vertical timbers divided the space within the frame equally

[1] Scientists at the British Museum considered it unlikely that CDD would have any affect on anything contained in the Taharqo wall painting (Hallett and Parker 2002).

into three and a shelf 60mm wide was added along the bottom edge, that would be let into a special cut along the bottom of the painting. The shelf allowed a seal to be made at the bottom doubling as the bottom-former for the mould on the back.[2] Those frame components coming into contact with polyurethane foam, including the shelf at the bottom, were covered with parcel tape and coated with wax as a release agent.

The frame was set in position, 50mm distant from the painting and held vertically upright by the attachment of raking supports, anchored by stakes driven into the earth. The bottom of the frame was similarly anchored, rendering the whole structure immovable. Once in position, the joint between the painting and shelf at the bottom was sealed with gauze and CDD. The gaps at either end were sealed with soft plastic foam, pushed between the frame and the painting; the foam was pre-wrapped in cling film, which would

Plate 5. Shuttering created a space to be filled with polyurethane foam. Note the soft foam wrapped in cling film sealing the gap.

easily separate from the polyurethane. Twenty-millimetre gauge shuttering was put in place, leaving a space 30mm deep,[3] to be filled with polyurethane foam (Plate 5). The shuttering consisted of 30mm timber battens and 70mm polyurethane foam battens, fixed in pairs to the top of the frame and extending across the whole width. Fixing was by means of screws, inserted through the frame into the timber battens, which also held the polyurethane foam battens by friction and in this way the whole frame assembly was locked together (Plate 6).

[2] The plaster was expected to be 4-5mm thick.

[3] Severe dishing of the wall at the southern end created a maximum space to be filled of 110mm.

Plate 6. The shuttering was screwed to the frame.

Installation of the shuttering was gradual; battens were added to contain the casting of each mix of PUF resin. PUF is formed by mixing equal quantities of Part A, consisting of resin and incorporating a foaming agent, and Part B, the cross-linking agent. Foaming increases the volume by a factor of 20 and the whole process takes about 10 minutes to produce hardened foam. A series of three 500ml mixes were prepared and poured simultaneously; the total weight of the facing was 12kg.

The foam adhered strongly to both the CDD and the shuttering, so that the painting was now ready to be supported by the frame. Consequently the wall was dismantled and the weight of the painting was transferred to the frame. Contrary to anticipation at the 2001 visit, the 20mm mud-plaster layer did not come away with the wall; instead it stayed with the painting, adding considerably to its weight.

Before laying it down, the frame was cross-braced to

Plate 7. The frame was cross-braced and timbers were added to rest it on the ground.

stiffen it against distortion during handling, and timbers were attached for it to rest safely on the ground (Plate 7). Now face down, preparations were made for casting PUF on the back, to provide firm, intimate contact that would protect it from any shocks and vibration that might occur during transportation (Plate 8). For this, a mould was constructed on the back of the frame and aluminium foil was laid over the mud plaster. A lid for the mould was made from plywood, and polythene sheeting was attached to it to act as a means of release from the foam.

Plate 8. Laying the painting face-down. Note the section of the wall painting left behind.

Plate 9. Carrying the painting to the dock.

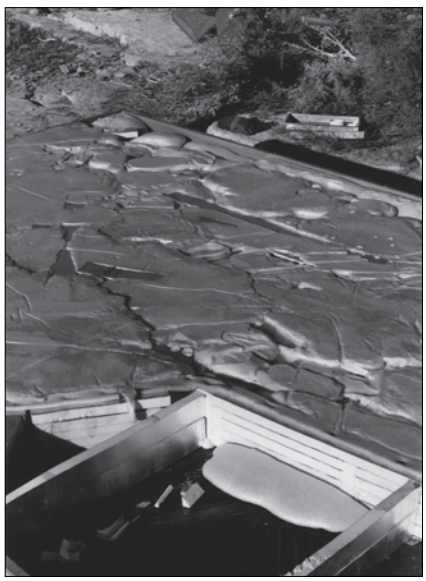

Plate 10. A polyurethane foam backing protected the painting during transportation

