

FINAL REPORT

2010 – 2011

ARCE Groundwater Lowering Response Project, Luxor

“Conservation of the Euergetes Gate”

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The Egyptian Antiquities Conservation Project (EAC)
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Awarded to

THE AMERICAN RESEARCH CENTER IN EGYPT (ARCE)

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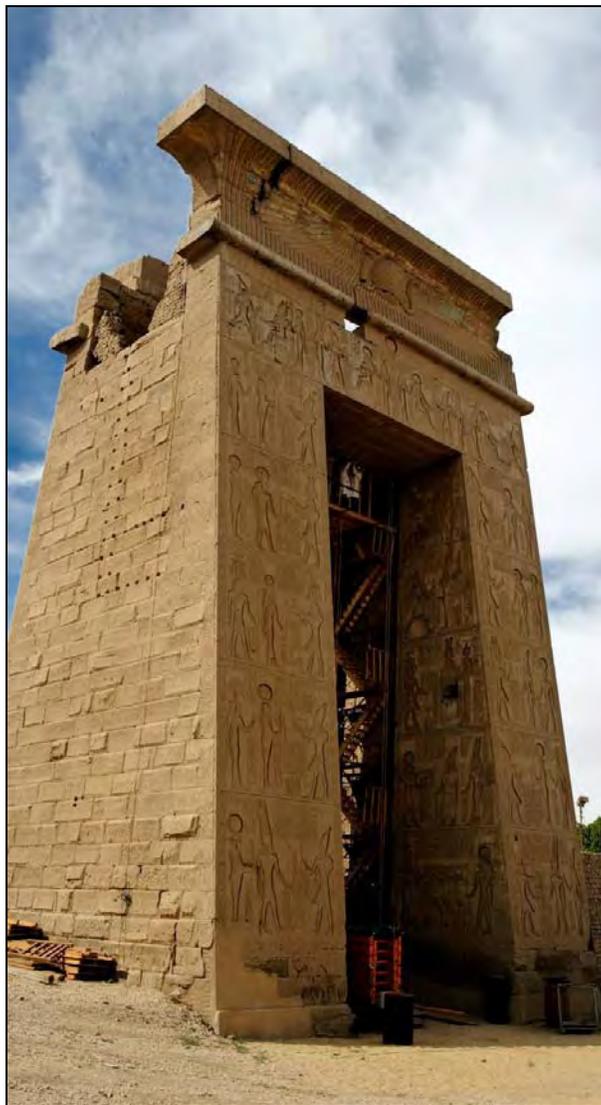
In collaboration with the United States Agency for International Development and the
Egyptian Ministry of State for Antiquities





2010-2011 SEASON: CONSERVATION OF THE EUERGETES GATE

FINAL REPORT



Christie Pohl, Chief Conservator, ARCE Luxor

ARCE 2010-2011: The Implementation of a new Documentation and Archiving System

This season ARCE conservation staff created and put into practice a new documentation system for all of the projects in Karnak and Luxor. The previous system involved long condition reports written only in Arabic which included historical information on the particular monument that was being treated.

The new documentation forms are standardized and bilingual (figure 1) which helps streamline the condition reporting and mapping processes. The forms are a combination of tick-box categories and additional room is provided for commentary. Once a condition report is complete, the conservation technicians follow the same format for a treatment proposal, or a general description of the treatment that is envisioned. Finally, a treatment report is filled out which includes all the details of the materials and products used during the conservation process.

The image shows a standardized, bilingual condition report form. At the top, it identifies the organization as the American Research Center in Egypt (مركز البحوث الأمريكية في مصر) and includes an ID Code field. The main title is 'CONDITION REPORT / تقرير توصيف الحالة'. The form is divided into several sections:

- Identification / التوصيف وتحديد التدخلات السابقة:** This section includes fields for Site (الموقع), Building (المبنى), Space (الفضاء), Division (القسم), Section Number (رقم القطاع), and Dimensions (cm) (الأبعاد بالسنتيمتر).
- General observation on the construction technique of each layer (Material, color, Finish):** A text area for describing the construction techniques of each layer.
- Overall Condition / الحالة العامة:** A section with radio button options for 'Very good', 'Good', 'Fair', and 'Poor'.
- Previous Interventions / التدخلات السابقة:** A section with checkboxes for 'Intentional Mechanical Damage', 'Repair Mortars', and 'Chemical Residue'. Each checkbox has a corresponding text area for details. There is also a checkbox for 'Application of a Surface Product'.
- Dates of Previous Interventions & Documentation Reference:** A text area for recording dates and references.
- Footer:** Fields for the Conservator (المحافظ) and Supervisor (المشرف) names and the Date (التاريخ).

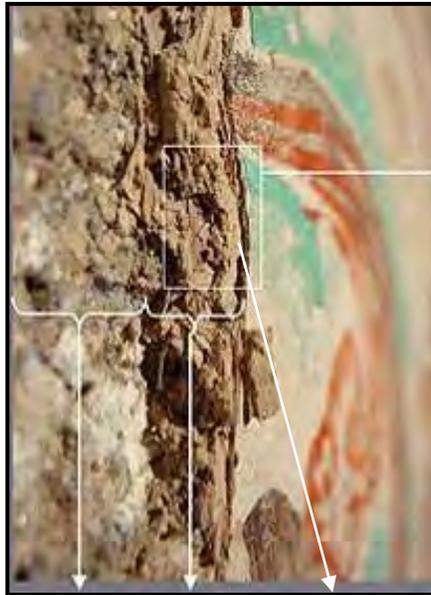
Figure 1. One of the pages from the new condition report forms.

The ARCE conservation staff also created an illustrated glossary (figures 2 and 3) that includes categories and conservation issues encountered in both Luxor and Karnak.

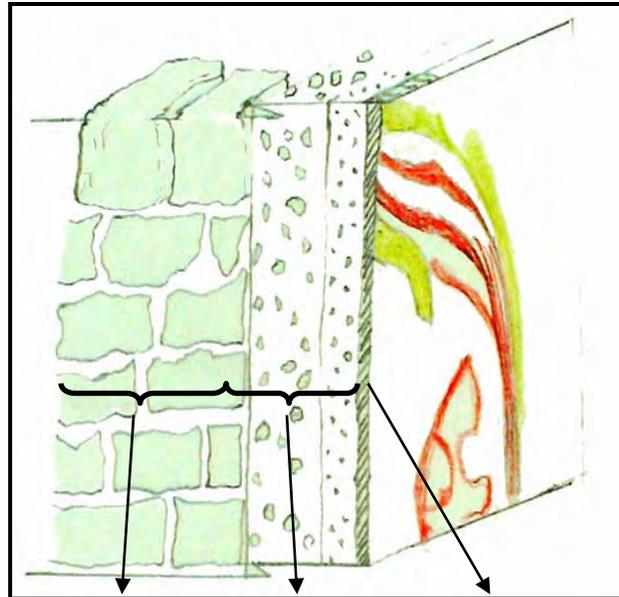
ILLUSTRATED GLOSSARY OF CONSERVATION TERMS FOR DOCUMENTATION

معجم مصطلحات الترميم لوثائق الحالة

Wall Painting Structure



هيكل التصوير الجدارى



Support Layer **Preparatory Layer** **Paint Layer**

لماح ري ووصلتلا طبقة التحضير طبقة اللون

<p>Intentional mechanical damage</p> <p>Loss of original material as a result of purposeful mechanical action. Some damage may have occurred in antiquity (defacement from chisel marks...) or in modern times (graffiti, vandalism...).</p>		<p>التلف الميكانيكى المتعمد</p> <p>فقدان المواد الأصلية كنتيجة لعامل ميكانيكى، بعض الضرر قد يكون تم فى العصور القديمة مثل (التشويه او علامات الأزميل) وبعض الضرر قد يكون تم فى العصر الحديث مثل (الكتابة على الجدران او التخريب)</p>
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Figures 2 and 3. The cover page of the illustrated glossary and an example of one of the categories.

For the condition maps, base drawings are created by the technicians that outline the major features of a wall register or level of a column. The drawings are created on tracing paper from a photograph (figure 4) and then photocopied to be used as condition maps. These maps document the different types of deterioration. A condition map is created beginning with any previous interventions (Layer 1) and additional maps are made which record superficial deterioration (Layer 2) support/stone deterioration (Layer 3), preparatory/plaster deterioration (Layer 4) and paint deterioration (Layer 5).

