LAURA MCCANN AND WERNER HAUN
DISCUSSION GROUP CO-CHAIRS

Library Collections Conservation Discussion Group 2009: Library Collections Conservation 2.0—New Directions. New and/or Adaptive Materials, Methods and Technologies Used in the Conservation Treatment and Housing of Library Collections

ABSTRACT

The Library Collections Conservation Discussion Group (LCCDG) of the Book and Paper Group was pleased to present "Library Collections Conservation 2.0—New Directions. New and/or Adaptive Materials, Methods and Technologies Used in the Conservation Treatment and Housing of Library Collections" at the 2009 AIC Annual Meeting held in Los Angeles, California. The theme for the session was inspired by the AIC annual meeting theme, "Conservation 2.0—New Directions." The session co-chairs, Laura McCann and Werner Haun, recruited speakers to present on practical applications of new and adaptive materials and methods in the conservation of library collections. Following the presentations, the co-chairs moderated a lively discussion period. Handouts were provided for each of the presentations and are published as figures.

PRESENTATIONS

SETH IRWIN AND RANDELL HEATH
COMPARISON OF TWO SOOT REMOVAL TECHNIQUES

Seth Irwin began the presentation by explaining the impetus of his project, comparing two soot removal techniques (fig. 1). In May 2006, a fire in the Sevier County Recorders Office in Richfield, Utah, caused soot damage to approximately three hundred ledgers. Randy Silverman, Preservation Librarian, Marriot Library, University of Utah, was called upon to assist in the recovery of these ledgers and he employed an experimental cleaning technique called "dry ice dusting" for removing the soot residue from the smoke-damaged ledger books. Visual observations suggested the technique was more effective than conventional surface cleaning with a rubber sponge. From this experience, there was interest in obtaining quantifiable analysis in order to consider dry ice dusting a viable option for treating smoke-damaged books. A project was conceived to compare dry ice dusting with rubber sponge cleaning, which is the more typical method, for removing soot residue.

Randell Heath, founder and president of Coldsweep, Inc., a company specializing in dry ice applications, described the "dry ice dusting" methods his company has used for soot removal. Dry ice dusting has been used in a number of applications in the recovery of cultural heritage collections, including cleaning five hundred thousand soot damaged books in Göttingen Germany. Essentially, the dry ice dusting is a spray application of solid carbon dioxide using a high-efficiency particulate air (HEPA) filter vacuum to draw the released soot away. A stated advantage of dry ice is that it is non-abrasive to materials that are harder than dry ice.

Irwin continued the presentation by describing his study methodology and results. The research method compared the effectiveness of the dry ice dusting and the rubber sponge cleaning method by measuring residual soot remaining on cleaned book surfaces with colorimetry and surface abrasion using laser scan profilometry.

Of the two cleaning systems, Irwin found that dry ice dusting consistently excelled at preventing surface abrasion to the book covering materials and at removing the soot. In a few instances the rubber sponge did slightly better at removing residual soot, but with a significantly higher probability of causing surface abrasion—in some cases with only a minimal number of wipes. One conclusion arising from this study is the certainty that dry ice dusting, when carefully applied, is a viable option for soot removal from the exterior of bound library materials.

Seth Irwin, Master of Arts degree candidate, Queen's University, and Randell Heath, President/Founder Coldsweep Inc.

Randell Heath, President/Founder Coldsweep Inc.

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.

Seth Irwin
Candidate for Masters in Art Conservation,
Queen's University, Kingston, Ontario, Canada

Randy Silverman
Preservation Librarian
Marriot Library, University of Utah

A Comparison of Two Soot Removal Techniques:

"Dry Ice Dusting" and Rubber-based Chemical Sponges

Abstract:

Pressed by the exigency of a fire in the Sevier County Recorders Office (Richfield, Utah), in May, 2006, Randy Silverman employed an experimental cleaning technique called "Dry Ice Dusting" for removing soot residue from the surface of smoke-damaged ledger books. Visual observation suggested the technique was more effective than conventional surface wiping with rubber-based sponges but quantifiable analysis was impossible to consider at the time.

Accordingly a project was conceived to compare dry ice dusting with conventional rubber sponge cleaning for removing soot residue from the surface of smoke-damaged books. The study defined an experimental approach that standardized soot deposition on four types of bookbinding material (leather, fine and coarse cloth, and paper). The research compared the effectiveness of these two cleaning methods by measuring residual soot remaining on cleaned book surfaces with colourimetry, and surface abrasion using laser scan profilometry.

