

**ARCE/EAP Subproject  
Conservation of the Sarcophagus of Ramesses VI**

**Tomb of Ramesses VI (KV 9)  
Valley of the Kings, Luxor**

**Progress Report for May/June 2003**

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**Abstract**

The work of the project this season focused on completion of the placement of fragment groups on the sarcophagus box and infilling some of the gaps with lime mortar. Additions to the limestone base were made to give it the same dimensions and plan as the red granite outer sarcophagus. The previous wooden platform for support of the lid assembly that covered part of the central pit in the floor was removed. A new wooden support for the lid assembly was constructed and a new site for its installation was chosen on the sloping floor of the deep central niche at the rear of the burial chamber. The lid fragments were assembled on the sloping wood platform and joined together with epoxy adhesive. More drawings of the box and lid assemblies were made for the final report and further photographic documentation was carried out.

## **I. Introduction**

This season the work plan was to complete the installation of the sarcophagus fragment groups either beside or on the box and to assemble the lid fragments together with the face replica on a new support that did not obscure the central pit in the burial chamber floor. Work on the sarcophagus box and lid began May 10, 2003 and ended on June 9.

The members of the team this season included Edwin Brock, project director, Dany Roy, stone carver, Lotfi Khalid Hassan, paint conservator, Lyla Pinch Brock, artist, Francis Dzikowski, photographer, Mohammed Mahmoud Hassan, conservation assistant and Nahed Samir, conservation assistant. The inspector assigned to the project this season was Mohammed Bakri Hassan.

The help of the Supreme Council of Antiquities is hereby acknowledged, including the Secretary General, Dr. Zahi Hawass, Magdy El-Ghandour, General Director of Foreign Missions and Permanent Committees, Dr. Holeil Ghaly, head of the Central Directorate of Upper Egypt and the Oases, Dr. Ali El-Asfar General Directorate of Theban West Bank Antiquities, Ibrahim Suliman, Chief Inspector of the Qurna Inspectorate, and Ezz El-Din Kamel El-Nubi, Chief Inspector of the Valley of the Kings. The assistance of the American Research Center and the Egyptian Antiquities Project is also acknowledged with gratitude, including Dr. Jerre Bachrach, Madame Amira Khattab, Robert K. Vincent Jr., Michael Jones, Jarek Dobrowalski and Janie Abdel Azziz.

During the work period it was possible for Jerre Bachrach and Michael Jones to visit the project and their interest and observations are appreciated.

## **II. Sarcophagus Lid**

### **II A. Removal of Wood Platform**

Following discussion with EAP this spring it was agreed that the wooden platform previously erected over the north side of the central floor pit should be removed as it obscured the view of the pit. A different means of displaying the lid assembly would be adopted that would support the lid on an inclined surface so that the face replica could be better seen by visitors standing at the east side of the chamber. This new support would be situated in the space between the edge of the pit and the northern bedrock platform. The actual location for the lid assembly was subsequently changed as is discussed below. Prior to removing the assembled but un-cemented lid fragments from the old platform, an outline of the lid was drawn on the surface of the platform, noting, as well, the location and outline of their lower edges where these touched the platform. After their removal a tracing was made on paper of the outline of the assembled lid fragments. This tracing would serve as a template for the new support for the lid assembly. The wooden platform was dismantled and the lumber selected for use in the construction of a new support for the lid.

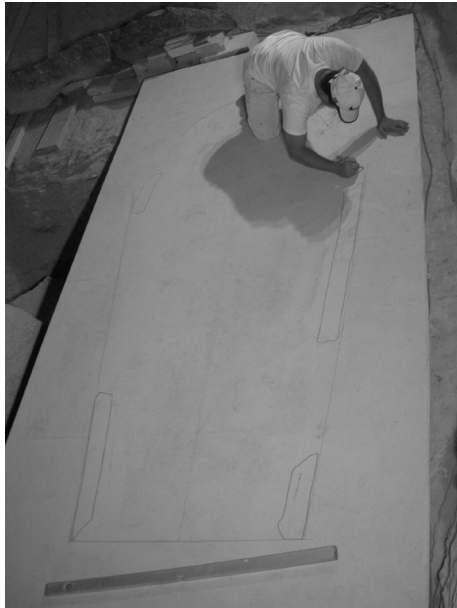


Fig. 1. Day Roy drawing outline of lid on old wood platform before tracing.



