

# Minimum intervention in treatment of books

Christopher Clarkson

## Abstract

'Minimum intervention' means minimum interference. Paradoxically, however, a book conservator needs to acquire considerable knowledge and experience before attempting to practise 'minimum intervention'. Since the late 1960s I have been conscious that in order to be able to create simple and adaptable working methods one needs to have a deep historical awareness of books and manuscripts, considerable practical experience, a command over tools, a knowledge of a large variety of materials, and a broad repertoire of techniques. It must be emphasized that these essential attributes and skills are quite different from those required to rebind books and will take time to acquire.

The main purpose of this paper is to convey my approach to trying to save the original integrity of bindings and their contents. Examples of various working practices will be used to emphasize and demonstrate that it is essential to have a good understanding of the book as a three-dimensional, mobile object and an appreciation of how a repair to one part of the functioning structure can effect other parts, before one can effectively simplify, adapt, and minimise treatments.

## Zusammenfassung

'Minimales Eingreifen' bedeutet minimales Einmischen. Jedoch ist es paradoxerweise notwendig, daß ein Buchrestaurator sich ein beträchtliches Wissen und Erfahrung aneignen muß, bevor er 'Minimaleingriffe' ausführen kann. Ich bin mir seit den späten 1960'ern bewußt, daß man, um einfache und anwendbare Arbeitsmethoden zu finden, ein tiefgehendes Bewußtsein für die Geschichte von Büchern und Handschriften braucht, wie beträchtliche praktische Erfahrung, Handfertigkeit im Umgang mit Werkzeugen, das Kennen und Verstehen der Arbeitsweisen verschiedenster Materialien und eine Bandbreite von Techniken. Es muß betont werden, daß diese essentiellen Merkmale und Fertigkeiten andere sind, als die, die zur Neubindung von Büchern gebraucht werden, und Zeit brauchen, daß man sie sich aneignet. Das Hauptanliegen dieses Artikels ist, meine Herangehensweise zu vermitteln, in dem Versuch, die ursprüngliche Integrität von Einbänden und deren Inhalt zu bewahren. Beispiele verschiedener Arbeitsmethoden werden aufgeführt, um zu betonen und darzustellen, daß das Begreifen des Buches als dreidimensionales und bewegbares Objekt und das Erkennen, inwieweit die Reparatur eines funktionalen Teils der Bindestruktur andere Teile be-

einflussen kann, unabdingbar ist, bevor man effektiv Behandlungsmethoden vereinfachen, anpassen und reduzieren kann.

## Minimum intervention in treatment of books

*'Interpretation has to be based on authentic qualities of the object. And if we want to pass down the objects to posterity as true documents, we have to care very much for the original substance. The extent to which this is spared during particular operations in conservation will depend very much on interpretation, mostly that by the conservator.'* [1]

## Introduction

Thirty years ago 'conservation' was a word only used in the physical treatment of paintings and museum objects. When I coined the phrase 'book conservation' in Florence in 1967, I was trying to express a clear break with European hand binding practices based on the past three centuries and to build a foundation of training based on the earlier periods of constructional creativity and diversity, using various materials in a wide range of qualities. [2, 3] I was concerned about the care and preservation of books and manuscripts; about the information conveyed not only by the text but by all aspects of the physical object as well – in fact the 'archaeology of the book'. [4] The 'objects', 'foreign marks', and 'foreign matter' found in and on a book can provide important evidence of the book's history and use, as well as the social history in which the book participated.

