



CCI Notes

11/7

Basic Care of Books

Introduction

Many books in libraries, museums, archives, and private collections are deteriorating because of poor storage and handling practices, improper environmental conditions, and lack of preservation. If not preserved, these collections will, in time, deteriorate beyond use.

Books are bound in a variety of materials, including leather, cloth, and paper. Many unique or rare editions may have intrinsic value as historic artifacts. This CCI Note will mainly address these types of books.

Environmental conditions and other factors such as handling have a direct bearing on the condition of book bindings, particularly on those made of leather. One important cause of deterioration of leather bindings is their absorption of atmospheric pollutants such as sulphur dioxide. In time, leather bindings lose some of the natural oils and fats that serve as lubricants, and begin to crack during normal handling.

Relative Humidity and Temperature

Do not subject books, and leather bindings in particular, to extremes of relative humidity (RH). Cold exterior conditions combined with

dry central heating can reduce the RH inside a building to less than 30%, and can cause loss of moisture and embrittlement of leather. High humidity (over 65% RH) encourages mould growth. Locally elevated temperatures (e.g., hot display cases, storage near a radiator) can desiccate leather. Recommended environmental conditions for leather are a stable RH in the range of 45% to 55% and a temperature of 18°C to 20°C. Adequate air circulation is also important.

Illumination

Do not store or display books under spotlights, sunlight, or artificial light, all of which can cause discolouration, desiccation, and photochemical degradation. Light fades or darkens some dyes and promotes deterioration. Because the damage due to light is cumulative and irreversible, limit exposure time. Display and store books at light levels of a maximum of 150 lux with an ultraviolet light content of less than 75 $\mu\text{W}/\text{lm}$. Extremely light-sensitive material, such as illuminated manuscripts, should be exposed to a maximum of 50 lux with an ultraviolet content of less than 75 $\mu\text{W}/\text{lm}$. Information on measuring environmental conditions is given in CCI Technical Bulletin No. 2, *Museum Lighting*; CCI Notes 2/4, *CCI Environmental Monitoring Equipment*; and CCI Notes 2/5, *Using a Camera to Measure Light Levels*.

Handling

Improper handling is a major cause of damage to bindings. Some suggestions for avoiding this type of damage follow.

- When removing books from shelves, grasp the book firmly around the centre of the spine and ease the volume from the shelf.
- Avoid pulling on the headcap (the leather covering at the end and tail of a book, formed by turning the leather on the spine over the head and tail and shaping it), because this will damage the spine.
- Use both hands for large or heavy volumes. If you are removing a volume that is beneath another, remove the top volume first.
- If books are removed for processing, cleaning, or conservation treatment, transport them on a trolley or in a cardboard box.

Photocopying

Photocopying books should be discouraged. Books and archival materials are often damaged unnecessarily during photocopying. Photocopying machines with flat copy platens require that the book binding be flattened in order to get a good image. If pages are forced open, the spine may crack and weakened pages may fall out.

Photocopying onto permanent, durable paper using an electrostatic copier is an option that can be used in-house if an item can be copied without damage. Machines with edge platens allow a book to be copied with the book open at only 90° instead of 180°.

Storage

Ideally, books should be stored on baked enamel steel shelving. Uncoated wooden shelving is not

recommended because all wood products contain volatile acids that can be released from uncoated surfaces. Because books can be damaged if stored in acidic environments, paint the surfaces of wooden display and storage shelves with an acceptable coating. The following are guidelines for choosing wood coatings.

- Do not use Varathane or similar oil-modified polyurethane varnishes. Oil-based paints and varnishes release corrosive materials as they dry. Common oil-based products include alkyd paints, varnishes, one-component epoxy esters, anti-corrosion-type paints (e.g., Tremclad), alkyd baking enamels, and most wood stains.
- Where a transparent coating is not necessary, a high-quality acrylic or vinyl-acrylic latex paint may be used, such as Pratt & Lambert's Vapex, Sico's interior semi-gloss, Canadian Tire's Mastercraft latex paints, or similar products. If the wood to be coated contains knots, first seal the knots with shellac. The latex paint may be used as both primer and top coat. Air painted cases and shelving for one month before using them to enclose artifacts, because the paint initially gives off acetic acid.

