

Archives Conservation Discussion Group 2009: Conservation and Preservation Approaches for Stabilizing Large-Scale Collections

ABSTRACT

The Archives Conservation Discussion Group 2009 focused on conservation and preservation approaches for stabilizing large-scale collections. When confronted with large-scale collections, the conservator must devise a plan that can be executed in the most efficient manner, making the best use of staff time and resources. Often large-scale treatments must be carried out in a timely fashion, such as in response to an influx of mold or when a particular collection is in high demand. Conservators may adapt a triage approach to the treatment of these materials to save on time and materials. Five conservators were invited to present four examples of large-scale efforts as applied to books, photographs, and paper-based materials. Presentations and a subsequent discussion included the use of adhesive-coated repair materials, large-scale mold remediation, the assessment and stabilization of a large collection of archival scrapbooks, and lessons learned from large-scale photograph preservation projects.

INTRODUCTION

Complementary to the Library Collections Conservation Discussion Group (LCCDG) theme, "LCCDG 2.0—New Directions," which highlighted advances in single-item treatment techniques, the Archives Conservation Discussion Group (ACDG) looked at treatment advances applied more broadly to large-scale collections. Conservators working with archival materials are familiar with collections that exist on a massive scale. When confronted with large-scale collections, the conservator must devise a plan that can be executed in the

This open discussion took place on May 21, 2009, during the AIC 37th Annual Meeting, Los Angeles, CA. The moderators organized the panelists, led the discussion, and recorded notes. Readers are reminded that the moderators do not necessarily endorse all the comments recorded and that although every effort was made to record proceedings accurately, further evaluation or research is advised before putting treatment observations into practice.

most efficient manner, making the best use of staff time and resources. Often large-scale treatments must be carried out in a timely fashion, such as in response to an influx of mold or when a particular collection is in high demand. Conservators may adapt a triage approach to the treatment of these materials to save on time and materials. The ACDG co-chairs invited a group of conservators to prepare presentations on a wide range of large-scale efforts as applied to books, photographs, and paper-based materials. The 2009 AIC Book and Paper Group ACDG met in Los Angeles on Thursday, May 21, to share and discuss these efforts, which included the use of adhesive-coated repair materials, large scale mold remediation, the assessment and stabilization of a large collection of archival scrapbooks, and lessons learned from large scale photograph preservation projects. In addition to their presentations, participants provided handouts with further information and resources and ended with a question and answer session. A summary of each presentation and the resulting discussion is provided below.

PRISCILLA ANDERSON AND SARAH REIDELL

PRE-COATED REPAIRS PART 2: PREPARATION AND APPLICATION

Adding to Priscilla Anderson's discussion of the pros and cons of pre-coated repair materials during the LCCDG session, Sarah Reidell focused on preparation and application during the ACDG session. Using her own experiences as well as information collected through a survey of conservation colleagues, Reidell presented the main categories of pre-coated materials, which include those reactivated with water, solvents, and heat. Reidell began her presentation with a discussion of incorporating the use of purchased, ready-made, heat-set materials and custom toning them with acrylics. Illustrations and instructions were provided showing several methods of toning the tissue by brush application as well as mention of the use of the airbrush demonstrated by Elissa O'Loughlin in an AIC-sponsored master inpainting class. Some conservators choose to add a cellulose ether such as Klucel G or methyl cellulose with a few drops of ethanol or other solvent to aid in

dispersion. Reidell stressed that in order to prevent disruption of the thin adhesive layer on ready-made, heat-set tissues the acrylics should not be applied too thickly.

Next, Reidell explained the preparation of pre-coated tissues in the conservation lab. These materials can be prepared in advance of treatment and are fast and easy to use, which is an important factor with large, batched treatments. While Reidell focused on pre-coating papers, conservators also use alternative materials such as goldbeater's skin, fish swim bladders, parchment, Tyvek, Mylar, and Hollytex. When a conservator wishes to reactivate with water, or an ethanol-water mixture, he or she will often use a wheat starch paste and methyl cellulose mix. Other adhesives used in preparation of water-reactivated materials include a 2–5% methyl cellulose, called the "Wagner method" (Wagner 1996), sodium carboxymethyl cellulose, called the "Baker method" (Baker 2007), and isinglass. All of these adhesives require the same application technique, which involves: 1) brushing out the adhesive onto the surface of a sheet of Mylar, 2) evenly draping the repair paper at the farthest edge of the adhesive-coated Mylar, while gradually dropping the paper down, and 3) allowing capillary action to wick the paper onto the adhesive.

