

# Beyond stain reduction: A collaborative solution for reducing the appearance of a stubborn stain



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## Summary

A collaborative approach was adopted for the treatment of an 18<sup>th</sup> century block-printed cotton handkerchief with a prominent dark stained area in the central area of the handkerchief's design. After unsuccessful localized stain reduction, solutions for reducing the stain turned to masking and other physical solutions for visual compensation. The stain was masked with thin layers of toned Japanese tissue and silk crepe line, and mounted onto gray fabric. This combination significantly reduced the appearance of the staining.

## Introduction

This printed handkerchief from the Winterthur collection (Acc# 1965.0010) showing General George Washington on horseback was featured in the exhibition: *Hamilton & Burr: Who Wrote Their Stories?* which opened on July 11<sup>th</sup> 2019, the 200<sup>th</sup> anniversary of the Hamilton/Burr duel. The red-on-white handkerchief from the museum's collection has been attributed, although inconclusively, to John Hewson, one of three known textile printers in the Philadelphia area in the mid to late 1700's. The design on the handkerchief was created using block printing, circa 1776. The handkerchief is printed on both sides, a technique that would have required careful and exacting technique, suggesting that the handkerchief would have been produced for a high-end market. A sizeable dark stain in the central area of the design was treated in the 1980's without success; instead a large muslin patch was stitched over the stained area to mask the area and reduce its visual impact.



Printed handkerchief of General George Washington, 1965.0010A, before treatment. **Above**, overall. **Right**, detail of dark stained areas.



## Rationale

The origin of the stain is unknown; possibly the dark area was caused by mold growth from poor environmental conditions before the handkerchief entered Winterthur's collection. Fourier-transform infrared spectroscopy (FTIR) analysis of a tiny sample from the stained area produced inconclusive results. Past attempts in the 1980's to locally reduce the stain produced minimal success, and a stitched muslin patch was used to mask the stained area. Although the handkerchief is in overall good structural condition, the stained area continued draw the viewer's eye. The lighting in the corridor where the handkerchief is framed and on long-term display illuminates from above, creating a slight raking light over the surface. The thickness and surface texture of the muslin patch was therefore discernable under normal viewing conditions. Due to the historical importance of the handkerchief, and its prominence in the upcoming exhibition, new approaches to reduce the stain were considered in 2019.

## Acknowledgments

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Emily Farek, WUDPAC class of 2019 and Conservation Manager at Tennessee State Library and Archives

## Treatment

In anticipation of the exhibition, we revisited the staining with a series of locally applied agarose poultices containing the chelator DTPA, as well as the enzymes lyticase and chitinase. Although the DTPA gels dramatically reduced the appearance of some small brown stains, the large area of gray discoloration was reduced only minimally by the various poultices. As a result, visual masking remained our best option for reducing the appearance of the stain. We consulted with our colleague and Winterthur Book and Library Materials Conservator Dr. Melissa Tedone to help formulate a treatment plan using Japanese tissue and silk crepe line fabric with a water-based adhesive to create a thin, semi-transparent layer over the stain.

First, Usumino Japanese tissue was toned with Pro-fab textile paints. Textile paints were chosen over regular acrylic paint because they tend to maintain good flexibility after drying. A sheer silk crepe line fabric was also toned with Lanaset dyes. After toning, both the paper and the silk were coated with a mixture of 1:1 wheat starch paste (Zen Shofu precipitate wheat starch) and methyl cellulose (2% w/v in deionized water). This was accomplished by brushing the adhesive mixture onto a sheet of Mylar®, and then gently placing the tissue or silk over the wet adhesive. The tissue or silk was then smoothed out with a soft brush, and allowed to dry before peeling the substrate and adhesive from the Mylar®.

