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# **CONTENTS**

**Chapter 1: History**

**Chapter 2 : Practices**

**Chapter 3 : Branches of preservation**

**Chapter 4 : Education**

**Chapter 5 : Non-academic facilities and preservation**

**Chapter 6 : Legal issues**

**Chapter 7 : Criticism**

**Chapter 8 : Reference**

## **Antecedent**

Antecedent moisture is a term from the fields of Hydrology and sewage collection and disposal that describes the relative wetness or dryness of a watershed or sanitary sewershed. Antecedent moisture conditions change continuously and can have a very significant effect on the flow responses in these systems during wet weather. The effect is evident in most hydrologic systems including stormwater runoff and sanitary sewers with inflow and infiltration. Many modeling and analysis challenges that are created by antecedent moisture conditions are evident within combined sewers and separate sanitary sewer systems.

## **Definition**

The word antecedent simply means preceding conditions. Combining the terms "antecedent" and "moisture" together means preceding wetness conditions. Antecedent moisture is a term that describes the relative wetness or dryness of a sewershed, which changes continuously and can have a very significant effect on the flow responses in these systems during wet weather. Antecedent moisture conditions are high when there has been a lot of recent rainfall and the ground is moist. Antecedent moisture conditions are low when there has been little rainfall and the ground becomes dry.

## **Hydrologic Basis**

Rainfall/runoff relationships are well defined within the field of hydrology. Surface runoff in hydrologic systems is generally conceptualized as occurring from pervious and impervious areas. It is the pervious runoff that is affected by antecedent moisture conditions, as runoff from impervious surfaces such as roads, sidewalks and roofs will not be significantly affected by preceding moisture levels. Pervious surfaces, such as fields, woods, grassed areas and open areas are highly affected by antecedent moisture conditions, as they will produce a greater rate of runoff when they are wet than when they are dry.

Rainfall dependent inflow and infiltration (RDII) into sewer systems is highly affected by antecedent moisture conditions, and these effects can be more complex than the rainfall/runoff

relationships for surface water. The travel paths for RDII entering the sewer system are more complex than surface water runoff, because the transport mechanisms include both surface runoff and subsurface transportation. This adds additional complexities to the hydrologic effects and antecedent moisture effects such as the saturation levels of the soils in the subsurface, ground water levels, and subsurface hydraulics.

Antecedent moisture conditions are highly affected by preceding rainfall levels. However, preceding rainfall is not the only condition that affects antecedent moisture, and many other variables in the hydrologic process can have a significant impact. For example, air temperature, wind speed and humidity levels affect evaporation rates, which can significantly change antecedent moisture conditions. Additional effects may include evapotranspiration, presence or absence of tree canopy and snow and ice melting effects.

## **Traditional Analysis Approaches**

Traditional approaches for analyzing antecedent moisture effects rely on physically based models derived from first principles, such as the principles of energy, momentum and continuity, which rely on measurements of many parameters for input and simulation. These include programs such as the Storm Water Management Model, Mouse RDII, or other rainfall/runoff simulation programs. These models are frequently calibrated to a specific antecedent moisture condition observed during a single storm. Fitting data from several storms that occurred during various antecedent moisture conditions requires modifying the model parameters and recalibrating the model. At the end of this process, the modeler is left with several models, each of which can fit a specific storm that occurring during a specific antecedent moisture condition, but none of which are capable of simultaneously fitting all of the data. This is the challenge of using event-based models with traditional approaches: it requires the user to select a particular antecedent moisture condition for design simulations.

Some modeling approaches, such as the Hydrologic Simulation Program - Fortran (HSPF) or the Stanford Watershed Model developed by Crawford and Linsley (1966) attempt to address antecedent moisture conditions through a complex physically based representation of the transport paths of water on the surface and in the subsurface. These tools have their place in researching and studying the various complexities associated with hydrologic transport

processes. However, the great number of parameters in these models, the difficulty of measuring the many parameters, and the sensitivity of the model output to slight variations in the parameters makes using these models to simulate antecedent moisture in sewer systems challenging. The principles of parsimony and Occam's razor provide evidence of these challenges from a systems perspective.

## **Data-Based Approaches**

An alternative approach for modeling antecedent moisture is to start from measurements of the behavior of the system and the external influences (inputs to the system) and try to determine a mathematical relation between them without going into the details of what is actually happening inside the system. This approach is called system identification. System identification is applied in several fields beyond engineering, ranging from economics to astronomy and comes under other names such as inverse modeling, time series analysis, and empirical physical modeling. System identification is a general term to describe mathematical tools and algorithms that build dynamical models from measured data. A dynamical model in this context is a mathematical description of the dynamic behavior of a system or process. A so-called white-box model based on first principles, e.g. a model for a physical process from the Newton equations, in many cases will be overly complex and possibly even impossible to obtain in reasonable time due to the complex nature of many systems and processes.

Data-based approaches based on system identification, such as the i3D antecedent moisture model, have been applied to hydrologic modeling for simulating antecedent moisture effects on wet weather events in sanitary collection systems. This modeling approach differs from traditional techniques because it is based on system identification and is guided by system observations (i.e. data) and mathematical routines are used to generate the correct model structure, rather than physically based first principles. This is in contrast to assuming that the correct model is known beforehand, as is typically the case for modeling within civil engineering. This technique allows information within the observations to guide the modeling algorithms so that only the relevant and observed dynamics are present in the model structure. The resulting models are not black box, but are grey box models that have parameters and structure that tie directly to physical understanding and interpretation.

