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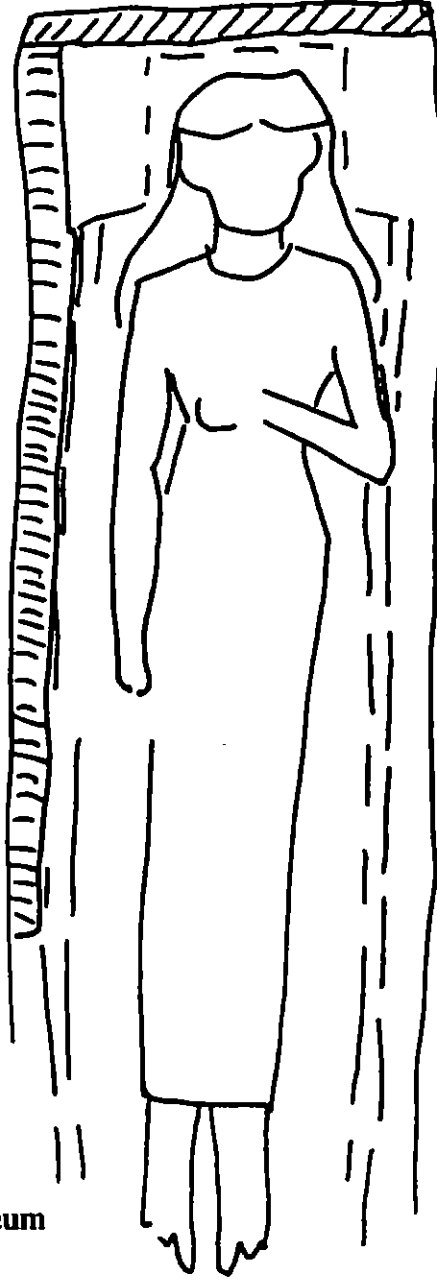
**TCN**

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**TEXTILE  
CONSERVATION  
NEWSLETTER**

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**CONSERVATION OF AN EGYPTIAN PAINTED MUMMY SHROUD**



Prepared by  
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1992

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Supplement to TCN, Spring 1993

**The Conservation of an Egyptian Painted Mummy Shroud**

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## The Conservation of an Egyptian Painted Mummy Shroud

### Description:

The predominant design on the shroud is that of a woman's figure, that of the deceased shown as a goddess. It fills almost the entire space and is shown frontally. The figure is outlined along the sides by a heavy border and around the head by a solidly-coloured background. Other small pattern details surround it.

The figure is wearing a beaded net skirt and a large elaborate collar, sandals, and two narrow armbands on each arm, one above the elbow and the other at the wrist. Her crimped hair falls below her shoulders and is held in place by a wreath. In the hand which rests just below her breast, she holds an olive branch and a fly-whisk; a square amulet hangs at her waist. The other hand which is carrying a libation pail for milk rests at her side.

Surrounding the woman are numerous figures. Two larger figures of jackals are sitting on either side of her feet. Above these are sacred eyes, symbols of the gods Isis and Osiris, another jackal, and figures of Isis and Nephthys mourning. Other funerary deities crowd the remaining space. Above the top of the border are a hawk facing a human-headed bird (representing the soul), each with a sun-disc behind it. On the top right is a standing jackal-headed figure, the god Anubis, and on the left a seated figure of the god Osiris under a sycamore tree.



5. Ehem. Sammlung J. Hirsch

1.

Mummy Shroud 1966  
Photograph as published  
in 1966, Parlasca, K.  
Mumien porträts und  
verwandte Denkmäler.

Such painted shrouds, with figures of the deceased as a diety, were popular in Egypt during the first two centuries of our era. The ROM example (983.154.1) is dated to the first century AD.

Technical Description:

The textile is tabby woven linen of a gold-brown natural colour with 13 warps x 13 wefts per cm. The paint used is tempera applied directly to the fabric. The colours of the painted areas are red ochre, pink, black, white and turquoise. The predominant colour is red ochre. Red ochre is used in all of the skirt, the border and the small figures inside the border. Pink is used for demarkation of the flesh only. Black is used for the hair and the lower jackals thereby providing some balance to the composition. It is also used to delineate the woman's figure. White is seen only in very small amounts. Turquoise serves as a colouristic accent only to strengthen and highlight some details. Approximately 70% of the fabric is covered with paint. The paint is thinly applied in washes and has penetrated the fibres to the back of the shroud. This is mostly in the reds and blacks. Originally, the pink areas of the bare skin were thickly applied to the textile. The turquoise colour is also thick but in a much more granulated form. White paint was thickly applied in the beads and netting of the skirt and in the collar.



2.