Fig. 2. Timbers for platform module assembled, with tracing of lid outline.

## II B. Construction of Wooden Support for Lid

The selected lumber consisted of 13 pieces of 2 x 4 varying in length from 2 - 3 meters. These were taken to a carpentry workshop and the pieces were planed and glued together, augmented by mortice and tenon joints. Three cross pieces were attached to the underside at the widest part, the foot end and halfway between. The tracing of the outline of the lid was then transferred onto this wooden construction and the final form was cut. Six other pieces of 2 x 4 were glued together in pairs along the widest surfaces to form three lengths of 4 x 4 to serve as 5 vertical supports for the sloping wood base. The longest of these 80 cm, would be placed below the head end two others would be set in from the edges at the widest part of the base and the remaining two supports would be placed halfway to the foot end. Wooden receptacles were attached to the underside of the lid at the head end, and near the ends of two of the cross bars to surround the upper ends of the legs in order to strengthen the contact with the platform and prevent lateral slippage. A slanting brace was inserted against the longest leg at the head end, running to the center of the cross bar at the widest part of the platform to further increase strength and stability. Another pair of slanting braces was placed between the legs at the widest part of the lid and a third pair at the second pair of legs. The wooden platform and legs were all painted a light beige to



Fig. 3. Underside of platform after cutting to the contour of the lid outline, showing placement of supports.

### II C. Selection of Display Site for Lid

After the new wooden base for the lid assembly was constructed, an attempt was made to find the best location to place it from the viewpoint of appearance and security of support. Using the replica of the face as a reference point, since it was light in weight, the wooden base was set up to the north of the central pit with as much of the base as possible positioned on the flat bed rock surface. The head end of the base was raised to approximately 80 cm, a height calculated to afford the optimal angle for viewing and held up temporarily by screw jacks. There still remained a part of the proper right side and foot end of the base that would rest over the uneven sloping surface of the edge of the pit. The original intention had been to lay the platform flat on the bedrock floor, place the fragments of the lid as well as the replica on the platform, glue them together, and then jack up the platform at the head end to the height of 80 cm and insert the support legs. If the lid fragments were placed on the base in this position, a considerable amount of weight would have been directly over the least stable part of the emplacement.



Fig. 4. Test placement of platform to north of central pit, looking north.

Aside from the difficulty of installing support for the wooden base and lid assembly of sufficient strength and stability to carry the load over this uneven sloping surface, maneuvering the fragment groups into place from their temporary storage position at the west end of the pit and in the rear niche across the open pit and onto the platform

would be difficult and perhaps dangerous. This would have to be done without the use of the winch as there was not enough available level space on which to erect it over the intended work area. Instead, only the strength of the available manpower working in the restricted space between the pit and the platform would be the only means of getting the pieces in position on the platform.

In addition to these stability and installation concerns, the overall appearance of the assembly and platform in that location was not appealing. In order to utilize as much of the flat floor area as possible to serve as a support surface, it would be necessary to locate the assembly and platform at the northwest corner of the floor area, rather than in a more aesthetically pleasing central location which would have put the right half of the assembly over the edge of the pit.



Fig. 5. Test placement of platform to north of central pit looking west.



Fig. 6. Test placement of platform in rear niche to west of pit looking west.

Another consideration of a more practical nature was that when the SCA conservation technicians were doing any future cleaning and restoration work on the wall and ceiling in this part of the chamber, the lid assembly would be in the way of any scaffolding they would need to erect. As a result there was the possibility that damage to the lid assembly might occur during conservation work or work would be impeded by its presence in this location.