Conclusions:

Cleaning efficiency and abrasion using dry ice misting and rubber sponge cleaning were compared for soot removal from four types of bookbinding materials. Of the two cleaning systems, dry ice misting consistently excelled at preventing surface abrasion to the book covering materials and consistently cleaned very well. In a few instances the Gonzo® Wonder rubber sponge did slightly better at removing residual soot but with a significantly higher probability for causing surface abrasion, in some cases with a minimal number of wipes. One conclusion arising from this study is the certainty that dry ice dusting, when carefully applied, is less abrasive than traditional dry rubber sponge cleaning.

Clear characterizations of proper cleaning protocols for soot damaged books have yet to be proffered in the literature for either technique. As a result of this study it has been demonstrated that dry ice misting can be effectively used for cleaning in a non-abrasive manner if the nozzle is held approximately 18 inches from the book surface and the mist is played onto the object in a constantly moving motion. With the rubber sponge, thorough cleaning is achieved with approximately 20 passes over the soot-covered surface, with the caveat that complete cleaning is often accompanied by abrasion of friable surfaces. This was determined using the science of profilometery and colorimetry, where a link was observed between changes in colorimetric values and changes in surface topography. Finally, a standardized protocol for controlling the deposition of soot on different materials was established for conservation by relying on existing standards currently in use at the NRC Fire Research Program National Fire Laboratory in Almont, Ontario.

Fig. 1.

BRENNA CAMPBELL

THE REMOVAL OF EXCESS LEATHER DRESSING USING THE REYNOLDS HANDI-VAC: FIRST IMPRESSIONS

Brenna Campbell discussed her work with removing leather dressings from leather books at the Morgan Library and Museum (fig. 2). Dressings of various concoctions have been used to refurbish or condition leather books; however, over time these treatments have fallen out of favor because "dressed" books suffer from bloom, formation of waxy verdigris around metal furniture, unpleasant odor, and sticky residue on the leather.

Residual dressing can sometimes be reduced with solvents, but traditional methods of application, such as poulticing and swabbing, can be technically and aesthetically problematic. In order to develop new treatment options, an experimental method of introducing a controlled amount of solvent within a vacuum packet created using the Reynolds Handi-Vac system was tested. Samples of different leathers were treated with various dressings and the preliminary results evaluated. Moderate success was reported in reducing and removing the dressing from calf skins with oil stains, and it appeared to be less effective on goat skins with waxy dressings. Issues with this the system were addressed, including the difficulty in monitoring treatment progress. The presentation concluded with suggestions for other uses of the Reynolds Handi-vac, including controlled drying, packing books for moves, and disaster recovery.

Brenna Campbell, Kress Fellow in Rare Book Conservation, Thaw Conservation Center, The Morgan Library and Museum

RENATE MESMER AND ANNE HILLAM

THE USE OF RUBBER CEMENT FOR FACING LEATHER SPINES: A VIABLE OPTION?

Renate Mesmer introduced the background and development of using rubber cement as a temporary facing for degraded leather books (fig. 3). The technique was developed by Per Cullhed in 1996 to treat fire damaged books in the city library of Linköping, Sweden (Cullhed 2003). Approximately one hundred tight-back books were heavily fire damaged, rendering the spines brittle, inflexible, and prone to cracking and loss. Per Cullhed researched a facing method that would cause the least possible damage to the spines and also retain the tooling. After testing various methods, it was determined that the rubber cement technique added flexibility and visibility, as well as a weaker bond that allowed the facing to be easily removed mechanically rather than with solvents.

In the second half of the presentation Anne Hillam discussed and presented slides showing the steps involved in this technique. The process must be completed in two weeks or less to prevent the rubber cement from hardening. Some of the advantages of this technique are: it is flexibile, it uses no solvents, there is no tissue residue, and it is less damaging to the spine because of the minimal adhesive bond. Some potential disadvantages are the time constraints and the need for a wax release layer. Additionally, the presenters emphasized that they use this technique only in extreme cases where no other technique is viable, and that quantitative and qualitative testing is needed to determine its long term effects.

