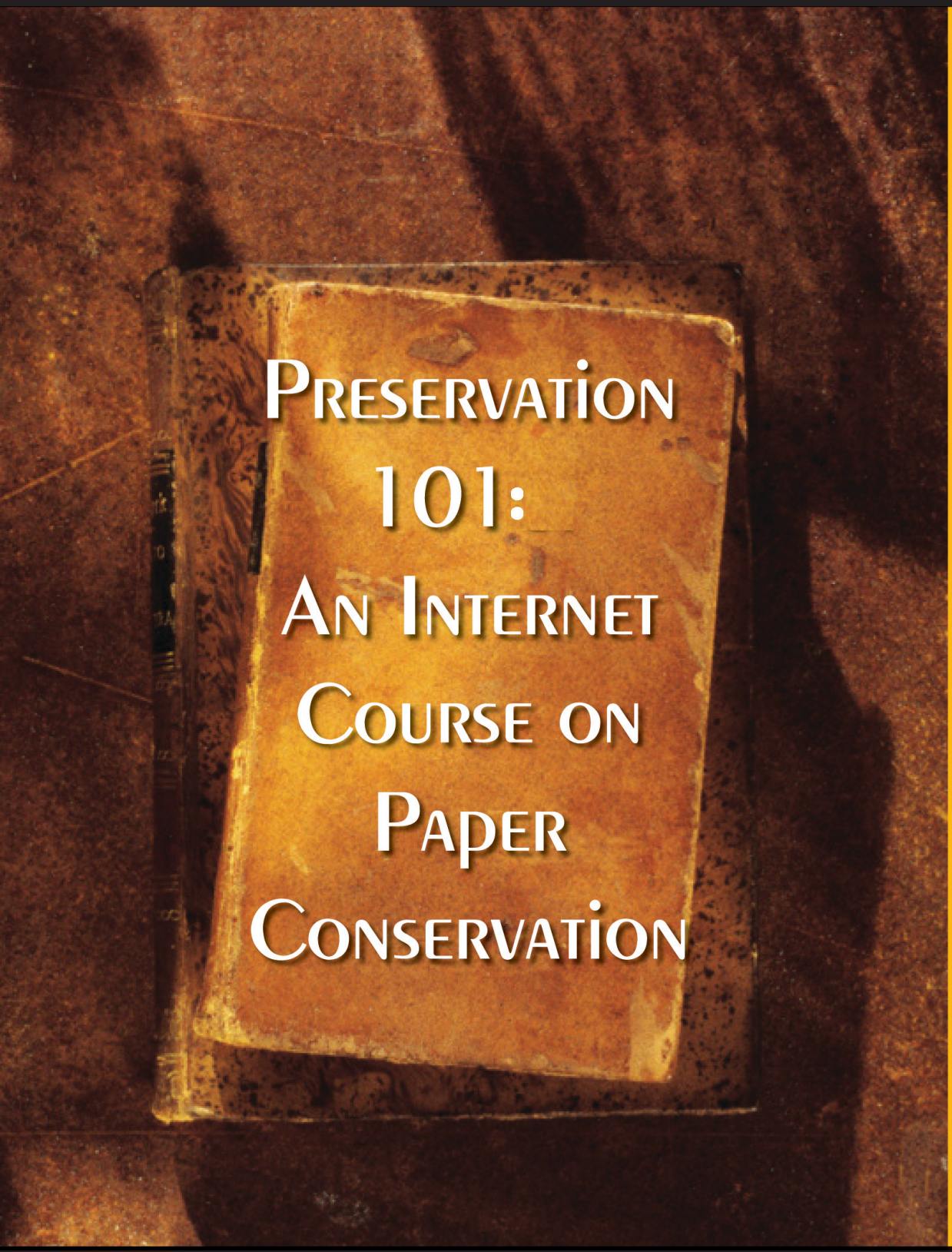
Materials Research Series



Preservation 101: An Internet Course on Paper Conservation

1999-30

J. Willard Marriott Library

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Northeast Document Conservation Center

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PRESERVATION 101:
An Internet Course on Paper Preservation

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http://www.nedcc.org

Last Modified: April 5, 2002

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Lesson 1: What is Paper Preservation?

An orientation to the importance of caring for library and archival materials

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What is Preservation?
Why do collections deteriorate?
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What is preservation?

A wide range of institutions and individuals are responsible for the care of cultural collections. Libraries, archives, record centers, museums, historical societies, and private collectors hold a variety of materials in different formats and media types. Virtually all are prone to natural deterioration over time.

The terms "preservation" and "conservation" are sometimes confused. The American Institute for Conservation (AIC) defines preservation as:

> *"The protection of cultural property through activities that minimize chemical and physical deterioration and damage and that prevent loss of informational content. The primary goal of preservation is to prolong the existence of cultural property."*[1]

Conservation is a more specific term, referring to the physical treatment of individual items, usually after some damage has occurred. Preservation is a

broader term, concerned with reducing or preventing damage in order to extend the life expectancy of collections. How can this be accomplished?

Iron gall ink can be so acidic that it "burns" through a paper sheet.

Many of you have seen items in your collection that are fragile or brittle, faded or discolored, broken, unusually spotted, or sticky. You might ask "when did the damage occur? what caused it?" More importantly, "how could it have been prevented?" Often such questions have no single, concrete answer. The causes of collection deterioration are varied and sometimes complex; they include poor manufacture, improper storage, rough handling, and pests.

Why do collections deteriorate? Why is preservation important?

We need to start building an understanding of deteriorating collections so that we may begin thinking about steps that can be taken to preserve them.

One reason collections deteriorate is "internal or inherent vice," caused by weakness in the chemical or physical makeup of an object introduced during its manufacture. This is the fundamental problem you face as you begin to consider the preservation of collections.

Scrapbooks present many preservation challenges. Treatment can be expensive. Start by simply boxing to provide better physical protection.

For example, papers composed of wood pulp may turn yellow and brittle in just a short period of time. Some adhesives will dry out and fail, while others may discolor and turn into a sticky mass. Old writing inks may seem to burn through a paper sheet, or, they may have faded and become illegible. Audio tapes become sticky and unplayable. Photographic prints can fade or become yellowed and brittle; and photographic films can emit an odor, or be wavy or spotted. These problems are due in part to internal vice, and they affect all types of collections--those in private homes to those in large institutions. For example, did you know that roughly 33% of all research collections in academic libraries

are embrittled to some degree and that many items are damaged beyond the point of safe use?

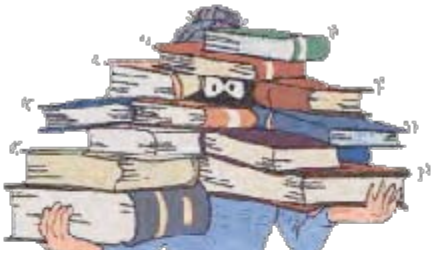
There are, of course, a number of other contributors to collections deterioration, which can be labeled "external agents of deterioration." They include: physical handling, theft, vandalism, fire, water, pests, pollutants, light, and uncontrolled temperature and relative humidity (RH).

These are risks that can be reduced or prevented by identifying, monitoring, and controlling them. You may not be able to do away with internal vice, but you can slow the rate of deterioration and/or avert damage by controlling external risks. AIC defines preventive conservation as:

Bookdrops can be very damaging.

"The mitigation of deterioration and damage to cultural property through the formulation and implementation of policies and procedures for the following: appropriate environmental conditions; handling and maintenance procedures for storage, exhibition, packing, transport, and use; integrated pest management; emergency preparedness and response; and reformatting/duplication."[2]

We hope that there will be new terms and ideas introduced throughout this program which will help you understand collections care. For clarification of words you will encounter, a glossary has been created, drawn from a variety of sources. In addition, other vocabularies, glossaries, and dictionaries are available online (such as "Bookbinding and the Conservation of Books: A Dictionary of Descriptive Terminology," by Matt T. Roberts and Don Etherington), at Conservation Online. Much of the printed literature includes abbreviated glossaries that you may find helpful.



Where do I start?

Convincing others of the importance of preservation can be a challenging process. Deterioration happens slowly over a long period

of time and is not immediately obvious, especially if it is due to internal vice or environmental problems. But anyone who has handled seldom-used books and been confronted with flakes of yellowing paper, knows that paper collections will not survive unless they receive special care.

Several strategies may be helpful in demonstrating the importance of preservation to others. Documenting deterioration and showing damaged materials to others can be very effective; highlighting positive evidence when preservation actions are carried out may also have an impact. If you are the person designated to take charge of preserving a collection, you must become informed about preservation issues, and keep up with recent developments in the field. Taking courses like this one and reading preservation literature are important steps. You should try to share preservation information with your colleagues in a non-threatening way—so that they do not resent the "preservation police!"

One way to begin addressing preservation problems within an institution is to conduct a survey. The purpose of a g*eneral needs assessment survey* is to identify hazards to the collection overall and to help preserve materials using preventive maintenance strategies. For example, this type of survey examines building conditions, storage and handling procedures, disaster preparedness, and policies that impact preservation. A formal report is then prepared which:

- identifies hazards to the collection;
- identifies actions required to help ensure the long-term preservation of collections; and
- prioritizes the needs of the collections and identifies steps necessary to achieve required preservation actions.

Please refer to the section below entitled "Sources of Information" for a list of general preservation resources, both in print and online. Note that many of the professional associations are very active, providing training for their members and producing or publishing preservation literature. You should consider exploring local, regional, national, and international organizations to see what preservation resources they offer for your type of collection or institution.

What is involved in preserving collections?

As a first step, an institution should develop a clearly defined mission statement and collecting policy. When resources are

limited—as they often are—it makes most sense to concentrate preservation efforts on materials that serve the real needs and mission of an organization. Look critically at materials that may have been gathered haphazardly and decide whether they really belong in your collection. Once this has been done and preservation needs have been identified, you will need to set priorities for preservation action. Unfortunately, preservation needs usually outnumber available resources.

It is important to keep in mind that few institutions have the time or the money to meet every preservation and conservation need for their collection. When resources are limited, choices may have to be made amongst preservation activities. Every institution with collections of enduring value should have a preservation plan that weighs the needs of the collection against institutional resources and provides a list of priority preservation actions. Setting priorities will be covered in Lesson 8 of this course.

Several areas of activity will make up a preservation program for your collections. Even a small repository—or a private collector—can undertake such a program. Introduced here, these activities will be discussed in more detail in later sessions of this course. They are:

- Environmental Control—providing a moderate and stable temperature and humidity, and controlling exposure to light and pollutants.

- Emergency Preparedness—preventing and responding to damage from water, fire, or other emergency situation.

- Security—protecting collections from theft and/or vandalism.

- Storage and Handling—using non-damaging storage enclosures and proper storage furniture; cleaning storage areas; using care when handling, exhibiting, or reformatting collections.

- Reformatting—reproducing deteriorating collections onto stable media to preserve the informational content, or the originals are fragile or valuable and handling should be restricted.

- Conservation Treatment—treating individual objects, using the services of a trained conservator.

It is helpful to keep in mind that the goal of preservation is to ensure a long and useful life for an entire collection. Preservation should not be limited to the treatment of a few select items. The most cost-effective way to establish longevity is to prevent or retard deterioration.

SELF-TESTING QUESTION

Which of the following activities can be considered "preventive care"? Select all that apply.

☐ **Implementing closing procedures that include shutting off small electrical appliances.**

☐ **Installing a space dehumidifier in a basement storage area.**

☐ **Cataloging and indexing unprocessed holdings.**

☐ **Buying a powder-coated map cabinet to properly house oversize maps.**

Submit

Who should be responsible for preservation?

The care of collections is no longer considered to be solely the responsibility of the conservator, as was once the case. Much can and should be done by collection managers and custodians, guided by published resources and advice from preservation professionals.

While some large institutions have a separate preservation administrator (or even a separate department), if you are responsible for preservation in a smaller institution, it is likely that preservation will be only one of many "hats" that you wear. You should try not to be discouraged by the scope of the preservation problem, but try instead to break tasks down into manageable projects that can be completed in a reasonable amount of time. This will give you a sense of accomplishment.

Remember that if preventive preservation is to be effective, it must become part of all activities within the organization. Part of your job will be to make your colleagues aware of their roles in the preservation program.

Preservation should be a part of all activities including, but not limited to:

- acquisition (use of non-damaging spine labels, etc.)
- binding (use of archival materials and non-damaging binding techniques that allow the book to open completely, etc.)
- shelving (storing oversized books flat or spine down, using proper bookends)
- photocopying (using a "edge" photocopier with an edge platen and being careful not to damage the spines of books), and
- exhibition (supporting collections properly and using non-damaging exhibit techniques, etc.).

In other words, preservation should not be an "add-on" activity--rather it must be an integral component of the day-to-day operations and responsibilities in every department, office, or division. Think for a moment about the people in your institution who have responsibilities that affect preservation of collections--perhaps without being aware of them. What are those responsibilities? How could you work with them to improve procedures?

One of the most important steps an institution can take is to support ongoing education and training of staff members with preservation responsibilities, and to provide the time needed to carry out these responsibilities. Some preservation projects such as weeding and shelf maintenance do not require a large investment in equipment or supplies, but they do require a commitment of staff time; also needed are knowledge of preservation principles and

proper procedures for care of collections. An investment in training and time for those who carry out preservation activities will serve to extend the useful life of the collections.

[1]AIC. "AIC Definitions of Conservation Terminology," in Directory, 1999.

[2]Ibid.

ASSIGNMENT

Check out some of the online preservation information resources available on NEDCC's Web site, as well as the other preservation Web sites listed below. Explore the links and see what else you discover that interests you. Bookmark those you would like to return to, perhaps organizing them in your "Favorites" file.

Sources of Information

This short bibliography has been prepared as a general resource for those who are relatively new to the field of preservation. The list is not exhaustive. Rather, it is intended as a place to start exploring a range of preservation problems and issues.

Printed Resources

Bachmann, Konstanze, ed. Conservation Concerns: A Guide for Collectors and Curators. Washington, D.C.: Smithsonian Institution Press, 1992.

Canadian Conservation Institute. Framework for the Preservation of Museum Collections. Wall chart (25" x 36 1/4", 63.4 cm x 92 cm) - $20.00; laminated wall chart - $45.00. *Can be ordered using information at the CCI Web site.*

Clapp, Anne F. Curatorial Care of Works of Art on Paper. New York: Lyons and Burford, 1987.

DePew, John N. A Library, Media, and Archival Preservation Handbook. Santa Barbara, CA: ABC-CLIO, 1991.

Greenfield, Jane. The Care of Fine Books. New York: Lyons and Burford, 1988.

Long, Jane S., and Richard W. Long. Caring for Your Family Treasures. Washington, DC: Heritage Preservation, 2000.

Ogden, Sherelyn, ed. Preservation of Library and Archival Materials: A Manual. 3rd ed. Andover, MA: NEDCC, 1999.

Ritzenthaler, Mary Lynn, Gerald Munoff, and Margery S. Long. Administration of Photographic Collections. Chicago, IL: Society of American Archivists, 1984.

Ritzenthaler, Mary Lynn. Preserving Archives and Manuscripts. Chicago, IL: Society of American Archivists, 1995.

Schnare, Robert E. Bibliography of Preservation Literature, 1983-1996. Maryland: The Scarecrow Press, Inc., 2001.

Society of American Archivists. Donating Your Personal or Family Papers to a Repository. Chicago: SAA, 1994. SAA Brochure. $20.00 U.S. for 50 copies.

Online Resources

American Association of Museums
www.aam-us.org
The professional organization for museums. A good resource for publications.

American Institute for Conservation
palimpsest.stanford.edu/aic
The professional association for art conservators. Located at 1717 K St., NW Ste. 200, Washington DC 20006, tel. 202/452-9545.

American Library Association
www.ala.org
The professional organization for librarians. Has an extensive publications catalogue. Preservation activities take place in PARS (the Preservation and Reformatting Section) within its ALCTS (Association of Library Collections and Technical Services) Division.

Association of Research Libraries
www.arl.org
A membership organization composed of the libraries of North American research institutions.

Canadian Conservation Institute
http://www.cci-icc.gc.ca/html/
A federal organization whose purpose is to promote the proper care and preservation of Canada's moveable cultural property, and to advance the practice, science, and technology of conservation. CCI produces many useful preservation publications.

Conservation Online
palimpsest.stanford.edu
The place to start for preservation information and links to preservation Web sites. Also contains the archives of the Conservation DistList online preservation discussion group.

Council on Library and Information Resources
www.clir.org
Fosters collaborative approaches to preservation and access issues facing libraries and archives, with a special emphasis on the challenges posed by technology. Produces excellent publications, many available online in full-text.

International Federation Of Library Associations & Institutions
www.ifla.org
IFLA's Core Programme for Preservation produces many useful publications. Select "Activities and Services" from the Home Page to locate core Activities.

Library of Congress Preservation
www.loc.gov/preserv
LC's Web site provides information about its preservation program, including preservation leaflets, and its extensive digital collections and programs.

National Archives and Records Administration
Archives and Preservation Resources
www.archives.gov
This Web site provides some useful online resources, including information on holdings maintenance for archives.

New York State Archives and Records Administration
www.archives.nysed.gov
"SARA" has a number of interesting and useful publications on collections organization and care available online.

Northeast Document Conservation Center
www.nedcc.org
Site includes online preservation manuals, suppliers and services lists, and resources for emergency response. Sources of Information has links to other resources.

Research Libraries Group
www.rlg.org
A pioneer in cooperative preservation activities, its preservation program has produced microfilming guidelines and currently sponsors various working groups on digital imaging.

Smithsonian Center for Materials Research and Education
www.si.edu/scmre/
See specifically "Guidelines." n.d., at

http://www.si.edu/scmre/takingcare/guidelines.htm (July 6, 2001), which provides broad guidelines and strategies for artifact and collections care, including care of specific types of museum collections. See also SCMRE's Research, Libraries and Archives Conservation Task Force at http://www.si.edu/scmre/relact/relact.htm, for online examples of survey forms, guidelines, video scripts, graphic illustrations, articles, etc.

Society of American Archivists
www.archivists.org
The professional organization for archivists. Another good resource for preservation publications. Provides links to regional, state, and local archival organizations in the United States and Canada.

SOLINET Preservation Services
www.solinet.net/presvtn/preshome.htm
Their mission is to maintain long-term, cost-effective access to information resources. Field Services offer excellent full-text leaflets and articles on preservation, as well as some extensive and current bibliographies.

Periodical and Serial Publications

(The following are excerpted from the NEDCC Technical Leaflet, "Preservation Planning: Select Bibliography" by Debra Saryan, Librarian, Northeast Document Conservation Center)

Abbey Newsletter. Ellen McCrady, ed. 7105 Geneva Drive, Austin, TX 78723.
palimpsest.stanford.edu/byorg/abbey/
Source of timely information on preservation and conservation subjects, including bookbinding, commercial binding, educational programs, supply sources, and news. Especially useful are book reviews, and thorough listings of relevant publications from a wide range of sources. Essential reading for anyone concerned with preservation and conservation issues.

American Association of State and Local History Technical Leaflets.
http://www.aaslh.org/leaflets.htm
A series of leaflets providing up-to-date technical information of interest to historical agencies and museums. Covers a very wide range of subjects, from general administrative issues to management of local government records, landscaping, care of textiles, and oral history. Catalog available online.

Professional Resources Catalog. Society of American Archivists, 527 S. Wells Street, 5th floor, Chicago, IL 60607-3922.
www.archivists.org/catalog/catalog/index.html
Excellent resources for those with archival responsibilities. The Basic Manual Series, published in the 1980s, describes and illustrates basic archival functions such as accessioning, appraisal, arrangement and description,

reference and access, security, reprography, and conservation. The Archival Fundamentals Series, in production since 1990, updates and expands upon the earlier series.

CCI Notes. Canadian Conservation Institute, National Museum of Canada, 1030 Innes Road, Ottawa, Ontario K1A OM5 Canada, www.cci-icc.gc.ca/frameset_e.shtml. *Select "The Bookstore" to locate CCI Notes and other publications. Hard copy only. A series of topics to offer practical advice about issues related to the care, handling, and storage of cultural objects.*

CLIR Publications. Council on Library and Information Resources, Commission on Preservation and Access, 1755 Massachusetts Avenue, NW, Suite 500, Washington, D.C. 20036-2188, (202) 939-4750, info@clir.org, www.clir.org. *Includes a section with preservation and access related articles; focus is on digital initiatives. Issues are available online. See especially CLIR Issues and the Reports.*

Conserv-O-Gram Series. National Park Service, Curatorial Services Division, Harpers Ferry, WV 25425. http://www.cr.nps.gov/museum/publications/conserveogram/conserv.html *Leaflets designed for use by the staff of national parks and museums provide detailed instruction as opposed to broad guidelines. Address environment, housekeeping, storage and handling, and health and safety, among other subjects. Cover objects of various types, biological specimens, and paper. Fiels are in .pdf format.*

National Center for Preservation Technology and Training (NCPTT) Notes. NSU Box 5682, Natchitoches, LA 71497, www.ncptt.nps.gov. *Provides information relative to the field of preservation and conservation in technology, education, and training.*

Regional Alliance for Preservation (RAP). *A cooperative project to share preservation training resources. RAP Website,* www.rap-arcc.org.

Spec Kits. Association of Research Libraries. *Executive summaries are available online at arl.cni.org/spec/index.html. Series devoted to library management issues, many of which relate to preservation. Each kit contains charts and documents gathered from various institutions that deal with the kit topic. Subjects include collection analysis, preservation organization and staffing, and exhibits.*

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Links Updated: July 9, 2003

Lesson 2: Introducing Archives

Managing Historical Collections

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Initial Planning
Identification, Appraisal, and Acquisition
Self-Testing Question
Arrangement and Description
Providing Reference Services
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In Lesson One we learned that preservation refers to those activities that reduce or prevent damage to collections, so that their life expectancy will be extended. You learned a bit about why collections deteriorate and what is involved in preserving them. You are probably already asking yourself several questions: "There's so much to do-where do I start, what do I do, and how do I decide what preservation activity is most important?" All of these questions and more will be addressed during the next few weeks, but this lesson poses another question that you may not have thought of: "Why am I preserving these collections?"

In planning for preservation, we must always remember that the ultimate reason for preserving historical collections is to make them available for the use and enjoyment of generations to come. All of our collections may be housed in archival boxes, stored in a moderate environment, and protected from disaster, but if they are not accessible to users, then we have neglected a basic responsibility. We must **evaluate** our collections (to insure that our collecting is focused, since no one has the time or resources to save everything), **organize** them (so that information can be easily located with minimal handling of the materials), and **assist researchers** in using them (while insuring minimal damage and keeping materials secure). Archivists, who are traditionally responsible for the care of historical records, have developed a number of procedures designed to facilitate both access and preservation. We will consider these in detail, but first…

Materials that are well organized and described can be readily accessed by researchers.

Definition of Terms (or, What Is An Archivist, Anyway?)

The Society of American Archivists defines archives as:

> "the non-current records of individuals, groups, institutions, and governments that contain information of enduring value."[1]

You may have also heard the term "archives and manuscripts." This usage arises out of the two historical traditions that came together to form the archival profession-the public records tradition and the historical manuscripts tradition. The former originated with the earliest American settlers and saw the maintenance and preservation of local and national governmental records as a means of ensuring the legal rights of citizens. The latter arose in the late 18th and early 19th century, focused at first on preserving the private papers of important individuals who had contributed to the establishment of the United States (this effort involved both collecting records and editing/publishing records to insure that information would not be lost to accident or disaster). Early historical manuscript collections were sometimes artificial collections of individual documents with literary or historical value that were brought together from different sources.

Theoretically, archival institutions might be termed either "archives" or "manuscript repositories" depending on what they collect and how they acquire it. An archives traditionally cares for the historical records of the organization or institution of which it was a part, acquiring material by law (in the case of governmental records) or through policies set up by the organization or institution. Manuscript repositories, on the other hand, traditionally collected personal papers, artificial collections, and records of other organizations, with the materials being acquired by deed of gift or other legal contract. In practice, this distinction sometimes holds true, as in the case of a corporate archives or a church archives-but there are also many archives that collect both archival records of their own organization and personal papers and records of other organizations (even the National Archives has a collection of donated personal papers, and university archives also often include related manuscript collections). Hence SAA's broader definition of the term "archives," with which we opened this section.

Before we move on, a word about archivists' relation to other professions concerned with preservation of historical collections. Archivists, librarians, records managers, museum curators, and historians have much in common, but there are important differences among them as well. Like archivists, librarians collect, preserve, and make their collections accessible, but they deal primarily with published items that are not unique; archivists deal with one-of-a-kind materials. Records managers and archivists often work with similar types of material, but records managers deal with large numbers of records that are retained only for a limited time; archivists work with the small subset of records that merits long-term retention. Museum curators deal with different types of collections than archivists-three-dimensional objects as opposed to paper, magnetic media, film, and electronic records (although in practice many historical societies and history museums have responsibility for both types of collections). And finally, historians work closely with the records in doing historical research, but are not generally concerned with management of records (although conversely, a large number of archivists do have historical in addition to archival training).

While the term "records" has traditionally referred to paper documents and record books, in fact archival collections often include photographs, architectural drawings and plans, prints and drawings, scrapbooks, ephemera, maps, video or audio tapes, films, and most recently, electronic records. But whatever the type of record, the archivist's task is to "identify records that have continuing usefulness, preserve them, and make them accessible through time."[2] Archivists carry out a number of tasks designed to facilitate both access and preservation-1) identification and acquisition; 2) appraisal; 3) arrangement and description; and 4) reference service. So let's move on to a detailed consideration of how an archivist would manage a historical collection.

Initial Planning

In the ideal world, you will devise a basic statement of your repository's mission and collecting goals before actually identifying and acquiring historical collections. This statement may be short or extensive, depending on the size of your repository and the circumstances. In repositories such as public libraries or museums where archival collections (e.g., a local history collection or a museum archives) are part of a larger institution, it is helpful to prepare a separate statement for the archival materials, since they need to be managed differently from books or museum objects.

Processing should also include replacing old enclosures with archival quality envelopes, folders, and/or boxes.

Your mission statement should articulate in general terms the purpose of the collection's existence (usually to collect and make available historical resources of varying types). What types of people and activities do you wish to document? What geographical area will you concentrate on? Will you focus on documenting a particular subject area, or a number of subjects? Will you collect materials relating only to your institution (e.g., a school or a church), or will you also collect related materials? The collecting policy should indicate in more detail the desired scope and depth of the collection, identifying particular subject areas and formats to be collected (e.g., books, manuscripts, photographs, recordings, etc.) and potential user groups (e.g., genealogists, local school children, professional researchers, etc.). Will you collect only books and manuscripts, or also photographs, sound recordings, etc.? Will you acquire materials only by donation or will you also purchase them? Who is your audience? Do you anticipate that local school children, genealogists, or professional researchers (or all of them) will be using your collections?

Your mission and collecting policy will assist you in adding materials to your collections in future and deciding whether or not to accept collections that may be offered to your repository.

Identification, Appraisal, and Acquisition of Historical Records

Identification

The next task of the archivist is to identify records that might potentially be of interest. Note that this does not necessarily mean they will actually be acquired-it is simply an information-gathering process. The archivist will physically examine the records and ask a number of questions. What are the records? Who produced them? What dates do they cover? How much material is there? Where is it? What condition is it in? Are they in a particular order? In the context of an institutional archives, these questions often take the form of a records survey, where records are examined in their original location to determine whether they should be transferred to the archives.

Appraisal

Once records have been identified, the archivist must decide what records will be acquired. Archivists call this decision-making process **appraisal**. *Note that this use of the term has little to do with the work of a professional appraiser (who would place a monetary value on historical books or other items).* While monetary value may be one of many considerations, archival appraisal is ultimately the process of setting an intellectual value on collections. Since no one has the time or resources to save everything, archivists must

develop a means of deciding which records have long-term research value and which do not. Appraisal has been the subject of a great deal of research in recent years, and there are various appraisal criteria and tools available in the literature. Although appraisal remains essentially a subjective process, it is important to try to develop guidelines for your repository so that decisions can be made as consistently as possible.