ROM 983.154.1  
Painted Mummy Shroud

Before treatment, front

Condition:

The condition is poor as many areas are in shreds and approximately 30% of the shroud is missing. There is a large amount of repairs. The majority of them consist of fabric patches and of inpainting at these patches. It is an obvious attempt to make the damaged areas invisible and the shroud look better than it really is.

A. Condition of the linen shroud fabric:

The dimension of the shroud before conservation is 102 cm long x 36 cm wide. The original size is unknown because all edges have been cut. This is most noticeable at the top edge where part of the painted palm tree is missing.

Missing, damaged, and weakened areas:

Damages to the linen fabric are of two kinds:

1. "wear and tear" i.e. warp and/or weft are missing, fibres are reduced to half of their diameter, single threads are pulled out. Most damage in the shroud is of this type.
2. Mechanical damage occurs in the forehead: the outlines there of the missing areas are sharp and distinct. There is a possibility that this area has been burnt. Also included in this type of damage would be the cut edges.

One of the largest and most damaged areas is in the top of the woman's head where a section approximately 11 cm long x 13 cm wide



is gone. The other large and extensive area of loss is in the right central area from the bent elbow down to the knee approximately 28 cm in length and 14 cm in width. There are also holes and missing areas on the right below the collar.

On the left side, a 9 cm wide loss extends down for 68 cm.

Staining and discolouration of the shroud fabric:

The colour of the textile has darkened in some areas. This is most visible on the right side. It starts at the top right extending down to the border for a length of 42 cm to below the elbow and advances inside the border towards the body. In the bottom right corner, the discolouration moves up in the form of an arch under the jackal through the toes and drops down to the left of the proper right foot. On the left side above the lower jackal's head is a diagonal stain. More discolouration runs along the left side predominantly to the left of the figure's shoulder. All of the top area which consists of a later addition has darkened.

There are more than thirty oval dark brown stains all over the shroud approximately one centimetre in diameter. On all cut edges there are the rusted outlines and pinholes of the thumbtacks that had been previously used for mounting.

There are also a few accretions, very hard and almost black in colour. They are most likely to be turpentine resins (CCI report).

One very small accretion is close to the bucket, another is in the bottom half of the figure's skirt above the fifth row of the beaded netting and another is on the left in the kneeling portion of the figure. A large accretion is found in the neck of the jackal at the bottom right.

Deformation of the textile:

In the central part of the shroud, the warp and weft threads are adhered to the patches with no consideration to their direction. They run on the bias, they are weavy, grouped together in cluster, not parallel to each other and with blank spaces between. Many gaps and missing areas are therefore much larger than they need to be. Seven sharp creases from 2 to 3 cm long are spread all over the shroud.

Repairs to the shroud fabric:

The whole shroud received over-extensive repairs, in the form of patches adhered from underneath and from the front of the shroud. Some patches were glued one on top of the other, the reason for that is not clear.

Fabric patches:

The number of patches is quite astonishing given both the shroud's size and its condition. There are thirty-three of them and they cover approximately two-thirds of the shroud's area. They are generally different in weave, colour, dimension and material

from the original fabric and from one another. Twenty-nine patches are cut of linen fabric tabby woven. Seven of them have the same colour and thread count as the shroud fabric. Two of these seven have small remains of turquoise paint. These two painted patches as well as two other plain ones belong to a "secondary" type of patch, i.e. one adhered from the back of the shroud to a larger patch which in its turn was adhered to the shroud directly. Four of the thirty-three patches are made of wool, tapestry woven, buff in colour and two of these have a woven pattern in indigo colour. All four patches are probably cut out from a tunic.

#### Adhesive:

It appears that two kinds of adhesive were used: starch paste and animal glue. Starch paste was applied to the left side edge of the shroud from the top down over the front of the shroud. A very long and narrow fabric patch (68 cm long x 9 cm wide) was placed on the top of the shroud. The layer of paste was applied so thickly that it went through the fabric of the patch and appeared unevenly distributed over its front side in the form of whitish diffused areas. This paste filled the area between the fibres. Animal glue was dabbed on, 2-5 cm apart, forming dark brown stains. These blobs are of oval shape, 0.5 cm to 1.5 cm in diameter. They are visible on the front side of the shroud in the form of distinct dark areas, glossy in appearance and extremely hard. This glue has penetrated into the fibres.



3.

