

PART 6. CONSERVATION AND ARCHIVING

CARE AND HANDLING OF BOUND LIBRARY MATERIALS

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ABSTRACT

THE CARE AND HANDLING OF LIBRARY AND ARCHIVAL MATERIALS HAS BECOME A MUCH - DISCUSSED TOPIC IN RECENT YEARS. CONSIDERABLE TIME, EFFORT, AND MONEY ARE BEING INVESTED BY MANY LIBRARIES AND ARCHIVES IN PROTECTIVE HOUSING, REBINDING, CONSERVATION, AND PRESERVATION MICROFILMING PROGRAMS. THESE ACTIVITIES ARE EXPENSIVE. THEREFORE IT MAKES GOOD FISCAL SENSE TO DELAY THE NEED FOR THESE COSTLY ACTIVITIES BY MAKING AN EFFORT TO PRESERVE LIBRARY MATERIALS IN GOOD CONDITION FOR AS LONG AS POSSIBLE.

Proper care and handling can significantly extend the useful life of library volumes and postpone the need for costly treatment, filming, or replacement. This morning I will discuss several handling, housing, storage, and exhibition procedures that will help reduce book deterioration.

Readers generally demand too much of books. The two parts of a volume most affected by use are the spine and the joints (or hinges). Strain on hinges in the course of use can be reduced by not forcing a tight or stiff joint to open flat. Even if the joint is flexible, the hinge can be damaged if the cover is unsupported and allowed to open too far. Books will most often work better if they are set up with both covers open at equal angles relative to the text block. In some cases, when the book is large and the joints very flexible, both covers can lie flat on the table. However, supporting the covers at an angle is usually best. Then both the hinges and the spine are protected as the book is kept from opening too far.

On older books and frequently on books with brittle paper, the spine is often in a condition where pressure exerted on the pages to make them open flat will literally crack the binding in half. A good rule of thumb is that, regardless of the strength or flexibility of a hinge, no book should be opened beyond the distance required to read it comfortably.

In the Rare Book Reading Room at the Library of Congress, we use very simple supports for books with weak or delicate hinges. Pieces of high-density foam, under a soft felt, support the open covers like a cradle. They are easy to construct in various sizes, and with a small stock of cradles on hand most books and angles can be accommodated. Readers are also given bean-filled velvet "snakes" to drape across a page that resists opening. The "snake" safely holds the pages flat and discourages readers from using their elbows or other heavy objects to hold the book open.

Enclosures which are placed between the pages of a book are usually damaging to its pages and binding. Enclosures add extra thickness to the volume and this in turn places unnecessary stress on the binding, particularly at the hinges. This additional stress causes the covers of tightly bound books to detach from the binding.

While most enclosures are pertinent to the history and identity of the book, it is better to house this material outside of the book itself in an acid-free envelope or folder. The folder can be placed next to the book or in a special file designated for this purpose.

At the Library of Congress, each book that receives full conservation treatment is returned to the shelf in a protective box. Often, a book with artifactual value will be returned to the shelf in a box with a portfolio compartment. This portfolio houses any ephemera that go along with the book, such as fragments of the original binding.

For most books, a good binding is sufficient to protect and preserve the text. For many books – particularly rare and fragile books– some additional housing may be desirable to protect it on the shelf (from abrasion, dust, dirt, sunlight) or during handling. Books suitable for protective enclosures might include those with bindings that are:

- 1) fragile,
- 2) particularly adverse to environmental conditions,
- 3) elaborately decorated or tooled,
- 4) vulnerable because of condition, size, or shape,
- 5) deteriorated or damaged,
- 6) covered with unusual material, and/or
- 7) large or odd-shaped.

There are many types of protective enclosures that vary in design and complexity. Some enclosures are relatively easy to construct while others require greater ingenuity and skill. The "phase box", for instance, is simple to construct and is suitable for most books. The double - tray clamshell box - a common design that has been used by book binders for decades - is somewhat more complicated than the "phase box" to construct. The clamshell box consists of two trays, one that fits around the other, with a case or cover wrapped around the outside. It is an efficient design suitable for small books with paper text blocks and with leather, cloth, or paper covers. Special boxes can also be constructed for large, or odd-shaped books, and books with associated ephemera.

In short, a successful protective enclosure should: 1) protect the object it houses from light, dust, and abrasion; 2) be constructed of permanent and durable conservation materials; and 3) allow easy removal of the item, without any design features that could lead to inadvertent damage during removal of the book from its container.

Two other aspects of book care for bound volumes that should also be considered are environmental monitoring & control, and library exhibition.

Most library materials are constructed from organic materials. Some books, because of the materials from which they are made and the manner of their manufacture, have a greater potential for change, and a shorter life expectancy, than others. The only power that most of us have over this natural process is the power to control the rate at which change takes place.

