DISPLAY CRADLES FOR BOOKS: BOARD
CONSTRUCTION / Linda Blaser

Books lying open and flat on display are subject to stresses that may prove
damaging to their bindings. People often assume that because books are made to
be opened there should be no concern about their being laid open on a flat
surface. This is not true. Not all books open easily, and even those that do may
not necessarily lie flat when opened to particular pages. The damage that can
occur from forced opening justifies the need for supporting books on display by
means of cradles. The most commonly encountered damage stems from the
stress created in the joint whenever a book is laid open, particularly if the book
does not open easily; this may indicate that the joint is already damaged and thus
display stresses will compound the damage. Books with sewn structures that are
weakened or breaking and those with non-flexible spines also benefit from the
use of a supportive cradle that can eliminate both new and compounded damage
to books on display.

The simplest type of supportive cradle is one that is made from folded card.
Card cradles are made to lie flat upon a flat surface and can be constructed
quickly and inexpensively.

The card used should have a neutral pH, or it should be an alkaline buffered
board of appropriate strength. Both Hollinger board and 4-ply all-rag matting
board work well as card cradles. The preferred adhesive for use in cradle con­
struction is an internally-plasticized polyvinyl acetate (PVA) aqueous emulsion
used in combination with 3M Company double-sided tape No. 415. The follow­
ing tools are necessary to construct a card cradle: a metal straight-edge, a utility
knife, a triangle, a T-square (preferably of metal), a pair of dividers, strips of
paper or a ruler for measuring, a pencil or a needle in a stick for measuring, and a
bone folder. Cradle construction will be discussed shortly.

Transparent straps are commonly used to hold books on their cradles. Poly­
ethylene is the best choice of strap material because it is not as likely as a stiffer
film to cut the edges of the textblock. The polyethylene straps should be cut into
strips approximately $\frac{3}{16}$" to $\frac{1}{4}$" wide. Whenever possible, the strap should be
placed over the text margin or over another blank area on the page to avoid
obscuring any of the text or illustrations. Care should be taken to avoid strapping
too tightly because the paper has a tendency to tear on either side of the strap.
The ends of the straps can be fastened together with double-sided tape. These
straps will also prevent the pages of the book from moving while on exhibit.

If a book will be laid open somewhere in the middle of the textblock, and does
in fact lie flat without straining the joint, strapping the text to keep it open may be
sufficient preparation for display. However, this method is suitable only if the
Figure 1

binding structure is sound. When a book with a weakened binding structure must be opened somewhere in the middle of the textblock and must lie flat, a single card can be added as a carrier for the book as it is being transported to and from its exhibit case.

The grain of the card for the carrier should run from head to tail with the book. The card is cut to equal the height of the book from head to tail less $1\frac{1}{16}$" to $1\frac{1}{8}$" and to equal the width of the opened book less $1\frac{1}{16}$" to $1\frac{1}{8}$". Cutting the card smaller than the book will keep it inconspicuous. After the card has been cut, the book should be positioned open on top of the card and strapped on. The polyethylene straps can be attached to the bottom of the card by means of double-sided tape.

A slightly different problem must be dealt with when a book made with a hollow—especially a stiff hollow—opens to its center. When a book with this type of binding structure is opened, the covering keeps its shape and moves off the spine (Figure 1).

When a book constructed with a hollow is opened, the weight of the textblock places pressure on the joint area. In order to support the joints properly, a simple cradle of laminated card can be constructed. The card is cut in the same manner as was the card for the carrier above; $1\frac{1}{16}$" to $1\frac{1}{8}$" shorter than the height and $1\frac{1}{16}$" to $1\frac{1}{8}$" shorter than the width of the opened book. With the book in position, mark the width and position of the book's spine (Figure 2).

