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Archives Conservators Discussion Group 2002: Humidification and Flattening

Notes and bibliography: NORA LOCKSHIN

ABSTRACT

The article is a summary of the Archives Conservators Discussion Group at the 30th Annual Meeting of the American Institute for Conservation in Miami, June 10, 2002. The general topic was humidification and flattening of archival materials on paper. The discussion included short presentations on recent research and on treatment of oversize objects and large volumes of objects. Participants contributed tips and techniques. A short list of references and resources is appended.

The Archives Conservators Discussion Group met at 30th Annual Meeting of the American Institute for Conservation in Miami, June 10, 2002, to discuss humidification and flattening of archival materials and to discuss how specific challenges have been met by conservators. The session, chaired by Kristen St. John and Kathy Ludwig (who was unable to attend), covered recent research, new large volume methods, and an open, broad discussion with tips and techniques presented by group members. Topics addressed included: performing work on a mass scale; identifying and dealing with a wide variety of materials within projects; and deciding when and why and how to treat—and dealing with the repercussions of those choices on access, repair, and staff time. A list of related references have been researched and are provided at the end of this review.

This open discussion took place on June 10, 2002, during the AIC 30th Annual Meeting, June 6–11, 2002, Miami, Florida. The moderators organized and 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.

The session began with a presentation of Kathy Ludwig's research on passive humidification. Her research included four experiments:

1. Rate of moisture gain in identical chambers (to see how quickly and to what RH identical chambers reached with different introduction of moisture).
2. Rate of moisture gain in damp packs (to see how quickly and to what RH damp packs reached and to observe the performance of Tyvek or layers of Reemay as substitute for Gore-Tex).
3. Rate of uptake of moisture in paper over time (to observe total moisture uptake of a single "archival" machine-made buffered paper in a saturated chamber).
4. Rate of uptake of moisture in *different* papers over time (to observe total moisture uptake of three different papers in a saturated chamber: wood pulp newsprint, 25% rag lignin-free machine-made buffered, and 100% rag).

Discussion on these experiments included a comment that Ludwig's results appeared to match those on equilibrium moisture content of paper discussed by Nyuksha (1979). The difference between Gore-Tex (vapor-permeable membrane of expanded polytetrafluoroethylene (ePTFE)), Tyvek spun-bonded olefin (vapor-permeable membrane of high density polyethylene (HDPE) fiber), and Reemay (spun-bonded polyester) were discussed. Ludwig's and others' independent results indicate that substituting multiple layers of Reemay for the discontinued felt-type Gore-Tex is a possibility as well as a cost-saving measure for some. No information was available on the comparative evenness of humidification throughout objects undergoing treatment using these different textiles.

Jerry Shiner, consultant for Keepsafe Systems, discussed a chamber at the National Archives of Ontario which was modified with a Micro Climate Generator (MCG8) to create a large humidification system with tight controls. This led to a broader discussion of high-tech humidification systems, their origins, and recent advances

in the technology of microclimate chambers since initial research was presented at the "Black Box" symposium (Royal Ontario Museum 1979). Products have evolved to feature a variety of options for humidifying, dehumidifying, and controlling air in treatment units, exhibition cases and large volume storage units. Keepsafe Systems expects to have the MCG8 (capable of humidifying 700-800 sq. ft., for laboratory and small case applications) on the market in 2002 and will also be offering consultation and custom design services. Discussion included comments on the practicality of being able to tightly control humidity levels for sensitive objects (e.g. moldy or with soluble media, parchments, and/or dehumidifying in minor disaster situations).

Toddy Glaser of the Northeast Document Conservation Center (NEDCC) presented a low-tech solution for an *in situ* flattening project (150,000-plus Frederick Law Olmstead drawings and plans) at the Springfield Armory, an historic site. Three technicians are working on this "ongoing archival processing with conservation component" project. They are unrolling, removing fasteners, surface cleaning, grouping items by support type, and humidifying and flattening at a rate of about sixty to one hundred (if tracing paper) plans per day, Monday through Thursday; mending is performed on Friday. The tank is constructed of Plexiglas with a top of polyethylene (PE) sheeting stretched taut over a PVC plumbing pipe frame; the plans are supported on two levels of screened platforms (using Gore-Tex as well, if the item is tracing paper) above plastic trays filled with hot tap water which is changed once during the day (or after three hours for paper plans). Average exposure time is six hours for paper substrates (blueprints, diazos, etc.), and four hours for tracing paper and cloth. Drawings are left to dry under three-eighths inch thick wool felts overnight. Discussion included questions as to whether felts had enough time to dry adequately under such heavy use and whether there were any storage problems post-flattening, since the technicians are generating a high volume. In answer to both, no major problems have been observed; felts dry overnight due to relatively low moisture content of humidified plans; mending items sometimes requires some delay in further processing. Sources for obtaining felts were discussed (see section on Suppliers at the end of this article).