## **Practices**

Care and handling

1. Exhibitions
2. Circulating collections
3. Special collections

## **Environmental controls**

Environmental controls are necessary to facilitate the preservation of organic library materials and are especially important to monitor in rare and special collections. Key environmental factors to watch include temperature, relative humidity, pests, pollutants, and light exposure.

In general, the lower the temperature is, the better it is for the collection. However, since books and other materials are often housed in areas with people, a compromise must be struck to accommodate human comfort. A reasonable temperature to accomplish both goals is 65-68°F however, if possible, film and photography collections should be kept in a segregated area at 55°F.

Books and other materials take up and give off moisture making them sensitive to relative humidity. Very high humidity encourages mold growth and insect infestations. Low humidity causes materials to lose their flexibility. Fluctuations in relative humidity are more damaging than a constant humidity in the middle or low range. Generally, the relative humidity should be between 30-50% with as little variation as possible, however recommendations on specific levels to maintain vary depending on the type of material, i.e. paper-based, film, etc. A specialized dew point calculator for book preservation is available.

Pests, such as insects and vermin, eat and destroy paper and the adhesive that secures book bindings. Food and drink in libraries, archives, and museums can increase the attraction of pests. An Integrated Pest Management system is one way to control pests in libraries.

Particulate and gaseous pollutants, such as soot, ozone, sulfur dioxide, oxides of nitrogen, can cause dust, soiling, and irreversible molecular damage to materials. Pollutants are exceedingly

small and not easily detectable or removable. A special filtration system in the building's HVAC is a helpful defense.

Exposure to light also has a significant effect on library materials. It is not only the light visible to humans that can cause damage, but also ultraviolet light and infrared radiation. Measured in lux or the amount of lumens/m<sup>2</sup>, the generally accepted level of illumination with sensitive materials is limited to 50 lux per day. Materials receiving more lux than recommended can be placed in dark storage periodically to prolong the original appearance of the object.

Recent concerns about the impact of climate change on the management of cultural heritage objects as well as the historic environment has prompted research efforts to investigate alternative climate control methods and strategies that include the implementation of alternative climate control systems to replace or supplement traditional high-energy consuming HVAC systems as well as the introduction of passive preservation techniques. Rather than maintaining a flat line, consistent 24/7 condition for a collection's environment, fluctuation can occur within acceptable limits to create a preservation environment while also thinking of energy efficiency and taking advantage of the outside environment.

Bound materials are sensitive to rapid temperature or humidity cycling due to differential expansion of the binding and pages, which may cause the binding to crack and/or the pages to warp. Changes in temperature and humidity should be done slowly so as to minimize the difference in expansion rates. However, an accelerated aging study on the effects of fluctuating temperature and humidity on paper color and strength showed no evidence that cycling of one temperature to another or one RH to another caused a different mechanism of decay.

## **Decision making and criteria**

Making a proper decision is an important factor before starting preservation practices. Decision making for preservation should be made considering significance and value of materials. Significance is considered to have two major components: importance and quality. "Importance" relates to the collection's role as a record, and "quality" covers comprehensiveness, depth, uniqueness, authenticity and reputation of the collection. Moreover, analyzing the significance of materials can be used to uncover more about their meaning. Assessment of significance can also

aid in documenting the provenance and context to argue the case for grant funding for the object and collection.

Forms of significance can be historically, culturally, socially, or spiritually significant. In the preservation context, libraries and archives make decisions in different ways. In libraries, decision-making likely targets existing holding materials, whereas in archives, decisions for preservation are often made when they acquire materials. Therefore, different criteria might be needed on different occasions. In general, for archive criteria, the points include:

- 1) the characteristics of a record (purpose, creator, etc.);
- 2) the quality of the information in the record;
- 3) the record in context (part of a series or not);
- 4) potential use and possible limitations; and
- 5) the cost against the benefits from its existence.

For library criteria, the following are evidence of significance:

- 1) uniqueness,
- 2) irreplaceability,
- 3) high level of impact – over time or place,
- 4) high level of influence,
- 5) representation of a type, and
- 6) comparative value (rarity, completeness, integrity relative to others of its kind).

## **Selection**

Since the 1970s, the Northeast Document Conservation Center has stated that the study of understanding the needs of the library is inherently important to the survival of archives and libraries. In order for the preservation of a collection to survive for a long time it is important that a systematic preservation plan is in place. The first step in planning a preservation program is to assess the institution's existing preservation needs. This process entails identifying the general and specific needs of the collection, establishing priorities, and gathering the resources to execute the plan.



Because budget and time limitations require priorities to be set, standards have been established by the profession to determine what should be preserved in a collection. Considerations include existing condition, rarity, and evidentiary and market values. With non-paper formats, the availability of equipment to access the information will be a factor (for example, playback equipment for audio-visual materials, or microform readers). An institution should determine how many, if any, other repositories hold the material, and consider coordinating efforts with those that do.

Institutions should establish an environment conducive to preservation changes, involve staff, and create an understanding among administration and staff. The first steps an institution should implement, according to the NEDCC, are to establish a policy that defines and charts the course of action and create a framework for carrying out goals and priorities.