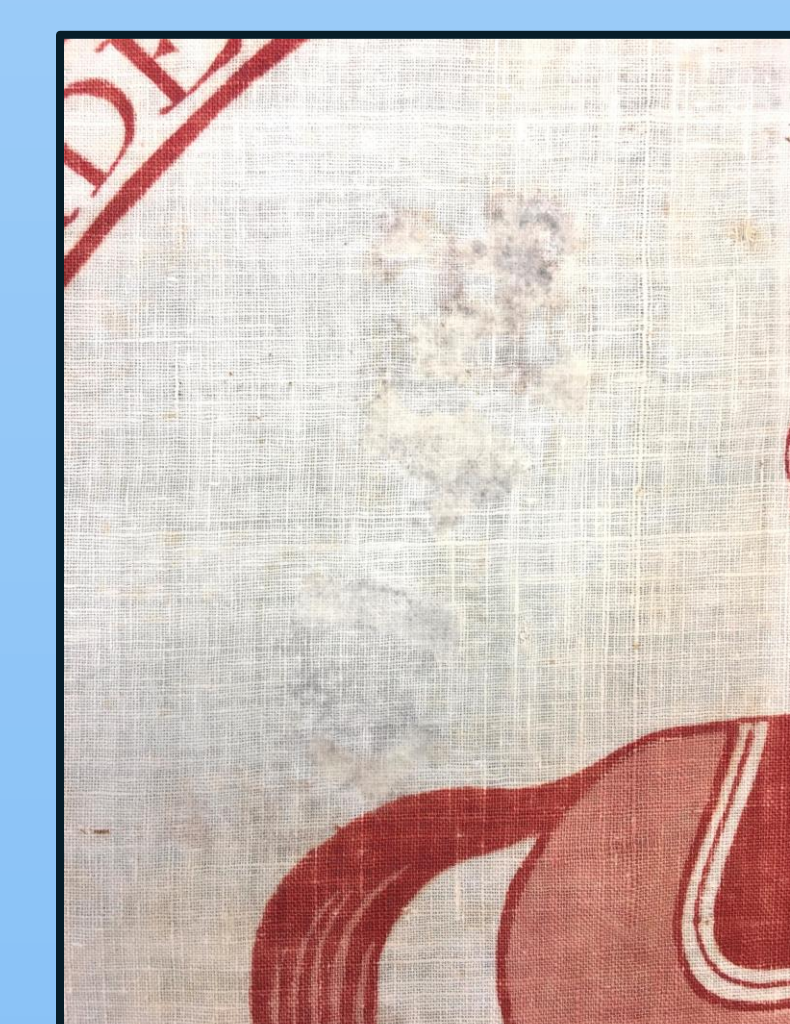
The toned Usumino tissue was shaped using a water cutting technique, drawing the outline of the desired shape with a small, damp brush before pulling the tissue apart to create feathered edges. The tissue shapes were then adhered over the darkest areas of staining, followed by larger patches of the toned silk crepe line over the entire stained area. Both the tissue and silk were adhered to the cotton surface with a 1:1 methyl cellulose/wheat starch paste adhesive. The adhesive was reactivated by misting with deionized water, and remains reversible. These sheer and lightweight materials in combination with the adhesive created close and smooth contact between the surface of the handkerchief and the masking materials.

**Right:** Applying the Usumino tissue overlays to the darkest areas.

**Below, left to right: 1)** Diagram of masking overlays; blue is Usumino tissue, pink is silk crepe line. **2)** Stained area with Usumino tissue overlays applied. **3)** Stained area with Usumino tissue and silk crepe line applied.



(1)



(2)



(3)

## Mounting

The final step for aesthetic improvement involved the mounting, which allowed for passive aesthetic improvement through the use of a gray cotton fabric directly behind the handkerchief. The gray cloth shadowed through the cotton fabric enough to even out the remaining contrast between the stained and non-stained areas. Small patches of white and red cotton were placed passively on the mount to fill losses in the handkerchief.



The handkerchief AT, with white background



The handkerchief AT, with gray background

## Conclusion

This treatment approach successfully masked the appearance of the stain, while still allowing the texture and appearance of the underlying weave structure to shadow through. The layer of gray fabric between the handkerchief and the support mount helps to further reduce the appearance of the gray staining. The handkerchief has returned back to display in the house, and is currently on view in Bertrand Hall. This treatment highlights the value of conversations and collaborations across conservation specialties. The water-based adhesive recipe inspired by library and paper conservation allowed this successful treatment to be completed with reversible and sympathetic materials.