Because of the humidity and temperature restrictions mentioned above, do not store volumes over radiators or furnace pipes, in damp basements, or near sweating pipes. Place books vertically, supporting them with bookends. To facilitate removal, do not pack books too tightly. Place library call numbers (shelf markings) on acid-free paper and insert them into books; do not apply them directly onto book spines. Store large volumes flat, keeping stacking to a minimum. Specially constructed slip cases and flat boxes (solander boxes) are excellent for storing rare and damaged volumes (see CCI Notes 11/1, *Protective Enclosures for Books and Paper Artifacts*).

Maintenance

Good housekeeping is essential to the care of books. Protection from and removal of dust, and inspection at least every 12 months, are recommended. Deal with signs of mould or biological attack immediately (see CCI Technical Bulletins No. 12, *Controlling Museum Fungal Problems*; No. 13, *Controlling Vertebrate Pests in Museums*; and No. 15, *Solving Museum Insect Problems: Chemical Control*; and CCI Notes 3/1, *Examining for Insect Infestation*).

Types of Materials

Before considering cleaning or treating any binding, identify the materials so as to avoid applying the wrong techniques.

Vegetable-Tanned Leather

Vegetable-tanned leather, such as goat, calf, sheepskin, and pig, were the principal leathers used for bookbindings. These leathers were favoured for their appearance, stability, and durability. In the past, many of these leather bindings were sealed with a varnish coating to protect the surface, creating an impervious film. Any leather dressing applied over such a film would not soak into the leather binding.

Vegetable-tanned leather frequently dries out and becomes powdery. An extreme form of powdery leather is caused not by low humidity or natural ageing but by the action of acids (e.g., sulphuric acid) found in air pollutants. This latter type of powdery leather is reddish-brown, and is frequently referred to as "red rot". Standard treatments should never be carried out on powdery leather or on leather that has "red rot". This condition should be treated by a professional conservator. For more information, see CCI Notes 8/2, *Care of Alum, Vegetable, and Mineral Tanned Leather*.

Rough Calf or Suede

Volumes bound in rough calf or suede use the flesh side of the leather, sometimes referred to as the nap side (the underside of the leather that is not stained, polished, or otherwise treated to give it its final finished appearance). These leathers are normally found on bindings done in the account, ledger, or letter book styles.

Chrome-Tanned Leather

Chrome-tanned leather has been treated with basic chromium sulphate. It is very tough, and is not frequently used for bookbinding because of the difficulty in embossing or gold-tooling it. Chrome-tanned leather tends to stretch more than vegetable-tanned leather, and has a water-repellant surface. This leather is normally manufactured for purses, shoes, and briefcases.

Vellum and Parchment

Vellum and parchment are generally used interchangeably. In many cases it is difficult to tell them apart.

Vellum is normally produced from unsplit calfskin, and has an ivory-hard surface finish. Parchment is produced from split sheepskin (sliced horizontally into two layers), is ivory in colour, and is thinner than vellum. Both materials were frequently used for limp-vellum or limp-parchment bindings in the 16th and 17th centuries.

Cloth

The majority of books in libraries are normally bound in a cloth, buckram, or rexine fabric. These materials come in a variety of colours, thicknesses, and textures. Many of these cloths can be easily damaged by wetting. Cloth produced today can be treated to provide an impervious coating to moisture.

Paper

Many books are covered in paper. These include pamphlet bindings consisting of a few leaves of printed

matter, and paper covers on paperback books.

Treatment

Cleaning

Cleaning improves the appearance of soiled bookbindings. First, thoroughly dust the binding using a dry, lint-free cloth or a soft-bristled brush such as a shaving brush or an artist's paint brush. To keep the binding clean, brush dust away from it (Figure 1).