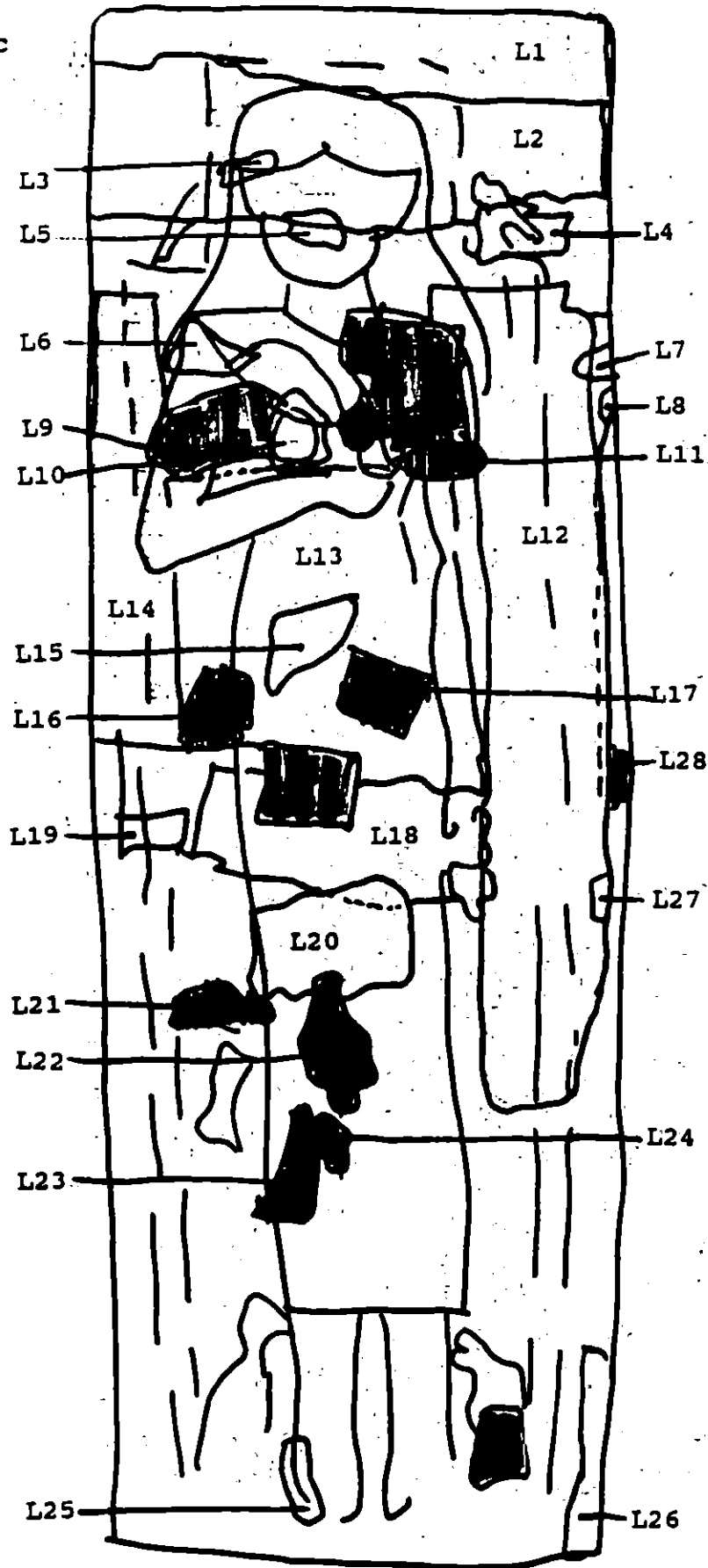
ROM 983.154.1  
Painted Mummy Shroud

Before treatment,  
reverse.

Fabric Patches on the Reverse of the Mummy Shroud

L - linen fabric

W - wool fabric



Mummy shroud  
983.154.1

Dimensions and counts of warp & weft per centimeter in the fabric patches.

A. Wool fabrics, all tapestry-woven:

W1  
W2  
W3  
W3

B. Linen fabrics, all tabby weave:

L1	34.5 cm x 7 cm	21 warps x 11 wefts
L2	34 cm x 10 cm	23 warps x 14 wefts
L3	3.5 cm x 1.5 cm	20 warps x 14 wefts
L4	5.5 cm x 3 cm	16 warps x 13 wefts
L5	4 cm x 3.5 cm	24 warps x 10 wefts
L6	5.5 cm x 3.0 cm	22 warps x 11 wefts
L7	4 cm x 3 cm	22 warps x 18 wefts
L8	4 cm x 1 cm	17 warps x 13 wefts
L9	2.75 cm x 2.75 cm	19 warps x 11 wefts*
L10	5.5 cm x 5 cm	17 warps x 9 wefts
L11	4 cm x 2 cm	19 warps x 13 wefts
L12	53.5 cm x 10 cm	32 warps x 18 wefts
L13	33 cm x 24 cm	17 warps x 13 wefts
L14	26 cm x 6 cm	22 warps x 12 wefts
L15	6 cm x 6 cm	21 warps x 11 wefts
L16	5 cm x 4.5 cm	19 warps x 13 wefts
L17	5 cm x 4 cm	19 warps x 13 wefts
L18	25 cm x 8 cm	22 warps x 12 wefts
L19	5 cm x 3.5 cm	18 warps x 14 wefts
L20	12 cm x 8.5 cm	19 warps x 10 wefts
L21	5 cm x 2 cm	18 warps x 11 wefts
L22	7 cm x 3 cm	18 warps x 11 wefts
L23	8 cm x 4 cm	18 warps x 11 wefts
L24	2.5 cm x 1.5 cm	30 warps x 17 wefts
L25	8.5 cm x 3 cm	16 warps x 14 wefts
L26	15 cm x 3 cm	19 warps x 14 wefts*
L27		
L28	3.5 cm x 1.5 cm	14 warps x 13 wefts