Hilary Kaplan presented creative solutions for unusually oversize materials developed at the Georgia State Archives (GSA) by herself and Elisabeth Schulte. Numerous metal sinks at the GSA are converted into large chambers by draping them with PE sheeting and introducing moisture through tubing connected to ultrasonic humidifiers. For extremely large rolled drawings (4 ft. x 5 ft.) a chamber was devised out of large tables and PE sheeting, using smaller tables within to support the drawings; the source of moisture was again the ultrasonic humidifier. When devising a system such as this, the operator must be aware of condensation which can accumulate dangerously on the PE tent or in the tubing. A strategy to avoid water dripping from the tubing is to angle the tube upward where it enters the chamber or bending the tube in a U shape, so that condensing water returns and pools in the tube rather than spitting out. Aquarium pumps (e.g. a pump made by Lee Valley, for ponds) were mentioned as a way to circulate wet air evenly.

Joan Irving of the Center for the Conservation of Art and Historic Artifacts (CCAHA) described Susan Bing's solution for working on oversize architectural drawings (renderings of the Frick Museum doors), which can require additional staff and take up excessive treatment space, displacing other workers. Bing's solution was to work locally on the drawing in a scroll-like fashion, with the ends rolled up on large tubes. Half the exposed section is humidified using GORE-TEX while the other half is flattened (after humidification) under blotters, tensioned with weights, then mended. Afterward, whole sections are humidified and flattened to unify the objects and reduce strain. The object is then mounted on thick (20–40 pt.) Archivart folder stock rolled loosely and tied with "strip-straps."

After these slide presentations, Stephanie Watkins spoke on diverse humidification and drying techniques, including traditional, ideal, and cost-saving effective models. The full text of her review follows this article.

Betsy Eldridge contributed the concept that effective drying is "introducing a new blanket of air under gentle restraint"; wet items may be kept dimensionally stable on felts, using Gore-Tex as a drying aid to keep moisture even for long, slow drying. John Krill reminded us of two important benchmarks for understanding the nature of wetting and drying of paper, Sugarman and Vitale's paper (1992) and a conference held at Conservation Analytical Laboratory (1990). Janice Schopfer contributed an idea for accelerated drying from the printing industry: creating a drying stack of the objects sandwiched in corrugated cardboard (with fluting arranged in same direction) under press or weight, and blowing gentle air through with a plastic bag at one end; the bag helps to recirculate the air current. Drying under pressure is especially selected for highly calendared machine papers. Barbara Rhodes (who could not attend) sent a book of experimental samples she has prepared, showing the effects of types of humidification on a variety of copying inks and pencils on different papers, which was passed around at the end of the session.

TIPS AND TECHNIQUES:

- For covering oversize chambers or as support for oversize objects, use sheets of corrugated triple-wall polycarbonate 'glazing' panels (the *structural type* of two

types available; this one is used in greenhouses). Corrugated polycarbonate provides needed rigidity at about a third of the weight of acrylic sheeting, a consideration for personal safety as well as practicality (Alan Puglia).
- Large blotters can be obtained from etching supply houses.
- Use saturated car wash chamois instead of old blotter for introducing water. It's lightweight, inexpensive and dries quickly after wringing out.
- Safety adaptations to the Horton Humidifier (Glaser 1999) include cutting a "window" in the lid of the chamber and placing blotter in that space to absorb condensation. Saturated blotters are also used instead of free water to prevent splashing (Kristin St. John). Clearly labeling the container cannot be emphasized enough! Putting the chamber on a dolly allows the heavy container to be gently moved out of harm's way in a tight space (Nora Lockshin).

Due to the liveliness of the discussion and comments received afterward, the decision was made to continue the topic at next year's ACDG.

SUPPLIERS OF PAPERMAKERS' FELTS

A new source for felts (Phoenix 10; 1/2" thick by 72 inches, 95% wool, undyed, min. order approx. 4 yds.) is National Non-Wovens, 1 (800) 333-3469.

Smaller felts (polyester or wool) can be obtained from Lee S. MacDonald, Inc., 1 (888) 627-2737 or <http://toolsforpaper.com>.

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