To determine the number of cards needed to give support to the joint, slide the cards, one at a time, beneath each of the cover’s boards. There are enough cards for support when the cover’s boards rest parallel to the base while the spine

Figure 2
continues to sit on the base. Cut the predetermined number of boards to size, with the width measuring from the spine mark to the edge of the base board. Measure each side separately in case there is a difference between them; for example, one side may need only two cards for support while the other side may need three or more (Figure 3). The support cards can be positioned and affixed to the base card with double-sided tape. After the supports have been attached, the book can be strapped in place, with the polyethylene straps adhered to the bottom of the cradle using double-sided tape.

Books placed on exhibit are often open to display the title page or another page close to a cover (Figure 4). When displaying the title page, the upper board needs support at its joint. This can be achieved with a folded card cradle. Begin with a card that is at least three times the width of the opened book and approximately 1/8" shorter than the height of the book from head to tail. The grain of the card should run from head to tail to allow easier folding. Lay the opened book on top of the card so that the lowest board of the cover is positioned just over the edge of the card (1/16" to 1/8"), keeping the card inconspicuous (Figure 5). Using a triangle, mark the point on the card at which the spine ends (Figure 6), making this the point at which the first fold, a valley fold, is made. Leaving the triangle in position, set a pair of dividers to the distance from the top of the card to the underside of the upper cover board (Figure 7). Transfer this measurement by placing one point of the set dividers on the first mark and by placing a second mark the set distance away from the first mark on the board. This is the point at which the second fold, a mountain fold, is made (Figure 8). Placing the triangle in the same position again, measure the width of the upper cover from the outside of the triangle to the fore edge. Subtract 1/16" to 1/8" from the fore edge measurement to keep the cradle slightly smaller than the book (Figure 9). Place a mark
Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Divider measurement

Spine end

Width of the upper board

Card short of foredge

Point at the end of the spine
this measurement away from the previous point (Figure 10). This third mark is where a mountain fold is made.

When the book opens easily, the next mark can be made using the previously set dividers, the distance between marks 1 and 2. Place a point this measurement away from mark 3 (Figure 11). This is the point where the fourth fold, a mountain fold, is made. All of the folds to be made for this type of cradle are at right angles. Once these four points have been marked, the folding can be done using a T-square to assure perpendicular folds. Each fold needs to be scored twice before folding in order to produce a neat and precise result. Each fold, whether it is a mountain or a valley fold, has a mountain and a valley side (Figure 12).

Each mountain side of the fold needs to be scored with a knife that should penetrate about one-third to one-half the thickness of the card. The valley side of the fold is then scored and folded using a bone folder. The first point, a valley fold, is scored and folded first. The next three marks are then scored and folded, making these mountain folds (Figure 13). Mark the point at which the valley fold hits the lower portion of the card when all folds are at right angles. Adhere the upper card to the lower card from this point to the far edge using double-sided tape (Figure 14). Once the two cards are attached, the excess can be trimmed off the lower card. The open head and tail ends of the block are then covered with card (Figure 15). The cards are cut to the outside dimensions of the open ends of the block and one card is glued to each end using PVA. The addition of these cards provides the block with greater rigidity, preventing the cradle from folding up flat under the weight of the book. At this point the book can be strapped to the cradle.

The cradle structure just discussed is designed for a book that opens easily, with no strain placed on the binding structure when the book is opened with its lower board flat on the base and its upper board parallel to the base. If the upper board does not turn easily to this parallel position, it must be allowed to rest at an angle so that the binding structure is not jeopardized. This cradle can be adapted to include an angular block that can support the upper board at a comfortable angle.
To construct an angular block, once again start with a card that measures the height of the book, head to tail, less $\frac{1}{8}$" and approximately three times the width of the opened book. The grain of the card should run in the same direction as the height of the book, from head to tail. Position the book on the end of the card in manner as before—just over the edge $\frac{1}{16}$" to $\frac{1}{8}$"—making sure that the book is sitting open “comfortably,” without strain. Attempts to force the book open farther than this will inevitably lead to a breakdown of its binding structure. Using a triangle and a pair of dividers, measure and mark first the point at which the spine ends, the distance from the top of the card to the underside of the upper board, and the width of the upper board minus $\frac{1}{16}$" to $\frac{1}{8}$" (Figure 16). Use the same techniques to measure these points as those used in making the first folded card cradle.