At this point we feared that the weight of the assembly was close to the combined maximum carrying capacity of the ten people available to move it. Consequently, it was taken to the dock area before more weight was added (Plate 9). After casting the backing (Plate 10), the lid was finally fixed in place and the painting was ready for transportation. The Skanska tug-boat returned on the last day (Plate 11) to take the painting to Toshka, together with the team, the equipment and all waste created during the project. At Toshka the painting was transferred to a lorry for its journey to Aswan, in convoy with the team and delivered to the Nubian Museum.

Plate 11. The painting being loaded on board the Skanska tug.

Applying the backing - February 2005[4]

Although a site for displaying the painting in the Nubian Museum had already been allocated, nothing could be done with it until it had been provided with a new support. The support designed for it was a grid of carbon-fibre tubing embedded in epoxy foam which would be attached to the mud plaster in a way that offered a means of removing it if necessary.[5] The mould used for the PUF backing (removed) was suitable, given extra height, for casting the foamed epoxy resin.

The mud-plaster layer was found to be in good condition and did not need consolidating, but its surface was loose and powdery and needed firming-up before receiving its backing. It was essential that such a treatment did not enter

[4] The team had been ready a year earlier to carry out this work, but materials and equipment sent ahead to Egypt were impounded by Customs for six months. This had implications for some materials, which were temperature-sensitive; fortunately these materials functioned normally in tests carried out in February 2005.

[5] In conservation, nothing should be applied to an object that cannot be removed.

the fabric and create a strongly consolidated outer-crust that could conceivably separate from an untreated substrate at some future date, leaving the painting unsupported. A concentration of less than 1% of Mowital B30H[6] in a solvent mixture of acetone and ethanol was used. Attention was then turned to holes bored through the plaster, possibly by the larval form of insects. Epoxy resin would constitute a highly destructive presence if it seeped onto the front. Pathways through the plaster, therefore, were blocked and insect holes were crammed with cotton wool and sealed with 20% B30H. Larger holes had been sealed, on site, with gauze bandage and CDD. These were now filled to the depth of the plaster with vermiculite granules[7] and sealed with aluminium foil tape. The seal was completed by burnishing the tape onto the edges of the holes, which had been hardened for the purpose with 20% B30H (Plate 12). The missing plaster at the top of the painting was represented in the mould with soft plastic foam, cut to shape and covered with polythene (Plate 13). Vermiculite was used to fill the void around the edges of the painting and covered with aluminium foil tape. Tape edges were burnished onto mud plaster, on one side of the vermiculite fill and onto the mould wall on the other to complete the seal.

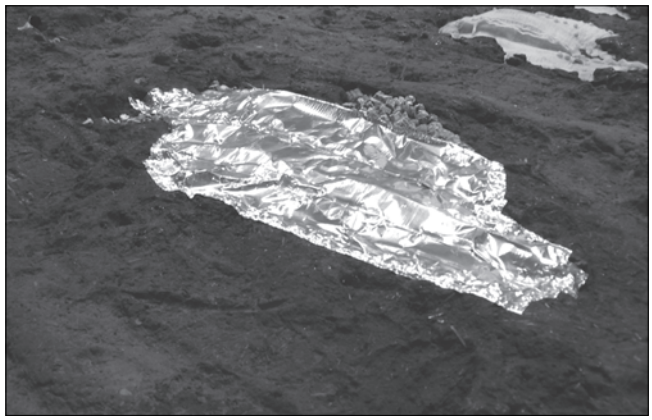

Plate 12. Holes were filled with vermiculite granules and sealed with aluminium foil tape.