A decision was then made to see what the effect would be if the platform was placed on the sloping floor of the rear niche as had originally been suggested in the initial proposal. The results from an aesthetic view were striking. The lid assembly would be visible to visitors from as far back as the entrance to the first pillared hall, and would draw their attention down into the burial chamber. The symbolism of the scene on the wall at the rear of the niche, showing the solar boat lifted out of the waters of creation at dawn is also evocative with the lid placed directly in front of this theme of resurrection. The sloping surface of the floor of the niche provides a suitable angle for viewing the face of the lid. Although the lid is not in its original position it is on the same original alignment in the burial chamber with relation to the tomb's main axis, just as the sarcophagus box is on the same axis of alignment it had in relation to the burial chamber while not in its original position. Regarding the argument that the



spatial separation of box and lid might make their interrelationship less apparent, it seems that similarity of material and present reassembled condition would reduce this confusion. In addition, the planned information sign should serve to further point out their interrelationship.

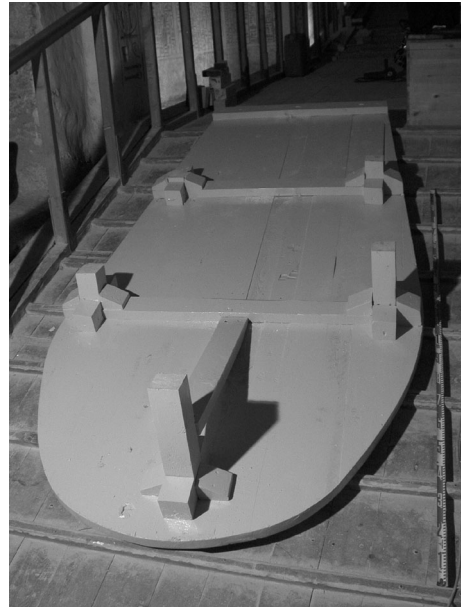


Fig. 7. View of sloping floor in rear central niche. Fig. 8. Underside of platform with legs adjusted to floor of niche.

#### **II D. Assembly of Lid Fragments**

Prior to the installation of the modified wooden base to support the lid assembly, the fragment groups from the proper left and right sides were placed in the appropriate sides of the niche so that they could be more easily placed on the wooden base. The wooden base was placed on the sloping floor and the legs cut down considerably to accommodate the angle of slope as well as irregularities in the floor surface. The bottoms of the legs were mortared to the floor surface using lime mortar. Three stainless steel rods, 1 cm in diameter, were inserted through the foot end of the platform and into holes drilled into the floor beneath to prevent the platform from sliding down towards the pit.

Placement on the sloping surface was difficult but eventually it was possible to place all of the groups together with the face replica in the necessary correct alignment. Wooden supports were installed beneath the assembled groups and stainless steel dowels 8 mm in diameter were inserted into the base at the lower (foot end) of the proper left and right sides to keep the fragments from sliding down. It was soon realized that these were not sufficient in strength, so they were augmented by a 2 cm stainless steel rod inserted in the base at the lower end of the proper left and right sides of the lid assembly. Metal strips 20 cm in width and 3 mm in thickness were attached to the sides of the base with screws. These projected above the upper surface of the base and engaged the sides of the lid where the lower edges touched the base surface, in order to restrict lateral movement of the fragments. Epoxy adhesive (Vantico) was used to cement the fragment groups together, with wooden blocks

placed beneath the central part of the lid for temporary support. The surface of the lid was cleaned of accumulated dust and dirt, particularly around the painted areas of the hands, scepters and striped headdress.



Fig. 9. Lower right side of lid with stainless steel dowels inserted to prevent slippage.