The measurement for the last fold is slightly different from that of the first folded cradle because the fore edge of the upper board is higher up off the base than is the spine edge. Making certain again that the book is “comfortably” open, place the triangle approximately $\frac{1}{16}$" to $\frac{1}{8}$" in from the upper board’s fore edge. Measuring at the fore edge next to the triangle, reset the dividers to the distance from the top of the card to the underside of the fore edge of the upper board. Place a point on the card this distance away from the third mark (Figure 17). The first fold is a valley fold. Folds 2, 3, and 4 are mountain folds. Folds 1 and 4 are at right angles to the base, while folds 2 and 3 are not at right angles. The proper
angles for the second and third folds will be achieved when the first and fourth folds are at right angles to the base (Figure 19).

Cards should be cut to cover the open head and tail ends of the block as discussed and shown in Figure 15. These cards should be cut to conform to the outside shape and dimensions of the open ends of the block and glued on using PVA. Once the opened ends are covered, the book can be strapped onto the cradle using the polyethylene straps.

An additional movement may occur with a book that has the problematic tendency of the lower board to lift slightly. The weight of the textblock may be too much of a burden for the lower board's joint to bear when the board lifts (Figure 20). This joint can be given the support it needs by using laminated cards. Once the cradle with the angular support block has been completed, the book should be placed loosely in position and not strapped down. Cards can then be slipped in under the lower board as necessary to give support to the joint. Once there are enough cards built up to lift the lower board and make it parallel to the base, the joint has the amount of support it needs. Giving this type of support to the lower joint is particularly necessary if it is already weak and/or partially broken. Cut the predetermined number of cards with the width measur-
ing from the joint of the lower board to the fore edge of the card, and the length equalling the head to tail measurement of the card. These extra support cards can be attached to the cradle using double-sided tape (Figure 21). Once these cards have been attached, the book can be strapped with polyethylene.

A book that is very difficult to open fully may need tapered blocks on both sides of its cradle. The double-tapered cradle can also be used to alleviate the strain on weak joints that is caused by forcing the book fully open, as well as help remedy the problems caused by stiff, hard guards in the textblock (Figure 22). Wherever there is an inflexible guard the leaf will begin to hinge on the edge of the guard and eventually break there, often causing adjoining leaves to break as well. Some of this breaking effect can be lessened by not fully opening the book.

Generally, when a book opens in the center and needs a cradle with two tapered blocks, the spine of the book rests on the base. The size of the card needed for this cradle should be the height of the book head to tail (less $\frac{1}{16}$" to $\frac{1}{8}$") and approximately four times the width of the opened book. The grain of the
Inflexible guard causing hinging point & eventual breakage

Figure 22

card should run from head to tail for easy folding. If Hollinger board or any other board that has two different surfaces is being used, place the right side, i.e. the grey side of the Hollinger board, on the workbench. Place the opened book in position 1/8" in from the end of the card. Measure the distance from this end of the card to the opposite end of the book, subtract 1/8", and mark this distance on the card (Figure 23).

Next, using a triangle and a pair of dividers, measure the distance from the top of the card to the underside of the cover board directly above the first mark (Figure 24). Make certain that the book is opened in the same position in which it will be displayed when this measurement is being taken. Place a point this measurement away from the last mark (Figure 25). Leaving the triangle in position, measure the width of the cover from the outer edge of the triangle to the point at which the cover touches the card (Figure 26). Place a point this distance away from the mark that measures the height to the cover (Figure 27). Next, measure the area on which the spine rests on the card. Place a point this measurement away from the cover width mark (Figure 28). Now measure the second board width of the cover. Take this measurement from the point at which the cover leaves the card to 1/8" short of the fore edge (Figure 29). Place a point this distance away from the spine width mark.