The second category was solvent-reactivated materials, starting with the use of Klucel G. Extremely thin repair papers—such as RK-00 and Berlin tissue pre-coated with Klucel G—make nearly transparent mends and are often used in the treatment of iron-gall ink deterioration and other water-sensitive media. Klucel G is applied through a screen to prevent the delicate repair papers from tearing. Frothing rather than traditional brush application of the adhesive mixture ensures that it is properly delivered into the interstices of the screen.

Reidell explained the preparation of pre-coated materials reactivated with solvents and/or heat. Examples included varieties of Lascaux as well as Rhoplex AC 73 and 234, used for what is known as the "Modified" Library of Congress heat-set tissue. These varieties of adhesives are often prepared on silicone-release polyester because they tend to stick to regular polyester films. Lascaux 498 HV can be used unthinned to coat thicker papers by applying the adhesive onto a silicone-release polyester sheet through a silkscreen using a squeegee. After misting the surface, the repair material is dropped onto the adhesive. The Lascaux 498 HV can also be thinned with deionized water. The final adhesive presented was BEVA 371 film (1 ml), which can be heat-sealed directly to the repair paper. There is also a BEVA 371 solution that can be sprayed from an aerosol or applied by brush. This adhesive is especially noted for its use in the repair of parchment and water-repellant oily or greasy paper artifacts. In two video clips Anderson clearly demonstrated the preparation of Klucel G and Lascaux pre-coated repair materials.

After explaining preparation in detail, Reidell described the application of these materials. Large scale treatments are

made more efficient by using a scalpel to precut repairs into thin strips a few millimeters wide. Feathered edges release uncoated fibers, ruining the mend. The repair strips are reactivated directly on Mylar, a black-tile for better visibility, a Plexiglas square, or the back of the hand. A common problem encountered by conservators is the appearance of sparkling on the repair surface, which can be avoided by preparing the sheet on a matte polyester film, such as lightly sanded Mylar. Giving the material time to fully gel and reactivate and preparation in a damp-pack or small humidity chamber also assist in preventing sparkling. An additional video clip showing Anderson reactivating a paper pre-coated with Klucel G illustrated the technique used for solvent-set repairs. The repair material is allowed to gel completely before application and the mend is set in place with tweezers and dried under blotters and weights, or with the heat of the conservator's hand.

To round out her discussion, Reidell provided the following tips based on comments and common problems encountered by surveyed conservators:

- Removing the material from a polyester film carrier when it is 99% dry can prevent the carrier from sticking to the paper. Additionally, one can avoid tears by peeling the carrier away from the paper rather than the paper from the carrier. Conservators also use silicone-coated boards and baking sheets as release layers.
- Readily available at hardware stores, wide wallpaper brushes, foam brushes, and paint rollers are useful alternatives to expensive traditional paste brushes, and they are easier to maintain and may not wick up as much adhesive.
- While linings must be custom-sized, pre-coated materials used for mends can be prepared in manageable sizes. Smaller sheets lead to fewer wrinkles, are easier to handle, and help conserve expensive repair papers such as Berlin tissue, which is likely to only be used for small repairs anyhow.
- In order to make use of space when producing these materials for large scale projects, the use of a retractable clothesline for air-drying can be beneficial.
- Dropping the papers onto the surface of the adhesive reduces the typical plastic appearance of the repair material.
- Thin adhesive layers are the most successful. Many people find that their initial tests tend to be too thick so it is important to experiment with the adhesive layer.
- Sometimes a carrier may not be used at all. "Naked" cast adhesive films are sometimes used for readhering delaminations and stepped tears.
- To be thrifty with materials and save on preparation time, many conservators save the margins and offcuts of linings or traditional paste mends and reuse them as "accidental remoistenable" pre-coated repair papers.
- Different properties of solvents can be used to the conservator's advantage, such as using isopropanol, which

evaporates more slowly and allows for more time to set the repair in place. Some conservators mentioned anecdotally that acetone results in more transparent mends because it penetrates the repair substrate.