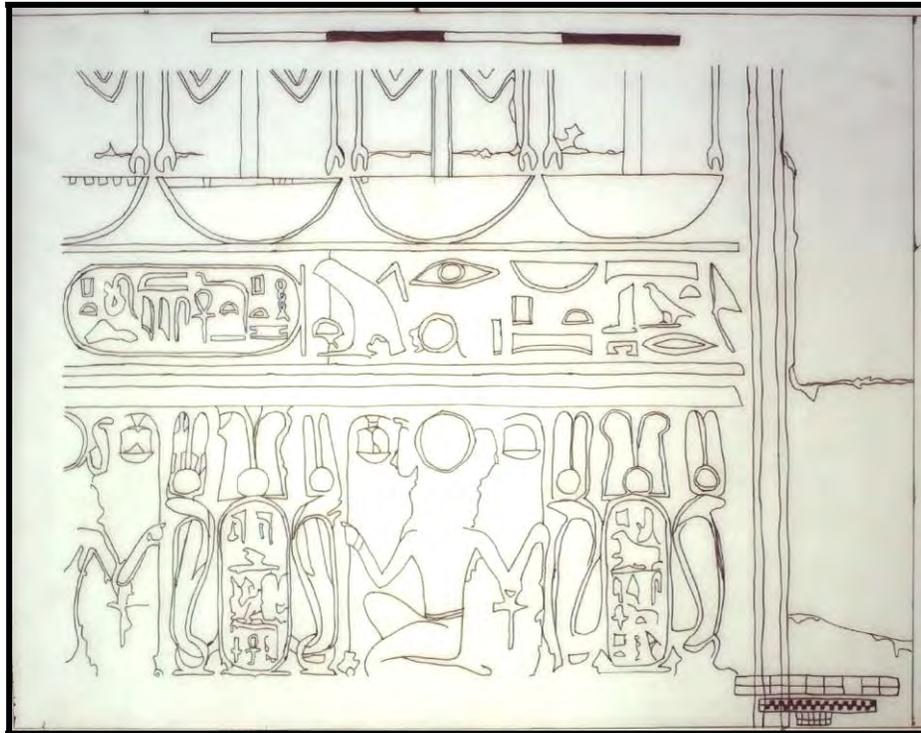
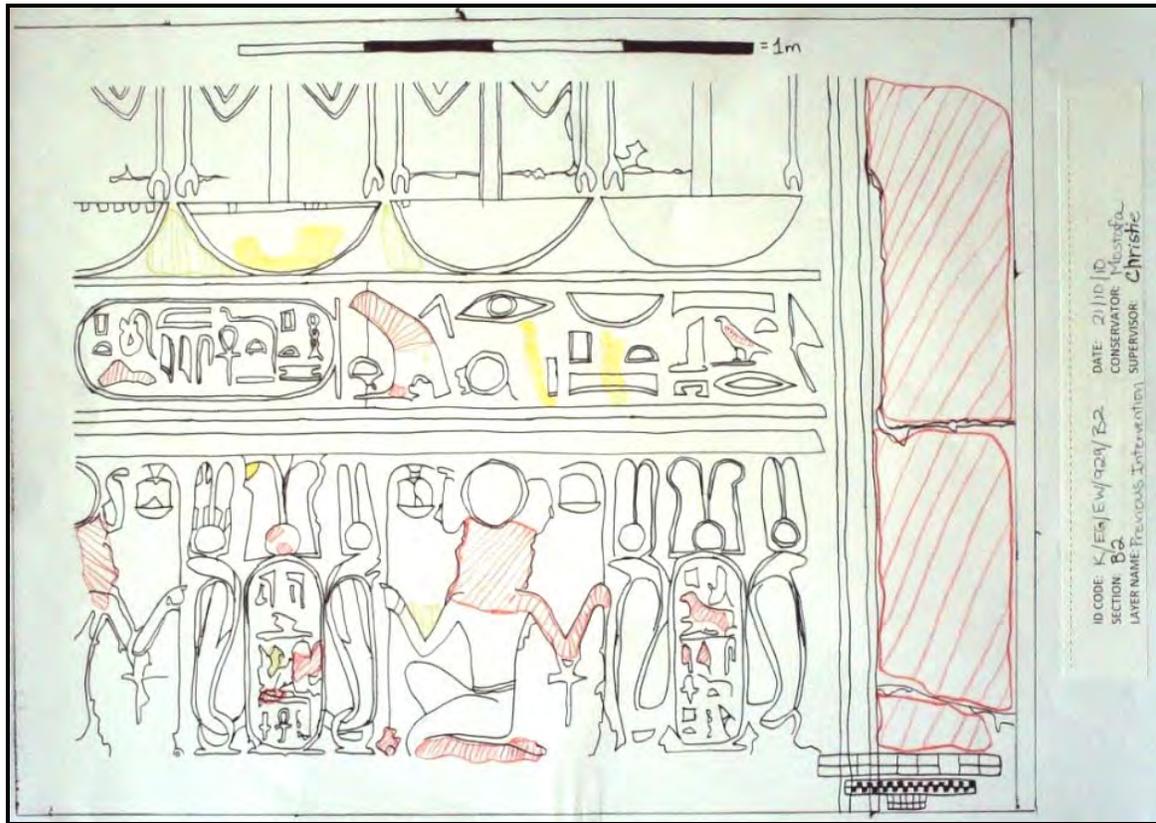


Figure 4. A base drawing of the B2 register - Eastern jamb of the Euergetes Gate

The different categories are noted using colored patterns and symbols. Figures 5-9 show examples of the condition maps for the B2 register on the Eastern jamb of the Euergetes Gate.



Previous Interventions التداخلات السابقة	
	Intentional Mechanical Damage الأضرار الميكانيكية المتعمدة
	Repair Mortars (Identify underneath each mortar) موتن الترميم (توصيف لكل مونة مستخدمة)
	Old Cement Fill المونة الاسمنتية للترميم السابق
	Recent Lime Mortar Fill إعادة المونة بمونة الجير
	Graffiti كتابات قديمة غير اثرية
	Metal Bar قضيب حديدي
	Chemical Residue (Stains, drips, spots, etc.) بقايا كيميائية (بقع كبيرة - قطرات- بقع صغيرة ... الخ)
	Application of a Surface Product الشكل المطبق لتطبيق المواد المستخدمة

Figure 5. Condition map and key - Layer 1 - showing areas where there were previous interventions or treatments completed.

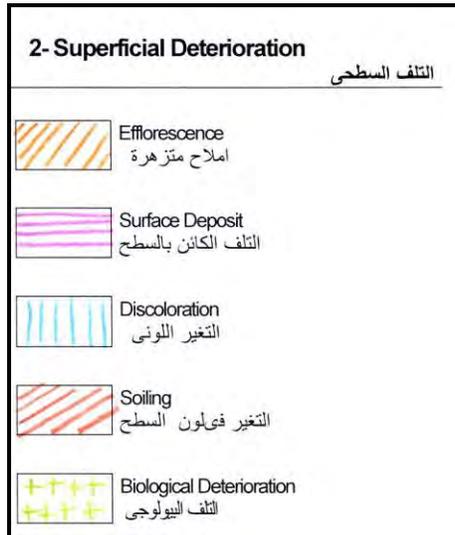
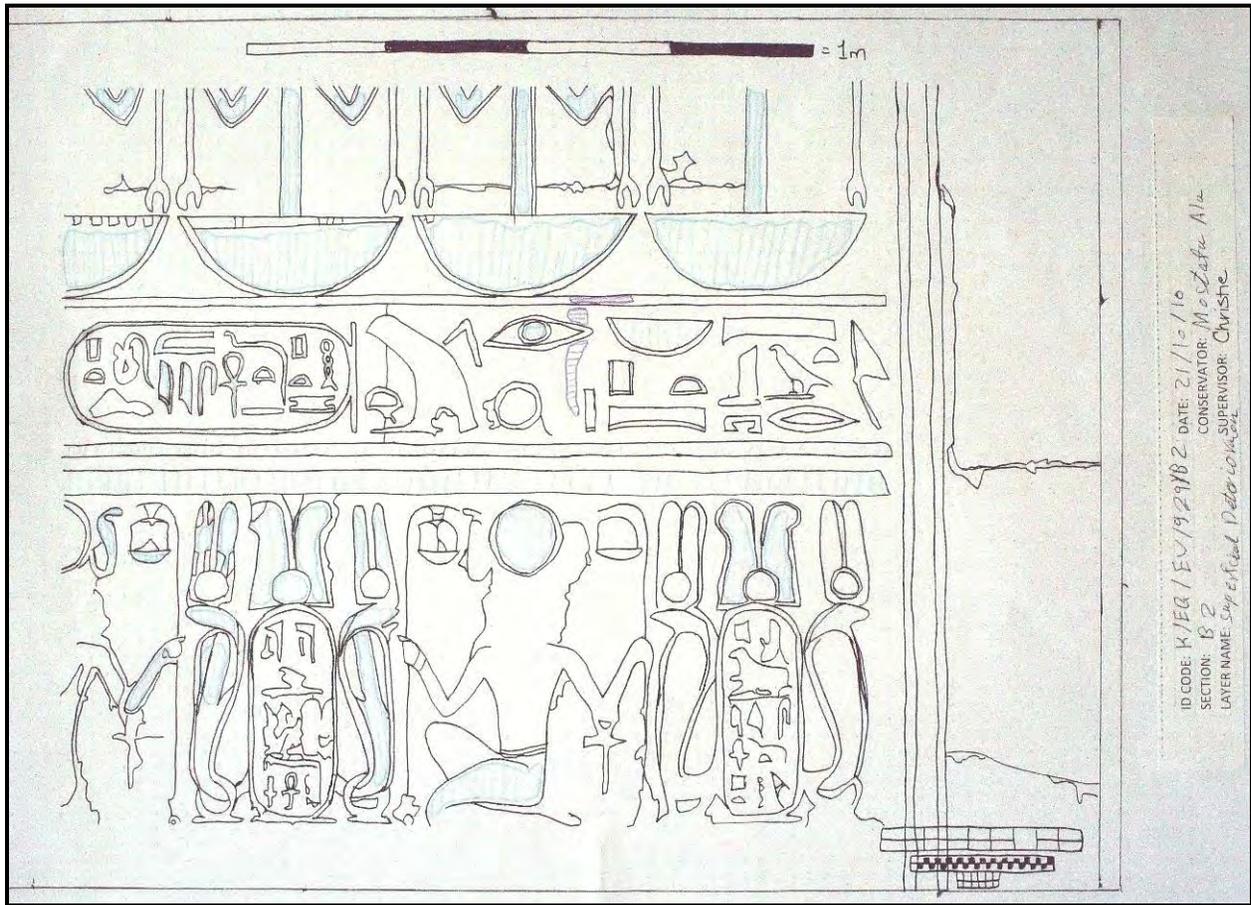


Figure 6. Condition map and key - Layer 2 - showing areas where there is superficial (surface) deterioration.