Before casting the epoxy foam, an intervention layer comprising muslin and 20% B30H was applied to the mud plaster (an intervention layer is an adhesive system that can be reversed by a solvent). To mitigate the effects of shrinkage in the adhesive as it dried,[8] the layer was applied in two phases, analogous to a checkerboard, in the first phase covering the 'black' squares and in the second the 'white' ones. Additionally, the height of the mould walls had to be increased to accommodate the new backing system and all the mould surfaces, including the aluminium foil tape, were covered with parcel tape and coated with wax, to present a surface that would easily separate from the epoxy resin (Plate 13).

Plate 13. Applying wax as a release-agent.

By itself an epoxy backing of such dimensions flexes if subjected to a bending stress. For this reason it needed an embedded stiffening structure, fulfilled here by a grid of 30mm carbon fibre tubing arranged in a series of horizontal and vertical members at 175mm centres, and fastened at each crossing with epoxy adhesive.[9] During assembly, cable-ties held the grid together while the epoxy hardened. The completed grid was laid in the mould and its orientation was adjusted with wedges (Plate 14).

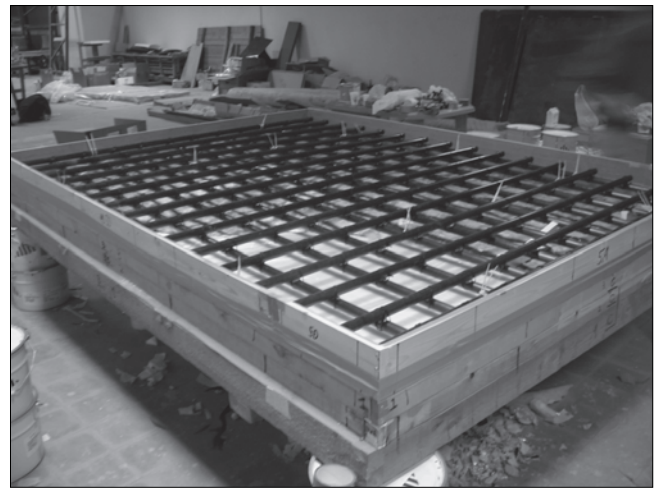

Plate 14. The grid was laid in the mould.

[6] Mowital B30H (polyvinylbutyral) is a highly stable material. It is used as the plastic component in laminated glass. Two important aspects regarding stability are that it does not change in appearance e.g. by yellowing and that it remains soluble.

[7] The effect of packing the holes with vermiculite granules will be to cast a recess in the epoxy foam. This will provide some flexibility for the final presentation.

[8] Shrinkage continues when the adhesive ceases to be fluid; in this phase the adhesive can damage its substrate.

[9] The epoxy used for this was Araldite 9323b/a

At this juncture another limitation of the epoxy foam had to be anticipated, namely that wood-screws cannot be gripped securely in its open structure. Embedded fixings are needed when the painting is ready for mounting in the museum. These were cast using Bonda Wood-fill, a polyester resin that simulates the strength and texture of softwood. Accurately positioning the fixings was not attempted; instead a number of them were cast and attached to the grid. Some were positioned to protrude through the back, and others were cast along the sides against the mould. It was convenient to use these fixings temporarily to hold the grid in position to allow the wedges to be withdrawn. Screws were inserted through the mould into four of them and taken out after the epoxy foam had been cast.

The epoxy resin[10] for the backing was supplied in 5kg tubs, premixed with the foaming agent. The bottles of hardener as supplied by the manufacturer contain the right quantity for a tub of resin, but casting the epoxy foam was not without its problems, since the polymerisation reaction is exothermic. The heat generated is proportional to the mass of the resin and a pour exceeding a depth of 10mm may heat up enough to distort or rupture the casting. Moreover heat could be transmitted through the plaster and cause damage to the painting. The volume was increased during

Plate 15. Foamed epoxy resin was poured into the mould.

the foaming phase by a factor of four, so that a 10mm layer produced a 40mm layer of foam. The reaction took approximately six hours to go to completion. Over a five day period, 22 tubs were mixed and poured to fill the 245mm deep mould (Plate 15).