Making certain again that the book is opened in the same position in which it
Figure 28

Layout at 1/2 scale

Mountain fold

Span on which spine lies

Figure 29

Layout at 1/2 scale

Valley fold

Width of second cover
will be displayed, use a triangle and a pair of dividers to measure the distance from the top of the card to the underside of the second cover. Place a mark this distance away from the second cover’s width mark (Figure 30). After these points have been marked the card is ready to be folded. Remember that the marks for folding are on the underside of the card; the first, second, fifth, and sixth folds are valley folds, and the third and fourth folds are mountain folds (Figure 31).

With folds 1 and 6 at right angles to the base, place the opened book on the cradle to determine where the flat spine area is to be attached (Figure 32). The spine area as well as the two ends can be attached to the base using double-sided tape. The four open ends of the tapered blocks should be covered by cards, as was previously discussed and illustrated in Figure 15. The cards should be cut to the outside dimensions of the blocks’ ends and glued on using PVA. Once the cradle is completed the book can be strapped with polyethylene.

A book experiences a great deal of strain upon opening, and near the beginning or the end of the textblock, i.e., the title page, needs a tapered, double-block cradle with another fold in the spine area. Follow the same procedures.
previously described on the first tapered, double-block cradle for marking the points for the first through the third folds (Figure 33). Once these three points have been plotted, score and fold them. Because no adhesion has yet taken place, a weight can be used to hold the half-folded cradle in position in order to determine the other folds (Figure 34).

Using a triangle, mark the point directly below the upper cover’s joint. This point should be as close to the joint as possible, but far enough away that the book’s spine does not interfere with folding the card (Figure 35). Leaving the triangle in position, set a pair of dividers the distance from the top of the card to the underside of the upper cover. Place a joint this measurement away from the mark below the upper cover’s joint. Continue from here to measure first the upper cover’s width and then the distance between the underside of the upper cover’s fore edge and the top of the card (Figure 38).
Figure 34

Figure 35

Point below upper's joint
Valley fold

Figure 36

Figure 37

Mountain fold
Height from card to upper cover
Points 4 through 7 are folded on the right side of the card. Bearing that in mind, number 4 is a valley fold and 5, 6, and 7 are mountain folds. Folds 1, 4, and 7 are at right angles to the base. The opened book should be placed on the cradle to determine where the spine area should be attached through the use of double-sided tape (Figure 39). Attach the ends of the two base cards using double-sided tape. The four open ends of the tapered blocks should be covered with cards, as previously discussed and illustrated in Figure 15. The cards should be cut to the outside dimensions of the blocks’ ends and glued on using PVA. Once the open ends are covered, the book can be strapped on using polyethylene straps.

A book remaining open on exhibit for any long period of time is vulnerable to, among many other things, stresses on its mechanical parts. The cradle structures described are designed to relieve these stresses by offering support to each book as an individual object. The cradle that is constructed to alleviate the problems of an individual book will keep its binding structure sound for the duration of the exhibit.

_Linda A. Blaser_, a book conservator in Washington, D.C., studied conservation at the Library of Congress during the early 1970s. This article was written toward the end of her stay at the Library of Congress. The 14 years following that stay were spent doing private work. She is currently working on a grant at the Folger Shakespeare Library.
PRESERVATION ENCLOSURES / Hedi Kyle

Fragile, rare, damaged, or deteriorated books and related communication formats found in libraries and archives will, to some extent, be protected from environmental hazards if they are housed in preservation enclosures. This is one of the most important practices in library preservation today. Compared to the single-item treatment of the past, we can now cope with many items on an emergency basis.

Often, preservation enclosures are only a stop gap on the way to further treatment. However, rehousing has become a preferred choice among conservators, curators, and librarians as a treatment that does not directly interfere with the physical state of an historical artifact or document. This is because we have witnessed the effects of misunderstood repairs or rebindings, and unsympathetic replacements of original parts. Although such restorations were once carried out with good intentions, they have caused irreversible impairment.

We realize today that the preservation of recorded information and knowledge is intimately connected with preserving the carriers of both word and image, as well as by defining their history and evolution from the Babylonian clay tablets to the 20th century micro-storage information systems. We want to guard against the disappearance of evidence by retaining original materials in suitable preservation enclosures.