A vacuum cleaner can also be used to remove dust (Figure 2). Attach a cheesecloth or fibreglass screen over the throat of the brush attachment to prevent loose pieces of paper or leather from detaching and being sucked into the vacuum cleaner (Figure 3).

Slightly ingrained dirt may be removed from stable cloth and paper bindings in good condition by gently working over the surface with powdered erasers (e.g., Skum-X) or white vinyl erasers (e.g., Magic-Rub). Meticulously remove all particles of eraser with a brush and vacuum cleaner. As with any cleaning method, first conduct a small test on an unobtrusive area.

Using moisture to remove stains is not normally recommended because this could disturb, darken, or remove the surface or dyes from the materials. In some instances, it may be possible to carefully use a moistened swab. Avoid using moisture on paper covers because the paper stretches when wet and is difficult to flatten.

Do not clean rough calf or suede leather with powdered eraser because the residue is difficult to remove. The surface of the leather can be carefully brushed or dusted, and should not be treated with oils or else blackening will occur.

Vellum and parchment bindings do not require leather treatment. These

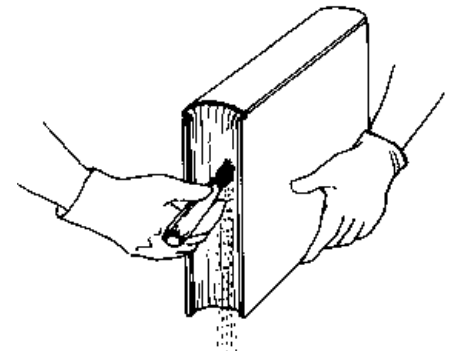


Figure 1. Brush dust away from binding.

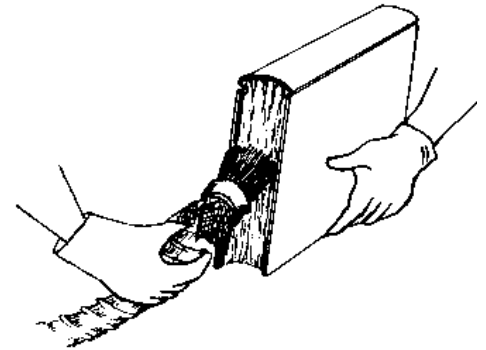


Figure 2. Removing dust with a vacuum cleaner brush.

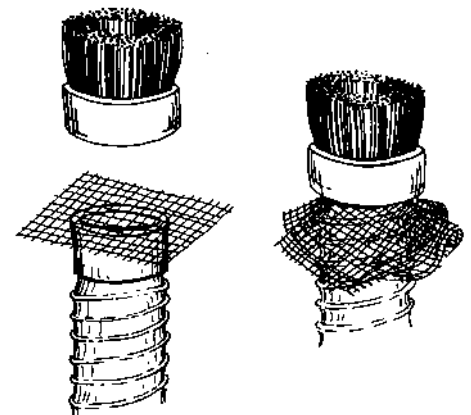


Figure 3. Place protective screen over vacuum cleaner hose.

materials are very sensitive to humidity, and cleaning with moisture should therefore be avoided.

Leather Dressings

Leather dressings, though commonly used in the past, are now not generally recommended

as a treatment for leather. These dressings, which consist of oils, waxes, or oil emulsions, were applied in an attempt to make leathers softer and more flexible. Some leathers, such as chrome-tanned leather, have a non-porous characteristic, which makes the successful application of a leather dressing difficult.

Many leather dressings are available on the market: British Museum Leather Dressing, neat's foot oil, lanolin, etc. However, recent research shows that dressings may not be effective in preserving leather (McCrary and Raphael 1987). Unless the oil content of the leather is known, through chemical analysis, to be below the optimum level for leather, the application of additional oils from a dressing may in fact cause further stiffening by dehydrating the leather (Stambolov et al. 1984). Furthermore, many oils and fats used in leather dressings lubricate in the short term but oxidize with time, resulting in additional stiffening of the leather. Many other problems are created by applying a leather dressing, including the risk of attracting dust or insects, darkening the leather's surface, or staining surrounding materials.