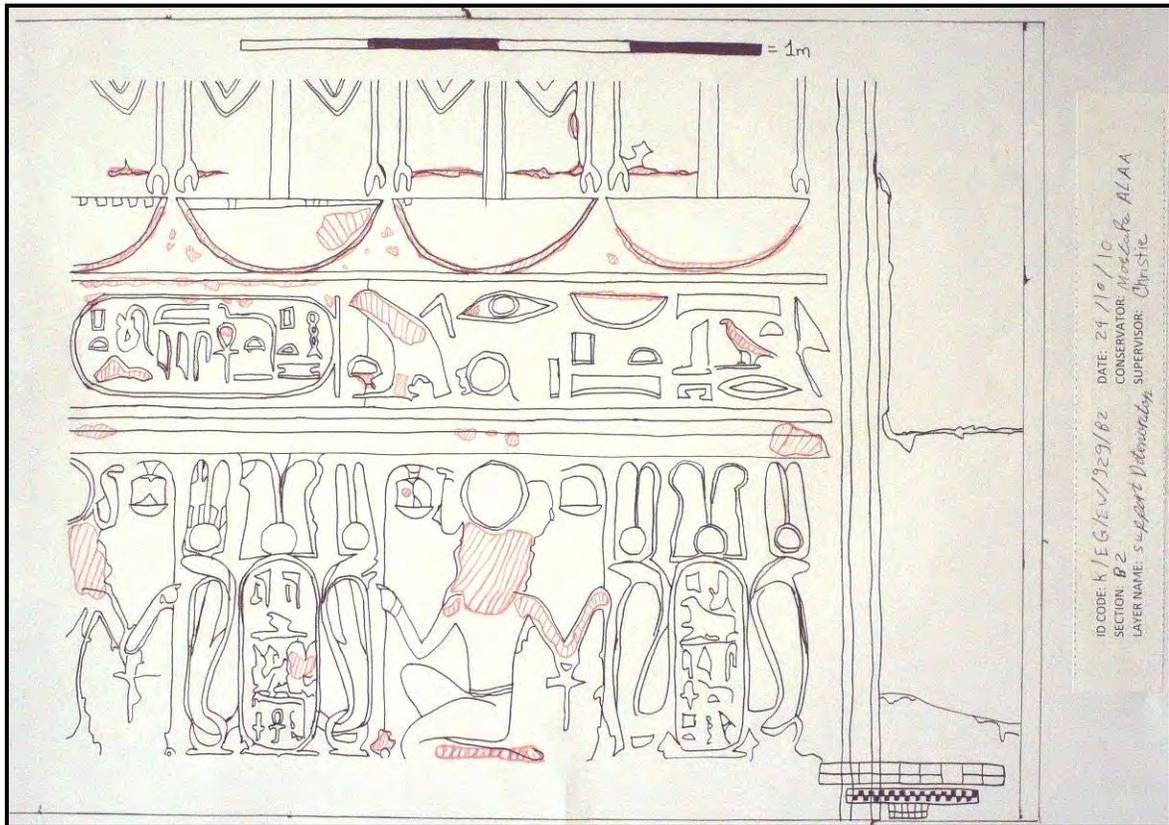


Figure 7. Condition map and key - Layer 3 - showing areas where there is support (stone) deterioration.

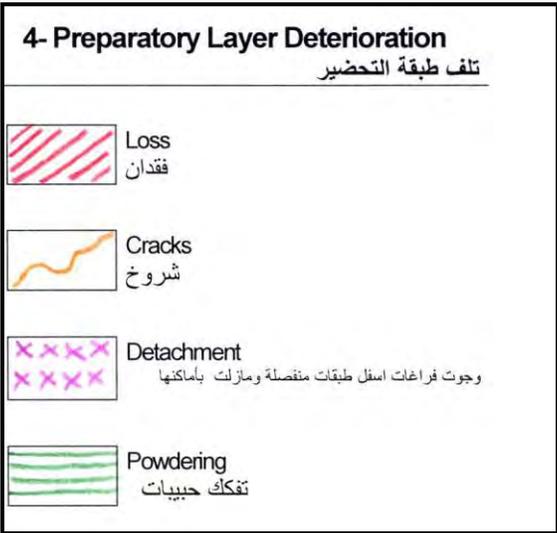
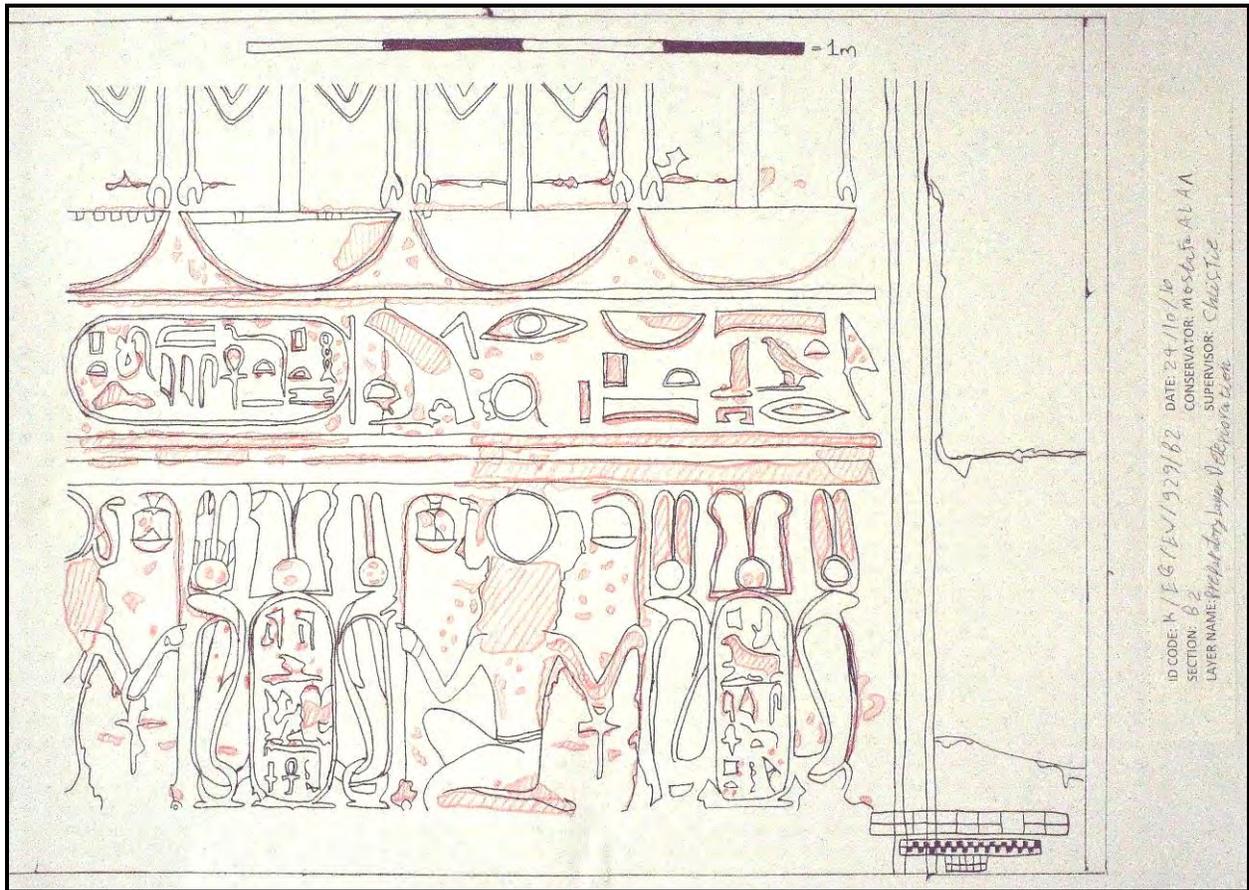


Figure 8. Condition map and key - Layer 4 - showing areas where there is preparatory layer (plaster) deterioration.

A corresponding treatment map (figure 10) is made during the conservation work which shows exactly where and what conservation methods were used for the treatment. There are different methods for condition reporting and mapping, some of which use more high-tech programs such as Photoshop® or AutoCAD®. However, ARCE conservators wanted to implement a sustainable documentation system that can be done by individuals with different skill levels, using materials that are inexpensive and readily available in Egypt (figure 11).

Once completed, all of the documentation is scanned into digital format and filed in an archive along with the hard copies in ARCE's office. Overall, the new documentation system was implemented smoothly and received well by all of the technicians who worked on ARCE projects this season. The bilingual forms are concise, yet still allow for an adequate amount of detail. Having the students make a base drawing and then record all the categories of deterioration (before beginning any conservation work) gives them the opportunity to become very familiar with the area they will conserve.

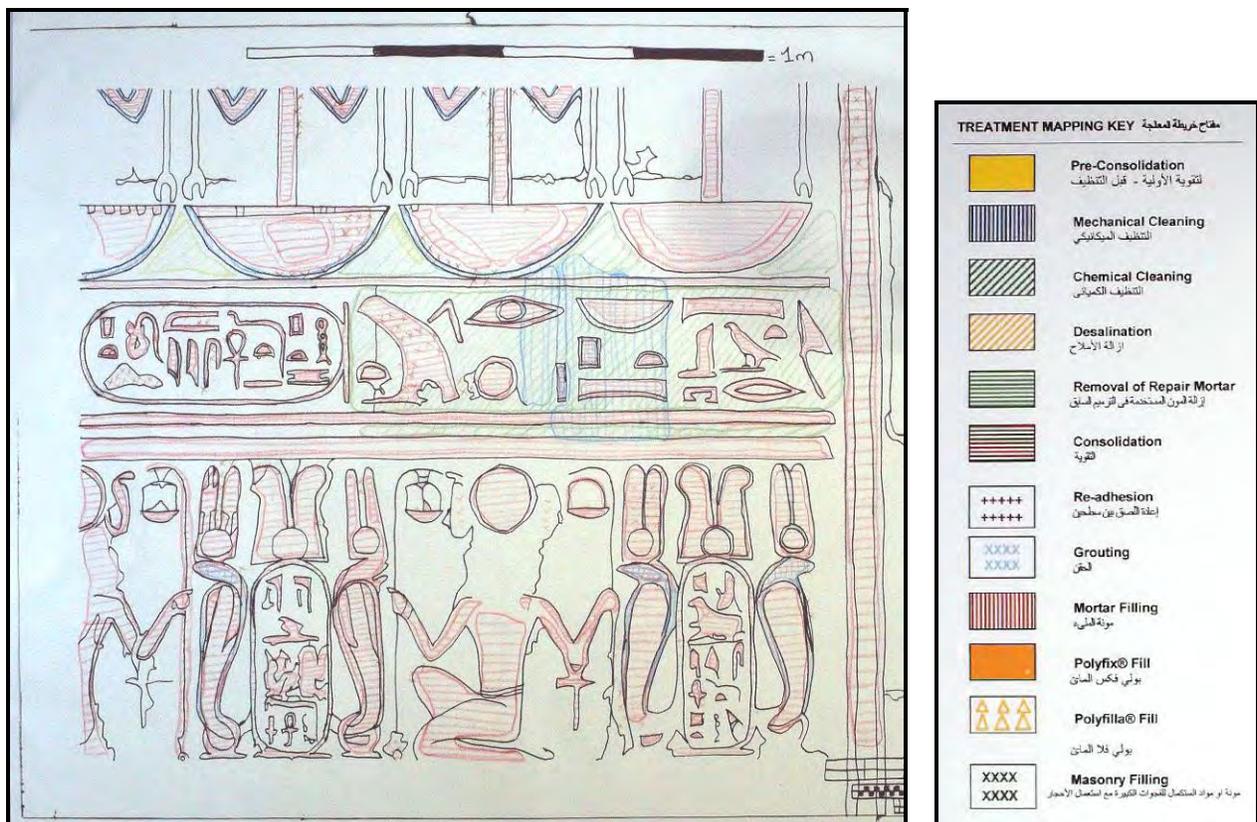


Figure 10. The treatment map and key documenting the work that was completed in register B2 on the Eastern jamb of the Euergetes Gate.



