DESCRIPTION:

General Remarks
This is a handwritten manuscript letter owned by the Cincinnati Hebrew Union College. It was written in the 19th century by Salomon Sulzer (1804-1890). Sulzer was a noted Hebrew composer and editor of liturgical music who was a cantor in Austria. He has become widely known as the first Jewish composer to combine Jewish music with the performance techniques of European/Western music.

Binding
This is a flat unbound manuscript.

Textblock

n/a

Primary Support
The letter is written on a beige handmade wove paper that is fairly smooth. The paper contains a watermark that reads, "J. Whatman / Turkey Mill / 1839."

Medium
The recto contains handwritten black ink. The verso contains two different sets of graphite handwriting, written in different scripts, possibly in different time periods.

Attachments | Inserts
There are three different varieties of tape adhered to the verso of the letter holding the detached parts of the letter together. There is a glassine-like tape, a white linen (?) cloth tape, and an "artist tape" with a paper carrier coated with a plastic. The letter is hinged to a thin, blue mottled paper board with four v-hinges, located at each corner of the letter. In order to conduct examination, the v-hinges were cut with a scalpel to release the letter from the backing.

Housing
As received, the letter was hinged onto a thin blue paper board and inserted in an oversized clear plastic sleeve.

CONDITION:

Summary
The letter is in extremely poor condition and is in severe need of archival storage and stabilization for long term preservation.

**Binding**
n/a

**Textblock**
n/a

**Primary Support**
The paper has discolored overall from beige to a light brown. The edges are slightly more yellowed than the center of the paper, particularly on the verso.

At some point in the object’s history, the letter was folded. It appears the sheet was first folded in half, then folded into thirds horizontally, and again folded into thirds vertically. In total, there are 18 quadrants formed by folds. Over time, the sheet’s center fold and horizontal folds have torn, breaking the sheet into six detached segments. Along these tears, there are many areas of paper loss, creasing, and small folded edges. Currently, the pieces of the letter are taped together on the verso. The taped sheet is hinged to an acidic backing board.

Overall, the letter is dirty. The verso of the document contains significant areas of differential dirt accumulation, corresponding to how the letter was folded. When folded, the outermost exposed areas of paper accumulated the greatest amount of dirt. These dirty areas of paper contain some of the handwritten inscriptions that are now difficult to read.

**Medium**
The black handwritten ink is in fair condition but is showing signs of ink corrosion, possibly iron gall ink corrosion. The ink has not faded but is strong in tone; however, the ink is beginning to strike through to the back of the paper. There is evidence that the ink contains heavy metal ions that have begun to catalyze degradation of the cellulose; there are small areas of paper loss within the black handwritten ink. The graphite is faintly present in areas of heavy dirt accumulation. Examination with infrared photography could help to better distinguish the writing from the dirt.

**Housing**
Custom

**Housing Narrative**
The thin blue board is deformed from poor handling. The right hand side contains a vertical crease running from the top edge to the bottom edge that is placing stress on the object. Over time the exposed areas of the board have drastically faded in color, such as around the edges of the letter and along the losses throughout the folded regions. This suggests the letter has been exposed to a significant amount of cumulative light.

**Attachments|Inserts**
The glassine tape is taped in four locations along fold intersections with larger areas of paper loss. The tape is brittle and yellowed with age.
The white cloth linen tape is adhered to the center sheet fold and the horizontal breaks in 19 locations, and is also used to hinge the letter to the backing board along the right side in two places. The linen cloth is gray from dirt accumulation and is stiff from age.
The artist tape with a paper carrier and plastic coating attaches the letter to the backing board with v-hinges along the left side of the letter. Components in this tape’s adhesive is migrating and visible from the front of the sheet, causing areas of dark discoloration.

**Previous Treatment**
The six detached pieces of the letter were taped back together in three different campaigns. The taped letter was hinged with four v-hinges to a poor quality backing board for support.
Materials Analysis
The translucent yellowed glassine (?) tape, the white cloth linen (?) tape, and the white silicone coated (?) paper tape adhesives were all tested for water solubility. To test whether the adhesives would soften with water, a thick methyl cellulose poultice was brushed onto the corner of each tape. After 30 seconds, one minute, and two minutes, each adhesive was tested for softening and swelling by inserting a thin metal spatula beneath the tape carrier.
Results:
The thin glassine tape readily softened after 30 seconds and could be easily lifted with a metal spatula. The white cloth tape required approximately two minutes to fully soften the gummed adhesive, which was also lifted with the aid of a micro spatula.
The silicone-coated paper tape did not solubilize in the presence of water. Instead, the adhesive, most likely an acrylic adhesive, began to become tacky after two minutes of contact with the methyl cellulose poultice. The tape did not release from the paper as easily as the other two forms of tape and had to be carefully peeled away from the paper substrate with tweezers.
The glassine and cloth tape left no adhesive residue behind once lifted. Dark staining was noted beneath the silicone-coated paper tape adhesive.
The manuscript ink was tested positive to Fell ions using non-bleeding naphthophenanthroline indicator paper.

TREATMENT:
Proposal
1. Gently surface clean the letter on the recto and the verso, taking care to avoid the areas of handwritten graphite.
2. Remove the damaging and brittle tape carriers and reduce the tape adhesive from the paper support.
3. Gently reduce creases and un-fold areas of paper around broken folds.
4. Re-align the detached letter segments and repair the broken folds.
5. House the letter in a polyester L-sleeve for extra support.
6. Mount the sleeved letter in an archival window mat with a protective front cover.