[10] Type PB250 foaming epoxy resin with type DM02 hardener, manufacturer: Sicomin Composites.

Plate 16. When the foam had hardened the mould was removed.

After the polymerisation of the final pour the mould was taken off; the waxed surfaces allowed it to come apart easily (Plate 16). At the end of the session the painting was wrapped in polythene to ensure retention of the CDD. It was needed to hold the painting firmly and protect it for the 2006 session when the PUF facing was to be cut away (Plate 17).

Plate 17. The painting was wrapped in polythene to retain the cyclododecane.

Removing the facing – February 2006

The assembly was estimated to weigh around 450kg. It was carefully braced to prevent movement of the frame and facing against the epoxy foam backing and tightly bound with ratchet-straps, then turned over (i.e. face-up) using handling equipment. The frame was dismantled, giving access to the shuttering which was removed by cutting into the PUF facing with a panel-saw. Exploratory holes dug into the PUF facing exposed the CDD layer, still protecting and toughening the painting, and its presence enabled a robust

approach to the removal of the facing using wood-chisels. On completion of that procedure the CDD had discharged all of its functions and it was left to evaporate.

Plate 18. Polyurethane traces are all that was left of the facing.

Working on the surface - March 2007[11]

Thin traces of polyurethane remained intact after the facing had been cut away and these were left lying loosely on the surface once the CDD had evaporated. They were collected together by brush and a vacuum cleaner used to remove them (Plate 18).

Until now, there had been no opportunity to examine the painting and so its condition was now assessed. The repairs carried out in the Meroitic period were examined in detail. Two Meroitic repair campaigns were identified and a record was made of them by mapping and coding them on Melinex sheet (Plate 19), prior to removing material that obscured the original painting. The outlines of painted detail were also recorded.

When the backing was applied, in 2005, the mud and straw plaster layer was found to be in very good condition, which now appeared true of the whole painting. Moreover, the fine plaster that supported the paint-layer remained soundly attached to the mud plaster and its condition was not found significantly to have deteriorated, either in the cohesion of its fabric or its continuity as a layer. There was an absence of systematic cracking. The paint layer had clearly suffered losses in the past, but no current instances were detected of powdering, or separation from its substrate, such as flaking. A loss of saturation of colour was attributed to tenacious grey dirt, identifiable as a layer under magnification.

The removal of the remaining Meroitic paint (Plate 20) uncovered a figure at the far left of the scene, possibly to be identified as Horus (Colour plate XXXIII). Very little paint remained under the rest of the Meroitic layers but enough information could be gleaned from what was found

[11] The team was joined this year by Leonie Saltzmann.

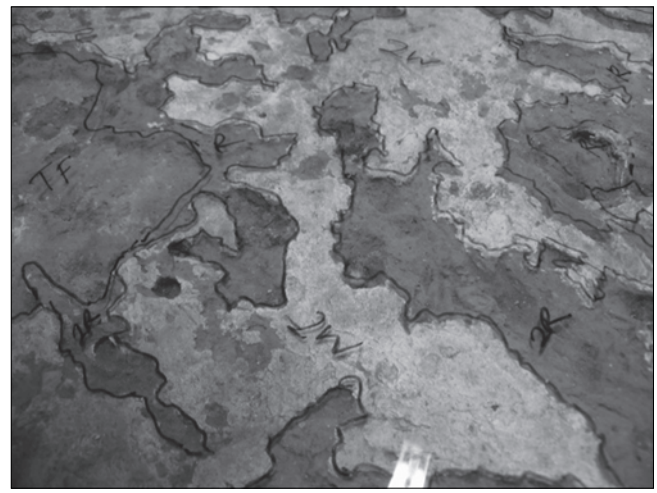

Plate 19. Meroitic repairs were mapped and coded on Melinex sheet.

to determine the outline of Taharqo's legs and feet and a tail, details of the lower part of the figure of Horus, which also included a tail, and the location and colour of the border along the whole length of the painting at the bottom.

