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NUMBER SEVENTEEN • 1983

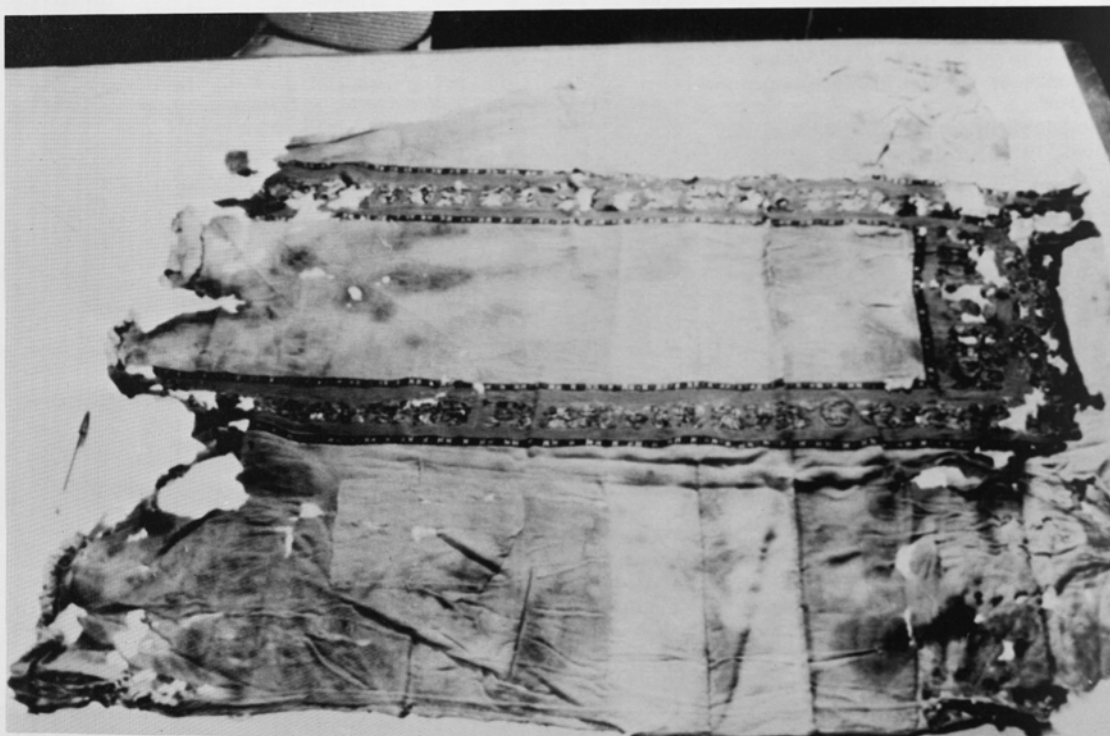
ANNUAL OF THE MUSEUM
OF ART AND ARCHAEOLOGY

Conservation of a Coptic Tunic Fragment

In 1979 the Museum acquired half of a Coptic tunic as a gift.¹ It arrived in the Museum neatly folded in a padded envelope measuring 10 x 14 inches. Upon inspection, the fabric appeared to be relatively supple, and it was decided that unfolding the fabric would not cause too much harm. What follows here is the report of the subsequent conservation measures taken to stabilize one of the largest and best archaeological textiles in the Museum's collection.

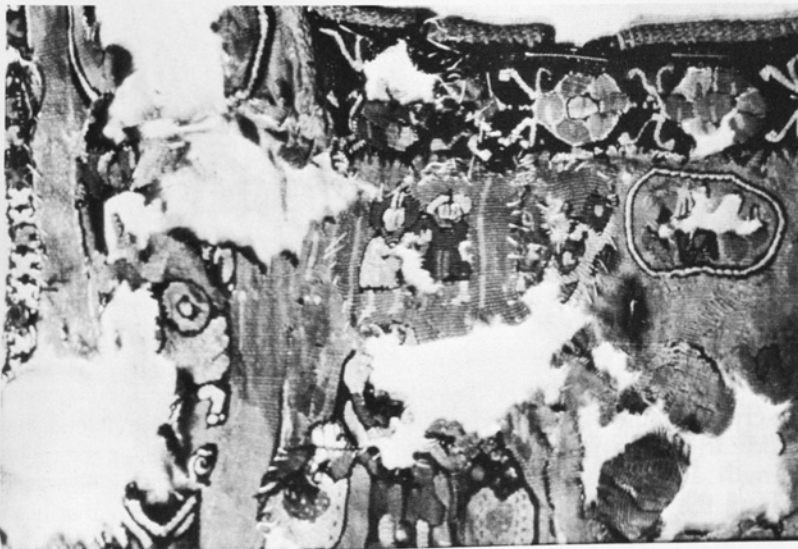
Examination. At its maximum points the tunic fragment measures 1.38 m. long and 1.115 m. wide (4 feet, 7 inches by 4 feet) (Fig. 1). It is woven in one piece except for the red bands sewn along the sides. The design consists of dark blue-bordered red clavus bands on a natural background with added red loops and bands along the sides. An 11 cm. tuck runs horizontally through the center of the fabric, though the