There are three methods for carrying out a preservation survey: general preservation assessment, collection condition surveys, and an item-by-item survey. General condition surveys can be part of a library inventory.

Selection for treatment determines the survival of materials and should be done by a specialist, whether in relation to an established collection development policy or on an item by item basis. Once an object or collection has been chosen for preservation, the treatment must be determined that is most appropriate to the material and its repository. If the information is most important, reformatting or creation of a surrogate is a likely option. If the artifact itself is of value, it will receive conservation treatment, ideally of a reversible nature.

## **Research And Testing**

With old media deteriorating or showing their vulnerabilities and new media becoming available, research remains active in the field of conservation and preservation. Everything from how to preserve paper media to creating and maintaining electronic resources is being explored by students and professionals in library and information science. The two main issues that most libraries tend to face are the rapid disintegration of acidic paper and water damage (due to flooding, plumbing problems, etc.). Therefore, these areas of preservation, as well as new digital technologies, receive much of the research attention.

The American Library Association has many scholarly journals that publish articles on preservation topics, such as *College and Research Libraries*, *Information Technology and Libraries*, and *Library Resources and Technical Services*. Scholarly periodicals in this field from other publishers include *International Preservation News*, *Journal of the American Institute for Conservation*, and *Collection Management* among many others.

## **Ethics**

Conservators should refer to the AIC Code of Ethics and Guidelines for Practice, which states that the conservation professional must "strive to attain the highest possible standards in all aspects of conservation."

Ethics will play an important role in many aspects of the conservator's activities. When choosing which objects are in need of treatment, the conservator should do what is best for the object in question and not yield to pressure or opinion from outside sources.

## **Preservation of Cultural Objects**

One instance in which these decisions may get tricky is when the conservator is dealing with cultural objects. The AIC Code of Ethics and Guidelines for Practice has addressed such concerns, stating "All actions of the conservation professional must be governed by an informed respect for cultural property, its unique character and significance and the people or person who created it." This can be applied in both the care and longterm storage of objects in archives and institutions.

The AIC Code of Ethics and Guidelines for Practice also states: "While recognizing the right of society to make appropriate and respectful use of cultural property, the conservation professional shall serve as an advocate for the preservation of cultural property." This statement speaks to the conservator's need to balance his or her duty to conserve objects and maintain a collection with society's right to have access and use of objects for their own cultural/religious purposes. While it is obvious that a member of a religion should be able to have access to an object or text that has spiritual value to them, it would be against the conservator's ethics to then allow that object

to incur damage from such use. The conservator should make sure that the care of the object is kept in mind when access to an object is granted. The object should remain in the best condition possible not only so it is preserved for prosperity, but also so that it can be studied by researchers and by members of the cultural or religious group that created it.

It is important that preservation specialists to be respectful of cultural property and the societies that created it, it is also important for them to be aware of international and national laws pertaining to stolen items. The AIC Code of Ethics and Guidelines for Practice also states that:

"The conservation professional should be cognizant of laws and regulations that may have a bearing on professional activity. Among these laws and regulations are those concerning the rights of artists and their estates, occupational health and safety, sacred and religious material, excavated objects, endangered species, human remains, and stolen property."

In recent years there has been a rise in nations seeking out artifacts that have been stolen and are now in museums. In many cases museums are working with the nations to find a compromise to balance the need for reliable supervision as well as access for both the public and researchers.

Conservators are not just bound by ethics to treat cultural and religious objects with respect, but also in some cases by law. For example, in the United States, conservators must comply with the Native American Graves Protection and Repatriation Act (NAGPRA). The First Archivists Circle, a group of Native American archivists, has also created Protocols for Native American Archival Materials. The non-binding guidelines are suggestions for libraries and archives with Native American archival materials.

With all these issues of respect and cultural sensitivity to consider, conservation and preservation issues are sure to arise. The care of cultural and sacred objects often affects the physical storage or the object. For example, sacred objects of the native peoples of the Western United States are supposed to be stored with sage to ensure their spiritual well being. The idea of storing an object with plant material is inherently problematic to an archival collection because of the possibility of insect infestation. When conservators have faced this problem, they have addressed it by using freeze-dried sage, thereby meeting both conservation and cultural needs.

Some individuals in the library science community have explored the possible moral responsibility to preserve all cultural phenomena, in regards to the concept of monumental preservation. Other advocates argue that such an undertaking is something that the indigenous or native communities that produce such cultural objects are better suited to perform. Currently, however, many indigenous communities are not financially able to support their own archives and museums. Still, indigenous archives are on the rise in the United States.

## **Preservation And The Library As A Sacred Institution**

In her book "Sacred Stacks: The Higher Purpose of Libraries and Librarianship," Nancy Kalikow Maxwell discusses how libraries are capable of performing some of the same functions as religion. Many librarians feel that their work is done for some higher purpose. The same can be said for preservation librarians. One instance of the library's role as sacred is to provide a sense of immortality: with the ever changing world outside, the library will remain stable and dependable. Preservation is a great help in this regard. Through digitization and reformatting, preservation librarians are able to retain material while at the same time adapting to new methods. In this way, libraries can adapt to the changes in user needs without changing the quality of the material itself. Through preservation efforts, patrons can rest assured that although materials are constantly deteriorating over time, the library itself will remain a stable, reliable environment for their information needs. Another sacred ability of the library is to provide information and a connection to the past. By working to slow down the processes of deterioration and decay of library materials, preservation practices help keep this link to the past alive.

