

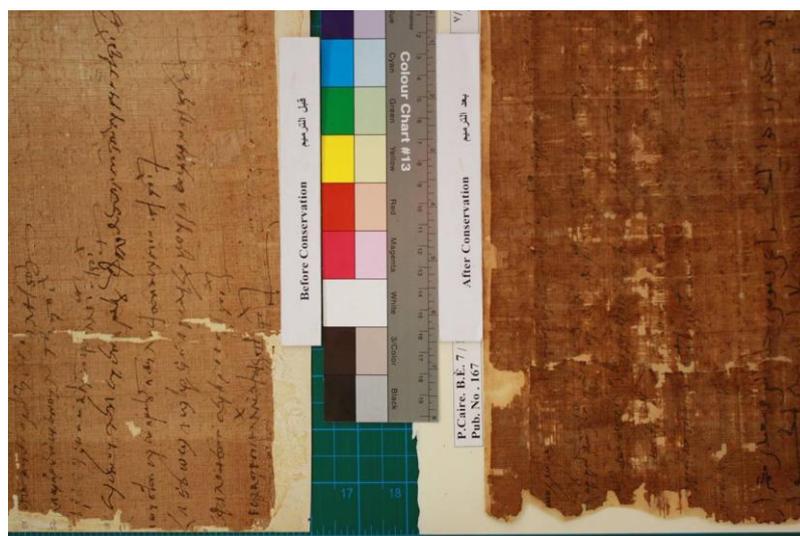
LOW-BUDGET AND 'LOW-TECH' SOLUTIONS FOR PAPYRUS CONSERVATION AND STORAGE AT THE NATIONAL LIBRARY OF EGYPT

Ana Beny (*Freelance Conservator*), Ahmed Youssef (*National Library of Egypt*),
Mohamed Hassan (*National Library of Egypt*), Maiada Esmail (*National Library of
Egypt*) and Noha Said (*National Library of Egypt*)

INTRODUCTION

In 2005, the Thesaurus Islamicus Foundation signed an agreement with the National Library of Egypt (Dar al-Kutub) to assist with the preservation, conservation, curation, and cataloguing of the National Library's manuscript collection. The Thesaurus Islamicus Foundation and Dar al-Kutub Manuscript Project aims to establish the National Library as a regional leader in collection care and management.

As part of the Project, conservators from the Foundation and National Library re-assessed its procedures for conserving and housing its collection of more than 4000 papyri. This reassessment showed that the treatment procedures for unfolding, relaxing, removing old repairs and mounts from papyri, and adding new repairs, supports or linings to papyri, introduced excessive amounts of moisture that caused some papyri to darken, change dimension and become more brittle. These problems were also aggravated by the use of fixatives to prevent damage to the inks during treatment. As a result, conservators from the Foundation and National Library devised and implemented new, improved minimal intervention treatment procedures to avoid changes to the structure and appearance of the papyri.



Comparison of papyri before and after past treatment procedures

HUMIDIFICATION, RELAXING, AND REMOVAL OF OLD REPAIRS

The new procedures use the least amount of moisture possible. Papyri are relaxed in a low-budget and 'low-tech' humidity chamber made by modifying two stackable plastic containers so that the papyrus rests on a perforated plastic grid suspended between them. The papyrus gradually and naturally absorbs the moisture from the chamber atmosphere. This method is based on Bridget Leach's *in situ* papyrus conservation at the tomb of Senneferi in Egypt [1].



During humidification process

Foam wetted with a mix of water and ethanol (70:30) is placed at the bottom of the stackable containers. Ethanol is added to aid evaporation. It also facilitates and regulates the penetration of moisture across the surface of the papyrus and prevents the development of microbiological activity during the humidification process.

Slow and controlled humidification is essential. The papyrus must be placed sufficient distance from the foam so that only the minimum amount of moisture is absorbed. The exposure time of the papyrus must be carefully controlled to prevent condensation or over-humidification. After some hours – and sometimes a day or more – of humidification, old repairs and adhesives, which swell and soften in the humid atmosphere, can be safely removed.

After removing foreign elements from and relaxing the papyrus, it is dried in a 'sandwich system' comprising the following layers: board, foam or cushioning material, moisture absorbent material, Hollytex, the papyrus, Hollytex, and board. It is important that only one layer of foam or cushioning material is used – either above or below the papyrus. If the foam or cushioning material is placed both above and below the papyrus, the papyrus and all of the other materials between the boards will warp. This sandwich is placed under light weight until the papyrus is dry.

CONSOLIDATION OF THE PAPYRUS

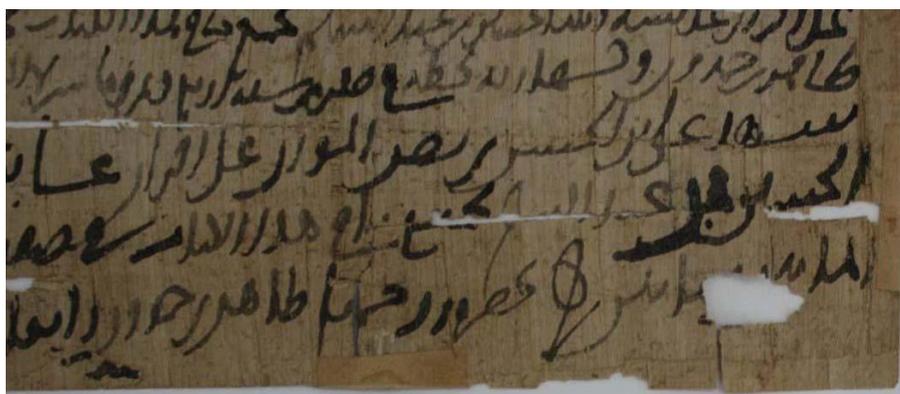
In the new procedures, tears are joined and weak areas are supported with a remoistenable tissue made from Kozo-Shi Haini Tengujo 1 (5.8 g.m²) and a 50:50 mixture of methylcellulose and Jin Shofu wheat starch paste [2]. This tissue is reactivated with a mix of water and ethanol, or solely water, depending on the condition of the papyrus and the solubility of the inks. Before the tissue is applied, capillary matting is placed below the papyrus to cushion it and absorb moisture. The surface of the papyrus is covered with a Hollytex barrier to protect it. The adhesive is moved into the fibres of the papyrus by means of gentle pounding with a coconut fibre brush through a Hollytex barrier. This method adapts the tissue to the texture of the papyrus and gives a sympathetic appearance with strong adhesion.



