FINAL REPORT

Fall Mission: November 22, 2011 – December 21, 2011

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"Conservation and Documentation of the Wall Paintings at the Red Monastery, Sohag"

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INTRODUCTION

This report covers work performed under the sub-grant, "Conservation and Documentation at the Red Monastery, Sohag", an activity of the Egyptian Antiquities Conservation Project (EAC) funded by the United States Agency for International Development (USAID). The American Research Center in Egypt (ARCE) was awarded the EAC project agreement in July 2004. The following report describes work performed from November 22nd to December 21st 2011.

The conservation campaign conducted in the Monastery of St Bishoi (Red Monastery) at Sohag[1] during the autumn of 2011 involved the following parts of the building: the lowest tier of the east lobe of the triconch; the vault of the prothesis (NEC); the counter façade (WEST) wall of the clerestory and, in the façade area, the lower part of the north wall (nave) and two of the monumental columns.

In the east lobe, work was carried out on the lowest tier inside the two lateral niches (north and south) [Figures 1 and 2] and restoration of the small apse within the central niche was started.

(Figures 1 and 2)

[1] The team comprised: Luigi De Cesaris, Alberto Sucato, Emiliano Ricchi, Emiliano Abrusca, Emiliano Albanese, Luigi De Prezzo, Chiara Di Marco, Alessanra Meschini and Riccardo Remigio.

In the upper part of the clerestory, work on the west wall and above the triumphal arch (Figure 3) has almost been completed. In the facade area, work has continued on the paintings of the cross inside the aedicule and the saint on horseback to approximately two meters above ground level. In the prothesis (NEC), another quarter of the composition has been completed. To date, only one quarter of the whole vault remains to be restored. The work on the largest column in the facade area (south side) and on the capital of the monumental column at the entrance (north side) means that the restoration of the monumental columns is complete.

All operations and areas of restoration work were comprehensively photographed throughout the campaign.

(Figure 3)

WORKING METHODS

Architecture

East Lobe

The triconch is built of blocks of limestone from local quarries, infilled with fired bricks. The joints between the limestone blocks are very precise and thin (1 to 1.5 mm) with mortar between them.

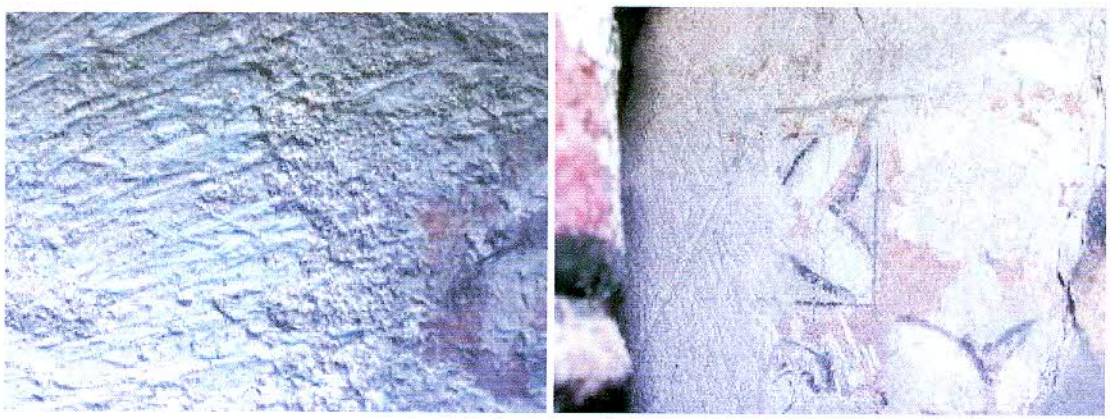
The niches in the lowest tier are built of fired bricks measuring approximately 19 x 9 x 11 cm, arranged horizontally lengthways. The moldings and semi-capitals are made of limestone.

The architecture does not differ substantially from that of the lowest tier of the north and south lobes although there are only three niches in the east lobe rather than the four present in the other two lobes.

Plaster

East lobe, north and south niches

In the niches of the lowest tier of the east lobe the palimpsest comprises three levels: the oldest, that has proved impossible to examine in the areas restored during the campaign, has been identified as the first decorative phase in the triconch. It is uniform with a fine white wash [*covering*] the surface of the stone and the masonry (Figures 4 and 5).