**October 16th, after careful examination and consideration, the treatment proposal was altered. During a phone conversation between Ashleigh and Laurel it was decided to take a more interventive treatment approach after discovering the manuscript ink tested positive for Fe2 ions. Because the severely brittle and acidic paper substrate contained actively corroding iron gall ink and was taped with water soluble tape adhesive, it was decided the document was a better candidate for washing and lining to stabilize. Thoroughly washing the document will greatly prolong the usable life of the document by better reducing tape adhesive on the verso of the document, reducing the overall acidity of the paper substrate and imparting an alkaline buffer, and removing unstable Fe2 ions in the iron gall manuscript ink. By both increasing the alkalinity of the paper and removing the unstable iron ions, this will greatly slow down the degradation mechanisms associated with iron gall ink corrosion.

Housing Need
Custom

Factors Influencing Treatment
In order to protect the extant graphite and prevent dark haloing around the handwritten inscription, the dirt accumulation on the verso of the letter may not be greatly reduced. Because the ink is showing signs of corrosion, introducing moisture from adhesives will be avoided as much as possible throughout treatment.

Performed Treatment
1. The recto of the letter was delicately surface clean as much as safely possible with an Absorbene soot sponge and vinyl eraser crumbs. Edges could not be extensively surface cleaned due friable and creased paper edges. The verso of the document was also surface cleaned overall with a soot sponge and vinyl erasers. The graphite inscriptions were not further cleaned so as to prevent loss of the inscriptions.
2. The tape carriers on the verso of the document were removed from the paper substrate by softening the
tape adhesive with a thick methyl cellulose poultice. Softened adhesive was mechanically removed with a spatula. After removing the tape the fragmented document consisted of six separate pieces that contain tears and breaks along creases.

3. Two fragments contained a greasy adhesive stain located in an outer corner caused by tape adhesive on the verso. This staining was reduced with solvents in the fume hood.

4. The six fragments were washed in a filtered water immersion bath for a total of 25 minutes in two baths, buffered to pH 8 with calcium hydroxide. After blotting the fragments dry after washing, creases and folded areas of paper were gently unfolded and smoothed with a Teflon spatula prior to drying.

5. After being removed from the baths, the fragments were individually dried on a suction table on low suction. Drying the fragments on a suction table helped dry the fragments quickly (preventing them from exposure to prolonged high humidity) and helped dry the fragments flat. After washing, the manuscript ink tested negative with bathophenanthroline indicator papers.

6. The fragments were re-aligned and re-joined by lining the document overall on a light table. The document was lined with a thin tengujo tissue and a 1:1 mixture of Zen Shofu wheat starch paste and methyl cellulose A4M. Lining with such a thin tissue enables the graphite inscriptions to be as clearly visible as they were before treatment.

7. To strengthen the overall handle-ability of the document and prevent the fragments from separating over time with handling, substantial areas of paper loss along folds were filled with a western handmade Windsor paper. The fill paper was toned with Golden Acrylcs to better match the tone of the paper. Areas with a high density of small paper losses that weakened joints were filled with paper pulp fills sized with methyl cellulose.

8. The document was pressed overnight in a pressing stack after losses were filled to dry flat.

9. The treated letter was housed in a polyester L-sleeve for extra support.

**Housing Provided**

Custom

**Housing Narrative**

Stored in a polyester L-sleeve that is mounted with photo corners in a buffered Rising museum mat board window mat with a protective cover.

**Storage Recommendations and Handling notes**

The letter is now stable and exhibitable. After treatment, the document is less prone to degradation from handling, poor storage, and iron gall ink corrosion. Store the letter in a humidity controlled environment, preferably in low humidity below 60% RH to prevent the iron gall ink from corroding and degrading the paper substrate. It is recommened to gently handle the document with the L-sleeve if removed from the mat.

**PRODUCTION - WORK ASSIGNMENT AND TIME**

<table>
<thead>
<tr>
<th>Team Member</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashleigh Schieszer</td>
<td>285 minutes</td>
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<tr>
<td>Ashleigh Schieszer</td>
<td>435 minutes</td>
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<tr>
<td>Ashleigh Schieszer</td>
<td>120 minutes</td>
</tr>
<tr>
<td>Jessica Ebert</td>
<td>180 minutes</td>
</tr>
</tbody>
</table>

**TOTAL Treatment and Documentation Time**

17 hrs
The Preservation Lab

Photographic Documentation by Jessica Ebert & Ashleigh Schieszer
During Treatment, normal illumination, acidic backing removed, backing mat contains fading from light damage

Before Treatment, recto, transmitted illumination, tape and paper losses are visible

Before Treatment, recto, transmitted illumination, watermark
notcat970_A03N_DET, Before Treatment, verso, normal illumination, detail of verso

notcat970_A03UV_DET, Before Treatment, verso, ultraviolet radiation, tape carriers are fluorescent
notcat970_A01R, Before Treatment, raking illumination from right, recto, document is severely creased

notcat970_D01R, After washing and lining overall, raking illumination from right, recto, creasing is reduced
notcat970_D01N, After lining overall with tengujo tissue, recto, normal illumination

notcat970_E01N, After Treatment, recto, paper losses are filled, normal illumination
After removing tape carriers, before washing, verso, normal illumination

After washing, verso, normal illumination

After lining with tengujo tissue, verso, normal illumination

After treatment, paper losses are filled, verso, normal illumination
notcat970_A02N, Before Treatment, verso, normal illumination

notcat970_A02UV, Before Treatment, verso, ultraviolet radiation

notcat970_E01UV, After Treatment, recto, ultraviolet radiation

notcat970_E02UV, After Treatment, verso, ultraviolet radiation