Archives Preservation Update

Archives Preservation Outlook: Research and Education

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In recent years, archives preservation has become pro-active, involving records creators and caretakers in actions intended to promote the longevity of archives materials. This strategy includes educating a wide user community about keeping and storing their materials, while supporting the development of standards to ensure the availability and use of stable materials. Scientific research stands at the core of these activities; it commands our attention because it provides the substance from which we may make informed decisions about preservation actions.

Before noting some of the ongoing research initiatives that are of particular interest to the archives preservation community, I wish to highlight the seminar on "Research in Conservation " that took place in the Spring of 1991. Sponsored by the International Council on Archives (ICA), the International Federation of Library Associations (IFLA) and Columbia University, this meeting was designed to provide an overview of current research and development activities specific to libraries and archives.

Three key areas dominated discussion: practical and philosophical research needs and approaches; research in control of biological agents (insect and fungi control and eradication) and research in areas of environmental control. Speakers, many of whom were conservation scientists, consistently encouraged preventive preservation as the "treatment" method of choice because only preventive preservation can avoid costly and risky remedial treatments or elude the possibility that no viable treatment option is available.

At the close of this seminar areas for future research were prioritized. Targeted topics included de-infestation; environmental issues; lifetime testing; basic causes of deterioration; and deacidification and paper strengthening. Research into economical technical solutions--such as building environments that consider prevailing conditions and other low cost methods such as good housekeeping were encouraged.

Seminar papers of particular interest include Paul Whitmore on "The Nature of Preservation Research," Frank Preusser on "Selecting a Pest Control Strategy," Nieves Valentin on "Controlled Atmosphere for Insect Eradication" Chandru Shahani on "Effect of Contained Environments on the Stability of Paper," Judith Hoefenk de Graaff on "The Effects of Pollutants on Paper,"

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and Glen Cass on "Protection of Collections From Damage Due to Deposition of Airborne Particles." Seminar organizers intend to publish these proceedings.

A synopsis of papers given at this important seminar appeared in the September 1991 Abbey Newsletter (Vol. 15 No. 5). A 14 page summary of the papers presented is also available from the Society of American Archivists. (600 S. Federal Suite 504, Chicago IL 60605; 312-922-0140)

Those unable to attend last year's Book and Paper Group General Session Update at which Dianne van der Reyden discussed "Recent Scientific Research in Paper Conservation" since 1988, can read the text of this informative presentation in the Spring 1992 issue of the AIC Journal, replete with citations for further reference. Dianne's talk during this year's general session on "Transparent and Coated Papers: Materials, Degradation and Evaluation of Solvent Treatments" noted among other findings the potential for goretex humidification systems to soften and lift coatings on some transparent papers as well as on some gelatin emulsions. These reports will be published in Proceedings of the 1992 Manchester and Windermere Conferences.

Architectural drawings pose complex issues for preservation and access. Lois Price of the Conservation Center in Philadelphia is currently engaged in research for a monograph on the fabrication and preservation of American architectural drawings to 1930. Her initial research includes a review of builder's and draftsmen's manuals, photographic manuals, trade catalogs and advertisements that document the materials and techniques used in the creation and reproduction of architectural drawings. The second part of her work will involve the use of visual and instrumental analysis for identifying reproductive processes, pigments and the components of tracing papers and linens. In the final portion of this project, Lois will develop guidelines for identification, storage, treatment and exhibition of architectural drawings based on the information she has gathered and the combined experiences of Conservation Center staff who have treated over 1,300 drawings in the last three years.

Kathy Ludwig of the Minnesota Historical Society will be working with BMSCAT representative Larry Wood to resolve questions of vacuum freeze-drying water damaged archives materials. Kathy's project will broaden knowledge that has been gained from practical experiences, and expand upon the recovery literature that currently focuses on selection and drying strategies for bound materials and photographs.

Little information has been available for salvaging archives holdings. In an archival setting, it is not unusual to find various kinds of materials and media housed together. The potential for photographs to be stored in the same box with encapsulated items, blueprints and thermofax copies is very real. Specific details for salvage are needed so that as complete a

recovery of information as possible can occur should materials become wet. Techniques that are least disruptive to the artifact are needed to minimizing subsequent reformatting or conservation treatments.

By the end of this project, Kathy hopes to discover if polyester film impedes the drying of encapsulated or sleeved sheets, and if freeze drying items flat or rolled has an influence on distortion. She will be examining the effect, if any, that freezing has on Mylar reproducibles, thermofax and other duplicating processes, and on the sensitized paper of copy press books. Kathy will determine whether or not water soluble starched cloth drawings as well as glue-dot scrapbooks can be successfully separated after drying.