Plate 20. Leonie Saltzmann removing Meroitic paint.

Although the painting escaped destruction in 2000, it did sustain some damage. The water-borne dark stain along the bottom is disfiguring. An attempt was made to extract the stain using a purified water and Laponite gel. Laponite is synthetic clay, manufactured to absorb a large volume of water. A small area was tested first to assess the resistance by the paint layer to the treatment and as the paint was unaffected, a larger area was ventured. Japanese tissue was laid on the surface to physically separate the paint from the gel. The gel imparted water into the painting, where it picked

up the stain material and carried it into the gel as it dried, but the effort was frustrated by an endless supply of stain material in the plaster, to replace it. An attempt to overcome the problem is planned, by impregnating the plaster with cyclododecane, which is hydrophobic, aimed at locking up the stain material, while leaving the paint layer to be poulticed free of it. The same treatment may also aid a cleaning process to remove or reduce the grey dirt that is veiling the paint elsewhere (Colour plate XXXIV).

Work planned for the future

This has been an account of the work in progress, and there is work still to be carried out before the painting can be exhibited in the position set aside for it in the Nubian Museum. Cleaning and removing stain material will be the main objectives for the 2008 session.

Acknowledgements

The team would like to acknowledge, with thanks, the help given to this project by the following individuals, institutions and companies:-

Hans Michael Hangleiter
The Conservation Research Group of the British Museum
Skanska Cementation International (Toshka)
Representatives of the Supreme Council of Antiquities, Aswan
Dr Ossama Meguid and Staff of the Nubian Museum, Aswan
Chas R. Linsell and Derek Arkell of Westland Helicopters Ltd
Adrian Rich of Worldspan
The Egypt Exploration Society's staff in London and Cairo

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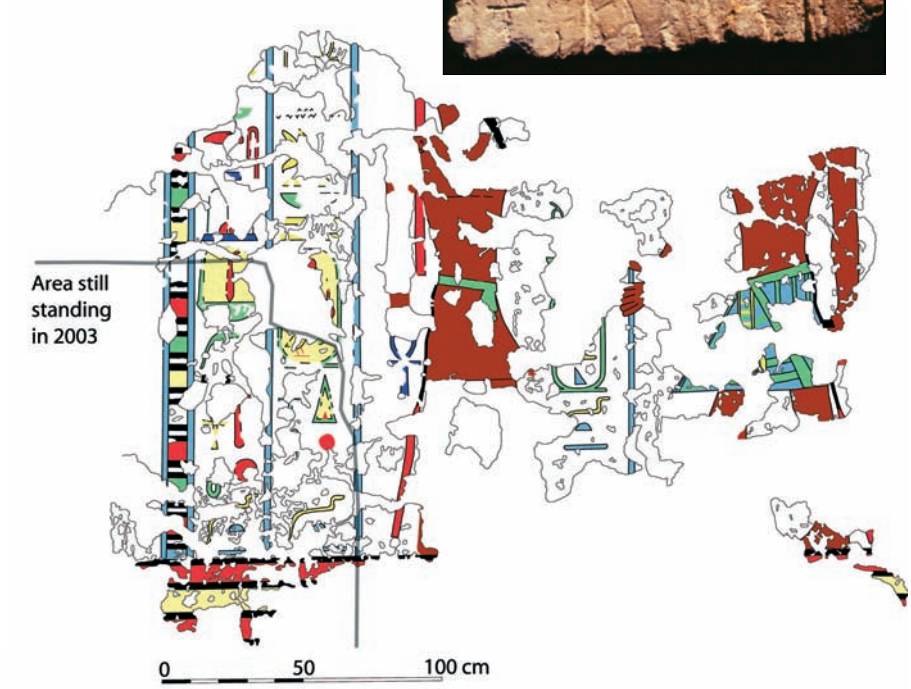
Further reading