(Figures 4 and 5)

(Figure 6)

This first thin layer is covered by the third-phase plaster. This was applied in a layer approximately ½ to 1 cm thick (it is thinner on the moldings and column shafts). It is lime-based with inclusions in the form of smooth round[2] grains of sand and has a white surface finish (Figure 6). Here the third-phase plaster here has a much smoother surface than it does in the upper tiers. This plaster is covered by the fourth and final late-antique phase with its trademark white wash.

The central niche, where only preliminary cleaning of the conch area has been carried out, has a fine white wash and atypical technical features that have made reliable attribution difficult until the present time. During the spring 2012 season it will be possible to collect more technical data on this area and its paintings.
The west side of the clerestory, just like the other three sides that have already been restored, has fourth-phase white wash applied over the older third-phase layer.

On the left side we have identified the presence below the layer of white wash of an area infilled in antiquity using a mortar that differs greatly from that typical of the third phase in terms of composition, application and surface characteristics. The mortar is particularly dark, probably contains a high percentage of mud and has a very irregular surface. These characteristics suggest that whoever who carried out the work was no expert on plastering. However, it is not impossible that this repair was carried out by the artist of the fourth phase whose practice was to paint on a layer of white wash and, as described with regard to the apse of the east conch, to effect rough localized repairs in order to smooth out old pick marks or areas of fallen plaster.

Here, as in the east apse, there are extensive areas where the presence of old gaps in the plaster enables us to ascribe a rough date sometime between the third and fourth phases of

[2] Cf. Artelab s.r.l, Studio dei materiali costitutivi e delle tecniche impiegate per la realizzazione delle varie fasi pittoriche [*study of the component materials and techniques used in the various phases of painting*], (September 2005)

painting to the major structural disturbance suffered by the building probably as a result of subsidence of the structure and/or a seismic event to (Figures 7 and 8).


(Figures 7 and 8)

In the facade area, cleaning of the granite shaft of the largest column on the south side has revealed a portion of white finish bearing some very patchy decoration. As for the monumental column on the opposite side, it is currently difficult to attribute this fragment to a precise phase in the decorative cycle of the building in view of its poor state of preservation.

Paint layer

The opportunity of working in the lateral niches in the lowest tier of the central lobe has allowed us to confirm data relating to the working techniques and the painted palimpsest of the niches with the icons. In both niches the fourth-phase white wash is well preserved and decorated with half-length representations of the archangels Michael (north) and Gabriel (south) respectively. The discovery of the archangels' names written in Coptic on the upper borders of the paintings (Figures 9 and 10) made it possible to identify the figures. Michael is depicted holding a stick with a cross in his right hand and the blessed bread (or rather, a plate bearing three pieces of bread) in his left. Similarly, Gabriel is holding a stick in his left hand and a chalice in his right (Figures 11 and 12).

(Figures 9 and 10)

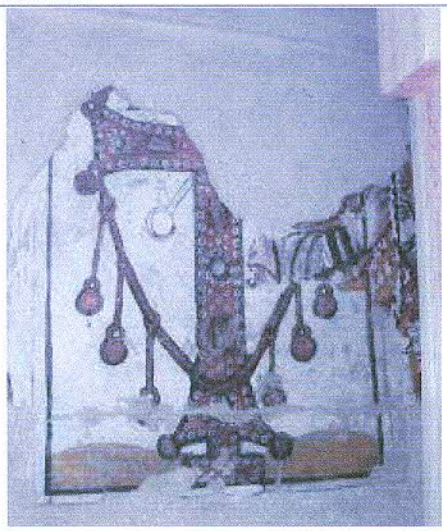
(Figures11 and 12)

Owing to the presence of some particularly patchy areas, we have been able to confirm the presence beneath the white wash of the palimpsest showing the same subject painted during the third phase. In particular, in the center of the icon of the Archangel Gabriel where the fourth-phase white wash is especially thin, some colored fragments of the face beneath are clearly visible. Cleaning of the same icon revealed a well-preserved Coptic inscription on the figure's neck. A preliminary interpretation supplied by Dr Bentley Layton suggests that the inscription bears the name of two artists (Figure 13).