Many archivists find it useful to create an appraisal checklist as a yardstick against which potential acquisitions can be measured. This checklist will be different for every repository, but some general guidelines for appraisal can be set forth. Certainly the first place to start is with the repository's mission and collecting goals-does the collection being considered fit those goals? Does it document people, activities, or areas with which you are concerned? How do the records relate to other materials you already have? Would they complete a gap or provide additional information on an important topic? What types of value might the collection have? Most archivists follow, at least in a general sense, the guidelines for value established by T.R. Schellenberg at the National Archives in the mid-1950s (his article is referenced in *Further Sources*). On the most basic level, Schellenberg distinguished between primary value and secondary value. The primary value of records is for the organization that created them, to assist in carrying out its administrative, financial, legal, and operating activities. Records may also have value to other organizations and/or private researchers (secondary value), and it is for this reason that they are preserved in archives. Schellenberg defines two types of secondary value: evidential value and informational value. *Note that these two types of value are not mutually exclusive-a record may be valuable for both evidential and informational purposes.*

Evidential value refers to the value of records in documenting the organizational structure and functions of the institution, or the activities of the individual, that created them. Who created the records? Do they accurately reflect the activities of the organization or person? Do the records provide evidence of the structure and policies of the organization or institution, or evidence of the changing interests of the person? In the case of an organization, are these records also maintained (in a similar or different form) elsewhere within the organization? Do the records reflect policy-making or implementation of functions?

Informational value refers basically to the subject content of the collection-information contained in the records about persons, events, places, etc., with which the institution or person dealt. Schellenberg sets forth three means of judging informational value: **uniqueness**, **form**, and **importance**. If records are to be termed unique, the information in them must be more complete and useful than that found on this topic in other existing sources, whether public or private. The records should also not be duplicated elsewhere, an occurrence that is fairly common in modern public records. In considering the form of the information, records that provide concentrated information (e.g. some information about many people, as in census records; or in-depth information about a few people, as in case files) are the best candidates for retention. The form of the record is also important-can it be accessed and understood easily by researchers? Finally, Schellenberg addresses the issue of importance for long-term scholarly and public research. This type of value is difficult to determine-who can say what researchers of the future will find useful? Certainly the archivist must acquire as much knowledge about the subject of the collection and current research interests as possible. The needs of both professional historians and those researching family or local history must be considered. Archivists generally try to document those subjects, people, and events that are considered important by the society within which the records were created.

If you begin to read in the archival literature, you will encounter other types of value. Some other common terms include administrative, fiscal, and/or legal value; intrinsic value; and historical value. Administrative, fiscal, or legal value refers to the ongoing business value (whether for operational, financial, or legal activities) of the records to the organization or institution that created them. Schellenberg called these values primary values, but some modern archives textbooks, such as Keeping Archives, also designate them as types of evidential value. Most often, materials are not transferred to an archives until they have lost their primary values, but in the case of a private or corporate archives, records (such as architectural plans of existing buildings) may continue to be used for current administrative purposes long after their transfer to the archives.

Intrinsic value refers to records that have value in their original form for various reasons, and thus the original must be maintained. This may be because of their age (in general, older records have more significance, but this is not always the case), because the records have a unique physical form or aesthetic quality, because the records are directly associated with people or events of historical significance, because they might be useful for exhibition, etc. Historical value is a term that is used in many different ways; it might refer to materials that are valuable because of their age or association, or it might be used to encompass both evidential and informational value.

Finally, remember that practical issues must be considered during the appraisal process-if you acquire records, you are accepting the responsibility to organize, preserve, and provide access to them. Are the records duplicated or maintained in another form elsewhere? Are the records complete? Fragmentary materials can be frustrating for research. Is the collection of manageable size for your resources? Are the records in a format that you are prepared to collect and care for? Do they need to be retained in their original form, or could they be reformatted (e.g., onto microfilm)? Do the records contain confidential information that would need to be restricted? Would the donor require additional restrictions on the use of the records? What is the condition of the records? Can you afford to do any necessary preservation work?

For additional perspectives on appraisal, see Selecting and Appraising Archives and Manuscripts, by F. Gerald Ham, and the chapter on "Appraisal and Disposal" in Keeping Archives, edited by Judith Ellis. For discussions of intrinsic value see *Conserve O Gram* 19/1, "What Makes a Book Rare?" and "Intrinsic Value in Archival Material", NARA Staff Information Paper Number 21. For more definitions of terms, see SAA's A Glossary for Archivists, Manuscript Curators, and Records Managers; the glossary in Keeping Archives; the glossary in *CRM Online*, Volume 22, No. 2; and the online glossary available at NARA. All sources are referenced in *Further Sources* below.

Acquisition

Acquisition itself involves both physical and intellectual transfer of the materials to your repository. If you are acquiring records created by an organization or individual outside your own, you will need to have legal ownership of the records themselves (as objects) transferred to you through the use of a

deed of gift form. If possible, legal ownership of the intellectual content should also be transferred, but this is sometimes problematic. You also need to take care that physical transfer of the records is carried off without losing or mixing up the records-not necessarily as easy as it sounds. The oft-quoted maxim is that, for destruction of records, "three moves equals a fire!"

But now you are asking, what about those collections you already have? What about the records that have been accumulating in the attic of the library over the course of 20 years or so? What about the materials that were donated by an important benefactor that you are not sure are relevant? Are you obligated to keep them? Absolutely not! Once you have created your mission statement and collecting policy, you can use those and your appraisal checklist to look critically at the collections that have accumulated over the years. You should identify those that do not serve the mission of your repository. These should then be deaccessioned or donated to other repositories as appropriate. This in turn allows you to concentrate your resources on those materials that are truly important to you.

SELF-TESTING QUESTION

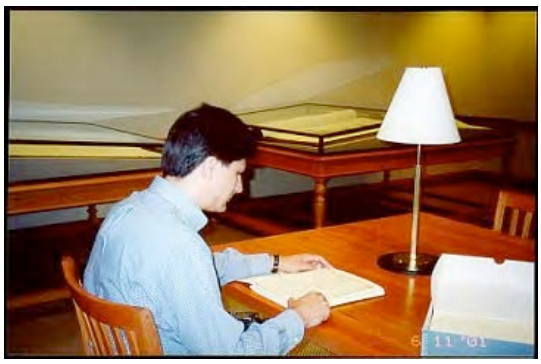
You are appraising the recently-donated records of the local League of Women Voters chapter, dating from 1940 to about 1990. They include financial records, e.g., canceled checks, bank statements, tax returns, and quarterly financial reports, minutes of committee meetings, and correspondence files. You know that over the years the local chapter advocated on behalf of the public on a number of issues, among them a controversial political redistricting project and a project to fund cleanup of the local river.

What type of value might these records have, and why? Choose two:

- ☐ **a. evidential value**
- ☐ **b. informational value**
- ☐ **c. intrinsic value**
- ☐ **d. administrative value**

Submit

Arrangement and Description of Historical Collections



Once you have decided which historical records are to be retained, it is time to think about organizing them in a way that will be useful to researchers. Organization of your collections will also make it much easier to set preservation priorities. Realistically, you must know what you have before you can make good decisions about what deserves preservation. An inventory of collections using standard library and archival descriptive practices can also help you to compare your holdings with those of other repositories, especially when cataloging has been automated using the standard USMARC format. Whether or not materials are preserved elsewhere can be an important factor in determining your own priorities.

If you are starting with a significant backlog of material that has never been organized at all, you should begin with a basic collection-level inventory of all materials (e.g., the Smith Family Papers, the library scrapbooks, the school year books, the Ladies Benevolent Society Collection). This should provide information about the records creator, the dates of the collection, the amount of material, and a general paragraph about the contents of the collection. Eventually you will arrange and describe all these materials in some detail, using standard archival practices.

Arrangement

For the archivist, arrangement is the process of putting a collection in order, both intellectually and physically. Arrangement is governed by two basic archival principles: provenance and original order.

Provenance requires that records created or accumulated by the same source (whether an organization or an individual) be kept together, since as a whole they shed light on the activities of the records creator-e.g., the Smith Family Papers are more valuable as a group of related items than the individual photographs or documents would be. For institutional collections, maintaining provenance allows the researcher to deduce where certain types of information might be found by determining what organization, department, or person would have produced that information.

Original order requires that the archivist maintain the original organization of documents within a collection. This can provide useful information about the routine activities of the organization, and can also be helpful in dating documents (e.g., undated documents in a chronological file) or attributing documents to an author (e.g., unsigned documents filed with a group of documents created by one person). Maintaining original order also makes sense on a practical level-it saves the archivist time and effort, and it allows the archivist to use any existing file indexes put together by those who created the records. However, it has been pointed out that "respect for original order does not extend to respect for original chaos!"[3] If there is no discernible order to the collection, the archivist will impose as straightforward an order as possible.

The physical arranging of a collection involves not just putting the collection in order, but also taking actions to slow physical deterioration. These include removing damaging fasteners, unfolding documents for storage, identifying items in need of conservation treatment, and placing the materials in archival folders and boxes. All of these activities together are termed processing. For information about simple hands-on procedures such as removing damaging fasteners, surface cleaning, or repair, see the NEDCC leaflets listed in *Further Sources*.

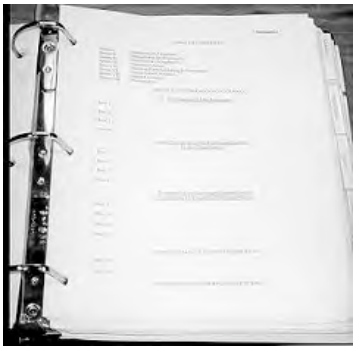
Description

The basic purpose of archival description is to enable the researcher to find both the collection he/she needs and the information within the collection by using various types of written guides. This prevents rummaging through large numbers of boxes and documents, which can cause handling damage and general disorder. It also means that the researcher is not solely dependent on the personal knowledge of the archivist or other staff member(s) to access the materials.

Normally an archives will have more than one type of descriptive guide. There might be an overall repository guide that provides brief overviews of each collection, more detailed finding aids for each collection, and finally indexes to enable researchers to access the materials by subject (often collections contain information about other subjects unrelated to the primary subject).

It is worth noting that the term "finding aid" can be used in a broad or a specific sense. Used broadly, it can refer to any type of guide that describes an archival collection or collections. This might include the above-mentioned repository-wide guide, indexes, databases, inventories, registers, etc. The term is also used to refer to a specific type of descriptive tool that has become increasingly standardized in recent years. A finding aid for an archival collection normally includes information about the records creator, the amount of material, the scope and content of the collection (what time period does it cover, what types of material does it include, what topics does it address, how is it organized, are there any gaps in the material?), and a listing of folder titles that notes what box the materials are in. Large collections often have several series (e.g., correspondence, financial materials), each of which may have a separate description and folder listing within the finding aid. In a few cases, it is deemed necessary to provide an item-by-item listing, *but this is rare because it is so time-consuming*. It is generally reserved for items that have significant artifactual value.

In-house indexes are also an important access tool. For example, in the case of personal papers and some organizations, determining where specific information might be located can be problematic. Thus, archivists index subjects, people, and events that might be of interest when they describe a collection, so that the researcher will be able to find this information (often in a card catalog that directs the researcher to the appropriate finding aid for more detail).



But you may be asking, how do researchers identify potentially interesting collections and decide which archives to go to in the first place? Over the years archivists have developed a number of national-level tools to help guide researchers to the appropriate place. ***It is essential not just to describe your collections in-house, but to do it in such a way that you can share that information outside your repository.***

Archivists prepare not only a finding aid, but also a summary catalog record for each collection. Just as there are rules for descriptive cataloging of library collections (e.g., Anglo-American Cataloging Rules, 2nd ed., known as AACR2), in the archival community Archives, Personal Papers, and Manuscripts: A Cataloging Manual for Archival Repositories, Historical Societies, and Manuscript Libraries (developed in the late 1980s and known as APPM) is the standard for producing summary catalog records for archival materials. Note that catalog records can be prepared manually using these standards, but the records can be shared more easily with others if they are automated in the standard MARC (machine-readable cataloging) format. The MARC format defines the structure of a computer

catalog record (the fields and subfields to be included in the record). It does not provide guidance for what should be put into the fields-that is the function of AACR2 and APPM. The MARC format was developed in the late 1960s for libraries, but was not widely used by archives until the 1980s.

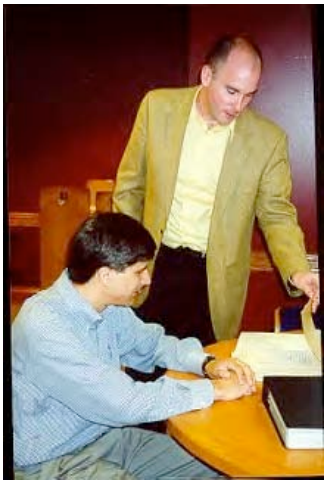
The first national tool for sharing catalog records was the National Union Catalog of Manuscript Collections (NUCMC, or "nuck muck", as it is known). It is a free-of-charge cooperative cataloging program operated by the Library of Congress, designed to assist smaller repositories that serve researchers regularly but do not have the resources to do computer cataloging. Cataloging was originally done manually and produced in hard copy, but NUCMC catalogers now create MARC bibliographic records in RLIN (the Research Libraries Information Network-more about this in a moment!). NUCMC's web site provides a gateway to RLIN.

More than 10 years ago, archivists began to list summary records of their collections on the two major library bibliographic networks, OCLC (Online Computer Library Center, originally geared toward public libraries) and RLIN (Research Libraries Information Network, geared toward university and research libraries). These networks require the use of AACR2 and/or APPM for cataloging in the MARC format. While OCLC and RLIN are excellent resources, MARC records inherently provide limited detail. There are also access fees that can be a barrier to using these services. Archivists are now increasingly using the Web to provide more comprehensive access to their collections by listing collections online. Some have begun to put entire finding aids online, but this task takes an enormous amount of time and effort if it is to be done in a useful and standardized manner. Standards have been developed for encoding finding aids for the Web. The Encoded Archival Description (EAD) Standard is maintained by the Society of America Archivists in partnership with the Library of Congress Network Development/MARC Standards Office. For more information, see the EAD Web site in *Further Sources*, below.

In summary, you will want to create an initial inventory of all your collections, and then proceed to the next level of description, creating a finding aid and summary catalog record for each collection, as well as a subject index. As noted above, the summary catalog record can be part of a manual catalog or it can be automated using the MARC format. If you do not want or don't have time to learn MARC cataloging, you can submit your collection information to NUCMC (see their Web site for more information). If you do want to do MARC cataloging in-house, two companies, MicroMARC and Minaret, provide PC-based programs that will allow you to catalog archival collections in the MARC format, so that the records can be uploaded to a national database. For more information, see their Web sites, referenced below.

For an online case study of how an archivist would go about processing a collection, see Introduction to Archival Organization and Description: Access to Cultural Heritage by Fox and Wilkerson (in *Further Sources*).

Providing Reference Services



Well, now that your collections are appraised, arranged, and described, you can just sit back and "let the researchers at 'em," right? Well, not exactly. Researchers need assistance in using collections, and you have certain responsibilities to carry out in the reference process.

Obviously, you will need to let the researcher know about any finding aids that are available; it is also helpful to conduct a reference interview and guide the researcher toward promising collections. You also have the responsibility to insure that the records are handled properly, so they will not be damaged (you will hear more about proper handling in a later lesson…). You also are responsible for maintaining security-researchers should never be allowed to "browse" the collections or retrieve materials for themselves. You should retrieve only those boxes or items that they need, and they should be supervised at all times when using the materials. Procedures for insuring that any photocopies are made in a non-damaging way are also necessary.

And finally, you must be concerned with the issues of privacy and copyright. Certain types of records may need to be restricted from use for a certain amount of time if they contain personal information-such a decision should be made separately for each collection. Copyright is a thorny subject-you must be aware that while your repository may own the physical documents, it may not own the copyright to the intellectual content. You may need to specify that it is the responsibility of the researcher to determine the copyright holder and acquire permission to reproduce copyrighted material. More information can be found in the basic archival texts listed below.

Putting it All Together: The Collection Management Policy

It is very important to decide on specific procedures for appraisal, acquisition, arrangement, description, and reference that are appropriate for the size and type of your repository-and it is important to write them down in the form of a collections management policy. This way, everyone who works with the collections will know the correct procedures to follow. As you go through the rest of the lessons in this course, you will add various preservation procedures to your collection management policy as well.

[1] Society of American Archivists, "So You Want to be an Archivist: An Overview of the Archival Profession," available at www.archivists.org/prof-education/arprof.html.

[2] Mary Jo Pugh, "Information-Seeking in Organizations and Archives." *Cultural Resource Management* 21, no. 6 (1998): 10.

[3] Richard Pearce-Moses, "The Information Ecology of Archives." *Cultural Resource Management* 21, no.6

(1998): 29.

ASSIGNMENT:

Think about your repository's mission and collecting goals. If you do not already have one, draft a mission statement and collecting policy (this can be as brief as one or two paragraphs, to begin with). Once you have done this (or if you already have a collecting policy), consider your existing collections-do you have archival materials that do not fit your collecting goals? Make a list of those collections that do fit your goals and those that don't.

Sources of Information

Printed Resources

Ellis, Judith. Keeping Archives. 2nd. ed. Australia: D.W. Thorpe in Association with the Australian Society of Archivists, 1993. Available from SAA, www.archivists.org

Ham, F. Gerald. Selecting and Appraising Archives and Manuscripts. Chicago: Society of American Archivists, 1992. Available from SAA, www.archivists.org.

Miller, Frederic M. Arranging and Describing Archives and Manuscripts. Chicago: Society of American Archivists, 1990. Available from SAA, www.archivists.org.

Phillips, Faye. Local History Collections in Libraries. Englewood, CO: Libraries Unlimited, 1995. Available from SAA, www.archivists.org

Pugh, Mary Jo. Providing Reference Services for Archives and Manuscripts. Chicago: Society of American Archivists, 1992. . Available from SAA, www.archivists.org..

Schellenberg, T.R. "The Appraisal of Modern Public Records," in A Modern Archives Reader: Basic Readings on Archival Theory and Practice. Washington, DC: National Archives and Records Service, 1984. Modern Archives is available from SAA, www.archivists.org.

Yakel, Elizabeth. Starting an Archives. Metuchen, NJ: Scarecrow Press, Inc., 1996. Available from SAA, www.archivists.org

Online Resources

American Association for State and Local History (AASLH) at www.aaslh.org. *The professional association for historical organizations. Publishes a number of technical leaflets and reports on managing archives and local history collections.*

Bellardo, Lewis J., and Lynn Lady Bellardo. A Glossary for Archivists, Manuscript Curators, and Records Managers. Chicago: Society of American Archivists, 1992. Available from SAA, www.archivists.org.

Cultural Resources Management Online at http://tps.cr.nps.gov/crm/issueindex.cfm. *See the issues entitled **Archives at the Millennium** (Volume 22, No. 2, 1999) and **The Information Ecosystem** (Volume 21, No. 6, 1998) for a number of interesting articles (several are listed separately below).*

Daniels, Maygene F. (1984). Introduction to Archival Terminology. Available at www.nara.gov/arch/geninfo/terms.html. *A very basic glossary developed in 1984 by the then National Archives and Records Service (now National Archives and RecordsAdministration). An updated and more comprehensive glossary was published by SAA in 1992 and is cited above.*

Encoded Archival Description (EAD) Official Web Site. At http://lcweb.loc.gov/ead/ead.html. Provides background information, a summary of the EAD structure, and information about the EAD listserv, plus additional information. The EAD Document Type Definition (DTD) is a standard for encoding archival finding aids using the Standard Generalized Markup Language (SGML). The standard is maintained in the Network Development and MARC Standards Office of the Library of Congress (LC) in partnership with the Society of American Archivists.

Fox, Michael J., and Peter L. Wilkerson. Introduction to Archival Organization and Description: Access to Cultural Heritage. The Getty Information Institute, 1998. Available at www.schistory.org/getty. *"Provides an online introduction to the principles of organization and description used in archives. Includes links to resources for further archival training such as workshops, readings, professional organizations, archival education programs and conferences."*

MicroMARC for Integrated Format at www.msu.edu/user/msumarc *MicroMARC for Integrated Format is a microcomputer collections management system supported by Michigan State University for use by libraries, archives, special collections, museums*

etc. It utilizes the national descriptive standard, the USMARC Integrated Format, for the record structure and can import and export records to any other system using that format.

Minaret Software at www.minaretsoftware.com for information. *Minaret is also a microcomputer-based collections management system that uses the MARC Integrated Format and can import and export records.*

National Archives and Records Administration (NARA), at http://www.archives.gov/index.html. *The site includes technical information on preservation and archives.*

National Archives and Records Administration, Staff Information Paper Number 21 (1982). Intrinsic Value in Archival Material. Available at http://www.archives.gov/research_room/alic/reference_desk/archives_resources/archival_material_intrinsic_value.html.

National Park Service *Conserve O Grams*. http://www.cr.nps.gov/museum/publications/conserveogram/conserv.html Available as .pdf files.
19/1 (July 1993), Nathanson, David. "What Makes a Book Rare?" 19/7 (July 1993), Jordan, Anne. "Archives: Reference Photocopying".

National Union Catalog of Manuscript Collections (NUCMC), at http://lcweb.loc.gov/coll/nucmc/nucmc.html. *A cooperative cataloging program run by the Library of Congress. Designed for small organizations without the ability to catalog on OCLC or RLIN.*

Northeast Document Conservation Center
1/5 "Collections Policies and Preservation" by Margaret Child (1999)
6/2 "Surface Cleaning of Paper" by Sherelyn Ogden (1999)
6/3 "Repairing Paper Documents" by Sherelyn Ogden (1999)
6/4 "Relaxing and Flattening Paper by Humidification" by Mary Todd Glaser (1999)
Albright, Gary. "Removal of Damaging Fasteners from Historic Documents" (Rev. 03/99)

"Repositories of Primary Sources" Web site, maintained by Terry Abraham at the University of Idaho, at www.lib.uidaho.edu/special-collections *A listing of over 4500 web sites describing holdings of manuscripts, archives, rare books, historical photographs, and other primary sources for the research scholar.*

"Ready, 'Net, Go! Archival Internet Resources", maintained by Leon Miller at Tulane University, at www.tulane.edu/~lmiller/ArchivesResources.html . *Described as "an archival 'meta index', or index of archival indexes. That is, from here we refer you to the major indexes, lists, and databases of archival resources."*

"So You Want to Be an Archivist: An Overview of the Archival Profession," Society of American Archivists. Available at http://www.archivists.org/prof-education/arprof.asp.

Society of American Archivists (SAA), at www.archivists.org. *The national professional organization for archivists. The site includes a publications catalog and information on archival education and SAA annual meetings.*

Vogt-O'Connor, Diane. "An Archival Glossary for the Millennium." Cultural Resources Management Online, Volume 22, No. 02 (1999).

Vogt-O'Connor, Diane. "Archives-A Primer for the 21st Century." Cultural Resources Management Online, Volume 22, No. 02 (1999).

Walch, Victoria Irons, with contributions by Marion Matters. Standards for Archival Description: A Handbook. Society of American Archivists, 1994. *Available at www.archivists.org/catalog/stds99/index.html. Describes the standards available for use in describing archival collections. Designed as both an introduction for beginning archivists and a reference tool for experienced archivists.*

Acknowledgement

NEDCC wishes to thank Beth Patkus, Course Instructor, for drafting this lesson.

PRESERVATION 101:
An Internet Course on Paper Preservation

Northeast Document Conservation Center
100 Brickstone Square
Andover, MA 01810-1494
Telephone: (978) 470-1010
Fax: (978) 475-6021
http://www.nedcc.org

Last Modified: April 9, 2004

Links Updated: July 9, 2003

Lesson 3: Environmental Damage to Collections

A review of the nature of paper materials and their deterioration.

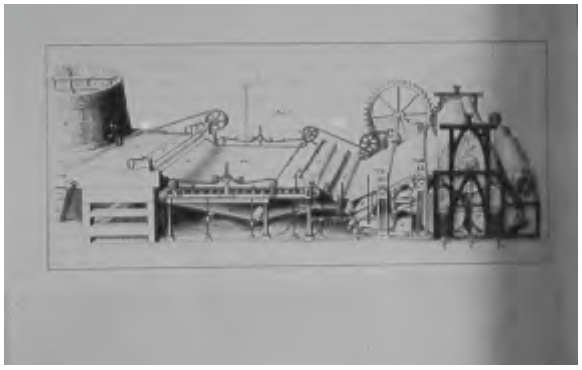
Course Content
Course Home

The Nature of Paper Collections
Self-Testing Question 1
Environmental Causes of Deterioration
Biological Causes of Deterioration
Self-Testing Question 2
Mechanical Causes of Deterioration
Assignment
Printed Resources
Online Resources

In this session, we will review the basic causes of deterioration in more detail, and start you thinking about the specific hazards facing your own collections. We will cover solutions to collections care in more depth in the fourth course session.

The Nature of Paper Collections

The best way to begin to understand how to care for collections is to understand the nature of the materials themselves, their history, technology, and manufacture. Conservation professionals have a scientific basis of knowledge and are devoted to the preservation of collections. They spend many years studying the properties of collections materials and perfecting their examination and treatment skills. Knowing how something is made and learning to identify various types of damage and their possible causes, forms the basis of sound and sympathetic preservation or conservation intervention.



Paper and board are by far the most common material found in library, archives, and records collections. Papermaking was primarily a hand process until the development of the Fourdrinier papermaking machine, which was put into operation in 1804. Machine paper is formed on a continuous roll, or web, rather than sheet by sheet using a mold, but is made with the same ingredients as

Graphic depiction of an early papermaking machine.

hand-made papers.

Cellulose, the most important ingredient in paper, is composed of hydrogen, carbon, and oxygen. It is a stable polysaccharide that serves as the structural element for plants, forming the walls of plant cells. Besides cellulose, plant fibers contain sugars, starches, carbohydrates, and lignin (a naturally occurring organic acid). Early paper made from materials such as linen and hemp was relatively stable and durable.

Unfortunately, the quality of paper has steadily declined since the late 18th century, primarily due to increased demand, which forced greater mechanization and resulted in poorer quality paper. For example, between 1600 and 1800 changes were made in ways of beating the pulp, resulting in a paper sheet with less strength. Also, bleaching chemicals (such as chlorine) were increasingly used to improve the brightness of the page. Residual chemicals such as this could cause the paper to become prematurely acidic.

Conservators generally consider the period from 1850 to the present to be the era of "bad paper". This is primarily a result of the increased use of alum-rosin sizing, and the use of plentiful softwood to make paper pulp. Alum, an agent added to help precipitate the rosin during in-the-vat sizing, produces sulfuric acid as it degrades, contributing to paper deterioration. Lignin is found in greater amounts in groundwood than it is in fibers such as flax or hemp. Lignin is not only acidic, causing the paper to become weak and brittle, but upon exposure to light it reacts with other compounds in the paper, causing the paper to darken. Most paper made with unpurified groundwood pulps (e.g., newsprint) have a life expectancy of less than 50 years. Note that fine quality materials also deteriorate over time, but are more chemically stable and have a longer life expectancy if stored and handled correctly.

Inherent vice, heat, light, high RH, and perhaps damage from pests can cause such extensive damage that conservation treatment will be required.

One important way that librarians and archivists have tried to reduce the magnitude of the "brittle paper problem" is to produce new documents or publications using permanent paper. All collections managers should use permanent paper when creating records that will be retained over the long term, and when making photocopies for preservation purposes. Records managers in particular can make an important contribution to the long-term preservation of archival documents by creating them on permanent paper. "Why Collections Deteriorate: Putting Acidic Paper in Perspective," an article by E. McCrady (online at

palimpsest.stanford.edu/byorg/abbey/ap/ap01/ap01-4/ap01-407.html) provides a brief history of acidity in paper and the rise of permanent paper.

A standard for permanent paper was developed during the 1980s because of demands by interested parties. More paper producers started manufacturing alkaline paper, and more books were printed on good paper for the first time in over 100 years. Permanent paper is defined by ANSI/NISO Z39.48-1992 (R1997), "The American National Standard for Permanence of Paper for Publications and Documents in Libraries and Archives." Free copies have been made available from NISO (National Information Standards Organization) as .pdf files at www.niso.org/standards/resources/Z39-48.pdf. The standard defines permanent paper as having a 2% minimum alkaline reserve (to make it more chemically stable), less than 1% lignin, good tear resistance (a measure of durability), and a pH of 7.5 to 10.0.