1. The Coptic tunic fragment, before treatment.



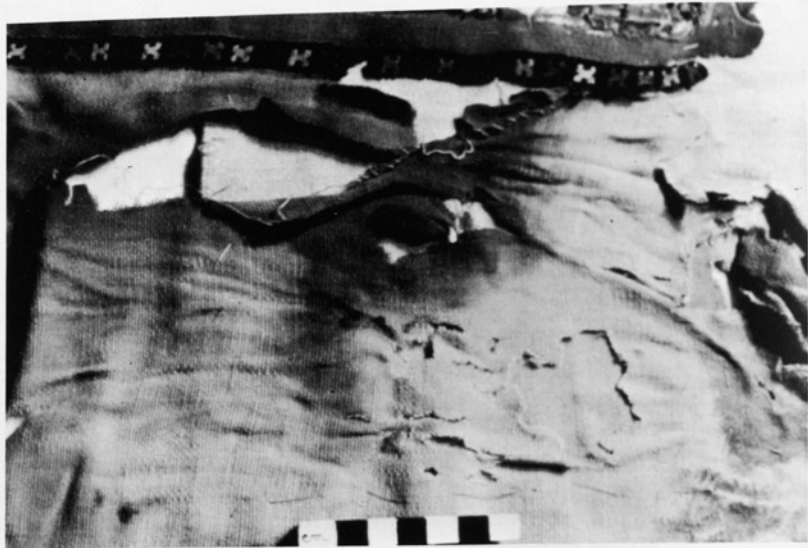
ancient sewing threads have since been cut and the tuck is now unfolded. The weave consists of: plain weave in the background, slit tapestry in the clavi, braiding at the neck, braiding with looping at interior top edges of clavus and along edges, and braiding of the bottom fringe. The fiber of construction, which was identified by microscopic analysis, is wool, both warp and weft. In weave construction it is fairly uniform with ten warps per centimeter by forty-eight wefts per centimeter.

The tunic has suffered from natural aging and from previous restoration. Although approximately eighty percent complete, there is extensive loss of fabric along the left side, at the top (especially in the design area), on the lower right side, and the bottom. Numerous tears, loss of warps and wefts are apparent throughout the fabric. Previous attempts at restoration of missing portions are visible; fragments of another ancient textile (possibly the reverse side of this textile) are sewn to this fabric with orange, green and white thread (Figs. 2 and 3). A particularly obvious repair is a rectangular area on the lower right side in which the tunic and the patch were cut to size and machine-sewed together (Fig. 4). That this patch is not part of the tunic is evident from the fact that the patch has a line of braiding which is inconsistent with the tunic's design in this area.

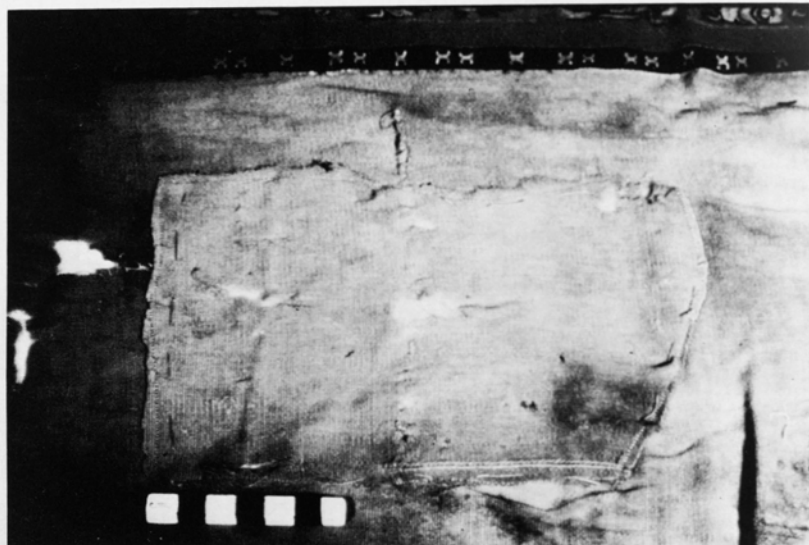


2. Detail of previous restoration: stitching and patches.

3. Detail of previous restoration: stitching and patches.



4. Detail of previous restoration: a large patch machine-sewn to the tunic.



Overall the fabric is heavily soiled. Stains, with accompanying accretion caused by the exudation of chemicals from the deteriorating body that was wrapped in the tunic, are prominent along the central length and at the shoulders. The fabric is somewhat brittle except along the central horizontal tuck, which is not only cleaner but is almost as supple as new wool fabric.

Treatment. The first step in the conservation treatment was to ascertain: 1) if the tunic could be wet-cleaned and 2) if wet-cleaning would strengthen the fibers. For these purposes one of the extraneous ancient-material fragments was removed from the tunic and tests were conducted on it. It was determined that the textile could withstand wet-cleaning with only a minimal loss of that fiber which was already powdered.