Figure 11. Conservators working on their condition maps prior to beginning the work on the Euergetes Gate, October 2010.

Documentation Kits and Toolboxes

As part of the new advanced training program, each technician received a documentation kit and toolbox containing a range of tools and materials to use during the projects (figures 12 and 13). The idea behind the documentation kits and tools was to introduce the technicians to a variety of materials which can help make their work more precise and efficient, while also helping to build their confidence and sense of responsibility as conservators. With the equipment being easily accessible, the work progressed faster and more smoothly. It also kept the work space more tidy and organized for the duration of the work on the scaffolding. Each person took their documentation kit and toolbox with them after their work with ARCE finished. Hopefully the technicians will continue to use these materials on any future conservation projects.



Figure 12. The documentation kit that was given to each technician.



Figure 13. The toolbox and contents that were given to each technician.

The following lists detail the materials that were provided in the documentation kits and toolboxes.

Documentation Supplies

قائمة التوثيق

ARCE: 2010-2011

مركز البحوث الأمريكي 2010 - 2011

1 pencil/pen bag	عدد 1 حافظة اقلام رصاص واقلام جاف
1 eraser	عدد 1 ممحاة
1 pencil sharpener	عدد 1 براية
1 ball point pen	عدد 1 قلم جاف
1 fine black permanent marker	عدد 1 قلم بروجيكتور
1 mechanical pencil	عدد 1 قلم سكرو
1 box of lead pencil replacements	عدد 1 علبة سنون
1 black pen for inking	عدد 1 قلم تحبير
1 box of colored pencils (12)	عدد 1 علبة اقلام خشبية ملونة (12) لون
1 razor blade	عدد 1 شفرة قاطعة
1 plastic binder	عدد 1 حافظة اوراق بيضاء
1 clipboard	عدد 1 لوحة رسم بلاستيك
1 lined notebook	عدد 1 كراسة نوتة مسطرة
1 cardboard folder	عدد 1 حافظة اوراق ملونة
1 wooden drawing board	عدد 1 لوحة خشبية للرسم

Toolbox Supplies

قائمة صندوق الأدوات

ARCE: 2010-2011- Karnak

مركز البحوث الأمريكي - الكرنك 2010 - 2011

1 small mortar mixing bowl	عدد 1 جفنة صغيرة لخلط المونة
1 small trowel	عدد 1 مسطرين صغير رقم 5
1 hammer (300 g.)	عدد 1 شاكوش 300 جرام
1 large metal spatula	عدد 1 فرة كبيرة
1 small metal spatula	عدد 1 فرة صغيرة
1 small syringe (10 ml.)	عدد 1 سرنجة 10 مل
1 medium syringe (20 ml.)	عدد 1 سرنجة 20 مل
1 large syringe (50 ml.)	عدد 1 سرنجة 50 مل

1 1" brush	عدد 1 فرشاة 1 بوصة
1 consolidation brush (size 5)	عدد 1 فرشاة مستريك للتقوية رقم 5
1 consolidation brush (size 8)	عدد 1 فرشاة مستريك للتقوية رقم 8
1 small re-adhesion brush (size 2)	عدد 1 فرشاة الوان تستخدم فى إعادة لصق القشور رقم 2
1 toothbrush	عدد 1 فرشاة اسنان
1 #3 scalpel handle	عدد 1 يد مشرط رقم 3
1 #4 scalpel handle	عدد 1 يد مشرط رقم 4
5 #15 scalpel blades	عدد 5 شفرة مشرط رقم 15
5 #23 scalpel blades	عدد 5 شفرة مشرط رقم 23
1 tweezer	عدد 1 جفت طبي
1 dental tool	عدد 1 فرة اسنان
1 plastic pipette	عدد 1 قطارة بلاستيك
1 smoke sponge/dirt eraser	عدد 1 قطعة اسفنج مدخنة لازالة الأتساخات
5 wooden skewers	عدد 5 ساق خشبية للتنظيف
5 tongue depressors	عدد 5 ملعقة خشبية
cotton	قطن
1 padlock and key for toolbox	قفل بعدد 3 مفاتيح

Conservation Work on the Euergetes Gate Prior to the 2010-2011 Season

One of ARCE's previous conservation projects included cleaning portions of the Euergetes Gate. Under the direction of former ARCE employees Ed Johnson and Saied Hassan, several graduates of the ARCE Conservation Field School began cleaning the ceiling and the jambs of the gate during the 2009-2010 field season. The methods used for cleaning the gate were as follows:

- 1) Distilled water applied to paper napkins and left on the wall for approximately 30 minutes each; this process was repeated several times.
- 2) Swabbing of the surface using a 3-5% solution of ethylenediaminetetraacetic acid (EDTA) and 5% ammonium carbonate in distilled water.
- 3) Large cotton sheets (figures 14 and 15) were then adhered to the wall and saturated with distilled water. Multiple sheets were applied until the cotton no longer turned yellow.

The previous cleaning method is a variation of *poulticing*, a technique which aims to remove dirt and staining from archaeological surfaces. However, the large amounts of

distilled water used to rinse and clean the wall did not allow for much control or the ability to protect areas containing water-sensitive original pigment.

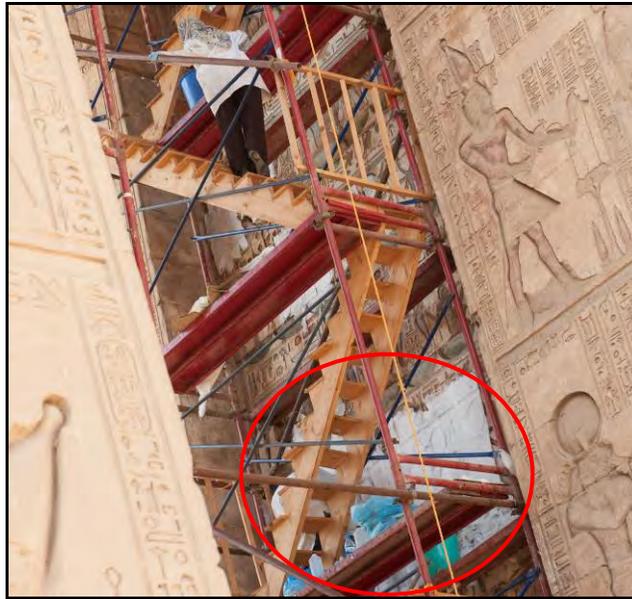


Figure 14. A section of the Western jambs during cleaning.



Figure 15: A section of wall showing cotton sheets saturated with distilled water.

During the later months of the 2009-2010 season, it became clear that the cleaning methods that had been used on the gate were problematic. The teams working on the gate were too large, making it difficult to supervise in the best possible manner. Changing the ratio of students to supervisors was a necessary change.



Figures 16 and 17. Students applying solutions to cotton sheets during the 2009-2010 field season

As a result of the use of very saturated cotton for the poulticing of the jambs (figures 16 and 17), the green pigment “migrated” away from its original position in many places. The excessive moisture activated the pigment which then travelled into the surrounding sandstone support layer. The end result was sections of decorative scenes where the green pigment became a halo around the original carvings and features (figures 18 and 19). The green pigment is particularly susceptible to water; fortunately, no other colors appeared to have bled into the surrounding sandstone.



Figures 18 and 19. Sections of decorative carvings showing green pigment that migrated into the surrounding sandstone and plaster layers as a result of the previous cleaning method.

In an effort to rectify this problem and remove some of the green pigment which traveled from its original position, several cleaning tests were performed in June 2010 by ARCE conservators Christie Pohl and Claire D'Izarny. The results of the initial cleaning tests have been included as an appendix to this report.

Condition Assessment for 2010-2011 Season

There were some specific additional treatments required on the ceiling and jambs of the Euergetes Gate and this work began in mid-October 2010. The following list details the primary tests and treatments planned for the work on the ceiling and jambs during the fall of 2010:

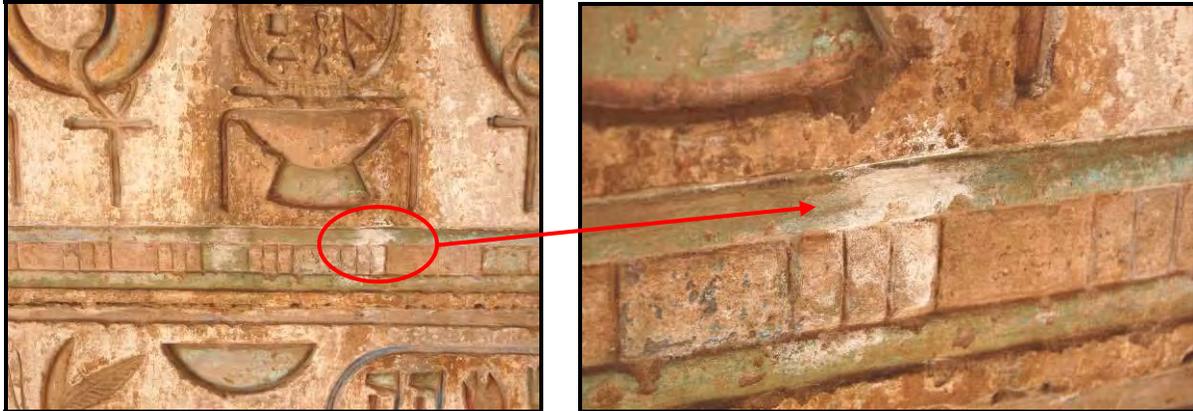
- Tests for removing an unknown white residue that had appeared on the surface of the wall in several places
- Tests to determine if salt is present on the surface of the wall in a few areas
- Cleaning tests to find a method for removing the staining from the stone and plaster
- Tests for the most effective paint consolidant
- Removal of the unknown white residue
- Removal of cotton remains left from the cleaning during the 2009-2010 season
- Poulticing to remove green pigment migration
- Poulticing of the plaster background to remove staining
- Consolidation of the surviving paint layer
- Removal of bird remains and installation of wooden and metal screens to prevent birds from resting in the upper corners of the monument
- Final dry cleaning of the surface of the jambs and ceiling

It should be noted that these specific treatments were agreed upon by ARCE management and conservators in an effort to rectify any remaining problems with the previous cleaning work and also attend to other necessary treatments which were not addressed during the previous season. There was a need to finish the work on the gate as quickly as possible for the benefit of all parties involved.