The chemical reactions associated with the breakdown of organic materials need a

certain amount of energy in order to occur. The more energy introduced into a system, the faster the reactions proceed. Heat is an energy source and it is an accepted maxim in chemistry that for every 10° C increase in temperature, the rate of chemical reaction doubles. Actually for paper the rate of deterioration more nearly doubles for every 10° F. This means that paper in books stored at 80° F. will deteriorate twice as fast as in books stored at 70° F.

Water facilitates chemical reactions by causing some metals to rust. Moisture also assists in the breakdown of alum into sulfuric acid to make acidic paper. Prolonged exposure to high humidity can lead to the growth of mold.

Light is also a source of energy. In the shorter ultraviolet wave length regions of the spectrum, it can alter the chemical make-up of certain materials in books such as lignin, dyes, and other organic substances. Prolonged exposure to the longer wavelengths of light can also have an equally destructive effect on book materials.

It follows then, that one way in which the rate of deterioration of library materials can be slowed is through the control of the levels of **heat, humidity, and light** in the environment in which they are stored.

For optimum preservation one must strive to maintain a library environment:

- 1) that is not too hot,
- 2) that is not so humid that mold grows and insects thrive, and
- 3) whose temperature and relative humidity are moderate and don't fluctuate to extremes.

In addition, direct sunlight should be kept from falling on the collections, and light levels and length of exposure to light should be kept as low and short as practical.

To help accomplish the above, there are several instruments which can be used to monitor environmental conditions. Among them are:

- 1) the sling psychrometer (gives temperature and relative humidity readings);
- 2) the recording hygrothermograph (produces a continuous chart that shows temperature and humidity extremes);
- 3) the light meter (gives light level readings in lux or footcandles); and
- 4) the ultraviolet light meter (measures ultraviolet radiation in microwatts per lumen).

Virtually every library places books on public exhibition from time to time. Exhibition is a particularly vulnerable time for bound materials because they are subject to a variety of environmental factors which can accelerate deterioration. Therefore, one should consider the following points when putting a display together:

- 1) Consider as books are being selected for exhibition, whether a given volume is in good condition. Can it withstand the strain of display? If it is damaged or badly deteriorated, schedule conservation treatment prior to display. If this is impossible, perhaps another book in better condition could be substituted.
- 2) Make a note of the book's physical condition prior to putting it in the case-- is the

cover faded; are any of the pages discolored ?

3) Keep an eye on the book during its display and again after exhibition. By monitoring it in this way, any negative aspects of the exhibit environment of which you were previously unaware will become apparent, and corrective measures can be taken when mounting the next show.

Most library exhibit cases are either upright or flat-topped rectangular units. They are usually set-up in halls or passageways where the public has easy access to them. To discourage theft and vandalism, make certain that the cases are securely locked and located within sight of library personnel.

The rate of air exchange in exhibit cases is generally slow. For this reason, there exists inside them a micro-environment that, although similar to the overall library environment, is uniquely characteristic of small enclosed spaces. In many ways the case acts like a greenhouse. During the day, lights burning within it or shining on it at close distances from the outside, heat the air so that the temperature inside the case can be much higher than that of the surrounding room. Under certain extreme conditions the air in a case can go through a 30-40^o fluctuation in a 24-hour period. Extremes of this sort are very destructive to books, and every attempt should be made to avoid them. If the book to be displayed is very valuable, a display case can be constructed with its own self-contained climate-control system. Most often however, adequate control is possible if a few simple rules are followed. For example, cases should not be placed in front of radiators, or in direct sunlight. Cases should be lit from the outside only, so heat isn't actually being generated inside them.

In addition to generating heat, light also causes damage in other ways. Sunlight is especially bad for books because it contains a lot of the shorter, high-energy, invisible ultra-violet (UV) wavelengths. Fluorescent lights -- found in most libraries -- also contain high levels of harmful UV radiation. Every effort should be made to remove or shield sources of UV light in the exhibition area. This can be done with the use of filtering material (such as UV plastic glazing or UV filter sleeves) or window shades. As mentioned earlier, non-UV emitting light in the visible spectrum can be as damaging to some materials as UV light if it is bright enough and if the exposure time is long enough. Therefore, if prolonged illumination is required, brightness of illumination should be kept as low as possible.

In display, as in handling, book bindings should never be forced into positions they cannot accommodate easily, should not be opened wider than is natural, and should not be restrained in any position with heavy weights. In addition, when books are displayed open, they should be supported along the bottom so they don't sag. All these things can be accomplished by displaying the books in custom-made cradles, made from plexiglas or from 4-ply board. The latter can be constructed easily in-house with inexpensive, commercially available products.

In this paper I have presented some ideas about how bound library materials can be preserved through proper care and handling. Good shelving, combined with careful handling can limit physical wear and tear. The maintenance of an environment in the library that keeps temperature, relative humidity, or light at moderate, stable levels can slow the rate at which chemical changes occur. Proper exhibition can also aid the preservation effort. Taken together, these practices will help prolong the life of a library's entire collection.