As a first step in the cleaning process, each colored area on the tunic was tested for permanence in the cleaning solutions. This was accomplished by placing one drop each of water and detergent solution on each color, letting it penetrate, and then blotting the area. All colors appeared to be stable in the solutions to be used.

In preparation for washing a medium weight polypropylene screening was stapled to a 5 x 6-foot frame constructed of 1 x 3-inch pine and reinforced in the corners with 1/8-inch masonite. The tunic was transferred to the screening, where the machine-sewn area and other puckering areas of restoration were removed. Due to the extent of loss in the neck area, the reinforcing fabric here was not removed in order to minimize further losses. With a second screen placed on top of the tunic, the tunic was loosely basted to the screening with 100% cotton thread, being careful to sew between the tunic's fibers. In order to prevent the setting of loose surface soil into the tunic's fabric, the mounted tunic was vacuumed, both front and back, through the polypropylene screening.

Due to the extraordinary size of the screened textile, a special washing tank had to be assembled out-of-doors. Wooden boards, measuring 2 x 8 inches, were assembled to form a 6 x 7-foot tank.² The tank was lined with two sheets of 10 mil polyethylene sheeting and filled with tap water. To complex with the iron, magnesium, calcium and other metals in the hard water, Calgon was added to each tank of water at a rate of two tablespoons per gallon of water. The washing sequence proceeded as follows at forty minute intervals: 1) preliminary wash in water, 2) two wash baths of Orvus in water,³ 3) three rinse baths of water. During each forty-minute cycle, the tunic was gently agitated by carefully pressing a sponge down over the entire surface (Fig. 5). This allowed for the dissolution of soil without displacement or straining of the tunic fabric. Altogether, the washing procedure used 100 gallons of water, twenty ounces of Calgon and one quart of Orvus detergent. After washing, the tunic was dried by pressing between clean blotters and then air drying inside the Museum.

Some discoloration still appeared on the blotters, which had come primarily from the body stain areas. While more staining might have been removed with continued washing, this factor could not outweigh the additional fraying or breaking of fibers already noted during the procedure. The washing procedure served to remove a large part of the ingrained dirt and dust, which would cause deterioration in the textile, and it served to strengthen the fibers.

During the drying process, the top screen and basting stitches were removed. On its backing screen, the tunic was laid down onto a



5. Gently pressing the tunic with sponges during the wash sequence.

one-inch thick sheet of styrofoam. Wrinkles in the tunic were gently reduced by pinning the textile to the styrofoam with brass insect pins. After drying, additional pinning, using steam to relax the fibers, reduced the wrinkles further and helped to align the warps and wefts. The reinforcing fabric in the neck area and other restorations were removed.

The tunic was then ready for permanent mounting. A 2/2 plain weave monk's cloth (100% cotton) was chosen as the permanent mounting fabric. This was washed twice in hot detergent solution to remove sizing, and then it was dyed to a color more consistent with the tunic. The monk's cloth was stretched over a 5 x 5½-foot strainer made of 1 x 3-inch pine boards with cross-braces. The tunic was transferred to the monk's cloth, aligned with the warps and wefts, and sewn down with 100% cotton thread. Stitches were placed approximately one inch apart in a grid-like pattern. The lost areas under the clavi were inlaid with 100% wool cloth and sewn down in a similar manner. Every fiber in the holes and on fragmented edges was sewn down individually. This procedure required many assistants and 600 hours of sewing time.⁴ The completely restored tunic is illustrated on page 82.

After mounting, the textile was framed behind Plexiglas, using a half-inch spacer between the textile and the Plexiglas. In choosing Plexiglas several factors were considered.

1. Plexiglas is electrostatic. However, since the design is woven and not applied paint, it was felt that there would be minimal effect to the tunic.
2. Plexiglas is less likely to fracture than glass, especially in the frame size considered.
3. Plexiglas weighs less than glass.

Now mounted, the tunic can be easily and safely displayed for six months and then covered and stored horizontally for six months. In the six-month viewing time, the textile builds up stresses, especially at the points of sewing. Also at this time light causes deterioration of the fibers. In storage, the fiber stresses are relieved and the black cloth covering prevents further light damage. In this way the tunic can be viewed today and preserved for the future.

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¹Gift of Mr. T.E. Bachman (Acc. No. 79.141).

²Wood for the tank was donated by the William Biers family.

³Orvus is a gentle-action, non-ionic detergent available from TALAS, 130 Fifth Avenue, New York, NY 10011.

⁴I would like to extend my thanks to everyone at the Museum for their patience during this treatment. Especially I would like to thank all the willing hands who helped in the washing and the tedious sewing: Anna Margaret Fields, Kathy Evans, Cindy Wayne, Richard Baumann, Lisa Kahn, P.J. Teer and Elizabeth Windisch. Most importantly I wish to extend my greatest appreciation to Jeffrey Wilcox, who helped in every way and designed the final framing.

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