\* different than the ground fabric

Condition of the paint layers:

Approximately 15% of the painted area is missing. The condition of the paint layer depends on the colour. The red ochre is generally sound. However, the pink of the flesh areas appears to have been abraded away, leaving a thin colouring behind. There are only small areas in the upper body where the pink paint is still thick. The flesh of the feet is generally intact. White accretions over the pink flesh areas appear in the upper body and proper left arm (infill areas). The white coloured areas of the collar and skirt are badly abraded. The turquoise is badly abraded as well. Remnants of the thicker paint are to be found in the stem of the lotus flower, the palm branch, the hair ribbon and the border design on the lower edge of the skirt. The black used in the two lower jackals has run. Otherwise, the original black is sound.

Retouches to the paint layers:

The distinction between the original paint and the retouches was sometimes difficult to detect. The CCI report was therefore very helpful in identifying the original from the later additions. Light pink retouching to fill in missing areas is found in the elbow and forearm. Red ochre retouching appears on the fabric patch to fill in the proper left side of the skirt (approximately 13 cm long x 4 cm wide) and in the border directly to its right. Retouching is also evident in the border and in the blobs in the knee area and between the feet. In general the black outlines have

been reinforced and the patch at the top of the head has been totally filled in with black paint.

#### TREATMENT

Samples of the two types of adhesive and samples of different colours of the paint were taken and sent to CCI, Ottawa for analysis. Examination and both written and photographic records were taken and discussions were ongoing with the curator. Previous owners kindly provided us with a pre-1981 photograph which provided assistance for comparison. The first step of the treatment involved the removal of the numerous patches.

#### The front side:

The elongated side patch which was adhered to the front of the shroud with starch paste was removed by lifting the fabric patch with a blunt spatula and slowly separating the two pieces. This was a relatively easy procedure. Underneath this fabric patch, however, the entire area was covered with a very thick white starch layer to the extent that the fragmented fabric below was not at all visible. This starch layer was mechanically removed with a blunt spatula and tweezers by crushing it and slowly lifting the bits off. It was very time consuming but it has been removed entirely from the shroud. Extreme care had to be exerted not to damage the shroud fabric invisible underneath the layer of paste.

#### The reverse side:



The shroud was then turned over and work began on those patches adhered to the back with animal glue. It was found that the areas between blotches were covered only with a very light brush coat of the glue. These areas were easy to separate by gradual lifting. However, the blotched areas presented a particularly difficult problem: the glue had been thoroughly embedded in both the shroud and patch fabrics. This glue had become exceedingly hard and made both fabrics inseparable. Pressure from the blunt spatula could not break it apart. An attempt at loosening the glue with water had the result of softening slightly the glue but at the same time softening and weakening the fabrics. Therefore this method could not be used. As a result, most of these glued areas were separated by cutting the patch fabrics along the outlines of the glue blotches and then by pulling out the fibres of the patch fabric which were not entirely embedded in the glue. The glue could then be partly drilled and crushed by using a spatula in one hand and holding the shroud fabric with a second spatula in the other to immobilize the shroud and protect against sudden movement and damage. In this way the fabric of the shroud remained intact, the glue was at least partly reduced and the patch was removed entirely. Although the patch was perforated with holes, the shroud remained intact.

In the case of the "secondary" patches, the larger fabric patch was separated first from the shroud and only then were the small, but vitally important, secondary patches removed.

Separating and removing the adhesive was constantly augmented with cleaning the shroud with a soft water colour brush and a small vacuum cleaner (Mini-Vac<sup>®</sup>).