Initial Testing

Tests for removing an unknown white residue

An unknown white residue was observed in several registers of the Eastern and Western jambs (figures 20 and 21). Two different methods were used to try and remove the white residue: dry cleaning sponges and swabbing of the area with distilled



Figures 20 and 21. An example of the unknown white residue on the Euergetes Gate

water. Two separate areas were selected for the tests: register A2 on the Eastern jamb (figure 22) and one area on the ceiling. The sponges worked moderately well to remove the residue, but the swabs and distilled water were very effective for removing the residue completely. Since it was easy to remove the residue in both areas using the same method, the conclusion was that the residue was likely remains of the solution used to clean the wall during the 2009-2010 season. Ammonium carbonate was an ingredient in the solution and it is possible for this to appear as a white residue if it is not properly removed.

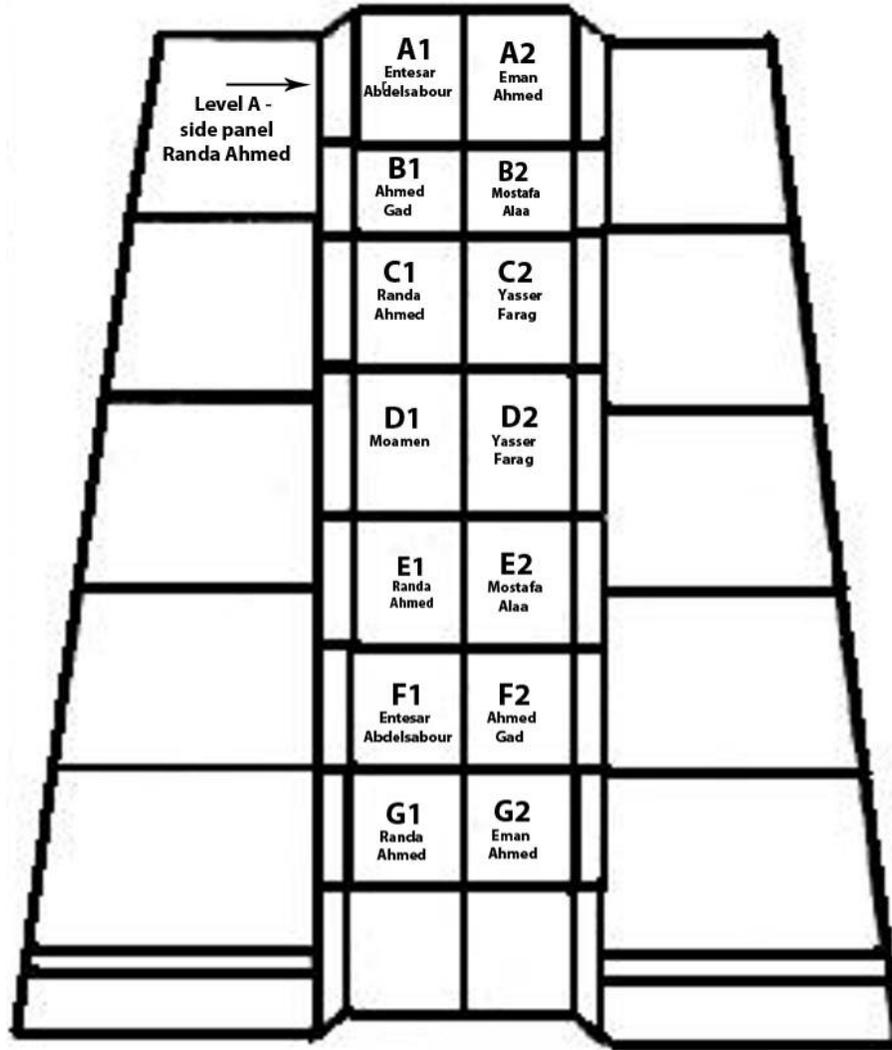


Figure 22. A diagram of the Eastern side of the Euergetes Gate showing how the jambs were divided into registers for the conservation work.

Testing for salts

Two areas on the Eastern jambs (register F2) were selected to test for the presence of salts. Samples were taken from the wall and tested using Merck® semi-quantitative test strips which can confirm the presence of chlorides, nitrates and sulfates. The samples were put into solution with 10 ml. of distilled water and both samples showed the following results:

~ 750 mg/L of chlorides

~ 1 mg/L of nitrates (most likely negative)

~< 200 mg/L of sulfates (most likely negative)

A few different methods were employed to remove the salts including mechanical cleaning and poulticing. The mechanical method was not very effective, so two poultices were tried:

1) 5% carboxymethyl cellulose (CMC) applied to Japanese tissue and left for approximately 30 minutes, followed by swabbing of the area with distilled water.

2) 2% ethylenediaminetetraacetic acid (EDTA) and 4% ammonium carbonate solution applied to Japanese tissue, then covered with 5% CMC and a sheet of Mylar.

The second test was not as effective as the first and so 5% CMC was used to remove salts from the surface of the walls and ceiling.

Cleaning Tests

Several different cleaning tests were completed in register F2 on the East wall. The objective of the tests was to try and find a method for removing both hard layers of dirt and staining from the plaster and stone surfaces. The following map (figure 23) shows where the cleaning tests were completed, it also includes the location where the two samples of salt were taken. The map is followed by a chart which details the different materials used for the cleaning tests.

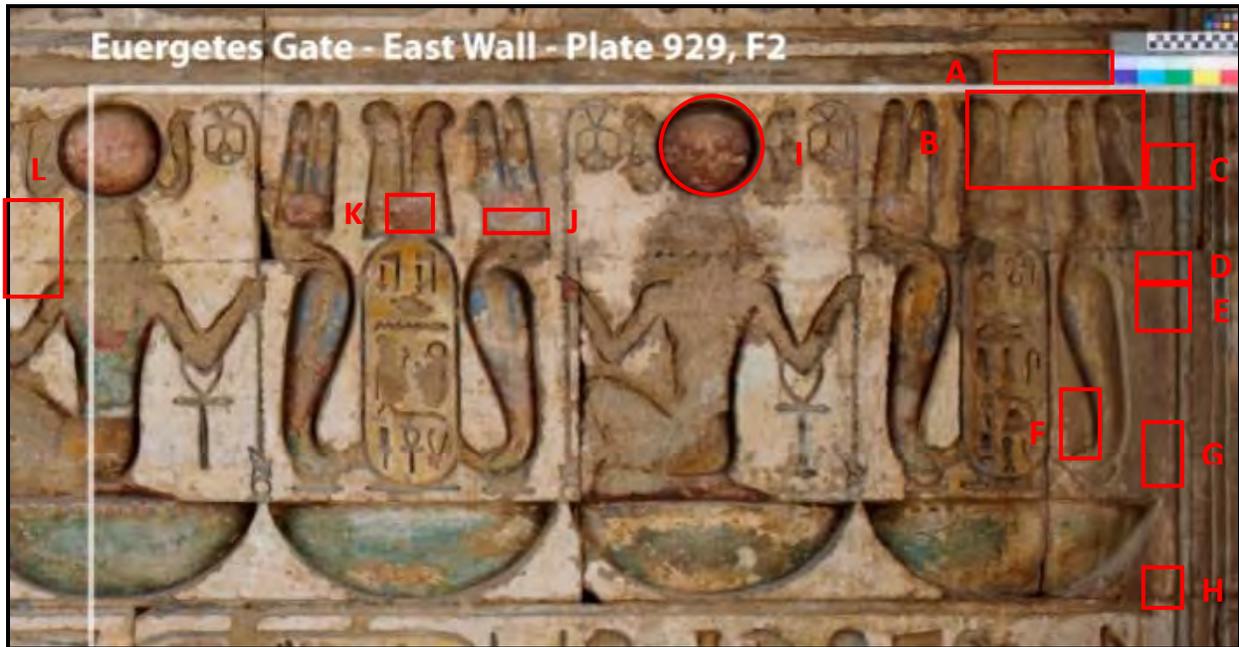


Figure 23. Map of the cleaning tests and sampled areas before treatment – Euergetes Gate – Eastern jamb – Register F2 – November 2010.

CLEANING TESTS AND AREAS SAMPLED: EAST WALL – Register F2 - November 2010	
LOCATION	CLEANING TEST/MATERIAL SAMPLED
A	Removed dirt with H ₂ O poultice
B	Removed dirt with H ₂ O poultice
C	Poultice: Japanese tissue, 6% carboxymethyl cellulose (CMC), 5% cellulose powder and 3% ethylenediaminetetraacetic acid (EDTA) in H ₂ O, covered with Mylar (second attempt using this mixture)
D	Poultice: Japanese tissue, 6% CMC, 5% cellulose powder and 3% EDTA in H ₂ O, covered with Mylar (first attempt using this mixture, left poultice on for 2 hours)
E	Poultice: Japanese tissue, 4% ammonium carbonate, 2% EDTA in H ₂ O, covered with layer of 5% CMC and Mylar, left poultice on for 1 hour
F	Poultice: Japanese tissue, 4% cellulose powder, 1.5% EDTA, 6% CMC in H ₂ O with Mylar cover, left poultice on for 2 hours
G	Poultice: Japanese tissue and 3% EDTA in H ₂ O, left poultice on for 1 hour
H	Poultice: Japanese tissue, 4% ammonium carbonate, 2% EDTA in H ₂ O, covered with layer of 5% CMC and Mylar (second attempt using this mixture, left poultice on for 1 hour)
I	Poultice to remove salt: 5% CMC in H ₂ O
J	Area where salt sample was taken for testing (positive for chlorides)
K	Area where salt sample was taken for testing (positive for chlorides)
L	Poultice to remove yellow staining from plastered area: Japanese tissue, 4% cellulose powder, 1.5% EDTA, 6% CMC in H ₂ O with Mylar cover

The following map (figure 24) shows the test areas after cleaning.