There are several ways to ensure that you are purchasing permanent paper:

- ask the manufacturer if the paper conforms to the standard;
- check to see if the stock you have purchased is alkaline by testing it with a pH indicator pen (Abbey Publications and some conservation suppliers sell these pens);
- check the publication "North American Permanent Papers", which lists companies and specific papers that comply with the standard. Note that you should never use pH pens to test collection materials; since the mark is permanent they should only be used to test storage materials.

Can you think of some other solutions for preventing "inherent vice" from becoming a problem in your collection?

Self-Testing Question 1

Which of the following are examples of ways to overcome the problem of "inherent vice"?

- ☐ Conservation treatment, such as water washing and deacidification.
- ☐ Reformatting thermal fax papers by photocopying onto permanent paper.
- ☐ Moving deteriorating film collections into cold storage.
- ☐ All of the above.

Submit

Environmental Causes of Deterioration

Ideally, an archives, library, museum, or historical society should provide environmental conditions that in no way accelerate the deterioration of material in its care. This section of "Preservation 101" will outline risks and basic strategies for combating them. They are generally associated with temperature, relative humidity, light, and pollutants, because each of these elements affects the rate of deterioration. Lesson Four, "Solutions to Collections Care", will go into more depth regarding control of conditions. Of course, achieving the best environmental conditions can be difficult and expensive. It is all the more important, therefore, to keep in mind that every step you take toward improving the environment will benefit the collection. Make a start—however small—to upgrade, and don't give up!

Temperature and Relative Humidity

In the past, environmental standards for collections were dictated primarily by the requirements of human comfort. Research now indicates that cooler temperatures are preferred for collections with long-term value. Generally speaking, heat accelerates deterioration. The higher the temperature the more rapidly your collections will deteriorate. In fact, the rate of most chemical reactions is doubled with an increase of 18 degrees F. In other words, a rule of thumb might be "the lower the temperature, the longer the life."

It is easiest to achieve and maintain cool conditions by storing your collection in a dedicated storage area, segregated from research use. Mixed use storage areas should be kept below 70 degrees F. If your collections are stored separately from use areas the temperature can be brought down further; 65 degrees F or less is preferable. However you control temperature in your building, you should work to maintain the same conditions, 24 hours a day, 7 days a week, 365 days a year. Your system should never be shut off at night, or on weekends and holidays. This will reduce the rapid daily fluctuations in temperature that are very harmful to collections. Try to maintain the temperature at ± 5 degrees F daily and monthly. Also keep in mind that materials that are already in poor condition can be stabilized by freezing or storing at extremely low temperatures—but you must be able to maintain those conditions under controlled humidity.

Relative humidity is defined as the amount of moisture that the air is holding at a given temperature, compared to what it could possibly hold (absolute humidity).

On a warm day air expands and can hold a great deal of moisture; as the temperature drops overnight air cools until it reaches its dew point, and at this point excess moisture condenses. As a general rule, for a given volume of air, the RH rises as the temperature drops.

High humidity allows chemical reactions requiring water to occur. This is known as hydrolysis. The more moisture there is in air, the more quickly these reactions proceed, causing faster chemical deterioration. Most paper collections are best stored at an RH of 20% - 40%.

Uncontrolled humidity levels can also cause mechanical damage. Most materials expand and contract with small changes in RH. If conditions are too humid, materials will swell and warp, resulting in cockling and other physical distortions. These dimensional changes weaken physical bonds and set up stresses that can shorten the life of most materials. If conditions are too dry, materials will become brittle and more susceptible to cracking, particularly during handling. Bookbinding adhesives and book leathers are good examples of materials that suffer at low RH. Mold and many insects also flourish under hot and humid conditions. See the section on Biological Causes of Deterioration below for more information about mold and pests.

Always keep in mind that temperature affects relative humidity: if temperature is increased, air can hold more moisture, and vice versa if temperature is decreased. Without proper control of temperature levels this can mean significant fluctuations in your RH levels.

Light

Here are some basics about the nature of light, and how it damages library, archives, and records collections. Essentially, light energy, in the form of waves, is absorbed by molecules within an object. This absorption starts a variety of chemical reactions which have the potential to damage paper, known as photochemical reactions.

Visible light is part of the electromagnetic spectrum between 400 and 760 nanometers (violet to red). Shorter wavelengths of light such as UV light (which falls below 400 nanometers) have a greater frequency (the waves occur closer together) and have more energy than longer wavelengths. They bombard an object with more energy in a shorter time and so cause photochemical deterioration to accelerate. This is why UV light is more damaging than visible light. Infrared light (IR), above 760 nanometers, can cause heating, thermal expansion, and spot desiccation. UV and IR do not improve our vision: they only increase the damaging effect of light and need to be reduced (or eliminated) wherever collections are stored or exhibited.

Practically speaking, light causes paper, bookbindings, and many media (such as inks and dyes) to fade, yellow, or discolor. Light will weaken and embrittle

paper fibers, textiles, and leather. While many people are already aware that high frequency UV energy is destructive, it is important to remember that all light (including visible light) is damaging. For example, in addition to causing fading, heat from incandescent lamps and direct natural light can also cause rapid and intense heating of collections, accelerating the rate at which materials age. Collections must therefore be protected from excessive exposure to visible light, as well as the UV component. Light exposure during exhibition of collections is particularly problematic. Light levels should be as low as 50-75 lux for sensitive materials such as textiles, paper, and dyed leather. Exhibition lighting is often much higher than that, so a few minutes may be needed for your eyes to adjust to the lower level. Another common problem is long-term exhibition, where collections become permanently yellowed and/or faded. Remember, the effects of light are cumulative and irreversible!

Although slightly technical, we suggest that those of you who are actively exhibiting sensitive collection materials review Karen M. Colby's article, "A Suggested Exhbition/Exposure Policy for Works of Art on Paper," available at www.lightresource.com. Select "Features - Articles, Products and the Archives," then scroll down to the paragraph that starts with "The degradation of works of art due to their exposure to light…"

Pollution

Airborne contaminants in the form of gases and particulates can jeopardize the preservation of collections. It is important for you to control not only external contaminates, but indoor pollutants as well.

For repositories in urban areas, gaseous pollution from sources such as industrial discharge, motor vehicle exhaust and other combustion products can be a serious concern. Gaseous pollutants can also originate indoors, given off by common substances such as paint, cleaning supplies, untreated wood, and certain kinds of adhesives and plastics. Photocopiers give off ozone, known to be an initiator in chemical reactions that cause deterioration of collections. Typically, gaseous contamination is filtered from outside air using granular adsorbing agents, such as carbon. Internal contaminants can be controlled by careful use of materials that have been tested for safety.

Particulate pollution is also a great concern. Particulates come in the form of tiny solids – grit, grime, smoke, dust – which originate largely in industrial processes, vehicle engines, wood-and coal-fired heating systems, smoking and cooking. They are generally abrasive and acidic, and often highly reactive chemically. To control particulates, it is important to minimize activities which generate particulate debris near collections (e.g., cooking), keeping the building as clean and dust free as possible, and, if possible, having an effective filter system. For example, in addition to a furnace filter, you will likely need a pleated 1" to 2" filter, as well as a high performance final filter in order to reduce particulate debris to an acceptable level in collections areas.

Although slightly technical, further information on pollutants and advice for preventing damage can be found at http://iaq.dk/papers/iada1999.htm, "Pollution in the Photographic Archive- A Practical Approach to the Problem" by Morten Ryhl-Svendsen © 1999 (May 2, 2001). More information about cleaning will be delivered in Lesson 5: Housekeeping, during week three of this course. Jean Tétreault's article "Display Materials: The Good, The Bad, and the Ugly" (at http://iaq.dk/papers/good-bad-ugly.htm, [May 2, 2001]) is also very interesting and should assist you with choosing the right materials for constructing exhibition cases.

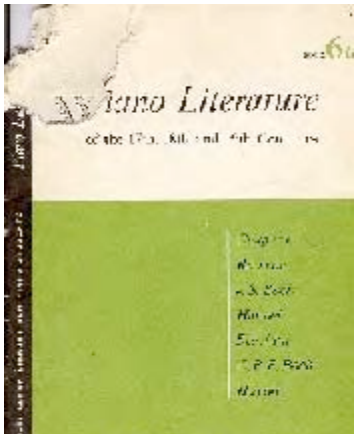
Biological Causes of Deterioration

Mold and pests (rodents, insects, small mammals) can cause serious, often irreparable damage to paper materials. It is important to learn to identify conditions that are conducive to infestation, and take measures to prevent and control problems before they become widespread.

Insects and Rodents

There are an estimated 6 million species of insects, making up the majority of living creatures on Earth. More than 70 different species have been identified as enemies of paper. The most common species affecting library and archives material are silverfish and firebrats, psocids (booklice), and cockroaches.

Many insects are attracted to dark, small, seldom-disturbed spaces, where significant damage can be done before the problem is discovered. Most insects are not attracted to the paper, but rather to sizing, adhesives, and starches; these are much more easily digested by insects. However, some insects will attack cellulose (paper and cardboard), as well as protein (parchment and leather). Insect damage is caused not just by eating, but also by tunneling, nesting, and bodily secretions. Of course rats, mice, squirrels, birds, and other small animals can also cause significant damage to paper collections. Rodents especially are attracted to environments that are dark, wet, dirty, cluttered, and undisturbed.



It is always best to control pests by targeting the source of the problem, i.e., the conditions that allow pests to enter and infest a facility. This strategy is known as integrated pest management, and emphasizes ongoing maintenance and housekeeping to ensure that pests will not find a hospitable environment.

You may wish to do a survey of your building and ask:

- Have there been pest problems in the past?

- What type of pests and which materials were affected?
- What was done to solve the problem?
- Are there potential insect habitats in your facility? In storage areas?
- How can rodents or insects enter my facility?
- Are incoming materials routinely inspected and quarantined?

You may discover problems that you didn't know existed, or you may recognize the potential for infestation, a risk that can be avoided if you start now to improve the environment, clean and reorganize storage spaces, and seal routes of entry.

Self-Testing Question 2

Which of the following activities could be part of an integrated pest management program?

- A. Emptying the trash every night before closing.
- B. Placing ant bait along baseboards.
- C. Using sticky traps to monitor for pests.
- D. Installing fine screens on all windows that open.

Submit

Mold

Mold spores are everywhere. Mold and mildew are types of fungi, microorganisms that depend on other organisms for sustenance. There are over 100,000 known species of fungi. The great variety of species means that patterns of mold growth and the response of mold in a particular situation can be unpredictable.

In their dormant state, low populations of most spores pose little threat to the general health of people or collections. However, if humidity

levels are high (70% RH or higher), or if collections get wet from flood, leaks, seepage, etc. and the moisture goes unchecked for more than a couple of days, mold growth is inevitable. Other factors that contribute to mold growth in the presence of moisture are high temperature, stagnant air, and darkness.

stains from mold damage

Molds excrete enzymes that allow them to digest organic materials such as paper and book bindings, altering and weakening those materials. In addition, many molds contain colored substances that can stain paper, cloth, or leather. It is important to realize that mold can be dangerous to people and can in some cases pose a major health hazard. Mold outbreaks should never be ignored or left to "go away on their own."

The best way to prevent mold growth is to control humidity levels in all areas where collections are stored, and to keep the temperature moderate. It is important to identify water hazards in your building (such as damp basement walls, leaky roofs, dripping pipes, etc.) in order to prevent water emergencies from occurring. An up-to-date disaster plan will help you respond effectively to an emergency, and to avoid mold damage if collections materials do get wet. It is also important to keep collections as clean as possible.

Photograph of wet books in library

Mechanical Causes of Deterioration

Mechanical damage to collections can be caused by a range of events, including vandalism, earthquakes, fire and water damage, careless handling, improper support during storage, and inadequate packaging for transport. These direct physical forces are extremely likely to result in damage, so every effort must be made to protect collections from physical harm.

Poor storage and handling can cause significant damage. Examples of damage include breaks, damaged edges, splits, tears, losses, and crumpling. Careless handling by researchers and staff can also be a problem. It can result in spilled liquids (and staining), marks from unclean hands, or ballpoint inks transferring from one work surface to another, potentially causing

permanent disfigurement and damage. Photocopying is another instance where fragile books and documents are damaged, more from rough handling (such as forcing books face down onto the platen) than by light.

Damage and deformation can be caused by:

1. improperly stacked book carts
2. poor shelving practices
3. poorly considered rolled storage systems
4. overfull cabinets
5. and furnishings or enclosures (envelopes, folders, boxes, frames, etc.) that do not provide adequate physical support

With a bit of forethought and common sense, however, proper handling skills should become routine. For general guidelines, see Care and Handling: General Guidelines, by Karen E.K. Brown.

It is also important to identify any risks to your building and collection due to lack of security, exposure to fire, or water hazards. Too often, inadequate staffing means that researchers are left alone to work with collections, resulting in loss of materials or vandalism. Many institutions have several entrances and exits that cannot all be monitored, making it easy for collections to be removed from the building. Fire and water are a different type of hazard, but can also result in loss or permanent damage (heat, soot and smoke damage, charring, mold, staining, or distortion). Fire can destroy collections; water damaged materials can often be salvaged, but they will never be the same. Storage in basements or in close proximity to water pipes makes collections vulnerable to water damage; the presence of fire hazards and the lack of fire detection and suppression systems allow fires to start and spread easily.

While the risk of damage from security lapse, or from fire, or water may seem remote, and damage due to poor storage and handling may not be immediately obvious, it is important to realize that these are real hazards to your collections. More information on emergency preparedness will be presented in Lesson 6.

ASSIGNMENT: Take a walk through one space where collection materials are used or housed and list 5 problems

that put your collection at risk. For each problem write down a couple of possible solutions. What actions can you take immediately to prevent or reduce damage to the collection? What recommendations might require more time or resources? Plan to make one small improvement that is low- or no cost to implement that would benefit your collection.

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PRESERVATION 101:
An Internet Course on Paper Preservation

Northeast Document Conservation Center
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Andover, MA 01810-1494
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Fax: (978) 475-6021
http://www.nedcc.org

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Lesson 4: Solutions to Collections Care

Practical methods of improving the storage of paper collections

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Storage, Care and Handling
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Monitoring and Controlling Temperature and Relative Humidity (RH)

Vault storage (as opposed to mix use areas) can allow storage at colder temperatures and enhance security.

As we noted in the last section, favorable environmental conditions have a profound positive effect on the longevity of every item in your collection. A benign environment with carefully controlled and stable temperature and relative humidity levels is generally agreed to be the single most important factor in extending the life expectancy of documentary materials of all types. High temperatures, very low or very high relative humidity levels, uncontrolled light, and repeated large rapid changes cause the most damage to cultural collections. Obviously, it is very important to know whether or not your climate control system is maintaining the desired conditions. This is true whether a centralized HVAC system or stand-alone air conditioners and dehumidifiers are used. Since our subjective impressions of climate levels tend to be inaccurate, it is essential to monitor the climate using an independent monitoring instrument.

Monitoring

Monitoring means measuring the temperature and RH, either constantly or at scheduled intervals, at a particular time and place. Monitoring is the only accurate way to recognize when and if you have a problem. It will also help you determine whether or not your system is working properly. For many of you, generating a record of measurements manually, mechanically, or from electronic data will be an essential first step. It will help you understand conditions in your facility and allow you to consider options for correcting problems. Records kept over the course of a year can be used to demonstrate existing conditions to others and can help in lobbying for permanent environmental improvements.

Some monitoring devices can be used to report immediate conditions ("snapshot" monitors), while others are designed to create an ongoing log of environmental conditions. Remember that

manual measurements and record keeping are limited to times of the day when a responsible party is actually on-site to note conditions. If you want to establish overnight or weekend conditions, an automatic recording device is essential. Examples of "snapshot" monitors include thermometers, dial hygrometers, indicator strips (useful in sealed exhibit cases), sling, motor-driven psychrometers, and "min/max" digital thermohygrometers. Automatic recording devices include the familiar recording hygrothermograph (creating a mechanical record of conditions on a chart, usually wrapped around a drum), and dataloggers, a battery-powered instrument about the size of a deck of cards. Both automatic devices are very good, but note that electronic data can be easier to manipulate and interpret. The data from most loggers will need to be downloaded to a computer before the conditions can be read, although some have a LC (liquid crystal) display.

A sling psychrometer is relatively inexpensive but is not as accurate as a motor-driven model

Digital display thermohygrometer

The environmental record might show that some areas in a building are damper, drier, warmer, or cooler then others, perhaps affecting the location of future collection storage places. It might show whether adjustments need to be made to a central HVAC system. It could show that conditions are very bad, or in fact very good, or if there is a season during the year when the use of local climate control equipment should be considered.

For further details on the types of monitors available, as well as ordering information, see NEDCC's technical leaflet "Monitoring Temperature and Relative Humidity." See also Tim Padfield's article, "Dataloggers for Climate Measurement in Museums and in Transport Cases", at http://www.natmus.dk/cons/tp/datalog/datlog1.htm.

Self-Testing Question 1

The data from hygrothermographs must be replotted by hand for analysis.

- ☐ True
- ☐ False

Submit

Controlling Temperature and RH

The National Information Standards Organization (NISO) has issued a technical report entitled "Environmental Guidelines for the Storage of Paper Records." This publication recommends temperature and relative humidity values for storage of paper records in libraries and archives:

Situation	Temperature	Relative Humidity
Combined stack and user areas	70 ° F maximum*	30-50% RH**
Stacks where people are excluded except for access and retrieval	65 ° F maximum*	30-50% RH**
Optimum preservation stacks	35-65° F***	30-50% RH**
Maximum daily fluctuation	± 2° F	± 3% RH
Maximum monthly drift	3° F	3%

* These values assume that 70° F is about the minimum human comfort temperature for reading and 65° F the minimum for light physical activity. Each institution can make its own choice.

** A specific value of relative humidity within this range should be maintained ± 3%, depending on the climatic conditions in the local geographic area, or on facility limitations.

*** A specific temperature within this range should be maintained ± 2° F. The specific temperature chosen depends on an organization's willingness to invest in the long-term preservation of its records.

- from "Environmental Guidelines for the Storage of Paper Records", p. 2.

Achieving these values can be difficult, even in a new building that has been designed and constructed for the express purpose of storing collections with long-term value. Whether you are planning new construction, renovation, system upgrades, or local corrective action, every effort should be made to achieve reasonable temperature and humidity levels, and to keep fluctuations to a minimum. ±5°F or 5% RH is certainly acceptable, as long as you keep conditions below the listed maximums.

Central Systems

The purpose of a heating, ventilating, and air conditioning (HVAC) system is to establish and maintain relative humidity and temperature, to filter the air for particulates and offending gases, and to perform these tasks throughout a specified area. Architectural and building design features (such as windows and vapor barriers) and building operation practices (24-hour systems and the availability of heating and cooling) must complement these purposes. Good air circulation is critical, but untreated outside air should be minimized. Add-on filtration systems are available for larger systems to control both particulate and gaseous contamination. Portable room

filters for both gaseous and particulate contamination can be considered in areas that are segregated from the entire system. Add-on residential systems are also effective, but they will only treat for particulates. Regardless of the system you choose, it is important to change filters regularly.

A chart-recording hygrothermograph. The horizontal arms hold pens that draw a line recording temperature and humidity on a chart held around the drum.

Heating and cooling are necessary, but a stable RH is also important. In most buildings in the Northeast, mechanical systems for both humidification and dehumidification are required to maintain the specified RH and must include a reheat capability when cooling is required. Air conditioning equipment alone does not usually provide adequate humidity control.

Whether you are considering central system installations, upgrades to an existing system, or a new building altogether, you will require the assistance of an environmental engineer and/or architect to study the project and provide reasonable options. In any case, staff and administration involved in planning should familiarize themselves with materials listed in "Preservation Concerns in Building Design: Select Bibliography". An invaluable publication highly recommended for guiding a library construction project is Conservation Environment Guidelines for Libraries and Archives by William P. Lull, with the assistance of Paul N. Banks (Ottawa: Canadian Council of Archives, 1995). [1] This book discusses building systems, cost trade-offs, responsible compromises, and steps in the planning, design, and construction process. It should be read and understood by staff, the architect in charge of the project, and the systems engineer prior to the final design phase.

Low-Cost Climate Control Options

Not everyone has a central environmental control system. Even if the need for better control is demonstrated, existing resources may mean that only local control is an option; the installation of a central HVAC system will depend on long-term planning, if it is possible at all. Planning for renovation or new construction that will deliver suitable environmental conditions requires adequate resources and careful preparation. Many institutions will need to implement immediate low or no-cost actions. For example, they might move particularly valuable and endangered materials such as deteriorating photographs to temporary storage where better environmental conditions can be provided. This will buy some time to begin the long process of:

1. considering the technical requirements of the building project,
2. raising the money, and
3. eventually doing whatever is needed to improve the environment permanently.

The first thing to consider when making environmental improvements is the building itself--maintaining it in sound condition so that it excludes the elements. "Letting the outside in" can contribute to the deterioration of collections, but also to the deterioration of the building itself. Look for air leaks around windows, doors that don't close properly, and dampness in the basement. Simple repairs and regular maintenance can make a big difference. Improvements can be made by adding weather stripping around doors and windows, insulating the attic, or installing storm windows. Simply wrapping steam and hot water pipes with insulation can minimize the effects of these localized, intense heat sources.

Other improvements include reorganizing your space. Move vulnerable collections out of damp basements or hot attics, and away from exterior walls. Rearrangement can improve air circulation and help maintain a uniform temperature and humidity throughout the space. Remove collections from beneath overhead water sources, away from heat registers, and out of direct light. And don't store anything on the floor! The most sensitive or fragile materials should be stored in a

space where the conditions are most stable. Can you identify this space in your building?

Local use of humidifiers and dehumidifiers can make a significant impact on keeping conditions stabilized. The first priority for a heated space is to provide humidification in winter. The unit is best piped into a constant clean water source, and should have a humidistat. Dehumidifiers can be used in enclosed spaces and should be self-draining. Local controls like these require staff vigilance to operate the equipment and rely on a good environmental monitoring device to regulate proper conditions.

Finally, you should know that using paper enclosures and cardboard boxes effectively creates a microclimate around collection materials, buffering them from sudden changes in the temperature and humidity. A properly fitted enclosure will also help keep out dust and pollutants.

As always, it is critical to remember that temperature and RH are intimately related, and that correcting one factor may alter the balance of the other. Remember that as the temperature increases the relative humidity drops, and vice versa. So, if you suddenly start cooling your storage area in summer, make sure you can control the humidity as well!

Measuring and Controlling Light

The most effective way to protect collections from light is to keep them in the dark. Since this isn't always possible, staff must compromise to provide the minimum amount of light necessary for the required function, such as exhibition, research, or navigating one's way through the stacks. Be aware that both natural light and lamps emit various types of illumination, some high in UV, some low, and with differing color characteristics. Be sure to ask the supplier or manufacturer to give you specifications describing their lamps, including color information and energy efficiency. The light that you allow into research and storage areas should be appropriate for the tasks being performed, with a minimum of risk to the collection. Each institution should develop guidelines and implement them to control light where collections are used or stored.

Light can be measured with a visible light meter that measures light in units of lux or footcandles; a separate UV meter will likely be required to measure UV energy in microwatts per lumen. Some UV meters can also measure visible light by changing detectors. A 35mm camera with a manual light meter can also be used to measure visible light levels, as described in the NEDCC technical leaflet "Protection from Light Damage". This leaflet goes into more detail about the nature of light, monitoring light, and methods of controlling both UV and visible light.

UV meter

Controlling UV light depends on eliminating or filtering sources of light with a high UV component (e.g., natural daylight and some fluorescent lamps). Natural light should be blocked completely from storage areas. If this is not possible, light should be filtered to reduce intensity, radiant heating (IR), and UV energy. UV filtering film can be applied to windows. Blinds, shades, or heavy curtains will control UV, visible light and IR. Low-UV fluorescent lamps should be used indoors; alternatively, filtering sleeves can be purchased to place over regular fluorescent lamps. Lights should be turned off when storage areas are not in use, and light levels should be kept as low as possible.

Incandescent lights use tungsten lamps. Most are low in UV energy, but can be quite hot, with low energy efficiency. Tungsten has a pleasing color, even at low wattage. Tungsten-halogen lamps are used for bright lighting in gallery spaces, and can have a much higher UV component, which should be filtered. Incandescent lights should never to used to "spotlight" fragile materials, as localized heat energy and fading can occur. Always use the lowest wattage bulbs appropriate for a given function.

Light levels of 200 to 600 lux are required for comfortable vision

in study and inspection areas; storage areas can be as low as 10 to 50 lux. When very sensitive materials (such as textiles, paper, and dyed leather) are exhibited, light levels should be as low as 50 to 75 lux; moderately sensitive materials (like parchment) can be exhibited at levels up to 150 lux. Paper and books should never be on permanent display. One guideline is to keep the annual exposure to 4 weeks, or 12,000 lux hours, assuming 75 lux and 40 hours a week of exposure. Photographs or other facsimiles should be used for those items in your collection that are very sensitive or frequently exhibited.

Any reduction of light reduces long-term damage. Awnings and outdoor plantings can help to block natural light. Boxing or placing materials in folders and drawers will also protect them. Finally, rearranging space might keep light from falling directly on your collection.

Self-Testing Question 2

Limited exposure to a high-intensity light will produce the same amount of damage as long exposure to a low-intensity light.

- ☐ True
- ☐ False

Submit

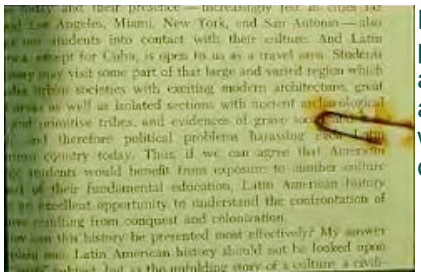
Storage, Care and Handling

Storage Enclosures

Photo of a custom-made mat storage container

Storage enclosures for books and flat paper should be made of materials which are durable (strong) and chemically stable (permanent). Damage such as yellowing, discoloration, or embrittlement can result from direct contact with acids produced by poor quality storage materials. Examples include mat burn, staining of book pages from acidic inserts, and broken photographic print mounts. Although all organic storage materials deteriorate over time, acid-neutral boxes, folders, envelopes, book marks, mat boards, and backings will last much longer than others, and are less likely to damage the objects they are "protecting". Paper enclosures with alkaline buffers will have an even longer life span. The standard for permanent paper discussed in last week's session (ANSI/NISO Z39.48-1992 [R1997]) can help guide you in selecting papers for storage or publication.

Plastic enclosures made of polypropylene, polyester, and polyethylene are generally safe to use for storing paper collections. However, evidence has shown that storage in plastic can accelerate deterioration by trapping acidic by-products of decay. Washing and alkaline washing before storage in plastic is preferred. Plastic sleeves can allow both sides of a paper to be viewed without touching the original, thus protecting from finger oils. They also provide additional support during handling. The choice of paper vs. plastic enclosures can be a compromise between protecting against handling or chemical damage. You should make sure plastics are free of stabilizers, UV inhibitors, and dyes that can damage materials over time. Never use plastic if the media is flaking or friable, as with charcoal or soft pencil.



Finally, avoid the use of metal fasteners such as paper clips or pins and rubber bands, and never use pressure-sensitive adhesives (including tape and Post-it Notes) on or near archival materials. If possible, remove damaging attachments when processing newly acquired collections (as long as they do not have value as part of the object itself).

Care and Handling

As we have seen, artifacts are easily damaged by poor or improper handling. Every effort should be made to ensure proper handling. Researchers should be supplied with instructions and supervised at all times when using the collection. Staff, too, need to learn better ways of handling and regular training should be provided for new staff. Restricting food and beverages, pens, smoking, and clutter in work areas can reduce damage to original materials. Every time staff handles collections materials, they need to ask themselves:

Food and beverages should be restricted from work areas

- Do I have a valid reason for picking this up?
- What is its condition?
- What is the safest way to hold it?
- Is it too fragile to lift without a secondary support?
- Are my hands clean? Should I wear gloves?
- After I have lifted the object, where will I set it down again?
- Is a second person needed to assist? Is a cart or trolley needed?

General guidelines from the previous lesson should also be reviewed to help you improve your handling practices.