#### Creases:

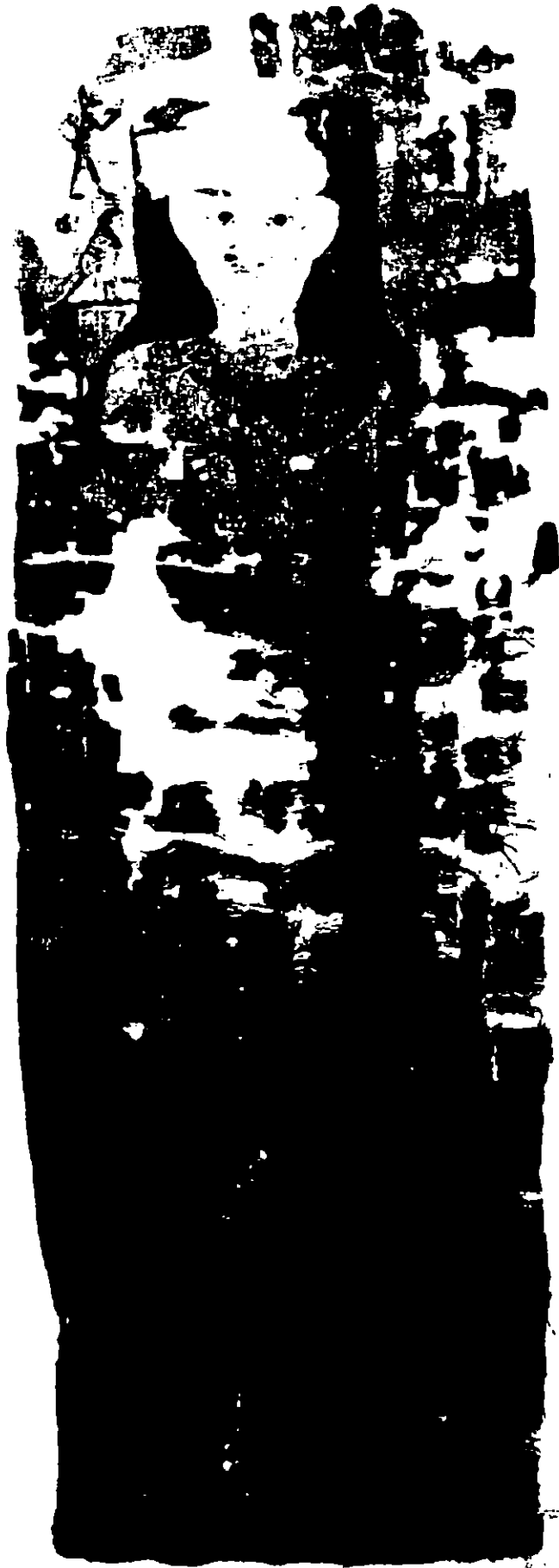
Creases were removed with blotters and moisture. A slightly damp blotter was placed on top of a dry blotter which covered the crease. When the fabric had softened it was slowly unfolded then covered again with both dry and damp blotters, and a plexiglas plate placed over it. When the crease had been relaxed and straightened, a brass weight was placed over the blotters and plexiglas for up to one hour.

#### Deformations:

The distorted fabric and warp/weft threads were straightened by brushing very lightly with a slightly dampened soft water colour brush. When the fabric fibres had softened, blunt tweezers were used to slowly return the warp and weft back to their original position. Once aligned, they were also covered with a dry and damp blotter, plexiglas and weights in the way the creases had been treated.

#### Treatment of the overpaint:

The confusion in the distinction between the original paint and the retouched areas resulted in the decision not to remove the overpaint but to reduce its intensity where necessary and only in



4.

ROM 983.154.1  
Painted Mummy Shroud

During treatment,  
reverse. Patches have  
been removed.

the areas where the retouches were obvious. It was removed by mechanical means using a soft flat bristle brush and occasionally a blunt spatula where the paint was very thick. The most distracting areas were in the forehead all along the edges of the large missing area. The dark pinkish colour was reduced but not eliminated and the black along the side edges of this area received the same treatment. In the second most distracting area, which was in the forearm, the most visible whitish pink paint layer was removed. The shroud was then turned over and the reverse side was cleaned and tidied.

#### Preparation for display:

Upon removal of the patches and overpaint, it was time to consider the support and display methods for the textile. The condition of the shroud determined many factors to be considered, as freed of the patches, the shroud had large areas of loss and numerous small loose fragments which had to be positioned.

Because of the paint layer and the fragmentary nature of the textile, it was decided that a "permanent" mount was needed which would have the dual purpose of displaying the textile and providing continuous protection during exhibition and in storage.