Another concern has been that as natural materials become more generalized and scarce in our synthetic age, books and libraries become a major resource for the wide variety of qualities displayed in everyday historic materials. The codex book has proved to be a very fine 'time capsule'; in the sense that if the materials used in its construction and decoration are of good quality, then the book may well have preserved them in their 'original state'. Hence we can find leaves in a medieval text-block looking as though they were made and printed yesterday, or an 18th-century book with water-colours quite fresh and bright. (If exhibited for a few days the 'fresh-state' can be lost forever). The codex was used deliberately as a repository and is also an accidental 'catch-all'. Therefore gutters of books are wonderful places where we can find early pins, needles, threads, and a wide variety of botanical specimens. [5] Very rarely have such marks or items caused any kind of damage; so please do not allow gutters of books to be brush-cleaned or page surfaces to be routinely dry-cleaned. Tidy-mindedness in

such cases is misapplied. A general rule is that ‘institutional dirt’ if judged destabilizing may be removed, but not ‘evidential dirt’. The devaluing of this type of information contained in our collections under the name of ‘conservation’ is now very great indeed. In such circumstances ‘minimum intervention’ is the only way forward.

I am fearful that the training of young conservators is not going in this direction, however, because it generally reflects only the past two to three hundred years of hand binding practice. During this time surface presentation was predominant, qualities of material deteriorated, and techniques continued to be abbreviated and generalized. There has been a further ‘dumbing-down’ over the last two decades, in the tendency to refer to ‘conservation binding’ as though it were a group of styles or binding types. This is quite wrong, for there are only conservation principles, which can be applied in different degrees and variation in order to stabilize or repair various binding types. This attitude, like misapplied mass-treatments (mass-treatments may, with great caution, have a place in our work; but ‘mass-thinking’ does not), can destroy our unique library and archive heritage, making our bookshelves neat and tidy, but altogether soulless.

Surprisingly, one is sometimes grateful for the crude patching of bindings of past custodians when comparing them with the thoughtless and ever increasing rebinding and restoration practices which replace and fake original material far too much. In the former case, non-professional patching and mending (which may, with care, be recoverable), while impairing the surface of a binding, has occasionally preserved bibliographical integrity. In the latter case the historical and bibliographical integrity of a book is more than likely to be lost forever.

If we wish to preserve books and historic collections we must develop sensitive conservation practices relating and linking closely to preservation policies [6] within our institutions. Minimum intervention, refurbishing, rejuvenating materials (where possible), and stabilizing, although quite time consuming and labour intensive, have to be promoted as major priorities. Only then will rebinding be considered thoughtfully and sensitively; and become a far smaller part of conservation programmes than it is today.

## Conservation and restoration defined

My definition of ‘conservation’ allows for minor interference with the object to stabilize it mechanically or chemically. This usually means the addition of a small amount of foreign or new material. Whether such material is visible is not my chief concern.

My use of the term ‘restoration’ implies a greater incursion into a particular area, for example ‘tail spine-cap’, ‘first three quires resewn’, etc. Where the encroachment of new material is greater I simply say ‘restored’; the difference in how this is done determines whether I would judge it a sympathetic restoration or not. The difference between a sympathetic repair and ‘facsimile’ (the word facsimile embodies the idea that past cultures, materials and crafts can be recreated) can be extremely subtle and depends largely on the mind and intention of the restorer.

## Minimum intervention defined

‘Minimum intervention’ means minimum interference. Paradoxically, however, a book conservator needs to acquire considerable knowledge and experience before attempting to practise ‘minimum intervention’. Since the late 1960s I have been conscious that in order to be able to create simple and adaptable working methods one needs to have a deep historical awareness of books and manuscripts, considerable practical experience, a command over tools, a knowledge of a large variety of materials, and a broad repertoire of techniques. Many of my tools, materials, and techniques have evolved with each project. [7, 8, 9] It must be emphasised that these essential attributes and skills are quite different from those required to rebind books and will take time to acquire.

For minimum intervention to be practised correctly a damaged item must be very carefully analysed, understood, and assessed before any action is taken.