Renate Mesmer, Assistant Head of Conservation, Folger Shakespeare Library and Anne Hillam, Head of Conservation, Gladys Brooks Book and Paper Conservation Laboratory, New York Academy of Medicine

Anne Hillam, Head of Conservation, Gladys Brooks Book and Paper Conservation Laboratory, New York Academy of Medicine

PRISCILLA ANDERSON AND SARAH REIDELL

ADHESIVE-COATED REPAIR MATERIALS: PREPARATION AND USE

This was a joint presentation with the Archives Conservation Discussion Group (ACDG). Priscilla Anderson presented during LCCDG while Ms. Reidell gave her portion of the presentation during ACDG. Both presenters participated in the discussion period (fig. 4).

Priscilla Anderson began the presentation by defining pre-coated repairs as sheets of materials that have been coated with adhesive and then dried for later use. The adhesive is reactivated with liquids, solvents, or heat. Some of the advantages are that little or no moisture comes into contract with the original, the repairs are applied and dried quickly, and the conservator can customize the adhesive, repair sheet and color to match the needs of the original. Through surveying the profession she has found that pre-coated repairs are being used in libraries, archives, museums, regional conservation centers, and private practice to conserve both circulating library collections and special collections. The adhesive-coated repair materials are applied in batch treatments and in single-item treatments. The stated advantages for single item treatments are generally good reversibility and portability. In addition, the method is appropriate for easily friable and water-soluble or -activated media. It is also suitable when tide lines are likely, where cockling or dimensional instability is a concern, and for mold-damaged or brittle items. For batch treatments, the advantages are ease and speed of use. The disadvantages are that adhesion may be difficult, there is less feathering than traditional mends, and there may be concerns about aging and reversibility, and solvent-sensitive media/coloring.

The Reynolds® Handi-Vac™: First Impressions

What it is

The Reynolds® Handi-Vac™ was designed as an inexpensive alternative to home food sealing systems.

How it works

The item to be sealed is placed inside a zip-closure polyethylene bag, the bag is sealed, and the air is sucked out. Under optimal conditions, the seal can last months. In practice, it must be checked periodically.

Conservation Applications

- Removal of stains and residues from leather and paper
- Packing of wet books to delay mold growth
- Controlled drying
- Stabilization of damaged books for transport or storage
- On-site work
- Substitute for traditional vacuum packer

Advantages

- Inexpensive (~$10)
- Portable
- Battery powered (6 AA)
- Bags can be re-used a few times
- Sealing system doesn't use heat
- Can seal items of many shapes

Disadvantages

- Seal can fail over time, especially on re-used bags
- Bags must be bought from Reynolds®
- Large size bag can only accommodate books 9-10" high

Tips

- For short term use (solvent treatment, flattening), bags can be re-used
- For long term storage, a new bag should be used each time
- Pieces of thin board can be sandwiched on either side of book for added protection, or between boards and textblock
- Dry blotter can be used to dry wet materials
- Blotter dampened with water or a solvent can be used for humidification or stain reduction

Cautions

- Quality control on bags is spotty—must check seal periodically
- System is not designed to handle flowing liquid—blotters or other absorbent material must be used to contain any liquid
- The Handi-vac™ filter chamber is soluble in acetone

For More Information

Handi-Vac™ Website: http://www.reynoldspkg.com/reynoldskitchens/handi_vac/en/home.asp

Brenna Campbell
Samuel H. Kress Fellow in Rare Book Conservation
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The Morgan Library & Museum
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Fig. 2.

The Use of Rubber Cement for Facing Leather Spines: A Viable Option?

This technique was developed by Per Cullhed in 1996 to treat fire damaged books in the city library of Linköping, Sweden. Approximately 100 tight back books were heavily fire damaged, rendering the spines brittle, inflexible, prone to cracking and loss. A facing method was needed that would cause the least possible damage to the spines (Many had retained their tooling). Various techniques were tested, including Japanese paper, heat-set and Archibond tissue, all requiring solvents to activate the adhesive layer. Rubber cement was added as an alternative method. After testing, it was determined that the rubber cement technique added flexibility, visibility and a weaker bond that allowed the facing to be removed mechanically.

This technique has been used both at the Folger Shakespeare Library and at the New York Academy of Medicine for the removal of tight back spines that would otherwise be too difficult to lift. It has proved to be a successful alternative to more traditional facing methods. As more members of the conservation community try this technique, we would love to get feedback from your results. Scientific testing results would be especially welcome.