It is important to make sure that storage furniture is made of safe, permanent materials, and that its use benefits the care and preservation of the collections it is meant to protect. Storage furniture should not contain chemicals, colorants, or acids that can damage your collection; you should be sure that storage units can support the full weight and dimensions of an object as well. The finish on shelving and cabinets should not contribute to chemical deterioration, nor should the structure have rough surfaces, projections, or sharp edges that might cause damage. The best finishes are baked enamel or powder-coated stainless steel. Wood will off-gas pollutants such as formaldehydes that can damage your collection. To some degree the wood can be sealed, but to do it well may be complicated and expensive. The storage area, too, should be assigned in such a way to allow for easy access and safe movement of collections.

See the technical leaflets "Storage Methods And Handling Practices", and "Storage Furniture: A Brief Review Of Current Options", for more detailed information on proper storage and handling of paper collections.

Disaster Planning and Security

The advantage of disaster planning is that it does not require a large commitment of resources—a moderate investment of staff time can bring a valuable return. The most basic protections are relatively low-cost. Try to enclose collections in good quality folders and boxes, store them at least 4" above floor level on shelves or pallets, and avoid storing them in areas vulnerable to flooding or below water or steam pipes, lavatories, mechanical air-conditioning equipment, or other sources of water. If storage in such areas is necessary, inexpensive water alarms can be used to warn you of problems—but remember that these must be monitored 24 hours a day to be effective. The best insurance against water damage is regular inspection and maintenance of your building's roof, gutters, drains, etc. Experience has shown us that well-maintained buildings are less prone to small emergencies like leaky pipes, and that they are more likely to survive in large disasters such as hurricanes, tornadoes, or earthquakes.

Fire protection is somewhat more complex since it depends largely on the installation and maintenance of heat and smoke sensors and fire suppression systems that are monitored 24 hours a day by the local fire department or other central alarm service. Modern wet-pipe sprinkler systems are increasingly recommended, due to their relative low cost, ease of maintenance, and dependability. But even if you do not yet have such systems, make sure that your institution is equipped throughout with portable fire extinguishers, that they are inspected annually, and that staff members are trained to use them (this is harder than it might seem!). You can (and should) eliminate existing fire hazards and hold regular fire drills.

Producing written policies is essential to disaster planning. If you do not have a written building maintenance schedule, work with your facilities staff to put one together. An ongoing log of building problems can also be helpful in tracing the history of a particular problem. Most importantly, prepare a written disaster plan for your institution. This should begin as a basic document that addresses the most likely emergency you might face.

Unfortunately, security must also be a concern in preservation of collections. If you do not have an automated security system that is monitored 24 hours a day, do your best to ensure that the building is well-secured, especially when it is closed to the public. Of course, security is also important during working hours. Distribution of building keys and keys to areas where special collections are kept should be limited, and use of collections by researchers must be carefully controlled. To the extent possible, monitor researchers, and keep records of collection use. At a minimum, researchers should be required to sign in and provide identification before using special materials.

Lesson 6 will explore emergency planning and prevention, and collections security in further detail.

Reformatting

Reformatting by microfilming or by photocopying onto permanent paper is well-suited to paper collections that are

valuable only for the information they contain, (e.g., deteriorating newspapers). Reformatting can also provide a surrogate copy so that fragile originals are protected from unnecessary use. Properly-produced and properly-stored preservation microfilm has a lifespan of about 500 years. In most cases, preservation microfilming is contracted out. If microfilming is selected as a preservation strategy, be sure to develop standards for the production of preservation microfilm and include them in service contracts. More information about preservation microfilming can be found in "Microfilm and Microfiche" on the NEDCC Web site.

Quality control inspection of master microfilm will help ensure your copies are complete, fully readable, and chemically stable

In-house photocopying onto permanent durable paper is an excellent way to preserve acidic paper materials such as news clippings. Paper used for preservation photocopying should meet the ANSI Z39.48 1992 [R1997] standard for paper permanence, and the NARA guidelines by Norvell Jones for preservation photocopying should be followed (see Sources of Information , below). A number of facilities specialize in facsimile reproduction of brittle books on buffered paper. Some of them are listed in "Resources for Facsimile Replacement of Out-of-Print and Brittle Books" on the NEDCC Web site.

Finally, a word about digitization. Many collections managers, particularly those in small institutions, have been confronted with a member of the Board of Trustees who asks, "Why don't we just buy a scanner? Then we wouldn't have to worry about preservation." The short answer is that while digitization is an excellent tool for researcher access, it is not yet considered an archival medium. As digital imaging evolves, and its potential as an access tool is carefully studied, a gradual partnership with preservation microforms is envisioned by the preservation community.

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[1]Out-of-print. This may be available through your local library.

ASSIGNMENT: Select a small, discrete group of materials in your collection that would benefit from rehousing, then read the NEDCC leaflet "Selection of Suitable-Quality Storage Enclosures for Books and Artifacts on Paper." Order a couple of archival supply catalogs (using the list Archival Supplies & Equipment - Supplies at www.nedcc.org/supsup.htm) and familiarize yourself with the range of storage products available. What types of enclosures would you select to rehouse your collection? Why?

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PRESERVATION 101:
An Internet Course on Paper Preservation

Northeast Document Conservation Center
100 Brickstone Square
Andover, MA 01810-1494
Telephone: (978) 470-1010
Fax: (978) 475-6021
http://www.nedcc.org

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Lesson 5: Housekeeping

The importance of keeping our collections clean and tips for doing so safely

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Tools of the Trade
Personnel
Cleaning the Building
Cleaning General Book Collections
Cleaning Individual Paper-Based Objects in Storage and on Display
Assignment
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Housekeeping as Preventive Conservation

The practice of good housekeeping is probably the most simple and inexpensive method of preventive conservation for any type of collection. Housekeeping will keep debris from gathering on and around objects in your collection. By keeping collections clean, you reduce the risk of damage from abrasion, reduce the risk of pest infestation, and greatly reduce the risk of serious mold activity. Moreover, a building that is clean and neat will promote respect and care for the collections and make for a healthier, more pleasant environment for staff and patrons. Housekeeping is thus an excellent method to help ensure the safe, long-term preservation of your holdings.

We know that "particulate pollution" (such as dust, dirt, smoke, ash, and mold spores) is disfiguring and can interfere with aesthetic appreciation of an object; heavy layers can obscure images, text and other fine details. However, particulates can also cause scratching, especially obvious on the smooth surface of objects such as photographs, silk screen prints, glass, or ceramics. In addition, particulates will attract moisture from humid environments to form acidic solutions that cause chemical deterioration. Dust and dirt also provide an

ideal environment for insects to live and mold to flourish, since dust and dirt contain organic materials that provide food for them.

There are two basic aspects to housekeeping that we will consider in this lesson: cleaning the building and cleaning the collections themselves.

Preventing Problems in Advance: A Housekeeping Plan

Housekeeping for the building and for collections in storage or on exhibit should be discussed and defined in a written housekeeping plan. The housekeeping plan should be part of a larger building maintenance plan that includes routine inspections and maintenance of key building elements and systems (e.g., roof, drainage systems, pipes and plumbing, fire protection equipment, and HVAC equipment). These issues will be addressed in Lesson 6, Emergency Preparedness.

The housekeeping plan should carefully delineate who will do the work, how often the work should be done, with what tools and methods it will be completed, and exactly how the work will be performed. The plan should detail weekly, monthly, quarterly and yearly tasks, as well as special instructions for specific materials. Keep in mind that since a number of people will likely be performing the different housekeeping tasks (e.g., custodians, paraprofessionals, students, librarians, collections curators), written schedules for each person and/or type of task may be needed.

How Often Do I Need To Clean?

Housekeeping work should be performed on a regular schedule based on need and the circumstances at hand. For example, spaces are usually very dusty during the first few weeks that the heating system has been turned on in the fall. Dust deposited in the ductwork is dried out by the heated air and becomes airborne and is deposited throughout the building. In the early fall, general dusting and vacuuming will be required more frequently than during other seasons.

Cleaning of general book collections is generally recommended once a year if possible. Since it is usually not practical to clean all collections at once in a large library (unless an outside cleaning service is brought in), libraries often divide the job into specific projects, where one section of the larger collection is cleaned at a time. This prevents book cleaning from turning into a never-ending (and discouraging!) project.

Although for most of us excessive cleaning is probably not an issue, remember that over-dusting and over-cleaning of collections will unnecessarily increase wear and the risk for damage from handling. Cleaning of individual special collections items should only be performed when necessary. Storage of collections inside boxes or furniture, or under muslin dust covers will reduce the amount of dirt and debris that settles on the collection itself.

Sample Custodian Cleaning Schedule
(for a small library)

Daily (5 times/week):

- Clean restroom toilets, sinks, countertops, mirrors
- Empty trash and recycling and put in outdoor trash enclosure
- Vacuum carpet on first floor and restroom floors

Twice/week:

- Wash foyer and restroom floors
- Dust main desk
- Clean staff kitchen sink, countertops, tables

Weekly:

- Dust computer areas, wipe keyboards and screens
- Vacuum meeting room, Local History Room, mezzanine, back hall, and stairways
- Clean meeting room kitchen floor, countertops, and sink

Biweekly:

- Clean desks, workstations, and tables in public areas, meeting rooms, and offices
- Dust edges of stairs, exterior of exhibit cases in foyer, skylight, mezzanine rail

Monthly:

- Dust exposed areas of bookshelves, windowsills, bookcase tops, and blower units

Quarterly:
- Sweep/vacuum basement, dust miniblinds office areas, dust all areas of building for cobwebs

Tools of the Trade

Appropriate tools and materials are required to clean collections and storage spaces properly. Clean cotton gloves and cloths, soft natural bristle brushes, high tech dusting cloths, and a High Efficiency Particulate Air (HEPA) filter variable speed vacuum cleaner are essential. The most important tools are the vacuum and the brushes.

Vacuuming is the method of choice for removing dust and dirt from the collection environment. Vacuuming makes it possible to actually remove the unwanted dust and dirt from the immediate environment. Sweeping and dusting with an ordinary cloth or feather duster just disperse and redistribute the dust and dirt. In order for the vacuum to remove even the finest dust, the vacuum must have a suitable filtration system. Otherwise the dust sucked up by the vacuum will simply be blown right back into the room via the vacuum system exhaust. Home upright vacuum cleaners and water filtration units are NOT appropriate for cleaning in cultural institutions.

HEPA filters are required for museum, library, and collection applications. These are readily available from many sources today. An essential feature on a vacuum for collection use is a variable speed motor that can be used to dial the suction power from low power suction to full power for different applications. This will make it possible to use the vacuum to clean fragile collection objects. A canister model is useful for large-scale work. A smaller, hand-held model is better for small objects and spaces. Note the location and power of the exhaust port on the vacuum. It is important to be aware of this port as air blown out of the vacuum can knock objects off of tables or blow them over.

Another important feature of a good vacuum cleaner is the availability of a micro tool set of attachments for the nozzle. Micro tool attachment kits can be purchased separately and will fit most standard size nozzles, allowing you to better clean corners and crevices. Remember to change the vacuum cleaner bag frequently. Never let any part of the vacuum nozzle or hose contact the objects.

Brushes used for cleaning in and around collections should have natural bristles. The bristles are better if they are white or light colored so that it becomes obvious when they have become soiled and need to be washed. The brushes should have soft plastic or fabric covered ferrules. Metal ferrules will scratch and snag materials and objects and can be very dangerous. Cloth adhesive tape can be used to cover metal ferrules.

Shelves, furniture, and collection materials can be dusted using a magnetic wiping cloth, which attracts and holds dust with an electrostatic charge. This type of cloth is sold commercially under names such as Dust Bunny, the Dust

Magnet, and Preserve-it. Do NOT use cloths that are chemically treated to hold dust, such as the One-Wipe, or chemical based products such as Endust, that are sprayed onto a cloth. Even if the chemicals are not used directly on the books, the oily residue can build up on workers' hands.

A conservator or other collections manager should screen any cleaning chemicals to be used on shelves, floors and building features for potential risk to the collection. In general, avoid products containing oil, chlorine, alum, peroxides, and ammonia. Cleaning chemicals should NEVER be used on the collections themselves, and care must be taken not to accidentally splash collections when cleaning floors.

Finally, remember that cleaning personnel will need aprons, rubber or cotton gloves (rubber gloves for handling cleaning chemicals, cotton gloves when cleaning collections), and face masks for protection from dust (particularly for large scale cleaning projects).

Personnel

Proper training and supervision of staff performing housekeeping tasks is crucial to the ongoing success of a housekeeping plan. While the professional staff may occasionally undertake the cleaning of individual items, routine cleaning of the building and the general collections will often be delegated to janitorial staff, student workers, or sometimes volunteers. So housekeeping must be considered a team effort between the cleaners and the professional staff.

It is important to remember that in many ways, the people performing the housekeeping tasks see and examine collection items more often and more regularly than anyone else on staff. They definitely see and examine the collection storage and exhibit spaces more frequently and more carefully than anyone else. In this way, they form the "front line" in the defense of the collection. For example, with proper training they can be alert to signs of insect infestation (such as the presence of frass on shelving), or obvious signs of damage or condition problems in need of immediate attention. Do not underestimate the importance of the housekeeper in collection preservation.

As noted above, a clear description of the duties of the cleaning staff, including any activities that relate to the collections, should be prepared in writing. All cleaning activities in collection storage areas and in exhibits should be specifically discussed in advance to avoid accidental damages to collection objects. Training should be provided for the staff performing the cleaning and should include topics relevant to collection care issues such as handling and emergency response. A conservator and a curator, archivist, or librarian should work together to develop the staff training. Be sure to point out possible hazards

and fragile objects, and instruct workers to handle collection objects carefully and only as required. Even after training has been completed, frequent oversight and supervision by professional collections and conservation staff is necessary to insure that all tasks are being performed in the proper way.

A critically important part of any housekeeping plan is a formal reporting system for the cleaning staff to report back to the supervisor and/or the conservator any observations or concerns about the collections or spaces where collections are found. A simple system for cleaning staff to leave notes or messages for the supervisory staff is important. Dates and locations of problems should be recorded and any follow up or corrective measures should be noted. Also be sure that the cleaning staff feels free to bring up any issues related to their own health that may arise during cleaning, such as allergies or sensitivities to cleaning chemicals.

For large scale cleaning projects, such as a library stacks project, institutions can rely on teams of temporary employees, student assistants, volunteers, or even a commercial cleaning company. However, be sure to provide proper training and supervision (as described above), and to be sensitive to the physical and emotional challenges associated with work that is dirty, strenuous, and redundant. You may wish to limit the time spent daily by each worker involved, and rotate tasks to reduce the risk of repetitive motion injury. It is also important to insure that workers do not have any allergies to dust or mold that might be aggravated by working in dirty conditions.

Cleaning the Building

To reduce the amount of dust and dirt that accumulates on collections and shelving the building itself should be kept as clean as possible. Positive air pressure will help to keep unfiltered air out of the building and storage areas. The HVAC system should remove as much particulate contamination as possible, especially fine soot; filters should be changed on a regular basis, as outlined in the housekeeping and maintenance plans. Thorough vacuuming and dusting should be performed regularly in all collection and building spaces, even those not often visited, such as mechanical rooms and storerooms.

The best methods for cleaning collection spaces are those that are safe and efficient. Commercial practices can be safely translated into the collection environment if they are screened by collection staff. Obviously, big heavy cleaning machines and equipment are not suitable for use around collections. Floors and other building

elements should be vacuumed using a HEPA system (as described above) and washed as needed. Walls and ceilings should be dusted and vacuumed. If wet solutions are being used to clean shelving, ensure there is adequate air movement and dehumidification to prevent mold activation. All shelving and mounts must be completely dry before replacing objects on their surfaces. Wet cleaning of historic elements such as gilded finishes, wallpaper, plaster, frames, mirrors or glass, and the use of waxes, polishes, and other cleaning solutions should only be undertaken with the advice and assistance of a conservator.

Extraneous materials stored in the building make it difficult to keep spaces neat and orderly. All extraneous materials such as trash, recycling bins, stored paper products, excess storage materials, cardboard boxes, and unused equipment should be removed from storage locations and unused spaces. These extraneous items provide attractive living and hiding places for pests, they are often contaminated before they are brought into the building, dust and dirt builds up on them, and they prevent careful and thorough cleaning of floors and shelves. If possible, these materials should be stored in buildings or locations where collections are not present.

Trash cans used to dispose of food products should be labeled and supplied with tight fitting covers. These trash cans should be emptied daily (at the end of the day) and the covers should be kept in place at all times. Housekeeping activities should be scheduled immediately following programs that include food service near collection areas.

It is often advisable to work in teams when cleaning around and in collection storage locations. One person can move objects and act as a spotter so that the other can focus on the cleaning activity. Always have two people present when a ladder is in use. It is advisable to begin the housekeeping process at the highest point in a room and to work to the floor. This way dust and debris from areas currently undergoing cleaning will not fall onto areas that have already been cleaned.

Cleaning General Book Collections

Most general book cleaning operations will be undertaken in the stacks, so proper equipment such as a book truck is required. Proceed one shelf at a time, finishing one before starting on the next; this makes it easier to maintain collection order. One cleaner should pass books down to the second person to arrange on the book truck, being careful to keep the books in order. Carry books vertically as much as possible, and make sure that the book stays closed so that dust does not fall down between the pages or into the spine. The first person can then

clean the shelf, while the person by the book truck cleans the volumes themselves.

To clean a book, grasp it firmly at the center of the fore edge with one hand. This will keep the book safely closed while you first clean the exterior. Vacuum the head of the text block, working from the spine to the fore edge, then vacuum the tail from the spine to the fore edge. Move your grip to the top of the book and gently vacuum the fore edge from head to tail. Lastly, vacuum the spine and the front and back cover boards. A small, soft brush can be used to clean the gutter margin, brushing towards the vacuum nozzle. When cleaning fragile books the nozzle should first be covered with clean cheesecloth. It should be changed, as required, to prevent transfer of dirt to other surfaces. Be careful that the cheesecloth does not snag at loose binding elements.

Once the books and shelf have been cleaned, be sure to dry the shelf before returning the books. One person should then hand the clean books to the other (a few at a time and in the proper order), who reshelves them, making sure they are well-supported on the shelf.

Cleaning Individual Paper-Based Objects in Storage and on Display

For single-item cleaning of objects in your collection a clean, well-ventilated work area should be provided for, including a large, smooth-surfaced, hard worktable, adequate light and ventilation. Clean, dry hands are needed to avoid contaminating the object. Food and drink must not be permitted in the work area. Staff should be instructed to wash their hands, and remove all jewelry or other items that could damage collections material. It is best to handle paper objects with clean, lint-free cotton gloves to prevent the transfer of oils to the object surface.

The cleaning of paper objects of any kind in a collection is not to be undertaken lightly. There are many serious factors to consider. A conservator and a curator, archivist, or librarian should be consulted in order to assess all the issues relating to the care of the object in question. These procedures should not be used on any objects that have:

- pastel or charcoal media;
- loose or friable materials of any kind;
- loose or flaking gelatin or baryta layers;
- active or wet mold;
- extensive repairs; and/or
- been rolled and will not stay flat without assistance

Objects exhibiting these conditions should only be cleaned by a conservator. In

addition, if you are unable to positively identify the process by which a photographic object was made, do not attempt to clean it. Even light surface brushing can remove silver image particles from a degraded salted paper print.

If the cleaning methods described here are determined to be appropriate for a specific object, then procedures should be followed using the utmost care and sensitivity. Only those who have been specifically instructed in these methods by a conservator should undertake them. Extreme care is needed to avoid doing more harm than good. The materials and techniques listed below have been tested and found to be safe and effective when used in a careful and sensitive manner.

Instructions for cleaning other types of museum objects have been included in Further Sources.

Materials Required

- clean, acid-free blotter
- clean, small, very soft, natural bristle brushes (such as a Japanese Hake brush)
- white or clear vinyl erasers
- small, clean kitchen grater
- a vacuum with variable speed motor for control of suction, micro tool attachments, and a HEPA filter (see discussion of vacuum cleaners above)

Procedures

Books: General procedures for cleaning books are given above. Extremely fragile or valuable books should be cleaned by a conservator.

Flat Paper: To clean flat objects begin cleaning by slowly and gently brushing the surface of the object to remove loose surface dust and debris. Use natural hair bristles only. As required, secure the object using clean, smooth weights to keep it from shifting. Brush the dust and soil onto the surrounding blotter on the work surface. Strokes of the brush during cleaning should begin in the center and move towards the edges of the object. A very light touch is most effective. If there are any signs of loose media or support stop the cleaning immediately and contact a conservator for further instructions. When the object has been cleaned on one side, place it on a different blotter on a nearby clean work surface and use the vacuum, on very low power, as a receptacle to remove the loosened dust and debris from the first blotter and work area. Because of the light weight of paper ephemera and the danger of parts being sucked into the vacuum, the vacuum should only be used after the object has been safely placed on a different work surface. After one side has been cleaned, brush the other side as described.

Framed Objects: If the object is framed or otherwise behind glass, the frame and glass can be dusted and vacuumed by brushing the dust and debris towards the vacuum nozzle covered with a very soft, clean, dry brush. If vacuuming the frame directly, It is best to cover the opening of the nozzle with cheesecloth to prevent parts from being drawn up into the vacuum cleaner where they are crushed or can not be retrieved. Neither the glass nor the frame should be cleaned with any liquids. Liquids will seep beneath the glass and cause serious staining of the object and could contribute to mold growth inside the object's housing.

Mats and Mounts: For cleaning the border of a paper object (mat or mount), vinyl eraser crumbs may be used. Grate your own vinyl eraser crumbs with a small, clean kitchen grater and a vinyl eraser, such as Staedtler Mars Plastic. Do not use Scum-X or other eraser crumbs as they may contain sulfur and other abrasive materials which may cause deterioration of nearby photographic images. Rub the vinyl eraser crumbs lightly in a circular pattern on the surface of the mount with the fingertips of a gloved hand or with the larger piece of vinyl eraser. Remove the crumbs by brushing them away from the photograph or object with a soft brush. Do not rub directly with an eraser as it may cause uneven cleaning. Do not use the eraser crumbs on the object, only on the border or mat. Be extremely careful not to erase or reduce any writing, numbers, or other inscriptions. Thoroughly brush off all eraser crumbs before placing the matted/mounted object into its frame or enclosure.

Photographic Prints: To clean the surface of a photographic print, hold the print face up on a clean, dry blotter with one gloved hand and brush from the center of the object towards the edges of the object with a soft brush. Again, a very light touch is most effective. If there are any signs of loose media (emulsion) or support, stop the cleaning immediately and contact a conservator for further instructions. Do not clean the surface of the print with eraser crumbs.

ASSIGNMENT

Walk through your collection storage areas and building to determine where your housekeeping practices need improvement. Pick one area to be improved and draw up a plan noting what needs to be done, who should do it, and how often it should be done. If you do not have one, price HEPA vacuums and plan for allocating funds for purchase.

Further Sources

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Zachary, Shannon. "Managing a Stacks Cleaning Project." Abbey Newsletter 22, no. 3 (1998).

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"Housekeeping for Historic Sites." Produced by Fred Woods Productions, 1996 (60 minutes). Available from SPNEA, 141 Cambridge Street, Boston, MA 02114, tel. 617/227-3957. *Intended for housekeepers caring for historic buildings, including the structure itself, furniture, and collections, this video details proper cleaning techniques for a range of objects, including floors, rugs, metal objects, and textiles.*

Online Resources

Resources for HEPA vacuums:
Take a look at the conservation suppliers (www.universityproducts.com, www.gaylord.com), or www.gaiam.com, or www.nilfisk.com. And be sure to search the Web using the search term "HEPA vacuums". It is important to compare prices and features to insure that you are getting what you need.

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PRESERVATION 101:

An Internet Course on Paper Preservation

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Lesson 6: Emergency Preparedness

Prevention and response strategies and tips for writing a disaster plan

What is an Emergency?
Emergency Planning
Protection and Prevention
Response and Recovery
Self-Testing Question
Contents of an Emergency Plan
A Word About Security
Conclusion
Assignment
Printed Resources
Online Resources

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What is an Emergency

Emergencies can affect entire communities or be limited to one small area. They can ruin entire libraries or damage only a few books. Emergencies include earthquakes, which happen suddenly, and hurricanes, of which we have prior warning. They can be nature-related like ice storms, man-made like faulty wiring, or technological, resulting in data loss. Emergencies can endanger lives, cause significant damage, or destroy important materials.

Damage to collections materials is sometimes unavoidable. However, anticipating problems and taking preventive measures may lessen damage or prevent it entirely. For example, an emergency may be prevented by moving collections out from under water pipes or trimming large tree limbs that jeopardize the building. Knowing what to do when an emergency occurs and gathering recovery supplies in advance can mitigate damage.

Effects of the 1998 ice storm in New York State

How do people respond to emergencies?

Some people experience fear, anxiety, or even panic when they face an emergency. Others may first deny its seriousness. Still others will be cool-headed and will take immediate action to address the problem. Quick action is essential to the salvage of wet materials. However, quick action can be problematic if it is the ***wrong*** action, for example, turning up the heat in an attempt to dry wet collections.

How should people respond to emergencies?

Ideally, people should respond to emergencies by acting calmly and rationally, cooperating with others at the scene. They should have the knowledge and training needed to salvage collections materials and prevent further damage. Creating an emergency plan in advance, educating staff, and periodically testing and revising the plan will provide the tools needed for adequate emergency response.

Some recent examples of emergencies that have affected cultural and home collections are given in sidebars throughout this lesson.

BRIDGEPORT, AL: November 9, 1999 - Fire gutted the 82-year-old Bridgeport Depot just as the city was preparing to reopen it as a museum after $350,000 in renovations.

Emergency Planning

Emergency planning is an institutional planning process designed to:

- Prevent disasters
- Prepare for emergencies in order to

minimize their effect
- Respond effectively to emergencies
- Recover from emergencies

The first step in creating an emergency plan is to gain institutional commitment to the planning process. The administration must approve the expenditure of time and money required to draft and implement the plan, and provide for staff training.

An emergency planning committee should be comprised of staff with responsibility for collections care. The committee will be large or small, depending on the size of the institution. A committee in a large institution might include library professionals, as well as a conservator, a facility manager, and a technology support representative. Input from fire safety professionals, police, and other interested parties will provide added energy to the planning process. It will also broaden perspective on various issues and elevate the status of the planning process.

A rolling 6.8 earthquake on February 28, 2001 knocked tens of thousands of books off the shelves, damaged stack ranges, and affected library services at the University of Washington in Seattle.

The emergency planning committee should be led by an emergency planning manager, appointed by the institution's director. This person is responsible for setting objectives, coordinating the project, establishing a budget, and approving expenditures. She must also prepare a realistic timetable for completion of each task or goal, including testing and future updates of the plan.

Tip: If you are in a small institution and must draft your plan alone, cooperate with other small organizations in your community. This will enable you to pool emergency resources and will help you stay on schedule.

The responsibilities of the emergency planning committee include:

- Defining the scope of the plan. For example, what types of emergencies will the plan address? Will it cover one or more buildings?
- Assessing potential hazards to collections and identifying preventive actions required to prevent disaster.
- Gathering information about supplies, equipment, and services needed. This might

include working with local emergency officials, arranging for local freezer facilities, etc.
- Setting collection salvage priorities.
- Compiling information about salvage and recovery procedures for various types of collections materials.
- Educating themselves and other staff members about emergency prevention and response.
- Identifying the financial implications of an emergency. For example, what is the insurance coverage, if any? Will money be available for commercial recovery services?

Once the plan has been written, it should be distributed to all staff for their comments. Staff must be trained to carry out the plan, which should be tested and revised as needed.

BOSTON, MA: The Boston Public Library in Copley Square was closed Sunday, August 16, following the rupture of a 42" water main on Blagden Street that caused extensive flooding in the basement of the Research Library (McKim Building) on Dartmouth Street and the General Library (Johnson Building) on Boylston Street. Image of damage to materials shelved in the Government Documents stack area, August 17, 1998.

Protection and Prevention

Risk Assessment

It is essential for the committee to conduct a risk analysis or assessment. This effort studies the probability of possible emergencies and their potential effects. It identifies the most serious risks to the collections. Factors to consider in this effort include:

- Effectiveness of existing procedures (e.g., is there regular backup of electronic records?)
- Frequency and occurrence of past problems (e.g., recurrent roof/pipe leaks?)
- Problems with the geographic location (e.g., is the building on a flood plain?)
- Risks associated with the physical location (e.g., is there a business next door which imposes a risk, for example, a restaurant?)
- Vulnerability due to the political environment (e.g., is this a federal building, which

might be vulnerable to political attack?)
- Deficiencies with the building and mechanical systems (e.g., how old is the roof? the wiring?)
- Effectiveness of the detection and alarm systems (e.g., fire, water, security)
- Maintenance, housekeeping, and pest management concerns (e.g., when were gutters last cleaned? have insects been noted?)