## **Regional Centers**

- The Conservation Center for Art and Historic Artifacts in Philadelphia, PA. CCAHA is a non-profit conservation laboratory specializing in the treatment of art and historic artifacts on paper. The Center also trains museum and library professionals in disaster planning, records and archives management.
- The Northeast Document Conservation Center in Andover, MA. Since its inception in 1973, the Center has instructed institutions and organizations, as well as librarians, conservators,

preservationists and museum professionals in preservation care and procedures. From 1995 to 2007, NEDCC presented its School for Scanning conference eleven times in cities across the United States. The school takes a leading role for digital preservation.

- LYRASIS is a not-for-profit membership cooperative of libraries and other information organizations in the southeastern United States. Established in 1973, as the largest regional library network in the U.S., LYRASIS provides a variety of preservation education programs and workshops.

## **Vendor Services**

Many private entities provide preservation and conservation services and supplies.

Standard functions of preservation programs

- Collections Care refers to the general maintenance and preventive care of a collection as a whole. This can include activities such as security, environmental monitoring, preservation surveys and more specialized activities such as mass deacidification.
- Conservation refers to the treatment and repair of individual items to slow decay or restore them to a usable state. Conservation is occasionally used interchangeably with preservation, particularly outside the professional literature.
- Digital preservation refers to the maintenance of digitally stored information. This should not be confused with digitization, which is a process of creating digital information which must, in turn, be digitally preserved. Means of digital preservation include refreshing, migration, replication and emulation.
- Disaster Preparedness (RT: Disaster Plan / Business Continuation / Disaster Recovery / Disaster Mitigation Plan) refers to the practice of arranging for the necessary resources and planning the best course of action to prevent or minimize damage to a collection in the event of a disaster of any level of magnitude, whether natural or man-made.
- Reformatting refers to the practice of creating copies of an object in another type of data storage device. Reformatting processes include microfilming and digitization.

## **Sizing**

Sizing or size is any one of numerous specific substances that is applied to or incorporated in other material, especially papers and textiles, to act as a protecting filler or glaze.

Sizing is used in papermaking and textile manufacturing to change the absorption and wear characteristics of those materials; it is the term used for oil-based surface preparation for gilding (and is also known as mordant in this context); and it is used by painters and artists to prepare paper and textile surfaces for some art techniques.

Sizing also refers to the process of including or applying the substance.

## **Papermaking**

Sizing is used during paper manufacture to reduce the paper's tendency when dry to absorb liquid, with the goal of allowing inks and paints to remain on the surface of the paper and to dry there, rather than be absorbed into the paper. This provides a more consistent, economical, and precise printing, painting, and writing surface. This is achieved by curbing the paper fibers' tendency to absorb liquids by capillary action. In addition, sizing affects abrasiveness, creasibility, finish, printability, smoothness, and surface bond strength and decreases surface porosity and fuzzing.

There are three categories of papers with respect to sizing: unsized (water-leaf), weak sized (slack sized), and strong sized (hard sized). Waterleaf has low water resistance and includes absorbent papers for blotting. Slack sized paper is somewhat absorbent and includes newsprint, while hard sized papers have the highest water resistance, such as coated fine papers and liquid packaging board.

There are two types of sizing: internal sizing, sometimes also called engine sizing, and surface sizing (tub sizing). Internal sizing is applied to almost all papers and especially to all those that are machine made, while surface sizing is added for the highest grade bond, ledger, and writing papers.

## **Surface Sizing**

Surface sizing solutions consists of mainly modified starches and sometimes other hydrocolloids, such as gelatine, or surface sizing agents such as alkyl ketene dimer (AKD) or acrylic copolymers. Surface sizing agents are amphiphilic molecules, having both hydrophilic (water-loving) and hydrophobic (water-repelling) ends. The sizing agent adheres to substrate fibers and forms a film, with the hydrophilic tail facing the fiber and the hydrophobic tail facing outwards, resulting in a smooth finish that tends to be water-repellent. Sizing improves the surface strength, printability, and water resistance of the paper or material to which it is applied. In the sizing solution, optical brightening agents (OBA) may also be added to improve the opacity and whiteness of the paper or material surface.

## **Internal Sizing**

Main article: Wet strength

Internal sizing chemicals used in papermaking at the wet end are alkyl succinic anhydride (ASA), AKD and rosin. By making the paper web more hydrophobic, the sizing agents influence dewatering and retention of fillers and fibers in the paper sheet. Next to paper quality, internal sizing agents' main effect is on runability of the paper machine.