Cullhed, Per. ***Facing Leather: A Description of a Facing Method for Fire Damaged Tight Back Leather Bindings.*** Paper Restaurierung Vol 4 (2003) No. 4.

Sequence:

1- Apply a layer of Micro-crystaline wax on the spine. This both establishes a barrier between the leather and the rubber cement and as a release layer allowing for easy removal of the adhesive.
2- Using a brush, apply a layer of rubber cement.
3- Place plastic wrap on top of the rubber cement and press with your fingers to ensure full adhesion. Pay particular attention to the sides of raised cords. (When facing a spine with raised cords you need to apply individual panels of plastic wrap instead of one single piece).
4- Remove spine piece (or label) with knife, as you would when using more traditional facing methods.
5- Once faced spine is removed, use either a spatula or a Dremmel to remove flesh layer in order to achieve the desired thickness. The plastic wrap provides support and flexibility sufficient to allow the creation of a very thin spine piece.
6- Reattach spine (or label) to new spine and let dry completely.
7- Gently remove plastic wrap, working slowly from one end to the other. Some rubber cement will lift up during this process. When the plastic wrap has been removed, peel or roll off any remaining rubber cement – it should come away easily. It is important to carry out this process within a three or four day period so that the rubber cement does not completely dry; it needs to remain somewhat gummy in order to facilitate easy removal.

Anne Hillam
Head of Conservation
Gladys Brooks Book and Paper Conservation Laboratory
New York Academy of Medicine

Renate Mesmer
Assistant Head of Conservation
Werner Gundersheimer Conservation Laboratory
Folger Shakespeare Library

Fig. 3.

Adhesive Pre-Coated Repair Materials

Book and Paper Group, LCCDG and ACDG
Priscilla Anderson and Sarah Reidell
May 21, 2009

Thanks to our generous conservation colleagues who contributed their opinions and experience. Special thanks to Jan Paris, whose curiosity and encouragement got us started.

ADVANTAGES	Successfully treated originals
Low- or no-moisture: suitable for water-soluble and water-reactive media; avoid distortion + tide lines; avoid reactivating mold damage	Iron-gall ink; copper-based media (Islamic mss, verdigris); brittle paper; art on paper with water-soluble media; colored papers; historic textiles; mold damaged or weak papers; Chinese papers (rubbings, books); transparentized papers; copy press books; thin papers
Customizable: your choice of repair sheet; pre-coating makes it possible to use a very thin mending paper (can't be pasted out, too hard to handle in wet-floppy state); can get very transparent mends	Double-sided manuscripts and art on paper
Speed: quick application and drying time	Circulating collections, batch mending projects; stabilization for large-scale digital projects; photographs mounted on boards
Portable: few tools needed, very little mess	Traveling exhibits and loans, on-site treatment
Reversibility: easy short-term removal lends itself to temporary applications	Leather spines; bridge mends and facings
Custom toning: before coating, after coating, even after mending	Leather and parchment bindings
Compatible: repair is aesthetically or materially compatible with original	Parchment texts and bindings; original pressure sensitive tape; short-fibered paper, clay-coated paper

DISADVANTAGES	How to mitigate:
Strength or flexibility of the repair (some are too strong/inflexible, some are not strong enough)	Experiment with adhesive type, dilution, preparation method, and with repair sheet thickness; if having trouble sticking, gel up the adhesive layer in damp pack or chamber
Undesirable plastic or sparkly look	Gel up the adhesive layer completely during application; experiment with plastic sheet that you are preparing on (i.e., matte polyester drafting film rather than shiny polyester
Time & complication of pre-coating the repair material	Weigh it against time saved in application
Staining/tidelines are possible from in situ liquid application	Test application method on small area of original; avoid in situ application with originals likely to stain
No feathered edges	Pin tear; use a thinner repair sheet that will blend in
Inconsistent application of adhesive can make portions of the pre-coated sheet useless	Experiment with screening (window or silk-screens), different brushes; reconsider for other application use
Original has solvent sensitivity	Stick with cellulose ethers and wheat starch paste because long-term reversibility of acrylics isn't proven
Repair more dimensionally stable than original	In storage conditions with dramatic RH fluctuations, stick with thinner repairs made with cellulose ethers, which discourage biological attack
Adhesive aging characteristics and long-term reversibility questionable	See forthcoming CCI research

Fig. 4.