This project will also examine silver halide microfilm on a polyester and an acetate base as well as vesicular film and microfiche. Kathy expects to find whether or not vacuum freeze-drying exacerbates problems of deteriorating acetate and nitrate negatives. With the assistance of 3M Company, measurements of uniformity of tone before and after the drying of magnetic audio tapes will occur. Medium and high frequency signals will be measured and charted on a readout.

The Canadian Conservation Institute carries out work applicable to a broad range of materials as well as research on individual item treatments. CCI is currently evaluating environmental controls and recommendations for lowering temperature and relatively humidity from the standard 68 degrees (20 degrees C) and 50% relative humidity. The selection and assessment of cellulose-based materials for use in the storage and display of paper materials is also underway.

Mass deacidification is a technology of great potential for treating paper based materials. CCI has recently completed a study of naturally aged archival materials that have undergone various methods of mass deacidification. While the study concludes that all methods investigated show promise, there are significant issues of quality control and these and other problems should be resolved before mass deacidification treatments commence.

Paper strengthening, another potential mass treatment for archival materials, has also undergone testing at CCI. A feasibility study for commercial scale-up using The British Library System based on deposition of acrylate polymeric substances is underway. Parylene (Nova Tran), another paper strengthening technique may not be suitable for routine mass treatments because of its expense, irreversible nature, and tendency to distort bound volumes, but may be the treatment of choice for extreme situations, such as fire-damaged materials. Research on the FMC deacidification process that claims to simultaneously strengthen paper is also ongoing at CCI.

CCI is involved in a number of projects that have furnished scientists important basic information on the chemistry of cellulose fibers. The knowledge gained by these studies will help in understanding specific treatments and in planning and conducting future research. These studies include assessing the detrimental effect washing with very pure water has on paper permanence; the benefits of adding small quantities of chemical salts to wash water; and to what degree the presence of lignin can determine whether deacidification may be beneficial or detrimental.

The Canadian Conservation Institute has also pioneered the application of borohydrides to archival materials to improve the stability and cosmetic appearance of papers exhibiting serious staining. CCI is also working to increase our knowledge of the technology, stability and removal of pressure-sensitive and gummed tapes. Findings on enzyme research will be revealed in a future CCI monograph.

Driven by the building of Archives II, the testing lab at the National Archives and Records Administration has been conducting ongoing Oddy tests for the presence of corrosive volatiles released by materials used in exhibit cases and construction materials. We can expect the results of these tests to assist conservation personnel in archives, libraries and museums in determining appropriate building materials for storage and exhibition.

The effect of Dupont's Clysar EHC shrink-wrapping is being investigated as a long-term measure to keep disintegrating bindings intact and for short term use to protect bound volumes in transit. New papers and late nineteenth-century papers were measured for brightness, pH, fold endurance, moisture content and viscosity (following standard TAPPI procedures) after aging control and shrink-wrapped volumes for 8 weeks at 70 degrees Celsius and 65% RH. The statistical evaluation of results is currently being awaited.

4 polyvinyl acetate adhesives (PVA's)--Jade 403, Elvace 40-704, Swift PVA and Conservation Resource's Reversible PVA--were tested on a variety of papers. Results obtained were to some extent dependent on the papers used in testing. Brightness of 6 papers was tested with adhesives before and after oven aging (2 weeks at 90 degrees Celsius and 50% RH) and in the Sunlighter (for 96 hours followed by 96 hours more). All PVA's darkened more than papers in oven aging, though changes were slight. Light aging results were difficult to generalize because some papers became lighter and some papers became darker.

NARA is also currently testing and evaluating the results of materials deacidified by diethyl zinc in 1989. Boxes containing a wide variety of archival materials were subjected to mass deacidification. These items are presently being visually inspected and tested with an indicator to determine if complete

deacidification occurred. Chemical and physical tests will be conducted on sheets inserted in test and control boxes.

In addition to these projects carried out in-house at NARA, an ongoing study is being done at NIST on the penetration of boxboard by SO2 and oxides of nitrogen. Last June, NIST issued its NARA funded report on "Factors Governing the Long Term Stability of Polyester-Based Recording Media." This notable study predicts that polyester-based magnetic tape will experience a life-expectancy of 20 years if maintained in an ambient environment. It was determined that acidic pollutants play a significant role in initiating degradation of magnetic media. A clean environment of 68 degrees F or less with a RH of 30-40% is recommended. Though the study focused on 1/2" magnetic tape on open reels, Leslie E. Smith, the study's investigator, believes its general conclusions likely apply to all magnetic media. The study discouraged periodic rewinding of tapes as a maintenance procedure, indicating that rewinding should only be done prior to playback.