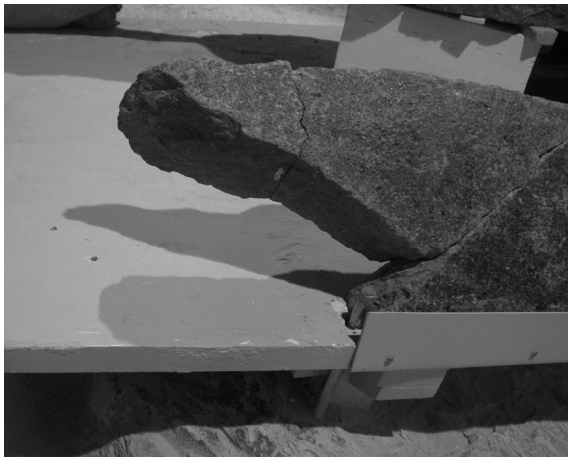


Fig. 10. Lower left side of lid with stainless steel dowel and metal plate to prevent movement.

### III A. Addition of Fragment Groups

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Three groups of fragments that had been fashioned during the previous season belonged to the proper left side of the sarcophagus box. At that time there were no secure surfaces on the box assembly on which to join these groups. Further examination of several un-joined fragments this season resulted in the discovery that some of them would act as intermediaries for joining between the fragment groups and the box assembly. This was particularly helpful because it allowed the assembly of the box, on one side at least, to be carried from the base to the upper edge. As a result, it was also possible to discover that the upper edge of the box was not parallel to the floor but instead sloped down from head to foot. By projecting a line along the upper edge, it was possible to estimate that the original height of the box at the head end would have been approximately 145 cm and at the foot end 125 cm.



Fig. 11. Fragment groups mounted on proper left side of box, from interior.

Three fragment groups that belonged to the curved head end of the box could not actually be joined to the box assembly due to the lack of intervening fragments to make strong joins possible. Two of the groups were from the proper left side of the head end but did not form a secure join with each other, although they were close together. The other fragment group, from the proper right side of the head end, was large and did preserve some of the upper edge. Unfortunately, there was no secure surfaces for attachment to the box assembly, which would have partly filled in the large gap that now exists at this end of the box assembly. Two wooden display racks were constructed to serve as mounts for these two groups. The fragments are held on the racks by stainless steel rods set into the racks beneath the fragments. These are placed on the platform west of the head end.



Fig. 12a, Fig. 12b. Un-mounted fragment groups from proper left and right sides of head end.



Fig. 13. Wooden racks for supporting un-mounted head end fragment groups.

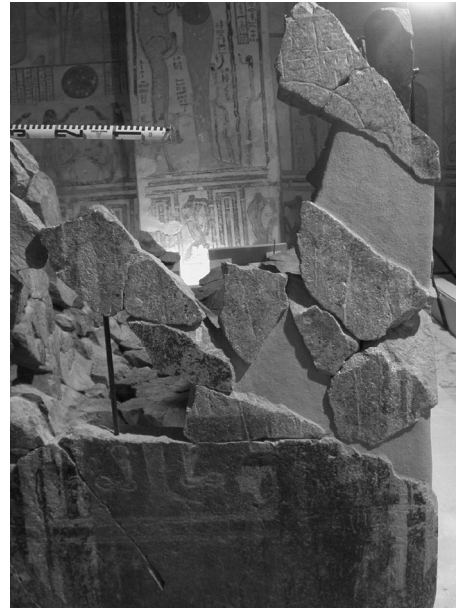


Fig. 14 Fragments added to proper left side of foot end supported by mortar.

It was possible to add two additional fragments to the foot end with the aid of lime and sand mortar filling. One of these was at the proper left corner and although it didn't directly join with the box, it was possible accurately estimate its position by comparison with assembled fragments along the proper right edge that had duplicate images. The other fragment that was attached at the foot end also needed support with lime mortar.

As with the lid cleaning of the surface of the box and the fragments groups to be placed on wooden stands was carried out to remove accumulated dust and dirt from the painted surfaces. No attempt was made to remove any of the black resinous coating. Clean was carried out mechanically using small scalpels. The only chemicals used were diluted alcohol.



Fig. 15. Lotfi and Nahed cleaning un-mounted box fragments.