Which of the identified risks are significant to the site or the collection?

Which sources of risk can be eliminated or moderated?

Which risks must be addressed in the emergency plan?

For more information on risk analysis, see Jan Lyall's article "Disaster Planning for Libraries and Archives: Understanding the Essential Issue," listed under Sources of Information, Online Resources (below).

Tip: Begin your plan by addressing the greatest risks.

Air-drying books requires space and staff to be effective

Prevention

Once risks have been identified, preventive measures can be implemented. There may be several recommended actions for each identified risk--both short-term and long-term solutions. Some measures may not be feasible, for example, there may not be enough money to replace the roof. Committee members should create a written schedule for building repairs and related inspections. Checklists and other standardized forms can be useful to streamline this process.

The following recommendations are designed to help you identify potential problems at your institution in order to prevent the two most common types of library emergencies--those caused by water and by fire.

Preventing Water Damage

- Inspect the roof, gutters and downspouts twice a year; clean or repair as needed.
- Inspect pipes and plumbing annually.
- Check routinely for signs of water (e.g., water stains, puddles) when opening and closing the building.
- Move collections away from water sources (such as under pipes or in basements).
- Raise collections at least four inches off the floor to prevent damage in case of minor flooding.
- Shelve collections snugly and enclose archival materials in boxes to minimize water penetration.
- Use surface water detectors tied into a central alarm system to give early warning of water hazards.
- Stockpile recovery supplies in-house for immediate response to small-scale water emergencies.

> **Tip: Do not store collections in warm, humid places that promote mold growth. Monitor the environment 24 hours a day.**

Preventing Fire Damage

- Install detection, alarm, and suppression equipment. Inspect and maintain it regularly.
- Install and test manual pull stations at all exit points.
- Locate appropriate portable fire extinguishers throughout the building.
- Inspect fire extinguishers annually and train staff in their use.
- Identify fire risks and discuss salvage priorities with firefighters.
- Investigate and correct nearby fire risks, if possible (such as restaurants, chemical storage facilities, etc.).
- Close book drops that open directly into the building and can be targets for vandals with incendiary devices.
- Determine evacuation procedures and conduct fire drills. Keep evacuation routes cleared of debris.
- Upgrade electrical wiring as needed.
- Locate gas, oil, and electric shutoffs and mark them clearly.
- Plan to renovate and compartmentalize the building if there is open stack construction.
- Upgrade the air-handling system to isolate smoke.
- Institute closing procedures to reduce risks (e.g., ensure that the building is unoccupied, that all appliances are unplugged, etc.).
- Do not allow smoking in buildings where collections of value are stored.

Consider other emergencies that may occur, such as pest infestation and mold outbreaks. See "Integrated Pest Management" and "Emergency Salvage of Moldy Books and Paper" for detailed preventive activities.

Prioritizing Collections for Salvage

Figuring out what to save after the fact can be a challenge

Determining which collections materials should be saved first is one of the most difficult tasks connected with emergency planning and recovery. It is best to identify high-priority holdings in advance of an emergency, in order to prevent haggling during a crisis. All staff must agree upon recovery priorities and must share those priorities with the fire department prior to an emergency.

High priority collections will vary from institution to institution. However, all organizations must give priority to **vital records**, including accounts receivable, payroll and personnel records, various legal documents, etc. Without this information, it may be difficult to restart operations in a timely fashion. Other high priority materials, used in order from the most important down, might include:

- Those materials that best support your institution's mission
- Unique collections
- Heavily used collections
- Collections necessary for research
- Collections that are difficult or expensive to replace
- Materials with monetary or artifactual value
- Collections that are prone to damage if left untreated (e.g., leather bindings)

You may find that some collections are beyond salvage. In this case, you will have to move on to the next priority collection and concentrate on those materials that can be successfully salvaged.

It is good to compile a list of the most important holdings and to draw a color coded map identifying their location. Protect this information in order to avoid creating a "shopping list" for thieves.

On July 28, 1997 - Colorado State University Library suffered devastating water damage to its entire basement from a summer flash flood. Based upon an analysis of a sample of the water-damaged materials, total loss is projected at approximately 51,000 books and 68,000 journals for a total of 119,000 volumes. This represents over 25% of the collection that was damaged.

Gathering Emergency Information

It is essential to identify and list the sources of necessary supplies, services, and equipment before disaster strikes. The planning committee

should assign someone the task of gathering information about supplies, including their cost. Telephone numbers must be listed for plumbing, heating, and electrical services, including after-hours contact information. Sources must be identified for emergency equipment such as fans, local freezer facilities, and vacuum freeze drying services. **This information must be easily accessible and kept up to date. Those on the emergency team should take a copy of this information home with them.**

> **Tip: Keep limited supplies on hand for immediate response to minor water emergencies. They might include mops, buckets, paper towels, unprinted newsprint, flashlights, etc. Note the location of these supplies in the emergency plan.**

Response and Recovery

The three stages of the overall recovery process are:

1. Initial response and assessment: preparing to deal with affected materials
2. Salvage: returning materials to a stable condition by freezing or drying
3. Restoration: the long-term process of restoring or replacing damaged materials.

The prime directives are to stabilize the condition of collections so no further damage occurs and to salvage the maximum number of valuable materials. Time is a crucial factor. If conditions are wet and warm, mold can develop in less than 48 hours. A mold outbreak will compromise your ability to recover collections materials successfully and can also pose serious health risks.

500 counties in nine states -- Illinois, Iowa, Kansas, Missouri, Minnesota, Nebraska, Wisconsin, North Dakota, and South Dakota -- were declared major disaster areas due to major flooding in the spring and summer of 1993. Federal Emergency Management Agency (FEMA), Andrea Booher, photographer.

It is helpful to assign responsibility for specific response and recovery efforts in advance of an emergency. A designated emergency recovery director (and an alternate) will be in charge of implementing the plan and coordinating recovery efforts. This person could be the institution's director, but might be someone else who reacts calmly to emergencies.

Priorities for Initial Response

Initial response is the period of time from when an emergency is first noted to when packing and removal of collections materials begins. The emergency information sheet should provide enough information for responding staff to make good decisions regarding people to contact and actions to take.

In the event of a large scale disaster that could affect building safety, staff must wait for clearance from emergency personnel before entering the disaster site. The director for emergency recovery (or the designated alternate) should try to determine the nature of the damage and the types and amounts of materials affected. S/he should assemble the team required for recovery, and determine which supplies, equipment, and personnel are needed.

The first task will be to stabilize and monitor the environment by reducing the temperature, removing standing water, recovering power, reducing humidity, etc. When they can actually look at materials, team members should make a detailed assessment of damage by compiling written, photographic, and/or video documentation. This information will be needed to support insurance claims, report to the media, and help with salvage efforts.

Drying Options

Several drying methods may be considered for salvaging water-damaged materials:

- Air drying: Items are dried by standing them up in a well ventilated area where temperature and humidity are low.
- Dehumidification drying: A commercial service provider dries the building, its furnishings, and damp collections in place using large dehumidifiers.
- Freezer drying: Items are placed in a self-defrosting freezer (below minus 10 degrees F). Ice crystals will be slowly sublimated over time.
- Vacuum freeze drying: Frozen materials are placed in a vacuum chamber and a vacuum is drawn; a small amount of heat is introduced and ice crystals are drawn out by sublimation.

If the number of damaged materials is small and they are mostly damp, air drying might be considered. However, if there are more damaged materials than can be handled within 48 hours using available staff and resources, then a commercial vendor should be contacted. This person can assist with the initial response, and with freezing and drying efforts. Unfortunately, no matter which option is chosen, the collection will never look the same again. Physical distortion is inevitable.

Self-Testing Question

When packing boxes with wet books for transfer to another site, which of the following would be correct:

☐ A. Remove undamaged material from the site, then the wet material.

☐ B. Line cardboard boxes with plastic bags to prevent the box from collapsing.

☐ C. Pack books spine down or flat; fill corners with unprinted newsprint

to prevent shifting inside the box during transit.

D. Interleave wet books or journals that have coated paper with wax paper to keep the pages from adhering to each other while they dry.

Submit

Contents of an Emergency Plan

Information about implementing prevention activities and responding to an emergency form the essential components of an emergency plan. A written document containing this information must be prepared by members of the emergency planning team and approved in writing by senior management. When finished, the emergency plan should include the following information:

Emergency Information Sheet

- Officials to be notified (security, fire, police, ambulance, personnel etc.)
- Instructions for immediate response (to water, fire, secruity breech, etc.)
- Evacuation procedures

Introduction

- Purpose of the plan
- Author(s) of the plan
- Scope of the plan
- Plan organization
- Tips for using the plan
- Locations of the written planning documents

- When and by whom the plan is to be updated

Communication of Information
Methods to be used: telephone tree, alternative modes of communication, etc.

Team Assignments, including lines of authority and team responsibilities

Collection Priorities, including locations

Prevention and Protection Measures, including schedules for testing and inspection, and checklists for tracking follow-up actions and recommended upgrades

Pre-Disaster Actions
Actions to take if there is warning of disaster: moving materials to upper floors, boarding up windows, wrapping collections/card catalog/finding aids in plastic sheeting with water proof tape, turning off gas, water, power, etc.

Instructions for Response and Recovery from water, fire, pests, mold, medical emergency, power outage, bomb threats, theft, disorderly conduct, etc.

Appendices
This is the best place for detailed information which can otherwise clutter the body of a plan and slow access to information that is needed in a hurry. It might include:

- Inspection checklists (e.g., detection systems, electrical systems, plumbing, etc.)
- Response and recovery instructions for diverse media (e.g., computer records, photographs, film, magnetic records, books, paper [coated, uncoated], oversized materials, etc.)
- Treatment options, rebinding or replacement information
- Record keeping forms
- Detailed building plans
- Supplier and services lists
- Accounting information
- Insurance information

A Word About Security...

Many institutions have experienced theft, vandalism, or disorderly behavior. A basic security policy with preventive activities and proper response procedures is critical to the protection of building, collections, staff, and patrons. Security preparations can be coordinated as part of the emergency plan or as a separate parallel security plan. Either way, the process is the same:

- Form a committee for security planning
- Study security risks
- Determine the most appropriate preventive measures
- Specify procedures for response

Basic building maintenance, good lighting, inventory control, and written staff/patron regulations can significantly enhance the security of collections. Concise response

procedures to incidents such as theft can help resolve potentially dangerous situations, protect property, and ensure conformity of legal uncertainties.

Davenport, IA: April 26, 2001 -- Residents of Davenport commute by rowboat. Photo by Andrea Booher/ FEMA News Photo

This list may help you identify ways to improve security at your institution:

- Enhance perimeter security by increasing exterior light levels, expanding light coverage, clearing bushes and debris, and securing windows, doors, and skylights.
- Make sure that telephone, power, and emergency lines are tamper proof.
- Install exterior doors of solid wood core construction or 16-gauge steel or aluminum alloy. Use burglar-resistant glass or Plexiglas.
- Install door frames, window frames, keyholes, and locks that resist prying, twisting, or cutting.
- Control keys carefully and keep a strict record of all keys issued and returned as employees come and go.
- Insist that all staff and patrons enter and exit by a single, monitored doorway. Alarm all other doors for unauthorized use. Seal/screen all windows to prevent people from dropping materials out the windows.
- Catalog the collection, identify valuable materials, and conduct regular inventories.
- Implement rules and regulations for use of special collections and archives. Register and supervise all patrons who use these materials. Track the use of collections and keep records of these transactions in case of loss.
- Install locked cabinets, cages, or vaults to provide additional security for valuable materials. Maintain strict control of access to these holdings.
- Determine the need for a book security system.
- Consider hiring overnight security personnel or police patrols.

For detailed information on security planning, including a sample patron registration form and a bibliography, see the NEDCC technical leaflet "Collections Security: Planning and Prevention for Libraries and Archives."

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Conclusion

Emergency planning can seem like an overwhelming project. However, having even a minimal emergency plan can have a significant impact on preserving valuable collections at relatively low cost. It can also help to reduce insurance costs.

Students practice recovery techniques for a fire and water damaged parchment

It is important to make a start, for example, by creating an emergency information sheet and knowing who to call in the event of an emergency. This can minimize damage and possibly even save lives. Begin the plan with your most serious concerns and expand it over time to encompass the full range of risks that might befall your institution.

Use the models and other printed resources below as a place to start, and confer with other institutions in your community who already have emergency plans. There is no reason to reinvent the wheel!

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[1]Excerpt from Terry Cook, "It's 10 O'Clock: Do You Know Where Your Data Are?" Technology Review (January 1995).

ASSIGNMENT:
Take the time to fill in company names and contact information appropriate to your needs in Section B., "Services Needed in an Emergency," of the NEDCC technical leaflet "Worksheet for Outlining a Disaster Plan." Use the leaflet "Emergency Management Suppliers and Services" to assist. Post copies by everyone's work station. Plan to update the list every six months.

Sources of Information

Printed Resources

Alire, Camila, ed. Library Disaster Planning and Recovery Handbook. New York: Neal-Schuman Publishers, Inc., 2000. *A detailed volume on all aspects of library disaster recovery, including administration, media relations, human resource management, emergency planning and recovery. Sample forms and "key recommendations" should prove helpful.*

Canada Mortgage and Housing Corporation. Cleaning Up Your House After a Flood. Ottawa, ON: CMHC, 1993. *Order number 6789E, $3.95 each. Outlines the potential*

health risks associated with flood, with clear instructions for drying out and cleaning flood or water damaged buildings and contents. A standard reference guide for everyone, especially homeowners. To order call CMHC at 1-800-668-2642 or 613-748-2003 outside Canada, or mail order to CMHC, P.O. Box 35005, Stn BRM B, Toronto, Ontario, M7Y 6E5. Also see After the Flood: A Homeowner's Checklist available in the Publications section of CMHC's website at https://www.cmhc-schl.gc.ca:50104/b2c/b2c/init.do?language=en.

Dorge, Valerie, and Sharon L. Jones, comps. Building an Emergency Plan: A Guide for Museums and Other Cultural Institutions. Los Angeles, CA: The Getty Conservation Institute, 1999. *Chapters are organized to target the Director, emergency preparedness manager, and departmental team leaders with step-by-step instructions for developing and implementing an emergency preparedness program.*

Fennelly, Lawrence J. Effective Physical Security. 2nd ed. Boston: Butterworth-Heinemann, 1997. *Subjects covered include building design, hardware, security lighting, and detection/alarm systems.*

Florian, Mary-Lou. Heritage Eaters: Insects & Fungi in Heritage Collections. London: James & James Ltd., 1997. *Designed to help identify the problem, eliminate it, and prevent it from recurring, this volume explores the materials in collections, the storage environment, and the biology of pests. Somewhat technical, this is one of the most current volumes on pest control in the conservation literature.*

Haskins, Scott M. How to Save Your Stuff From a Disaster. Santa Barbara, CA: Preservation Help Publications, 1996. *Instructions for preventing disaster and for salvaging family collections covering a range of materials and formats.*

Kahn, Miriam. Disaster Prevention and Response for Special Libraries: An Information Kit. Washington, D.C.: Special Libraries Association, 1995. *This has a very usable checklist format designed to aid in preventing disasters, with an extensive bibliography for further information. Good coverage on machine-readable strategies. Available from Special Libraries Association, 1700 Eighteenth Street, N.W., Washington, DC. 20009-2514, tel. 202-234-4700, ext. 643.*

Liston, David, ed. Museum Security and Protection: A Handbook for Cultural Heritage Institutions. New York: ICOM, 1993. *A handbook to review the physical requirements of cultural protection to assist in the prevention and response to a broad range of hazards. Excellent, detailed information, especially with respect to guard services and physical protection. Good checklists.*

Lord, Allyn, Carolyn Reno, and Marie Demeroukas. Steal This Handbook! Jackson, MS: Southeastern Registrars Association, 1994. Reprint 2001. To order contact SERA Treasurer Cindy Cable, Old Capitol Museum, P.O. Box 571, Jackson, MS 39205, telephone 601-359-6930. Cost is $25 with check payable to Southeastern Registrars Association.

National Task Force on Emergency Response. Emergency Response and Salvage Wheel. Washington, D.C.: The Task Force, 1997. *A compact reference tool to assist in immediate response procedures in the event of a disaster. Available from Heritage Preservation, 1730 K Street, NW, Suite 566, Washington, D.C. 20006, telephone 202-634-1422. Ordering and other information at www.heritagepreservation.org.*

Reilly, Julie A. Are You Prepared? A Guide to Emergency Planning. Omaha, Nebraska: The Nebraska State Historical Society, 1997. *A consice, well-organized manual prepared to assist the development of emergency preparedness plans in the state of Nebraska, but*

certainly useful beyond. To order email Sabrina Navarrette at the Nebraska State Historical Society, snavarrette@mindspring.net.

Shuman, Bruce A. Library Security and Safety Handbook: Prevention, Policies, and Procedures. Chicago: American Library Association, 1999.

Trinkaus-Randall, Gregor. Protecting Your Collections: A Manual of Archival Security. Chicago: Society of American Archivists, 1995.

Trinkley, Michael. Hurricane! Surviving the Big One: A Primer for Libraries, Museums, and Archives. 2nd ed. Atlanta, GA: Chicora Foundation, Inc., and SOLINET, 1993. *A thorough planning aid for institutions in hurricane areas. Portions will be useful in planning for recovery from any region-wide natural disaster. To order contact the Chicora Foundation, Inc., P.O. Box 8664, Columbia, S.C. 29202, telephone 803-787-6910. Further information is online at www.chicora.org/prespubs.htm.*

Online Resources

American Institute for Conservation. Emergency! If You're First. n.d. (May 8, 2001). Leaflet. http://aic.stanford.edu/disaster/emrgncy.html. *General recommendations intended to provide practical guidance in the recovery of water-damaged objects.*

Canada Mortgage and Housing Corporation. "Floods: What To Do Before and After." Ottawa, ON: CMHC-SCHL, 1996-2001 (May 8, 2001). *Instructions for how to prepare your family for area-wide flooding, then rehabilitating home and property. http://www.cmhc-schl.gc.ca/en/burema/coem/flood/flwhbeaf/index.cfm.*

Chicora Foundation, Inc. Fire. Columbia, SC: Chicora Foundation, 1999 (May 8, 2001). www.chicora.org/fire.htm. *Brief but useful information for salvage of both buildings and collections, with attention to smoke damage. Good advice for dealing with restoration companies.*

_____. Mold. Columbia, SC: Chicora Foundation, 1999 (May 8, 2001). www.chicora.org/mold.htm. *Provides an overview of the biology of mold with instructions for cleaning buildings and collections. Good advice for dealing with cleaning companies.*

Hess Norris, Debra. "Disaster Recovery: Salvaging Photographic Collections." Philadelphia, PA: CCAHA, 1998. *Available online at www.ccaha.org. Current and detailed, this is an authoratative document on the subject.*

Jaffe, Marlene and members of the AIC Textile Specialty Group. Salvaging Water Damaged Textiles. December 1, 1995. Leaflet (May 8, 2001). http://aic.stanford.edu/disaster/txsalv.html. *Instructions for proper handling, cleaning, and drying wet textiles.*

Lyall, Jan. "Disaster Planning For Libraries And Archives: Understanding The Essential Issue." Provenance: The Electronic Magazine 1.2 (March 1996). *Available at* www.nla.gov.au/nla/staffpaper/lyall1.html.

National Park Service *"Conserve O Gram"* series. *Available at* http://www.cr.nps.gov/museum/publications/conserveogram/conserv.html
2/6 (July 1993), Jones, Douglas C. "Preparing Salvage Caches for Emergency Use."
2/8 (July 1995), Knapp, Anthony M. "Hantavirus Disease Health and Safety Update." 3/2 (July 1993), Merritt, Jane. "Mold and Mildew: Prevention of Microorganism Growth in

Museum Collections."
3/7 (August 1998), Child, R.E. "Monitoring Insect Pests With Sticky Traps."
3/8 (August 1998), Pinniger, D.B. "Controlling Insect Pests: Alternatives to Pesticides."

NEDCC Technical Leaflets
3/1 "Protection From Loss:Water And Fire Damage, Biological Agents, Theft, And Vandalism" by Sherelyn Ogden (1999)
3/2 "An Introduction To Fire Detection, Alarm, And Automatic Fire Sprinklers" by Nick Artim (1999)
3/3 "Disaster Planning" by Beth Lindblom Patkus and Karen Motylewski (1999)
3/4 "Worksheet For Outlining A Disaster Plan" by Karen E. Brown (1999)
3/5 "Emergency Management Bibliography" by Karen E. Brown (1999)
3/6 "Emergency Management Suppliers And Services" (1999)
3/7 "Emergency Salvage of Wet Books and Records" by Sally Buchanan (1999)
3/8 "Emergency Salvage of Wet Photographs" by Gary Albright (1999)
3/9 "Emergency Salvage of Moldy Books and Paper" by Beth Lindblom Patkus (1999)
3/10 "Protecting Collections During Renovation" by Karen Motylewski (1999)
3/11 "Integrated Pest Management" by Beth Lindblom Patkus (1999)
3/12 "Collections Security: Planning And Prevention For Libraries And Archives" by Karen E. Brown and Beth Lindblom Patkus (1999)

Olcott Price, Lois. "Managing a Mold Invasion: Guidelines for Disaster" Response. Technical Series No. 1. Philadelphia, PA: CCAHA, 1996. *Available online at www.ccaha.org.*

SOLINET. "Invasion of the Giant Spore." Atlanta, GA: SOLINET, 2001 (May 8, 2001). http://palimpsest.stanford.edu/byauth/nyberg/spore.html. *Updated version of Sandra Nyberg's 1987 leaflet. One of the best introductory articles on the subject. Extensive bibliography for further research.*

Trinkley, Michael. "Protecting Your Institution From Wild Fires: Planning Not To Burn And Learning To Recover." (14 August 1998). http://palimpsest.stanford.edu/byauth/trinkley/wildfire.html (June 12, 2001).

Walsh, Betty. "Salvage at a Glance" and "Salvage Operations for Water Damaged Archival Records: A Second Glance." WAAC Newsletter 19.2 (May 1997). *Available at* http://palimpsest.stanford.edu/waac. *Excellent recovery guidelines for minor, moderate and major disasters. "Salvage at a Glance" is a chart worth printing, and posting, to assist with proper response decisions.*

Preservation 101 faculty wishes to thank Beth L. Patkus and Mildred O'Connell for their kind assistance writing and editing this lesson. We also acknowledge previous contributions by Karen Motylewski and Lisa Fox during their tenure at the Northeast Document Conservation Center.

PRESERVATION 101:
An Internet Course on Paper Preservation

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http://www.nedcc.org

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Lesson 7: Care of Photographs

Strategies for the proper storage, care, and handling of photographic images

Course Content
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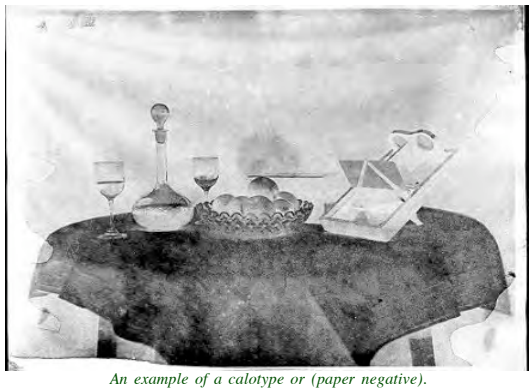
History and Identification of Photographic Images
The Principle of Photography
Life-Expectancy of Photographic Materials
Enclosures and Storage Systems
Handling Photographs
Reformatting
Self-Testing Question
Printed Resouces
Online Resources

History and Identification of Photographic Images

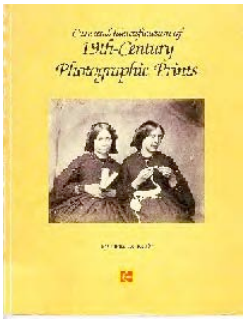


An example of a calotype or (paper negative).

Visual images have played a central role in human communication since the dawn of civilization, originating with symbols, picture-writing, and pictographs. Today, images in many diverse formats convey important information to a wide variety of people, including artists, scholars, collectors, medical personnel, legal investigators, advertisers, publishers, and students. Among the materials collected and organized by educational and research institutions, photographs are the most treasured and heavily used.

Extensive technical and aesthetic changes have affected photography since 1839, when Louis Daguerre developed a practical method for creating permanent images. Equipment has evolved from a simple camera obscura, through many versions of lightproof boxes fitted with a glass lens, to the digital cameras on the market today. The ability to capture an image with light sensitive materials has been tried and tested with a wide variety of supports and processing techniques. Today, digital cameras capture the data, and we reproduce images with inks and dyes.

Each photographic process has unique characteristics that affect its deterioration, storage, and handling. In order to care properly for photographic collections, you must understand how photographs are made and learn how to identify their various types. You must also become familiar with problems related to their physical and chemical composition.



Since the technical information presented here is necessarily limited, we suggest that you purchase Care and Identification of 19th Century Photographic Prints, available from Kodak Publications. Valuable hands-on experience can be gained by participating in a photographic identification workshop, especially useful to those who oversee collections containing many different types of photographs.

The Principle of Photography

A photographic image may be a print; it may also be a positive or negative transparency. In order to produce an image, light-sensitive materials such as silver salts are applied to a support made of paper, cloth, plastic, or metal, and exposed to light. This forms either a direct visible image or a latent image, which can be developed out in a chemical developer. The image is "fixed" in order to remove excess light-sensitive material and stop the darkening process. It is then washed to remove residual fixer. Improper washing could cause fading or staining over time.

Early Photographs

The earliest photographs were "direct positive images." Because they were produced without negatives, they were one of a kind. They were also reversed from left-to-right relative to the image being captured.

Three types of direct images made during the 19th century did not have paper supports. They are the daguerreotype, the ambrotype, and the tintype.

1. The first popularized positive image[1] was the daguerreotype, developed in France by Louis Daguerre. It remained in common use from 1839 until circa 1860. Daguerreotypes, produced on a silver-plated copper sheet, were mostly used for

portraits and packaged in velvet-lined leather cases. Dagerreotypes are finely and sharply detailed on a highly reflective, mirror-like surface. The image may appear positive or negative, depending on the viewing angle.

2. Ambrotypes, introduced in 1854, were commonly available until 1881. These negative images, produced on glass, appear as positive images when viewed against a black background. The glass plate negative was therefore backed with black paint, paper, or cloth. Ambrotypes were less costly to produce than daguerreotypes, but were made to look expensive by enclosing them in ornate cases.

3. Tintypes were popular from the 1850s until the 1930s. They were direct positive images printed, not on glass, but on thin sheet iron that had been lacquered black or brown. Tintypes have an overall gray tone, with white tones that appear dull or creamy. The least expensive image of its day, tintypes were sometimes cased, but were mostly mounted in paper folders.

Prints

In 1839 William Henry Fox Talbot developed the technology for printing images on paper. In his "photogenic drawing" process, he sensitized paper with silver chloride, which darkened rapidly when exposed to direct sunlight or daylight. The image, often of objects such as leaves, appeared spontaneously during exposure, without chemical development. His calotype or paper negative process of 1841 transformed photography into a two-step operation. He created a paper negative from which any number of positive, tonally correct copies could be made. These are known as salted paper prints. Photographic prints that do not require chemicals in order to bring out the image are known as printing-out papers.

Albumen paper became the dominant print material of the 19th century. Very thin, lightweight paper was coated by floating in a bath of albumen or egg white and sensitized with silver salts. It was then exposed in sunlight to create an image. The paper albumen print was washed, toned in order to alter color, improve image stability, or increase contrast, fixed, and finally mounted on a heavy card stock because the paper was so thin. Albumen prints have a glossy surface, rich purple or red tones, and sharp detail. The improved quality of albumen prints caused them to replace salted paper prints in popularity.

Albumen prints in your collections may have yellowed over time and developed a fine crackle pattern on the surface. Their mounts, made of poor quality paper stock, usually become brittle as they age.

The surface of collodion prints are easily scratched and abraded.

Collodio-chloride and gelatino-chloride prints dominated the market for about ten years at the turn of the 20th century. Like albumen prints, they were produced by direct exposure to sunlight, without chemicals.