Priscilla Anderson, Collections Conservator, Baker Library Historical Collections, Harvard Business School, and Sarah Reidell, Associate Conservator for Books and Paper, New York Public Library

Sarah Reidell, Associate Conservator for Books and Paper, New York Public Library

DISCUSSION SESSION

Immediately following the final presentation, the co-chairs opened the discussion period for comments and questions/answers. Questions and comments from the audience were directed to all the speakers and are summarized by presentation.

COMPARISON OF TWO SOOT REMOVAL TECHNIQUES

There was a great interest in dry ice dusting applications in the preservation of library collections. One participant asked if dry ice dusting can be used for cleaning mold. Heath described residential application of mold remediation using dry ice dusting, but he has not applied the method in treating mold-infected library collections to date. Additional questions addressed the practicality of dry ice dusting, specifically the time and set-up requirements, cost-effectiveness, and the possible side effects caused by condensation. The speakers reported that: an average of five minutes was required to effectively clean soot from a volume using dry-ice dusting (20–30 psi), the set-up can be in-situ or the books can be sent to the vendor, and there was no observed evidence of condensation on volumes after dry-ice dusting. Significant reduction of odor was reported after dry ice dusting, which was also observed in the testing with the rubber sponge. Cost effectiveness was considered on a case-by-case basis dependent upon the scale of the project.

THE REMOVAL OF EXCESS LEATHER DRESSING USING THE REYNOLDS HANDI-VAC: FIRST IMPRESSIONS

A question regarding the type and age of the leathers used in the testing of the leather dressing removal (modern leathers) led to a discussion about modern versus historical leathers. It was suggested that the results of the leather dressing removals may be more successful on historical leather than modern leathers as the quality of modern leather is relatively poor and further testing with historic leather would be worthwhile.

There was interest from the audience in the Reynolds Handi-Vac and its various applications in library collections conservation. Campbell described other projects using the device or similar devices. These including the controlled drying of the recently discovered "Bog book," and using it for moving large collections and a range of anoxic treatments.

THE USE OF RUBBER CEMENT FOR FACING LEATHER SPINES: A VIABLE OPTION?

Questions directed to Anne Hillam and Renate Mesmer about the use of rubber cement as a facing material focused on technique and materials. The speakers have only used the technique on calf bindings to date and have not observed any darkening of the treated spines. A discussion took place on preparation activities necessary before using the facing, consolidation, and the application of the microcrystalline wax release layer. Mesmer reported that she used the consolidant Klucel G in either an ethanol or acetone solution. Hillam described her method for applying the very thin layer of microcrystalline wax using a cotton pad. Methods for removing the rubber cement were described by the speakers as using fingertips and rubber crepe erasers. The importance of fully drying the wax release layer before application of the rubber cement was emphasized. A participant inquired about alternatives to microcrystalline wax. One suggestion of cyclododecane was rejected, because of concerns of brittleness. Speakers encouraged further research into the method, especially research employing natural aging and instrumental analysis.

ADHESIVE-COATED REPAIR MATERIALS: PREPARATION AND USE

Priscilla Anderson and Sarah Reidell encouraged participants to attend the Archives Conservation Discussion Group for further information about the preparation of adhesive-coated repair materials. A question was raised about failed mends and mends that were very shiny. The speakers emphasized the need to completely swell the adhesive before application as a repair material. Shininess is caused by non-adhered adhesive. A discussion took place on the methods used to cut the repair material. Scalpels, Olfa knives, awls, pin tools, and the Crayola Cutter were reported as tools used for shaping repairs.

ACKNOWLEDGMENTS

The co-chairs of LCCDG wish to express their gratitude to speakers Priscilla Anderson, Brenna Campbell, Randell Heath, Anne Hillam, Seth Irwin, Renate Mesmer, and Sarah Reidell for their presentations and handouts. Their willingness to share their experience with new and adaptive materials and methods is greatly appreciated. The co-chairs also thank Angela Andres for recording the session.

REFERENCE

Cullhed, Per. 2003. Facing leather: A description of a facing method for fire damaged tight back leather bindings. Paper Restaurierung 4 (4): 29–34.

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