During the subsequent discussion, questions arose regarding whether there were heat sensitive dyes and if different colorants influence the way the mends react. An audience member suggested the toning of resins. Reidell also pointed out that it is possible to accidentally rinse out the adhesive when toning or reactivating very thin repair papers. An additional audience member commented on successfully using a very thin solution of Klucel G to reactivate the repair material. Comments were made regarding a mixture of Lascaux 360 with 498 HV, which may prevent blocking, and it was mentioned that toned BEVA can be molded into a loss in leather bindings as a fill material, similar to techniques used in the conservation of leather objects. In regard to batched repairs for leather bindings, time is saved by preparing toned tissue in three different colors ahead of time, completing all the repairs followed by fine-tuning the tone, and ending with a final waxing of all completed repairs. Ultimately dwell time is one of the most important factors in successful repairs.

In conclusion, Reidell emphasized that pre-coated repair papers are versatile and lend well to customization. While some time and energy is required in preparation, the ease of use leads to speed and efficiency, especially in the context of large-scale batched treatments. Anderson and Reidell provided a handout that includes a list of adhesives and their preparation guidelines and reactivation methods, which can be found in the write-up for the 2009 LCCDG session (McCann and Haun 2010).

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MELISSA STRAW

LARGE-SCALE MOLD REMEDIATION AT A SPECIAL COLLECTIONS LIBRARY

In the second presentation, Melissa Straw explained how more than three hundred thousand special collections items were affected by a mold outbreak at the University of Illinois at Urbana-Champaign (UIUC) in late 2007. The Rare Book and Manuscript Library (RBML), located within the Main Library building at the UIUC, holds approximately three hundred thousand volumes and over 7,100 linear feet of manuscript and archival material. The collection comprises audiovisual media in a wide range of formats, as well as three-

dimensional items such as framed artwork and artifacts. From September 2007 to May 2008 the staff of the RBML along with the Preservation and Conservation Departments, Library Administration, and Campus Facilities and Services worked closely to devise and implement a mold remediation plan to clean all items found within the collection.

After university mycologists positively identified the mold as a species of *Aspergillus*, library conservators undertook an item-level assessment of one of the two floors. This assessment required sixty hours to complete but provided invaluable information used throughout the course of the project and confirmed that the mold was widespread throughout the storage vault. A map of the concentration of mold in the storage areas was created showing that the areas with the highest concentration of mold spores were found clustered around HVAC outflow vents. The assessment also confirmed that the mold was growing on a full range of materials from the oldest incunabulum to the most contemporary editions in the collection. To date no identifiable cause for the mold outbreak has been determined, although environmental factors and storage conditions are contributing factors.

After the scope of the outbreak was determined, University Administration and the Conservation Department prepared time frames and budgets for both in-house and outsourced cleaning of the collections. Cost and time estimates, liability issues, and impact on patron services were carefully considered and compared. University Administration decided to contract Blackmon-Mooring Steamatic Catastrophe (BMS CAT), to complete the cleaning of the collection materials, storage areas, and HVAC system during a ten-week period in early spring 2008. Cleaning of the RBML's collections and spaces was completed in May 2008 and certain University departments are still involved in projects related to this large-scale operation.

BMS CAT mobilized a small work crew to begin a week-long cleaning of the three air-handling units. Along with cleaning each unit, they cleaned all associated supply and return vents before beginning on the collection materials. The air handling units were cleaned using a HEPA vacuum on all associated surfaces. Ducts and vents were fogged using chlorine dioxide.