The most comon type of paper print today is the gelatin silver print, invented in the early 1880s. Gelatin paper prints, are produced by immersing exposed paper or other film support in a developer to bring out the image. The silver-based light sensitive material, briefly exposed to light, forms an invisible or latent image that can be developed-out with chemicals. The exposed paper or film must be kept in the dark until processed. Gelatin prints are relatively stable, however, greenish-bronze surface discoloration can appear if they are improperly washed.

The blue color of cyanotypes makes them easy to identify. They should be protected from light exposure.

Non-silver print processes such as platinum prints (silver gray in color), cyanotypes (blueprints), and carbon prints were also popular in the late 1800s and early 1900s. You may well have examples of these prints in your collection. Blue cyanotypes are easy to identify, but identification of the others may be a challenge. The Kodak book, Care and Identification of 19th Century Photographic Prints will help you distinguish between the various types of photographic prints represented in your collection. It provides detailed descriptions and visual clues, and contains a very useful flow chart.

Hand coloring, retouching, and varnishing can confuse the identification process. These additions to the original image are sometimes so subtle that consultation with a conservator may be required for positive identification.

Photographic prints can be difficult to identify; they are also difficult to treat. Photographs are extremely sensitive to moisture, solvents, and abrasion. Their cleaning or repair should be carried out by a photographic conservator or trained technician in order to guarantee sympathetic care and prevent further damage.

Negatives

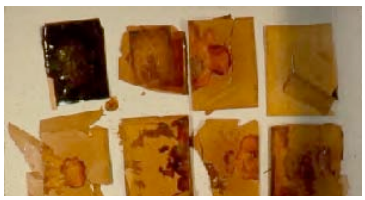
Talbot's original paper negatives were not entirely satisfactory. They were dense and required long exposure to light in order to produce satisfactory copies. The resulting image was softened by the paper fibers in both the negative and the salted paper.

In the early 1850s, the wet collodion negative was introduced. A glass plate was treated with collodion and silver nitrate, and exposed and processed while still wet. This required the photographer to apply the coating and develop the negative on-site. Collodion can be identified by its uneven surface coverage and slightly green tone.

Historic photos can be difficult to identify. This is a gelatin developed out print of a daguerreotype.

Gelatin dry plates of the 1870s soon replaced the wet collodion negative. The photographer was no longer required to coat his own plates and could develop them at any time in the future, as long as they were protected from light in the interim. Gelatin dry plates were machine made, producing a smoother plate with a more even emulsion than collodion plates.

More familiar to us is the flexible film format. In 1889, Kodak introduced nitrate film, made of cellulose nitrate plastic, which could be wound in rolls to improve portability. Nitrate was used to produce sheet film, as well as motion picture film. Unfortunately, cellulose nitrate proved to be highly flammable, especially in reel format; it also became acidic when poorly stored.



These problems led to the development of "safety film" in the 1930s. Made of cellulose acetate plastic, this film is harder to ignite and is self-extinguishing. Unfortunately, early safety film is also impermanent. As cellulose diacetate (the earliest form) degrades, it generates acetic acid that smells like vinegar. This phenomena is sometimes refered to as the "Vinegar Syndrome" in the preservation literature. Its gases can damage paper or photographic collections in the proximity of the degraded film. In 1947 Kodak introduced another type of safety film, cellulose triacetate. Although it is much more stable and still used today, it also has inherent problems and unless stored under optimum conditions may eventually exhibit the same problems as earlier films.

Polyester film was developed for use as a film base after World War II and is used for most roll film, movie film, and sheet film today. It has demonstrated excellent dimensional and chemical stability and is the plastic film base of choice whenever long-term preservation is a concern.

Example of black and white negative film

Should you find nitrate or early safety film in your collection, segregate them from other materials as quickly as possible. These materials should be stored in buffered paper envelopes and boxes and kept in a well ventilated area.

Both nitrate and early safety film should be monitored on a regular basis and ultimately duplicated onto a stable polyester film base. Institutions should give highest priority to duplication of film that shows early signs of deterioration, since deterioration can proceed very quickly once begun. Nitrate and acetate safety film deteriorate at about the same rate, so one film type need not necessarily be duplicated before the other.

Monique Fischer's article, "A Short Guide to Film Base Photographic Materials: Identification, Care, and Duplication", available online, is an excellent guide to identifying film bases in your collection. For more general information about negatives, see Paul Messier's article, "Preserving Your Collection of Film Based Photographic Negatives", listed in the Online Resources section.

Color Materials

Color photographs, negatives, slides, and motion picture film are found increasingly in library and archival collections. Most date from after the mid-1930s, when chromogenic development was first used by Eastman Kodak and Agfa. Earlier color processes, some of them on glass, are less commonly found, among them autochromes (1907-ca. 1930).

The most significant fact about the preservation of color materials is that they are inherently unstable. Most dyes used in color emulsions fade within a few years if exposed to light. Many will fade within 35 years, even when stored in the dark. While their stability has improved in recent years, color materials have a far shorter lifespan than black-and-white materials.

The authoritative work on preserving color materials is Henry Wilhelm's The Permanence and Care of Color Photographs, (see Sources of Information, Printed Resources, below). It offers detailed specific information on the storage of photographs, including black-and-white media.

A Word about Albums and Scrapbooks

Many historical collections contain albums and scrapbooks, that often pose challenging preservation concerns. Bindings can be fragile or damaged; support pages are often acidic and brittle. Scraps may include a variety of formats. For example, cards, photographs, booklets, and other ephemera might be includeded in the same volume, complicating preservation options.

When confronted with deteriorating photographs in albums or scrapbooks, you must make some critical decisions. You must evaluate the extent of damage being caused to the photographs, whether it is possible to remove and rehouse them, and whether the album or scrapbook itself has value as an artifact.

If the contents are adhered to acidic pages, it may be desirable to "recreate" a scrapbook by transferring its contents to a new scrapbook of archival quality. Alternatively, photographs may be removed from an album and rehoused in permanent quality enclosures. In both cases, identifying information must be transferred.

In some cases, it may be impossible to remove photographs that have been glued down. In other cases, it may be undesirable to do so even if it is possible, for example, if the pages themselves have extensive notes or decoration that gives the scrapbook special value. Making a preservation photocopy or microfilm copy of fragile volumes should be considered for access purposes (see the Reformatting section below).[2]

You may decide that the album or scrapbook has artifactual value and must remain intact. In this case, the book should be housed in a box of archival quality that conforms to the size of the book. Interleaving sheets of thin Mylar or chemically stable paper may be used to keep deteriorated objects from damaging adjacent pages. No objects should be in contact with endsheets, since they tend to be acidic.

Life-Expectancy of Photographic Materials

Effects of Environment

Storing photographic materials under poor environmental conditions can result in irreversible damage. High temperatures accelerate deterioration, causing fading and discoloration, especially when relative humidity (RH) is also high. When combined with air pollution, these conditions may cause silver images to oxidize, color dyes to shift and fade, and mold to grow. Mold may be impossible to remove without damaging the photograph.

High RH levels can soften emulsions and allow dirt to become embedded, making the images vulnerable to mechanical damage. Ferrotyping can occur at high RH levels, and softened gelatin can adhere to plastic enclosures. High RH is also a major cause of highlight yellowing of albumen prints. Conversely, extended storage at low RH can cause photographic emulsions to shrink and crack, supports to curl, and mounts to warp.

Photographs are very sensitive and should only be treated by a professional conservator.

Photographs are extremely sensitive to atmospheric pollutants. Particulate pollutants may cause abrasion and attract mold or insects. Sulfur compounds form silver sulfide in moist air, which can cause fading. Indoor pollutants such as paint, plywood and cleaning supplies may also result in staining or fading. Moisture in the air may combine with processing chemical residues to cause fading, yellow and brown stains, or silver mirroring of prints and negatives.

Exposure to light can also damage photographic prints, causing them to fade and become brittle. Well-processed black-and-white silver gelatin prints are relatively stable at moderate light levels. However, color prints and early black-and-white images, especially salted paper and albumen prints must be protected from unnecessary light exposure. Resin-coated or "RC" papers are especially vulnerable to light,

developing a metallic sheen known as "bronzing."

Recommended Storage Conditions

The fact that photographic materials are so vulnerable to excesses of heat, humidity, light, and pollutants makes it imperative for us to protect them from adverse conditions. Clean, filtered air and regular housekeeping will combat pollutants. Exhibition times for original materials must be strictly limited; copies should be made for display purposes whenever possible.

Photographic materials must not be stored in hot places or near heat sources. Heat accelerates chemical reaction, causing the rate of deterioration to double with each temperature increase of 18 degrees F. Conversely, deterioration of some materials can be slowed by storing them at low temperatures. For example, humidity-controlled cold storage vaults have been constructed for deteriorated film and color collections at the National Archives of Canada, the JFK Library in Boston, and the Smithsonian Institution in Washington, D.C.

An example of poor photographic storage

An appropriate frost-free refrigerator is the only simple way to store color negatives, slides, prints, and motion pictures at low temperature and relative humidity. Older manual-defrost refrigerators should NOT be used since they have high relative humidity levels. Cellulose nitrate film should not be kept in refrigerators, but should instead be stored in special explosion-proof freezers.

Photographic prints and films should be packaged in envelopes, boxes, or polyethylene bags to protect them from humidity fluctuations during defrost cycles or when the door is opened.[3] The refrigerator should not be too tightly packed so that air can circulate. Cold storage should be used only for limited access collections, since the climate inside the refrigerator cycles each time the door is opened. Humidity levels in the refrigerator should be tested regularly with a dial hygrometer. Photographs removed from the refrigerator should be allowed to warm up for 2-3 hours before unwrapping.

The Sapwater article, "Images On Ice," in the Online Resources section, and Wilhelm's book, cited above, are excellent resources for further information about using cold storage as a preservation tool.

The American National Standards Institute (ANSI) and other industry groups, such as the International Standards Organization (ISO) and the National Information Standards Organization (NISO), have generated standards that can be used to determine the best practices for storing photographic materials. ANSI uses the term "LE Designation" for rating the "life expectancy" of recording materials, including photographs. In this system the number following the "LE" is the maximum number of years during which "information" can be retrieved without significant loss when stored at 21 degrees C and 50 % RH. For example, "LE-100" indicates that information in a certain format can be retrieved after at least 100 years of proper storage.

ANSI has also defined the quality of various storage environments. For example, "medium term" storage conditions will preserve information for a minimum of 10 years. "Extended term" storage conditions are considered suitable for the preservation of recorded information (photographs, magnetic media, etc.) over the long term. For most freshly processed photographic film, this can be as long as 500 years. Here are some storage conditions recommended by ANSI based on industry research:

Film: ANSI/PIMA IT9.11-1998/ISO 5466-1996. "Imaging Media - Processed Safety Photographic Films - Storage."

Medium term storage: 77°F, 50% RH

Extended term storage (high end):

Acetate: 45°F, 20-30% RH
Polyester: 70°F, 20-50% RH
Color: 36°F, 20-30% RH

Prints: ANSI/NAPM IT9.20-1996/ISO 6051-1997. "Imaging Materials - Reflection Prints - Storage Practices."

Medium term storage: 77°F, 20-50% RH

Extended term storage: 64°F, 30-50% RH

35°F for some color material processes

Photographic Plates: ANSI/NAPM IT9.18-1996/ISO 3897-1997. "Imaging Materials - Processed Photographic Plates - Storage Practices."

Medium term storage: 77°F; 20-50% RH

Extended term storage: 64°F; 30-40% RH

User group standards and guidelines are also available for consultation. They include the publications of the:

- National Park Service (NPS), such as Conserve O Gram;
- International Federation of Library Associations & Institutions (IFLA), such as Mark Roosa's article Care, Handling, and Storage of Photographs; and
- Research Libraries Group (RLG), who are responsible for preservation microfilming standards.

Both NPS and IFLA recommend a temperature of 65-70 degrees F and an RH of 40-50% for the general storage of photographs (mixed collections or mixed use and storage areas).

Enclosures and Storage Systems

Deteriorated photographs that are extremely valuable as artifacts may require conservation treatment by a professional photographic conservator. However, expensive conservation treatment is neither feasible nor cost-effective for most deteriorated photographs. Instead, educating staff and users in proper care, handling, and storage will have the greatest positive impact on the long-term preservation of entire collections.

Most storage solutions will require some compromise between what is ideal and what is feasible. It is best to separate photographic prints from negatives, if at all possible. This will prevent contamination of prints by acidic gases and will make it easier to monitor the condition of the film. Storing similar sized items together is also recommended, so that good support is ensured and distortion prevented.

Best Practice: Photos should be stored inside individual enclosures, then boxed or stored in appropriate cabinets

Originals should be separated from copies, with copies made available to researchers. Originals should be stored under proper environmental and security conditions, protected from fire and theft.

Ideally, the process used to produce a photograph should help to determine its storage. Storing daguerreotypes with daguerreotypes would also prove to be an advantage in case of disaster, since different types of photographs require different recovery techniques. Note that storage by type of photograph requires good indexing and cross-referencing, which can be time consuming and complicated.

Ideally, materials used to house photographs will function well during archival processing, use, reformatting, and long-term storage. Providing several "layers of protection" will help ensure good support and physical protection. Each item should be individually enclosed then organized inside folders (as required), which are themselves placed inside a box or file cabinet. Standardizing the size of enclosures and boxes may save money, since it makes more efficient use of staff and space resources.

These acidic enclosures will damage the materials they are meant to protect and provide little physical support

Enclosures are designed to provide physical support and protection and may be made of paper or plastic. Paper enclosures require photographs to be removed for examination. Plastic enclosures allow a researcher to view the image without handling it, thus reducing the danger of abrasion. Paper enclosures are easily labeled with a graphite pencil. Polyester, polypropylene, and high-density polyethylene that are free of slip agents and plasticizers are currently the only plastics acceptable for photographic storage. Uncoated transparent polyester (Mylar D) is the material of choice, but is also the most expensive.

Gary Albright describes the do's and don't of selecting enclosures in NEDCC's technical leaflet, "Storage Enclosures for Photographic Materials."

Two standards are available for information about enclosures.

- ANSI/PIMA IT9.2 - 1998. "Photographic Processed Films, Plates, and Papers, Filing Enclosures and Storage Containers."
- ANSI/NAPM IT9.16 - 1993. "Imaging Media - Photographic Activity Test." Photographic Activity Tests (PAT) determine the effect of housing materials on photographic materials. Some archival suppliers now highlight products that meet this ANSI standard.

Storing photographs on edge may be considered for items measuring less than 10 x 12 inches, as long as they are supported vertically every six inches. Fragile, damaged, and oversized photographic materials are best stored flat in boxes that conform to the size of the objects. Allowing materials to slump inside boxes can result in permanent planar distortion. Conversely, if boxes are too full, physical damage may result during retrieval.

Photographs may be kept in albums or scrapbooks as long as the books are made of permanent quality materials and provide good support. This manner of storage is best suited for small-sized photographs; it is inappropriate for photographs mounted on board. "Pocket pages" made of safe plastics are available for albums in a variety of sizes. Conservation suppliers also stock paper or plastic photograph "corners," that will allow easy and safe removal of the photograph from the album in the future.

Glass Plates

Glass plate negatives are extremely vulnerable to breakage. They are best stored in four-flap, seamless enclosures, which require the user to lay the plate on a flat surface in order to open the enclosure. Enclosed glass plates should be boxed in document storage boxes, lined on the bottom with Ethafoam. Glass plates must be stored upright on the long edge, not flat, because the pressure and weight of the plates on top will damage those on the bottom of a pile. Because glass plates are so heavy, boxes should not be more than six inches deep to permit safe handling. Boxes should be stored on sturdy shelving, not inside file cabinets, which are not designed for such heavy loads. Boxes containing glass plates should be marked "Fragile Glass, Heavy." Broken glass plates with flaking emulsion need to be stored in a sink mat and horizontally (flat).

Cased Photographs

Like glass plate negatives, cased photographs (daguerreotypes, ambrotypes, tin types) should be housed in four-flap enclosures and boxes. The enclosed cases may be stored flat or vertically inside large boxes or padded drawers. Leather dressing should not be used on cases since the dressing can become sticky and contribute to the deterioration of the object. Cased photographs should not be disassembled, since breaking the seal will admit damaging pollutants and oxygen into the package, resulting in fading and deterioration.

The inside of a typical daguerreotype case (photograph removed)

Slides

Slides with long-term value should never be projected, since heat and exposure to light will destroy them over time. Instead, duplicates should be made for projection, copying, and extensive research with a light box. Slides should be stored in boxes or in polypropylene slide pages.

The most important factor to consider when choosing color transparency film for new images is to determine how the slides will be used. Kodachrome films are best because of their unsurpassed stability in dark storage. However, Kodachrome has the worst projector fading stability of any slide film on the market today. If originals are only projected occasionally or if routine duplication is not feasible, then Fujichrome films are the best option. Fujichrome slides have twice the projection life of Ektachrome slides; their stability in dark storage is roughly equivalent with Kodachrome slides.

Handling Photographs

Proper handling is critical to the long-term preservation of photographic materials. Photographic emulsions are easily scratched, and oils and dirt from hands can damage the support, binder, and image material. The following guidelines should be followed by staff and researchers who are planning to handle a photographic collection.

Care & Handling of Photographic Materials

- Wash hands before handling photographs. Always wear clean, white, lint-free cotton or nylon gloves when handling photographic materials.
- Always pick up a photograph with both hands. Handle it by the edges only.
- Always place a secondary support under the photograph, especially if it is large, heavy, delicate, or damaged.
- Support mounted objects so that the board does not break. Be aware that mounting boards often become brittle with age.
- Turn objects over by placing them between two stiff secondary supports, holding the sandwich together lightly between your palms, and flipping gently.
- Never stack glass plate negatives on top of each other.

Rough handling caused this brittle mount to break resulting in loss of part of the image

Removing Photographic Items from Paper Envelopes or Plastic Sleeves

- To open a paper envelope, hold it in one hand and support its weight with the other hand. Pinch the sides of the envelope to allow visual identification of its contents. Do not blow into the envelope since you are likely to spit at the same time.
- Decide whether or not you need to remove the item completely from a paper enclosure.
- Orient the carrier and emulsion side of the object so that the image is up. In order to be "right reading," negative or sheet films must be emulsion side down.
- To remove items from paper envelopes or plastic sleeves, grasp the photograph by its extreme edge and pull a short length of it from the enclosure. Place the photograph down on a clean secondary support. Slide the envelope away from the photograph with one hand while holding its edge securely in place.
- Replace the photograph to its enclosure by sliding the envelope or sleeve onto the photograph, not the photograph into the sleeve.
- Do not attempt to remove a photograph that appears to be adhered to its enclosure. You will probably cause further damage.
- Use two people, if necessary, to retrieve oversized photographs from their storage enclosures and housing.

Removing Photographic Items From A Flap-Style Enclosure

- Place the enclosure down on a flat surface.
- Open the flaps and view the enclosure's contents.
- Close the flaps properly when you are done.
- Orient photographs stored in flap-style enclosures with the emulsion side down.

Handling Glass Negatives

Attempting to turn glass plates over between secondary supports can be risky, since the plate can easily slide out from between the cards.

Alternatively, place the pads of the fingers of one hand against an edge of the glass plate. Place the pads of the fingers of the other hand against the opposite edge. Gripping the edges firmly, pick up the plate and turn the object over.

If you cannot grip the edges, slide the glass plate carefully to the nearest edge of the secondary support and allow it to extend over the edge, far enough to let you grip it. Pick up the glass plate and turn it over. Be careful that its surface is not damaged during the sliding step, especially if the emulsion side is face down.

Be careful with glass plates that are broken. Ask a conservation technician or qualified framer to construct a sink mat enclosure to house the original. Reformat the image before returning the plate to archival storage.

Reformatting

Reformatting photographs is a preservation option when handling of photographs must be limited because of value or condition, or when information alone must be preserved. Only copies of unique, valuable or fragile images should be given to researchers.

Both preservation photocopying and preservation microfilming produce quality copies and allow researchers to browse collections. Continuous tone microfilm is a very reasonable preservation option for reformatting black-and-white sheet film and glass negatives. While the quality is not as good as the interpositive/duplicate negative process described below, continuous tone microfilm is acceptable as a lower cost preservation solution.

A skilled microfilm camera operator insures a proper exposure for every frame

Preservation microfilming and preservation photocopying may also be used effectively for scrapbooks. They are good options for scrapbooks containing newsclippings; they also capture the "look" of a family scrapbook containing photographs, notes, and other memorabilia.

The best quality copying of negative photographic film is accomplished by the interpositive/duplicate negative system (IP/DN). This creates an "interpositive," which becomes the master copy; it is best stored off-site under good environmental and security conditions. The duplicate negative is created from the interpositive and can be used to make additional prints. Deteriorated 35 mm roll film may be copied using sheet film and the IP/DN method.

For a general overview of this duplication process, see "Duplication of Historical Negatives" by Gary Albright. For those of you who are interested in doing your own copying, more detailed information is available in Kodak's Copying and Duplicating: Photographic and Digital Imaging Techniques.

Self-Testing Question

How do you distinguish between the gelatin emulsion and the film side of a modern photographic negative?

1. The film side is shiny, while the emulsion side is matte in appearance.
2. Text in the image or edge markings are "right reading" when the negative is viewed from the shiny side.
3. The emulsion layer swells in contact with water.
4. The film has a slight curl towards the emulsion side.

Submit

Digitization

Digitization of photographic collections has become a "hot" issue in recent years. These materials seem ideal candidates for presentation on CD- ROM or on the Web. While it is true that digitization can greatly enhance access to photographic collections, it is essential to understand that

1. Digitization is more than simply scanning photographs into a computer. Extensive indexing is required to make the collection useful online.
2. Digitization for access and digitization for preservation are two different things. The latter requires a long-term commitment to maintaining the images indefinitely through changes in software and hardware. It also requires a significant initial investment to create images of preservation quality.

Digital imaging has by no means made preservation microfilm obsolete. Ultimately, those in the preservation community envision a gradual partnership of digitization with preservation microfilm. If additional information on digitization is needed, see NEDCC's technical leaflets "Digital Technology Made Simpler," and "The Relevance of Preservation in a Digital World," by Paul Conway. The technical reports of the Council on Library Resources are also very useful, especially reports by Abby Smith and Stephen Ostrow, available online at http://www.clir.org and listed in the Online Resources section below. Finally see Handbook for Digital Projects, edited by Maxine K. Sitts to assist with issues such as selection, copyright, and best practices.

[1]Positive images are customary in appearance: light areas in the subject appear light in the image; dark areas appear dark.

[2]Preservation photocopying refers to producing acceptable, long-lived copies by plain paper electrostatic (or xerographic) photocopying onto archival paper. See Sources of Information for references to further information.

[3]"SafeCare® Image Archive Freezer Kits" from Metal Edge, Inc. (800-862-2228) contains all the materials needed to make five freezer-ready packages.

ASSIGNMENT: Conduct a mini-condition survey of a discrete set from your photographic collection. Do any exhibit obvious

signs of deterioration? Which materials demand immediate attention? Consider what is needed to improve storage and handling for these at-risk materials. Which actions are most feasible, and which would have the most impact? Plan to implement one preservation action that will help ensure the longevity of your photographs.

Sources of Information

Printed Resources

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Note 16/3 Care of Black-and-White Photographic Negatives on Film
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Lesson 8: Preservation Planning

Organizing a preservation program.

Course Content
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Funding and Grants Organizations and Agencies

What is "preservation planning"?

We have identified factors that cause or accelerate deterioration and introduced some preventive strategies. Now we are ready to discuss methods for identifying preservation needs and deciding which of those needs should be addressed first. Preventive conservation allows us to identify and quantify internal and external risks to a collection, and determine the most cost-effective means of reducing those risks.

some preservation problems are pretty obvious...

Preservation should be a planned operation, not merely reactionary in nature. Preservation planning can be defined as a process by which preservation priorities are determined, corrective actions and their feasibility are reviewed, and resources for implementation are identified. This is the foundation for developing a long-range preservation plan that will help you establish an effective program for collections care.

It is best to undertake preservation planning by consensus, involving a range of institutional staff. This helps to increase staff understanding of preservation

issues and builds support for the inevitable changes the plan will bring. It also establishes the principle that preservation cuts across existing organizational divisions and, indeed, affects virtually every aspect of a repository's operations. As changes are made, they should be formally articulated in policies and procedures. This will help to institutionalize preservation efforts and create a firm foundation for on-going preservation activities.

Surveying

Surveys are the best way to determine preservation needs and thus become the basis of the preservation program. There are two survey methodologies: quantitative and qualitative. A quantitative survey consists of statistical and random sampling, to determine the extent of acidic paper or deteriorated film in a collection. These "condition surveys" generate important data and provide evidence of patterns of deterioration from inherent vice. Gathering data on temperature and humidity through a monitoring program is another example of a quantitative survey.

Broader qualitative studies are more common, and in many cases more helpful to cultural institutions. Such surveys generally focus on activities intended to prevent damage. For example, a qualitative survey might evaluate:

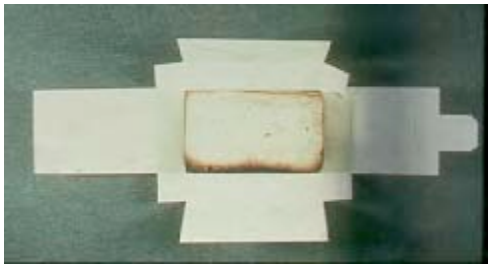
- collections management issues (e.g., acquisition, intellectual control, and use of the collection; staffing; policies and procedures, etc.)
- the building and environment (structure, temperature, relative humidity, light, pollution)
- emergency management (fire, water, security, pests, the existence of a plan and training)
- storage and handling
- exhibition practices
- reformatting
- general conservation treatment needs

This type of survey identifies risks to the long-term survival of collections and provides options for improving conditions. Such surveys are called "general preservation planning surveys."

Once identified, preservation needs must be critically considered and presented in a clearly organized written report that prioritizes recommended actions. This report will be a starting point for preservation planning.

You might ask yourself whether it would be better to have a staff member conduct your preservation survey or to bring in a consultant. Certainly, if you have a professionally trained preservation specialist on staff, it is appropriate to engage his or her expertise. If not, you may find that a "do-it-yourself" survey does not command the same authority as a survey done by an outside consultant. A consultant may also be more objective about preservation needs than an "insider." The major disadvantage of a consultant is, of course, that their services are costly.

Phased Preservation



A "Level 1" safeguard, archival quality enclosures help protect your collection

When balancing what **should** be done to preserve collections against what **can be** done, it is sometimes helpful to consider a model called "phased preservation," developed by the Library of Congress in the 1970s. This approach strives to maximize the effectiveness of limited resources to address the massive needs of large collections. This model divides preservation activities into three broad categories:

Level 1 addresses collection-level safeguards which include: benevolent environment; protective enclosures; commercial library binding; educated preparation, handling, and use; security; fire protection; emergency preparedness; and housekeeping. All Level 1 activities are focused on slowing the rate of deterioration of the entire collection and not just select objects. They also prevent premature loss or damage. These Level 1 activities comprise what has been termed "responsible custody." In fact, most activities at this level can be effectively implemented by the collections custodian, guided by the advice of preservation professionals.

Level 2 directs attention to groups of objects. It includes conservation treatment by technicians or professionally trained conservators, to repair or reverse existing damage. This level of preservation focuses on groups of objects in collections, rather than on the collections as a whole. Examples include removal of adhesive residues, washing, repairing tears, and repairing bindings. Level 2 also includes reformatting in order to preserve the information contained in deteriorating materials. Such treatments are often most economically applied to groups of objects.

Level 3 provides detailed treatment for special, individual objects. Conservation treatment and/or cosmetic restoration is assigned to this level and reserved for specific purposes, such as exhibition

of artifacts of special value. In most circumstances such activity requires the dedication of resources to the needs of relatively few valuable materials. This option can be fully warranted, but should be carefully considered in light of the overall needs of the collection. The benefits of in-depth treatment to the mission and interests of the institution must also be considered. Treatment at this level is not usually recommended if the item/s are to be returned to an inhospitable environment.

But within these levels or categories, many choices remain to be made. How do you set priorities?

SELF-TESTING QUESTION

Which of the following actions would be considered Level 1 preservation activities? Select all that apply.