(Figure 13)

During the mission, we were able to start work in the small apse of the central niche in the lowest tier of the east conch. Preliminary cleaning and consolidation of the paint layer revealed a small picture of the Virgin painted on a thin layer of white wash and depicted with a red dress and open arms. In the background yellow and green pigments applied using the encaustic technique seem to represent flowers while the lobes of the shell that form part of the third-phase decoration can still be seen, suggesting that perhaps they were intentionally preserved. A more precise understanding and interpretation of the image will have to await the completion of restoration work during the spring 2012 season.

(Figure 14)



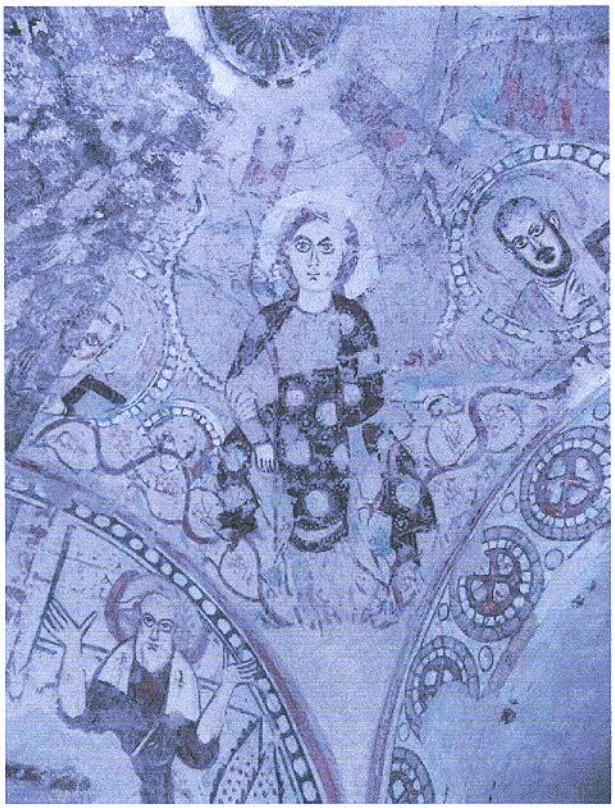
(Figures 15 and 16)

Work around the triumphal arch on the west side of the clerestory has revealed an extremely interesting painting showing the same palimpsest of paint layers as the other three sides of the same tier. On fourth-phase white wash to the right and left of the central window are painted, within aedicules, two gem-studded crosses from whose arms hang small ampullae. The composition, that shares certain features with those in the fourth phase of the north and south apses, is extremely precise although it makes use of a limited palette that often includes the white of the background.

The patchy nature of the white wash belonging to this phase makes it possible to see the underlying phase where the figures of three saints holding rolls bearing the sacred scriptures can be made out. The figures of the third-phase saints painted on the other sides of the clerestory are depicted partially overlapping each other owing to the limited space available (Figures 14, 15 and 16).

Two peacocks also belonging to the third phase of painting are depicted lower down on the right and left of the extrados of the arch. Painted on a faux gold background of jarosite yellow originally applied using the encaustic technique, the two birds are surrounded by encaustic plants and flowers that are now only partially preserved (Figures 17 and 18). Above only a few fragments of fourth-phase white wash survive. However, these are sufficient to suggest the iconography of the painted decoration.

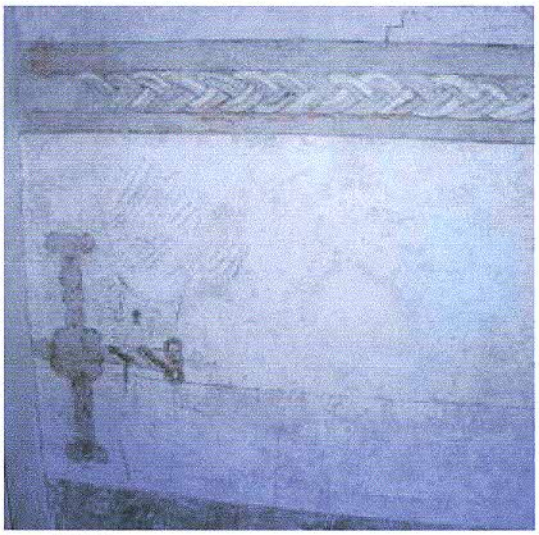

(Figures17 and 18)



(Figure 19)

In the prothesis (NEC), work on a further quadrant (NW) of the vault has been completed (Figure 19). Information gathered during the course of the work has confirmed the stratigraphy of the palimpsest revealed during previous missions, proving the presence of the third and fourth phases in this area. The cleaning operations and the patchy nature of the fourth-phase white wash have revealed an interesting iconographical detail from the first phase: the eagle is holding a set of scales in its beak (Figure 20).