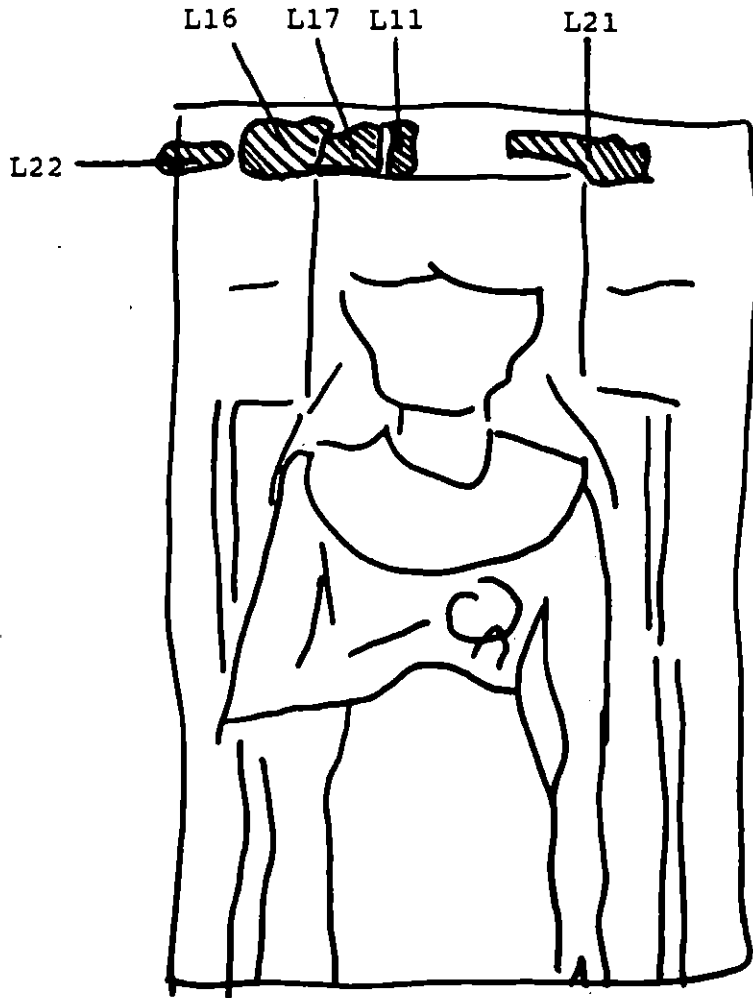
With a composite of mat board etc. a neutral ivory colour linen was chosen as the background fabric onto which the shroud would rest. However, the large losses and missing areas determined

that the shroud itself should be placed over a fabric chosen with precise requirements. Both the colour and texture of this support fabric were very important. The colour had to match the shade of the shroud fabric but not be too bright nor too pale in order to enhance the colour of the shroud. It also had to be neutral enough so as not to be too visible and detract attention from the shroud itself. Texture was also an important factor as the many missing areas in the shroud meant that much of the support fabric would be visible. Therefore, it would have to have a similar grain, texture and vertical striations as in the fabric of the shroud and have a nap which would help to hold separated fragments and loose threads in place. Consequently, a 100% cotton fabric in an orange-brown colour with a suitable texture was chosen.

The cotton fabric was prewashed, ironed and placed over the reverse side of the shroud and then turned front side up, always turning between two sheets of board. The shroud was realigned over this fabric. The correct placement was found for the loose fragments by correlating the irregularities of their thread, weave, size, shape and colour with similar areas in the main textile. There were three loose fragments placed in the skirt area and an additional thirteen fragments were relocated mostly from the right side of the shroud.

Five fragments which had been used as patches and had the same thread count and the same weave as the shroud fabric were

Location of Original Fabric Patches



incorporated into the top part of the shroud. Three of these fitted at the top in shape and two of these three matched in both shape and painted areas. The three other patches with the same thread count as the shroud did not fit this area or elsewhere.

Once all of the realignments of the shroud onto the support fabric had been completed, it was possible to cut the cotton support fabric to the exact shape of the shroud. The shroud after conservation retained exactly it's width as before treatment while the length increased by 2 cm. The overall decreases in length when the top patch was removed and the decrease in the central body area by realigning the constricted warp and weft were counteracted by an overall increase in length from the replacement of the patches from the reverse.

As previously mentioned, the decision had been made to house the shroud in a mount that provided security during both exhibition and storage. In designing the mount the following criteria were also considered: the textile should be viewed from as close as possible and at the same time be provided with total security, the textile should be buffered against any potential and real changes in RH on display and in storage, all of the materials used for the mount should be safe for the objects and uniformity of frame dimensions and mounting was necessary to correlate with other similar artifacts in the gallery.