- ☐ **Registration of researchers before using special collections material.**
- ☐ **Monitoring for pests using sticky traps.**
- ☐ **Encapsulating maps in Mylar.**
- ☐ **Repairing the roof of your building.**

Submit

Setting Policy, Weeding, and Organizing Collections

There are some actions that must be taken (or at least begun) before you can set preservation priorities for your collections. The first is to devise a mission statement and collecting policy, as outlined in Lesson 2, "Introducing Archives." Policies will allow you to look critically at collections that have accumulated over the years and identify those that do not serve the mission of the organization. These should be weeded, deaccessioned or donated to other repositories. This in turn allows you to concentrate you preservation resources on those materials that are truly important to you. Organization and description of your collections will also make it much easier to set preservation priorities.

Priorities for Preservation

Prioritizing is the process of deciding which actions will have the most significant impact, which are the most important, and which are the most feasible.[1]

It is important to keep in mind that few institutions have time or money to meet all preservation and conservation needs for their collections. When resources are limited, choices must be made among preservation activities. Every institution with collections of enduring value should have a preservation plan that weighs the needs of the collections against institutional resources, and provides a list of priority preservation actions.

While a general preservation planning survey should be the first step in putting together such a plan, the survey report in itself should not be considered a preservation plan. The survey report cannot provide a complete analysis of the many factors that must be considered when setting priorities for preservation action. Some of these factors—available funding for preservation, staff time and expertise, user demand for collections—change as institutional circumstances change. Other factors require an in-depth understanding of the institution and its collections that only staff members possess—political considerations or the relative value of collections to the institution.

There is general consensus regarding factors to consider when prioritizing potential preservation actions:

Collection-Specific

1. **Use**—materials that are used frequently may be at higher risk than others. They include materials used by researchers or exhibited routinely.
2. **Storage**—collections that are stored under adverse environmental conditions or in damaging enclosures may require prompt preservation action.
3. **Condition**—items or collections in fragile condition may be at risk unless they receive attention quickly.
4. **Value**—absolute value (rarity, monetary worth, intrinsic or associational value, etc.) and/or relative value of collections to the institution may influence preservation priorities. Whether collections have long- or short-term value to the institution will also affect decision-making.
5. **Format**—whether or not materials need to be preserved in their original format will also influence priorities.

Overall

1. **Impact**—those actions that will result in dramatic improvement or a slowing of deterioration, and those that will affect the greatest number of items, may be the highest priority.
2. **Feasibility**—this factor is essential; it includes staffing levels and expertise, policy and procedural changes, political considerations, and financial considerations (outside funding, capital outlay, operating costs, expenses for materials and services). Even if the impact of a preservation action is high, it may be given a low priority if implementation is not feasible.
3. **Urgency**—there will always be some activities that require immediate action; collections may be damaged or lost, or an opportunity to act on a particular project may be lost, if action is not taken.

phase boxes are often used to store books

In general, those preservation activities with the highest priority will have both high impact (such as improved climate control, rehousing of a collection, or microfilming) and be highly feasible (that is, staff, time, and money are available to carry them out in the near future). Activities with high impact but low feasibility such as replacing the HVAC system, may be given a lower priority until circumstances make them more feasible. Actions that are feasible but have only minimal impact (such as installing UV sleeves on fluorescent lights) may or may not be undertaken, depending on cost, visibility within the institution, and collection value. A written preservation plan may only allow you to begin with small projects, but it will enable you to act when the opportunity arises to address more ambitious preservation projects.

Thus, a good preservation plan includes not just a list of collection needs and the actions required to meet them, but also **a list of high priority actions that are achievable and a timetable for implementing them**. Once you have completed your survey, your goal should be to produce a timetable, using the recommendations in the survey report as a starting point. Worksheets listing preservation actions, resources, steps required, and target completion dates may be helpful. And remember—a preservation plan (unlike a survey report) cannot remain static; it must be periodically revised as circumstances change and preservation needs are addressed.

Planning Tools

A range of specialized publications has been developed to help librarians, archivists, and other collection custodians to assess and prioritize preservation needs. The most basic ones provide an outline for conducting site assessments, such as Karen Motylewski's "What an Institution Can Do to Survey Its Own

Preservation Needs," (in Collection Maintenance and Improvement by S. Byrne), The Conservation Assessment Guide for Archives by Jane Dalley, and John Fleckner's Archives & Manuscripts: Surveys. More sophisticated tools will help in the entire planning process, and include organizing a preservation committee, surveying the collection, determining priorities, and writing a long-range plan (S. Ogden's Preservation Planning: Guidelines for Writing a Long-Range Plan). A few are quite lengthy and may include additional resource materials such as samples of policies or articles about statistical surveying. Still others are automated and easily utilized, such as the PreNAPP from the Research Libraries Group, or "CALIPR", developed by Barclay and Jones. Both these tools include a condition component.

Funding Sources

How will you pay for a professional survey, and for future preservation work? There are various potential sources of funding for preservation surveys, and for more specific preservation activities like microfilming and rehousing of collections. Federal sources for preservation funding include the National Endowment for the Humanities (NEH) Division of Preservation and Access, the Institute for Museum and Library Services (IMLS), and the National Historical Publications and Records Commission (NHPRC). The Conservation Center for Art and Historic Artifacts (CCAHA) in Philadelphia offers grants for subsidized general planning surveys to non-profit institutions by a preservation professional. This program is funded by a grant from NEH.

There are also state preservation grant programs, including those of the New York State Library, Connecticut State Library, and the Massachusetts Board of Library Commissioners. These programs provide funding for preservation planning surveys, and subsequently for implementing survey recommendations. Remember that private funding is also a possibile source of funding. Many small foundations have specific interests and you may be able to find one which matches your needs. For example, if you are trying to preserve a local history collection, you might consider approaching local businesses or others with an interest in the community. In many cases you will have to provide funds to match the grant, so be prepared!

Finally, don't be discouraged if things don't move along as quickly as you'd like. Choose small, manageable projects that will give you a sense of accomplishment as they are completed. Opportunities to address

preservation issues
sometimes arise unexpectedly—so you will be ahead of the game if you have a preservation plan in place that allows you to take advantage of such opportunities.

[1]Sherelyn Ogden, "Considerations for Prioritizing," in *Preservation of Library and Archival Materials*, 3rd ed., edited by S. Ogden (Andover, MA: NEDCC, 1999).

ASSIGNMENT: Review NEDCC's technical leaflets "Considerations for Prioritizing," and "Priority Actions for Preservation." List those actions that you (or your planning committee) feel would have a high impact on preservation of your collection, and that would be highly feasible to implement. Divide these into short-, medium-, and long-term priorities.

Sources of Information

The following list of sources should help you gather information about the condition of your collections and current environmental and storage conditions. It will also help you weigh the needs of your collections against their value to your institution and the resources you have available. Regional field service programs are available to assist in all aspects of preservation planning, including surveys and training.

Printed Resources

Anderson, Joanne S. Guide for Written Collection Policy Statements. 2nd ed. Chicago, IL: American Library Association, 1996.

Atkinson, Ross W. "Selection for Preservation: A Materialistic Approach," and Child, Margaret, "Further Thoughts on Selection for Preservation: A Materialistic Approach," Library Resources & Technical Services 30 (October/December 1986): 341-362.

Banks, Paul N. and Roberta Pilette, eds. Preservation: Issues and Planning. Chicago, IL: American Library Association, 2000. SOLINET: *"Authored by leading experts in the field, this book presents a concise analysis of the key preservation management issues facing libraries and archives."*

Boomgaarden, Wesley L. "Preservation Planning for the Small Special Library." Special Libraries 76 (Summer 1985): 204-211.

Dalley, Jane. The Conservation Assessment Guide for Archives. Ottawa, ON:

Canadian Council of Archives, 1995. *To order, call 613/995-0210 or order using the .pdf file order form on the CCA Web site at www.cdncouncilarchives.ca.*

Darling, Pamela W., and Duane E. Webster, compilers. Preservation Planning Program: An Assisted Self-Study Manual. Rev ed. Revised by Jan Merrill-Oldham and Jutta Reed-Scott. Washington, DC: Association of Research Libraries, 1993.

Fiske, Betty. "Metropolitan Museum of Art Japanese Print Collection: Condition Survey, Computer Cataloging and Exhibition Concerns." The Book and Paper Group Annual 12, 1993. *Available online at http://aic.stanford.edu/conspec/bpg/annual.*

Fleckner, John A. Archives & Manuscripts: Surveys. Basic Manual Series. Chicago: Society of American Archivists, 1977. SAA: *"An effective records survey can aid research, promote preservation, bolster collection building, and foster administrative efficiency by providing knowledge of the documentary universe beyond an archivist's own institution. This manual tells you how." To order use the online publications catalog on the SAA Web site at www.archivists.org/catalog/catalog/index.html, Tel. 312/922-0140, or Fax at 312/347-1452.*

Green, Sara Wold, ed. The Conservation Assessment: A Tool for Planning, Implementing, and Fundraising. 2nd ed. Marina del Ray, CA and Washington, D.C.: Getty Conservation Institute and National Institute for the Conservation of Cultural Property, 1991. *Available from Heritage Preservation, www.heritagepreservation.org. Look under "publications" then select "additional publications" from the table of contents on the left side of your screen. A .pdf file order form is available, or call 888/388-6789 with questions.*

Ham, F. Gerald. Selecting & Appraising Archives & Manuscripts. Chicago: Society of American Archivists, 1992. SAA: *"Factors and considerations in appraisal for both archives and manuscripts, including the theoretical foundations for identifying, soliciting, selecting, evaluating, and authenticating records, are thoroughly discussed in this volume. Also included is the role of records management in controlling the life cycle of modern organizational records, as well as collections management and documentation strategies for other holdings." To order use the online publications catalog on the SAA Web site at www.archivists.org/catalog/catalog/index.html, Tel. 312/922-0140, or Fax at 312/347-1452.*

McCrady, Ellen. "The pH of New Library Books, 1976-1993: A Compilation of Survey Results." Abbey Newsletter 21, no. 1 (May 1997). *Also available at* http://palimpsest.stanford.edu/byorg/abbey/an/an21/an21-1/an21-101.html

Merrill-Oldham, Jan and Jutta Reed-Scott, revs. Preservation Planning Program: A Self-Assisted Study Guide for Libraries. Washington, D.C.: Association of Research Libraries, 1993. See Michèle Cloonan, "Organizing

Preservation Activities." Washington, DC: Association of Research Libraries, 1993. *Available through their Web site at www.arl.org/pubscat/index.html. Select "Complete List of Publications." List is arranged chronologically. The order form is on the Web page cited here.*

Miller, Frederic M. Arranging and Describing Archives and Manuscripts. Chicago: Society of American Archivists, 1990. SAA: *"Follow the continuum of activities designed to provide administrative, physical, and intellectual control over archives and historical manuscripts. At the core of this volume are the three basic activities of accessioning, arrangement, and description. This manual will prove especially helpful to the novice archivist coming to the profession through educational programs or the assignment of new archival responsibilities. Numerous tables and sample forms are an added resource." To order use the online publications catalog on the SAA Web site at www.archivists.org/catalog/catalog/index.html, Tel. 312/922-0140, or Fax at 312/347-1452.*

Motylewski, Karen. "What an Institution Can Do to Survey Its Own Preservation Needs." In Collection Maintenance and Improvement, ed. Sherry Byrne. Washington, DC: Association of Research Libraries, 1993. *Paper copies can also be obtained by callling NEDCC's Field Service Office at 978/470-1010.*

Ogden, Barclay, and Maralyn Jones. CALIPR. Sacramento, California: The California State Library, 1997. *Available online at http://sunsite.berkeley.edu/CALIPR. Note this URL is case sensitive.*

Ogden, Sherelyn. Preservation Planning: Guidelines for Writing a Long-Range Plan. Andover, MA: NEDCC and the American Association of Museums, 1997. *Order forms and information are available at the NEDCC website, www.nedcc.org/pubs.htm. Select "Order Information for Additional Hard Copy Publications."*

The Paper Conservator, 17 (1993). Includes papers from the Survey Workshop held at Oxford on September 25, 1992:

- Helen Creasy. "A Survey in a Day: Cost-Effective Surveys of Museum Collections in Scotland," pp. 33-38.
- Bronwen Evans. "The Duke Humfrey's Library Project: Using an Item-by-item Survey to Develop a Conservation Programme," pp. 39-44.
- Katherine Swift. "The Oxford Preservation Survey. 1: The Main Survey," pp. 45-52.
- Nancy Bell. "The Oxford Preservation Survey. 2: A Method for Surveying Archives," pp. 53-55.

Online Resources

Northeast Document Conservation Center, http://www.nedcc.org
1/1 What is Preservation Planning? by Sherelyn Ogden (1999)
1/2 Preservation Assessment and Planning by Dr. Margaret Child (1999)
1/3 The Needs Assessment Survey by Sherelyn Ogden (1999)
1/4 Considerations for Prioritizing by Sherelyn Ogden (1999)
1/5 Collections Policies and Preservation by Dr. Margaret Child (1999)
1/6 Preservation Planning: Select Bibliography by Debra Saryan

SOLINET. "Preservation Planning: Selected Bibliography." Rev. 01/10/2000. *Available at http://www.solinet.net/preservation/leaflets/leaflets_templ.cfm?doc_id=107 (June 1, 2001).*

Funding and Grants Organizations and Agencies

Council on Foundations. www.cof.org *A non-profit coalition of grantmaking foundations and corporations whose goals are to promote responsible and effective philanthropy. This site includes "Foundation News and Commentary" and "Council Columns Newsletter", publications of books and videos, general information on foundations, and foundation home pages.*

The Foundation Center. http://fdncenter.org "The Foundation Center's mission is to support and improve institutional philanthropy by promoting public understanding of the field and helping grantseekers succeed." *This site provides grantmaker information, funding trends and analysis, training and seminars, libraries and locations, fundraising process, Foundation Center publications, and a list of cooperating libraries. Links to more than160 private, community, and corporate foundations, plus federal grants and public charities. Also ranks foundations by assets and total giving.*

The Grantsmanship Center. http://www.tgci.com. *TGCI is known for grants and fundraising seminars. Excellent print publications can be ordered for $3-$4 U.S. each. Links to TGG Magazine, Federal Register grant information, and links to grantmaking foundations.*

Institute of Museum and Library Services (IMLS) www.imls.gov *IMLS supports museums of all types. This includes art museums, history museums, and historic houses and sites. To apply for IMLS programs, your institution must be a museum exhibiting objects to the general public, open 120 days or more per year, with at least one full-time or full-time equivalent staff member.*

Massachusetts Board of Library Commissioners (MBLC)
www.mlin.lib.ma.us/flash3.html *The MBLC provides funding for preservation of public library collections in Massachusetts. Support is provided for preservation surveys and for implementation. In 1995, MBLC introduced a new grant category for public libraries which funds conservation treatment and preservation microfilming. To be eligible for an implementation grant, a public*

library must have had a preservation survey and must have produced a brief written long-range preservation action plan based on the survey recommendations.

Types of projects funded include preservation/conservation surveys; projects to determine priorities for conservation and to implement a preservation action plan; acquisition of preservation equipment and supplies; evaluation and remediation of physical facilities; and projects to develop cost-effective methods of sharing preservation resources, such as staff training, reformatting, shared storage facilities, and emergency preparedness.

National Endowment for the Humanities (NEH) www.neh.fed.us *The National Endowment for the Humanities provides grant funding to advance and disseminate knowledge in all the disciplines of the humanities. NEH has been restructured into four divisions: Preservation and Access, Public Programs and Enterprise, Research and Education Programs, and Challenge Grants.*

National Historical Publications and Records Commission (NHPRC) www.nara.gov/nhprc *The purpose of the NHPRC is to preserve and protect America's documentary history. NHPRC funds projects that preserve endangered historical documents, plan for the preservation of archival materials, train those who work with historical records, and make documentary resources available to researchers, students, and teachers through publication. NHPRC has three application deadlines per year. Each deadline addresses specific objectives that have been identified as important by NHPRC. See the NHPRC web site for current grantr deadlines.*

New York State Library Conservation and Preservation Grants
http://www.nysl.nysed.gov/libdev/Conservation/Preservation Discretionary Grant Program
The Conservation/Preservation Discretionary Grant Program provides financial support up to $25,000 for projects to preserve library research materials in the collections of libraries, archives, historical societies, and similar agencies within New York State (other than the eleven comprehensive research libraries). Grant funds can be used for surveys of preservation needs; improvement of storage environments; microfilming of manuscripts, books, or other research materials; professional conservation treatments; copying of photographic materials; or for other preservation activities.

Regional Alliance for Preservation www.rap-arcc.org *Several of the regional field service programs offer NEH-funded grants for preservation surveys.*

Wilbers, Stephen. "Grant proposal writing: links, resources, and columns." Writing for Business and Pleasure. n.d. www.wilbers.com/grants.htm (May 8, 2001). *Four short, useful articles to assist the grants seeking and writing process.*

PRESERVATION 101:
An Internet Course on Paper Preservation

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Links Updated: July 11, 2003

Faculty

Course Content
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Course Creator/Lesson Author
Karen E.K. Brown

Karen Brown served as Field Service Representative for the Northeast Document Conservation Center from April, 1997 until June, 2001. In that capacity Karen organized and conducted preservation surveys and workshops, provided technical advice to libraries, museums, and archives, and advised on disaster planning and recovery.

Karen received a Bachelor of Fine Arts in 1983 from the Cooper Union in New York City. She graduated from Queen's University in Ontario, Canada, with a Master's of Art Conservation in 1990 (specializing in paper conservation), and received an MLS from Dalhousie University in Halifax, Nova Scotia in the spring of 1997. Prior to her last degree, Karen worked for five years at the Provincial Archives New Brunswick where she performed conservation treatments and delivered preservation workshops for institutions in Atlantic Canada. She begins a new position as Preservation Librarian at SUNY Albany in July 2001.

Course Instructor/Lesson Author
Beth Patkus

Beth Patkus was formerly Field Service Representative at Northeast Document Conservation Center in Andover, MA. She has been working as a private preservation consultant for the past four years. She graduated from Wellesley

College and received her MLS from the University of Michigan, where a concentration in archival administration led to an interest in archival and library preservation. She worked as an assistant archivist at the Archives of the Archdiocese of Boston before joining NEDCC in 1992. She has provided preservation planning surveys and workshops to a variety of institutions throughout the Northeast;and she has provided technical assistance and consulting on a wide range of preservation issues, including disaster preparedness and recovery.

Lesson Author
Julie Reilly

Julie Reilly received a Bachelor of Arts degree, Magna cum Laude, in Anthropology from Towson State University in 1979. She completed minors in Art and Mathematics. In 1982, she earned a Master of Arts degree in Anthropology from the George Washington University with concentrations in Conservation and Applied Sciences. Ms. Reilly completed a pre-program internship in art conservation at the Baltimore Museum of Art and post-program internships in paper conservation and objects conservation at the National Museum of American History, Smithsonian Institution.

Ms. Reilly has worked in object conservation for the National Museum of American History, Smithsonian Institution; the Applied Archeology Center of the National Park Service; the Colonial Williamsburg Foundation; and the Henry Francis du Pont Winterthur Museum and Gardens. She served as Adjunct Associate Professor for object conservation for the Winterthur/University of Delaware Program in Art Conservation and is an Adjunct Professor for the Museum Studies Department at the University of Nebraska at Lincoln. She is currently an Associate Director and Chief Conservator for the Nebraska State Historical Society where she directs the Gerald R. Ford Conservation Center in Omaha, Nebraska.

Ms. Reilly has been a consulting conservator to many cultural institutions and has spoken widely on topics relating to the care and conservation of collections. She has given a number of professional presentations and has published in professional journals. She is currently Associate Editor for the Journal of the American Institute for Conservation, a member of the AIC Nominating Committee, on the Board of Heritage Preservation, and a member of the AIC Collections Care Professional Task Force. She is a Fellow member of the AIC.

Ms. Reilly spent 14 years living outside the United States and has traveled widely throughout Asia, Europe, and Africa.

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Glossary of Terms

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Absolute Humidity

Humidity is the amount of water held as vapor in air. It is expressed as the weight of water in a given volume of air. This measurement is called the absolute humidity and is usually given as the number of grams of water vapor in a cubic meter of air. (Wilks, 23)

Acquisition

An addition to the holdings of an archives, whether received by transfer under an established and legally based procedure, by deposit, purchase, gift, or bequest. (SAA Glossary)

Administrative Value

The usefulness of records/archives for the conduct of current and/or future administrative business. (SAA Glossary)

Albumen Prints

Invented in 1850 by Louis-Desiré Blanquart-Evrard, this was the prevalent type of print until about 1890. An albumen print was made by floating a sheet of thin paper on a bath of egg white containing salt. After drying, the ablumenized paper was sensitized with silver nitrate solution and dried again. The image was created by contact printing in the sun with a negative, fixing, and washing. (Baldwin, 7).

Ambrotype

An underexposed and then developed collodion negative on glass which is then backed with an opaque coating to appear as a positive. Similar in size and packaging format to the daguerreotype, with without the surface reflections. Easier to tint and faster and cheaper to make and sell than

daguerreotypes, they rapidly replaced daguerreotypes in the late 1850s. (Baldwin, 8)

Appraisal

The process of determining the value and thus the disposition of records based upon their current administrative, legal, and fiscal use; their evidential and informational value; their arrangement and condition; their intrinsic value, and their relationship to other records. (SAA Glossary)

Archives

1) the documents created or received and accumulated by a person or organization in the course of the conduct of affairs, and preserved because of their continuing value; 2) the building or part of a building where archival materials are located; 3) the agency or program responsible for selecting, acquiring, preserving, and making available archival materials. (SAA Glossary)

Archivist

A person professionally educated, trained, experienced, and engaged in the administration of archival materials, including the following activities: appraisal and disposition, acquisition, preservation, arrangement and description, reference service, and outreach. (SAA Glossary)

Arrangement

The intellectual and physical processes and results of organizing documents in accordance with accepted archival principles, particularly provenance. (SAA Glossary)

Autochromes

A colored transparent image on glass that can be viewed by being held up to the light or projected onto a surface. The process was invented by Louis Lumière in 1904. The process consisted of coasting a glass plate with sticky varnish, then with a thin layer of potato starch (the starch grains were dyed [red-orange, blue-violet, or green] and randomly distributed on the plate), more varnish, then a light-sensitive bromide emulsion. After processing a residual positive color image was created. (Baldwin, 10)

Calotype

This was the first viable positive/negative process, invented by W.H. Fox Talbot around 1840. Light sensitive paper was exposed to form a latent

image, developed, and fixed. The back of the calotype negative was then waxed to facilitate contact printing. (Jones, 70)

Camera Obscura.

Ancestor of the modern camera, this was originally a draftsman's tool to facilitate life drawing. The simple form of the apparatus consisted of an oblong box fitted at one end with a lens that could be adjusted to focus on an image. Inside the box, at the other end, a mirror was attached at a 45 degree angle, and this mirror projected the image up onto a ground-glass screen that had been set into the top of the box. It was on this ground glass screen that the image could be traced on thin paper. (Baldwin, 18)

Carbon Prints

Popular between 1870 and 1910, the process' underlying principle is the fact that gelatin to which potassium bichromate has been added becomes insoluble when exposed to light. A sheet of tissue is coated with gelatin, containing potassium bichromate and a pigment (e.g., carbon black, although other pigments can be used), and exposed to light. The exposed gelatin hardens, and once protected by another insoluble layer, the unexposed gelatin layer is washed away to reveal the image. (Baldwin, 19-20)

Cellulose Acetate

Obtained by the action of acetic anhydride on cellulose, usually cotton, in the presence of glacial acetic acid. It forms the basis of the non-inflammable celluloids, commonly known as "safety film." Films prepared with it fuse and char, but will not burn. (Jones, 96)

When it deteriorates acetic acid is produced, a process that once started can be slowed but not stopped. Deteriorating film should be segregated from the collection and placed into cool, dry storage and plans made to have it reformatted onto polyester.

Chromogenic

A color print made from a color transparency in which the print material has at least three emulsion layers of silver salts sensitized to one of the three primary colors of light (blue, green, and red). During processing dye couplers are added that combine with the silvers to form the colors corresponding to each emulsion layer. The final image appears in full color when seen against the white base of the paper stock. (Baldwin, 24)

Collodion

The wet-collodion process was invented in 1848 by F. Scott Archer. Collodion (cotton soaked in nitric and sulfuric acid and dried, then dissolved in a mixture of alcohol and ether to which potassium iodide had been added) was poured onto a clean glass plate and immediately sensitized by bathing in a solution of silver nitrate. While still wet the plate was exposed in the camera and developed. Dry-collodian processes were tried in the 1850s and 1860s, essentially working to extend the time between preparing the plate and exposure, but inconsistent results and longer exposure times kept the dry process from becoming popular. (Baldwin, 29)

Collodio-chloride

A printing-out paper that seems to be very stable, especially if toned. Very popular for portraiture, this machine made paper was first produced in the early 1880s and was in use until around 1910.

Conservation

The profession devoted to the preservation of cultural property for the future. Conservation activities include examination, documentation, treatment, and preventive care, supported by research and education. (AIC Directory 1999)

- **Examination:** The investigation of the structure, materials, and condition of cultural property including the identification of the extent and causes of alteration and deterioration.

- **Documentation:** The recording in a permanent format of information derived from conservation activities.

- **Treatment:** The deliberate alteration of the chemical and/or physical aspects of cultural property, aimed primarily at prolonging its existence. Treatment may consist of stabilization and or restoration.

    - **Stabilization:** Treatment procedures intended to maintain the integrity of cultural property and to minimize deterioration.

Cyanotypes

Invented by John Herschel in 1842 this printing process is derived from the light sensitivity of iron salts. The paper is treated with ferric ammonium citrate and potassium ferricyanide. The image or object is placed on the sensitized sheet and it is exposed to light; the unexposed areas appear white, while the rest appears blue (cyan). (Baldwin, 32)

Cyanotypes are extremely light sensitive and should never be exhibited.

Daguerreotype

An image formed on a sheet of copper plated with silver and sensitized by iodide vapors. Highly vulnerable to physical damage and tarnishing they were normally protected by a metal mat and a covering sheet of glass. The image is on a highly polished plate, and to be seen must be held at an angle to minimize reflections. (Baldwin, 35)

Description

1) the process of analyzing, organizing, and recording information that serves to identify, manage, locate, and explain the holdings of archives and manuscript repositories; 2) the written representations or products of the above process. (SAA Glossary)

Developed-out

A photographic image produced by chemical development rather than by the action of light alone (see printing-out). Developing-out papers are exposed to light through a negative to create the latent image, then chemically treated to produce the photograph. (Baldwin, 37)

Electromagnetic Spectrum

Light is a form of electromagnetic energy called radiation. The radiation that we know from medicine and nuclear science is energy at wavelengths far shorter than the light spectrum; radio waves are much longer wavelengths. Visible light, the form of radiation that we can see, falls near the center of the electromagnetic spectrum. The visible spectrum runs from about 400 nanometers (nm, the measurement applied to radiation) to about 700 nm. Ultraviolet wavelengths lie just below the short end of the visible spectrum (below 400 nm). The wavelengths of infrared light lie just above the long end but our eyes cannot see them. This type of light also damages collections. (Patkus, 1999)

Evidential Value

The worth of documents/archives for illuminating the nature and work of their creator by providing evidence of the creator's origins, functions, and activities. (SAA Glossary)

Ferrotyping

A defect that occurs when the emulsion side of film is held in contact with

the base side of another sheet of film or plastic enclosure under conditions of high humidity, high temperatures, abnormal pressure, or extended time. The gelatin surface pressed against the more glossy surface produces a variation in sheen that is visible by reflected light. (Stroebel and Zakia, 299)

Ferrules

A metal ring or cap put around the end of a stick, tool, cone, etc. to prevent splitting or to give added strength. (Simon & Schuster, 1979)

Fiscal Value

The worth of records/archives for the conduct of current or future financial or fiscal business and/or as evidence thereof. (SAA Glossary)

Footcandle

The density of light striking an object; the result of one lumen striking one square foot; an English system measure of illuminance at a point on a surface, equivalent to about 11 lux. (Lull, 90)

Foxing

A descriptive term used for scattered spots commonly reddish-brown in color, but also applied to spots of other coloration ranging from yellow to black, found in paper sheets. Despite 60 years of research there remains uncertainty as to the cause. It may be fungal, from metal debris left in the paper stock during the papermaking process, from the interaction of moisture and cellulose, or may be due to multiple causes. AIC Paper Conservation Catalog, 1)

Gelatino-chloride

Paper treated with an emulsion of silver chloride in gelatin. (Jones, 273) This machine made printing-out paper was first produced in the early 1880s, and is still available today.