### III B. Filling Gaps

In order to insure better structural integrity for the box assembly several gaps were filled in with lime and sand mortar. On the proper right side, this was done in the central portion where some heavy fragments were placed over gaps with little support beneath. On the proper left side, a major gap was filled near the foot end and the floor of the box. After the large fragment groups were added to the proper left side of the box, mortar infilling was added to give additional support.



Fig. 16. Mortar infill of gap on proper right side of sarcophagus.

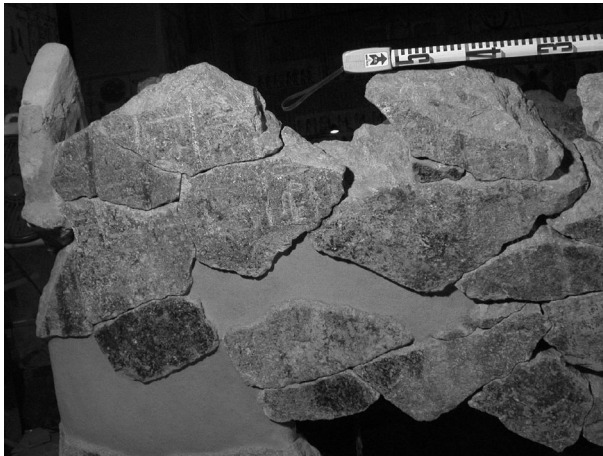


Fig. 17. Mortar infill of gaps on proper left side of sarcophagus.

### III C. Additions to Base

The present base of limestone slabs was augmented by the addition of more limestone left over from unused slabs. The intention was to give the base the same size and form

as the outer granite box that originally held the mummiform second sarcophagus. This necessitated adding 5 cm of material at each side and 17 cm of material at each end to enlarge the limestone base to the dimensions of the outer box at the level of its floor, where the second sarcophagus originally rested. Then outermost of the two 17 cm slabs placed at the head end had their outer corner cut to imitate the curve at the head end of the outer box. The two outermost slabs at the foot end had their corners cut to replicate the indentations at the foot of the outer box. This resulted in a plan similar to the cartouche shape of the outer box. The result of these additions to replicate the dimensions and plan of the outer box should serve to better elucidate the original interrelationship of these monuments.

#### **IV. Documentation**

Lyla Pinch Brock spent several days working on the production of drawings of the box and lid assemblies during the later stages of the work. She accomplished this by a combination of on-site tracings of some of the fragments and digital photography of the assembled groups, particularly the recent additions to the proper left side of the box. She then scanned the digital imagery into a computer and after printing these images out used the prints as the basis on which to create reduced scale drawings. These were then scanned back into the computer for adjustment and final printing. Prior to the beginning of work this season, Francis Dzikowski was able to photograph the face replica in position on the initial lid assembly. He will make a final shooting session of the completed assemblies of the box and lid on June 21.

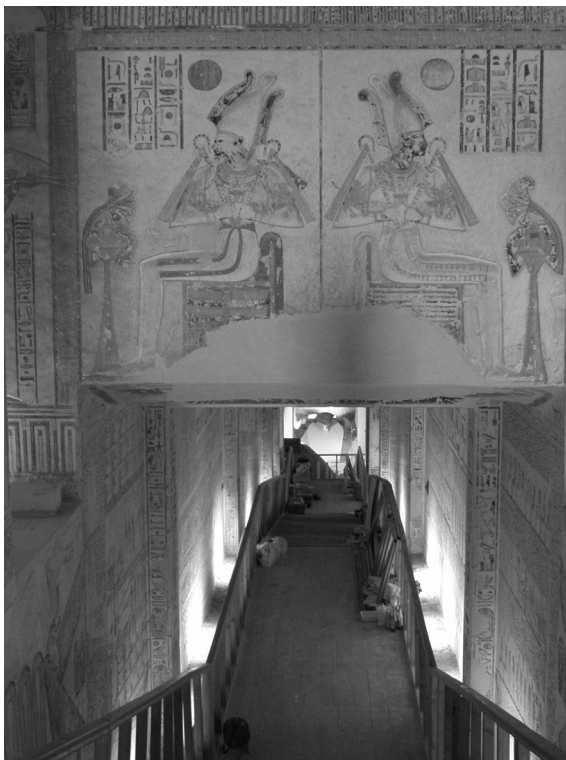


Fig. 18. View from first pillared hall down lower corridors to burial chamber with test emplacement of lid platform in rear niche.