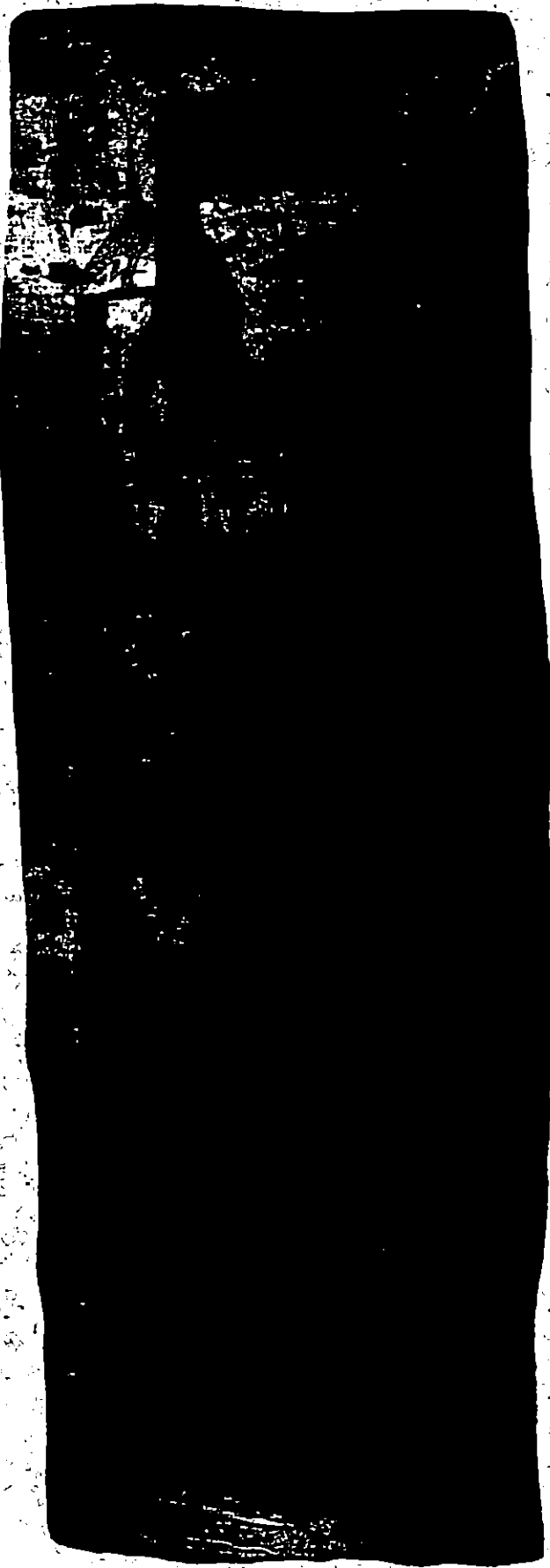
It was decided that a frame with glazing and a specially constructed core mount to house the fragment would provide the above mentioned criteria.

Discussion:

Because of the paint layer, the mummy shroud could not be treated solely as a weakened textile normally would be, employing a support fabric and attaching the original to it using a thread and needle. Due to the medium used, the paint cracks readily with any movement of the textile and the open weave of the fabric does not provide a great deal of support for the paint. It was desirable to minimize movement of the textile in order to reduce the damage to the paint layer.

The nature of the shroud with the loose weave and the tempera medium precluded the use of adhesives. The total impregnation of the fragment with an adhesive, whilst consolidating the paint to the fabric, would alter the refractive index of both the paint and the textile and darken the tonality of the piece. A nap bond approach would not provide sufficient adhesive to attach the paint layers to the fabric and it would not allow the reverse of the fragment to be examined readily. Aqueous adhesives could potentially cause bleeding of the colours. Because of the potential for discolouration and the degree of irreversibility associated with adhesives they were eliminated as a solution.





5.

ROM 983.154.1  
Painted Mummy Shroud

After treatment, front

In considering the above factors, it was decided to mount the shroud so that movement of the textile and paint was restricted but not to the extent that the object was compressed and that neither needle and thread nor adhesives would be used. This was to be achieved by employing a multilayer mount construction in which the shroud would rest in a slight depression but be held in place with the nap of the cotton support fabric and the slight overall pressure provided by glazing within a frame.

#### Mounting:

The custom made frame of maple had sides deep enough to house the mount with the shroud. A separate insert of wood reinforced with two cross bars was made to screw to the back of the frame in order to keep the mount firmly in place and to add an additional slight pressure to the mount. All frames were painted with latex enamel in a colour chosen by the designers.

The core mount consists of one sheet of 8-ply acid-free mat board, a flannelette layer over the board for cushioning the textile, a template cut in 4-ply acid-free board in the shape of the shroud and cotton support so that the shroud would lie in a shallow recess not squeezed or compressed by glass but just covered tightly enough to not shift, a second layer of flannelette to cover the template to give a soft outlook to the linen fabric overlay, a neutral coloured linen fabric over all these layers with the edges turned over and adhered to the back side of the 8-ply board using

strips of Beva 371 Film<sup>o</sup>.