Gelatin Dry Plate

Invented in 1871 by Richard Maddox, a glass plate coated with a dried, light-sensitive gelatin emulsion that came into general use in the mid-1880s. (Baldwin, 41)

Gelatin Silver Prints

Papers coated with gelatin containing light-sensitive silver salts invented in 1873 by Peter Mawdsley and still in general use today. (Baldwin, 48-49) These are developing-out papers usually exposed to an image in an enlarger, then chemically processed to produce the photograph.

Humidistat

A control "thermostat" which senses relative humidity instead of temperature. (Lull, 91)

HVAC
Heating, ventilating and air conditioning

Hydrolysis

A chemical reaction in which a compound reacts with water (H+ and OH-) to produce a weak acid, a weak base, or both. (Simon and Schuster, 1983)

Hygrometer

Any of several instruments used for measuring atmospheric humidity. Some types of hygrometers are: 1) psychrometer - measures the temperature difference between a wet-bulb and a dry-bulb thermometer. A sling psychrometer is mounted in a frame, then whirled in the air for ventilation. 2) hair hygrometer - measures the expansion and contraction of a human hair that is mounted under tension. A gold beater's skin hygrometer uses a proteinaceous membrane for the same type of measurement. 3) dew-point hygrometer - measures the temperature for the formation and evaporation of dew that is observed using a photoelectric cell. 4) diffusion hygrometer - measures the diffusion of water vapor through a porous membrane. 5) lithium chloride hygrometer - measures the temperature and electrical conductivity of a hygroscopic salt that becomes conductive when it absorbs water.
- from Boston MFA Conservation and Art Materials Dictionary
http://www.mfa.org/conservation/qsearch.htm (May 3, 2001)

Informational Value

The worth of documents/archives for reference and research deriving from the information they contain on persons, places, subjects, etc., as distinct from their evidential value. (SAA Glossary)

Integrated Pest Management

Preservation professionals increasingly recommend a strategy called

integrated pest management (IPM). This approach relies primarily on non-chemical means (such as controlling climate, food sources, and building entry points) to prevent and manage pest infestation. Chemical treatments are used only in a crisis situation threatening rapid losses or when pests fail to succumb to more conservative methods. (Patkus, 1999)

Internal or Inherent Vice

Deterioration caused by weakness in the chemical or physical makeup of an object introduced during its manufacture.

Intrinsic Value

The inherent worth of a document based upon factors such as age, content, usage, circumstances of creation, signature, or attached seals. (SAA Directory)

Latent Image

The action of light upon a sensitive material causes no visible change, but if the exposed material is treated with an agent, usually termed the developer, the "latent" image can then be seen. (Jones, 328)

LE Designation

Rating for the "life expectancy" (length of time that information is predicted to be retrievable) of recording materials and associated retrieval systems. The number following the LE symbol is a prediction of the minimum life expectancy in years for which the information can be retrieved without significant loss when properly stored under extended-term storage conditions. (ANSI/AIMMTR-2-R)

Legal Value

The worth of records/archives for the conduct of current or future legal business and/or as legal evidence thereof. (SAA Glossary)

Lignin

natural aromatic polymer that is found in the cell walls of grasses and woody plants. Lignin and hemicellulose cement the fiber cells together. Lignin composes 17-30% of wood. In the destructive distillation of wood, it decomposes to produce methanol. In the manufacture of paper pulp by the chemical processes, the lignin is removed by reaction with alkaline or sulfur compounds. The presence of lignin in paper shortens its overall lifetime as lignin can photo-oxidize to form acidic products which can then

attack the cellulose. The lignin produced as a waste-product in the manufacture of paper is used as a stabilizer, binder, dye dispersant and filler in phenolic plastic products and as a source of vanillin.
] - from Boston MFA Conservation and Art Materials Dictionary http://www.mfa.org/conservation/qsearch.htm (May 3, 2001)

Lumen

A measure of the amount of luminous flux or light energy, such as the light output of a lamp. (Lull, 91)

Lux

The density of light striking an object; the result of one lumen striking one square meter; a metric system measure of illuminance at a point on a surface, equivalent to about 0.09 footcandle. (Lull, 91)

Microclimate

A microclimate, or a *microenvironment,* refers to the isolated environment within a small enclosed space such as an exhibit case, closed cabinet, drawer, box, or other container. Depending on the construction materials and quality of the seal, a cabinet or container can isolate the collections from short-term temperature and humidity fluctuations within a room. (Weintraub and Wolf, 123)

Nitrate

Produced by Eastman Kodak starting in 1889, nitrate film was the first practical flexible-base film. Nitrate film is very flammable, becoming highly acidic (nitric acid) and increasingly flammable as it degrades. Nitrate film should be segregated from other collection materials, placed into a special explosion-proof freezer, and plans made to have it reformatted onto polyester.

Original Order

The principle that archives of a single provenance should retain the arrangement established by the creator in order to preserve existing relationships and evidential significance and the usefulness of finding aids of the creator. (SAA Glossary)

Oxidation

The process in which a substance loses electrons and the oxidation state of some element in the substance increases. (Segal, 962)

Oxidizing Agent

A substance that oxidizes some other species and is itself reduced. (Segal, 962) Ozone (O_3), is a very powerful oxidizing agent, initiating chemical oxidation-reduction reactions with other substances.

Permanent Paper

The ability of paper to last at least several hundred years without significant deterioration under normal use and storage conditions in libraries and archives. (ANSI/NISO Z39.48-1992)

Photochemical Reaction

A reaction that is initiated by shining light, either visible or ultraviolet, on the reactants. (Segal, 963)

Pictographs

Writing by the use of pictures representing an idea.

Platinum Prints

Invented in 1873 by William Willis, this process depends on the light sensitivity of iron salts. The image is contact printed and developed to chemically change the exposed image to platinum, which is then washed in weak hydrochloric acid and water. This durable, fine quality print was popular until the 1920s when the price of platinum became prohibitive. (Baldwin, 71-72)

Polyester

Polyester (polyethylene-terephthalate) film, introduced in 1965, is a flexible film with excellent extended life expectancy and strong dimensional stability. Many, but not all, photographic film products are currently produced on polyester. Original film and copies with long-term value should be produced on polyester film.

Preservation

The protection of cultural property through activities that minimize chemical and physical deterioration and damage and that prevent loss of informational content. The primary goal of preservation is to prolong the existence of cultural property. (AIC Directory, 1999)

Preventive Conservation

The mitigation of deterioration and damage to cultural property through the formulation and implementation of policies and procedures for the following: appropriate environmental conditions; handling and maintenance procedures for storage, exhibition, packing, transport, and use; integrated pest management; emergency preparedness and response; and reformatting/duplication. (AIC Directory, 1999)

Primary Value

The value that records/archives possess, by virtue of their contents, for the continued transaction of the business that gave rise to their creation. (SAA Glossary)

Printing-out

Producing a photographic image, usually a print from a negative, by the action of light alone on a light-sensitive material, rather than by using chemicals. The paper was exposed in contact with the negative until the image was wholly visible. (Baldwin, 73)

Processing

The activities of accessioning, arranging, describing, and properly storing archival materials. (SAA Glossary)

Provenance

1) The organization or individual that created, accumulated, and/or maintained and used records in the conduct of business prior to their transfer to an archives; 2) information regarding the origin and custodial history of documents; 3) the principle that records/archives of the same provenance should not be mingled with those of any other provenance. (SAA Glossary)

RC Papers

Photographic paper with pigmented polyethylene resin extruded onto both sides. Since such supports do not absorb water or chemicals, RC (resin-coated) papers can be processed and dried quickly. (Stroebel, 694)

Reduction

The process in which a substance gains electrons and the oxidation state of some element in the substance decreases. (Segal, 965)

Reference Service

The range of activities involved in assisting researchers using archival materials. (SAA Glossary)

Relative Humidity

The relative amount of moisture in air expressed as a percentage of the total amount of moisture the air can hold, varies with the temperature and air pressure. (Lull, 92)

Restoration

Treatment procedures intended to return cultural property to a known or assumed state, often through the addition of non-original materials. (AIC Directory, 1999)

Salted Paper Prints

The earliest positive prints normally made by contact printing with a paper negative. Invented by William Henry Fox Talbot in 1841 salt prints were created by sensitizing a sheet of paper with sodium chloride solution and coating it with silver nitrate. The paper, once dry, was exposed in the sun through the negative until the desired image intensity was reached (see printing-out). Salted paper prints were popular until around 1860 and the rising use of albumen. (Baldwin, 74)

Secondary Value

The capacity of documents to serve as evidence or sources of information for persons and organizations other than their creator. (SAA Glossary)

Series

File units or documents arranged in accordance with a filing system or maintained as a unit because they result from the same accumulation or filing process, the same function, or the same activity; have a particular form; or because of some other relationship arising out of their creation, receipt, or use. Also known as a record series. (SAA Glossary)

Silver Mirroring

The visible damage to gelatin developed-out papers, a result of unfixed-out silver salts decomposing and the silver migrating to the surface. The damage is usually most apparent where the image is most exposed to the atmosphere.

Sublimated

Water goes directly from the solid ice phase to the vapor phase under lowered air pressure (vacuum) with carefully controlled heating. Because the moisture does not go into a liquid state further water damage is eliminated. (Barton and Wellheiser, 66)

Temperature

An intrinsic property of a system. It is a measure of the average kinetic energy of the molecules in a system. (Segal, 968)

Tintype

The tintype, or ferrotype, is a collodion image produced on a thin sheet of iron coated with an opaque black lacquer or enamel. Tintypes were almost always used for portraiture since their introduction in the 1850s and remained popular until the end of the 19th century because they were very inexpensive. (Baldwin, 80-81)

Toning

A means of changing the color of a photographic image, the toning process can enchance image stability and increase contrast. The range of tones is wide, including browns, purples, sepias, blues, olives, red-browns, and blue-blacks. (Baldwin, 81-82)

USMARC Format

A communications format developed at the Library of Congress for producing and distributing machine-readable bibliographic records. (SAA Glossary)

Weeding

The removal of an item, determined to have little or no further use, from a collection. The item can be placed in storage or discarded.

William Henry Fox Talbot (1800-1877)

The presently popular negative-positive system of photography was developed by Talbot in 1840 after he discovered that a silver-based light-sensitive material, when exposed to light for a short period, formed a latent image. This image was then made visible through the use of a chemical developer.

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Care and Handling General Guidelines

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The most important factor in the safe care and handling of any object is support. The full weight and dimensions of an artifact must be supported during storage, transport, and use, to prevent dropping, breaks, folds, tears, cracks, contamination with dirt and liquids, and other physical damage.

GENERAL GUIDELINES

- Always wash your hands before handling valued materials. Wash them frequently during extended use of collections.
- Handle archival materials as little as possible.
- Do not eat or drink in storage, exhibition, or work areas. Food can attracts pests and cause stains. Liquids are easily spilled and will also stain archival objects. These stains are often difficult, if not impossible, to remove.
- Use pencils only in areas where valued materials are handled, used, or stored. Inks can easily offset onto hands and counters and transfer onto objects in your collection.
- Patrons should not make notations in any media on archival materials. During arrangement, the archivist should only label records using a soft (HB) pencil.
- Do not use metal paper clips or rubber bands to secure objects together. Individual folders can be used to organize and combine multi-sheet records.

- Never attempt to repair items, especially with pressure sensitive tape. Do not use any pressure sensitive tabs or labels in direct contact with archival materials.

- The effects of light damage are cumulative! Turn off direct sources of light, such as table lamps, when items are left unattended. This will reduce heat buildup (causing accelerated chemical reactions) and fading. Always protect records from extended exposure to sunlight.

- Cover items when left unattended to protect from light, dirt or moisture. Place a sign that reads "FRAGILE OBJECTS BELOW" to warn others to be careful.

- Make sure work surfaces are clear of junk, dirt and debris before placing objects. Clean blotter may be laid down to provide a cushioned surface.

- Do not carry too much at one time. If you find you have no free hands, that the parcels are awkward to hold or move with, or that the weight is uncomfortable, stop and rethink the situation. Use a book truck as required.

- Know the route you are traveling. Consider obstacles such as closed doors, stairs, and tight turns. If necessary, get someone to accompany you. Also know where you are setting the object down when you get there.

- Protect records and artifacts from inclement weather and shock when transporting them out of the institution.

FLAT PAPER DOCUMENTS

- Do not hold documents while reading them.

- When retrieving a single item from a folder, first remove the file folder from the box, then remove the item. Do not extract the item from the file folder while it is still in the box.

- Be sure you have adequate space for handling oversize documents.

- Lift large sheets from opposite, diagonal corners by clamping the sheet, scissors-style, between index and third fingers. Do not use your thumbs, or you may cause fiber breakage and dimples to the

paper sheet.

- Turn objects over by placing them between two stiff secondary supports, holding the sandwich together tightly between your palms, and flipping gently. You may tape the edges of the cards together to prevent the object sliding out from in between, but beware: tape has a way of sticking to things when you least expect it!

- Be mindful that mounting boards can become brittle with age. Support a mounted object adequately to ensure that the board does not break, resulting in a broken or fallen object.

- Lift the top of a matte very slowly and carefully. It may be attached to the object or backing. The object can be easily torn, and the housing damaged, if handled roughly.

- Do not remove objects from Mylar sleeves during use.

- Use a clean, smooth weight to prevent items from being blown off tables, both when working and when leaving objects unattended.

- To transport paper objects, place on a board or blotter, hold the item securely to the underlying support by one corner, and provide support overall with the other palm from below.

BOOKS

- Use a book cradle or padded supports when viewing fragile volumes.

- Do not force a book open by pushing or pulling at the gutter margin. If a volume will not lie open easily, use clean light weights to hold the halves open.

- Do not place an open book face down, or fold over the corners of pages, or use Post-it notes to mark your place. Always use an acid-free or alkaline paper or light card stock bookmark.

- Patrons should not make notations in books belonging to the collections.

- Use a piece of stiff card, paper fingers, or a microspatula to lift and turn book pages, especially if the paper is damaged, weak, or brittle

to the touch.

Storage and Transport

- Shelve books so they do not lean. Remove a shelved book by first pushing back the volume on either side, then grasping the desired volume firmly around the spine to the covers, sliding the book out gently. Never pull books out by inserting fingers into the top or bottom of the spine.

- Always keep a book closed during transport. Keep the cover and pages supported to prevent loosening of covers and loss of inserts or unattached pages. Handle flat or with the spine in the palm on your hand.

- Carry oversize volumes with two hands. Support the weight of the object from underneath using the palm and forearm, and balance it using the opposite hand. When transporting any large, heavy item or numerous items use a book cart.

- Large books should not be used as trays for delivering other items. Objects on top may slip and fall, becoming damaged.

- Box damaged books, especially those with loose or broken pieces.

Shelving Books

Vertical Orientation: Books should not slump and the textblock should not fall away from the boards when in the upright position.

- Volumes should be shelved vertically if:
  - The height is 40 cm. (16") or less, or
  - The thickness is 8 cm. (3") or less, and
  - The condition is sound and the volume is capable of standing with the support of adjacent volumes and/or bookends.

- Volumes shelved vertically should be oriented with the tail (bottom edge) or spine resting on the shelf. They should not rest on their fore-edges.

- Volumes of similar height that can help to support one another should be shelved vertically as a unit. Interspersing short and tall

volumes in a vertical unit must be avoided, since the taller volumes need the support of their neighbors to avoid warping.

- To avoid interspersing short and tall volumes, small volumes should be placed in standard archives boxes if possible. This will also help to avoid the problem of small volumes being pushed to the backs of the shelves.

- Another approach is to physically separate groups of short and tall volumes on the shelf, using multiple bookends to separate and support the groups.

- All shelves containing volumes shelved vertically should be equipped with bookends, ideally of "non-knifing" design. Bookends should be positioned at both ends of a group of volumes to hold them in a true vertical orientation.

- Sufficient free space should be left at the end of each shelf to permit access to the bookend so that it can be adjusted when volumes are removed from the shelf and when they are reshelved.

Horizontal Orientation

- Volumes should be shelved horizontally if:
  - The height exceeds 40 cm. (16"), and/or the thickness exceeds 8 cm. (3");
  - The volume is in poor condition or is noticeably distorted; or
  - The volume is a scrapbook, album, or similar composite structure with mounted elements that can be damaged or lost if they sift to the bottom of the volume during vertical storage.

- Volumes shelved horizontally should not be placed in stacks higher than 15 cm. (6"), or more than three volumes high. Thus the thickness of the volumes will determine if one, two, or three volumes may be placed in a stack.

- Large volumes should never be stacked on smaller volumes. Only volumes of similar size should be stacked on top of one another so that volumes are fully supported and prevented from warping or becoming misshapen.

- Volumes should not extend beyond the edges of shelves.

- Volumes must not be placed horizontally on top of a group of vertically shelved volumes.
- To prevent abrasion, always lift books from shelving or in the work area, rather than dragging them across a surface.

Portions of this guide are based on "*Preserving Archival Records: Guidelines For Shelving Bound Volumes*", prepared by Mary Lynn Ritzenthaler, National Archives And Records Administration (n.d.). Aso available at http://palimpsest.stanford.edu/byorg/nara/volume.html

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Further Sources

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For your convenience a list has been compiled of all the publications and web resources associated with Preservation 101. We felt it might be easier if you could print this information as a single document to assist in gathering resources for your "preservation library". We invite you to submit suggestions to the instructor of other printed or online resources that you discover which we might share with all Pres101 participants.

Archives 101
Care of Photographs
Disaster Preparedness and Response
Environmental Monitoring and Control
Fundraising and Grants
General Preservation
Housekeeping
Light and Exhibition
Materials, History, Technology and Manufacture
Pests and Mold
Preservation Planning
Reformatting
Security
Sources of Information
Storage, Care and Handling

Archives 101

American Association for State and Local History (AASLH) at www.aaslh.org. The professional association for historical organizations. Publishes a number of technical leaflets and reports on managing archives and local history collections.

Cultural Resources Management Online.
See the issues entitled **Archives at the Millennium** (Volume 22, No. 2, 1999) http://crm.cr.nps.gov/archive/22-2/22-02-1.pdf and **The Information Ecosystem** (Volume 21, No. 6, 1998) http://crm.cr.nps.gov/archive/21-6/21-6-1.pdf or a number of interesting articles (several are listed separately below).

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Ham, F. Gerald. Selecting & Appraising Archives & Manuscripts. Chicago: Society of American Archivists, 1992. SAA: *"Factors and considerations in appraisal for both archives and manuscripts, including the theoretical foundations for identifying, soliciting, selecting, evaluating, and authenticating records, are thoroughly discussed in this volume. Also included is the role of records management in controlling the life cycle of modern organizational records, as well as collections management and documentation strategies for other holdings."* To order use the online publications catalog on the SAA Web site at http://www.archivists.org/catalog/pubDetail.asp?objectID=139, Tel. 312/922-0140, or Fax at 312/347-1452.

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MicroMARC for Integrated Format at www.msu.edu/user/msumarc MicroMARC for Integrated Format is a microcomputer collections management system supported by Michigan State University for use by libraries, archives, special collections, museums etc. It utilizes

the national descriptive standard, the USMARC Integrated Format, for the record structure and can import and export records to any other system using that format.

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Minaret Software at www.minaretsoftware.com for information. Minaret is also a microcomputer-based collections management system that uses the MARC Integrated Format and can import and export records.

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"Ready, 'Net, Go! Archival Internet Resources", maintained by Leon Miller at Tulane University, at www.tulane.edu/~lmiller/ArchivesResources.html . Described as *"an archival 'meta index', or index of archival indexes. That is, from here we refer you to the major indexes, lists, and databases of archival resources."*

"Repositories of Primary Sources" Web site, maintained by Terry Abraham at the University of Idaho, at www.lib.uidaho.edu/special-collections A listing of over 4500 web sites describing holdings of manuscripts, archives, rare books, historical photographs, and other primary sources for the research scholar.

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www.archivists.org
The professional organization for archivists. Another good resource for preservation publications. Provides links to regional, state, and local archival organizations in the United States and Canada.

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Note 16/1 Care of Encased Photographic Images
Note 16/2 Care of Black-and-White Photographic Glass Plate Negatives

Note 16/3 Care of Black-and-White Photographic Negatives on Film
Note 16/4 Care of Black-and-White Photographic Prints
Note 16/5 Care of Colour Photographic Materials
Note 16/6 Processing Contemporary Black-and-White Photographic Films & Papers

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Fundraising and Grants

Council on Foundations. www.cof.org A non-profit coalition of grantmaking foundations and corporations whose goals are to promote responsible and effective philanthropy. This site includes "Foundation News and Commentary" and "Council Columns Newsletter", publications of books and videos, general information on foundations, and foundation home pages.

The Foundation Center. http://fdncenter.org *"The Foundation Center's mission is to support and improve institutional philanthropy by promoting public understanding of the field and helping grantseekers succeed."* This site provides grantmaker information, funding trends and analysis, training and seminars, libraries and locations, fundraising process, Foundation Center publications, and a list of cooperating libraries. Links to more than160 private, community, and corporate foundations, plus federal grants and public charities. Also ranks foundations by assets and total giving.

The Grantsmanship Center. www.tgci.com. TGCI is known for grants and fundraising seminars. Excellent print publications can be ordered for $3-$4 U.S. each. Links to TGG Magazine, Federal Register grant information, and links to grantmaking foundations.

Institute of Museum and Library Services (IMLS) www.imls.gov

IMLS supports museums of all types. This includes art museums, history museums, and historic houses and sites. To apply for IMLS programs, your institution must be a museum exhibiting objects to the general public, open 120 days or more per year, with at least one full-time or full-time equivalent staff member.

Massachusetts Board of Library Commissioners (MBLC) www.mlin.lib.ma.us/flash3.html

The MBLC provides funding for preservation of public library collections in Massachusetts. Support is provided for preservation surveys and for implementation. In 1995, MBLC introduced a new grant category for public libraries which funds conservation treatment and preservation microfilming. To be eligible for an implementation grant, a public library must have had a preservation survey and must have produced a brief written long-range preservation action plan based on the survey recommendations.

Types of projects funded include preservation/conservation surveys; projects to determine priorities for conservation and to implement a preservation action plan; acquisition of preservation equipment and supplies; evaluation and remediation of physical facilities; and projects to develop cost-effective methods of sharing preservation resources, such as staff training, reformatting, shared storage facilities, and emergency preparedness.

National Endowment for the Humanities (NEH) www.neh.fed.us

The National Endowment for the Humanities provides grant funding to advance and disseminate knowledge in all the disciplines of the humanities. NEH has been restructured into four divisions: Preservation and Access, Public Programs and Enterprise, Research and Education Programs, and Challenge Grants.

National Historical Publications and Records Commission (NHPRC) www.nara.gov/nhprc

The purpose of the NHPRC is to preserve and protect America's documentary history. NHPRC funds projects that preserve endangered historical documents, plan for the preservation of archival materials, train those who work with historical records, and make documentary resources available to researchers, students, and teachers through publication. NHPRC has three application deadlines per year. Each deadline addresses specific objectives that have been identified as important by NHPRC.

New York State Library Conservation and Preservation Grants
http://www.nysl.nysed.gov/libdev/
Conservation/Preservation Discretionary Grant Program
The Conservation/Preservation Discretionary Grant Program provides financial support up to $25,000 for projects to preserve library research materials in the collections of libraries, archives, historical societies, and similar agencies within New York State (other than the eleven comprehensive research libraries). Grant funds can be used for surveys of preservation needs; improvement of storage environments; microfilming of manuscripts, books, or other research materials; professional conservation treatments; copying of photographic materials; or for other preservation activities.

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1/5 "Collections Policies and Preservation" by Margaret Child (1999)
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Source of timely information on preservation and conservation subjects, including bookbinding, commercial binding, educational programs, supply sources, and news. Especially useful are book reviews, and thorough listings of relevant publications from a wide range of sources. Essential reading for anyone concerned with preservation and conservation issues.

American Association of Museums
www.aam-us.org
The professional organization for museums. A good resource for publications.

American Association of State and Local History Technical Leaflets. http://www.aaslh.org/leaflets.htm. American Association of State and Local History Technical Leaflets
A series of leaflets providing up-to-date technical information of interest to historical agencies and museums. Covers a very wide range of subjects, from general administrative issues to management of local government records, landscaping, care of textiles, and oral history. Catalog available online.

American Institute for Conservation
http://aic.stanford.edu/
The professional association for art conservators. Located at 1717 K St., NW Ste. 200, Washington DC 20006, tel. 202/452-9545.

American Library Association
www.ala.org
The professional organization for librarians. Has an extensive publications catalogue. Preservation activities take place in PARS (the Preservation and Reformatting Section) within its ALCTS (Association of Library Collections and Technical Services) Division.

Association of Research Libraries
www.arl.org
A membership organization composed of the libraries of North American research institutions.

Canadian Conservation Institute
www.cci-icc.gc.ca
A federal organization whose purpose is to promote the proper care and preservation of Canada's moveable cultural property, and to advance the practice, science, and technology of conservation. CCI produces many useful preservation publications.

CCI Notes. Canadian Conservation Institute, National Museum of Canada, 1030 Innes Road, Ottawa, Ontario K1A OM5 Canada, www.cci-icc.gc.ca/frameset_e.shtml. Select "The Bookstore" to locate CCI Notes and other publications. Hard copy only. CCI Notes
A series of topics to offer practical advice about issues related to the care, handling, and storage of cultural objects.

CLIR Publications. Council on Library and Information Resources, Commission on Preservation and Access, 1755 Massachusetts Avenue, NW, Suite 500, Washington, D.C. 20036-2188, (202) 939-4750, info@clir.org,www.clir.org. CLIR Publications
Includes a section with preservation and access related articles; focus is on digital initiatives. Issues are available online. See especially CLIR Issues and the Reports. CLIR Issues

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http://palimpsest.stanford.edu
The place to start for preservation information and links to preservation Web sites. Also contains the archives of the Conservation DistList online preservation discussion group.

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Leaflets designed for use by the staff of national parks and museums provide detailed instruction as opposed to broad guidelines. Address environment, housekeeping, storage and handling, and health and safety, among other subjects. Cover objects of various types, biological specimens, and paper. Files are in .pdf format.

Council on Library and Information Resources
www.clir.org
Fosters collaborative approaches to preservation and access issues facing libraries and archives, with a special emphasis on the challenges posed by technology. Produces excellent publications, many available online in full-text.

International Federation Of Library Associations & Institutions
www.ifla.org IFLA's Core Programme for Preservation produces many useful publications. Select "Activities and Services" from the Home Page to locate core Activities

Library of Congress Preservation
www.loc.gov/preserv LC's Web site provides information about its preservation program, including preservation leaflets, and its extensive digital collections and programs.

National Archives and Records Administration
Archives and Preservation Resources
www.archives.gov

This Web site provides some useful online resources, including information on holdings maintenance for archives.

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National Center for Preservation Technology and Training (NCPTT) Notes
Provides information relative to the field of preservation and conservation in technology, education, and training.

Northeast Document Conservation Center, http://www.nedcc.org
Site includes online preservation manuals, suppliers and services lists, and resources for emergency response. Sources of Information has links to other resources.

New York State Archives and Records Administration
www.archives.nysed.gov
"SARA" has a number of interesting and useful publications on collections organization and care available online.

Regional Alliance for Preservation (RAP). Regional Alliance for Preservation (RAP)
A cooperative project to share preservation training resources. RAP Website, www.rap-arcc.org.

Research Libraries Group
www.rlg.org
A pioneer in cooperative preservation activities, its preservation program has produced microfilming guidelines and currently sponsors various working groups on digital imaging.

Smithsonian Center for Materials Research and Education
www.si.edu/scmre/
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The professional organization for archivists. Another good resource for preservation publications. Provides links to regional, state, and local archival organizations in the United States and Canada.

SOLINET Preservation Services
www.solinet.net/presvtn/preshome.htm
Their mission is to maintain long-term, cost-effective access to information resources. Field Services offer excellent full-text leaflets and articles on preservation, as well as some extensive and current bibliographies.

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PRESERVATION 101:
An Internet Course on Paper Preservation

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Fax: (978) 475-6021
http://www.nedcc.org

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