## **Preservation**

While sizing is intended to make paper more suitable for printing, it also makes printing paper less durable and poses a problem for preservation of printed documents. Sizing with starch was introduced quite early in the history of papermaking Dard Hunter in *Papermaking through Eighteen Centuries* corroborates this by writing, “The Chinese used starch as a size for paper as early as A.D. 768 and its use continued until the fourteenth century when animal glue was substituted.” In the early modern paper mills in Europe, which produced paper for printing and other uses, the sizing agent of choice was gelatin, as Susan Swartzburg writes in *Preserving Library Materials*: “Various substances have been used for sizing through the ages, from gypsum to animal gelatin.” Hunter describes the process of sizing in these paper mills in the following:

The drying completed, the old papermakers dipped their paper into an animal size that had been made from the parings of hides, which they procured from the parchment-makers. It was

necessary to size that paper so that it would be impervious to ink, but sizing was more needed in writing than in printing papers. Many books of the fifteenth century were printed upon paper that had not been sized, this extra treatment not being essential for a type impression. The sizing was accomplished by a worker holding a number of sheets by the aid of two wooden sticks, and dipping the paper into the warm gelatinous liquid. The sheets were then pressed to extract the superfluous gelatine. This crude method of sizing the paper was extremely wasteful as many sheets were torn and bruised beyond use. The sizing room of the early paper mills, was, for this reason, known as the 'slaughter-house'.

With the advent of the mass production of paper, the type of size used for paper production also changed. As Swartzburg writes, "By 1850 rosin size had come into use. Unfortunately, it produces a chemical action that hastens the decomposition of even the finest papers." In the field of library preservation it is known "that acid hydrolysis of cellulose and related carbo-hydrates is one of the key factors responsible for the degradation of paper during ageing." Some recent professional work has focused on the specific in the degradation involved in the deterioration of paper that has had a rosin sizing process, and what amount of rosin affects the deterioration process, in addition to work on developing permanent paper and sizing agents that will not eventually destroy the paper. An issue on the periphery to the preservation of paper and sizing, is washing, which is described by V. Daniels and J. Kosek as, "The removal of discolouration ... in water is principally effected by the dissolution of water-soluble material; this is usually done by immersing paper in water." In such a process, surface level items applied to the paper, such as size in early paper making processes as seen above, have the possibility of being removed from the paper, which might have some item specific interest in a special collections library. With later processes in paper making being more akin to "engine sizing," as H. Hardman and E. J. Cole describe it, "Engine sizing, with is part of the manufacturing process, has the ingredients added to the furnish or stock prior to sheet formation," the concern for the removal of size is less, and as such, most literature focuses on the more pressing issue of preserving acidic papers and similar issues.

## **Gilding**

Sizing is a term used for any substance which is applied to a surface before gilding in order to ensure adhesion of the thin gold leaf to the substrate. Egg whites have often been used as sizing;



the Ancient Egyptians sometimes used blood. Other commonly used traditional materials for gold leaf sizing are rabbit skin glue diluted and heated in water (water gilding), and boiled linseed oil (oil gilding); modern materials include polyvinyl acetate.

Sizing of the warp yarn is essential to reduce breakage of the yarn and thus production stops on the weaving machine. On the weaving machine, the warp yarns are subjected to several types of actions i.e. cyclic strain, flexing, abrasion at various loom parts and inter yarn friction.

With sizing the strength — abrasion resistance — of the yarn will improve and the hairiness of yarn will decrease. The degree of improvement of strength depends on adhesion force between fiber and size, size penetration as well as encapsulation of yarn. Different types of water soluble polymers called textile sizing agents/chemicals such as modified starch, polyvinyl alcohol (PVA), carboxymethyl cellulose (CMC), acrylates are used to protect the yarn. Also wax is added to reduce the abrasiveness of the warp yarns. The type of yarn material (e.g. cotton, polyester, linen), the thickness of the yarn, type of weaving machinery will determine the sizing recipe.

The sizing liquor is applied on warp yarn with a warp sizing machine. After the weaving process the fabric is desized (washed).

Sizing may be done by hand, or in a sizing machine.

Leather can be decorated by a variety of methods, including pyrography and beading.

## **Cordwain and Cuir de Cordoue**

Fragment of Cuir de Cordoue

Cordwain, once a synonym of cordovan (through Old French cordewan) meaning "from Córdoba" describes a certain kind of fine leather, originally from Córdoba. Cordwainer is still used to describe someone in the profession of shoemaking.

The related term Cuir de Cordoue refers to painted and gilded (and sometimes embossed) leather hangings manufactured in panels and assembled for covering walls as an alternative to tapestry.

## **Main article: Cuir de Cordoue**

In modern culture

A motorcycle-style leather jacket.

Due to its excellent resistance to abrasion and wind, leather found a use in rugged occupations. The enduring image of a cowboy in leather chaps gave way to the leather-jacketed and leather-helmeted aviator. When motorcycles were invented, some riders took to wearing heavy leather jackets to protect from road rash and wind blast; some also wear chaps or full leather pants to protect the lower body. Top-quality motorcycle leather is superior to any practical man-made fabric for abrasion protection and is still used in racing. Many sports still use leather to help in playing the game or protecting players; its flexibility allows it to be formed and flexed.

The term leathering is sometimes used in the sense of a physical punishment (such as a severe spanking) applied with a leather whip, martinet, etc.

Leather fetishism is the name popularly used to describe a fetishistic attraction to people wearing leather, or in certain cases, to the garments themselves.

Many rock groups (particularly heavy metal and punk groups in the 1980s) are well known for wearing leather clothing. Leather clothing, particularly jackets, are common in the heavy metal and Punk subculture. Extreme metal bands (especially black metal bands) and Goth rock groups have extensive leather clothing, i.e. leather pants, accessories, etc.