(Figure 20)



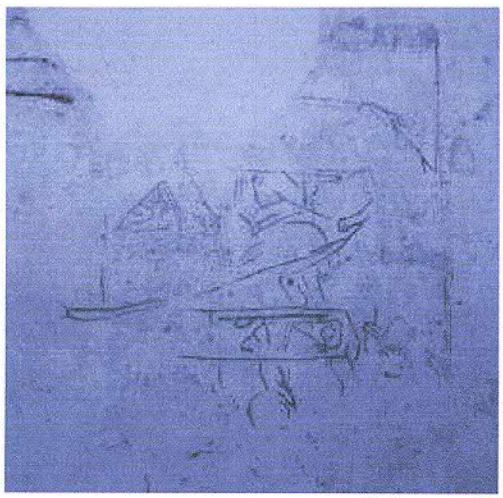
(Figures 21 and 22)

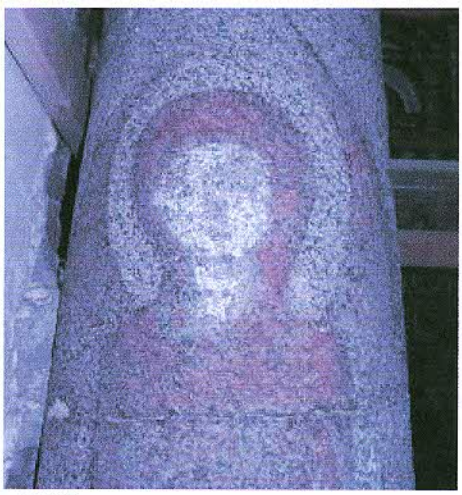
On the north wall in the facade area (F), cleaning operations have enabled a new reading of the lower part of the large medieval cross within the aedicule. The scene, framed by a braided border, also contains a smaller cross with twisted arms. During the work, the remains of small bushes, originally painted using the encaustic technique, were recovered together with numerous inscriptions in Arabic and Coptic written on the white background of the plaster (Figures 21 and 22).

Ongoing work on the icon of the Saint on Horseback has recovered the delicately painted trappings of the horse, a small subdued-looking solider on the right-hand border and a Coptic inscription on the opposite side between the horse's rear hooves. We have also been able to confirm that white lead, which has now turned purple in many places, was the white pigment used to highlight certain details. Usually the painter left areas of the background plaster unpainted in order to obtain white. In spite of the very patchy nature of the painting, it has striking technical and compositional similarities to the cycle of saints on horseback at the Monastery of St Antony on the Red Sea (Figure 23).

We have discovered a small and incomplete monochrome sketch on the plaster to the right of the horse's nose. The few lines visible suggest that it could depict a martyrdom (Figure 24). It is possible that the artist's original intention was to depict stories from the life and/or martyrdom of the saint in small paintings on the right-hand side; an intention that was subsequently never realized.

(Figure 23)





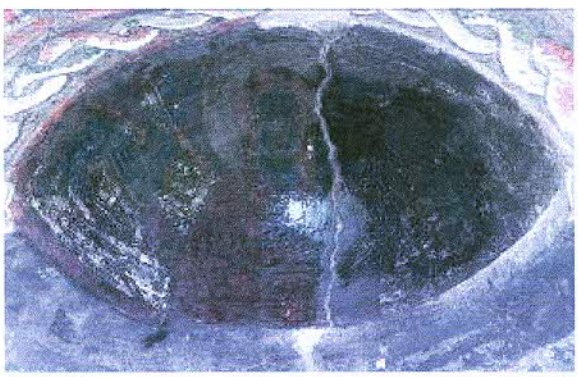
(Figures 24 and 25)

Still in the area of the facade, we have cleaned the icon on the shaft of the largest monumental column on the south side. The broad outline of the upper body of a saint inside a niche has been revealed, but the icon's state of preservation currently prevents us from attributing the scene to a particular phase of the palimpsest in the church (Figure 25). This mission has also seen completion of the restoration of the monumental polychrome capital of the north column of the arch leading to the triconch.