After the HVAC systems were cleaned, the ceilings, floors, and walls of the library were vacuumed and cleaned with Microban, an anti-microbial agent. Areas of positive and negative pressure were established in the collections areas through the use of plastic sheeting, tape, zippers, and microtrap air filtration units. Positive airflow encouraged contaminated air away from an area, and in this case it kept the mold away from areas already cleaned. Numerous zippered chambers were created in order to maintain positive and negative pressure while continuing to use cleaning equipment in different areas.

Additional personnel from BMS CAT assisted with the collection-wide cleaning of over three hundred thousand items

after the air handlers and vents were cleaned. Approximately 2% of the books showed signs of mold growth but the entire collection was treated to save on the time it would take to examine each item individually. Additionally, all the books in the storage vault were soiled even without the presence of mold due to a lack of regular housekeeping procedures.

Conservation staff, along with help from the RBML staff, created a manual detailing care and handling procedures for the various formats found within the library, as well as site-specific policies such as enclosure retention and pamphlet binders. This manual contained a photo identification guide for easy reference. In addition to this manual, BMS CAT employees completed a training session from conservation staff prior to handling the collections.

Using a top-down approach, ten teams of two individuals worked at various points within one range of compact shelving. Each team was equipped with at least one book truck, a variable speed Nilfisk vacuum, an air filtration unit, book-ends, string, scissors, etc. In areas without compact shelving within the RBML, the shelves were physically removed from the support structure, vacuumed, and wiped down with Microban. Collection materials were also vacuumed and then wiped with a dry microfiber cloth and replaced onto the cart. Finally, the cleaned books were returned to the cleaned and dry shelf. Once an area was entirely clean, the range of compact shelving was draped with plastic sheeting to prevent re-contamination.

The wide range of materials housed in the RBML presented considerable challenges for both library staff and the contracted BMS CAT cleaning crews. Warping vellum, decaying leather, fragile book jackets, and the many layers within framed art required a great deal of pre-planning by UIUC staff, sensitive handling during the cleaning process by BMS CAT crews, and follow-up vacuuming by conservation staff on items deemed too fragile for others to handle safely. Areas of loose materials such as broadsheets or newspapers were treated in stacks and BMS CAT vacuumed the exterior of each stack. The RBML also has approximately 150 framed items. Each of these were sent to the conservation lab and taken apart for vacuuming. The various layers of each framed piece were photographed and vacuumed with a variable speed Nilfisk vacuum within a bio-safety cabinet. Cleaning took place ten hours a day for ten weeks. Ten conservation and RBML staff members spent at least five hours per week in the storage vault overseeing proper care and handling.

The compact shelving posed a structural challenge. There was not enough space between the ranges to have more than one aisle open at a time so one range of compact shelving held up to three crews at a time. The teams paced themselves, coordinating the completion of each section. Additionally, the compact shelving had a six-inch gap between the wall and the built-in components. Cleaning of the wall and backside

of the shelving system was completed through access panels. An additional problem arose due to a lack of electrical outlets. Power supplies were brought in with help from the Library Facilities Department, ensuring that no circuit breakers were tripped due to a greater demand on the power supply.

The contracted cleaning ended in May 2008, and since then the RBML and Conservation Department have undertaken projects related to large-scale tasks. Thousands of items in the collection were already temporarily stabilized with either binder's board and/or string ties. During cleaning for mold remediation, all existing ties were discarded and the stabilization boards were vacuumed. Certain items were flagged for re-tying and the old string ties were replaced with archival quality string. Supplemental binder's board was ordered for items requiring support and stabilization as identified during mold remediation. Additionally, particular types of pamphlet binders were found to be more prone to mold bloom than others within the collection. These pamphlet binders were generally older in nature and had a green cloth spine. Over 6,000 identified pamphlet binders were discarded. Currently the string-tying is complete but the replacement of the pamphlet binders is still in progress.