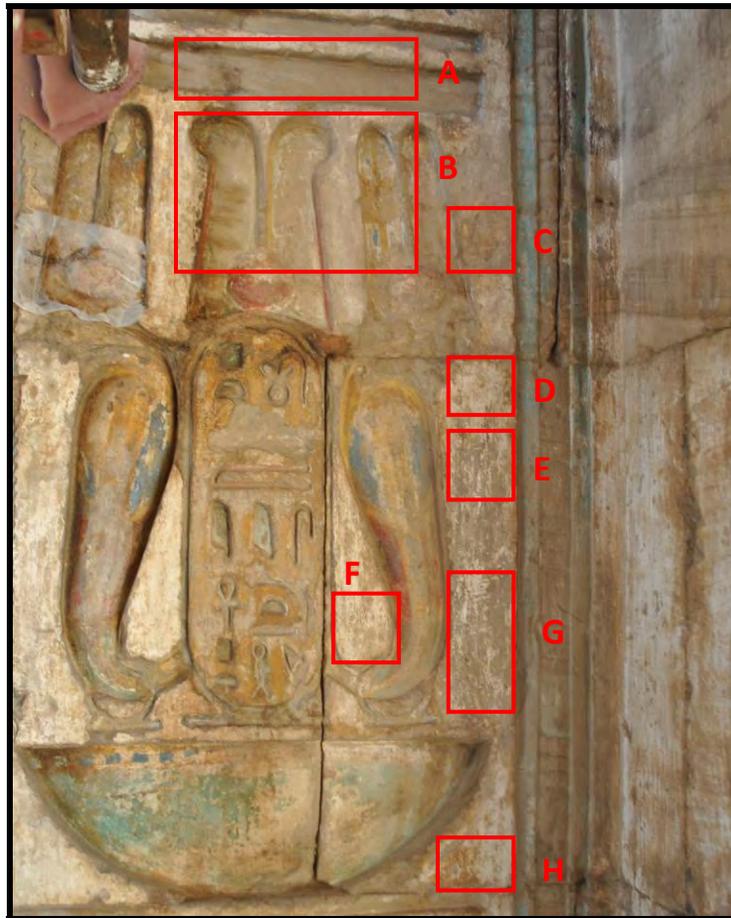
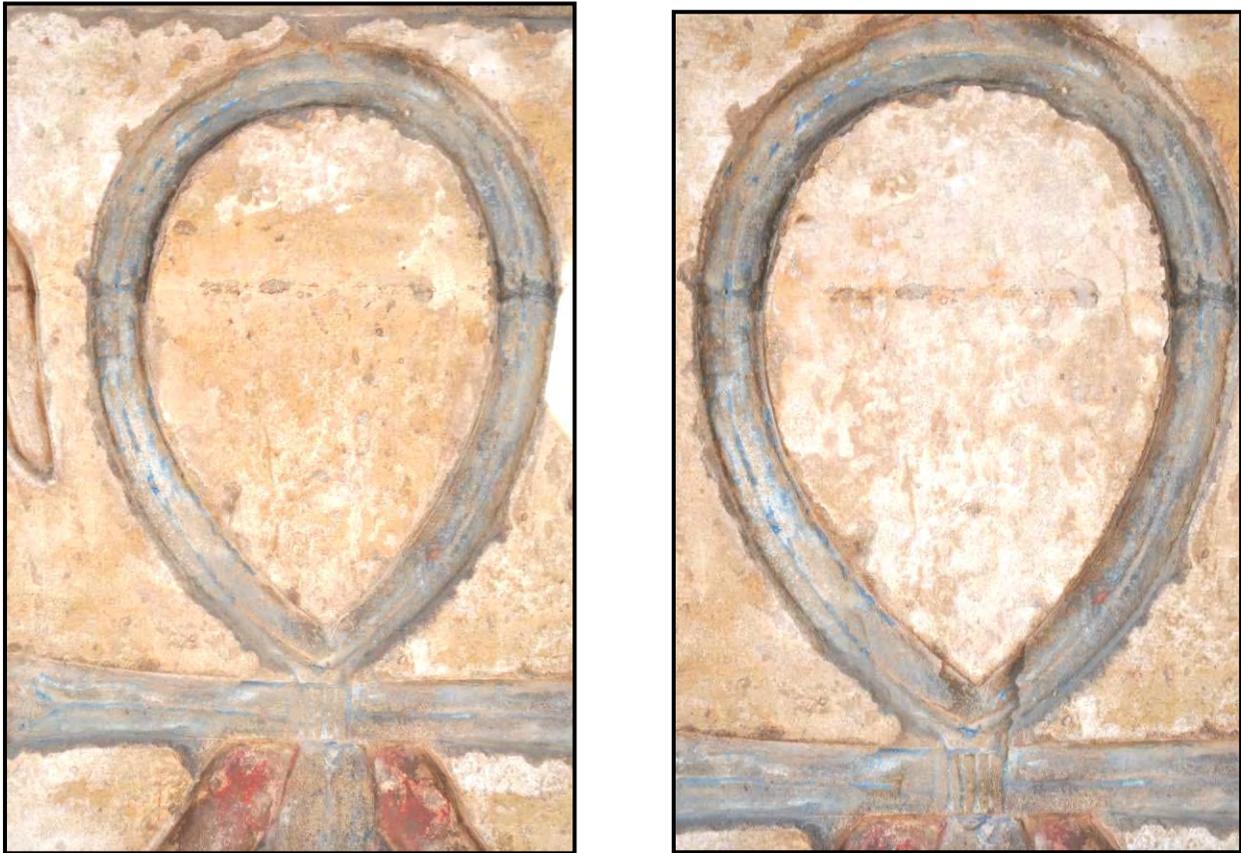


Figure 24. After the completion of the cleaning tests.

Out of all of the tests for removing staining from the plaster and stone surfaces, the poultice using Japanese tissue, 4% cellulose pulp, 1.5% EDTA, 6% CMC in distilled water (covered with Mylar) was the most successful. Figures 25 and 26 show a larger test area on the Western jamb (register D1) before and after poulticing a stained area of plaster.



Figures 25 and 26. Stained area of plaster before poulticing (left) and the same area after poulticing (right) with a paste made from 6% CMC, 1.5% EDTA, 4% cellulose powder in distilled water applied to Japanese tissue and covered with Mylar.

It was fortunate to find a poulticing paste which successfully removed the unsightly yellow staining. This was not part of the original scope of work for the gate, but after the success of the test it was added to the overall treatment plan. The poulticing process itself will be detailed further in the treatment section of this report.

Tests for paint consolidation

Two tests were completed in an effort to find the most effective consolidant for the remaining paint layer (figures 27 and 28). The goal was to find a concentration that

strengthened the paint layer without altering the color. 2% Paraloid® B44 in acetone and 2% Paraloid® B44 in xylene were selected for testing. Paraloid® B44 was selected as it has a high glass transition temperature (60 Tg°C) and this is necessary due to the high temperatures in Egypt. The results showed that the solution containing acetone darkened the color of the pigment slightly. There was no change to the color where the xylene solution was applied. Also, xylene helps the B44 penetrate further into the paint layer. The paint consolidation process will be discussed further in the treatment section of this report.



Figure 27. The area selected for the consolidant tests.

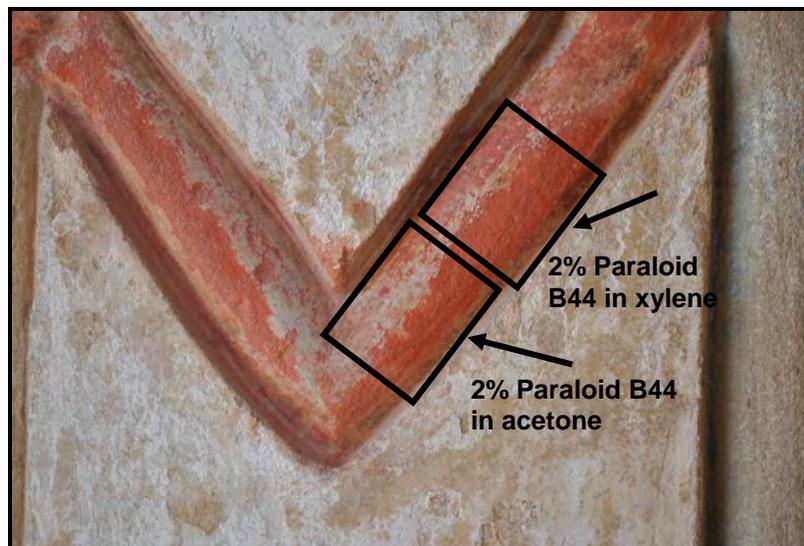


Figure 28. The area after testing.

Treatments Completed on the Eastern and Western Jambs and Ceiling

Removal of white residue

As mentioned previously in the initial testing section, the white residue left behind on the surface of the ceiling and walls (figure 29) was easily removed using cotton swabs and distilled water (figure 30).



Figure 29. Examples of white residue on the ceiling.



Figure 30. One of the conservators removes white residue from the ceiling.

Removal of cotton remains from the previous cleaning (2009-2010 season)

Figure 31. Cotton remains from the previous cleaning of the gate

As a result of the copious amounts of cotton that were used for cleaning the gate during the 2009-2010 season, there was a significant amount of cotton left behind on the surface of the walls and ceiling (figure 31). All of the bits of cotton were removed by hand using tweezers (figure 32) and were collected in a plastic bag. It was also necessary in some places to wet the cotton slightly and then remove it with a stiff brush as some of the cotton had hardened and become fixed to the surface.

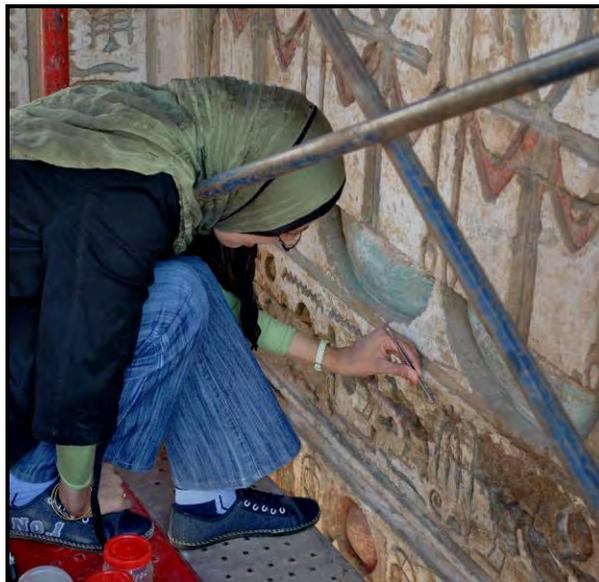


Figure 32. A conservator removes excess cotton with tweezers.