STATE OF PRESERVATION AND PREVIOUS RESTORATION WORK

Masonry and plaster

In antiquity the east lobe was affected by structural instability that caused cracks and falls of plaster. The causes of this instability and the subsequent subsidence of the structure were considered in the report for the mission of spring 2007[3]. Damage linked with these events can be seen clearly in the masonry, plaster and paintings of the east lobe as evidenced by the deep crack passing through the center of, and above, the central niche in the lowest tier (Figure 26). The right-hand niche has suffered extensive plaster loss owing to the installation at an unknown point in the building's history of brackets and wooden uprights for a small cupboard. The fragmented stone slab forming the floor of the niche was repaired at a fairly recent point in time using abundant quantities of cement pointing (Figure 27).



(Figures 26 and 27)

(Figure 28)

[3] : L. De Cesaris, A. Sucato, Red Monastery – Monastery of St. Bishoi, Conservation of the wall paintings – Final Report- Spring 2007

The extensive areas in the clerestory (west side) where falls of plaster occurred in antiquity are also associated with major structural disturbances the triumphal arch has suffered over the centuries. These areas were repaired with render during the restoration work carried out by the Comité. The consolidation of the structure carried out at the same time included repositioning the stone blocks of the arch and inserting new ones (Figure 28). As described in the paragraph on working methods, a sizeable area to the left of the central window was already infilled during the late antique period to facilitate the execution of the fourth-phase paintings.

This enables us to identify the major (although perhaps not the first) structural disturbance affecting the church as having taken place in the short period of time between the execution of the third and fourth phases of painting (see Figures 7 and 8).
The horizontal crack in the shaft of the monumental column (to the right of the door to the church) whose restoration has been completed during this season is probably also connected with this event.

Paint layer

The state of preservation of the paint layer varies enormously as a result of numerous factors:

- The properties of the materials used and the stratification of the palimpsest.
- Rainwater leaking through cracks, windows and the roof. This has caused the washing away of pigments, deposits of dust and mud, saline efflorescence and blackening on the painted surface.
- Bird droppings and the establishment of colonies of insects on the painted surface, in cavities in the masonry and in sockets for woodwork.
- Human depredations caused by: attempts to clean the surface; the removal of more recent paint layers in search of older ones and inscriptions, the religious ceremonies that result in the excessive deposition of sooty particulate matter and wax; cleaning and maintenance work.
- The collapse of the vaults and the roof of the nave exposed the paintings to the elements and solar radiation, particularly in the upper part of the triconch and the facade.


(Figures 29 and 30)

Before restoration the three niches in the lowest tier of the east lobe were heavily soot-blackened as a result of their intensive use during religious services, especially once the iconostasis was moved back to the threshold of the conch, thereby confining the sanctuary of the church to this small area. The floors of the niches were therefore continually used as shelves for oil lamps and candles (Figures 29 and 30). The blackening of the paintings inside the niches made it impossible to decipher their subjects.

In the north niche, the depiction of the archangel Michael was almost entirely covered by a thin layer of modern white wash. Possibly applied as a maintenance measure, this sacrificial layer has actually protected the underlying painting.

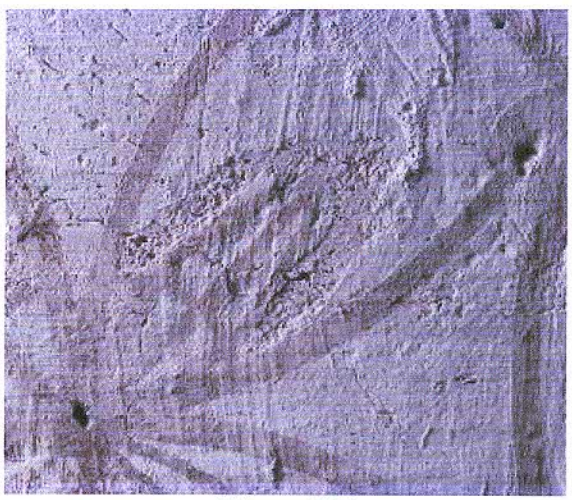
(Figure 31)

(Figures 32 and 33)


(Figures 34 and 35)

The west side of the clerestory was affected by an extensive deposit of dust and loose and partially consolidated particulate matter. The painted surface was damaged by the effects of rain water and wind erosion associated with the prolonged exposure of this part of the building in the absence of windows and roof. Most of the fourth-phase whitewash has fallen off, especially on the right, revealing the figure of a third-phase saint almost in its entirety and, lower down, the two peacocks. The extensive plaster loss was caused by the poor adhesion of the whitewash to the third-phase wax-painted surface (especially the jarosite backgrounds painted using the encaustic method). Areas where the plaster fell away in antiquity have been repaired using unsuitable mortar types that often encroach on the paint layer (Figures 31, 32 and 33).