During the discussion that followed, an audience member asked whether the crew wore respirators during mold remediation. Straw explained that the use of respirators is part of UIUC's policy and the crew was given the option to use them. Ultimately, the crew of BMS CAT chose not to work with respirators, although they took protective measures such as wearing gloves. An additional audience member asked whether the items treated for mold were flagged. Straw responded that they were, using foil-backed labels. In the reading room, these items may require gloves and the book supports will be cleaned more often. If they are deemed unsafe for use they are removed from the collection, therefore there are no special restrictions on use in general. It was mentioned that Harvard used to place flags in items treated for mold but they were removed as requested by the General Council because they implied that all other books are clean, which may not be the case in such large collections. There is a downloadable guideline for managing mold contamination on the Harvard Library Preservation website at: http://preserve.harvard.edu/guidelines/mold_contamination.pdf.

In conclusion, Straw stressed that the cleaning process was very efficient and could not have been achieved in the same time span by an in-house cleaning crew alone. Although the entire process was harrowing and exhausting, the cleaning was done as quickly and efficiently as possible and it was a successful collaboration for conservation and RBML staff. Straw stressed that although an outside vendor was contracted to clean the entire collection, the amount of time and energy UIUC staff put into this project remained high. Straw was happy to report that a new HVAC system will soon be installed to prevent future outbreaks. A handout

In the following discussion, a question arose regarding whether preservation photocopies were considered in place of treatment for the scrapbooks. Teper explained that it was definitely an option and may be considered for parts of the remaining untreated collections when deemed necessary and would be addressed in the future.

Teper shared the following time and cost observations:

- Development of guidelines: 30 hours total
- Protective enclosures for 148 items at 1 hour per scrapbook = 148 hours total
- Reattachment/repair for 112 items at 2.5 hours per scrapbook = 280 hours total
- Total estimated project time = 458 hours

A handout providing further details on this project was prepared by Teper and is currently available on the Book and Paper Group website at http://206.180.235.133/sg/bpg/exec/meetings/current_year/ACDG_2009_Teper.pdf.

Jennifer Hain Teper, Head, Department of Conservation, University of Illinois at Urbana-Champaign

BRENDA BERNIER

LESSONS LEARNED FROM LARGE-SCALE PHOTOGRAPH PRESERVATION PROJECTS AT THE NATIONAL ARCHIVES AND RECORDS ADMINISTRATION AND HARVARD UNIVERSITY LIBRARY

Brenda Bernier knows from experience what it takes to complete large-scale preservation projects. As the former senior photograph conservator at the National Archives and Records Administration (NARA), and now as the Paul M. and Harriet L. Weissman Senior Photograph Conservator at Harvard University Library, Bernier has been involved in numerous large-scale preservation projects, with collections containing tens of thousands to hundreds of thousands of photographs. Looking back at some of these projects, Bernier presented eight general lessons for planning and executing large survey, treatment, and rehousing efforts. She also offered a few specific tips for saving time, money, space, and aching backs.

Bernier began the presentation with her definition of large-scale projects. A small project includes one to one hundred items, a medium project is one hundred to ten thousand items, and a large project is ten thousand to a million items. With each of the lessons presented, Bernier gave examples and provided images from real-life projects. The scope of what she has dealt with in her career is impressive, and although the vast number of items she has been responsible for is daunting, the prospect of realistically accomplishing the

preservation of such monumental collections is achievable with a little organization and creativity.

The following is a list of lessons learned:

Lesson 1 – Dedicate time each week

By reserving specific time in your schedule for the project it is easier to see progress and you are less likely to succumb to project fatigue. Bernier advised the audience not to lose sight of the project goals, and to consider the individual situation. Will the project require a large amount of supplies? Is it more cost effective to buy large quantities of materials, or if storage is inadequate are you better served by ordering supplies on an as needed basis?

Bernier provided an example of ten to twenty thousand distorted, mounted photographs belonging to the U.S. Navy Records at NARA, which were slumped and unsupported in flip-top document boxes. Before they could be properly rehoused, the photos had to be flattened. Therefore the photos were efficiently humidified in stacks of damp blotter and Tyvek. The following tips were provided:

- Tyvek is an excellent substitute for Gore-tex when humidifying objects.
- After initial humidification, a fine mist from a commercial air-pump garden sprayer was used to wet the verso of the photos. Since large batches of photographs were humidified at once, the garden sprayer was more efficient and comfortable than traditional Dahlia or pump sprayers (Bernier 2005).
- A stainless steel rolling kitchen cart with multiple shelves is useful for keeping large pre-cut blotters and other supplies handy and mobile.