The shroud was placed in the recess and covered with Denglas<sup>o</sup>. Small strips of framing tape were adhered to all four sides to hold the core mount together. This ensured sufficient pressure to the glass to hold the textile in place.

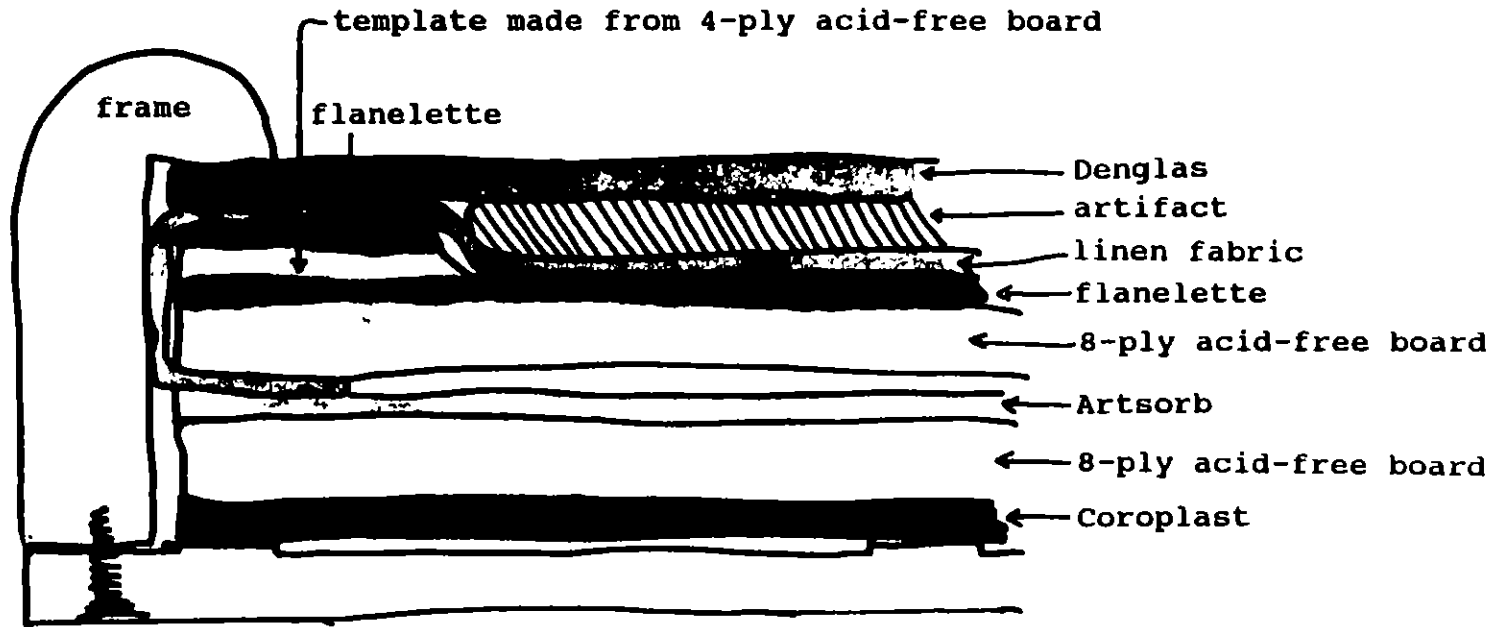
Although glass is breakable, Plexiglas was excluded as the glazing material because of its' static charge. Instead a non-reflective glass, Denglas<sup>o</sup>, was chosen.

Once the shroud was encased in its core mount, a buffering layer of Artsorb<sup>o</sup> (silica gel in sheet form) was prepared. Taking into consideration a preferred RH for textiles of 50% up to 60%, a preferred RH for tempera of 45% up to 50%, the original environment of the mummy shroud and the Museum environment, it was decided that the best RH for the painted textile would be 45%. This was achieved by placing the sheets in the laboratory and using the room environment.

The core mount was placed over one layer of Artsorb<sup>o</sup> and two layers of 4-ply mat board. A Coroplast<sup>o</sup> layer was precisely cut to the inside dimensions of the frame to provide an additional buffer against fluctuations in relative humidity. Once everything was assembled, one on top of the other, the whole unit was placed over top of the wood insert. Then the frame itself was set over the

whole mount. The wooden insert was screwed to the frame from the underside. This was done by sliding the mount to the table's edge and while one person held the mount firmly in place, the other person attached the screws from below. Warnings not to turn the mount upside down were written on the lower edge of the frame. In addition, the reverse side of the mount was provided with information on how the mount was built and instructions and warnings on how to proceed when opening to recondition the Artsorb®.

Mounting and Framing



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