On the north wall of the facade, also exposed to atmospheric agents for an unknown length of time, both the cross and the Saint on Horseback were badly abraded (Figures 34 and 35). Exposure to the sun has resulted in the loss of those details painted using the encaustic technique. On the saint's face, details painted using white lead have suffered the discoloration typically associated with this pigment and turned a purplish brown. The heating of the surface has also caused those areas painted using the encaustic technique to contract and tear off the finish of the plaster before falling, leaving imprints slightly below the surface (Figure 36).



(Figure 36)

(Figure 37)

Near the wall built by the Comité, abrasion and loss of the paint layer caused by the construction process can be seen.

In the prothesis, the two phases of painting that can be seen (the first and the fourth) present differing states of preservation (Figure 37). The yellow pigment used to paint the forms of the eagles is well preserved but only faint traces of the details painted using the encaustic technique remain. The blue background visible between the wings and plant tendrils is quite patchy, presumably as a result of the pigment's natural fragility. The painted surface has been heavily blackened by unconsolidated deposits and soot produced by the burning of oil lamps and candles.

The fourth-phase painting is adhering well to the plaster even though there are localized areas where it has fallen off or become raised along the margins of gaps. This damage has probably been caused by mechanical cleaning and dusting operations coupled with the intrinsic fragility of the original whitewash. The presence of wasps' nests has also been noted.

RESTORATION WORK CARRIED OUT

We have carried out our restoration work in accordance with the methodological guidelines first laid down in 2003. Since then, we have continued to refine and update our working methods and the materials used in response to new problems that have arisen and the need to ensure the health and safety of the conservation team and visitors.

The first task was to remove dust from the surfaces using soft bristle brushes. Where portions of plaster, fragments and elements of the paint layer (palimpsest) were in immediate danger of falling, they were secured by means of small strips of Japanese paper stuck to the surface using a 15% solution of acrylic resin (PARALOID B72) in acetone. This operation was necessary on the third-phase plaster inside the south niche in the lowest tier of the east lobe and on the edges of the plaster fragments on the west side of the clerestory, together with the removal of cement-based mortar used in old repairs.

In places where the plaster had been repaired during earlier restoration work using inappropriate mortar, this was removed mechanically using micro-chisels and scalpels. In places where the composition of the pointing was compatible with the original plaster, it was brought to the level of the original paint layer by mechanical means, uncovering each hidden fragment of plaster and paint layer (Figures 38 and 39).

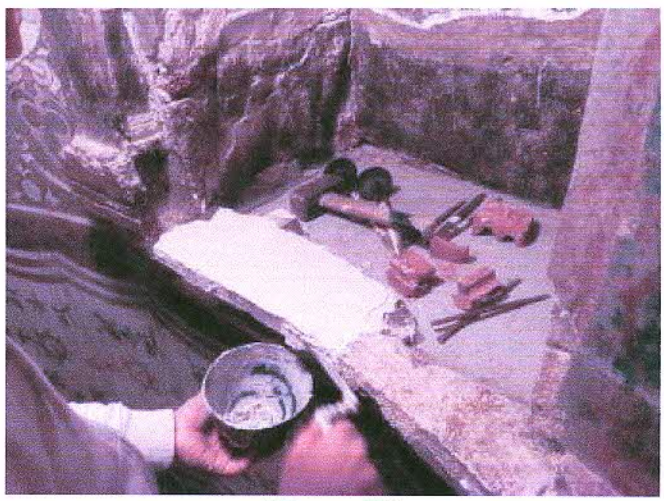
(Figures 38 and 39)

The gaps in the plaster were repaired with mortar similar in appearance and composition to the original plaster types (Figures 40 and 42). Hydrated lime, local sand and a small percentage of crushed local limestone were used (1.5 parts lime, 2 parts sand, 1 part crushed limestone). The cement pointing on the floor of the south niche in the lowest tier of

the east lobe was removed and replaced with a mortar composed of suitable constituents (Figure 41).