There are a variety of prefabricated preservation enclosures now available from conservation material suppliers. One needs to be alert and to investigate these enclosures in order to decide which is more economical—buying versus custom making the enclosures in-house. Each library or institution has its own policy in this regard and these policies largely depend on the preservation budget, the size of the preservation staff, and the available equipment at each library.

My presentation reflects the methods that we have established at the American Philosophical Society, a library known for research into the history of science, medicine, and technology, as well as for historical research of the United States to 1840. Our library houses over 180,000 volumes and bound periodicals, and 6 million manuscripts.

We have invested in several pieces of equipment: a Vagelli board shear, a Minter ultrasonic encapsulator, a drill press, a heat set press, a corner rounder, and a grommet punch. We also have access to a photocopying machine and to an IBM computer with printer. With this equipment, we are able to fabricate enclo-
sures in satisfying numbers, following step-by-step time-saving procedures that have evolved over the years. From time to time, we discover that a step can be eliminated, performed more efficiently, or replaced with a better technique.

Our choices of materials have been made as a result of experimentation and trial and error. However, we are not rigid, but rather check the market continuously while considering the recommendations and samples of our colleagues.

For the most part our enclosures are simple, utilitarian, and even uniform, at least within their specific groupings. Their purpose is to provide good protection, easy access, and sufficient identification of content. There are, however, numerous occasions when special items require specific and uniquely designed carriers. Figuring out and constructing enclosures is by no means a routine, boring activity. It is always a welcome challenge to accommodate unusual requests.

Good packaging not only enhances the object inside, it also heightens the sensuous pleasure and curiosity to reach it. With this in mind, a variety of enclosures may be examined (Figures 1 through 4).

**Organizing**

- Sorting by size
- Deciding on type of enclosure
- Estimating materials and cost

**Materials**

- Binders board
- 10 and 20 point library bristol (also called library board or map folder stock)
- Acid-free corrugated board
- Pressboard
- Permalife paper
- Book cloth
- Mylar
- Tyvek
- Matboard (4-ply)
- Gortex
- Tim Barrett cover paper

**Techniques**

- Scoring
- Folding
- Creasing
Figure 1. Wrappers. (1) Self-closing wrapper; (2) Hardcover wrapper; (3) Storage wrapper; (4) Oversized corrugated wrapper; (5) Detached board wrapper; and (6) Scroll wrapper.
Figure 2. Slipcases. (1) Slipcase with chemise; (2) Wrapped slipcase; (3) Multisection slipcase; and (4) Nonadhesive slipcase.
Figure 3. Folders. (1) Document folder; (2) Narrow concertina folder; (3) Wide concertina folder; and (4) Oriental magic folder.
Figure 4. Boxes. (1) Clamshell box; (2) Post binder box; (3) Wrapper box book; and (4) Box with inset.
More techniques

• Corner rounding
• Cutting thumb notches
• Cutting circles
• Measuring
• Gluing

Adhesives

• PVA
• Double-sided tape
• Uhu gluestick

Fasteners

• Clips
• Buttons
• Tongue and slot
• Rods
• Velcro
• Ties
• Magnets
• Brass round head fasteners

Labelling

• Computer printed labels
• Photocopied labels (reduced title pages or covers)
• Letterpress labels
• Handwritten labels

Identification

• Symbols that stand for type of binding
• Symbols that stand for materials bound in
• Symbols that stand for future treatment

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SELECTED REPAIR OF JOINTS AND BINDINGS / Don Etherington

Repair of Broken Leather Joints Using Japanese Paper

Sequence of Operation

1. Assess the condition of the binding and textblock; assess also the endpaper, construction and the quality of the paper.
2. Trim the edges of the boards clean and decide upon the method of original endpaper attachment.
3. Using paste, attach a Japanese paper hinge either on top of or below the original flyleaf. The hinge should be about 1" wide.
4. Treat very acidic or red-rotted leather with Klu-Cel G prior to attaching the hinge.
5. If required, dye the Japanese paper to match the tone of the original leather.
6. If possible, lift the board paper along the inside edge so that the Japanese paper hinge can be placed beneath the original endpaper.
7. Trim the strips of dyed Japanese paper to size. I generally trim them to about 3/16" wide and about 1" longer than the boards.
8. Attach the strips of dyed Japanese paper along the hinge, overlapping the spine and the board edge by about 1/16" using either a mix or a paste.
9. When dry, turn in both the top and bottom turn ins.
10. Slip the Japanese paper hinge beneath the original endpaper.