Lesson 2 – Large custom orders can save time, space, and money

To deal with moving 53,000 cubic feet of film in off-site storage for NARA, Bernier ordered custom boxes. Using these ready-made boxes to pack for moving resulted in efficient use of space as well as time. Polyester sleeves on a roll were also a useful custom order for large-scale treatments. Panorama fold-lock sleeves on a roll from Atlantic Protective Pouches have been used for large-scale rehousing at both NARA and Harvard University.

Lesson 3 – Do a mock-up to estimate time

When confronted with the rehousing of nearly 95,000 lantern slides at the Fine Arts Library of Harvard University, it was helpful to do a mock-up before estimating the time and cost of the project. The first month of work produced a little less than the estimate, but the project was ultimately completed ahead of schedule.

Lesson 4 – Be comfortable

The 25,000 to 40,000 Angus McBean glass plate negatives in the Harvard Theatre Collection are stored in a room with virtually no appropriate space for completing conservation work. Considering the scope of the project, it was not feasible to move the negatives to another location to be re-housed. The expense of buying small but comfortable chairs and a table that fit easily in the narrow hallway was well worth the purchase price.

Lesson 5 – Adapt tools

Bernier gave a detailed account of using an inkjet copier to transcribe historical inscriptions onto new archival enclosures, eliminating transcription error and allowing for the preservation of original handwriting and penmanship. She provided a handout that was originally created with Andrea Youngfert, also of the Weissman Preservation Center at Harvard University, as a poster for the Society of American Archivists 2008 Research Forum. The handout can be currently viewed on the Book and Paper Group webpage at: http://aic.stanford.edu/sg/bpg/exec/meetings/current_year/bpg_prog.html. In summary, Bernier and Youngfert describe the use of an Epson Stylus CX6000 3-in-1 inkjet copier to efficiently copy 1,700 historical inscriptions from acidic original negative enclosures onto archival storage envelopes. The copy system saved on time and resources and can be used with enclosures ranging in size from 4x5 to 8x10 and even 4-flaps. Pigment-based inks can be water-soluble but tests by Bernier indicated that in the event of a flood, the ink does not bleed through the enclosure and remains legible. One other caution is that the density cannot be manually adjusted on many newer inkjet copiers, which is a drawback when copying light pencil inscriptions. Density manipulation can be achieved through the use of colored filters found at stage-lighting suppliers, although this also darkens the background resulting in a darker tone overall.

Lesson 6 – Know your materials

Non-traditional photographs can stump the conservator when it is not clear what materials were used and how they might deteriorate. Bernier encountered this with a collection of three-dimensional experimental vectographs from the Polaroid Corporate Collection at Harvard's Baker Library Historical Collections. With large collections, it is worth the time spent on researching the technical aspects of the material so the long-term preservation can be well planned from the start of the project.

Lesson 7 – Get organized

Keeping track of the preservation needs of Harvard's eight million photographs can be a tremendous challenge. Bernier discussed the creation of an Access database called COMPASS—Comprehensive Preservation Assessment. The system was

designed in-house to track the preservation needs of special collections in over 50 Harvard repositories. The needs can be prioritized and linked to projects, which are also tracked in terms of tasks, materials, labor, timeframe, and costs. Even without such a sophisticated system, Bernier emphasized the importance of using simple spreadsheets or other electronic tracking to keep control of project data.

Lesson 8 – Don't panic!

Addressing the preservation needs of large collections can seem daunting, even to experienced conservators. However, it is important to remember that the lessons Bernier presented are adaptable and scalable to projects of many types and sizes. Bernier's experiences give true meaning to the phrase "large-scale." In conclusion, organization and thorough preparation well in advance are the keys to staying calm and collected while achieving large goals.

A handout providing further details on this project was prepared by Bernier and is currently available on the Book and Paper Group website at http://206.180.235.133/sg/bpg/exec/meetings/current_year/ACDG_2009_Bernier.pdf.

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