Over the last few years, interest in the preservation of machine-readable records has increased dramatically. In 1990, NARA's annual preservation conference focused on the preservation of electronic media. An absence of standards and the obsolescence of playback equipment forces us to think about the preservation of this media in a very non-traditional way. This conference repeatedly emphasized that the preservation of machine-readable data will be accomplished only by migrating to the next highest level of technology--moving from one format to the next. The ongoing preservation of this media cannot help but have serious long term budgetary implications.

Concern for the preservation of audio recordings is also rising. Conference sessions sponsored by the Society of American Archivists have drawn large audiences. A lack of research and standards in audio preservation as well as appropriately training archival audio technicians have hampered extensive preservation efforts in this area. Institutions with large holdings of deteriorating cellulose acetate discs and magnetic tapes are actively pursuing opportunities for cost-effectively reproducing these materials onto more stable media.

Work being done at the Image Permanence Institute on silver image stability and the polysulfide treatment of microfilm has particular significance for both archival and library communities. IPI's SilverLock makes film chemically resistant to atmospheric pollutants. By converting metallic silver to silver sulfide, oxidation resistance is increased and the likelihood of damage to film is reduced.

Other work at IPI of great interest to the archives community focuses on proposed ANSI standards for testing and storage enclosures; the effects of pollutants on microfilms; work on acetate and nitrate stability; and stability of color microfilm.

A knowledge of scientific research developments is indispensable to the archives conservator--but this information must reach beyond the conservation professional to archival administrators and the mainstream archives community. Though archivists are awakening to acknowledge that preventive actions make good sense, there are many who believe that solutions to preservation problems arrive by way of chemicals treatments, high tech-expensive equipment and the presence of professional conservation personnel on staff. Staff does not always understand that even when a conservator is present, she can not just fix the fractured document based solely on its condition without knowing how that item fits into larger institutional priorities.

Because funding generally lags behind technology, costly purchases made without a solid understanding of what that purchase can hope to accomplish may prove disappointing and wasteful. Too often, the acquisition of sophisticated equipment or conservation personnel may be as much a matter of pride as a matter of need--or a misunderstanding of preservation needs.

In early 1991, NAGARA, the National Association of Government Archives and Records Administrators released GRASP, a guide for helping archival repositories systematically address preservation needs for staffing, facility and holdings. This tool consists of a computer-assisted self-study based on artificial intelligence, a manual providing specific preservation planning strategies and a resource compendium replete with citations. Copies of GRASP are available on loan through state archives, and for purchase through the Society of American Archivists.

To respond to the need for expanding preservation literacy throughout the United States, The Society of American Archivists has sought and received NEH funding for a Preservation Management Training Program to develop a series of comprehensive archives preservation workshops designed to advance knowledge of archives preservation. This program promotes preservation as a basic function of overall archival management, introducing strategies that integrate preservation into general archival functions. Forty to sixty institutional participants will learn to assess preservation needs and develop priorities based on cost-effective solutions. Four series of workshops will be presented throughout the country beginning in Fall 1992. SAA Preservation Program Director, Evelyn Frangakis has been making details of this program widely available, and can be contacted at the SAA office at 312-922-0140.

The Society of American Archivists has served as an effective conduit for communicating preservation information to its constituency. In 1990, it devoted an entire issue of its

journal, The American Archivist to preservation. An "Archives Preservation Resource Review," a bibliography covering publications relating to archives preservation from 1986 to 1990 appeared in the journal's first 1992 issue. In 1993, SAA will publish Mary Lynn Ritzenthaler's updated and revised Preservation Manual. Infinity, a newsletter devoted to issues and events influencing archives preservation is produced by SAA's Preservation Section. In 1991, SAA became a voting member of NISO to have a say in the development and revision of standards affecting archives issues.

Archivists and preservation personnel have been working to assess appraisal strategies and their relationship to institutional practices in order to fashion a national preservation plan for archives.

In 1990, Buffalo State College issued their Final Report to NEH on devising an archives conservation curriculum within the existing art conservation program at Buffalo. While the College was very interested and prepared to support this project, there is no space available at present, and the current economic climate in the State of New York has placed future plans for this project in limbo.

The Department of Library Science, School of Library and Information Science at the University of Pittsburgh is publicizing a new, flexible area studies program in Archives, Book Arts and Preservation, where students can focus on one of these interrelated subjects.

This Fall, the Columbia Conservation Education Program will move from its home in NYC for more than a decade to the University of Texas at Austin. It is expected that the conservation program will include a stronger archives preservation component, building on existing strengths of the Humanities Research Center and the University of Texas Library and Information Sciences Program.

Quantifying progress in archives preservation is inherently difficult. While administrators have long measured achievements in preservation by numbers of items treated or dollar amount spent, a limit to financial and human resources has placed more emphasis on cost-effectiveness. By practically adapting research findings to daily needs, and educating our staff and user communities, archives conservators expect to have an impact on archives preservation into the 21st century.

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