## Analysis

Part of the purpose of an analysis is to be able to describe a condition clearly. This involves using a well-defined terminology. The difficulties of describing in words the qualities or substance of a material are enormous but very important to document. To help in this I use many samples to touch, feel and compare but all the time one is making a personal judgement which is difficult to communicate in words, photographs or diagrams. Skin materials are a good example of what I mean because other than surface texture or general phrases such as ‘soft handle’, ‘hard handle’ etc., a useful description is very difficult to obtain. Even when new there are many variations within the manufacturing process of leather, parchment, or tawed skin – variations which may resolve or exacerbate a repair. [10]

Analysis also helps to better understand the cause of the condition. Moreover, a better understanding of the cause of the condition facilitates the process of finding a solution, for example:

- Has the damage been caused by abrasion or chafing?
- Has the damage been caused by a burst tear or by tensile force?
- Did the break/s occur due to strains in the original binding structure, strains caused by later restoration, awkward handling or exhibition display?

A thorough analysis of the problem may well lead to the conclusion that non-repair is an option, because a repair can throw up new stresses and endanger other areas of the binding structure. Some common examples that might be encountered:

- Replacing fore-edge clasps, stressing an original or aged sewing system or joints. A book-box which supplies gentle, even pressure overall would be a better option.
- A repair which dries, becoming less flexible than the surrounding period material endangers that material and/or neighbouring materials.
- A stiff-board vellum binding in which the upper joint has broken because the covering at the spine is too inflexible, a common problem of late 16th- and 17th- century vellum bindings with hollows (for stresses caused see comments below under Hollows).

In this paper I wish to give six examples which illustrate my various approaches and methods for repairing book structures and list other types of repair problems.

#### Example I.

'Board leverage' is a term I use to refer to the readjustment of the text-block as its book-boards swing open. Good board-leverage depends on the weight, quality and condition of the layers of material (usually four: covering, bands, endleaf reinforcement and board-sheet) across the spine and at the joints. An important factor affecting the character of the leverage is how the bands enter the boards. For example, heavy alum-tawed bands entering the spine-edge of the boards produce an effect different to that of the North European Gothic attachment technique, where the wooden boards were so shaped at the spine-edge, and attached to the text-block in such a way, that when the boards were closed a convex spine and joint-shoulders were naturally, rather than artificially, formed.

#### Damage

Damage can occur when text fragments that have been used as endleaf reinforcements are lifted; board leverage is then lost, allowing the boards to swing, hinging and dragging like doors. In this state the joints soon break down. Many collections are being seriously damaged in this way.

#### Repair

One must quickly restore the inner tension to the joint. This is not an easy task without causing major disruption, such as unsewing the first or last quires and re-introducing parchment or linen reinforcement pieces. A slightly less intrusive approach would be to insert comb-liners through the joints, pasting the 'tines' across the book's spine (under the covering material), and the liner overlay to the inner face of the board (under the board-sheet). Obviously there would be many instances where this should not or cannot be done, but assessing the problem and quick intervention is crucial in saving the binding. [11]

If one can obtain good board-leverage with a flatter action, there is less tendency for the joint edges of the cover material to form compression wrinkles each time a joint is flexed, compared to conventional tight-back or tight-jointed repairs where there is the need or desire to trim back considerably the original covering material from the joints.

#### Example II

In sharp contrast to the previous example are the late 19th-century European stiff-board, tight-back bindings in which 'third-of-a-circle' rounding and sharp, square backing shoulders force the covering and joint material to flex very acutely indeed. Characteristically in this binding type, the boards hinge independently and freely from a solid, compressed text-block; and covering leather is pared very thinly at the joints and board edges.

#### Damage

Either the upper board or both boards have parted from their text-block and require reattaching. A major problem is the slick gold tooled and polished leather surfaces.

#### Repair

I started to work on a solution to this problem at the Library of Congress in the mid 1970s and came up with board-slotting, further developed at the Bodleian Library, where a slot is cut in the board to accept a tongue of cloth attached to text-block. [12, 13] Attaching the tongue can be a problem when the leather is firmly adhered to the consolidated spine with a thin glue layer. A similar period binding with a tube hollow would be no problem.