## ASSEMBLY AND RESTORATION OF THE PAINTED SARCOPHAGUS OF THE TOMB KV9.

### PART III – May 2003

#### 1. Introduction

The conservation project of the sarcophagus of kv9, continued the final part of its work for twenty days. The third part of the work contained the assembly the fragments of the lid and to assembly the fragments of the box as much as possible to have a final shape of the box.

This phase was pointed on assembly more fragments as much as possible to give more information about the final shape of the sarcophagus and how and where to display the lid and reconstructing the platform for the lid.

#### The professional staff was composed of

Ted Brock as Egyptologist and project director.

Dany Roy as stonecutter

Lotfi K. Hassan as stone and paint conservator

#### 2. Conservation process (sarcophagus box)

##### 2. 1. Gather pieces

As for the unidentified fragments, these were tested according to their thickness, condition of the surface and paint.

##### 2. 2. Consolidation and Assembly fragments/ join pieces.

The consolidation has done by epoxy resin between the fragments which it loaded by other fragments and it has a space down by missed fragments.



Fiberglass  
dowels to hold  
the fragments  
during the  
assembly

### Section of external side

### The photo showing the consolidation points have done by epoxy resin as preparing phase to take off the dowels

The consolidation was been applied as drops by using syringe. On the internal side was consolidated by filling with mortar.

The fiberglass dowels which were hold the fragments and to secure the work during the assembly phase, were taken off after it has been consolidated the joins by epoxy resin because it was not necessary to keep them after consolidation of the joins and it was not good ecstastically .



*The internal side*

*The photo showing the points of filling with mortar as consolidation by mortar.*

#### **2. 2.1. Assembly fragments/ join pieces**

##### **Reconstruction of sarcophagus box**

In June 2002 the most of fragments of the sarcophagus box have been assembled. There were four groups composed of more pieces together to identify and to have an idea for the final shape.

In this third and final phase of the project, Edwin C. Brock, who was able to find more joins to identify concerning two groups. We were able to assemble and glue them to the sarcophagus box and to have a complete idea about the final shape of the sarcophagus where it indicated that the sarcophagus board was carved as incline way. The other fragments group were displayed separately near to the box.

The fragments have been assembled by using two different epoxy resins (Araldite 106 / Vatico, Egypt with setting time of three hours) and Araldite in tube20ml, made in England with setting time of five minutes).



The Araldite 106 have been used as a mainly glue and the fast one have been used just as a help to hold the pieces together.



(1)



(2)

**The two groups before assembly phase**



*View shows the board of sarcophagus box was carved in incline way*



### 2.3 Treatment of losses (filling with mortar)

The treatment of losses or damaged or missed areas in stone objects or mural paintings should be approached basically in the same way as for other works of art and the same aesthetic and historical considerations should be given to it.

Filling with mortar, was done using by hydraulic lime and inert (sand, stone powder and clay to have suitable color) as 1: 2. it was done as two layer; one is first coarse mortar, it used to fill the space, using small stone as filler to reinforce and second one is fine mortar with suitable color as a final filling.

The filling of losses based on consolidation of fragments together as one block and distribution the weight of fragments on each and also to have stability of the fragments assembled , so the filling of losses was applied on some area where it was necessary to do.

The filling by mortar is removable in case of finding other fragments could be insert in .