Many cars and trucks come with optional or standard "leather" seating. These days most car manufacturers due to consideration of durability use synthetic PU leather or Bonded Leather, including luxury car brands like Mercedes-Benz, BMW, and Audi.

Leather is used exclusively by publishers like The Easton Press to bind books, for both practical and aesthetic purposes.

## **Religious Sensitivities**

In religiously diverse countries, leather vendors are typically careful to clarify the kinds of leather used in their products. For example, leather shoes will bear a label identifying the animal

from which the leather was taken. In this way, a Muslim would not accidentally purchase pigskin leather, and a Hindu could avoid cow leather. Many Hindus who are vegetarians will not use any kind of leather.

Such taboos increase the demand for religiously neutral leathers like ostrich and deer.

Judaism forbids the comfort of wearing shoes made with leather on Yom Kippur, Tisha B'Av, and during mourning.

Jainism prohibits the use of leather since it is obtained by killing animals.

## **Alternatives**

Some vegetarians, vegans and animal rights activists boycott the use of all items made from leather, believing the practice of wearing leather to be unnecessary. Animal rights groups such as PETA have called for boycotts and encourage the use of alternative materials such as synthetic leathers.

Many pseudo-leather materials have been developed, allowing those who wish to wear leather-like garments to do so without actually wearing leather. One example of this is vegan microfiber, which claims to be stronger than leather when manufactured with strength in mind. Polyurethane materials, pleather, Naugahyde, Durabuck, NuSuede, Hydrolite, and other alternatives exist, providing some features similar to leather.

## **Education**

One of the biggest challenges in the field of preservation today is educating a library's community, especially librarians and other staff, in the best ways to handle materials as well as the conditions in which particular materials will decay the least. This challenge is exacerbated by the fact that preservation is a peripheral element of most library science curricula; indeed, there are few places where one can receive a specialized education in preservation.

One of the primary degree granting institutions for library and archival preservation is the University of Texas at Austin's School of Information Science. The conservation and preservation program is offered in partnership with the Kilgarlin Center for Preservation of the

Cultural Record and trains both conservators and preservation administrators. There are a number of other preservation administration programs in the United States including the University of Michigan School of Information which specializes in digital preservation management. Recently the Institute for Museum and Library Services (IMLS) has funded a number of digital curation education programs around the United States, including at the University of North Carolina at Chapel Hill. Digital curation includes the activity of digital preservation management.

Other conservation programs in the United States focus on Art Conservation and are considered to be more museum focused than library focused. These programs are all part of the Association of North American Graduate Programs in the Conservation of Cultural Property (ANAGPIC).

The Rutgers Preservation Management Institute provides post-graduate training in preservation administration for working librarians who have already completed a Master's degree. UT Austin also offers certificates of advanced study in conservation and preservation to librarians who already hold their MLS.

Another educational resource available to preservationists is the Northeast Document Conservation Center or NEDCC. This institution was founded in 1973 as a reaction to the growing problem of paper deterioration occurring in repositories in the New England area. The Center provides institutions and organizations, as well as librarians, conservators, preservationists, and museum professionals, with help in learning proper care and procedures to better preserve the integrity of their collections. The institution provides a variety of services such as imaging, surveys and consultations, and digitation. They also assist with disaster planning. The educational opportunities it provides include provision of workshops, conferences, and specialized trainings. Additional online courses are also available. For instance, some of the workshops offered by the NEDCC include: Basic Preservation, Collections Care, Emergency Preparedness, Integrated Pest Management (IPM), Identification and Care of Photographs, Basic and Intermediate Book Repair, Basic Paper Repair, Preservation of Scrapbooks, Preservation Technologies, Holdings Maintenance, Creating and Maintaining Digital Collections, Scanning Training, and Grant Writing. Additionally, the NEDCC is responsible for the creation of a Preservation Education Curriculum, which has been made available online to serve as an

instructional aid for introductory preservation courses taught at Library and Information Science schools.

Additional preservation education is available to librarians through various professional organizations, such as:

- American Institute for Conservation of Historic and Artistic Works
- American Library Association
- Amigos Library Services Preservation Service
- Association for Information and Image Management (AIIM)
- Association for Recorded Sound Collections (ARSC)
- Association of Moving Image Archivists (AMIA)
- Buffalo State College. Art Conservation Department, Buffalo, NY
- Campbell Center for Historic Preservation Studies, Mount Carroll, IL.
- George Eastman House. School of Film & Video Preservation Rochester, NY
- The Kilgarlin Center for Preservation of the Cultural Record
- Library Binding Institute
- New York University. Conservation Center, Institute of Fine Arts, New York, NY
- North Bennet Street School. Boston, MA
- Northeast Document Conservation Center (NEDCC)
- The Conservation Center for Art and Historic Artifacts in Philadelphia, PA
- Queen's University. Master of Art Conservation Program, Ont, Canada
- Rare Book School (RBS) at the University of Virginia
- Society of American Archivists

- LYRASIS
- University of Delaware. Winterthur Art Conservation Program, Newark, DE
- The National Archives

There is a longstanding tension between preservation of and access to library materials, particularly in the area of special collections. Handling materials promotes their progression to an unusable state, especially if they are handled carelessly. On the other hand, materials must be used in order to gain any benefit from them. In a collection with valuable materials, this conflict is often resolved by a number of measures which can include heightened security, requiring the use of gloves for photographs, restricting the materials researchers may bring with them into a reading room, and restricting use of materials to patrons who are not able to satisfy their research needs with less valuable copies of an item. These restrictions are annoyances to researchers who feel that these measures are in place solely to keep materials out of the hands of the public.