#### Example III

A bookbinding with a hollow-back is one where the covering material at the spine is left free of the text-block's spine and so can flex independently when the book is opened. There are two types:

1. The type which I term 'natural hollow' – limp and semi-limp paper and vellum bindings, certain Germanic 17th–18th-century stiff-board bindings and publishers' case bindings ('casing hollow') of the 19th and 20th centuries are all examples of this type. It has a slight gusset action at the joints.

2. 'Tube' or 'formed' hollows. In the 19th century a method of forming a hollow on the rounded shape of a spine was devised for certain leather work. It consisted of a paper tube exactly fitting the curved spine between the crown of the shoulders. One side of the tube supplies extra spine liner/s, and the other a spine stiffener for the cover, which often includes fake raised bands. By the time the third-of-a-circle spine shape came along, such hollows were the rule rather than the exception. Because it has tight joints with a tube-hollow, the joint materials hinge acutely at the crowns of the backing shoulders.

3. Another type should be listed: a tight-back where a hollow has developed through the strains of the books use, or where the adhesive has deteriorated, so that the spine area now acts like a hollow-back.

Later in the century, and certainly up to the present day, the hollow-back has been considered the only solution for obtaining improved opening of many text-blocks without recourse to some fundamental changes in the conventional European handbinding technique. On opening a book with a hollow the text-block's spine arch becomes concave while the portion of cover at the spine becomes more convex. Anything which impedes these movements will cause strain thus:

#### Damage

There are several scenarios:

1. If the spine-stiffener is not flexible enough, or has become inflexible over the years, then the book's opening will be restricted. [14] If forced open, strains are thrown directly onto the edges of the tube hollow, or in the case of 'natural hollows' onto the joint area causing joints to break, or zigzag-type stress to appear at endleaf joint areas.

2. If the stiffener is in a brittle or weaker condition than the joints, instead of increasing in convexity the stiffener will peak and crack.

3. However, if the cover portion of the hollow is stronger or less flexible, opening the book will stress the sewing structure and joints. When the book is opened the text-block spine tries to arch and decrease in width. The joint will break if it is the weakest point and the opening is forced.

4. If joint areas are stronger, then on opening the book, the arch at the spine of the text-block will become pointed, causing liners to crack between the quires. When this happens, the bands will flex acutely at a place near the centre of the text-block. When the bands finally break, one is confronted with a major handling problem. An urgent repair is required because the text-block is in two halves, and the area of sewing thread retaining the neighbouring quires can start slipping off the bands. Do not make the mistake of imagining that maximum flexibility at the spine area is always what is required in a binding, for it depends much on the text-block dimensions, weight, material flexibility and other qualities, plus the book's intended use.

#### Repair

When analysing the problems of repair there are some general points to remember about books with hollow-backs:

A balance of flexibility between the text-block's spine and the 'cover spine piece' must be achieved. (I am not generally in favour of the technique of limiting a 'peaking' text-block by decreasing the flexibility of the 'spine-cover-piece' because this approach dramatically increases the strain on the joints.) To gain such a balance, attention to the substance and flexing properties of the text-block's spine liners and bands is required. Not much can usually be done to make the sewing supports more flexible, so they usually become the controlling factor in how much of the previous spine lining is removed and the type and quantity of new material that is applied. Unless one can satisfactorily solve such problems or permanently restrict the opening angle, then a sensible option is to stabilize the sewing system, leaving the cover to move separately and connected only at one joint (more acceptable to Special Collection personnel when an upper rather than a lower joint is concerned). This suggestion may appear to be an unacceptable compromise but repairing the joint could recreate the strains which caused the original damage. A warning, i.e. in the box lid, should always be given as to such a handling problem.