On the north wall of the facade, the composition of the mortar used was slightly different in that straw was added to the mix (4 parts lime, 1 part sand, 1 part crushed limestone, ½ part straw). The mortar was always formulated to have a lower mechanical resistance than the original plaster. Repairs and pointing were carried out whilst respecting all levels of the palimpsest, taking care not to cover any phase of painting.

(Figure 40)



(Figure 41)

(Figure 42)

The plaster was consolidated by injecting it with a liquid mortar whose composition was similar to that of the original plaster (Figure 43). In some cases, the edges of the plaster had to be consolidated by means of injections of 35% acrylic resin in an aqueous emulsion (ACRYL 33) into specific areas. Micro-pointing was carried out in the cracks and at the edges of the gaps in the plaster to prevent the injected liquid mortar from running out.

In urgent cases, small fragments of detached plaster were replaced using a mortar based on 35% acrylic resin (ACRYL 33) in an aqueous emulsion bulked out with micronized calcium carbonate until the desired consistency was reached.

Raised areas of the paint layer in imminent danger of falling were stuck down by means of injections of 15% acrylic resin (ACRYL 33) in an aqueous emulsion. In some cases slight pressure with a flexible spatula was required, interposing a sheet of polyethylene between the spatula and the surface. This procedure proved particularly necessary on the vault of the prothesis where fragments of fourth-phase whitewash had become detached from the underlying plaster.

(Figure 43)

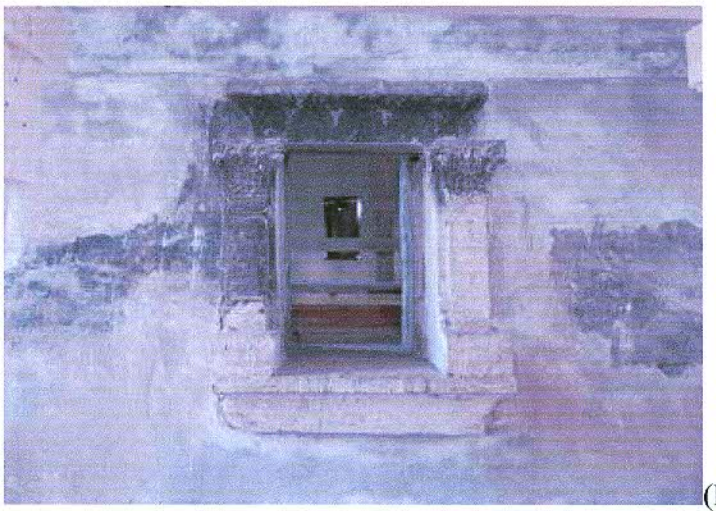
The cleaning system we have developed for the painted surfaces and stonework has proved effective and safe as far as concerns the materials used. The cleaning system involves the use of organic solvents applied using Japanese paper covered with several thicknesses of single-ply paper tissue to dissolve the substances on the surface (oil- and resin-based varnish) and minimize mechanical removal methods.

In brief, we proceeded as follows: removal of varnish (oil- and resin-based) alternately using the organic solvents ACETONE and DIMETHYL SULFOXIDE dissolved in acetone at 50%) applied on single-ply paper tissues until evaporated. Each application of solvent was followed by the application of acetone in the same manner in order to encourage the evaporation of the solvent just used. The residue of oily substances applied to the surface and repainting work were removed with a pH controlled polar solution (70 g/l ammonium carbonate in distilled water). The solution was applied to the surface using several thicknesses of single-ply paper tissue with contact times varying between 3 and 5 minutes. We then went on to remove sooty deposits, oily residue and thin films of saline efflorescence using a slightly basic polar solution (10 drops of ammonia per liter of distilled water) applied on single ply paper tissues and working in small areas at a time Figures 44 to 49). Thicker saline efflorescence was removed mechanically using a scalpel.

Consolidated deposits of dirt made up of particulate matter and carbon residues were removed by dabbing with a simple solution of ammonium carbonate (70 g/l in distilled water). In some places a sheet of Japanese paper was placed between the pad and the surface and the pad rolled over it.