Poulticing to remove green pigment that migrated from its original location

As mentioned in the previous section of this report on the past cleaning methods, many instances of green pigment migration occurred on the Eastern and Western jambs (figures 33 and 34).



Figures 33 and 34. Examples of green pigment that migrated from its original location

A poulticing method was discovered during the June 2010 tests which successfully removed the green pigment that migrated away from its original location. At the beginning of the season, ARCE conservation supervisors Christie Pohl and Claire D'Izarny demonstrated the technique to their teams of technicians who worked on the gate (figure 35).



Figure 35. ARCE conservator Claire D'Izarny demonstrates the poulticing method to the conservators.

The steps of the poulticing process were as follows:

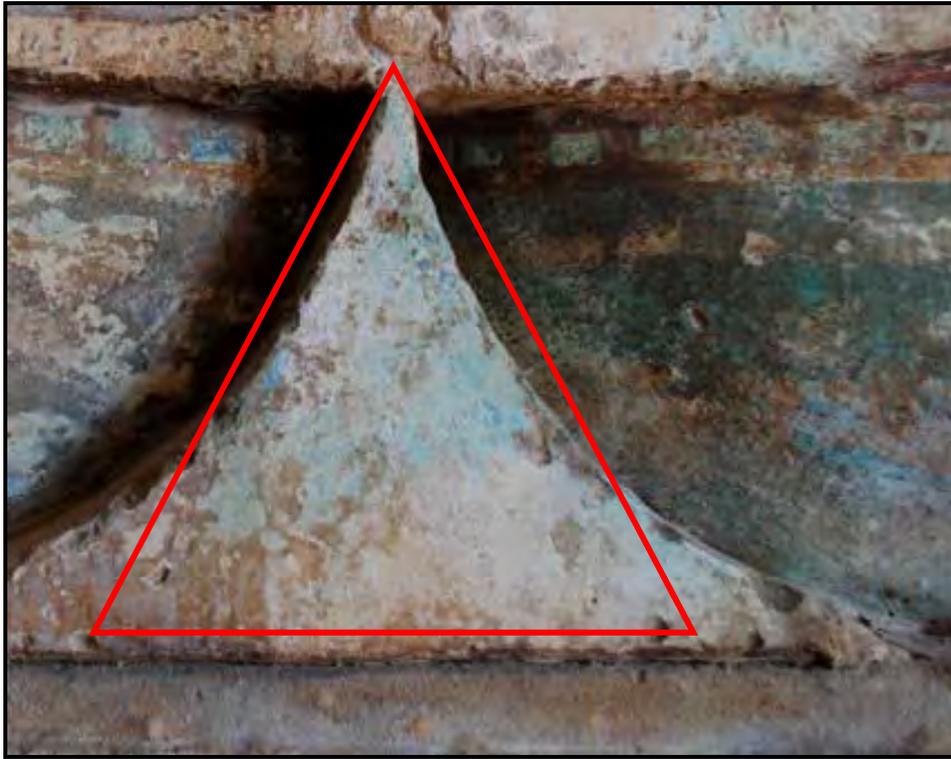


Figure 36. A section of wall before the treatment for pigment migration

- 1). A sheet of Japanese tissue is applied to the surface where the migration occurred and it is adhered to the wall by brushing the edges with a 5% solution of carboxymethyl cellulose (CMC).
- 2). The poulticing paste is made using 4% cellulose powder/pulp, 1.5% ethylenediaminetetraacetic acid (EDTA), and 6% CMC in a liter of distilled water. The paste is applied as a thick layer to the surface of the Japanese tissue (and wall) using a metal spatula.
- 3). To keep the poultice in place and encourage the process, a sheet of silicone-coated Mylar® (polyethylene) is cut to size and placed on top of the paste (figure 37).
- 4). Depending on the amount and severity of the green pigment migration, the poultice is left in place for approximately 30 minutes and, in more severe cases, a few hours.
- 5). After removing the Mylar®, paste and Japanese tissue, the entire area is cleaned using cotton swabs and distilled water (figure 38).



Figure 37. During poulticing.



Figure 38. Cleaning the area with distilled water.

In a few cases, it was necessary to poultice the same area two or three times in order to completely remove the green pigment. No modern pigment was added to the areas which lost pigment. ARCE's practice is one of minimal intervention and, therefore, the goal was to just remove the pigment that bled out into the surrounding sandstone. Figures 36-39 show the poulticing process before, during and after completion.

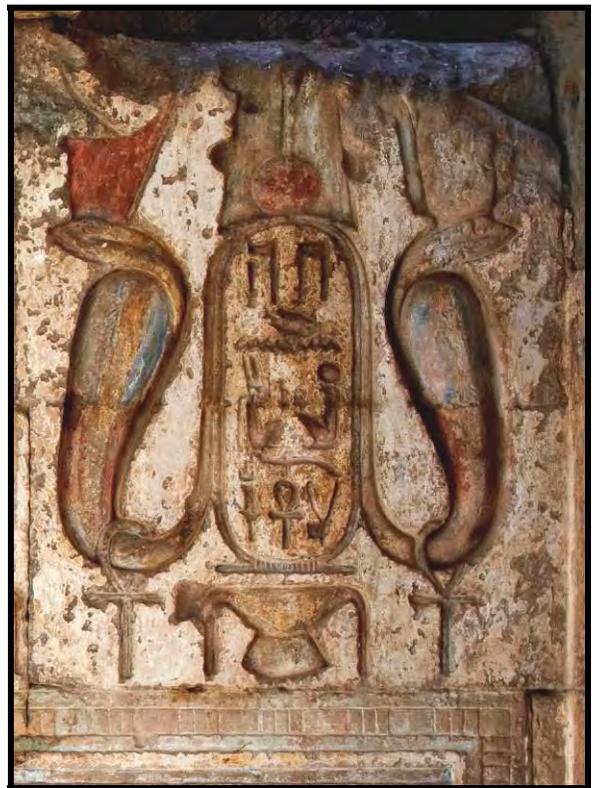


Figure 39. After poulticing and cleaning.

Poulticing of the plaster background to remove staining

After the discovery that the paste used to remove the green pigment successfully reduced some of the yellow staining from the plaster background, this treatment was incorporated into the overall scope of work. The method for applying and cleaning the poultice used on the plaster background is the same as the method described on page 25: a paste made from 4% cellulose powder/pulp, 1.5% EDTA, and 6% CMC in a liter of distilled water applied on top of a sheet of Japanese tissue and covered with Mylar®, then cleaned with cotton swabs and distilled water.

The effectiveness of this treatment was discovered mid-way through the work on the gate, so registers that had been completed were revisited in order to reduce the staining on the plaster background. Overall the work on the gate progressed faster than anticipated so it was possible to spend some additional time doing poulticing work. The end result was a more homogeneous looking surface on both the Eastern and Western jambs. Figures 40 and 41 show a section of the A2 register on the Eastern jamb before and after poulticing of the plaster surfaces.



Figures 40 and 41. Before poulticing of the plaster background (left) and after treatment (right).

Consolidation of the surviving paint layer

The surviving paint on the jambs and ceiling of the gate is extensive. In general, the green and blue pigment is more fragile than the yellow and red pigment. After experimenting with two solutions (previously described in the testing section of this report) a solution of 2% Paraloid® B44 in xylene was selected for the consolidation of the paint layer. Because of the fragile nature of the blue and green pigment a plastic pipette was used to apply the solution; a brush is more likely to remove flaking areas, whereas the use of a pipette keeps the contact with the paint layer to a minimum (figure 42). Respirators were worn by the technicians during the consolidation process due to the toxic nature of xylene.

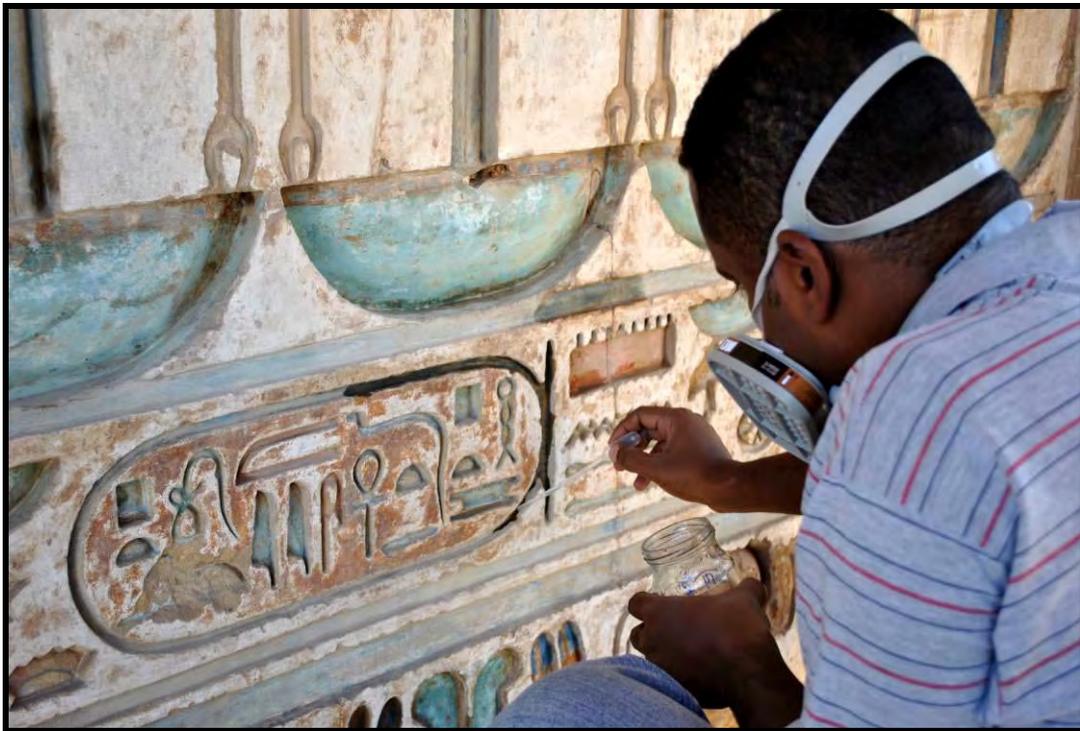


Figure 42. A conservation technician applies consolidant to an area containing fragile blue pigment.