There is also controversy surrounding preservation methods. A major controversy at the end of the twentieth century centered on the practice of discarding items that had been microfilmed. This was the subject of novelist Nicholson Baker's book *Double Fold*, which chronicled his efforts to save many old runs of American newspapers (formerly owned by the British Library) from being sold to dealers or pulped. A similar concern persists over the retention of original documents reformatted by any means, analog or digital. Concerns include scholarly needs and legal requirements for authentic or original records as well as questions about the longevity, quality and completeness of reformatted materials. Retention of originals as a source or fail-safe copy is now a fairly common practice. Another controversy revolving around different preservation methods is that of digitization of original material to maintain the intellectual content of the material while ignoring the physical nature of the book. Further, the Modern Language Association's Committee on the Future of the Print Record structured its "Statement on the Significance of Primary Records" on the inherent theoretical ideology that there is a need to preserve as many copies of a printed edition as is possible as texts and their textual settings are, quite simply, not separable, just as the artifactual characteristics of texts are as relevant and varied as the texts themselves (in the report mentioned herewith, G. Thomas Tanselle suggests

that presently existing book stacks need not be abandoned with emerging technologies; rather they serve as vitally important original (primary) sources for future study).

Many digitized items, such as back issues of periodicals, are provided by publishers and databases on a subscription basis. If these companies were to cease providing access to their digital information, facilities that elected to discard paper copies of these periodicals could face significant difficulties in providing access to these items. Discussion as to the best ways to utilize digital technologies is therefore ongoing, and the practice continues to evolve. Of course, the issues surrounding digital objects and their care in libraries and archives continues to expand as more and more of contemporary culture is created, stored, and used digitally. These born-digital materials raise their own new kinds of preservation challenges and in some cases they may even require use new kinds of tools and techniques.

## **Non-academic facilities and preservation**

### Public libraries

Limited, tax-driven funding can often interfere with the ability for public libraries to engage in extensive preservation activities. Materials, particularly books, are often much easier to replace than to repair when damaged or worn. Public libraries usually try to tailor their services to meet the needs and desires of their local communities, which could cause an emphasis on acquiring new materials over preserving old ones. Librarians working in public facilities frequently have to make complicated decisions about how to best serve their patrons. Commonly, public library systems work with each other and sometimes with more academic libraries through interlibrary loan programs. By sharing resources, they are able to expand upon what might be available to their own patrons and share the burdens of preservation across a greater array of systems.

## **Archival repositories and special collections**

Archival facilities focus specifically on rare and fragile materials. With staff trained in appropriate techniques, archives are often available to many public and private library facilities as an alternative to destroying older materials. Items that are unique, such as photographs, or

items that are out of print, can be preserved in archival facilities more easily than in many library settings.

## **Museums**

Because so many museum holdings are unique, including print materials, art, and other objects, preservationists are often most active in this setting.

Archival research is a type of primary research which involves seeking out and extracting evidence from original archival records. These records may be held either in institutional archive repositories, or in the custody of the organisation (whether a government body, business, family, or other agency) that originally generated or accumulated them, or in that of a successor body. Archival research can be contrasted with (1) secondary research (undertaken in a library or online), which involves identifying and consulting secondary sources relating to the topic of enquiry; and (2) with other types of primary research and empirical investigation such as fieldwork and experiment.

Archival research is generally more complex and time-consuming than library and internet research, presenting challenges in identifying, locating and interpreting relevant documents. Archival records are often unique, and the researcher must be prepared to travel to reach them. Some finding aids to archival documents are hosted online, but many more are not, and some records lack any kind of finding aid at all. Although most archive repositories welcome researchers, and have professional staff tasked with assisting them, the sheer quantity of records means that finding aids may be of only limited usefulness: the researcher will need to hunt through large quantities of documents in search of material relevant to his or her particular enquiry. Some records may be closed to public access for reasons of confidentiality; and others may be written in archaic handwriting, in ancient or foreign languages, or in technical terminology. Archival documents were generally created for immediate practical or administrative purposes, not for the benefit of future researchers, and additional contextual research may be necessary to make sense of them. Many of these challenges are exacerbated when the records are still in the custody of the generating body or in private hands, where owners or custodians may be unwilling to provide access to external enquirers, and where finding aids may be even more rudimentary or non-existent.



Archival research lies at the heart of most academic and other forms of original historical research; but it is frequently also undertaken (in conjunction with parallel research methodologies) in other disciplines within the humanities and social sciences, including literary studies, archaeology, sociology, human geography, anthropology, and psychology. It may also be important in other non-academic types of enquiry, such as the tracing of birth families by adoptees, and criminal investigations.

## **History of Archival Research**

Many archives have been around for multiple hundreds of years. For instance Vatican Secret Archives was started in the 17th century AD and contains state papers, papal account books, and papal correspondence dating back to the 8th century. Most archives that are still in existence do not claim collections that date back quite as far as the Vatican Archive.