Another factor is that for spine liners especially, I never rely upon adhesive, because in time it will break down, particularly at the crown of the backing shoulders or at an area across the spine where the text-block's spine was 'peaking'. This is usually due to a break down of a band/s, or a break in a layer of hide glue or the lining material. At these points I will stitch the lining material with fine thread via the centres of appropriate quires/sections and always at the crown of the backing shoulders. If the headbands need to be rebuilt I will try to achieve this in such a way as to improve the consolidation and flexing across the spine. The introduction of 'end-of-spine-bands' – a wide band of cloth, parchment or alum-tawed skin, filling the area between the kettle and end of spine and held in place by paste and then firmly by the headband tie-downs – can often help to achieve a similar end.

To improve the flexibility, where required, of a 'spine-covering-piece' with false raised bands of glue-saturated cord or pieces of card, I may replace them with lightly pasted cords or strips of leather. The layers of paper from the previous tube hollow must nearly always be removed and the covering material treated. Both of these operations are more difficult if only one joint of the book is broken. Apart from making the spine parts more flexible, the aim is to retain the book's original di-

mensions; so the idea is to take away an equivalent amount of lining and hollow material to compensate for the thickness of the replacement plus the paste layer.

I hope enough has been said above to stress the kind of mechanical considerations and preparation required of the text-block's spine and the spine-covering-piece.

The next problem is the choice of joint repair. The gusset-like joints of the natural or case hollow allow a little more space and tolerance for the insertion of repair materials, compared with the tube hollow. This will often supply the opportunity to build-in the desired strength (on smaller format books especially I miss the very thin and fine handkerchief linens made famous by Roger Powell's effective use of them when rebinding Celtic manuscripts). When repairing natural hollows try to keep, or recreate, the original width or contour of the groove of the joint in such a way that the new material, when dry, does not shrink back, (all cloths should have been pre-shrunk).

The tight-jointed tube hollow should be thought of quite differently, because little space or tolerance exists for the repair materials at joints which hinge sharply from the backing shoulders. The folds of a hollow must exactly line-up with the crowns of the backing shoulders. One useful technique I designed while working and teaching at The Library of Congress which, with variations, has served me well over the years, is to build a hollow by taking two linen cloths, the length of the books spine but wider than its thickness and stitch them together with two rows of stitches, their distance apart being exactly the width of the books spine (measured from the crown of the backing shoulders). Cut the cloth on the bias for strength and after sewing one seam curve the two layers of cloth to reproduce the convexity of the spine before stitching the other seam. I place a thin barrier paper in the hollow before pasting it to the spine, (removed after the repair is finished). When it is dry I stitch it with fine thread, via the centres of the outer quires or sections to the crown of the backing shoulders. This method supplies strong and precise hinging points, as opposed to the bulk of folds of a conventional hollow, resulting in two cloth over-lays on either side of the text-block aiding the reattachment of the boards. If the opportunity arises I will paste one of the overlays to the board under the covering material and the other under the board-sheet, I may form them into a tongue to be inserted into a slot made in a board. Often only one fold of a hollow is broken in which case the two layers of cloth would be narrower and only require one seam. Where only one or two spine panels have broken away I will often use a similar technique, cutting the newly made hollow to panel size. Always test whether all parts of such a hollow open and move together and are in a straight line along backing shoulder/s, before continuing. For the small format publisher's case with a broken joint I may replace linen with a strong fibred Japanese paper.

#### Example IV

A bookbinding lying horizontally on a shelf is truly at 'rest'. However, when standing vertically, on the tail edge, a binding is under constant strain. Many structural, or once-structural, elements in a bookbinding had become conventions within a trade system by the time the bookshelf arrived in the late 16th century. This is important to remember, as storing books vertically for long periods was a new idea, and it



would have been immediately evident to earlier craftsmen that quite new stresses were being exerted. Since 1600 the book-binder has never adequately solved the structural problems set by the vertically standing book. In a way, the last 400 years have been an attempt by the bookbinder to try to live, by various means, with this fundamental problem. