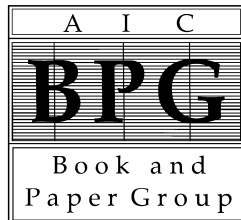


The Book and Paper Group ANNUAL

VOLUME FORTY-TWO 2023

The American Institute for Conservation of Historic and Artistic Works



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Nanocellulose Application in Photograph Conservation

INTRODUCTION

In recent years, there has been a surge of research in the application of nanocellulose in multiple disciplines including material science, biomedical engineering, and art conservation, to name a few. Nanocellulose is “cellulosic extracts or processed materials having defined nano-scale structural dimensions” (Abitbol et al. 2016, 76). There are three main types of nanocellulose: cellulose nanocrystals (CNCs), also known as nanocrystalline cellulose (NCC); cellulose nanofibrils (CNFs); and bacterial cellulose (BC). A variety of methods is used to extract the nanoparticles from the different sources, and each method results in varied crystallinities, surface chemistries, and mechanical properties, all which can be utilized for different applications (Abitbol et al. 2016, 76). For instance, CNFs are ultimately entangled fibrils that are composed of both amorphous and crystalline cellulose components, unlike CNCs which are almost perfectly crystalline (~90%). There are three main processes to create CNFs: mechanical treatments, chemical treatments, and a combination of both. Unlike the other two types of nanocellulose, BC is synthesized as pure cellulose; therefore, lignin and hemicellulose do not need to be removed (Völkel et al. 2017). This distinction is of particular importance to paper conservators, as lignin and hemicellulose can be the source of deterioration in paper-based objects made from poor-quality paper.

One of the important properties of nanocellulose to consider is its tensile strength, which varies among the different types of nanocellulose. This characteristic is of some interest to paper conservators especially in tear repair. Furthermore, nanocellulose displays many optical characteristics that are also useful for paper conservation. CNCs and CNFs can be cast as optically transparent films which are useful for tear repair of thin objects. A study conducted at the National Library in France demonstrated that nanocellulose film combined with 5% Klucel G in ethanol worked very well when repairing tears on translucent paper objects (Dreyfuss-Deseigne 2017, 36).

Another study tested the hypothesis that, due to the compatibility between nanocellulose and paper-based artworks, the addition of an adhesive is unnecessary when applying nanocellulose as a mending material (Völkel et al. 2017). The authors tested several types of nanocellulose suspensions that were modified with ethanol and gelatin. The suspensions, under a vacuum to control moisture, were brushed on or applied with a film applicator to different test papers, including rag paper, book paper, paper with lignin, and Whatman paper. They were then dried for 12 hours. Once the samples were prepared, they were analyzed using microscopy, the tensile strength was measured, and brightness and visual characteristics were observed. The samples were then aged and tested again. Overall, the authors found it possible to modify the nanocellulose suspensions by adjusting the water content during preparation and adding adhesives like gelatin in different concentrations. However, these modifications changed some properties of the nanocellulose, including surface sheen, tack, and fiber length. The higher the concentration of nanocellulose, the hazier the appearance of the film. BC appears shinier, whereas CNF films appear more matte, with a whitish haze. In general, the modified nanocellulose suspensions aged well and did not cause damage to the paper substrate, thus demonstrating a promising method for tear repairs or other treatment options in paper conservation.

Another common treatment in paper conservation that has benefited from the addition of nanocellulose is the calcium phytate treatment to stabilize paper with iron gall ink degradation. A more recent study by Völkel et al. (2020) incorporated nanocellulose into different steps of the standard calcium phytate process and then aged the samples to determine if they had visually, chemically, and mechanically changed. They also used LA-ICP-MS to track the movement of iron migration in the paper substrates, as that is one of the main concerns when treating objects with iron gall ink. The authors found that the addition of the nanocellulose fibers did not impair chemical treatment and provided significant physical stabilization during the process. This study added to the body of research demonstrating the usefulness of modified nanocellulose in paper conservation treatments, such as

Papers presented during the Book and Paper Group Session, AIC's 51st Annual Meeting, May 16–20, 2023

Trial	Solution	Colorant	Number of Sheets	Thickness
1	100% water	Pan watercolor: dark gray/black	4	0.0095 mm
2	100% water	Pan watercolor: light dark	4	0.0095 mm
3	50/50 water and ethanol	Tube watercolor: gray	3	0.0095 mm
4	90% water and 10% ethanol	QOR watercolor: dark gray with pearl	3	0.0095 mm
5	85% water and 15% ethanol	QOR watercolor: warm brown/yellow	3	0.0095 mm
6	Water and retention agent	Aardvark colors	3	0.0105 mm
7	Water and less retention agent	Aardvark colors	3	0.0105 mm
8	Water and retention agent	Aardvark colors	3	0.0105 mm
9	Water, ethanol, and 2.5% methyl cellulose	QOR watercolors	3	0.0095 mm
10	Water, ethanol, and 5% methyl cellulose	QOR watercolors	3	0.0095 mm
Control	Water	No pigment	3	0.0095 mm

Table 1. Summary of the Components for the Different Colorant Trials

utilizing gelatine-infused nanocellulose in the treatment of paper damaged by copper-based pigments or iron gall ink.

Finally, Canham, Murray and Hill (2023) published on the practical aspects of nanocellulose, as well as its use as a remoistenable or precoated tissue substrate. The authors conducted several tests to characterize the shrinkage and expansion of nanocellulose when moisture is introduced to the nanocellulose film. They also tested several adhesives that are commonly used to create remoistenable tissue, including methyl cellulose, a mixture of methyl cellulose and wheat starch paste, Klucel G, gelatin, and Aquazol 200. The authors found potential for remoistenable tissues prepared with methyl cellulose and gelatin with the addition of nanocellulose.

The research presented here builds on the preceding studies and demonstrates how nanocellulose can be used to create colored fills with different surface textures and glosses that can then be applied to fills on photographs. Matching fill materials with the original photographs can be difficult due to the varied surface glosses and tonal ranges possible in photographs. Nanocellulose presents a unique opportunity to help solve this difficulty because the nanocellulose pulp can be colored and cast before it is applied to the photograph. The goal of this study is to find the best way to color, cast, and apply fills to different types of photographs. This was accomplished through a variety of trials using different coloring agents including watercolors, Aardvark colors, and acrylic paints. These colorants were mixed with the nanocellulose suspension in combination with water and ethanol. The films were then applied to photographs using common adhesives used in conservation, including wheat starch paste, gelatin, Klucel G, and methyl cellulose. Overall, the best results were obtained with QOR watercolors sized with methyl cellulose and then applied to the photograph with methyl cellulose; however, several interesting observations were also made throughout the trials, including a difference

in gloss and color between the mold side and air side of the nanocellulose films.

EXPERIMENTS

To determine what materials and methods allowed for the best coloration of the nanocellulose, several different colorants were tried, including tube watercolors, pan watercolors, Aardvark colors, QOR watercolors, and acrylic paints. Table 1 shows the different variables tested in the trials. Step-by-step procedures for each trial type are presented in the appendix.

Although different colorants were used to color the film, the general procedure remained the same. First, a small amount of nanocellulose was weighed. The amount depended on how many sheets were to be made, the desired thickness of the films, and the diameters of the molds used to cast the films. All of this data was input into an online calculator designed by Canham and Yeomans to determine the proper amount of nanocellulose needed (<http://www.burroakbookbinding.com/nanocellulose-calculator/>). Then half the amount of water was added to the nanocellulose along with a stir bar. This was stirred for a few minutes using a stir plate. While the nanocellulose was stirring, the remaining water was placed in another beaker and colorant was added to that water and stirred with a glass rod. The colorant was added until the desired color was reached using one to three colors. For some trials, some of the water was replaced with ethanol to help disperse the pigment. The water and color mixture was then added to the nanocellulose suspension and stirred for approximately 10 minutes. After stirring, the suspension was poured into a silicone mold and allowed to air-dry for about a week, leaving just the colored film behind. The general experimental method is shown in figure 1.

After experimenting with colorants, the issue of how to apply the nanocellulose films was addressed. Due to their

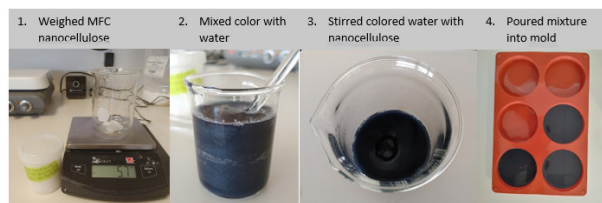


Fig. 1. Simplified procedure for creating air-dried nanocellulose films.

thinness, nanocellulose films are extremely sensitive to moisture. The introduction of moisture can cause the film to warp and tear; therefore, applying the adhesive to the nanocellulose was unsuccessful. Instead, a small dot of adhesive was applied to the support to which the nanocellulose film was to be adhered. Different adhesives were explored, including methyl cellulose, gelatin, Klucel G, and wheat starch paste. During the initial testing to determine how to best adhere the films, a piece of Japanese paper was used as the support. Six of the 14 trials were chosen, along with a control to adhere to the Japanese paper support. These films were chosen because they had the most evenly dispersed colorants, and they came out of the mold easily. Two small pieces of nanocellulose film were adhered using each adhesive. One piece was adhered with the mold side up, and the other was adhered with the air side up since the color and gloss varied according to side in all the samples (fig. 2). The success of each adhesive was

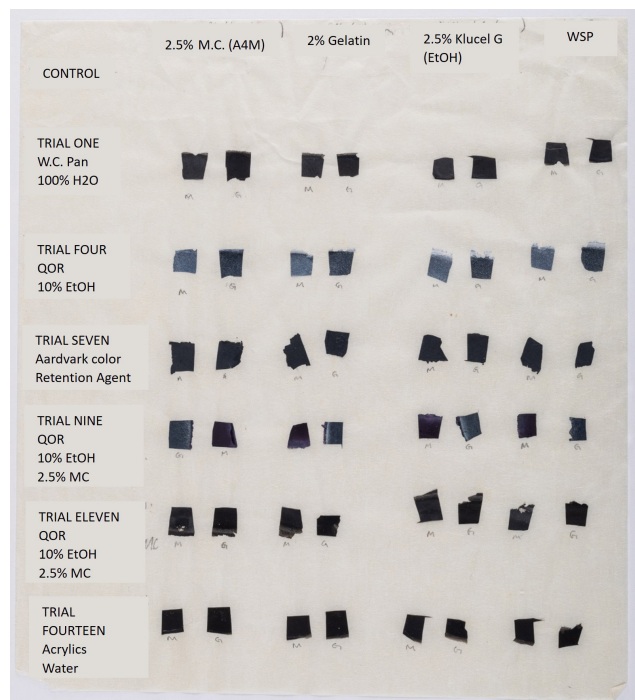


Fig. 2. Application of trials using different adhesives including methyl cellulose, gelatin, Klucel G, and wheat starch paste. The paper was divided so that there were four columns for the different adhesives and five rows of the different colorant trials.

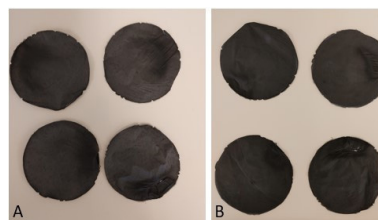


Fig. 3. Trial 1 films. (a) Air side, normal light. (b) Mold side, normal light.

assessed based on how well the nanocellulose adhered to the Japanese paper, using as little adhesive as possible to avoid warping the film. Observations were also made in raking and normal light.

RESULTS AND DISCUSSION

Trials 1 and 2: Water and Kremer Photograph Inpainting Palette

The first two trials were conducted using water and Kremer pigments. The pigment distribution was quite uneven, with the highest concentration in the center of the film. There was also a difference in gloss on the side dried against the mold (or mold side) and the side exposed to the air (or air side). The mold side was noticeably glossier than the air side. Furthermore, when the sheets were removed from the mold, there was a fair amount of pigment transferred to the mold and hands. Images of trial 1 and trial 2 in both normal and transmitted light are presented in figures 3 through 5.

Trials 3, 4, and 5: Water, Ethanol, and QOR Watercolors

Trials 3, 4, and 5 were colored with QOR watercolors because it was easier to get a larger amount of pigment from a tube

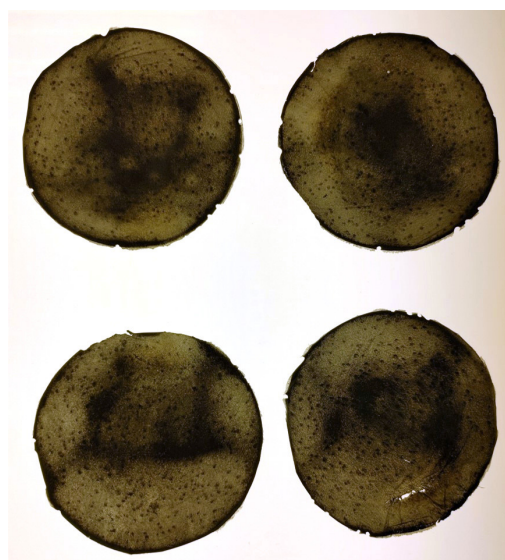


Fig. 4. Trial 1 films, air side, transmitted light.

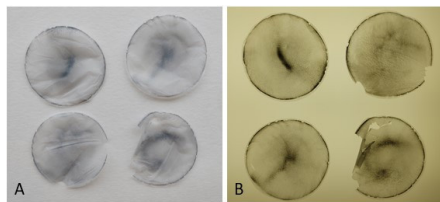


Fig. 5. Trial 2 films. (a) Air side, normal light. (b) Air side, transmitted light.

than a pan and also because QOR watercolors use a binder of Aquazol, which is soluble in water and ethanol. Ethanol was used in these trials in hopes of aiding the dispersion of pigment. As seen in the trial 4 image, there was better pigment dispersion and less pooling in the middle of the films (fig. 6). There remained some difference in gloss between the air and the mold sides, with the mold side having higher gloss.

Trial 5 showed an interesting phenomenon with the air and mold sides differing significantly in color. When the pigments were in suspension, the solution had a warm yellow-gray color similar to a common tone of albumen photographs. Once dry, the air side was gray and the mold side was more yellow. This was due to the individual pigments in the mixture settling differently as the solvent dried (figs. 7, 8).

Trials 6, 7, and 8: Water, Retention Agent, and Aardvark Colors

To address the problems of color offsetting from the dry films and the color change caused by differential pigment settling, Aardvark colors with a retention agent were used for trials 6, 7, and 8. Aardvark colors, first developed by Carriage House Paper, are pigments used specifically for coloring paper pulp. Considering that nanocellulose is essentially purified paper pulp, it seemed like a good option for achieving even color. The Aardvark colors are designed to be used with the Carriage House Paper retention agent, which is a cationic substance that gives the pulp a positive charge. The pigments tend to have a negative charge and therefore will remain affixed to the pulp if the proper quantity of a cationic retention agent has been added.

Although the retention agent adhered the colorant to fibers very well, it also made it extremely difficult to remove the films from the mold. They were decidedly stuck and came

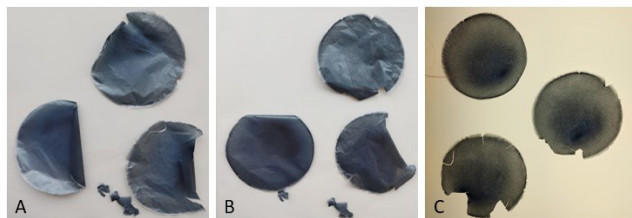


Fig. 6. Trial 4 films. (a) Air side, normal light. (b) Mold side, normal light. (c) Air side, transmitted light.



Fig. 7. Trial 5, air side, normal light. The less dense pigments rose to the top of the film. The final color appears more gray.

out of the mold in several pieces. As seen in figure 9, the films did not come out of the molds easily even when the retention agent was reduced. Furthermore, the films colored with the pigments and retention agent were more opaque, and there



Fig. 8. Trial 5, mold side, normal light. The denser pigments sank to the bottom of the film. The final color appears more yellow.

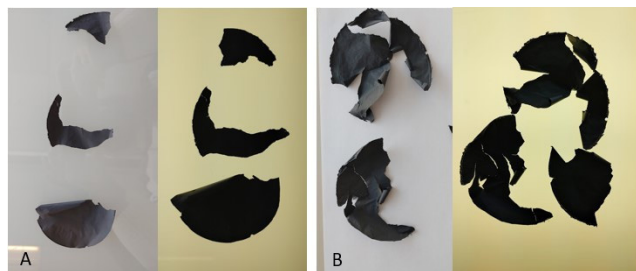


Fig. 9. (a) Trial 6 films, air side, normal and transmitted light; (b) trial 7 films, air side, normal and transmitted light.

was no color transfer to the mold or hands. Three different colors were also combined to see if differential settling would occur, and none was observed as in previous trials.

Although the trials with the Aardvark colors were not as successful as others because of the difficult removal from the molds, the films were strong and the color distribution was even, so more testing could be conducted using different casting methods, such as casting a larger film using a suction table and silicone-release Mylar instead of a mold.

Trial 9: Water and Ethanol (9:1), 2.5% Methyl Cellulose Sizing, and QOR Watercolors

After the slightly unsuccessful trials with the Aardvark colors, QOR colors were revisited with a slight variation—the addition of 2.5% methyl cellulose as a sizing agent. Methyl cellulose was added to the nanocellulose suspension after the colorant was added. As seen in figures 10 and 11, the distribution of color was fairly even, the films came out of the molds easily, and there was no transfer of color to the mold or hands. Three pigments were used to create a purple-gray color often seen in photographs and to determine if the methyl cellulose would prevent the variation in color from one side to the other. As additionally seen in figures 10 and 11, there is still a difference between the two sides, with the mold side being glossier and lighter gray in color and the air side being more matte and a darker, purple-gray color. Finally, when compared to the others, these films had less drape and behaved more firmly, whereas the trials without methyl cellulose were softer and pulpier.

Trials 10 and 11: Water and Ethanol (9:1), 5% Methyl Cellulose Sizing, and QOR Watercolors

The samples in trials 10 and 11 were created the same way as in trial 9, but instead of 2.5% methyl cellulose, 5% methyl cellulose was used to determine if the distribution of pigment would be different with a higher concentration of the sizing agent. As seen in figure 12, the methyl cellulose pooled in certain areas and caused a water droplet effect throughout the films. Trial 11 also employed 5% methyl cellulose, but it was stirred for another 20 minutes on the stir plate to determine



Fig. 10. Trial 9 films, air side, normal light.



Fig. 11. Trial 9 films, mold side, normal light.

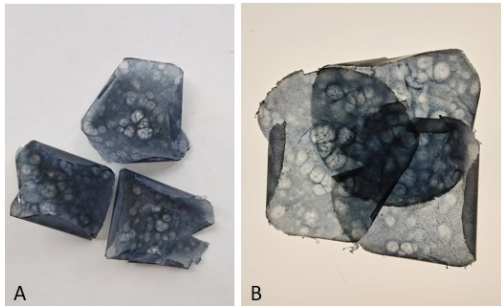


Fig. 12. Trial 10 films, overlapping mold side, transmitted light.

if this would prevent the pooling of the sizing solution. The extra stirring was somewhat successful, but there were still some uneven areas.

Trials 12 and 13: Water, 2.5% Methyl Cellulose Sizing, and QOR Colors

Trials 12 and 13 returned to 2.5% methyl cellulose as the sizing solution since it resulted in a more evenly dispersed film. No ethanol was used in these trials to determine its effect on pigment dispersion. Ultimately, the dispersion for both one and three colors appeared to be the same when using just water or 10% ethanol in water. The variation in appearance between sides was still significant. The air side appeared grayer, whereas the mold side was glossier and yellower (fig. 13).

Trials 14 and 15: Water, 2.5% Methyl Cellulose Sizing, and Golden Acrylics

In the final two trials, acrylic paints were used as a comparison to the QOR watercolors and Aardvark colors since acrylic paints are a familiar material in paper conservation treatments. It was hoped that the trials could answer questions such as how well acrylic paints disperse in the nanocellulose film, if there is a difference in texture and gloss, and if pigment combinations settle unevenly, thus causing a difference between the air side and mold side. The films colored with acrylics had the most even dispersions of all the trials. However, the texture of these films was more plastic-like than the other trials.

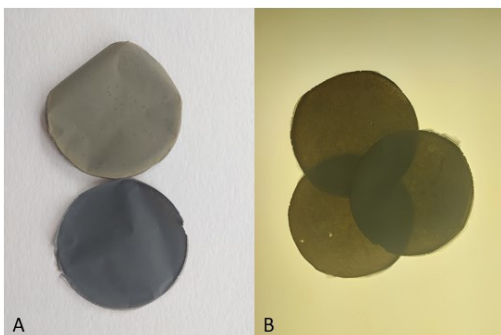


Fig. 13. Trial 13 films. (a) Air side, normal light. (b) Overlapping films, air side, transmitted light.

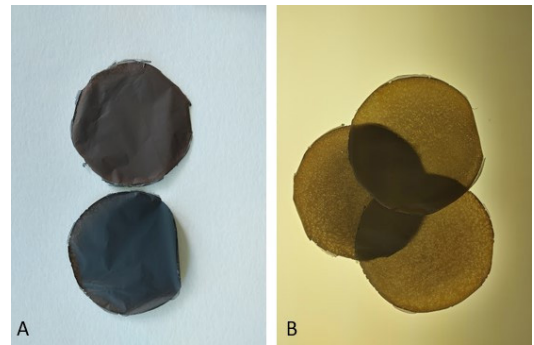


Fig. 14. Trial 15 films. (a) Reddish air side (top) and darker gray mold side (bottom), normal light. (b) Overlapping films air side, transmitted light.

There was also a distinct difference in appearance between the air side and the mold side, with the mold side having a higher gloss and redder hue, whereas the air side was more matte and grayer (fig. 14). Although the texture of the films is fairly different from paper, these films could be used for thin fills on photographs. The acrylic-colored films could be explored for other applications, such as objects conservation.

Results for Application Methods and Adhesive Options

As mentioned earlier, small pieces of nanocellulose film from several trials were cut and adhered to a Japanese paper substrate using several adhesives, including methyl cellulose, gelatin, Klucel G, and wheat starch paste. Due to the thinness of the nanocellulose films, the adhesive could not be applied directly to film and then applied to the substrate like a typical paper mend. Rather, the adhesive was applied to the substrate and then the film was placed on top of the adhesive and dried under Mylar and a weight. Regular Mylar was used, and there was no issue with it sticking; however, silicone-release Mylar could be used as well. It is important to note that the nanocellulose film is quite impressionable when slightly damp, and therefore anything pressed on the film while drying will impart its texture, including a fingerprint. Thus, if a glossy texture is desired, it is necessary to use Mylar or silicone-release Mylar. This does pose an interesting research avenue for fills that require texture. Table 2 summarizes observations made when the films were adhered to the Japanese paper.

Trials on Practice Photographs

Vintage photographs purchased from eBay were used to practice the nanocellulose fill techniques. Several photographs with small emulsion losses were selected. The films from trials 1 through 15 were used to create fills, even if the color was not an exact match. For the first trial on a silver gelatin photograph, the best color match was chosen from trial 14, which used one acrylic paint to color the nanocellulose film. A small piece just larger than the area of loss was cut from the film. Next, a small drop of 2.5% methyl cellulose

	Observations
2.5% Methyl cellulose (A4M)	Adhered well to both nanocellulose and Japanese paper. To keep the gloss on the mold side piece, it needed to be dried under Mylar, not Hollytex. The most distinctive color difference between the mold and air sides was found in trial 4 with the QOR watercolors.
2% Gelatin	Did not adhere as well to the Japanese paper and nanocellulose as the methyl cellulose. Still needed to dry the mold side under Mylar to keep the gloss.
2% Klucel G in ethanol	Dried quickly and did not adhere well to the Japanese paper. Had to reapply adhesive over nanocellulose and dry again.
Wheat starch paste	Fairly wet and caused some warping of the nanocellulose when applied to the Japanese paper. The most distinctive color difference between the mold and air sides was found in trial 4 with the QOR colors.

Table 2. Summary of Observations of Adhesives Used to Adhere Nanocellulose to Japanese Paper

was placed in the area of loss. The nanocellulose film was carefully placed on the adhesive using tweezers. A smooth piece of Mylar was then placed on the fill with a small weight on the top and left to dry for about 15 minutes. Once dry, the Mylar was carefully removed, leaving the nanocellulose film adhered to the area of loss. The excess film was carefully removed around the edges of the loss by gently pulling with tweezers while holding down the fill with Mylar. This left just the nanocellulose film that was adhered to the loss, creating an even fill (fig. 15).

A second warm yellow-gray silver gelatin photograph with loss of both the emulsion layer and some of the paper beneath was chosen for another trial. The film from trial 13 was chosen as the best color match. Trial 13 was one of the trials that produced films with two distinct sides: one was a

warm yellow-gray, whereas the other was darker gray. The color of one side was not an exact match with the original photograph, but when two films were layered on top of one another, it was a closer match. In addition, because the area to be filled was deeper than the previous fill, the layered fill helped compensate for the deeper loss. Furthermore, it allowed for preliminary experimentation of layering different colored films to create a desired color. Once laminated together with methyl cellulose and dried under Mylar, a slightly oversized piece of nanocellulose film was placed on a dot of methyl cellulose over the area of loss and left to dry under Mylar for about 15 minutes. Upon removal of the Mylar and excess material, the fill appeared less glossy than the surrounding photograph, so another small dot of methyl cellulose was placed on top of the fill and left to dry under Mylar. When dry, the gloss of the fill was significantly closer to the original photograph, and the overall texture of the fill appeared similar to the orange peel texture of a silver gelatin photograph under magnification (fig. 16). Although the color was not a perfect match, the application technique proved successful based on the overall texture and gloss of the fill.

CONCLUSIONS

Overall, these different trials demonstrate that nanocellulose film can be colored fairly evenly using QOR watercolors, ethanol, and a 2.5% methyl cellulose sizing agent. In addition, when creating nanocellulose films, it would be prudent to create large batches of films with the range of colors and hues that are often seen in photographs, as it takes about a week for the films to dry. Once the films are made, they can be stored in paper folders between sheets of regular Mylar or silicone-release Mylar. The major factors to consider when creating nanocellulose films are as follows:



Fig. 15. First fill application trial on silver gelatin photograph. (a) Missing emulsion on silver gelatin photograph. (b) Matching a prepared nanocellulose film with the photograph. (c) 2.5% methyl cellulose placed on bare spot and nanocellulose overtop with Mylar. (d) Nanocellulose fill dried and excess removed.



Fig. 16. Second fill application trial on a silver gelatin photograph. (a) Missing emulsion on silver gelatin photograph circled in red. (b) Matching a prepared nanocellulose film with the photograph and adhering it with 2.5% methyl cellulose. (c) Another layer of methyl cellulose added on top of the fill and dried under Mylar. (d) Nanocellulose fill on photography, normal light, photomicrograph.

- The difference in gloss between the air side and mold side of the film should be considered.
- Using mixtures of pigments can cause a difference in color from the mold side to the air side.
- Application of the nanocellulose films works best when the adhesive is applied to the substrate rather than the film itself.
- Overlapping nanocellulose films of different colors can create the desired hue.
- If a glossier surface is desired, cast the fill against a smooth surface like Mylar.

Figure 17 summarizes trials 1 through 15, demonstrating the differences in color, gloss, and texture for the different colorants used.

Finally, there is much potential for future research on nanocellulose films as a colored fill material, including different



Fig. 17. Overview and comparison across trials for both mold and air sides in a combination of normal and raking light.

casting methods, such as using a suction table, which may help prevent the differential settling of pigments. Another area of exploration is casting films of various thicknesses against different textures, which could then be used to create fills for textured photographs or other objects. Nanocellulose is a useful tool in paper conservation with great potential for further exploration to expand its capabilities within the field.

ACKNOWLEDGEMENTS

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APPENDICES

Trial 4 Procedure: QOR Watercolors, Water, and Ethanol

QOR watercolor paints were combined with 9:1 water and ethanol and CNF, then cast and left to dry. The goal of this trial was to determine the following:

- How does ethanol affect opacity?
- Does adding ethanol help disperse the pigment?
- Does the color of the solution remain the same once dry?

Procedure:

4.18 g CNF
72.81 mL water
8.09 mL ethanol
28.4 mL of CNF suspension added to each mold

1. Measure 4.18 g of CNF in a 200-mL beaker.
2. Using a 100-mL beaker, add 8.09 mL of ethanol.
3. Add water to the 100-mL beaker containing ethanol until the 50-mL mark is reached.
4. Tare the scale and place the 100-mL beaker of ethanol on the scale, then add the QOR watercolor paint, noting the weight of each color as added:
 - a. 0.1 g iridescent pearl
 - b. 0.1 g Paynes gray

5. Add the rest of the water to the 100-mL beaker (it weighed a total of 80.9 mL).
6. Add the ethanol and water mixture to the measured CNF and stir.
7. Use a stir rod and stir plate to mix the suspension for about 15 minutes.
8. Measure 28.4 mL of CNF suspension, and pour it into one of the molds.
9. Repeat for the remaining two molds.
10. Let sit for about a week to dry.

Trial 6 Procedure: Aardvark Color, Water, and Retention Agent

Aardvark color and retention agent were used to color the CNF before it was cast and dried. The goal of this trial was to determine the following:

- How does the combination of retention agent and colorant affect opacity?
- Does the retention agent help with dispersion and adherence of pigment to fibers?
- How does the pigment disperse in the dried sheet?

Procedure:

4.62 g CNF
80.4 mL water
0.31 g retention agent
0.31 g wet pigment slurry
28.4 mL of CNF suspension added to each mold

Thickness: 0.0105 mm

1. Measure 4.62 g of CNF into a 400-mL beaker.
2. Measure 40.2 mL of water into a 100-mL beaker.
3. Add 0.31 g of the retention agent to the water in the 100-mL beaker.
4. Add the solution of water and retention agent to the pulp mixture in the 400-mL beaker. Allow it to stir on a stir plate for 10 minutes.
5. Add the following proportions of pigments to the other half of the water (40.2 mL) in a 100-mL beaker:
 - a. 0.11 g titanium dioxide
 - b. 0.2 g carbon black
6. Combine the pigment and water solution with the pulp suspension. Stir for 10 minutes on the stir plate.
7. Pour 28.4 mL of the suspension into a 30-mL beaker.
8. Pour the measured colored suspension into a 9.5-cm-diameter silicone mold.
9. Repeat filling the other two molds in the same way.
10. Let sit with a domed paper cover to help prevent large changes in airflow from the AC system and to prevent dust from settling on the film (it took about a week for the water to evaporate).

Trial 9 Procedure: QOR Watercolors, Water, Ethanol, and 2.5% Methyl Cellulose Sizing

This trial was based on correspondence with Rachel Mochon, who had some success adding 5% methyl cellulose (A4M) to the colored mixture of nanocellulose and water.

Procedure:

4.18 g CNF
72.81 mL water
8.09 mL ethanol
2.09 g of 2.5% methyl cellulose
28.4 mL of suspension added to each mold

1. Measure 4.18 g of MFC into a 200-mL beaker.
2. Add half the water (36.4 mL) to the MFC in a 200-mL beaker.
3. Add 2.09 g of 2.5% methyl cellulose (A4M) to the MFC and water mixture. Stir for 10 minutes on a stir plate.
4. Place the other half of the water (36.4 mL) into a 100-mL beaker, and add 8.09 mL of ethanol.
5. Add about 0.2 g of QOR watercolors (three different colors), and stir with a glass rod until the desired color is reached.
6. Pour the watercolor mixture into the MFC mixture, and stir on a stir plate for 10 minutes.
7. Pour 28.4 mL of the stirred solution into each mold (three molds).
8. Let air-dry for about a week.

Trial 14 Procedure: Acrylics, Water, 2.5% Methyl Cellulose Sizing

As a comparison to the watercolors, a trial using acrylic paint was conducted. The goal of this trial was to determine the following:

- How well do acrylic paints disperse in nanocellulose that is sized with methyl cellulose?
- Is the texture different from the previous trials conducted with watercolors and Aardvark colors?
- How is the gloss and color different from the films colored with watercolors?

Procedure:

4.18 g CNF
80.9 mL water
2.09 g of 2.5% methyl cellulose
28.4 mL of suspension added to each mold

1. Measure 4.18 g of CNF into a 400-mL beaker.
2. Add half the water (40.0 mL) to the CNF in the 400-mL beaker.
3. Add 2.09 g of 2.5% methyl cellulose (A4M) to the mixture of CNF and water. Stir for 10 minutes on a stir plate.

4. Place the other half of the water (40.0 mL) into a 100-mL beaker.
5. Add about 2 g of QOR watercolor (three colors), and stir with a glass rod.
6. Pour the watercolor mixture to the MFC mixture, and stir on a stir plate for 10 minutes.
7. Pour 28.4 mL of the stirred solution into each mold (three molds).
8. Let air-dry for about a week.

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SOURCES OF MATERIALS

Aardvark Colors – Carriage house pigments – carriagehouse-paper.com/supplies/pigments-additives/pigments
CNF Nanocellulose – umaine.edu/pdc/nanocellulose/
QOR Watercolors – www.dickblick.com/brands/qor/
Silicone Molds – amazon.com

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Conservation of Mark Rothko's Paintings on Paper

INTRODUCTION

Contemporary artists often eschew traditional frames or even use no frames at all for their work. Mark Rothko, born in 1903, created abstract paintings between 1946 and 1970 and is considered one of the earliest abstract expressionists. To enhance the appearance of the tacking edges of his canvas without using frames, he would wrap the canvas around to the back and staple it at the sides and back. In his earlier days, he stretched the canvas and left the edges unpainted. Later, either he or his associates would restretch and wrap the canvas to the back and paint the tacking edges. It then became his practice to first apply the background of the basic color to the front and the side-tacking edges. Afterward, he built up multiple paint layers for the designs on the front surface. This was his oil-on-canvas technique.

For painting on paper supports, Rothko used gouache and acrylic paints. His techniques were similar to those used for oil paintings, except the paper supports were not stretched onto stretchers like his canvas paintings. He used commercial watercolor blocks for small-sized paintings and painted all the way to the edges. For oversized paintings, he used a roll of paper, which was cut, flattened, and attached with pins and masking tape onto a large plywood board for painting. This resulted in unpainted blank masked borders. Rothko's presentation of paintings on paper was left uncertain, although there were a number of experimental mounting options on panels employed during his lifetime.

CHRISTOPHER ROTHKO AND KATE ROTHKO PRIZEL

Christopher Rothko and Kate Rothko Prizel, the son and daughter of Mark Rothko, contacted the Nishio Conservation Studio for the conservation of 10 paintings on paper: 4 large and 6 small paintings (fig. 1). The initial conservation proposal for the four unmounted flat small paper objects was

to mat them with archival acid-free mat board and frame them with nonrefractive UV filtration Plexiglas, in line with standard paper conservation practice. The authors' or conservators' practice was a "Preservation First Policy." However, Christopher and Kate expressed their strong desire to align these flat paper objects to match the rest of the Rothko paintings by mounting them on panels. These paintings resemble canvas paintings and are unmistakably Rothko's style. They even chose not to use Plexiglas cases for protection due to distracting reflections. They have inherited and continue to uphold their father's philosophy. Their policy is a "Presentation First Policy," although both parties prioritize both preservation and presentation as a whole. This project marked a 180-degree shift in the conservators' career, transitioning from traditional Asian painting conservators to paper conservators focused on developing cutting-edge methods for this unique project.

PREVIOUS MOUNTINGS

BEVA/Canvas Mounting

This painting (2095.69) on paper was mounted on a stretched cotton canvas with an interleaf of BEVA-coated Mylar film.¹ The authors believe this lining was done by reactivating the BEVA adhesive using a heated iron from the cotton canvas side. However, blisters and separation occurred between the paper support and the BEVA-coated Mylar film. These blisters and separations were caused by differences in the expansion and shrinkage of these different materials in response to changes in climate and humidity (fig. 2).

Japanese-Style Lattice Panel Mounting

Four paintings were previously mounted on Japanese-style under-core lattice wooden panels by Asian painting conservators in New York in 2008. Japan has a long tradition of paintings on paper mounted on wooden lattice, covered with multiple layers underneath the panels. This lightweight panel works very well for portable *byobu* folding screens and *fusuma* sliding screens (fig. 3). It also works well for Japanese papers, which do not expand or shrink much with moisture or when dried. However, when heavy western cotton rag

Papers presented during the Book and Paper Group Session, AIC's 51st Annual Meeting, May 16–20, 2023

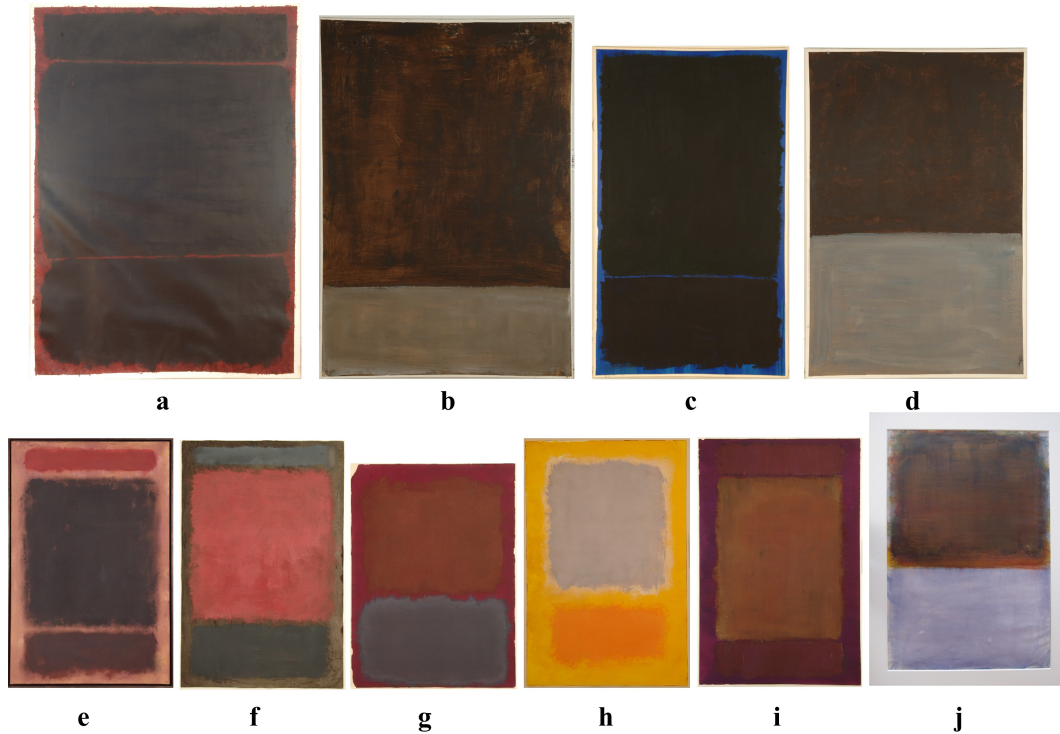


Fig. 1. (a) Painting 2045.69. (b) Painting 2093.69. (c) Painting 2036.69 mounted on Japanese-style wooden lattice with multiple paper layers inside. (d) Painting 2095.69 mounted on stretched cotton canvas with an interleaf of BEVA-coated Mylar film. (e) Painting 2122.60 mounted on Japanese-style wooden lattice panel. (f) Painting 2120.59. (g) Painting 2110.68. (h) Painting 2121.59. (i) Painting 2117.59 unmounted flat paper supports. (j) Painting 1245.52 flat paper support matted with window mat.

paper is mounted on these lightweight lattice panels and undergoes shrinking during drying, the lattice under-core twists and warps. Often, conservators apply the same tension materials on the verso, but twists and warp still occur.

Additionally, these Japanese *byobu* folding screens and *fusuma* sliding screens are periodically remounted, approximately every 50 to 100 years, due to the shrinking and deterioration of the wood.



Fig. 2. Left: The separation and blisters occurred between the paper support and the BEVA-coated Mylar film on the painting (2095.69). Right: Before treatment photograph of the painting (2095.69).



Fig. 3. Left: Japanese conservators preparing the lattice wooden panels for folding screens. Right: Japanese fusuma sliding screens (Source: Old plum, Kano Sansetsu in 1646 from the Metropolitan Museum of Art, New York).

NEW APPROACH FOR CONSERVATION AND CONSERVATION GOALS

The Rothko family had been experimenting with various methods to conserve and mount their father's works on paper for the past 50 years. Some of the prior methods led to preservation issues. The authors not only needed to develop new mounting methods that aligned with current conservation ethics, but they also needed to consider the aesthetic tastes of both the artist and the clients. As a result, this project was both unique and challenging. After countless discussions over a three-year period, an agreement was reached to add new side-tacking edges to the paintings and wrap around to the back. Both the authors and the clients agreed on the use of SmallCorp's honeycomb panels for remounting all the paintings. Plexiglas covering cases will not be used, although they may be easily installed by future owners.

INTERVIEW

An interview with Mark Rothko's children, Kate Rothko Prizel and Christopher Rothko, was conducted at the Nishio Conservation Studio on January 16, 2023 (fig. 4). They made it clear that they did not witness their father painting closely or hear him explaining his work to them. Therefore, what they shared during the interview does not constitute firsthand evidence but rather reflects their thoughts and observations. They have lived with their father and mother, associated with their father's friends and business associates, conducted numerous research projects, and developed a sense of what their father wanted or would have wanted regarding the display of his paintings.

It is important to note that they are the current owners of the artworks who care and feel that they must continue to carry out their father's legacy. They possess a passion that is unique to close family members of the artist, a passion that art conservators and historians sometimes may not have.

The following selected quotes from our client interview inform our conservation approach.

Why Did Rothko Display His Paintings without Frames?

Kate: He (Rothko) doesn't want to limit the viewer's line of vision. He wants to let them expand their vision and thoughts beyond the confines of the painting. He has not told me what he was thinking. So this is my feeling when I look at the painting: somehow, my line of vision is not limited. I can think about expanding beyond the painting and where the painting might take me.

Christopher: It's about expanding view. His (Rothko's) famous quote is "Art is not about an experience; it is an experience." He always talked about painting being a real object. If you put something in a frame, you are making it like someplace else. If it is a landscape, you are looking through the frame, looking into another place or imaginary place or someplace that is not real. He was saying his paintings are real. This is the real world on the wall you are interacting with. By taking out of frame, he is emphasizing, "This is not a presentation; it is a real experience."

Kate: He wrote about the surface of the paintings, too, because he was interested in getting away from perspective to draw the views in. He wanted the flat experience. To me, that flatness, along with borderless expansion, is one way to immerse the viewer into the painting.



Fig. 4. Interview with Kate Rothko Prizel and Christopher Rothko.

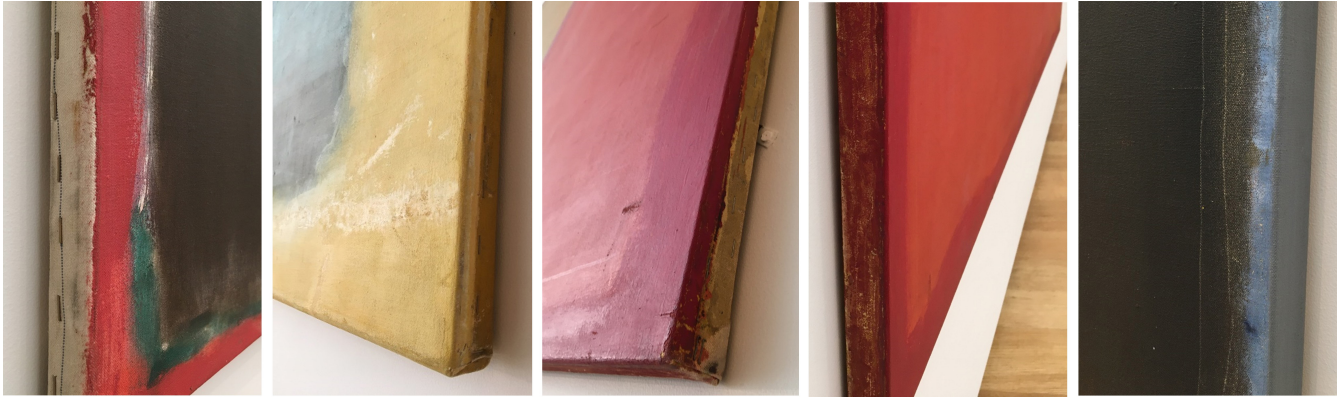


Fig. 5. Different tacking edges on Rothko's oil paintings from the National Gallery of Art, Washington, DC. Left to right: Not painted, changed the dimensions, changed the dimensions, background color, painted later.

Painted Tacking Edges

Kate: In his treatment and management of his works, very often he would finish by focusing on the surface. And he would put them away. I do not know how long. My feeling is that in those cases, he had not painted the edges. He probably only pulled them out when he had decided to exhibit them. And then he painted the edges because of the exhibition halls where people would see the edges.

Christopher: He did not like people watching him paint, so we do not have firsthand evidence. There are not very many paintings [where] the edges were not painted. He changed his mind about the dimensions later. Mostly, the edges had the background color. Sometimes you can see he had painted the tacking edges later.

Interviewer: Some of the paintings have staples on the canvas on the sides. Later, he would only staple the canvas to the back sides and nicely paint the tacking edges or sides (fig. 5).

Works on Paper

Christopher: Rothko did not date his work unless they were leaving the studio, which might be for either sale or exhibition, but there were very few in the earlier portion of his career. We have works on paper that we believe are as early as 1925 to 1927, which is the beginning of his career. He painted landscapes and portraits using watercolor. In the 1940s, for the surrealistic works, there were probably more works on paper than canvas. Later in the 1960s, there were many works on paper. But throughout his career, [he] always embraced works on paper.

Kate: In his surrealistic period, the feeling of the works on paper is so different from the works on canvas. I feel it is less as you go along in his career. But certain use of watercolor or

gouache medium to capture the mythical ideas that he was expressing in his surrealistic works is very different in feeling from his canvas paintings. It is freer.

White Unpainted Borders

Christopher: He would tape a piece of paper onto a plywood board. Those white masked unpainted borders would be used to wrap around the panel as side-tacking edges. Later, he started to think this white border was a part of his composition.

Kate: He clearly did not want to keep the white borders with tack or pin marks within the borders. He did intend the white borders to be wrapped around.

Panel Mounting for Works on Paper

Kate: For his post-1950s works on paper, he never had his works framed. He would try many varieties of mounting that would be sent to numbers of conservators. Often, those various mountings were not reversible. It is absolutely clear that he wanted them to be displayed equivalent to his works on canvas, giving a similar effect to the viewers.

Plexiglas Protection

Kate: I do not think he would have wanted his paintings to be displayed behind any barriers. Many in the museum world have pointed out the risk of the display without any protections. We feel that he would not want to display with Plexiglas or any barriers, and if we let that happen, we feel we would dishonor his will. We are very much aware of all those high risks (vandalism), including the light exposure and time of display as well.

Christopher: We have a "not so strict" mathematical calculation. I would rather people have the full experience for half the time than half of the experience for twice as much time. You must have the full effect of a Rothko because it is a subtle

thing, and it is easy to make it into a wallpaper. You need to have face-to-face encounters, otherwise you get nothing.

Conservation of Works on Paper

Christopher: We have a goal that paper be presented flat and be presented the same way as his canvas paintings. We tried various materials and techniques, such as mounting on cloth canvas, modern films, and adhesives. But we have learned that paper needs to be mounted on paper so that they can move, expand, and shrink together without putting too much strain on the paper. So we are excited about the work you have done using solid or rigid aluminum honeycomb supports. The paper support is connected to other paper, Japanese paper, and supported to expand and shrink more or less together.

Education and Working Together

Kate: We've had frustrations with other approaches in the past. Coming here [Nishio Conservation Studio] and learning those approaches [has been] so much education. We've not only learned what the conservators are going to do but also know how the other previous approaches caused the problems. Through conservation with Nishio, we feel confident to try the new approach. Not only for the mounting—I also got educated on the infills, and we are more involved in aesthetics as well. For example, how those tones for inpaintings and side-tacking edges will appear in different tones.

Interviewer: Conservators are like medical doctors or plastic surgeons. If clients say “I want this way” and conservators do not want to do exactly what the clients want to do, they will go to other conservators who can do what they want. That is exactly what I did not want you to do. Instead, we have thoroughly explained. If the clients say “I want this way now,” we will have to use time so that the clients have time to rethink and are able to change their minds. Those 10 paintings have been in the studio for three years. We had lots of time to discuss and change our thoughts and minds.

TREATMENT PROCESS

Surface Cleaning and Spot Testing

During the examination, it was observed that there was dust present on the surface overall. Additionally, there were unknown shining adhesive spots around the old infills. After gently brushing off the dust with a soft sheep-hair brush, surgical scalpels were utilized to remove the old adhesive. The spot test results indicated that only the purple and red-purple paints in the background were slightly water sensitive, with most paints not soluble in water.

Removal of Old Mounting Materials

Upon arriving at Nishio Conservation Studio, the 10 paintings exhibited various mounting styles. Four of the paintings

did not have previous mounting materials, as they had been taken from watercolor blocks by the artist. The painting (1245.52) came with matting, and the craft tapes that were used to attach the painting directly to the mat board were still there. The authors later carefully removed the craft tapes with ethanol.

The painting (2095.69) had been lined with stretched cotton canvas with an interleaf of BEVA-coated Mylar film. This led to numerous blisters or separations caused by differing shrinkage and expansion rates among the paper, cotton fabric, and BEVA film. Furthermore, the canvas texture on the tacking edges did not match the painting's paper texture. The BEVA was softened, using a hot-air gun, followed by removal of the BEVA residue using Staedtler Mars erasers.

Four paintings were mounted on Japanese-style wooden lattice panels that had warped. These paintings had tears along the Japanese paper tacking edges. The Japanese paper tacking edges were insufficient to keep the paintings flat on the panels due to the strong tension of the paintings. This resulted in warping toward the front and tears along the edges. Careful removal of the paintings from the wooden panels was achieved using a bamboo spatula. A small amount of water was then applied to the backside to remove the old Japanese paper lining.

Preparation of New Tacking Paper and Infills

The Rothko paintings were created on heavy watercolor paper. Several types of watercolor paper were compared for thickness and texture; 100% cotton, 90-lb. Arches cold-pressed watercolor paper was selected for the new tacking edges due to its durability and comparable texture to the paintings. The thinner-weight watercolor paper was easier to fold and attach to the panels. For the infills, 300-lb. Arches cold-pressed watercolor paper was chosen for its heavier weight and similar thickness to the paintings. Achieving Rothko's distinctive color hues was crucial, so professional-grade emulsion acrylic paints were used to prepare the paper for the new tacking edges. The paint was applied in layers gradually to achieve the best result (fig. 6).

Infilling Losses

The infills were marked along with the outlines of losses, and their edges for the joints were thinned using a Japanese engraving knife. After affixing the infills with thick starch paste, the authors used a Teflon spatula to push the edges of the infills from the back, ensuring they appeared flush on the front. The infills along the edges of the paintings were trimmed to match the paintings' shapes. The pinholes and staple holes on these paintings were filled as well.

Attaching the New Tacking Edges

The tacking edges were also thinned in the pasting area to reduce thickness at the joints (fig. 7). After pasting with thick



Fig. 6. Preparation of the new tacking edges. Coloring cold press Arches 90-lb. watercolor paper using acrylic paints.

starch paste and attaching the new tacking edges around the paintings, they were gently hammered for tight adhesion. Once again, the joints between the paintings and the new tacking-edge paper were pressed from the back to achieve flushing edges on the front (fig. 8). This made the painting and the extended tacking edges appear level on the front surface.

Mending, Reinforcing, and Lining

The four Japanese-style lattice-panel-mounted paintings had been lined with Japanese paper, whereas the others in the group did not have Japanese paper lining. Some of them also displayed tears and creases. The authors aimed to ensure sufficient support on the panels. Thus, the decision was made to mend the tears, flatten and reinforce the creases with Japanese paper strips, and line both the paintings and



Fig. 7. Tacking edges were thinned in the pasting area to reduce thickness at the joints.

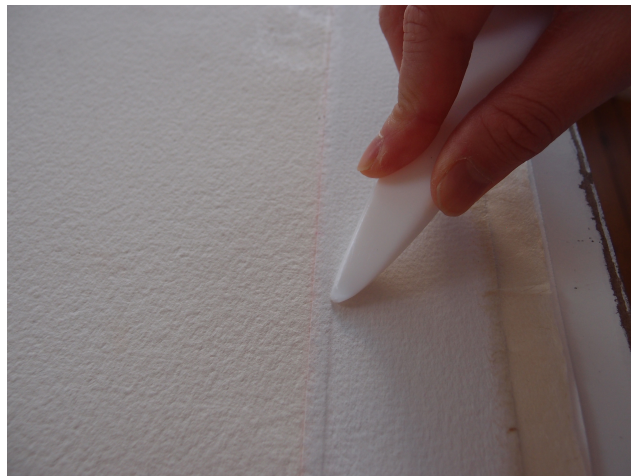


Fig. 8. The joints of the tacking edges were pressed from the back to achieve flushing edges on the front.

their tacking edges overall. The new lining paper used was medium-weight handmade Hosokawa paper, made from 100% Japanese kozo fibers. The two layers of lining paper were applied with a medium-thickness starch paste. The Hosokawa paper has highly unidirectional fibers. The first layer was applied with the chain lines oriented vertically (fig. 9) and the second layer with the chain lines oriented horizontally. This cross-fiber application results in even tension and support. Those two layers with different fiber directions will prevent splits or tears in the future. The fills and joints were pushed from the verso to make the edges flush on the front surface.

Drying and Flattening

The paintings were affixed to *karibari* drying boards for several weeks following the lining process. Once they had



Fig. 9. Lining the paintings using starch paste and Japanese kozo paper. Courtesy of Kyoichi Itoh.

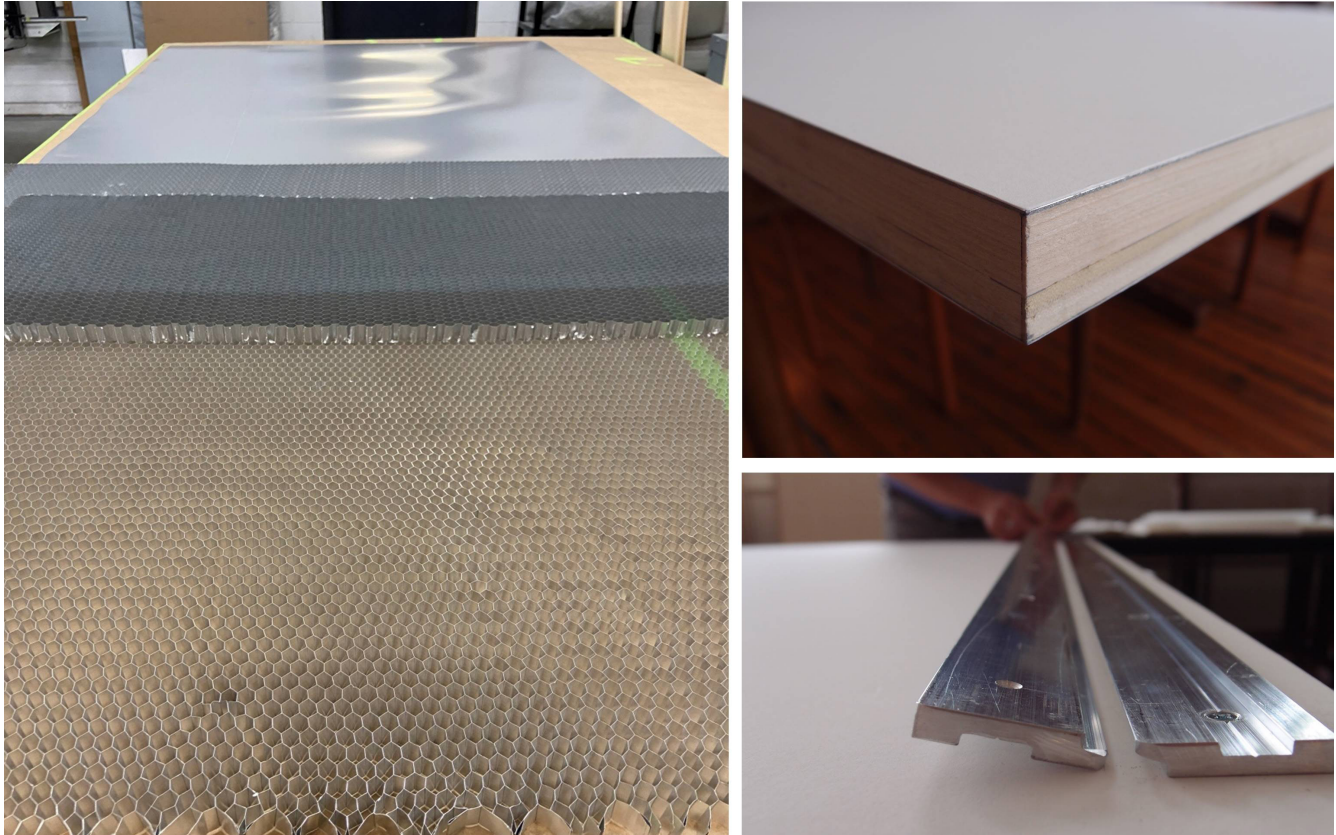


Fig. 10. Honeycomb panel: SmallCorp SP1 Panel Archival mat board face on both sides. Internal 2-in. poplar wood with female thread inserts for cleats to the top and bumpers to the bottom of the internal wooden bar.

thoroughly dried, precise measurements were taken to construct the custom-made honeycomb panels.

MOUNTING

New Panel Structure

The new panels feature a double-deck aluminum honeycomb structure with aluminum plates and archival acid-free mat board attached on both sides. The thick archival barrier mat board buffers the temperature of the aluminum and prevents it from transferring to the paper support. This will prevent condensation caused by the temperature differences of the materials. The four edges are secured with 2-in. poplar wood bars. On the back of each panel, there is a set of aluminum cleats for hanging. One side is screwed onto the panel with inserted female threads so that the wooden bar will not get damaged by multiple reinstallations of the cleats, whereas the other piece is designed for attaching to the wall. Additionally, there are two bumpers on the bottom, which are of the same thickness as the cleats to maintain the panel's parallel position to the wall. The thickness of each new panel is either 1 in. or 1¼ in., depending on the size of the painting (fig. 10).

Mounting Process

Immediately after removing the painting from the drying board, the authors applied medium-thickness starch paste to the backside of the tacking-edge areas. The process was performed quickly because the removed paintings was at risk of shrinking. The author did not spray water on the painting at all during the process.

Subsequently, the adhesive-covered tacking edges were affixed to the sides and partially to the backs of the panels (fig. 11). For mounting the oversized paintings, a Plexiglas sheet was temporarily placed on top of the painting to maintain a flat surface (fig. 12).

During the mounting process, the paintings were not yet perfectly flat due to the wetness of the adhesive. However, the adhesive on the tacking edges dried, and the paper shrunk slightly as time passed, resulting in a tighter surface. The humidity within the workspace was carefully controlled between 55% and 60% RH throughout this process. In typical museum climate control spaces, the humidity is maintained within a range of approximately $\pm 50\%RH$. The authors adhered to this humidity level to ensure the paintings maintained appropriate tension and remained flat while preventing sagging.



Fig. 11. Mounting the paintings on the new panels. Courtesy of Kyoichi Itoh.

In previous mounting processes, the conservators used more water or paste to expand the paintings maximally before they were attached on the lattice panels. This caused the tension of the paintings to become too high when they dried. Moreover, the lattice panels started to warp inward, and some edges were even torn later.

On the backside of the panels, the authors applied paper-lined Japanese silk fabric and screwed in the cleats and bumpers (fig. 13).

RESULTS

Following the conservation treatment and mounting processes, the color and texture of the new tacking edges harmoniously matched the background of the paintings. The authors ensured that all tacking edges were matched to the same background color tone but refrained from attempting to imitate Rothko's brushwork (figs. 14–17). For the paintings with white margins, there remains the question of whether



Fig. 12. During the mounting process, a Plexiglass sheet was temporarily placed on top of each oversized painting to maintain a flat surface. Courtesy of Kyoichi Itoh.

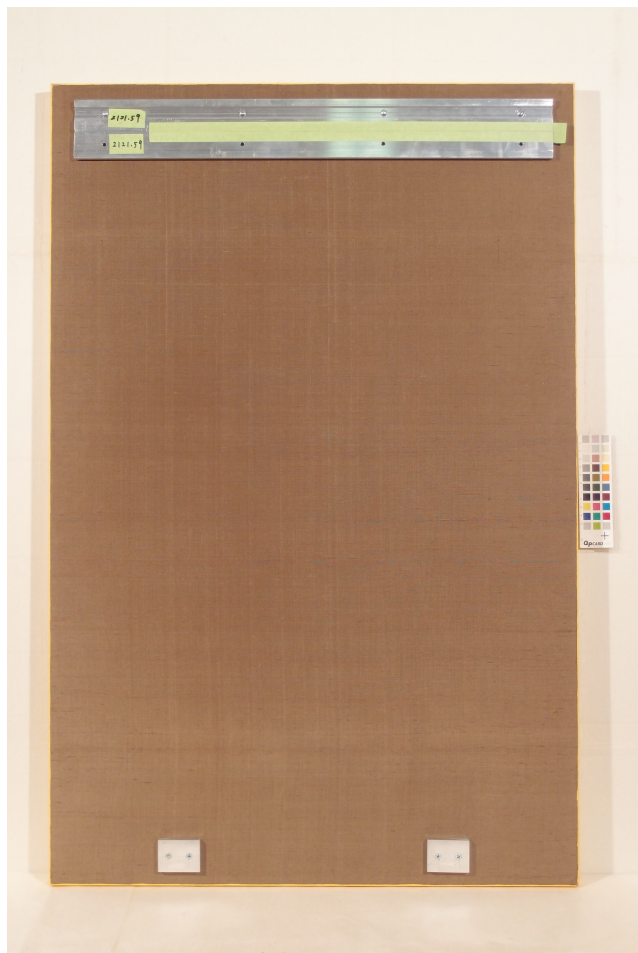


Fig. 13. On the backside of the panels, the authors applied Japanese silk fabric and screwed in the cleats and bumpers.

to keep the margins on the front surface as borders or to wrap them as tacking edges. For the time being, the authors and the clients decided to leave them the way they were first



Fig. 14. Before treatment of Rothko painting 2110.68.



Fig. 15. After treatment of Rothko painting 2110.68.

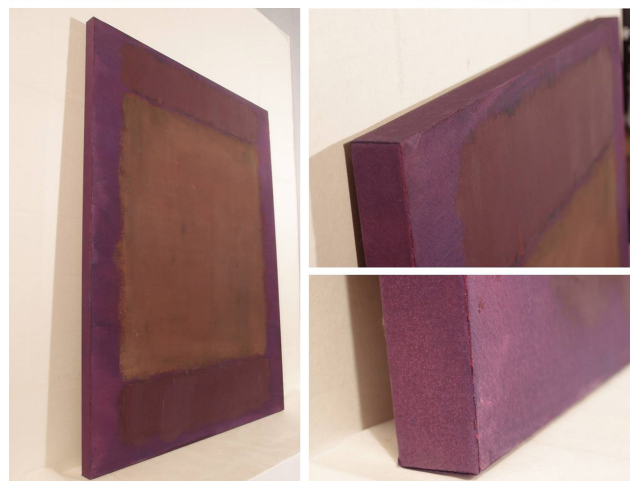
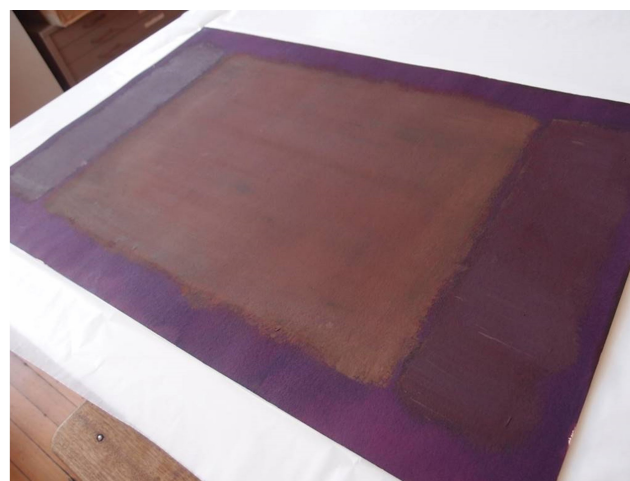


Fig. 16. Top: Before treatment of Rothko painting 2117.59. Bottom left and right: Before treatment of Rothko painting 2117.59.



Fig. 17. After treatment of Rothko painting 2120.59.

mounted. The color tone of the blank white borders also matched. Some white margins had been cut off by previous mounters or conservators. The authors adjusted to ensure that the margin proportions were uniform around each painting (fig. 18). One of the oversized paintings (2045.69) had uneven margins and bleeding paint. The Rothko family did not believe that their father had intended to exhibit the

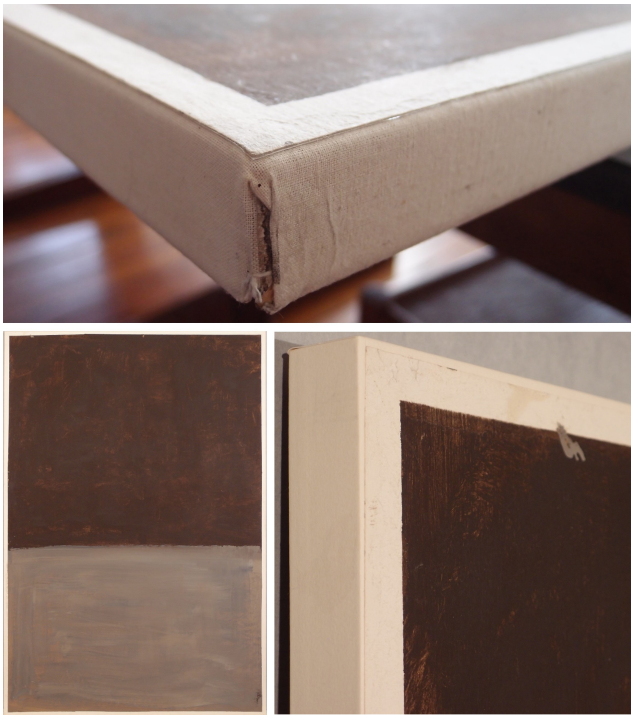


Fig. 18. Top: Rothko painting 2095.69 (on paper) was mounted on a stretched cotton canvas with an interleaf of BEVA-coated Mylar film. Bottom left and right: After treatment of Rothko painting 2095.69.

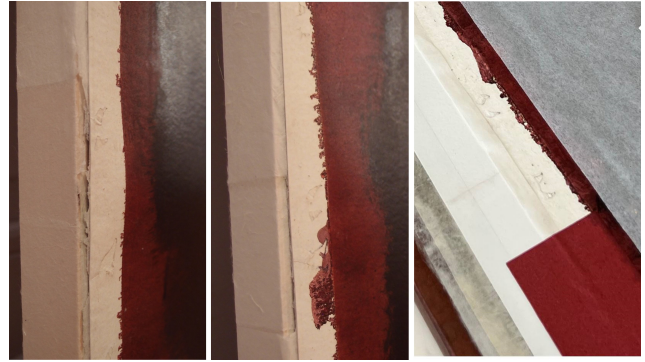


Fig. 19. Left: Before treatment, showing tears between Rothko painting 2045.69 and the old Japanese paper tacking edges. Middle: The painting had uneven margins and bleeding paint. Right: During the process of applying the very thin watercolor paper to cover the uneven margins and new tacking edges.

margins. It was conceivable that the artist would have sought a framer to trim or retouch the margins. However, from the standpoint of the art conservators' best practice, the authors were disinclined to pursue that route. They ultimately affixed very thin paper on top of the uneven margins, matching the same background tone (fig. 19). Additionally, they added tacking edges to the painting. Based on post-treatment photos, the painting's edges appeared even and clean (fig. 20). In the future, a conservator could opt to remove the added paper to view the original margins.

EXHIBITION

Because of these conservation and mounting efforts, these paintings can once again be safely exhibited to the public. Six of the 10 paintings were displayed at the National Gallery of Art in Washington, DC, in November 2023. They will also be exhibited in Norway in 2024.



Fig. 20. After treatment of Rothko painting 2045.69.

CONCLUSIONS

The clients, Christopher Rothko and Kate Rothko Prizel, have engaged numerous conservators and explored various techniques since the 1970s to preserve their father's artworks. In 2008, they found Asian painting conservators in New York with extensive experience in conserving paintings on paper mounted on panels. These conservators, often involved in creating Japanese folding screens and sliding doors, possessed valuable expertise in panel mounting. However, the authors (who have similar backgrounds in Asian painting conservation) chose a different conservation treatment approach for the following two reasons:

1. The western watercolor papers used by Mark Rothko have a broader range of expansion when wet and stronger contraction when dry. That strong contraction and tension caused Japanese wooden lattice panels to twist and warp, and even tear at the edges. If the painting had been done on Japanese paper, this issue might have been avoided.
2. In Japan, those wooden lattice panels are very practical for their light weight and portability for *byobu* folding screens and *fusuma* sliding screens. However, those wooden lattices have a limited lifespan, as wood naturally shrinks and deteriorates over time. Those Japanese screen paintings are periodically remounted with new wooden lattices, often every 50 to 100 years. Both the author and clients wanted this conservation and remounting to be the last time for the safety of the paintings. The weight is not the primary concern as it is with Japanese portable *byobu* folding and *fusuma* sliding screens. As a result, the authors and clients chose aluminum honeycomb panels instead.

Honeycomb panels have their own disadvantages since they contain metal plates. Metals often tend to have a lower temperature than wood or paper, which can lead to condensation on the metal surface during abrupt climate changes. To address this issue, archival mat board was placed between the metal and the art objects. This buffer helps regulate temperature and absorbs moisture coming from the surface of the metal.

Another potential downside is that solid aluminum plates can impede airflow. In a humid environment like Japan, with greater than 70%RH, this could potentially cause mildew or mold inside. However, in a museum environment with $\pm 50\%$ RH in the United States, the risk of mildew or mold is significantly lower.

Last, the success of this conservation project can be attributed to the ample time invested and the willingness

to engage in discussions. Because the clients were educated and informed, they were interested in participating in the decision-making process. The authors strongly believe that this project was carried out by the conservators and clients together.

ACKNOWLEDGMENTS

The authors gratefully acknowledge Christopher Rothko and Kate Rothko Prizel; Kyoichi Itoh, conservator at Nishio Conservation Studio; Jay Krueger, Kimberly Schenk, and Adam Greenhalgh at the National Gallery of Art; and Sarah Anderson of SmallCorp Inc.

NOTE

1. Because Rothko did not typically title his paintings, they are referred to in this article by their inventory numbers.

SOURCES OF MATERIALS

SP1 panel: paper face on both sides (1 in. and 1¼ in. thick), 2-in. of internal wood with threaded inserts on sides, and attached cleats and bumpers to the backside of the panel

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Teizo Takano
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Iterations of Mourning: On Variability and Change in Barbara Siegel's *Missing*

INTRODUCTION

The American artist Barbara Siegel (1946–2015), for nearly four decades of her life, lived and worked in a loft about a mile from the World Trade Center. As an essential part of her artistic practice, she often documented her surroundings with a camera. She also collected everyday objects, from clipped stories she read in the *New York Times* about people who led creative and unusual lives to items found on the streets of her Tribeca neighborhood. These finds varied from deformed cans and bottles to abandoned gloves and eyeglasses. Siegel also collected artwork from different cultures, particularly wax votives of body parts and ex voto paintings that she purchased from antique and knick-knack stores all over the world. The spiritual power and apotropaic function of these forms, which often depict either tragic or hopeful scenes accompanied by a written prayer, deeply resonated with her. Siegel used her archive of things as fodder for sculptures, artist's books, drawings, prints, and installations incorporating both two- and three-dimensional works. Her oeuvre can be seen as a quasi-journal chronicling her interactions with people, objects, and history. In her work, Siegel frequently explored themes of death and remembrance, having experienced tragedy at a young age. Her aunt died by suicide when Siegel was only three years old. And, in her 20s, a hotel fire in Copenhagen claimed the lives of four of her family members. Both incidents had a profound effect on Siegel, her husband Gary Schwartz would note after her death (Schwartz 2022). But it may have been the events of September 11, 2001, that influenced one of her most compelling, personal artworks.

Titled *Missing*, this biographical project assumed form as a wall-and-floor installation that incorporates images of and text about the lives of 60 victims of the 9/11 World Trade Center attack. "The images of the missing people ... and the installation as a whole is a form of retablo," Siegel wrote,

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referencing a kind of votive image. In connection with the work's first public exhibition, she described it as "a memorial to tragedy and loss, but also to our shared belief in the need to survive and affirm life" (Siegel 2002, A12).

She began working on this project during the fall of 2001, as people were still grappling with the unthinkable scale of the terrorist attacks. Over a period of several weeks, Siegel began photographing the arresting missing person posters pervasively pinned up throughout her neighborhood. From this profusion of poignant notices, she selected an eclectic sampling of individual victims to commemorate—food servers, traders, elevator operators, and firefighters—because, in her words, "diversity is what [she] value[d] most about New York City" (Siegel 2002, A12). After making electro-photographic prints (photocopies or laser prints) derived from these photographs, she then utilized various techniques to collage and transfer them onto paper and wax substrates. Accompanying the prints is a poem about the attack written in graphite by Schwartz, "Os Urubus," in which vultures (*os urubus* in Portuguese) are the disturbing, central metaphor.¹ In Siegel's own words, the ensemble served as "a memorial biography of lives cut short," as well as an emotional catharsis for the artist (Siegel 2015). The work now shapes our perception of the past as a historiographic document (fig. 1).

In 2022, seven years after Siegel's death, Schwartz donated *Missing* to the 9/11 Memorial & Museum. The piece had only been displayed once during her lifetime, in 2002, at the Lehman College Art Gallery in the Bronx. This made obtaining documentation about the work challenging. Unfortunately, the Museum only received from Schwartz and the artist's gallery a single out-of-focus image of that installation, along with limited other creative instructions about the artwork. However, additional images of *Missing* found on the artist's now-defunct website via the *Wayback Machine* helped clarify the work's arrangement.

Siegel designed *Missing* as a related wall and floor installation, evoking the overflowing makeshift memorials prevalent in the cityscape after 9/11. Even though the artist conceived the installation to simultaneously conjure the contours of an



Fig. 1. Exhibition view, Barbara Siegel, *Investigations: Remembering Barbara Siegel*, curated by Kathleen Schneider and Nancy Storrow, 2021, A.I.R. Gallery, Brooklyn, NY. Courtesy of Matthew Sherman, the artist, and A.I.R. Gallery.

airplane, a vulture, and a phoenix (the airplane and vulture symbolize 9/11's devastation; the phoenix represents hope and humanity), her intended placement of some of the missing-poster prints cannot be readily discerned from the available documentation. It is unclear whether the work deliberately sought to create meaningful adjacencies among the images—like Michael Arad's *Reflecting Absence*, in which victims were

grouped according to personal connections that could be deduced among them—or whether Siegel's placements were fluid and open to variation among different installations.

This article explores characteristics of Siegel's *Missing* that are likely to shape its future meaning, including display criteria specific to its inclusion in the 9/11 Memorial & Museum's collection. It also considers requirements for sustaining a

memorial artwork's essential purpose and original values—that is, maintaining its authenticity and ongoing resonance well beyond its time of creation. Moreover, delving into *Missing*'s story, from its making to its institutional acquisition, allows us to consider the ethical concerns that attend exhibiting an artwork that contains images of actual people killed on 9/11 in a memorial museum committed to outreach to, and trust-building discourse with, 9/11 community members and victims' families. This extends to the question of whether Siegel's *Missing* should even be displayed without the awareness and consent of those whose loved ones are depicted in the artist's composition.

BACKGROUND

On the morning of September 11, 2001, Barbara Siegel was working in her studio on Washington Street, one block south of Canal Street. She assumed the loud explosion she heard shortly before 9:00 a.m. came from a collision on the West Side Highway. As a longtime Lower Manhattan resident, she was largely oblivious to the cacophony of city noise. Siegel had lived through, among other events, the 1981 morning rush hour crash of a Staten Island Ferry into a Norwegian freighter, the 1988 Tompkins Square Park riot, and the 1993 terrorist bombing of the World Trade Center. When she learned that a plane had crashed into the World Trade Center, she rushed to the street, thinking that perhaps “a distracted pilot [had flown] too low [and] hit one of the towers” (Siegel 2001). However, a neighbor's radio soon reported the crash of a second plane into the South Tower, making it clear that a more sinister reality—an extraordinary act of terrorism—was unfolding. Transfixed, Siegel watched the burning towers and saw “hundreds of people...silently pouring...up Greenwich Street, many in business suits, some carrying small children and all looking grim and numb, like refugees” (Siegel 2001).

Siegel returned inside to call her husband and son to confirm that they were safe (they were, respectively, at work in the Bronx and at school on the Upper East Side), not expecting the imminent collapse of the two 110-story-high steel rulers dominating the Manhattan skyline, in which thousands of people would perish. Despite her relative physical safety from the disaster site, Siegel's home was located in what subsequently was deemed the World Trade Center Exposure Zone, referring to the geographical area whose residents and workers would meet eligibility criteria for the 9/11 Victim Compensation Fund and the World Trade Center Health Program due to their exposure to toxins. Siegel and her family were among the estimated 400,000 people exposed to the harmful contaminants that filled the air when the Twin Towers collapsed and the ensuing environmental catastrophe that persisted for months, if not years, thereafter (Centers for Disease Control and Prevention, n.d.).

Evidence of the attack was inescapable in the ensuing days and weeks. Dust from the pulverized buildings turned the city grayscale. A seemingly infinite amount of office paper scattered into the air when the towers were hit, eventually settling onto rooftops, apartment balconies, and streets. And an unforgettable smell of decay permeated Lower Manhattan. Susan Meiselas, a photographer who arrived at Ground Zero just after the North Tower collapsed, described the scene as “total chaos,” which also somehow coexisted with “a bizarre calmness” (Basbanes 2014, 356). It was a cityscape in flux. People responded to the unfathomable trauma by creating impromptu public shrines assembled from materials that were both modest and fragile, including candles, flowers, flags, postcards, stuffed animals, and “I Love New York” messages. Philosopher Arthur Danto later wrote that “[b]y nightfall on 9/11, New York was complex of vernacular altars...the city was transformed into a ritual precinct, dense with improvised sites of mourning” (Danto 2005, paragraph 1) (fig. 2).

According to art historian Harriet Senie, mourners initially left mostly impersonal items without a specific connection to the dead—likely because the victims' identities and the number of casualties were still unknown (Senie 2003). But missing posters, made by friends and families searching for unaccounted-for people, quickly intermingled with the offerings comprising these more generic shrines. Generally depicting the “missing” with pictures from happier times, they were often annotated with handwritten personal details, like what someone was wearing on 9/11; where they worked or were last seen; their faith; the color of their hair, skin, and eyes; and whether they had identifying marks or scars on their bodies. As recounted by Dr. Jan Ramirez, chief curator of the 9/11 Memorial & Museum, “given the complete crippling of the telephone and electrical systems” in the immediate aftermath of the attacks, “[these posters] became the only urgent and most efficient mode of communication” (Basbanes 2014, 360) (fig. 3).

Collectively reproduced via tens of thousands of photocopies made in color and black and white, the missing person posters quickly covered Manhattan electrical poles, bus shelters, commuting hubs, and building facades. The exteriors of local hospitals, such as Bellevue and St. Vincent's, proved particularly popular posting sites. Families searching for loved ones also left fliers at the Pier 94 Family Assistance Center, the New Jersey Family Assistance Center, well-trafficked subway and train stops (including Penn Station and Grand Central Terminal), and the Lexington Avenue Armory on 23rd Street, which provided free printing and copying services. Families could report their missing loved ones at the Armory, which led to the accumulation of numerous posters on its façade. (The Armory was not designated or open for that purpose until 24 hours after the Tuesday attack) (Edkins 2011, 18–19). As time passed, the 9/11 missing person posters came to exist in a liminal state, something “between a call for information and a death notice” (Kirshenblatt-Gimblett 2003, 11) (fig. 4).



Fig. 2. Spontaneous memorial for the victims of September 11, New York, 2001. Courtesy of David Finn. <https://www.loc.gov/item/2002717255/>.

Today, it is hard to imagine a crisis situation or breaking tragedy where information is not communicated or shared instantly via social media platforms, e-mail, and text messages. At the time of the 9/11 attacks, however, unfolding news circulated at a far different pace and often was printed on paper—the cost, reproducibility, and accessibility of photocopy technology made it an efficient method for disseminating information. The “copy,” in other words, was still king. Fliers and posters were papered all over New York City,

advertising products and date-specific events. They were also deployed as a form of art. In the 1990s, for example, “xeroxes,” or photostatic processes, were used by David Wojanrowicz and Felix Gonzalez-Torres to create works for widespread dissemination and to protest AIDS bias.

Missing posters have become ingrained in our collective consciousness at least since 1979 when six-year-old Etan Patz went missing while walking to his school bus stop in Manhattan. Patz’s endearing photograph was the first to



Fig. 3. Post September 11 World Trade Center attack, memorials and photos of missing loved ones, New York City. Courtesy of Joan Slatkin/UCG/Universal Images Group via Getty Images.



Fig. 4. Three nuns viewing a wall covered with missing person posters after September 11, New York, 2001. Courtesy of David Finn. <https://www.loc.gov/item/2002717254/>.

be placed on milk cartons in an effort to elicit information about his disappearance and, more broadly, to raise awareness that his abduction was not an isolated event. However, as pointed out by political scholar Jenny Edkins, missing person posters have a much longer provenance. “In the aftermath of the Second World War, missing posters prepared by the German Red Cross appeared in post offices and railway stations. [And] [i]n the . . . Kosovo crisis of the later 1900s similar forms of missing posters were found” (Edkins 2011, 21). Along the same lines, in 2023, paper fliers of people abducted in Israel by Hamas terrorists have been posted by the thousands throughout public streetscapes around the world. For Siegel and Schwartz, the prevalence of missing person posters in their Tribeca neighborhood profoundly affected them. Aside from the volume and scale of human loss the posters communicated, their poignant, elegiac quality established a personal connection between their viewers and the people at the tragedy’s center. The posters’ complex mix of “ineffable sadness and irrepressible optimism” moved Siegel (2002, A12), who could easily empathize with those depicted: people very much like herself—friends, mothers, wives, neighbors, and teachers (Siegel was an adjunct professor at Parsons).

It soon became clear that the majority of the people represented on these missing person posters were not, in fact, missing; they were dead. Nevertheless, the fliers remained intact—in some cases, for years. (How could anyone bear to take them down? As one *New Yorker* later wrote, “No one dared to touch them. To do so would be sacrilegious” [Fitzpatrick 2001]). The staff at St. Vincent’s Hospital, for example, took great care to maintain their condition. Initially, the posters had been displayed on a wooden structure on the hospital’s south wall. When the weather and other conditions became untenable, hospital personnel respectfully deinstalled and transferred them to binders, where they remained until the hospital closed in 2010. They were subsequently given to the 9/11 Memorial & Museum (Langer 2010).² Through donations like this, the Museum came to possess many, if not all, of the missing person posters utilized by Siegel in *Missing*—although in some cases, even though the subject sought by the poster maker is the same, the posters themselves vary. These differences may simply reflect the condition of the posters she encountered, or that sometimes more than one version of a missing poster was created for the same individual.

The explanation generally given for this sense of reverence attached to the missing posters is that “by the time people realized that for ‘missing’ they should read ‘presumed dead,’ the posters had become shrines where people could remember those killed” (Edkins 2011, 33). They did this by embellishing the fliers with messages and poems, and leaving flowers, candles, and other offerings, evincing historian Ittai Weinryb’s theory that mourning rituals and votive objects

can reveal how human sentiment is embodied in artifacts (Weinryb 2018, xii). Mary O’Neill has likewise emphasized the importance of engaging in rituals when death occurs outside the accepted natural sequence of generations, such as with victims of terrorism and other crimes against humanity. In those moments, art can help us divine meaning from these affronts to our “notion of ourselves as [generally] good and caring” (O’Neill 2008, 96).

People also photographed the shrines, endowing them with a kind of immortality that transcended their ephemeral nature. The artist Jeffrey Lohn photographed several missing posters as they began to deteriorate from weather exposure and other elements. As the subjects’ faces faded and became disfigured, to Lohn the individuals depicted seemed to die “a second death” (Danto 2005). Siegel’s and Lohn’s artworks help to index time by documenting the evolution and destruction or dematerialization of these objects and, of course, the people they depicted. In this subtle performance, they offer a striking counterpoint to the infamous images ingrained in our collective memory of the towers burning and human beings falling from them, the dust clouds, and the piles of steel debris. Susan Sontag said that photographs serve as reminders of the passage of time, acting as “memento mori.” They further enable us to “participate in another person’s (or a thing’s) mortality, vulnerability, and mutability” (Sontag 2005, 15). Thus, when we view pictures of the 9/11 missing person posters (and the derivative artworks made from them), it helps us personalize and comprehend another human being’s suffering, which in turn makes the tragedy more visceral and real.³

Although official memorials like the 9/11 Memorial & Museum now exist to honor those killed on 9/11 and promote a respectful and accurate understanding of history, vestiges of the makeshift memorials are still extant (many are now preserved in museum collections). These memorials and the related information about the people these shrines honored convey powerful messages about contemporary commemoration practices and how individuals respond to trauma long before permanent institutions are organized to commemorate traumatic events. Siegel’s creation of *Missing* can be understood as stemming from a uniquely human desire to express memory and emotion concretely. Her artwork can also be seen as a counter-monument, using James Young’s concept in that it is “ethically certain of [its] duty to remember, but aesthetically skeptical of the assumptions underpinning traditional memorial forms” (Young 2022, 453). *Missing* indeed defies conventional modes of commemorating significant historical events with its relatively intimate scale and use of modest, ephemeral materials. The missing person poster medium is likewise relatable and facilitates a personal connection. *Missing* defies a reductive single-point perspective of history, privileging space for viewers to reflect on the complexities of human identity and loss.

Artworks like *Missing* can be seen as containers of people's experiences which can also hold the essence of tragedy. By studying these fragments of history, we gain valuable knowledge beyond their physical attributes. To develop a preservation strategy for *Missing*, it is necessary to understand its historical context. However, to ensure its continued vitality, it is equally important to recognize the significance of the piece as a work of social engagement; part of its essential value and virtue is the audience's experience of *Missing*. We must therefore consider how the work continues to impact public memory rather than freeze it as a static remnant of the past.

THE 9/11 MEMORIAL & MUSEUM'S ACQUISITION OF *MISSING*

When a contemporary artwork—like *Missing*—is acquired by a museum, it is critical to establish its primary identity beyond the usual cycles of decay and transformation. Like most accredited museums, the 9/11 Memorial & Museum has set criteria for evaluating items for permanent collection consideration. These were first established by the World Trade Center Site Memorial Center Advisory Committee Recommendations in 2004, before the physical museum existed. These guidelines emphasize the importance of acquiring materials expressing a range of perspectives and personal stories from victims and eyewitnesses, survivors, responders, and area residents. The Museum's historical and memorial exhibitions are perhaps the most prominent showcases for these artifacts and visual items, but the institution also collects response artwork. Candidates for the latter must, however, fit into several specified categories, such as “work created by eyewitnesses and artists who lived in [L]ower Manhattan during the terrorist attacks of 1993 and 2001” (9/11 Memorial & Museum 2018).

In 2022, when the 9/11 Memorial & Museum acquired *Missing*, it arrived as several organized folders that were assumed to have been created by the artist. These were labeled with annotations such as “1–14, top three rows” and “55–64, floor pieces.” The prints themselves, however, did not have corresponding numbers written on them. Moreover, the number of prints in each folder was inconsistent with the annotations, making it difficult to use them as installation instructions. There were also folders labeled “injured” and “documentation texts” with several prints enclosed; however, there were no further instructions. In this sense, Siegel can be understood as an artist who, as conservator Pip Laurenson put it, only “‘thinly’ specif[ie]d” her works (Laurenson 2006). Laurenson categorized installation artists into two groups for preservation purposes based on the work of Stephen Davies, a philosopher of music: “Artists who ‘thickly’ specify their works are those who determine precise details of the installation of a work through instructions that fully determine how the work can be manifested, while artists who ‘thinly’ specify

their artworks tend to be more open about how the artwork can be installed” (Laurenson 2006).

After examining the prints, our collections team was able to ascertain both the materials and techniques Siegel had used to create the artwork. Our analysis indicated that, in making the prints, she employed transfer methods utilizing solvent and acrylic gel. By studying her photographs of the posters, we deduced that she most likely used a black-and-white laser print or photocopy as her printing matrix. Siegel then likely modified her original photographs before transferring them. (Regrettably, the originals are no longer available to allow for cross-referencing or comparison.) The transferred pictures were smaller than the original missing person posters, which were all 8.5 × 11 in. To avoid reverse printing when transferred onto paper and acrylic substrates, the images were rotated by 180 degrees. Additionally, Siegel applied beeswax to the prints to give them an aged or somewhat removed appearance. We also determined that the folder labeled “injured” contained process prints. Some differed in tone and image clarity from their final print versions, as evidenced by the several proofs depicting Celeste Torres Victoria, a 41-year-old single mother who, on 9/11, was attending a conference held by her employer, Risk Waters Group, at Windows on the World near the top of the North Tower (fig. 5). Interestingly, by converting all the original missing posters into black-and-white prints, Siegel effectively minimized their differences, freezing them in time due to the stability of the electrostatic print.

To complete the installation, Siegel handwrote Schwartz's short 20-line poem 12 times in an expressive style, then placed six copies on the work's left- and right-hand sides, starting at floor level and extending upward in two columns of three. In addition, a printed version of the poem was cut into several pieces, which were then appended to certain missing posters.

The artwork displays various traces of printing techniques that uncover its complex identity and the significance of printmaking to Siegel's concept. Each process presents distinct characteristics that unveil multiple stories interwoven in the prints. Embedded in the work is the story of the original missing posters, Siegel's photographs of them, and features of the solvent transfer process, and “the pixilation and distortion of a text or image as it is copied and recopied requires [the viewer] to become increasingly active in the reading process” (Eichhorn 2016, 9–10) (fig. 6). After inventorying the prints, we determined that there were more than the 60 missing person posters required for the installation. This suggests the possibility that Siegel was open to some variation in the work across successive installations or had simply experimented with other prints at some point in *Missing*'s development.

Interestingly, the folder labeled “documentation texts” contained several prints that combined newspaper articles about the victims with Siegel's own typewritten notes. These

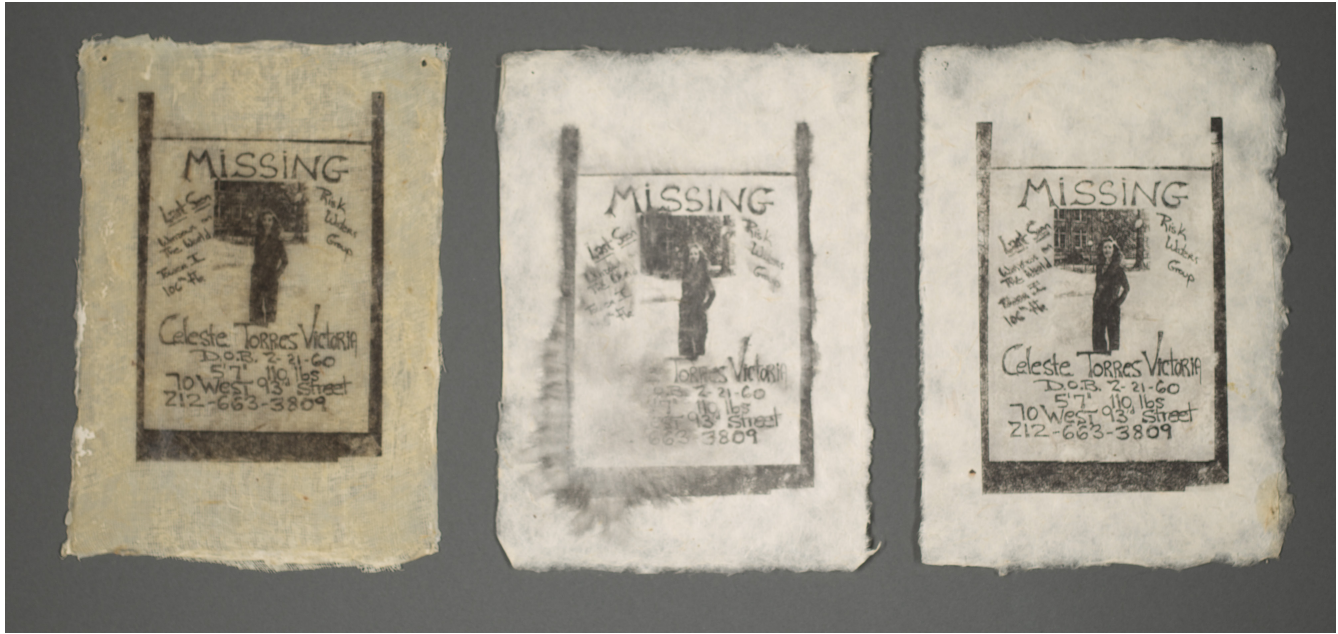


Fig. 5. Detail of *Missing*, Celeste Torres Victoria, transfer print (left). Working proofs, Celeste Torres Victoria, transfer print (center and right). Collection of the 9/11 Memorial & Museum, Gift of Gary Schwartz. Source: Photography by Samantha Tepper.

were formatted differently than the missing-poster prints, generating confidence that they were part of Siegel’s process but not meant for inclusion in the installation. In one example, Siegel mentions reading in the *New York Times* that a poster

she had photographed—purportedly depicting a child named Mya Braker, which the artist had found particularly upsetting because of the victim’s youth—was fraudulent (fig. 7). There was, in fact, no such child victim. (There were eight children



Fig. 6. Detail of *Missing*, Hugo Sanay, transfer print (left). Collection of the 9/11 Memorial & Museum, Gift of Gary Schwartz. Missing Person Poster of Hugo Sanay, inkjet print (right). Collection of the 9/11 Memorial & Museum, Gift of Sisters of Charity of New York, St. Vincent’s Hospital. Source: Photography by Samantha Tepper.

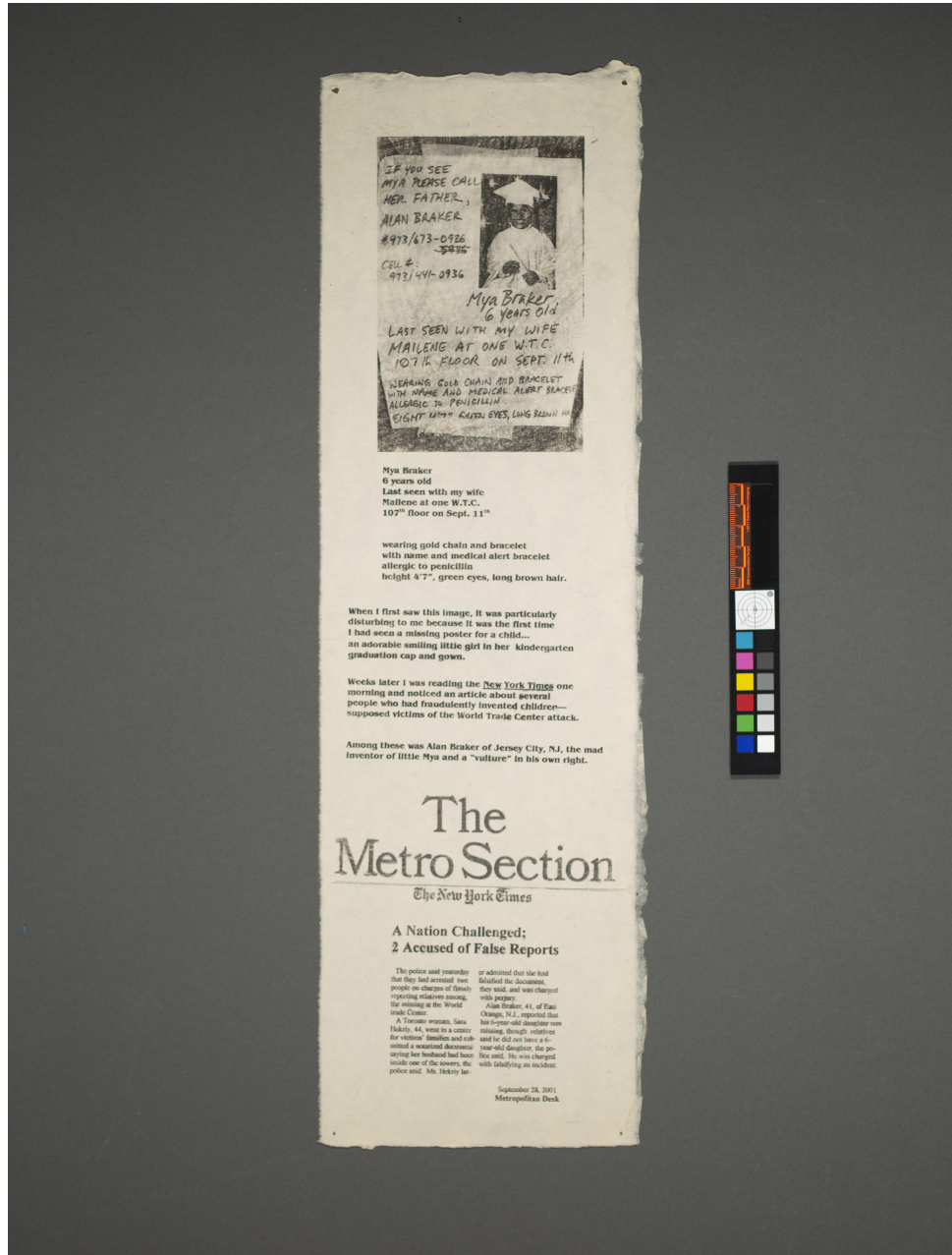


Fig. 7. Barbara Siegel, *Documentation Text* about missing poster depicting “Mya Braker,” solvent transfer. Collection of the 9/11 Memorial & Museum, Gift of Gary Schwartz. Source: Photography by Samantha Tepper.

aboard three of the four hijacked flights, but none were ever confirmed as a casualty at or around the World Trade Center.) It is worth noting that the print of Braker was featured in both exhibitions of the artwork.

RECONSTRUCTING *MISSING*

Missing has been shown twice—first, in 2002 at Lehman College, where Siegel personally installed the work. The

artist’s statement for this show includes the only image of the work’s exhibition that she supervised, albeit a highly pixelated one (fig. 8). This photograph, along with Siegel’s statement (as well as the image from the *Wayback Machine*), makes clear that *Missing* was intended to be installed on both the wall and adjoining floor. Notations on the folders combined with the blurry shapes discernible in the photograph allow one to reconstruct the grid conceived by the artist (i.e., the number of columns and rows, and the number of prints in each).



Fig. 8. Exhibition view, Barbara Siegel, *Missing: An Installation*, 2002, Lehman College Art Gallery, Bronx, NY. Courtesy of Matthew Sherman, the artist, and A.I.R. Gallery.

With this information and using the copies of corresponding missing person posters in the 9/11 Memorial & Museum's collection, the arrangement of prints can largely be deduced. As discussed earlier, some variations exist between Siegel's prints and the missing person posters now preserved in the Museum's larger collection. These variables are probably related to environmental-related changes that evolved in the latter holdings and because, for some victims, different posters were created. It is nonetheless possible in many cases to compare the Museum's posters against those reflected in the Lehman College installation image and then try to reconstruct their placement. Of the 72 total works that comprise the inaugural installation overseen by Siegel—60 prints of missing person posters, plus the 12 sheets comprising the poem—about 85% of the original placements can be ascertained (fig. 9).

In 2021, coinciding with the 20th anniversary of the 9/11 attacks and some years after the artist's death, *Missing* was installed again at the Brooklyn-based A.I.R. Gallery, established in 1972 as the first not-for-profit, artist-directed-and-maintained gallery for women artists in the United States. The work was included as part of *Investigations: Remembering Barbara Siegel*,

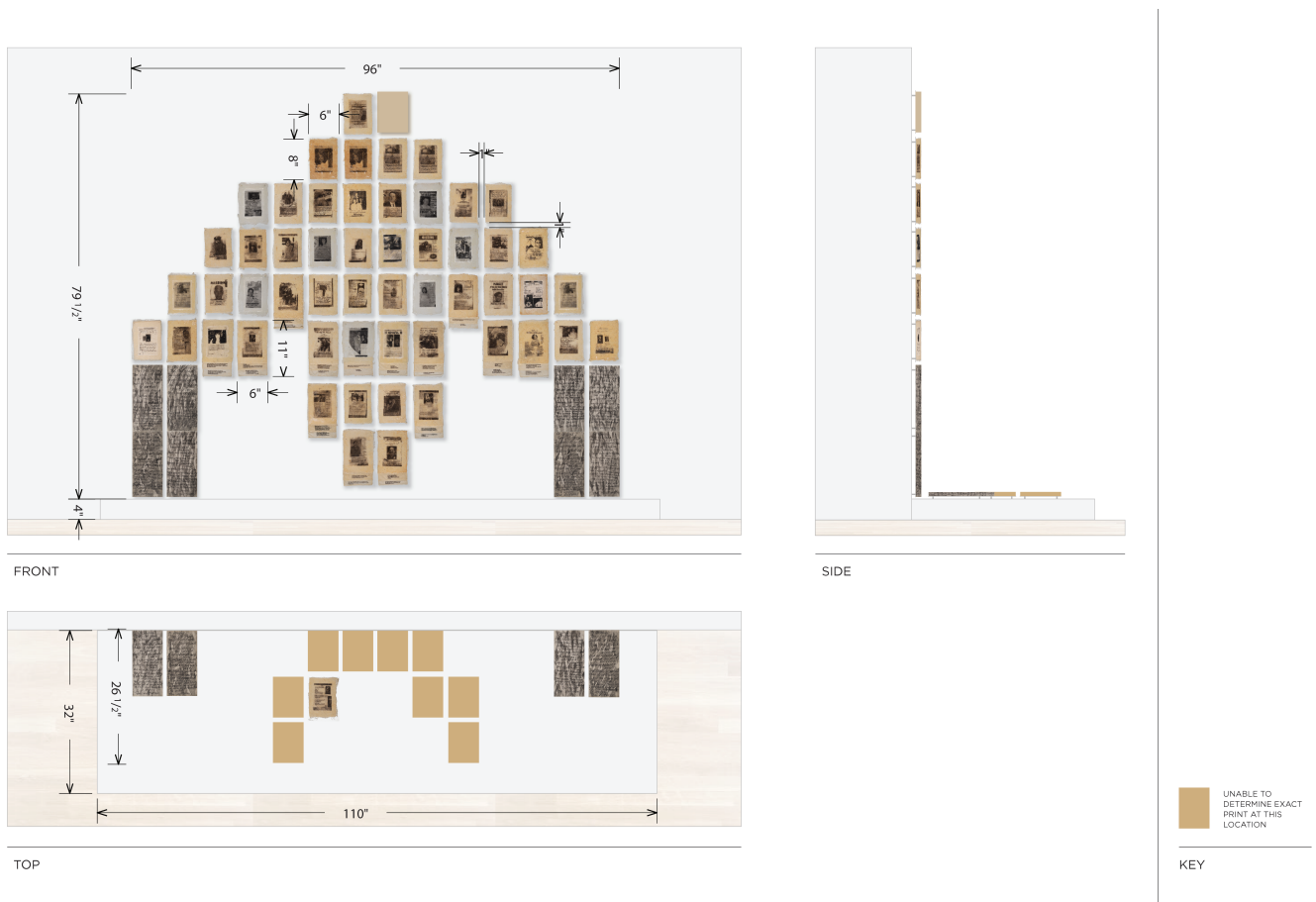


Fig. 9. Elevation drawing, Barbara Siegel, *Missing*. Collection of the 9/11 Memorial & Museum, Gift of Gary Schwartz. Source: Drawing by Gayle Ulrich.

a special exhibition celebrating Siegel's legacy. Two of Siegel's friends, Kathryn Schneider and Nancy Storrow, curated the show in collaboration with Taylor Bluestine, A.I.R.'s communications and program associate. Despite having access to the same documentation, at A.I.R., the prints were displayed entirely on the wall because of gallery space constraints. This is not necessarily problematic, although as Laurenson has discussed, there is a certain inherent variability about installation art: "[I]t can and does exist as both object and concept, only actualized through installation" (Laurenson 2006). Additionally, since missing posters were somewhat haphazardly put up on the street in the chaotic hours and days after 9/11, it seems fair to conclude that some variation in their order when displayed should not affect the work's overall meaning or impact nor contradict Siegel's intent.

Indeed, the manner in which the work was displayed at A.I.R. lends some insight into Siegel's intentions, given the curators' familiarity with the piece and their close personal relationship with the artist. In the Brooklyn venue, the prints were displayed without frames and pinned 4 in. from the wall. This provided an unobstructed as well as an intimate viewing experience, similar to how one would observe missing posters on the street. However, since Siegel passed away before the A.I.R. installation, the Lehman College Gallery's iteration is the most reliable record of her intentions.

To learn more about the conceptual underpinnings of *Missing*, we researched some of the other works documented in the artist's personal archives. Based on these findings, we became more confident that the prints should be displayed on both the wall and floor in a way that enabled more direct viewer interaction with them. The artist frequently displayed her works in a fluid manner within gallery spaces, blending them into the pre-existing environment and transforming the viewer's perception of that surrounding space.

APPROACHES TO CONSERVATION

In developing a preservation approach for Siegel's work, analyzing the biography of the piece is essential. This approach focuses on the artwork's exhibition and related interactions with viewers beyond the genesis and physical materials of the end product (Wharton 2015, 4–5). As time passes, an artwork can become associated with new things and people, leading to subtle changes in its function and contemporary meaning. Whereas preservation efforts in the past centered on protecting an artwork's physical materials, multiform works like *Missing* require us to consider the artwork's essence and "mission" as a vital part of any conservation strategy.

Conservators' decision-making processes have long focused on authenticity. However, current conservation theory acknowledges that a work of art can embrace multiple authentic states that may change over time (Laurenson 2006; Gordon and Hermens 2013; Marçal 2019). According

to conservator Hélia Marçal, this means that "artworks and conservation 'co-become,' or [develop] together" (Marçal 2019, paragraph 39). This idea is particularly germane for conceptually driven works like *Missing*. Even though the objecthood of the artwork is important in evoking the missing posters, its main purpose is to convey through the ex voto medium a message of collective trauma and loss arising from 9/11, along with gratitude and hope. The artwork can be experienced from multiple perspectives, including the initial emotional shock of 9/11, the haunting visual impact of the missing posters, and the despair and sorrow they invoked. Maybe more to the point, as Danto reflected, acts of piety take many forms. In his article *9/11 Art as A Gloss on Wittgenstein*, Danto (2005) recalled Ludwig Wittgenstein's account of Franz Schubert's brother cutting up Schubert's scores into small pieces after his death and giving them to his favorite students. This, Wittgenstein observed, was just as "understandable" as an act of piety as keeping the scores intact or, at the opposite end of the spectrum, burning them. Variations in future installations of *Missing*, then, can be seen in this same light as people co-create the work based on their unique interactions with it.

Siegel's short statement about the work from the single occasion it was exhibited during her lifetime describes how she felt seeing the missing person posters after 9/11. She articulates the work's concept as "a form of retable... a memorial to tragedy and loss, but also to our shared belief in the need to survive and affirm life" (Siegel 2002, A12). Like the votive art that fascinated Siegel, the interpretation of *Missing* may evolve over time as we move further away from the causal event provoking its creation. After experiencing the trauma of terrorism, Siegel turned to the act of making *Missing* as a way to move forward. But as it was displayed, the artwork's meaning was shaped by the objects around it and people's interactions with it. Siegel hoped that each person who viewed the work would interpret it according to their own understanding of 9/11 and forge a unique meaning for themselves. Eventually, as the artwork inevitably deteriorates, it will also take on a new function as a symbol of its past (Hughes 2016, 32–34).

The act of making ritual offerings at memorial sites, which is similar in some ways to the tradition of votive giving, provides a useful framework for understanding *Missing*. David Morgan—who builds on French sociologist and anthropologist Marcel Mauss's notion of the gift and the relationships and obligations that gifts propagate—has suggested that contemporary ritual giving is a way for people to keep "memory alive and sustain a relationship as if paying respect might rescue from oblivion those lost to death" (Morgan 2018, 124). He sees such offerings as not only generous acts but also a response to a gift already given. Accordingly, "[a] letter to a fallen soldier suggests that the living are bound to respond to the gift offered by the dead, even if they feel they can never

properly repay the debt of what the dead have given them” (Morgan 2018, 125).

This sort of exchange can be seen in both unofficial community-driven memorial sites, such as those dedicated to victims of gun and police violence, which often appear spontaneously at the sites of these incidents, as well as state-sponsored ones, like the Vietnam Veteran’s Memorial in Washington, DC. Jeanelle Austin, executive director of the George Floyd Memorial, describes the significance of offerings—the word itself—as a secular way to recognize individual contributions to spontaneous “altars” of remembrance, while also acknowledging the collective belief in the spiritual act of making an offering to a place deemed sacred by a particular community (Austin and Grabow 2023, 129). Similarly, art historian Jaś Elsner has noted that the *ex voto*, when grouped with other objects—like, for example, *Missing*’s central constellation of missing person posters—can “create the ethos of a sacred site” and take on the qualities of one through the addition of various sacred votives (Elsner 2018, 16).

Taking care of unofficial memorial sites through the self-elected efforts shouldered by affected community members can likewise be seen as a form of gift exchange. For Austin, caring for the memorial site at George Floyd Square was an expression of protest, a way to stand up for Black lives “that would allow [her] to heal and not add to ... existing trauma” and “care for ... the people who entered the sacred space of the memorial” (Austin and Grabow 2023, 129). In the same vein, after the 9/11 attacks, Gerry McCarthy, who lived in midtown Manhattan near the Fire Department’s Engine Company 54, took care of the growing, sprawling impromptu memorial that developed outside the firehouse to mourn and honor the 15 firefighters from that company who gave their lives. By doing so, she also supported those rescue workers who had survived. As McCarthy would later explain, she “[tried] to make the best decision about what [could] be done with [the memorial materials].” She felt that she had “no right to judge whether [it was] good stuff or bad”; she “just want[ed] to make it easier for the guys” (McCarthy 2002). As it turned out, the centerpiece of that memorial, a fiberglass sculpture of the Statue of Liberty adorned with notes, mass cards, rosary beads, and other offerings left by thousands of people from around the world, became the first three-dimensional object officially collected by the nascent 9/11 Memorial & Museum.

The conservation and future display of *Missing* can be seen as a more professionalized undertaking of the same sort and spirit of effort. By preserving *Missing* as something more than a static document of a past tragedy, the work becomes activated from the exchanges between those who participate in its care, those who encounter the work in our public gallery spaces, and the unique individuals whose existence and deaths are memorialized in the missing posters—and the larger National September 11 Memorial.

ETHICAL CONCERNS

When preserving an object like *Missing* in a memorial museum setting, it is crucial to consider its cultural significance along with its artistic and material characteristics. Employing a people-centered conservation approach enables individuals with a personal connection to the object and the story it incarnates to actively participate in the process. Such collaboration is particularly important when dealing with sensitive objects that can invoke violent, traumatic events, present and past. Gathering information about an object’s historical significance and personal meaning can enhance understanding of its resonance over time.

As part of the process of acquiring *Missing*, the 9/11 Memorial & Museum sought input from various individuals connected to the work, including Gary Schwartz, fellow artist and friend Nancy Storrow, and Bluestine, from the A.I.R. Gallery. Each shared aspects of the artist’s life experiences and knowledge about the work, offering valuable if different perspectives. Storrow, for instance, shared that during the installation of *Missing* at A.I.R., in 2016, after Siegel’s death, she felt incredibly close to the artist and thereby gained a new appreciation for the work.

Although Siegel, Schwartz, and their friends and loved ones are integral to *Missing*’s creation and meaning, the work also relates to dozens of other individuals whose lives ended abruptly on 9/11. The perspectives of their families and friends are also important, although their views on how to present the human consequences of terrorism will likely diverge in important respects. In contemplating the possibility of a future exhibition of *Missing*, several complicated questions arise. Should all family members of the depicted victims be consulted in advance of deciding whether or how to display the work (if that is even possible)? Additionally, how should museum staff handle disagreements among family members about the artwork’s presentation or whether it should be exhibited at all? Do museum workers possess the necessary training to navigate these emotionally fraught issues? What to the general public may appear as an ensemble creation is a piece of exquisitely nuanced private emotions and connotations to those whose loved ones were killed.

Alerting the relatives of the portrayed victims about its future display will pose certain challenges. As a practical matter, the Museum at present simply does not have personal relationships with or contact information for all the families of the individuals portrayed in the work. Some victims’ families have chosen not to engage with the Museum, preferring to mourn and remember privately. We always want to respect personal boundaries and not overreach. As time passes, it is conceivable that some reluctant next of kin and relatives may feel more comfortable sharing, especially as distance from the 2001 attacks increases. Regardless, this will always remain an issue that requires sensitivity and a flexible, individualized approach.

There is also the problem surrounding the fabricated young victim, “Mya Braker,” and what to do about the erroneous missing person print depicting her. At the very least, a didactic would be necessary to explain that she was not, in reality, a victim of the 9/11 attacks. But perhaps the subsequent print that Siegel made, as a sort of footnote to her artwork, which included the *New York Times* article that made her aware of this fact, and her own thoughts on the revelation, could be included as part of an exhibition presentation.

One distinction that might be instructive in determining the extent of consultative effort invested in reaching relatives of those featured in the missing person posters used by the artist has been suggested by the Museum’s chief curator, Dr. Ramirez. In her view, it is significant that Siegel’s intentions in creating *Missing* were never commercial; they were, instead, reflective and commemorative. Additionally, since Siegel’s intentions were pure and heartfelt, there is less concern that victims’ families would be disturbed by the work’s exhibition within the setting of the 9/11 Memorial & Museum (Ramirez 2023).

CONCLUSIONS

In *A Grief Observed*, C. S. Lewis wrote about the experience of dealing with his wife’s tragic death: “I thought I could describe a state; make a map of sorrow. Sorrow, however, turns out to be not a state but a process. It needs not a map but a history, and if I don’t stop writing that history at some quite arbitrary point, there’s no reason why I should ever stop. There is something new to be chronicled every day” (Lewis 1989, 7). The waves of grief, sorrow, and anger that resulted from the unspeakable tragedy of September 11 may have been felt most acutely in the immediate aftermath of that horrific day. However, the emotions released that fateful Tuesday persisted for years afterward and continue to this day, as more lives are lost to the illnesses linked to exposure to the toxic contaminants that wafted through Lower Manhattan and also infiltrated parts of Brooklyn and Staten Island after the Twin Towers collapsed.

Despite the looming presence of death, *Missing* tells a poignant tale of mourning and recovery in the aftermath of 9/11, bringing us closer to a collective human experience. Additionally, although the work preserves the public memory of several dozen of 9/11’s victims, it also provides a space to consider and cope with emotions of loss and suffering akin to the feelings experienced by every affected family member, co-worker, friend, neighbor, and resident of New York City and beyond at the time of this century-defining event. However, the work is not static. Like the grieving process itself, it is transformed by the unique perspectives of those who encounter it, including museum collection workers tasked with cataloging, housing, and preserving it and contemplating the possibility of its exhibition in the future. Siegel, it seems safe to say, understood this and embraced it.

Accordingly, even though any future installation of *Missing* will inevitably deviate to some extent from the installation overseen by the artist in her own lifetime, as long as the work continues to serve as “a memorial to tragedy and loss, but also to our shared belief in the need to survive and affirm life,” it will honor Barbara Siegel’s creative intentions.

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NOTES

1. “Os Urubus”

They call them
The birds of death
Flying silhouettes black
Heading locked-on
to carrion
Beak and unfeathered
neck
To rupture and pluck
and ravish
Guided by madmen’s
hands
And exquisite conviction of
Their ascents to immortality
To pick the strange fruit
of architecture
They buried themselves
beyond belief beyond belief
One fine day in Manhattan
Os Urubus
The Vultures

2. When a museum acquires an object, a formal deed of gift is typically used to establish ownership and any restrictions on the gift. Although a signed deed of gift is the most straightforward way of proving ownership, other forms of communication such as e-mails or letters may also be accepted as evidence. However, in the case of

spontaneous memorials, which are usually created anonymously, the situation can be more complicated. For example, if a spontaneous memorial is created on a public street in New York, the creator would not have any ownership claim to it, as New York's abandoned property law does not usually apply to such memorials because they do not have any tangible value. Offerings left at public memorials are not owned by their creators in the same way that leaving property on the street would not give someone legal recourse if it were taken. Even though museums may face ethical dilemmas about who owns these memorials and their attendant caretaking, this does not involve proper law principles.

3. If an artist creates a new work based on something that is already protected by copyright, it is referred to as a derivative work. For a derivative work to be protected under copyright law, it must have significant differences from the original or include a substantial amount of new material. The copyright protection for a derivative work only covers the new or altered material, not the pre-existing material. It is unlikely that any of the initial missing posters were copyrighted, and *Missing* as a whole is distinct from any single missing poster, so copyright infringement would not be a concern.

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Abstracts presented during the Book and Paper Group Session

American Art/Italian Paper: The Partnership between the Japan Paper Import Company of New York City and the Historic Paper Mills of Fabriano, Italy

Sylvia R. Albro, Paper Conservator in Private Practice

My presentation looks at the relationship between these two entities beginning in 1901 and lasting close to 100 years in various forms. The personal relationships that sustained this long-lasting business partnership across changing histories and fluctuating economies will be examined through correspondence preserved in the historical archive of the Foundation associated with the Fabriano paper mills, among other sources. Technical records documenting the formulas for high-quality artists' papers made by hand and machine in the 20th century with a wide variety of new ingredients will be revealed. Papers commissioned in New York City, produced in Fabriano and favored by prominent American artists, printers, and designers in a variety of media will be illustrated. Advertising samples of these same papers from the Harrison Elliott Collection of Paperiana at the Library of Congress will be compared. (Elliott represented Japan Paper Co. from 1925 to 1951).

The Fondazione Fedrigoni Fabriano (FFF) historical archive contains formula books, receipts, and samples of special orders of many types of papers designed and made for the American market, including Ingres, Roma, Rosaspina, Tuscany, Murillo, Lombardia, Umbria, and Fabriano Artistico watercolor paper. Appreciation for aesthetic qualities of many of these imported papers will be highlighted by the numerous works by American artists and printers who used them, from the collections of the Library of Congress, the National Gallery of Art, and the Phillips Collection in Washington, DC.

Evidence of industrial changes in methods of fabrication and ingredients used in 20th-century papers provides important information to conservators charged with preserving iconic works by American artists and printers, now in the collections of many museums and private owners. They include dyes and pigments, fillers, pulp furnish of a variety of sources, whiteners, and both internal and surface sizing agents. Awareness of the numerous components in modern artists' papers and their identification is essential to a conservator's

decision-making process when considering the treatment, long-term housing, and/or display of these artworks.

Plastic Findings in Book Bindings: Surveys of Materials, Structures, and Condition for the Care of Changing Collections in Australia

Cancy Chu, National Archives and Records Administration; Francesca Zilio, South Australian Museum; Julianne Bell, Grimwade Centre for Cultural Material Conservation, The University of Melbourne; Melanie Barrett, Singapore Art Museum; Petronella Nel, The University of Melbourne; Sarah Bunn, Art Gallery of New South Wales

Commercial bookbinding techniques have changed over the past century to include components composed of semi- or fully synthetic polymeric materials, commonly known as plastics. As identified in collection surveys at the Victoria and Albert Museum and the British Museum in the 1990s, certain plastics are known to be comparatively unstable and potentially harmful in close contact with other materials. These plastics are referred to as 'malignant.' Two recent surveys at the New York University Library and National Library of the Czech Republic further identified common plastic types in archives and libraries, including the presence of the four malignant plastics. Although a recent questionnaire indicates that plastic-containing book bindings are likely found in more than 90% of Australian archives, there is limited information available on the structures of plastics found in books, common deterioration concerns, and available strategies for prolonging use and stability. This knowledge gap hinders the capacity for conservators to identify and care for recent and incoming book collections in libraries, archives, and other paper-based collections.

This project aimed to formulate storage strategies for plastic-containing books in Australia. Three paper-based collections were surveyed in a collaborative project to determine the types, structures, and condition of plastics in books, namely at the South Australian Museum, the Art Gallery of New South Wales, and the Grimwade Centre for Cultural Materials Conservation at the University of Melbourne. Fourier-transform infrared spectroscopy with attenuated total reflection (ATR-FTIR), a noninvasive contact-based technique, was used to identify plastic polymer types. Documentation of structures and condition was achieved

with a standardized template to ensure the consistency of data collection, using hierarchical fields to document relational links.

Results from 165 books dating from 1949 to 2019 identified six polymer types, including two malignant plastics. A total of 36 unique binding structures were documented and summarized as 10 binding types to aid in the visual identification of plastic components. Plastics were identified in book cloth, spines, covers, jackets, and adhesives. Visible deterioration was grouped into four categories based on hypothesized cause, then addressed with proposed storage strategies for decreasing the probability of damage. Results are compared with and supplement existing literature on plastics conservation, book conservation, and studies on plastics in paper-based collections. Proposed strategies are low-cost, accessible techniques in line with sustainability principles.

This project recognizes the changing nature of materials used in traditional formats, framing plastics conservation within a book collection context. Results increase the current understanding of plastics in book collections, equipping conservators with possible plastic types and deterioration patterns to guide decision making if similar materials are encountered. Identified conservation storage practices highlight the need for the continued challenging of assumptions to address novel material combinations. Overall, this project demonstrates the benefits of interdisciplinary collaboration between specialties in managing changing collections.

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Application of a Large-Scale Working Rack for an Oversized Silk Painting Conservation during the Pandemic

Ting-Fu Fan, San-Jian Art & Conservation; Yi-Chiung Lin, San-Jian Art & Conservation Co. Ltd.

Regular-sized Eastern painting and calligraphy can usually be treated on a conventional-sized red lacquered working table. However, for a silk painting that exceeds 2.4 m in height, 66 m in length, and weighs 32 kg, it is apparently impossible to carry out its treatments and backing, which we found especially true during the pandemic between 2020 and 2021.

How to arrange the practical working schedule to meet limited requirements for conservators and related team members, and furthermore to efficiently use the conservation laboratory space to complete the treatment, backing, and flattening of this super-sized artwork? A helpful and convenient large-scale working rack would be the best solution.

Our conservation team used an off-the-shelf industrial storage rack system, redesigned it according to the treatment

requirements, and built a set of large-scale working racks for this giant painting conservation project. The set of artwork supports made this 66-m-long painting not only easy to roll and unroll but also able to have stepless control in adjusting sections undergoing treatment. Therefore, while protecting the artwork, it also allowed us to reduce the number of art handlers and comply with the government's pandemic regulations.

With three height-adjustable tabletops, the system can maximize the three-dimensional use of small working spaces, take condition pictures, and allow conservators to treat multiple fronts and backs locally at the same time. In addition, multiple adjustable bridges across the artwork are helpful for conservators to carry out treatments on top of the painting and complete two layers of kozo paper backing. The final stage of drying and flattening on this racking set reduces the rent, air-conditioning costs, and environmental control expenses for a super-large space. This set of large working racks that can assemble and install repeatedly can ship to different locations for artwork treatment when necessary.

Finding the Forest amongst the Trees: Unlocking the Hidden Layers of a Kashmiri Birch Bark Codex

Mary French, Boston Public Library; Rebecca "Bexx" Caswell-Olson, Northeast Document Conservation Center

When an exceptionally fragile 16th to 17th century Kashmiri birch bark codex from the Chapin Library at Williams College was brought to the Northeast Document Conservation Center (NEDCC) for conservation and digitization, its contents were largely inaccessible. Each text leaf in the manuscript consisted of two to four layers of naturally and/or artificially laminated birch bark, and most leaves had moderate to severe delamination, creases, and loss. The leaves had long horizontal splits in the fore edge and sewing stations that made it impossible to open the text block without abrading vulnerable areas, and whole sections of the text block were crumpled, tangled, and interlocked together. Scholarly interest in both the unknown text and the understudied Kashmiri binding structure created a unique opportunity for a multidisciplinary project that integrated scientific analysis into the conservation and research process.

As a non-western binding structure rarely encountered by conservators in the United States, understanding the historical, cultural, and design aspects of the Kashmiri binding was an important part of creating an appropriate treatment plan. The task of recontextualizing this manuscript was of significant scholarly interest to the Book and the Silk Roads project, which also helped to coordinate the scientific analysis of the object. Radiocarbon dating established the age of the manuscript to approximately 1500 to 1640 CE. Micro-CT scanning informed the conservation process by offering a rare chance to study the book's internal structure and original condition

even in areas not visible to the human eye without disturbing the historic binding. To further assist in the conservation process, a binding model was constructed based on a study of the manuscript and a thorough literature review was also conducted to ensure that the treatment plan was culturally, historically, and materially appropriate. Following conservation and digitization, images of the manuscript were sent to an expert in the Śāradā script, who was able to identify the text and assist the conservator in determining the exact locations of loose fragments of text. Some fragments were able to be reunited with the main body of the text, and the remainder were housed in a complex custom-encapsulated post binding.

This article will discuss how a conservation treatment plan was designed and carried out to restore access to the manuscript, address the logistics of managing a project with multiple institutional partners across two countries, and highlight the benefits of an interdisciplinary approach to the care and treatment of manuscripts.

Paper, Metal, and Liquid: Bronzing Degradation in a Nineteenth-Century Lithograph

Meredith French, Aaron Shugar, Jiuan Jiuan Chen, Rebecca Ploeger, and Theresa J. Smith, Patricia H. and Richard E. Garman Art Conservation Department, SUNY Buffalo State

Lithographs featuring religious subject matter were common in 19th-century America. The print that is the focus of this research, however, is an unconventional version of the Irish-Catholic patron-hero, St. Patrick. He is depicted standing on three snakes in a landscape with a steepled building in the background. Stenciled matte black paint frames the scene and fills the space behind him. A shiny, green-gray design borders the print and identifies the subject as St. Patrick. All color was painted freehand or through stencils, and the print bears no information about the artist, publisher, or date. The object displayed excessive dirt and debris within the frame, planar deformations throughout the sheet, and a disfiguring dark stain from a liquid event in the lower left region. Furthermore, the tide line of the stain was curiously deformed with bumps protruding from the interior of the paper sheet. St. Patrick was a popular subject for 19th-century American and European lithographs; however, the black background is not a common aesthetic feature. Although this research did not uncover similar backgrounds in other lithographs, the steepled building was found in another print featuring St. Patrick by the prominent American lithographic firm Currier & Ives. Investigating the technologies, materials, and body of work created by Currier & Ives and similar American firms provided a rich, cultural context for the subject of this treatment, and the two prints are likely related. Scientific analysis and multimodal imaging identified the pigments and revealed that the shiny, green-gray border was in fact degraded brass

powder. Bronzing, the historical technique of applying metallic powder to a print, would have given the media a golden appearance. XRF mapping of the brown stain showed that whereas some copper from the brass powder remained on the border design, nearly all of the zinc relocated to the tide line. This could indicate dezincification of the alloy. Additionally, XRF revealed a surprising abundance of metals in the stain, including iron, lead, aluminum, potassium, calcium, and manganese. Grenz radiography identified the nature of the protrusions in the tide line: dense dendritic crystals. Analysis of the crystals using SEM-EDX spectroscopy indicated they are primarily composed of sulfur and magnesium. Although the full meaning of these results is unclear, some conclusions about metal in paper can be drawn. Even though an aqueous treatment was designed for this project, the discovery of numerous metals in the stain and the solubility of some media changed the course of treatment. Instead, the object underwent surface cleaning, minor structural repairs, inpainting of insect grazing and abrasions, as well as optical inpainting to reduce the appearance of the brown stain and foxing. Originally envisioned as a complex stain reduction treatment, this project evolved into the historical research of early lithographic-print houses, printing technology, and the analysis of water-catalyzed degradation of brass powder in paper.

Ammonium Citrate as a Washing Additive for Paper

Ute Henniges, Staatliche Akademie der Bildenden Künste; Antje Potthast, University of Natural Resources and Life Sciences, Vienna; Crystal Maitland, Canadian Conservation Institute; Irene Brückle, Staatliche Akademie der Bildenden Künste; Philine Venus, Staatliche Akademie der Bildenden Künste; Theresa J. Smith, SUNY Buffalo State

Major goals of aqueous treatment in paper conservation concern reducing unwanted discoloration and improving paper permanence. Both goals are met in most established washing treatments that involve the use of mildly alkaline (deacidification) solutions with calcium compounds. Further brightening may be achieved by bleaching, although this more invasive treatment carries the risk of cellulose damage. Lately, ammonium citrate is being used by practitioners as another method of “enhanced washing,” viewed as a more powerful brightening agent than washing and less aggressive than bleaching. However, there are few studies backed with analytical data to clarify the chemical effects of ammonium citrate on paper’s cellulosic backbone. Some publications reveal the astonishing cleaning effect, whereas others warn against stripping calcium carbonate from paper, compromising its stability.

We designed an experiment with two historic papers and one laboratory filter paper that were immersed in solutions of 3% ammonium citrate (pH 5.5 and pH 8.5), and, for

comparison, 3% citric acid (pH 2.5), ammonium hydroxide (pH 9.0), and calcium hydroxide (pH 9.0). One set of papers was washed exclusively in these solutions, and the other subsequently received an alkaline reserve (calcium hydrogencarbonate). We determined the CIE L*a*b* values for all samples before and after the treatment and after accelerated aging (heat-moist aging at 80°C and 65%RH for three weeks) to capture color changes. A selection of 36 samples underwent molar mass determination by GPC-MALLS-RI.

Testing revealed clear differences between the samples in contact with citric acid and ammonium citrate compared to the other treatment solutions. Specifically, both historic papers brightened and maintained their brightness after accelerated aging. One historic paper sample and the filter paper underwent molar mass determination (the other historic paper was already too degraded for this analysis). The molar mass data clearly indicate that both the filter paper and the historic paper degraded in the aging conditions chosen for this experiment. The other significant finding shows that deacidification following the treatments helped to maintain the molar mass of the two tested papers during the harsh aging conditions. The test treatments themselves did not cause differences on a molecular level.

In conclusion, our findings show that the application of ammonium citrate may be considered as a method of enhanced washing, and the mildly acid variant (pH 5.5) brightens the papers tested in our study without compromising its molecular integrity as long as the treatment solution is thoroughly washed out and an alkaline reserve is added. We noted that, as with other washing treatments, the hue of the treated papers changed and this color change should be taken into consideration. For long-term stability, it is crucial to rinse the treated papers and remove the substances used for enhanced washing and to add an alkaline reserve.

Heroes Behind the Chinese Albums: Two Cases of Qing Dynasty Functional Brocade Boxes

Jia-Yu Hu, Tainan National University of the Arts, Graduate Institute of Cultural Relics; Hsin-Kuan Liao, National Palace Museum

Traditionally, the way to contain and store a Chinese album was to make a tailored brocade box to protect it. The brocade box is made of cardboard overlaid with brocade using thickly applied paste. It is a special packaging method; rather than a fixed box, it can fully unfold and lay flat on the table. When it is folded, it will interlock tightly and become a firm box because of its unique structural design. The purpose of this design is to offer a convenient way to take the album out of the box. However, to make the box foldable, the edges are only two layers of brocade and silk, which causes it to abrade and tear easily.

Brocade boxes typically will not be displayed in exhibitions because they were considered as protection for Chinese albums and thus were less important than the albums themselves. But from a historical viewpoint, they are worthy of restoration, not only to preserve the historical information but also to preserve the spirit of protecting cultural artifacts. This study will include two conservation cases from the Qing dynasty (17th–20th century) brocade boxes. The albums inside contained Buddhism stories with detailed embroideries lined with paper. The boxes were seriously damaged. They had torn into individual pieces, and some brocade was lost. In addition, the broken pieces had been improperly taped together. As well, because the cardboard is water sensitive, it caused yellow stains on the brocade. Heavily stained brocade cannot be washed until it is separated from the cardboard underneath.

The restoration treatment balanced functional, historical, and aesthetic values, and it integrated paper and textile conservation materials. We used the original brocade that was folded underneath and Japanese tissue paper to fill losses; we also used Japanese tissue paper as well as silk crepe line to strengthen the structures, while protecting the edges and corners to prevent further tear and abrasion. Because of the thinness and transparency of Japanese tissue paper, it visually merged with the brocade and made a perfect reinforcement. After treatment, the two brocade boxes maintained accurate size to fit the albums, thus restoring the protecting function.

In this changing society, not only the most valuable objects are worthy of preserving but also what might seem less valuable but has historical significance. Although the brocade boxes seem like mere appendages, they have been protecting the albums for centuries. The value is not just artistic value but the spirit of preservation. These conservation projects can convey a message to future generations and inspire continuation of protecting our cultural memories.

Controlled Anarchy: Technical Study and Treatment of Lygia Pape's *Tecelares*

María C. Rivera Ramos, Art Institute of Chicago

In 1959, artist Lygia Pape wrote, “The problem of chance does not exist in the sort of printmaking I do. All of it is controlled: from the choice of material . . . to the final print.” Pape (1927–2004) was one of Brazil’s foremost contemporary artists, and throughout most of the 1950s she used printmaking as the vehicle for her Concrete and Neo-Concrete explorations. Scholars have argued that her predilection for woodcut reflects her desire to subvert long-established hierarchies in the visual arts which privileged painting. But Pape also subverted paradigms of printmaking itself. Her techniques aligned with traditional Latin American craft and the use of prints, broadsides, and posters to address sociopolitical

issues, yet her largely unique prints explore formal concepts. The woodcuts made between 1952 and 1960, which she named *Tecelares* (Weavings in Portuguese), represent an important time in her career when she manipulated printing matrices in anticipation of making three-dimensional work. Close examination of both extant matrices and impressions from the *Tecelares* yields insight into how Pape exploited her materials to conceptualize form and space.

Even during the earliest years of her artistic production, Pape grappled with aesthetic, formal, material, and technical challenges, solving them in innovative ways. Such solutions speak to an ethos of experimentation, as well as command of her craft. The artist favored gossamer-thin Japanese papers, which were exceedingly difficult to use when printing the sharp relief of hardwood and metal matrices. However, successful impressions on such translucent papers gave her the freedom to privilege the verso of a print over its recto. Throughout her printed oeuvre, Pape repeated, reworked, and reformatted her compositions—sometimes in incredibly subtle ways—to discover new resonances within groupings of hand-carved, geometric forms. She invented her own language of making by incorporating the vocabulary of craft.

This presentation will detail conservation-related research into Pape's materials and process carried out in anticipation of the exhibition *Lygia Pape: Tecelares*, on view at the Art Institute of Chicago from February to June 2023. During a year-long study, the author collaborated with the exhibition's curator to examine more than 100 prints and matrices. To the author's knowledge, this is the most extensive direct investigation of Pape's work through the eyes, sensitivity, and intellectual questioning of a paper conservator. A key element of the artist's practice involved wrapping incredibly thin papers around rigid supports for presentation purposes. As a result, many interventions of structural stabilization were crucial. Other conservation issues associated with long-term storage conditions included significant losses due to insect activity, extensive discoloration of the delicate supports, and staining related to poor-quality mounting materials. Due to the fragile condition of many of the prints, 75 works required treatment to make them stable enough for exhibition. This presentation will touch on conservation issues associated with Pape's work and the approaches to treatment that were ultimately selected. Housing and display considerations will be discussed.

Conserving and Exhibiting NYPL's 1799 Copy of Albrecht Dürer's Triumphal Arch

Denise Stockman, New York Public Library

One of the largest prints ever made, Albrecht Dürer's Triumphal Arch is a wall-sized (about 10 × 12 ft.) architectural

woodcut intended as imperial propaganda commissioned in 1515 to convey Emperor Maximilian I's magnificence and illustrious lineage. The 1799 printing was a reprint from the majority of the 190-plus wood blocks, with a few lost or damaged blocks recreated as etchings. The New York Public Library's copy was on long-term display in the library's Astor Hall from the 1930s until 1984, when it was removed due to its "advanced state of deterioration." The muslin mounting onto which the more than 80 individual pieces of the print were adhered was cut apart, and the print remained in storage until 2019, when it was brought to conservation to be prepared for New York Public Library's Treasures exhibition.

Treatment included removing the muslin backing, washing, light bleaching, lining, and filling losses, including digital fills. In addition to preparing the print for exhibition, the goals of treatment included planning for ease of storage, accessibility, and digitization. The presentation will describe how the print was mounted, transferred, and installed into the main gallery of the Library's iconic 5th Avenue building for exhibition (short-term this time).

The Frederick Douglass Collection at Northwestern Libraries: Stewardship, Research, and Treatment

Roger S. Williams, Brown University Library

Northwestern University Libraries holds a small but historically significant collection of manuscript documents by and about the 19th-century abolitionist, activist, orator, writer, and public intellectual Frederick Douglass. These were treated in 2021 in preparation for digitization. Although the treatment itself was straightforward, the significance and historical nature of the materials made research and analysis vital for informing the treatment decisions. Archival research, along with micro-FTIR analysis of old mending adhesives, was used to decipher the origins of the papers that had been applied to the documents.

The Douglass documents at Northwestern University Libraries were previously part of a collection entitled African American Documents, which was made up of materials donated to the Libraries in the early 20th century by a private collector who was a patron of the university. The conservation department's work with this collection required thoughtful consideration of provenance and stewardship, which ultimately led to a reparative description effort led by the Libraries' Archivist for the Black Experience and an exhibition curated by a PhD student. The exhibition included a description of the conservation process, creating a dialogue around the Libraries' custodianship of slavery documents.

Art on Paper Discussion Group 2023

What Is a Print?

INTRODUCTION

Printmaking as an art form and the prints that result are oftentimes some of the most complex types of art that paper conservators grapple with. The various methods of creating a “print” range from the traditional matrix printed onto paper to multilayered, composite objects that move between sculpture, drawing, and painting. Printmaking also has the capacity to utilize and integrate the latest technologies during the creation and display of prints. Throughout history, printmaking has been a democratic art form of the people, offering the ability to respond to current events in an immediate, ephemeral way. In short, prints can be everything all at once, making the subject increasingly tricky to discern and define. This year’s discussion was a hybrid model with two speakers in person and one virtual. Speakers each spoke for 15 minutes, followed by 45 minutes of questions and comments from the audience. The presenters covered a range of topics. Sarah Bertalan discussed French color lithography in the 19th century and the roles of artist versus commercial printer. Kyla Ubbink provided an introduction to Canadian Inuit prints and printmaking, as well as the treatment challenges such prints present. The third speaker was virtual; Christina Taylor prerecorded her talk on the prints of Louis Delsarte, deconstructing his printmaking techniques in creating color offset lithography. She also discussed and shared her instructional videos demonstrating a variety of printmaking methods.

PRESENTATION SUMMARIES

SARAH BERTALAN
CONSERVATOR AND CONSULTANT FOR WORKS ON PAPER

Sarah Bertalan shared part of her research on French color prints, printing manuals, and various art publications of the

Summaries of discussion groups at the Book and Paper Group Session, AIC’s 51st Annual Meeting, May 16–20, 2023

1890s. This time period marked the shift from the mass production of prints on poor-quality paper by large commercial shops to smaller runs of prints on higher-quality paper gathered in such publications as *L’Estampe originale*.

The artisans in commercial printing shops in the 19th century were known for their ability to skillfully produce large numbers of prints. Very few were designed by an artist. When artists did provide the initial design, they were not integrated into the production process. Artists were shown proofs to approve, whereas master printers and technicians produced the final prints. For lithographs, this back and forth was facilitated by the use of transfer papers to convey edits to designs without moving heavy lithographic stones. The artisans at print houses, trained at trade schools or through apprenticeships, had very different skill sets than artists trained at the Académie. Most print professionals had backgrounds in engineering or chemistry, and this is reflected in the technical manuals of the time, which detailed process, materials, and techniques meant for commercial technicians. One manual written specifically for artists focused on instructions for using media, such as lithographic ink and crayon—not on process.

Color printing was the avant garde artistic medium in Paris in the 1890s. This arose from a mania for color posters earlier in the century, with celebrated artists designing color posters that captured the attention of the public. During most of the 1890s, color prints were considered too popular and too commercial to be fine art. It was only in 1899 that the Académie admitted color prints to its annual salon. Generally, color printing was done on cheap, poor-quality papers. This is well documented, with the chemical additives, cheap gypsum fillers, and rapid deterioration of these papers lamented in the literature. Papers were also heavily manipulated during the printing process, including running them through paper-stretching machines, which led to physical damage of the support. So, as publishers competed to secure a slice of the color printing market, they began to offer limited edition chromolithographs from the most popular poster artists on good-quality paper as a marketing tool.

French handmade papers of the time were renowned for their quality and many mills were fabricating traditional handmade laid papers, but the texture and tone of most of these papers was unsuitable for color lithography. Good-quality Chinese paper had been used in the commercial shops in the intermediary steps of the printing process to achieve the print proof. Bertalan illustrated several telltale signs of Chinese papers. One is the red and blue ink along the edges of the sheet, stamped to the sides of paper stacks prior to export. Another is the textured brush marks that are visible on the sheets' surface from the drying process during manufacture. The last is due to the presence of clay as an additive. Conservators have often identified this additive as starch, but it is indeed clay that is responsible for the absorbency of the sheet as well as the complications that arise due to local treatments. The Chinese papers were technically superior to any other paper in their affinity for even the lightest trace of printing ink. However, this benefit was weighed down by the high cost of the sheets and the impurities in the papers. Desiring the benefits of the Chinese papers for lithography without the drawbacks, French papermakers like Maison Kléber (now Rives BFK) introduced lightly sized or unsized wove papers of a high quality called *chine français*.

This type of paper was used for the first volume of André Marty's publication, *L'Estampe originale*, a subscription based, limited edition collection of original prints from contemporary artists of the day. The first volume was printed in 1893, and by the end of production he had issued a total of 95 prints in nine albums over three years. The color lithographs in the first volume were printed on handmade wove paper, although the papermaker is unknown due to lack of watermarks. Each print in *L'Estampe originale* bears an embossed stamp designed by the sculptor Alexandre Charpentier. Interestingly, the edition was not credited to any professional shop and the prints were not consistently signed or numbered. There is no uniformity in paper quality or size, even within a volume. As the work of diverse artists would have had great appeal to sell and collect individually, a complete set is extremely rare. Bertalan ended by noting her observations of two prints in the volume that were printed planographically by two artists known to work in intaglio and relief processes, further highlighting the implementation of transfer processes in the print production.

Printmaking in Paris circa 1890 and L'Estampe originale

KYLA UBBINK

PRINCIPAL CONSERVATOR, UBBINK BOOK AND PAPER
CONSERVATION

Ubbink spoke on the topic of Inuit printmaking. Her presentation covered a brief history of the artistic practice, common materials used to create these types of prints, and some conservation techniques used to treat them. As a

private conservator based in Canada, Ubbink has examined and treated many Inuit prints in the course of her practice over the years.

The art of printmaking was introduced to the Inuit community in the mid-20th century by artist James Houston. While on a hunting trip on Baffin Island, his Native friend Osuitok was curious about the method of reproducing graphic designs on cigarette tins. Houston quickly demonstrated the process by rubbing soot into the incised lines of Osuitok's latest tusk carving and rolling it along a length of toilet paper. They both instantly realized that printmaking could be a new industry for struggling Inuit communities. The middle of the 20th century was a hard time for Northern Native Canadian populations. The decline of the traditional whaling and fur industries, the ravages of tuberculosis, and the loss of traditional spirituality through government implemented assimilation programs led to great strife. The federal government was just beginning to fund programs intended to stimulate the economy in these regions through the Arts and Crafts movement. For several years, James Archibald Houston had brought Inuit soapstone and ivory carvings to galleries in Montreal, where their popularity was growing. In 1949, the Department of Indian and Northern Affairs took advantage of his relationships and knowledge, appointing him "Roving Crafts Officer." Through this role, he and Osuitok gathered the first group of print artists and established a cooperative at Cape Dorset (present-day Kinngait).

Being above the tree line, the Inuit artists looked to their well-honed skills of stone carving to produce printing blocks in soapstone. They also developed their own stencil printing techniques using seal skin cutouts and shaving brushes as ink applicators. The seal skin was rapidly replaced by wax paper and oiled cardboard, as the skins were too valuable as furs and also would not lie flat; however, these stencil prints still bear the inscription of being 'seal skin prints.' The group launched their first exhibit in 1959 at the Shakespeare Festival in Stratford, Ontario. From its success, Houston was able to secure funding to study woodblock printing in Japan under master Un'ichi Hiratsuka. He brought his refined knowledge back to the Inuit community in Cape Dorset, who quickly developed it to reproduce their own works of art on Japanese papers. Other print cooperatives soon followed: the Povungnituk printing cooperative, the Holman print cooperative, and the Sanavik cooperative were all established in the early 1960s. Each print cooperative had their own style and chop marks to denote their works. For example, the Povungnituk cooperative did not highly polish their stones, which resulted in grains and cracks in the printed images. They also did not carve away the exterior of the stone. Both attributes allow the stone to speak in the final image. Self-sufficiency was an important aspect of the Inuit print cooperatives, and once established, government assistance was only accepted in the form of surplus buildings for

work space and support for marketing and promotion. In 1961, James Houston established the Canadian Eskimo Arts Committee (CEAC). Their goal was to prevent the market from being flooded by fakes, ensure the quality of the art to protect the artist's reputations, and avoid exploitation by art dealers. A group of 12 appointed artists, curators, and art experts reviewed and approved sketches and drawings for printing. Print runs were limited to 50, and the committee facilitated distribution and exhibition of the works. These prints are all denoted by the blind-stamped Inuktitut syllabic spelling of *Namatuk*, meaning "Genuine," within a circle.

The movement continued to grow with cooperatives appearing in Pangnirtung, Clyde River, and a second at Cape Dorset in the 1970s. Copper plate engraving and lithography on high-quality Canadian-made papers had been rapidly incorporated into the repertoire of techniques. By the 1990s, more than 8000 images had been produced by more than 400 Inuit artists. The CEAC was replaced by the Inuit Art Foundation in 1989, and by 1994 most of its members were Inuit artists. As time passed, more and more artists adopted westernized techniques and began to work independently. Presently, most of the print cooperatives have vanished, leaving the original one in Kinngait (Cape Dorset) as the only regularly active shop.

Ubbink states that from the beginning, the style of the Inuit prints reflected the culture and perspectives of the people making them. Their images encompass heritage, values, history, spirituality, aspirations, and lived experiences. Some print cooperatives produced work that was descriptive in nature, whereas others depicted historical and mythical narrative. Early critics deemed the work primitive and accused it of commercializing a romanticized version of the culture; however, in reality, the artists were doing what every artist does: expressing and interpreting their childhood, family stories, and worldview. Ubbink makes the point that "primitivity" lies within the interpretation of the work through a western European spatial conceptual lens. She shows examples where Inuit artists purposefully use two dimensionality to create clear, concise descriptions that create narrative. Size and negative areas are used to connote distance, whereas the flow and juxtaposition of the figures create the story. She notes that the use of color gradation and multiplicity are employed to create movement. Creases and wrinkles in the paper created prior to printing reflect the rough tundra landscape, and the use of clean untouched expanses of white represent the vastness of the snow-covered land. Understanding these intentions of the artist and the materials they are working with, Ubbink says, is vitally important to designing a thoughtful and successful conservation treatment.

In Ubbink's experience treating these types of prints, she has noticed several trends. Many have voids and cracks in the printing ink that are artifacts of stone printing, not to be mistaken for damage or loss. The Japanese papers used for

stone cut printing are prone to foxing due to impurities in the papermaking process, as well as creasing and wrinkling. Many of the prints were framed with acidic materials and without UV-filtering glazing, resulting in discoloration, both local and overall. From Ubbink's perspective, the decision of how far to take the conservation treatment involves the original intent of the artwork in the context of being art and not a historical object. To best reduce creases and wrinkles, she has found that aqueous treatment and flattening is most effective as opposed to humidification and flattening. Ubbink finds that bathing with calcium hydroxide or calcium bicarbonate is often necessary to neutralize acidic products of deterioration introduced by framing and housing materials. Careful attention to the blind stamps and print chops during this process is required. Removing the appearance of foxing and light damage is imperative to restoring and preserving the artist's original aesthetic and intent. Ubbink finds that bleaching treatments are the only successful option. She often opts for sodium or calcium hypochlorite for this step with thorough neutralization and rinsing being paramount to the success of this treatment. The use of chlorine test strips informs the treatment progress, ensuring the removal of the oxidizing chemical. She finds that sodium borohydride treatments are too risky in terms of blistering the paper and that sun bleaching is not viable due to the length of time needed for treatment to be successful in achieving the level of restoration required. In her experience, foxing is tenacious and not always receptive to hydrogen peroxide, citric acids, or ammonium acetate. The thin nature of the Japanese paper and its excellent strength facilitates the success of hypochlorite treatment. Her goal for all treatments is always to strike a balance between aesthetically reversing the foxing and light damage while introducing as little damage to the paper fibers as possible. She concludes her talk by underlining that the reversal of the damage on these prints is essential to restoring the original intent of the artists. By doing so, she maintains that we best respect the vision and artistic practice of the peoples who made these pieces.

Past the Tree Line and Into the Snow: Inuit Print Making and Conservation

CHRISTINA TAYLOR

ASSOCIATE PAPER CONSERVATOR AT THE STRAUS
CENTER FOR CONSERVATION AND TECHNICAL STUDIES
AT THE HARVARD ART MUSEUMS

Taylor spoke about two distinct topics concerning printmaking during her presentation. First, she explains and describes the creation of a Louis Delsarte color offset photolithograph: *Unity*. Following that, she presents the process behind a series of videos she created to demonstrate various printmaking techniques.

Harvard Art Museums acquired more than 80 works by various artists (*Unity* included) in 2018 from Brandywine

Workshop and Archives as part of a larger initiative to place satellite collections in university art museums around the United States. The works span the history of the workshop from the early 1970s to today and also includes working proofs by some of the artists for future study. Brandywine Workshop and Archives was founded in Philadelphia in 1972 by Allan Edmunds. Its intent was to provide a creative environment for artists from diverse backgrounds to create cutting-edge prints. There is a heavy focus on collaboration and experimentation between master printers and artists with the goal of pushing the technical boundaries of printmaking. Louis Delsarte was a Brooklyn born painter and muralist who grew up in New York City. His influences include jazz, opera, musicals, and the blues, and he was influenced by the Harlem Renaissance, African American history, and world cultures. *Unity* is the first print that Delsarte ever made, and he did so by working with master printers at Brandywine to help facilitate his vision into a finished product. It is a color offset photolithograph that was printed in 1995. Taylor had the opportunity to visit Brandywine and interview Edmunds in 2018 as part of the Straus Center's artist interview program. These interviews focus on the materials and processes used to make specific works of art, and Edmunds was able to relay incredible information about many of the artists and their artworks through recollections of working with them. In 2022, Edmunds visited the Straus on the occasion of an exhibition celebrating the recently acquired Brandywine prints. At that point, Taylor had the opportunity to speak to Edmunds more specifically about Delsarte and his working methods.

In addition to the *Unity* print, the Straus also acquired 12 related color separations. Color separations are drawings made on plastic sheets used to create the final print. Typically, artists do not retain color separations after a print is complete, as they are often seen as a means to an end. However, for a conservator interested in the process, they are an excellent opportunity to learn about Delsarte's technique. Like almost all forms of color printmaking, the need to separate individual colors before printing is paramount. Each layer of color is printed individually on top of each other to build up the final image. Taylor explained that because the color separations are photographically exposed to the printing plates, it is the opacity (or the light blocking/transmitting ability) of the drawing material on the plastic sheets that translates to the tonal quality of the final image. The denser the media on the color separation is, the darker the printed passage will be. If less dense media like an ink wash or gradated pattern is used in the color separation, that will translate to a lighter passage in the final print. Taylor showed examples of this in detailed areas of the color separations. She also pointed out the different ways that Delsarte achieved this in his process: layering graphite in areas, pressing firmly and working quickly, using a fine point pen to use hatching, cross hatching, and stippling techniques, and the addition of collaged elements like bright

orange PVC strips. She showed examples of where Delsarte uses reductive techniques like selectively wiping ink away with a cloth or paper towels and areas where he uses a fine blade or tool to scrape thin frenetic lines. She highlighted the fact that above all, Louis Delsarte loved to draw. Each color separation is a drawing in itself, full of varied technique that results in expression.

Taylor then showed the audience a mock-up that she made when the Harvard Art Museums acquired the print to illustrate and clarify how the color separations really work. She explained how the drawing on the color separation was exposed to a photolithographic plate and developed to create a replication of the drawing onto the print plate. Then, this plate was inked and printed to produce the final print. She noted that while most printing plates need to be drawn in reverse, these photolithographs are offset printed, so they get reversed twice, meaning the orientation of the drawing and the print are the same. Taylor pointed out that while color separations are often photographic in nature, they do not need to be, as shown by these very separations. The "photo" portion of the label photolithographic process comes from the plate exposure process, not the creation of the image itself. And while photolithographs are often printed offset, especially in a commercial setting, this is not mandatory. The plate exposed from the color separations could also be printed directly on a more traditional lithographic press.

Once Delsarte exposed his color separations, they were printed in 12 individual colors to build up the final print. Taylor approximated the colors of each layer based on the printing notations seen on each color separation and comparing them to the final print. Taylor showed details of the color separation and how they relate to the final print. In doing this, she drew attention to a discrepancy between what was a purple color separation layer and the final printed image. There are elements that do not correspond between the color separation and the final image, indicating that this color separation was not used to create *Unity*. Although it will never be known why or how this occurred, it is one more example of what one can learn by looking closely at the process.

Similar to how Taylor created a mock-up to illustrate Delsarte's process, she also created a series of four videos demonstrating printmaking techniques seen in other prints in the Harvard Art Museums' collection. This was a project that began during the pandemic, blossoming out of a study of relief aquatint prints by Dan Flavin. During the lockdown, the museum was reaching out for digital content, and as Taylor had access to a home printmaking studio, she took the opportunity to film her recreation of the relief aquatint process that she was carrying out to aid her own research. The demonstration video was a success, so she made a second video describing the color woodcut process using Ernst Ludwig Kirchner as an example. This was eventually

linked to a free downloadable coloring book developed by the Museums. The final two videos were used as related programming for exhibitions and featured prints by Edvard Munch and Pablo Picasso. Taylor was surprised that these videos were as successful as they were and wanted to share some takeaways from the project. First, the setup was “low-tech.” Taylor used a phone on a tripod and used the iMovie software that is included on Apple products to edit her videos. In consultation with the Harvard Art Museums’ digital content manager, they decided that “low-tech” might be more approachable to the public than highly edited and produced videos. Her second takeaway was that making these videos is extremely time intensive. Between planning, shooting, and editing, she estimates that each video took about two to three weeks to produce. She advises to have a clear and concise message, which resonated with her viewers. Taylor is pleased with how the videos turned out and is very excited that they are reaching a wider audience than she anticipated, including teachers as well as professionals in both the museum and printmaking worlds. She ended by sharing that they were also successful because she enjoys teaching and printmaking, and sharing what you love makes the process worthwhile.

Louis Delsarte's Color Separation Mylars: Drawings for a Print and Printmaking Demonstration Videos

DISCUSSION SUMMARY

The discussion portion of the session consisted of several audience members offering comments, asking follow-up questions, and sharing their own experiences with the subjects the speakers presented.

For questions directed toward Bertalan, the topics covered mostly the quality of the papers and the relationship between artist and printer in the studio. Bertalan spoke a little about the trend in Europe to domestically produce papers to eliminate the need to import papers. The rise in popularity of lithography catalyzed this trend, as traditional handmade papers did not suit the printing process. As European papermakers were trying to match the quality of the Chinese papers, there was variation in quality of the products, with some being downright terrible. She was asked how the poor quality of these papers informs her decisions about conservation treatment, to which she responded that in most scenarios, the best thing to do is to not touch them due to their inherent vices. Proper housing is a more effective intervention. Following that discussion, an audience member asked who had the last say between artist and printer in the 19th-century French system, to which Bertalan replied that often it was the printer who had the last say, especially the master printer. She also noted that in the technical manuals, the printers refer to artists who have nothing to do with who we would refer to as an artist, but rather an in-house technician who we would probably classify as a printer.

The questions for Ubbink spanned the topics of conservation treatment techniques and artist methods. An audience member asked about her use of sodium hypochlorite for bleaching and whether she had seen any reversion in color. Ubbink noted that she has been using the technique for many years and is familiar with the reversion issue in general, but has never seen anything she has treated come back with reversion. She attributes this to her thorough rinsing steps that are corroborated with the use of chlorine test strips to make sure all the chlorine is gone from the wash water. She stated that often several rinse baths are needed to effectively eliminate the presence of chlorine. Another conservator asked if she has ever seen any damage to the paper as a result of printing with stone and whether she has had to line any prints as a result of that type of damage. Ubbink shared that she has not observed that particular type of damage, as the paper is laid upon the stone to print and is a gentle process. She has very rarely lined an Inuit print: only when the tears were so extensive that lining was deemed necessary. When queried about the source of the printing ink, Ubbink mentioned that while they were using commercially produced ink to make the prints, she did not have information on where it was imported from. Ubbink was also asked whether she knew how the Inuit printers achieved the variation in tone seen in many of the stone prints. She answered that the Inuit printers applied the ink directly to the stone using stippling brushes, originally shaving brushes. If observed closely, each print is slightly different, which is a result of this technique, almost a monotype. She also shared that the artists seemed to give the printers a lot of leeway when printing the image, a reflection of the cooperative attitude of the shops.

In response to Taylor’s topic, conservators wanted to know where to find her videos and whether she will continue to produce them. Taylor answered by saying that while the return to the office and the fact that her presses are no longer in her home studio has definitely slowed her momentum, she does plan on creating more videos. The demand for the videos is there, and she looks forward to making more in the future. The videos can be found on YouTube by searching within the general search bar or finding the Harvard Art Museums’ channel.

In addition to specific questions for the speakers, there were two topics in particular that generated internal discussion. The first was contact sharing among the audience regarding specific museums and collections that have Inuit prints and people who are working on their research. The other was a discussion between all attendees on various flattening and drying techniques. Conservators stood up and offered suggestions for effective drying of thin papers, including in a sandwich between felts and Gore-Tex membrane, the use of Pellon, *karibari* boards (and gatorboard as an alternative for *karibari* boards), and the use of a vacuum suction table. Other

audience members offered helpful reminders about the presence of optical brighteners in new materials and encouraged the use of UV to check for them, whereas another pointed to the recent conservation literature about the presence of optical brighteners in TekWipe.

The discussion session closed out with a question to each participant regarding how they found their presentation topics. Bertalan and Ubbink mentioned that the exposure to their subject areas came through their private practices, whereas Taylor mentioned that hers comes from a background in printmaking. All three speakers shared an obvious passion for their topic, which came across during their thoughtful presentations and their enthusiastic engagement with the audience.

ACKNOWLEDGMENTS

The Art on Paper Discussion Group co-chairs would like to thank the presenters for volunteering to share their topic with

the attendees, and they would like to thank the attendees for such a successful and engaging discussion session. Heartfelt thanks also go out to BPG Program Chair Morgan Browning and Assistant Program Chair Amy Hughes for their assistance in organizing the session.

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Library and Archives Conservation Discussion Group 2023

Library and Archives Conservation Workflow through a DEI Lens: Before, During, and After Treatment

INTRODUCTION

The Library and Archives Discussion Group (LACDG) co-chairs held a virtual session of short presentations and a panel discussion during the 2023 AIC-LACDG on Tuesday, June 6, 2023. This session occurred after the AIC 51st Annual Meeting 2023 as an interactive Zoom meeting, discussing how library and archives conservation best practices for documentation are not neutral. LACDG co-chairs asked presenting colleagues to consider and discuss conservation workflow issues using a DEI lens, broadly in the context of the mission of our work and from a day-to-day conservation workflow level. Participants were asked to consider the voice of conservators in institutional, grant, exhibition, or digitization priorities, understanding that these are sensitive issues requiring a well-constructed discussion space for colleagues to share their ideas and speak freely.

SUMMARY OF PRESENTATIONS

EPHRANETTE BROWN

LET'S START IN THE MIDDLE: CRAFTING A PROTOCOL FOR TREATING SENSITIVE MATERIALS

Ephranette Brown presented on behalf of Emory Libraries Conservation, discussing their department conversations about treating sensitive or difficult material. The presentation explored past treatments of sensitive materials, highlighting the outcomes of treatments without a laboratory policy or protocol and the ideas generated from those engagements. The process of developing a protocol for treating sensitive materials was explored, including comparing library policies and examining the benefits of crafting a flexible treatment protocol. Brown began by recounting three occurrences

Summaries of discussion groups at the Book and Paper Group Session, AIC's 51st Annual Meeting, May 16–20, 2023

when staff encountered sensitive materials and how those occurrences were handled or resolved.