In specific cases (e.g., library collections, new books, as part of a maintenance program), it may be appropriate to apply a leather dressing. However, such a decision should be made by a qualified conservator.

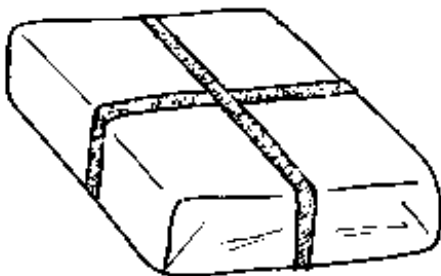


Figure 4. Wrapped volume awaiting conservation treatment.

Damage

Books can suffer from a wide variety of damage, including broken joints, damaged boards, split endpapers, tears, acidic paper, etc. In many cases, it may be possible to carry out minor repairs or to store damaged books in acid-free enclosures.

Broken Joints

Many books deteriorate, especially leather-bound volumes, and the boards separate at the joints. Do not repair these joints with a pressure-sensitive tape such as carpet tape or adhesive tape. In time, these tapes leave permanent stains and are almost impossible to remove without damaging the surface of the material.

An easy alternative is to wrap the volume in a piece of acid-free paper and to tie it up with a soft piece of twill tape until conservation or rebinding can be undertaken (Figure 4). Alternatively, purchase a solander box from an archival supplier or make an acid-free box to store the book in (see CCI Notes 11/1, *Protective Enclosures for Books and Paper Artifacts*).

Mending Tears

Torn pages in books always present a problem. Ideally, all tears should be repaired using Japanese tissue paper and wheat or rice starch paste. Over the years, this has proven to be the safest method and is easily reversible with water. These repairs should be carried out by a qualified paper conservator.

If temporary repairs are necessary, commercial archival tapes are available. Most of these tapes contain synthetic adhesives of limited reversibility; therefore, it may not be possible to remove the tape at a later date without substantial damage to the object. Although **not** recommended for use on historic material, the following archival tapes were found to be chemically stable with a neutral pH, but they may still present problems with reversibility.

- Archival Aids Document Repair Tape
- Archival Aids Framing Tape
- New (post-1985) Filmoplast P and Filmoplast P90

Please note that tapes are commercial products that the manufacturer can alter chemically without notice and without changing the product name.

Suppliers

Companies listed below provide catalogues on request.

Solander boxes, acid-free paper and boards, Archival Aids document repair tape and framing tape, Filmoplast P & P90

University Products of Canada
6535 Millcreek Drive, Unit #8
Mississauga, Ontario
L5N 2M2
(416) 858-7888
Toll-free: 1-800-667-2632
Fax: 1-416-858-8586

Bury Media & Supplies Ltd
B-5 4255 Arbutus Street
Vancouver, B.C.
V6J 4R1
(604) 731-3439
Fax: 604-736-7492

Archival Conservation Resources
(Canada) Ltd (Distributor for
Conservation Resources)
P.O. Box 2506
Station "D"
Ottawa, Ontario
K1P 5W6
(819) 994-1127

Carr McLean
461 Horner Avenue
Toronto, Ontario
M8W 4X2
Toronto area: (416) 252-3371
Ontario (except area code 807):
1-800-268-2123
All other areas: 1-800-268-2138
Fax: (416) 252-9203

Woolfitt's Art Enterprises Inc.
390 Dupont Street
Toronto, Ontario
M5R 1V9
(416) 922-0933
Fax: (416) 922-3017
or
Calgary, Alberta
(403) 278-0565
Fax: (403) 278-2050

Solander Boxes:

Opus Binding Ltd
15 Capella Court, Unit 15
Nepean, Ontario
K2E 7X1
(613) 727-5063

Skum-X Erasing Powder

Available from distributors of
conservation products, including
Dietzgen of Canada Ltd
1111 Flint Road, Unit 34
Downsview, Ontario
M3J 2J6
(416) 736-1677