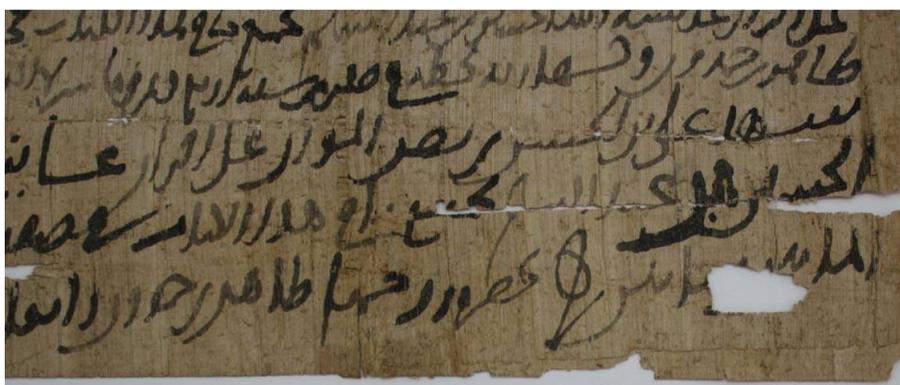
Removing previous repairs



Pounding process



Before tape removal and repair of tears



After tape removal and repair of tears

LINING

When a papyrus is so badly damaged and fragile that it requires extra support, lining is used as a final recourse. A lining made from the same remoistenable tissue used to join tears and support weak areas is applied to only one face of the papyrus. Moisture from blotting paper dampened with a mix of water and ethanol (70:30) activates the adhesive. To prevent direct contact between the papyrus and the damp blotting paper, a 'sandwich system' comprising the following layers from bottom to top is used: board, damp blotting paper, capillary matting, Hollytex, remoistenable tissue, the papyrus, Hollytex, dry blotting paper, 10mm thick sponge, and board. The sandwich is put under weight or in light press until the two layers of blotting paper reach equilibrium. The gentle drying process is continued by removing the sandwich from under weight or light press, turning it over, changing the topmost layer of damp blotting paper for a dry layer, and replacing the sandwich under weight or in light press. This process is repeated as often as necessary until the papyrus is completely dry. The papyrus is kept under weight for several days before re-housing.



Example of papyrus before treatment



Example of papyrus after treatment

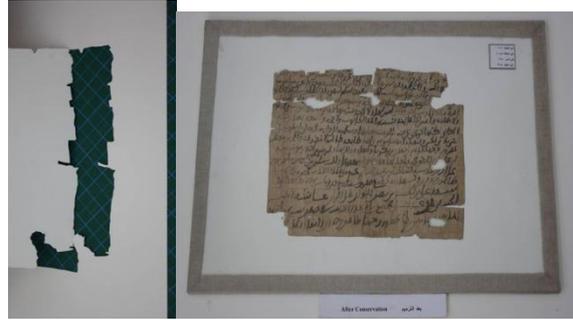
HOUSING

In 1978, Gerhard Banik and Herbert Stachelberger analyzed a number of residues that appear on glass surfaces when papyri are held between glass without the presence of buffering materials. In 1994, Ted Stanley presented two options for mounting papyri in Princeton University's collection, and stressed the need to relieve the papyri from pressure and to buffer them from environmental changes. The Foundation and National Library's conservators designed a modular housing system based on Stanley's 'Stabiltex Sling System' and made from materials readily available in Cairo.

The papyri are housed between sheets of 3 mm glass, pre-cut to four modular sizes. Each papyrus is surrounded by a profiled passe-partout made from alpha cellulose Fabriano paper with a neutral pH. The passe-partout holds the papyrus in place without using any adhesives, reduces the pressure applied to the papyrus by the glass, buffers the papyrus from changes in temperature and humidity, and absorbs gaseous pollutants. The glass is sealed with unbleached cotton fabric pre-pasted with wheat starch paste.



Old housing



Cutting the
passe-partout

New housing

AUTHORS

Ana Beny (a.beny@anabeny.com) graduated from the Conservatori de les Arts del Llibre in Barcelona. Since 1986, she has worked as a freelance conservator with her own workshop for important institutions and private collectors in Spain, Andorra, Brazil, Egypt and the Philippines. She has taught in these countries as well as in Bolivia and Italy.

Ahmed Youssef graduated from Cairo University with a BA in Archaeology: Restoration. He trained in papyrus conservation in Austria and bookbinding at the National Central Library in Florence, Italy. He specializes in papyrus conservation at the Manuscript Conservation Center in the National Library of Egypt.

Mohamed Hassan graduated from Cairo University with a BA in Archaeology: Restoration. He trained in manuscript conservation in Malaysia and previously worked as a conservator at the Egyptian Museum. He now specializes in papyrus conservation at the Manuscript Conservation Center in the National Library of Egypt.

Maiada Esmail and Noha Said both graduated from Cairo University with BAs in Archaeology: Conservation and specialize in papyrus and parchment conservation at the Manuscript Conservation Center in the National Library of Egypt.

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