1. A pregnant conservation technician was tasked with identifying damage within Health Science journals containing graphic medical imagery that triggered a nausea response. This project was passed to another laboratory employee to identify and flag damage. The affected staff member was then able to go directly to those pages without being exposed to the imagery more than necessary.
2. A conservator was tasked with stabilizing and repairing photographs that depicted lynching. This staff member compartmentalized their discomfort and accelerated the workflow to handle the photographs as quickly as possible.
3. A conservator was tasked with washing a pair of Klan robes. They completed the washing with discomfort, later creating a presentation around treating difficult materials in the workplace and igniting the discussion to have a policy or protocol within the laboratory.

Once these examples were given, Brown discussed her efforts to find examples inside and outside of Emory Libraries, illustrating how occurrences of treating sensitive materials were addressed. Those examples included a Duke Libraries zine for student employees who process special collections. This zine outlines self-care when encountering upsetting material, empowering the individual to speak up and alert a supervisor of any discomfort or distress.

As another example, Rose Library at Emory University has a training document that contains an entire section on *emotional care*. The language acknowledges that interacting with difficult or harmful materials is an unfortunate part of the job and suggests coping strategies.

The final example was the Homosaurus international LGBTQ+ linked data vocabulary. Emory Libraries Cataloging staff are currently exploring the best ways to use this controlled vocabulary to represent LGBTQ+ topics

more equitably. This includes applying language originating from relevant communities and increasing the visibility of library materials by using terms that will help people identify relevant materials more easily.

By learning from past occurrences and referring to established examples of policies surrounding the treatment of difficult materials, Brown stated that the Emory Libraries Conservation Lab recognized that an *empathy-based approach* is best. She further explained how this approach might be realized.

1. Create a statement that acknowledges how treatment of sensitive material may be difficult. Allow staff to decide how the material affects them and emphasize that not everyone will have the same response. Remain open minded about what might be difficult for others.
2. Being aware of any pre-established trigger warnings and adequately notify those who will be involved with the project. Adjust the workflows as necessary. For example, work in pairs. Divide the treatment schedule for multiple people to complete the necessary tasks. Allow for flexibility. Ask if affected staff members would like to proceed with item treatment or not.
3. Provide any needed resources for support. At Emory, contact the Faculty Staff Assistance Program (FSAP) and Counseling and Psychological Services (CAPS) for student employees.

Brown ended her presentation by stating that this is just the beginning for the Emory Libraries Conservation staff, who will collaborate and consider the following when they have a formal protocol in place:

1. In a deadline-driven field, how do we make space for getting the work done without inflicting trauma?
2. How do we responsibly manage project deadlines and workflows while maintaining a professional and collaborative environment of addressing difficulties?

Finally, Brown expressed the importance of staying open and approachable to staff and students. Remain engaged with everyone who treats sensitive or difficult collection material. Pay especially close attention to how staff members are feeling during this work.

Ephranette Brown, Head of Library Conservation, presented on behalf of Emory Libraries Conservation staff—Emory University

ELIZABETH RYAN, AISHA WAHAB, ANN MYERS
PARALLELS: CATALOGERS + CONSERVATORS +
ANTI-RACIST WORK

Elizabeth Ryan, Aisha Wahab, and Ann Myers presented on behalf of the Stanford Libraries Conservation Services Department and the Department of Special Collections and

University Archives. The presentation described guidelines developed by the Anti-Racist Description Discussion Group at Stanford Libraries and ideas generated from those engagements. Libraries and archives are institutions with diverse expertise and knowledge, providing unique opportunities for learning, collaboration, and parallel work with colleagues outside of our conservation units. At Stanford University, the Anti-Racist Description Discussion Group—a university-wide grassroots effort of catalogers and other library and non library staff—works to develop antiracist descriptive practices. Their work inspired and continues to inspire the conservation department to learn and develop parallel initiatives and possible collaborative efforts between catalogers and conservators.

The Anti-Racist Description Discussion Group at Stanford Libraries has developed a best practice guide that includes guidelines for putting content warnings in catalog records or archival finding aids when the material described includes content that may be harmful. Discussions with conservators have brought up ideas of flagging initial conservation requests in addition to a verbal heads-up. Due to the intensive level at which conservators often engage with content, potentially harmful material might be discovered during treatment. Conservators can request that materials in question be reviewed by catalogers to determine the inclusion of an appropriate catalog warning.

The similar work of both rare book catalogers and conservators in their recording of detailed codex and material descriptions provides opportunities for collaboration in antiracist descriptive practices. Conservators can develop parallel work: evaluating used language in our field, initiating discussion and change, and eliminating harmful language in our descriptive practices.

Additionally, catalogers and conservators can share preferred terminology and resources with one another. Although catalogers must follow prescriptive rules for writing catalog records, alternative controlled vocabularies, as well as liberal use of notes field, provide opportunities for preferred terminology and additional context. Conservators can offer terminology for notes fields, particularly with materials where existing controlled vocabularies are lacking, such as in the case of Islamicate materials. In the same manner, catalogers may have subject specialist codicology expertise whose knowledge could be helpful for filling in conservation gaps and moving terminology in a more antiracist direction in conservation documentation practices.

Both catalog descriptions and conservation treatments are informed by their historical and cultural contexts. Such contexts can influence the level of detail in a catalog record or specific choices made in conservation work. Institutional considerations such as the circumstances of acquisition and intended use also inform decision making. Recognizing our own cultural context as individuals is also important in both

cataloging and conservation. This can affect our interpretation of objects from other cultures and how much expertise we bring to that interpretation.

In conservation, visual aspects of books and documents can be altered in treatment, and the conservators' cultural and aesthetic biases influence treatment expectations and outcomes. Recent conservation work on Islamicate materials at Stanford Libraries provides an example of how historical, cultural, and institutional contexts inform treatment. Our conservation department's research about these structures, related cultural practices, and curatorial consultations have informed treatment decisions about opening angles, repair materials, and sewing structures, among others. We have shared the resources we have consulted about descriptive terminology for Islamicate structures with our rare book catalogers, providing them with additional aids for physical description in corresponding catalog records.

Libraries and archives are amazing institutions with so much expertise and knowledge that we can learn from and share with. It is our hope that these ideas might inspire our colleagues to find opportunities for similar work or collaboration with library colleagues.

Elizabeth Ryan and Aisha Wahab represent the Stanford Libraries Conservation Services Department, and Ann Myers represents the Department of Special Collections and University Archives at Stanford University in California.

DISCUSSION

After both presentations, the session moderators took questions from the attendees and monitored comments from the virtual chat box. These questions, as well as the responses by the presenters, are paraphrased next.

Chela Metzger: Would someone like to discuss their ideas or experience with content warnings in their catalog? What does it entail? How is that working for you? How do you avoid mistakes, if we want to use that word?

Ann Myers: I can say a little bit about the content warnings in Stanford's catalog, which is a recent practice for us at Stanford. So we're still kind of feeling things out, but it's a very collaborative practice. Folks will bring material to our discussion group, and if there is consensus in the group that it warrants a content warning, we will consult with the curators who acquired the material.

There is not always agreement on whether there should be a content warning or not. Sometimes we strike a compromise and may not label something as a content warning because that carries a certain weight. We will put a note field in the record that describes what the content is—that someone might be triggered by it or find it objectionable. It is clear, particularly if an item does not present itself obviously as

something that might be problematic. We want to make sure that the context is given somewhere in the catalog record and that users are informed. By the same token, we give at least verbal heads-up to the conservation staff as we pass material along to them—for example, if the work has a large racial epithet written across three pages or something.

We also have a feedback function in our catalog so that folks can submit feedback if they feel that something should have a content warning or, on the other hand, to ask why something has a content warning. We've not yet received any feedback, but I think one thing that's important in doing this work is to recognize and acknowledge that we will make mistakes. We need to be prepared to respond to those mistakes with humility and to be willing to work to correct them.

We are at-the-ready for feedback, and our guidelines are not fixed. These are living documents that will continue to be revised as we refine our practices and as standards shift.

Elise Calvi: I'm at Indiana University, and just yesterday, a bunch of Indiana librarians were meeting and talking about this subject. One of the people there is a cataloger who does public services and works the front line. She talked about how a lot of the supplied titles and terminology describing their archival collections, field recordings, and all sorts of ethnographic materials were done a long time ago. So whenever she can, she'll take the opportunity to talk to patrons (during their reference interaction, while they are looking at catalog records, or reviewing the materials) to just say that they would like to know how the material strikes them, if a person from the culture is being represented, and which terminology they would prefer that we use.

The previous speaker talked about collaboration and engaging patrons. In conservation, I think that we can't always do that because we're a few steps removed. The more that we can work with our frontline people to do those sorts of things, the better it is for everyone down the line.

Marieka Kaye: I'm at the University of Michigan, and something that concerns me is that some terms are hard to replace. I've been hearing that they are not words that we should use anymore, like recto and verso. That is a very Eurocentric way of looking at things. I think about this all the time. What can I say instead of those terms as new publications come out and still use them everywhere? I'm wondering if anyone has started thinking about any alternatives for that.

Chela Metzger: That's a great, great question, and I think it is one that will take collaboration across the so-called rare book world to move that into new directions.

Elizabeth Ryan: Yeah, we've struggled with that. In literature describing East Asian materials, we have seen the terms *upper and lower board* used instead of recto and verso. So we tried

to make that an option in our treatment documentation. I appreciate the dilemma, yes.

Mariëka Kaye: I've been thinking about it all the time ever since she brought that up. It's a very good thing to think about, but I still haven't found a thing that everyone in the whole profession would have to agree on. It's impossible.

Aisha Wahab: Yeah, when we were trying to figure this out during our terminology project at Stanford, we flagged a lot of problematic terms, but we were really struggling with what our alternatives would be and tried to come up with suggestions. There were debates among us. What do we agree upon, and do we need consensus within the profession?

It is a little different from cataloging. We don't have the Library of Congress to determine what our language should be. So we have flexibility, but it's important for one conservator to understand the language that another conservator is using. You kind of want some type of agreement, so I think our next step, maybe, is to start putting out suggestions, I guess. I don't know exactly how it gets done without a Library of Congress-type system to make that final call on what's being used. Until then, we still have terms like *recto*, and our department isn't sure what to do, either.

Some of the thoughts in our department were that we'll finally decide on terminology when we come up with new documentation forms. We haven't gotten to that point yet.

Michelle Smith: Thanks, everybody, for these great talks. It's also nice to see so many former colleagues. but my question is for Ephranette. Thanks for the awesome talk, and I'll try to make this coherent. I was thinking about what you were saying about trying to figure out how to help staff be able to become comfortable with what they're working on to get the work done. Maybe they're not comfortable but find someone who is, or extend the timelines to help and that sort of thing.

For myself, and maybe for others, sometimes the thing that makes me the most uncomfortable is not knowing how the material is going to get used and presented to other people, especially if it was sent to me with no context and no acknowledgment of the kind of content that was there. Maybe if the content's brought up, there's not really much concern. Taking more time with the object isn't going to make me feel differently about that. I guess it can depend on where you work, and if there's trust with your colleagues, that they kind of know what the deal is.

I would love to hear you talk more about it. Have you had experiences like that at Emory, or what is that relationship like? Maybe a back-and-forth with catalogers and curators?

Ephranette Brown: That's a great point. I will say I can only speak for myself. I will not speak for my team members. I

can only say for myself that this may not be healthy. I tend to disassociate. I do tend to look at things as the item itself, instead of the content, only because I feel like that is my coping mechanism and has been safer for me.

So I don't ask the question of what is happening once it leaves my bench. I can see how that is a great pathway to deal with anything difficult or sensitive. If I'm understanding your question or your point, putting everything all in context so that you're able to engage with it differently. Yes, that is my answer, and I do try to empower my team members to dialogue personally with the curator or the archivists so they can provide that context. That is important. If they prefer to do that through me instead, they can.

Sometimes it's not for me to decide, but I think you can get into the weeds of the collecting areas and larger administrative bodies when a couple of steps are removed from things like donor relations, collecting policies, and things of that nature. That's not to say that there isn't room for collaboration with those departments to provide context.

Ann Myers: If I could piggyback there, a lot of what you said in your talk really resonated with me and what we're trying to do in our department as well. I think that is why we have this question that comes up in our description group. Our curatorial team has been very supportive in encouraging us whenever we ask questions like "Why did we acquire this item?"

Speaking for myself, I had a collection of artists' books that I had to catalog, and I found it physically nauseating to engage with them. It helped to distance part of myself emotionally from them, which came from understanding the context of why we had acquired them and what this artist was trying to say through the work. So okay, I find the images objectionable, but I can understand the artistic intent behind them yet develop my personal practice for getting through the material and doing the work while also taking care of myself mentally.

Elizabeth Ryan: Knowing more about the context of materials is so helpful. Our conservation department presented examples of our work in Stanford Libraries' online exhibit platform, and a curator provided context for one of the collection items we chose to include, the *Negro Motorist Green Book*, a document about travel from the Jim Crow era. We collaborated with this curator, who gave some nice context for it, describing how it fits into our collections and how it's used in teaching and research. So I think it really complemented the treatment presentation to have this contextual part of the material explained.

Aisha Wahab: I think, similarly to Anne reaching out to get context about what she is working on, I think sometimes, as conservators, we are a little hesitant to have that kind of voice to question what we're working on or at least to be able to get

more information on it. I think we're still kind of coming out of this idea of staying neutral with our work, and we're slowly moving in a different direction.

One treatment came in that I was quite uncomfortable working on, and I was hesitant. I didn't know whether I should bring it up, but I finally did. I wanted a little more context, and once I did get more context, it really did help me do the treatment and feel comfortable with what I was working on and spending time on.

I think there was that initial hesitation—that I'm like a doctor. I don't care what this patient has done. I just must fix it. I think we are a little different than doctors, and we have the time to ask about the context of the treatments that we're working on. I think it's okay to do so.

Laura McCann: Thank you. And thanks to everyone who presented it. At NYU, we have a lot of collections that can be really challenging, and engaging with the curators who are bringing them in has been very helpful. Over the years, we've managed in Preservation to be a little bit more involved in not necessarily the decision making but being present at the table. So I attend the processing priority meetings. That's done yearly and gives us a sense of what's coming through, and then I'm able to talk to everybody in the department about it. We try to get somebody at that table to know what's coming from Acquisitions. In our area of rare books, while there is some challenging material, it's a little slower collection, and we tend to just be told immediately what to expect.

My question to the group is that we had a couple of discussions, particularly around erotica and porn, and one of the big discussion points that came up—when we brought archivists, curators, conservators, and preservationists together—was this idea of being able to *opt out*. Some people feel like we can have this policy. You can say “I don't want to work on this” or “I want to work on it like this.” Within the power dynamics of organizations, do people here really, truly feel that we can shepherd that? Some people may feel more comfortable. Some people may feel less so. What was sometimes happening was with very challenging content, supervisors tended to just step in and say “I'll do this.” What does that mean for them? Do they end up taking on this larger burden?

And then the question, particularly with video and audio, when you rip a video, you're watching it in real time, and sometimes you don't know what's going to be on that, which can be very intense. It could also be a transgressive film, which we collect as well. If we outsourced that, maybe it's sort of a cop-out to ask somebody else to do that in our community. How do we handle this idea of opting out? We're still struggling with it. So I just want to bring it up in case anybody is further along than us. I don't know if there are any folks who are involved in video and audio preservation because it's that visual thing of real time.

Elizabeth Ryan: Before this meeting, I was talking with the person who works with audio and video preservation here at Stanford. He was really interested in this topic, but he also said when people decide they're going to engage with video material, they know they must be prepared for anything.

Chela Metzger: At UCLA, audiovisual is in the same big room as paper-based conservation, so we all discuss these topics of being able to opt out, which is an interesting approach. Can we say “I don't want to deal with this”? Can I hand it off to my colleagues? What if nobody wants to deal with it? Do we outsource? We've had those same discussions.

We have a lot of primary source AV material that deals with very sensitive medical issues, and people have encountered things in real time that are very complicated and difficult. It is hard, and I know our AV folks try to take care of each other through this. I think the empathetic kind of lab culture that has been so eloquently discussed here is very important. Outsourcing requires quality control. There absolutely is no way to avoid encountering things with quality control, and the real-time aspect of AV work is very tough. It may be interesting to have a conversation with the AIC Electronic Media group on this.

Ann Myers: Just another thought to throw in. I think, Laura, you alluded to this a little bit in your question about when it's a small shop and there's not a lot of people. You can't necessarily pass it off, and you can't necessarily say, well, I'm not going to do this. Then, it's not going to get done, and that's not always an option. I think in our organizations, maybe we can build in, as you said, options for stepping away from the work. To say “I'm not prepared to work on this right now, but I know it's waiting there. I can mentally prepare.”

From an organization's administration, it is important to have decision-making permission for setting a longer timeline, as Ephranette discussed in her presentation. As you mentioned about opting in or opting out, it makes a difference to have the mental space to make this decision. Opting out may make it easier to work on something, and then it doesn't feel like you're being forced to do it. You're making a choice on the logistics of how you make it happen, which is complicated. I think it's worthwhile to have those discussions and set those expectations.

Fletcher Durant: I'm just thinking here about the complicated history of maybe not so much conservation but the complicated history of collection care at my organization, at UF, and other organizations where I think people oftentimes avoid working or collecting certain material, traditionally African American materials or LGBTQ+ materials, from whatever the opposite of an ethic of care is.

It's a complicated topic, obviously, and I'm trying to work through it on the fly here but thinking about making sure

there's space for staff to step away from undertaking some work individually while also ensuring that those objects are still worked on eventually. Then, generosity of an ethic of care where we don't press people to work on the emotionally challenging materials isn't then co-opted to avoid working on whole subsets of materials based on bias or bigotry and just making sure that we're continuing to work on diverse materials, even if some staff members may have personal objections, and recognizing the gray area of that challenging space.

Laura McCann: Thanks, Fletcher. That's a good point, as our institutions are coming at this from different places. One more thing that I wanted to bring up within this context is that we are talking a lot about doing this in our emergency planning—like trauma-informed care. So this is part of it, especially when you are talking about particularly very violent or explicit imagery, whether it's print or not, is when you're coming at things from trauma-informed care, and you don't know what's on it. That's some of the challenge, but certainly they will be preserved.

Chela Metzger: I see a note from Brenda Bernier about her work in a Holocaust memorial museum and at NARA. I think the protocols that those kinds of organizations have set in place are good guidelines for all our workplaces. Thank you, Brenda, and I really appreciated all the engaged conversation here; there have been a lot of amazing thoughts here. We can continue all these discussions through the Book and Paper Group, through AIC, ALA, and SAA. One of the things that's been occurring to me is the beautiful structure and specificity of rare book cataloging and how it is quite different from a finding aid in archives. For example, UCLA has a large archive where any one box doesn't have an item-level description on it, and people can encounter Lord knows what.

Cataloging everything as it comes in, but what about amending as it's viewed, amended by what our users see in the library? Do we have an avenue for them to walk up to the reading room staff and go "Whoa! Do you know what I just saw in here? Do you know what's in here?" Chances are, with a large archival collection, we simply don't know everything that's in it.

I want to keep bringing up the controlled vocabulary too, but the size of archival collections and the diversity of content and format in these collections is unruly, shall we say.

Ann Myers: I appreciate you bringing that up, and I'll add that I know at Stanford with those large collections, sometimes different formats get processed at different times. The papers might get processed initially, but then the AV format doesn't get processed until much later. There could be multiple iterations of the finding aid and the associated catalog

record, and I think our archivists all acknowledge that. No, we didn't see every object in those large collections, so we absolutely welcome feedback, whether it's a conservator who discovers something in a box, or a user and student in the reading room, or a researcher scholar. That's a good point, and even with the rare book records, I don't read every page of everything. We might miss something that somebody finds problematic.

Chela Metzger: I was thinking about Michelle Smith's earlier question about a feeling of discomfort in terms of not knowing how something is going to be used. For example, we've been lending out a lot of material recently to the American Academy for Motion Picture Arts and Sciences Museum. They have been doing various exhibits on African-American film history, Black film, and we have an important collection from a very early African-American film company, the Lincoln Film Company. Along with those archival materials, they wanted to exhibit a first edition of *Uncle Tom's Cabin*, and it's a very important book in American history. It's a very important part of Civil War history.

I reached out to the curator and said, "Can you tell me what your didactics are going to be for this?" I just asked because I felt comfortable, but I didn't feel like it was my position to say "You can't have the book." If I was very uncomfortable with what they said about the book, I probably would have gone to the head of special collections and said, "Did you know what this is, what their didactics are?" I just think you should know, but I agree that my conservation education didn't necessarily prepare me for that level of concern, potentially for how something is going to get used. Of course, that's a very big-ticket item, and I felt it was important for me to ask that question. I don't always ask those questions, and I have not always felt I had a voice to ask those questions.

Aisha Wahab: I have a question for the group, if I may. Ephranette talked about emotional and mental well-being, and I'm curious if any other labs have some suggested guidelines for emotional and mental well-being, including when working with difficult collections. I'm curious if any conservation labs have also taken on something like that.

Chela Metzger: I'll just quickly say that we have it in our onboarding materials, but I wouldn't know if it's exactly a guideline. I'm glad to hear that Duke has done this for student colleagues' onboarding materials. We haven't had as many student colleagues recently, but we probably will have more in the future. We do have it officially in our departmental onboarding materials about the difficulties of working with some of this material, options for self-care, who to talk to on campus, resources for emotional issues that may come up, and things like that.

Ann Myers: So I can say that the best practices document that you mentioned does not have the weight of policy. These are guidelines put together by a grassroots group of staff members, so it has the weight of suggestion and, hopefully, inspiration. Within my cataloging unit, I have had these verbal conversations with staff members, and they have read that section of the best practices document which is like what Chela was mentioning, of acknowledging that you might come across material that you find difficult, encouraging self-care practices, and referring to the faculty and staff help center on campus, if needed. So that's there as a resource, but we have not gotten to the point of making this departmental policy or officially part of onboarding, yet I think that those would be important next steps.

Chela Metzger: One of the things that occurs to me here, for those of us in institutions, is that we have certain kinds of challenges and certain kinds of resources. If you encounter things in private practice that you find disturbing, I don't know what resources you have. I feel very fortunate in the resources I have on campus and with my colleagues on campus or even just colleagues around town to discuss these things with, and not everybody is in an institution that offers as much care, potentially. If you're in private practice, we haven't really provided these kinds of emotional resources through AIC, or at least I'm not aware of them.

Aisha Wahab: I think that was kind of what I was asking about, to see if a lab or something had already compiled some resources, any practices, or guidelines that maybe can be shared among other labs, through AIC, or the BPG Wiki.

Chela Metzger: We have had a great opportunity here to share ideas, and this can continue in a variety of ways. I look forward to all the creative ways we can support each other with these questions. Thanks to everybody for sharing and participating in this great discussion.

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