Singleton, D., E. Miller, and P. Rose 2004. *The Taharqo Wall Painting Rescue at Qasr Ibrim*. The Conservation of Decorated Surfaces on Earthen Architecture, 15-23, Los Angeles: The Getty Conservation Institute. [includes a description of the decision-making process which led to the removal of the wall painting]

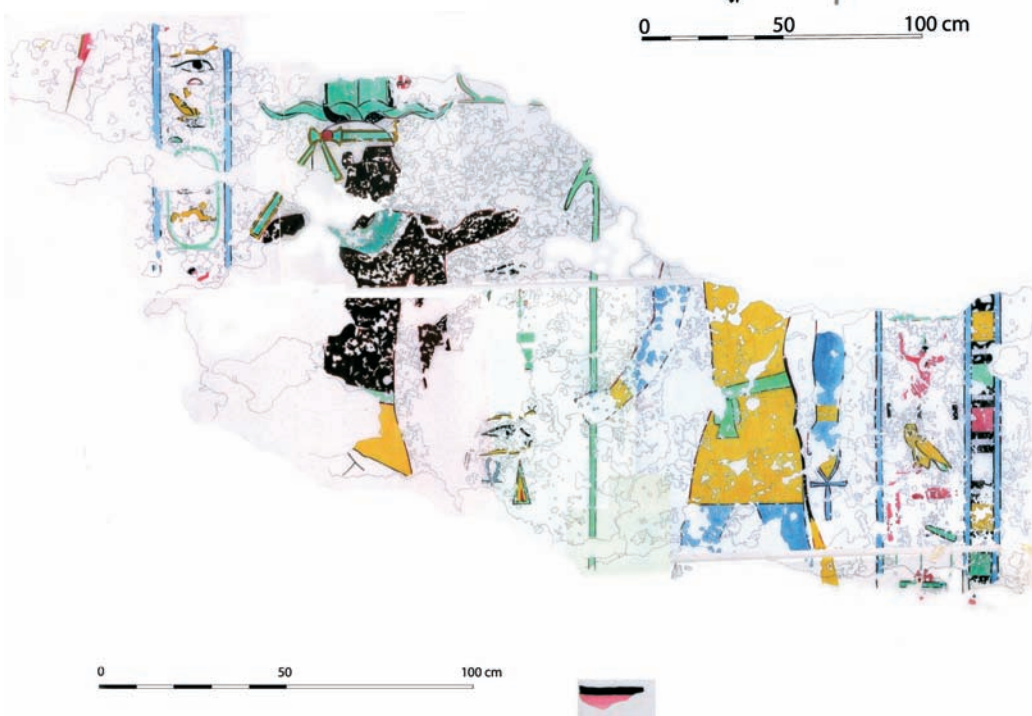
Singleton, D. and E. Miller 2007. 'The backing system for the Taharqo wall painting from Qasr Ibrim', in *Decorated Surfaces on Ancient Egyptian Objects: Technology, Deterioration and Conservation*, Cambridge, publication pending.

Colour plate XXVIII. Qasr Ibrim. Relief block showing the king before Amun-Re.

Colour plate XXIX. Qasr Ibrim. Relief block showing the king before a ram-headed Amun.



Colour plate XXX. Qasr Ibrim. The north-east wall.



Colour plate XXXI. Qasr Ibrim. The north-west wall.

Colour plate XXXII. Qasr Ibrim. This photograph of the painting was taken in 2000. A height dimension was taken from it for the rescue plan. (The structure in the background is the 8th century cathedral.)

Colour plate XXXIII. Qasr Ibrim. Horus (?) with superimposed outline (the face is missing). Compare an image of Horus from the tomb of Seti I in the Valley of the Kings in Thebes.

Colour plate XXXIV. Qasr Ibrim. Removal of the dirt layer will enhance the image.