*View shows the missing part*



*two final mortar test*

*first coarse*

*filling*



*After filling with mortar*



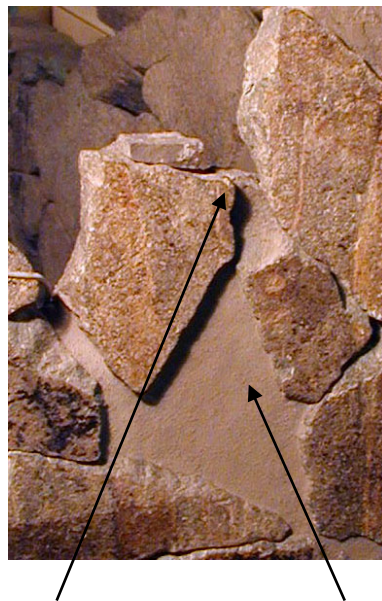
*The filling from the back side*

*The filling from the front side*

*View showing the filling of missed areas by hydraulic lime and stone powder*



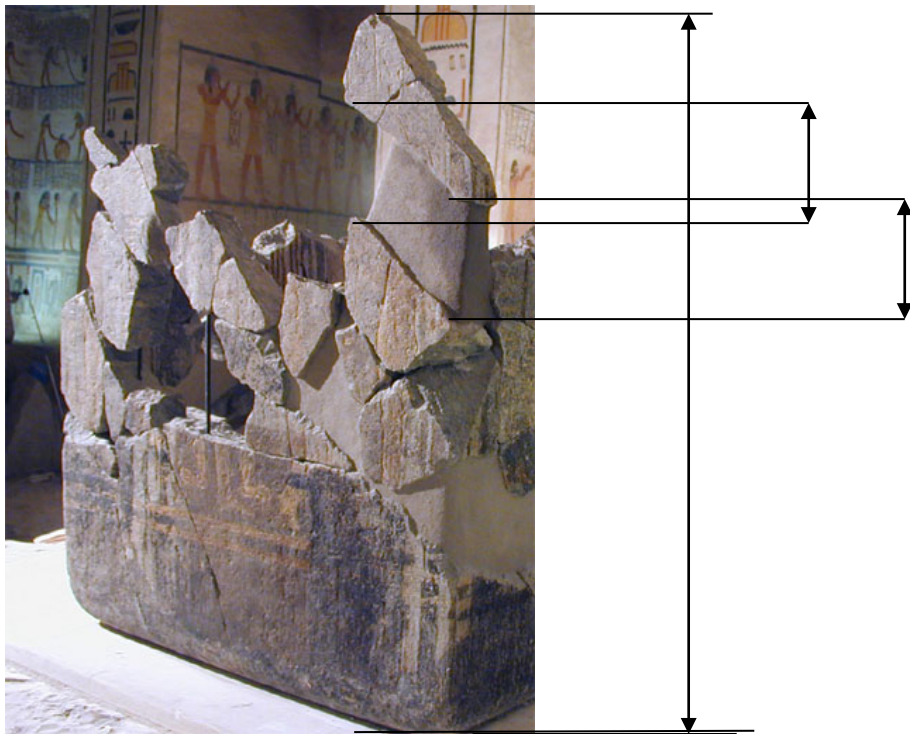
It has been used the filling with mortar not only to fill between fragments, but also to hold the fragments have not good joins.



*Very tiny join*

*the filling with hydraulic lime*

It has been also done small reconstruction by mortar to join another fragment to get an idea about the higher of the sarcophagus.





### 3. Conservation process (sarcophagus lid)

#### 3.1. Gather pieces

The fragments of the lid have been assembled in two sections attending the arrival of the head cast of the original.

In this final phase it has been done the platform where the lid fragments assembled on it. It has been chosen the place where the lid displayed.







It has been not glued the head to the fragments of the lid for two reasons; the first is the facilities in future to move and to add other fragments could be find. The second is the different materials between the head cast and the original materials.

Also, it has been not glued the piece which join the head to the left side of the lid.

#### **4. Conclusion**

The filling of losses was applied on some area where it was necessary to apply.

The fragments of the sarcophagus box were assembled y except some fragments were not known.

Some of the fiberglass dowels were taken off after it had done consolidation by resin.

The fragments of the lid have been assembled in two sections and It has been fit with head without glue.

Very lightly mechanical cleaning was done on lid fragments.