Repairing an Original Cloth Case Binding

Sequence of Operations

1. Inspect and assess the deterioration of the textblock and the binding. Think ahead about the major motive of your work: to make the book usable and durable without losing the feel and handle of the original. Try to avoid adding any stress to the opening or the flexibility of the binding.
2. Generally, the textblock should be removed from the case by cutting along the joint edge. If the ends are intact, lift them off of the textblock and cut along the joint.
3. Clean off the spine, remove all deteriorated glue, and check the sewing structure. If the spine lining and the spine of the textblock look sound, the old spine lining may perhaps be left intact.
4. Textblock consolidation can run the gamut from resewing to reinforcing weak sewing or strengthening the first and last signature. The type and condition of the textblock will usually determine your options.

5. Attaching original flyleaves or adding new ends are options that will vary from book to book. For joint attachment I generally prefer Japanese paper combined with the spine lining of linen. Attachment of endpapers to the textblock will again be determined by the condition of the textblock, e.g., if the paper is brittle, the Japanese paper hinge is wrapped over the shoulders of the spine. See Figure 1.

**Figure 1**

**Tipped on Endpaper**

Japanese paper
under tipped on endpaper

**Sewn on Endpaper**

Japanese paper
over original endpaper

Thickness of Japanese paper is exaggerated for diagrams
6. Consolidate the spine with either a paste and PVA mix or with reversible PVA. I usually attach the linen prior to reshaping the spine because it helps to protect weak paper from the backing procedure. *Hammer softly.*

7. Attach the second lining to assist in holding the shape. Generally, I dampen the second lining very lightly before attaching it. By doing this, it will be more taut when dry.

8. Tackle the case now. Trim off all excess material on the spine edge of boards. Cut the original case about $\frac{1}{32}$" from the spine edge and remove excess. Lift the original cloth from the board approximately $\frac{3}{4}$" from the edge.

9. If desired, lift the endpaper approximately $\frac{3}{4}$" from the spine edge.

10. To alleviate the lump from the new spine strip that sometimes shows under the cloth, I remove excess board by using masking tape to evenly remove a small amount (generally about $\frac{3}{8}$" from the spine edge). Use the handy gadget shown in Figure 2 to hold the cloth out of the way while you are working; this tool also prevents the cloth from creasing where you have lifted the material.

11. Cut the spine linen for the case; I sometimes use blotting paper as it is more easily shaped.

12. Select Japanese paper to match the color of the original cloth and attach it to a piece of linen. Sometimes dyeing the Japanese paper will produce a better color match. After trimming the paper to size, coat the paper with an acrylic wax to harden its surface.

13. I generally attach a new Japanese paper/linen sandwich to the front board first, then attach the spine inlay in exact position. Remember that the gap between the spine and the board varies depending on whether it was originally a tight joint or a French joint.

14. Cut the new spine to exact width and attach it to the back board.

15. Apply adhesive to a polyester film strip, slip the strip beneath the original cloth, and rub it down. Then, slide out the polyester film. Tap the cover down carefully.

16. Case in by using new ends or by fixing the linen hinge.

17. Attach the old spine and rub it down carefully.
Minimal Intervention for Preservation of Collection Problems:
Split Joints on Leather Bindings

Faced with the problem of determining the best use of the conservation dollar, preservation administrators are always looking for ways to minimize the labor intensive procedures that have been prevalent over the last fifty years. While at The Library of Congress, I was instrumental in developing the concept of "phased preservation," a technique that protected, rehoused, and supported material en masse with, at times, some minimal treatment.