Removal of bird remains and the installation of screens to prevent birds from perching in the upper corners of the gate

There were two areas in the upper corners of the monument (the A2 register on the Eastern jamb and the A1 register on the Western jamb) where pigeons would perch and leave behind their droppings (figure 43). In order to prevent the birds from accessing these areas, wooden frames and metal screens were custom made to fit inside of the corners. These screens were made to be removable since the corner on the Eastern side is the only access point to the roof. Figure 44 shows the upper corner of Register A2 on the Eastern side after conservation treatment and installation of the screen.

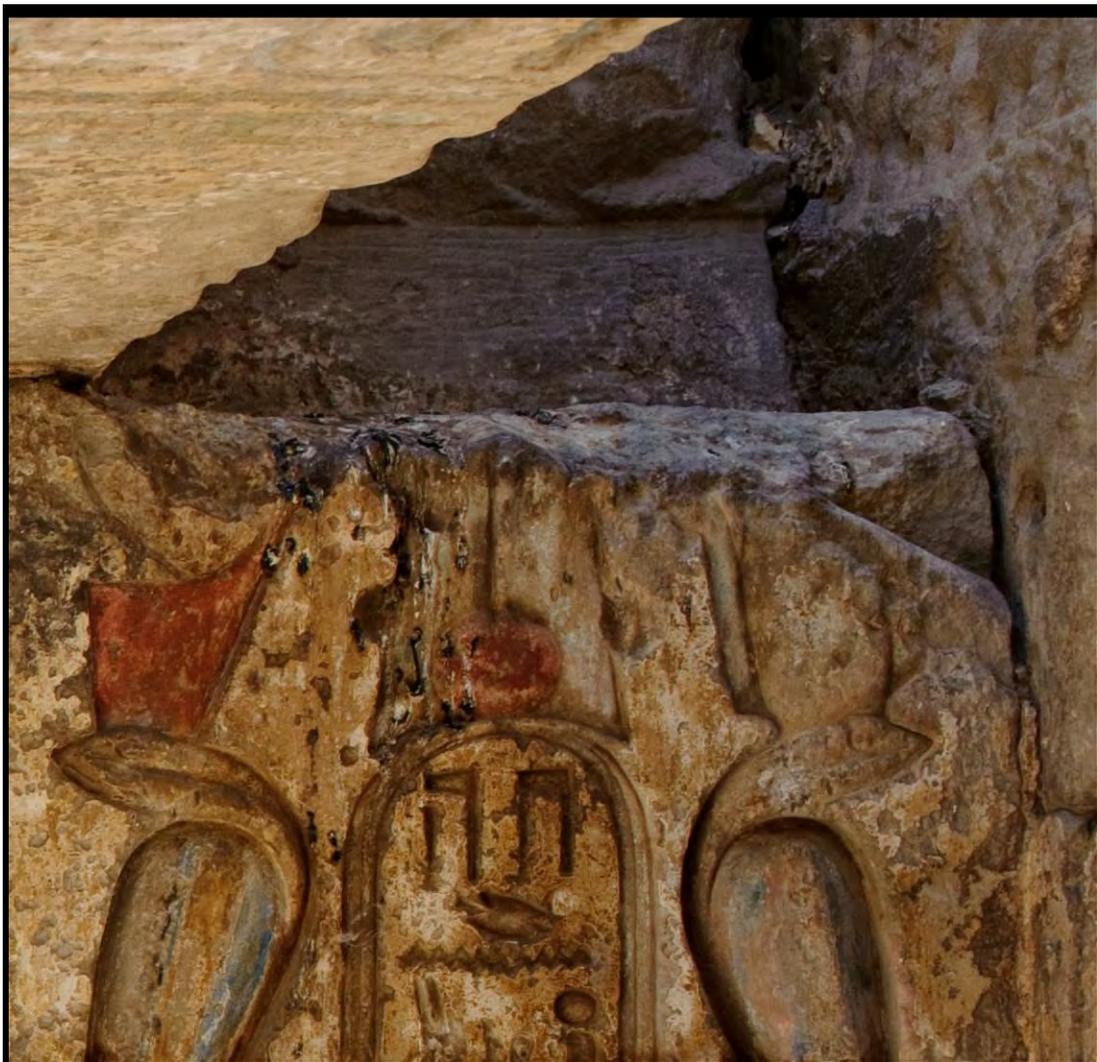


Figure 43. The upper corner of the Eastern jamb showing the flat area where pigeons could perch and soil the decorated surface with their droppings.

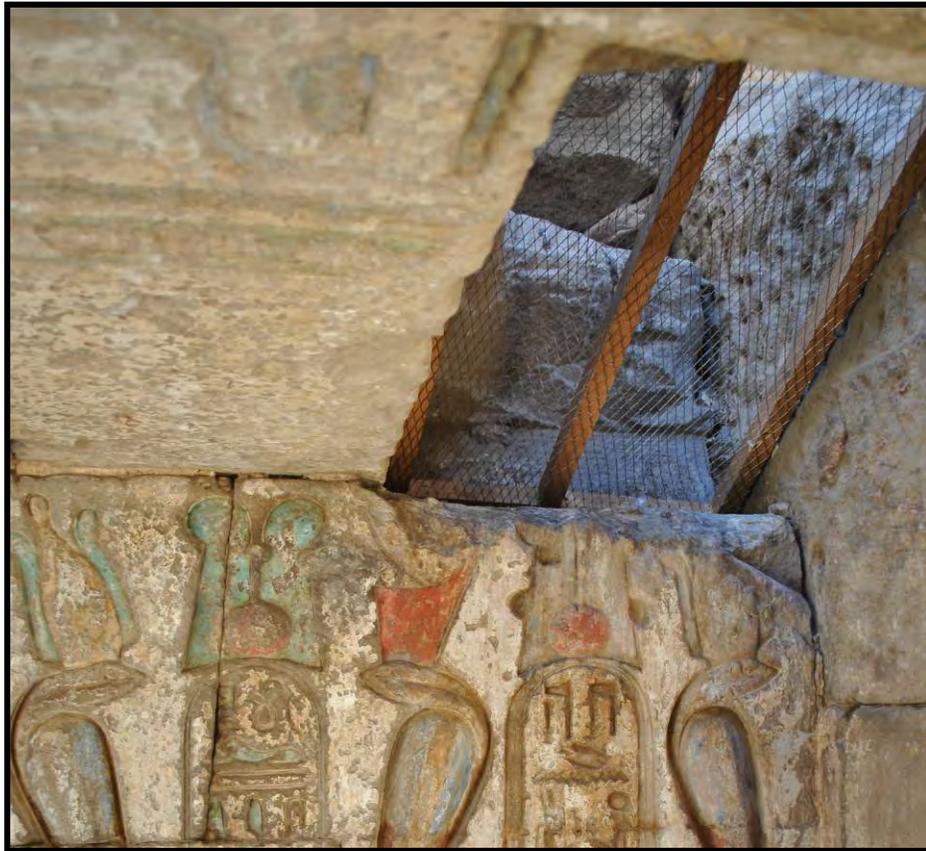


Figure 44. The upper corner of the Eastern jamb after cleaning and installation of the removable screen.

Final dry cleaning of the surface of the jambs and ceiling

After completing all of the treatments included in the scope of work for the 2010-2011 season, each register of the jambs and ceiling was given a final dry cleaning using a large, soft brush to remove any remaining dirt and/or dust (figure 45).

A temporary cover using canvas or another breathable material should be considered if any extensive excavation or construction work is to take place in close proximity to the gate in the future.

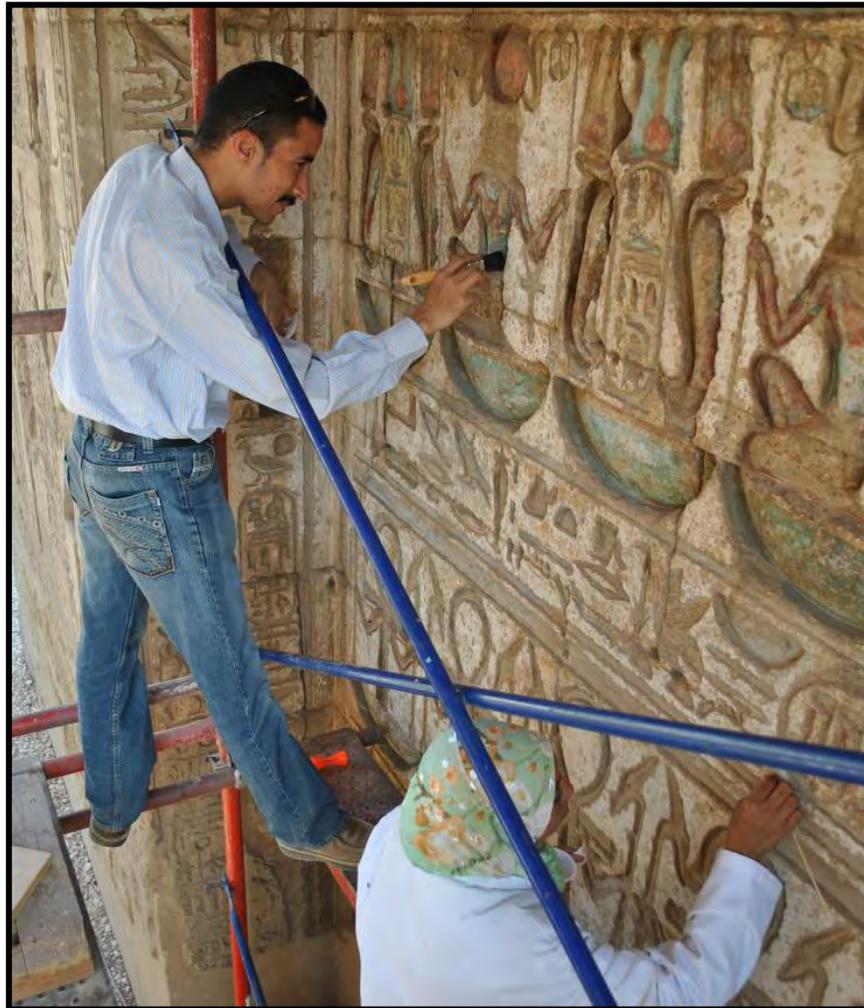


Figure 45. Dry cleaning a section of the Eastern jamb after completing all the conservation treatments.