However, many national archives were established over one hundred years ago and contain collections going back three or four hundred years ago. The United States National Archives and Records Administration was established originally in 1934. The NARA contains records and collections dating back to the founding of the United States in the 18th century. Among the collections of the NARA are the Declaration of Independence, the Constitution of the United States, and an original copy of the Magna Carta. Similarly, the Archives nationales in France was founded in 1790 during the French Revolution and has holdings that date back to AD 625.

Universities are another historic venue for archival holdings. Most universities have archival holdings that chronicle the business of the university. Some universities also have cultural archives that focus on one aspect or another of the culture of the state or country in which the university is located. The University of North Carolina at Chapel Hill has archival collections on the subjects of Southern History and Southern Folklife. Boston University's Howard Gottlieb Archival Research Library has collections dedicated to chronicling advances and famous moments in American art, drama, and public/ political life.

The reason for highlighting the breadth and depth of historical archives is to give some idea of the difficulties facing archival researchers in the pre-digital age. Some of these archives were dauntingly vast in the amount of records they held. For example, The Vatican Secret Archive had upwards of 52 miles of archival shelving. In an age where you could not simply enter your query

into a search bar complete with Boolean operators the task of finding material that pertained to your topic would have been difficult at the least. The Finding aid made the work of sifting through these vast archives much more manageable. A finding aid is a document that is put together by an archivist or librarian that contains information about the individual documents in a specific collection in an archive. These documents can be used to determine if the collection is relevant to a designated topic. Finding aids made it so a researcher did not have to blindly search through collection after collection hoping to find pertinent information. However, in the pre-digital age a researcher still had to travel to the physical location of the archive and search through a card catalog of finding aids.

## **Pre-Internet Data Storage**

Organizing, collecting, and archiving information using physical documents without the use of electronics is a daunting task. Magnetic storage devices provided the first means of storing electronic data. As technology has progressed over the years, so too has the ability to archive data using electronics. Long before the Internet, means of using technology to help archive information were in the works. The early forms of magnetic storage devices that would later be used to archive information were invented as early as the late 19th century, but were not used for organizing information until 1951 with the invention of the UNIVAC I.

UNIVAC I, which stands for Universal Automatic Computer 1, used magnetic tape to store data, and was the first commercial computer produced in the United States. Early computers such as UNIVAC I were enormous and sometimes took up entire rooms, rendering them completely obsolete in today's technological society. But the central idea of using magnetic tape to store information is a concept that is still in use today.

While most magnetic storage devices have been replaced by optical storage devices such as CDs and DVDs, some are still in use today. In fact, the floppy drive is one example of a magnetic storage device that became extremely popular in the 1970s through the 1990s. Floppy disks have for years been used by millions of people to back up the information on their hard drives.

Magnetic tape has proven to be a very effective means of archiving data as large amounts of data that don't need to be quickly accessed can be found on magnetic tape. That is especially true of

aging data that may not need to be accessed again at all, but for different reasons still needs to be stored “just in case”.

## **Internet Age Archiving**

With the explosion of the Internet over the past couple decades, archiving has begun to make its way online. The days of using electronic devices such as magnetic tape are coming to an end as people start to use the internet to archive their information.

Internet archiving has become extremely popular for several reasons. As mentioned earlier, the attempt to have as much information take up as little space as possible is very helpful for many archivers. Using the Internet to archive allows for this to be possible as well many other benefits. Internet archiving can be used to store as little information needed for a single person, or for as much information needed for a major company. Internet archives can contain large-scale digitization as well as provide long term management and preservation of the digital resources similarly to the electronics used in the pre-Internet data storage era. Along with the idea of storage benefits, archiving via Internet ensures that ones information is safe. There is risk of misplacing your information, or having it get destroyed by water or fire etc. Those are problems that may occur when archiving using floppy discs, hard drives, and computers. Lastly, the ability to access the information from almost anywhere is one of the main attractions to online archiving. As long as one has access to the Internet they can edit and retrieve the information they are looking for.

Most institutions with physical archives have begun to digitize their holdings and make them available on the Internet. Notably the National Archive and Records Administration in Washington, D.C. has a clearly defined initiative that was started in 1998 in an attempt to digitize many of their holdings and make them available on the Internet.

## **American Archives Month**

October is officially noticed throughout the United States as American Archives month, with both Ireland and the United Kingdom noticing the event as well. The month was founded in 1969 by the Michigan State University Archives & Historical Collections, but now Archives Month is a collaborative effort by professional organizations and repositories. Their main point of

American Archives month was and is to celebrate the importance of archives and to raise awareness about the value of archives. Lessons of how to preserve certain photographs and documents are also provided for each state. Each state normally celebrates the affair through a series of week-long events. The majority of the states get involved and plan out different sorts of activities that pertain to archiving. There is also a guide that goes into detail about planning for the event. For the most part, each state coins a phrase each year to describe their interest in archiving. For example:

- Georgia: "Quench your thirst for History."
- North Dakota: "That's Entertainment."
- North Carolina: "Celebrating the NC Record."

Wisconsin was the most recent state to join National Archive Month, joining in 2009, coining the phrase "Scrapbook Wisconsin." One of the major events is hosted by the staff at the University Archives & Historical Collections. They contribute to American Archives month by hosting a contest about trivia questions pertaining to archives, but it is only open to MSU faculty, staff and students, MSU alumni, and the greater Lansing community.

### **Suggested Reading**

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