In pursuing this philosophy over the last twenty years, I have developed various ideas that are used extensively throughout the United States. The latest idea is to use Japanese paper for re-attaching or supporting the weakened joints of leather bindings, particularly of 19th and 20th century vintage, on books no larger than 10" high and 1½" thick.

The procedure is relatively simple and has proven particularly effective on books that have a tight spine that would generally have required skilled expertise and extensive time to execute. Anyone who has contemplated rebacking a tight spine, especially on a thin book with raised bands, will appreciate the problems associated with this type of work.

Many research libraries have, in their special collections, large groups of 19th and 20th century bindings bound by French and English trade houses. These bindings exhibit detached boards or weakened joints, both inside and out. This is caused by poor quality leather at the outset and by the trade practice of parring leather very thin for aesthetic tastes and ease of working. Usually, the spine itself is intact and the sides of the boards are in good condition; it is only at the joint that the damage is apparent.

To alleviate the time-consuming practice of lifting the leather spine and the leather from the sides of the boards, I have used a Japanese paper strip, which is placed over the joint and extended slightly over the spine and the boards. Another strip of Japanese paper serves to strengthen the inside joint. The paper used for the outside is a very strong solid-dyed paper with good tear strength; for the inside, I use Japanese paper to match sympathetically with the endpapers or textblock. If it is necessary to match the original color of the leather cover, some dying of the colored paper can also be attempted.

Ideally, the dyed paper as produced by the manufacturer can be used as there are some thirty-five or so colors to choose from.

The strips for the inside are attached to the textblock before attempting the outside repair. This is to make sure that allowance has been made for ease of opening at the joint. The other portion of the inside hinge will be attached to the board at a later stage.

A strip of Japanese dyed paper is cut to size using a technique that allows for a
slightly feathered edge. I use a sharpened bone folder dipped in the water jar where the brushes used for PVA adhesive are standing. This mixture gives a well-defined line for tearing the paper strips. The strip is generally no more than $\frac{1}{4}''$–$\frac{5}{16}''$ in width, extending about $\frac{1}{2}''$ longer than the boards.

The boards are placed in position on the book and a weight is placed on top. Use paste, or use a mixture of rice starch paste and reversible PVA to attach the strip across the joint, rubbing down lightly with the palm of the hand so that the paper sinks into all the undulations and across the edges of the raised bands. The feathered edge of the strip blends into the leather nicely. Let dry for an hour and then turn in the strip at the head and the tail. In most instances, I turn it down only to the height of the square of the board and then cut it off by the edge of the endpaper.

The Japanese paper strip is now attached to the inside of the board. This attachment can either be over the original endpapers or slid beneath them. I generally let the structure of the book indicate what is possible. Obviously, attachment under the original endpapers (both the free-fly end and the board paper) is a more sophisticated method. In general, if the need to lift the inside board paper is purely cosmetic, the added cost should then be evaluated carefully.

After the book has been repaired, the leather and the repair strip are given a light application of a surface coating. This wax coating is available from the Leather Conservation Centre. It is a wax plasticised acrylic polymer SC6000 which seems to enhance the look and feel of the repair. If the book is valuable and heavily gold tooled on the spine, I sometimes remove areas of the strip that may be covering some of the tooling, and lift any original leather labels along the extremity, slipping the edge of the Japanese paper underneath. These techniques are more a visual improvement than anything else.

If a leather binding exhibits red rot, treat the leather with KLU-CEL G, a consolidator produced by the Hercules Chemical Company, and obtainable from the usual conservation supply houses. This treatment is necessary, as books with friable red rot will reject the Japanese strip.

For books that are broken only at the joints, the rationale for making repairs with a strong Japanese paper instead of with a pared strip of leather comes down to one word: “strength.” The application of two strips of Japanese paper, one outside and one inside, tends to create a strong board attachment to the spine, and is a method of minimal intervention with the original binding, which normally takes about one hour.

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