Check with your museum advisor for
a local distributor of equipment and
materials, or refer to the following
publication:

*Museum and Archival Supplies
Handbook (MASH)*, published by the
Ontario Museum Association and
the Toronto Area Archivists Group.
It is an excellent resource and is
available from the following
addresses:

Ontario Museum Association
George Brown House
50 Baldwin Street
Toronto, Ontario
M5T 1L4
(416) 348-8672

Toronto Area Archivist Group
P.O. Box 97
Station "F"
Toronto, Ontario
M4Y 2L4

Further Reading

Banks, Joyce M. *Guidelines
for Preventive Conservation*.
Available in Canada through
Associated Bookstores and other
booksellers, or by mail from
Canadian Government Publishing
Centre Supply & Services Canada,
Ottawa, Canada, K1A 0S9.
Catalogue No. SN3-167/1987
ISBN 0-66053823-7 1987.

British Columbia Museums
Association. *Preventive Conservation:
A Manual*. 2nd ed. Victoria, B.C.:
British Columbia Museums
Association, 1986.

Canadian Conservation Institute.
*Care of Alum, Vegetable, and Mineral
Tanned Leather*. CCI Notes 8/2. Ottawa:
Canadian Conservation Institute, 1992.

Canadian Conservation Institute.
*CCI Environment Monitoring
Equipment*. CCI Notes 2/4. Ottawa:
Canadian Conservation Institute, 1993.

Canadian Conservation Institute.
Examining for Insect Infestation.
CCI Notes 3/1. Ottawa: Canadian
Conservation Institute, 1988.

Canadian Conservation Institute.
*Protective Enclosures for Books and
Paper Artifacts*. CCI Note 11/1.
Ottawa: Canadian Conservation
Institute, 1988.

Canadian Conservation Institute.
Removing Mould from Leather.
CCI Notes 8/1. Ottawa: Canadian
Conservation Institute, 1989.

Canadian Conservation Institute.
Using a Camera to Measure Light Levels.
CCI Notes 2/5. Ottawa: Canadian
Conservation Institute, 1992.

Canadian Council of Archives. *Basic
Conservation of Archival Materials:
A Guide*. Ottawa: Canadian Council
of Archives, 1990.

Dawson, John E. and
Thomas J.K. Strang. *Solving Museum
Insect Problems: Chemical Control*.
CCI Technical Bulletin No. 15. Ottawa:
Canadian Conservation Institute, 1992.

Greenfield, Jane. *The Care of Fine Books*.
New York: Nick Lyons Books, 1988.

Horton, Carolyn. *Cleaning and
Preserving Bindings and Related
Materials*. Revised edition.
Chicago: Chicago American
Library Association, 1965.

Library of Congress. *Preserving Leather
Bindings*. Preservation Leaflet no. 3,
Washington, D.C.: Library of
Congress, 1983.

Macleod, K.J. *Museum Lighting*.
CCI Technical Bulletin No. 2. Ottawa:
Canadian Conservation Institute, 1978.

McCrary, Ellen and Toby Raphael.
*Leather Dressing: To Dress or Not To
Dress*. Conserv O Gram No. 9/1,
September 1987. Available from
National Parks Service, P.O. Box
37127, Washington D.C. 20013-7127.

Middleton, Bernard. *The Restoration of
Leather Bindings*. Chicago: American
Library Association, 1972.

Stambolov, T., H.A.B. van Soest and
P.B. Hallebeek. "Conservation of
Leather," *Studies in Conservation*
(1984), 29: 21-31.

Strang, Thomas J.K. and John E.
Dawson. *Controlling Museum Fungal
Problems*. CCI Technical Bulletin
No. 12. Ottawa: Canadian
Conservation Institute, 1991.

Strang, Thomas J.K. and
John E. Dawson. *Controlling
Vertebrate Pests in Museums*.
CCI Technical Bulletin No. 13.
Ottawa: Canadian Conservation
Institute, 1992.

Copies also available in French.

Le présent texte est également
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