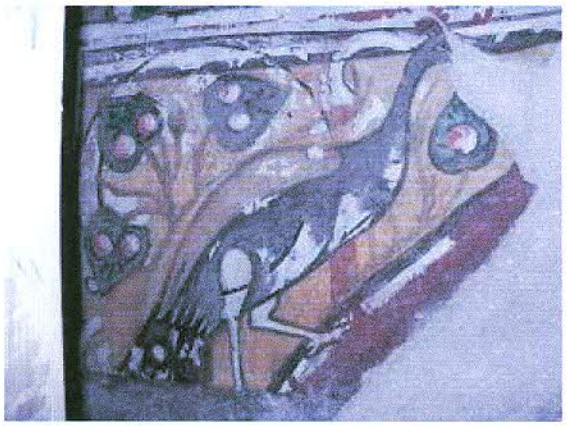
The black lines around figures and decorative elements added as a finishing touch to the painting process were particularly fragile in some instances. As a result, after preliminary cleaning, some of them had to be fixed with a solution of acrylic resin (5% PARALOID B72 in Dovanol) applied with a brush. Once the cleaning operation was completed, the fixing was removed with organic solvents applied through Japanese paper.


(Figures 44 and 45)



(Figure 46)

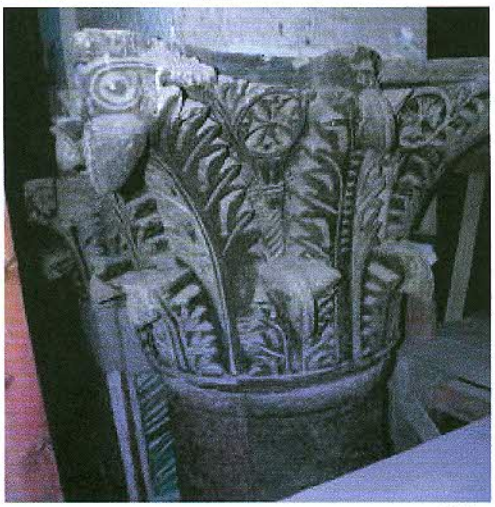
(Figure 47)



(Figures 48 and 49)

The granite stonework (largest monumental column on the north side of the façade) was cleaned by applying compresses made up of a medium (wood pulp) and a moisture retainer (TYLOSE) added to a solution of inorganic salts. This compress was easy to apply for different contact times, some of them quite long, without soaking the stone unduly.

Once the compress was removed, the granite and limestone were rinsed using sponges and soft-bristled brushes (Figures 50 and 51).



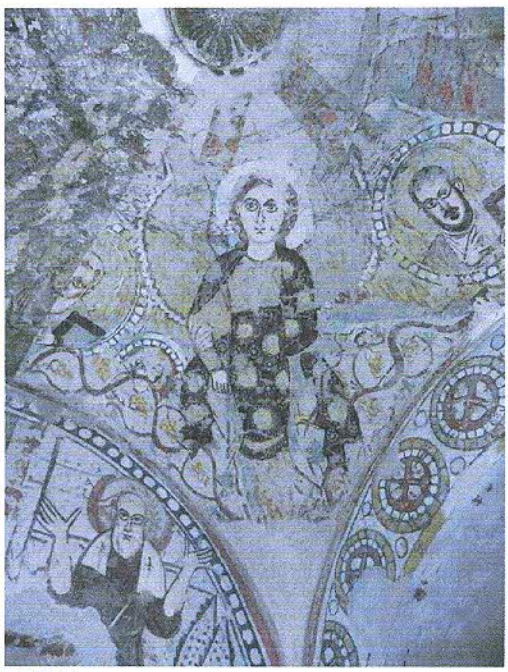

(Figures 50 and 51)

Finally, areas where the paint layer was failing to adhere were consolidated with the application of a low percentage solution of acrylic resin (PARALOID B72) at 1.5 % in a nitro-thinner, applied with a nebulizer and, where possible, a brush.

The granite stonework was given a surface treatment of ethyl silicate (ESTEL 1000) applied with a brush.

The gaps in the paint layer were blended in using the technique of toning down with watercolors (WINDSOR & NEWTON). This technique restores legibility to the palimpsest of decoration and painted surface and clarifies the reading of the different paint layers (Figures 52 to 54).

(Figure 52)



(Figures 53 and 54)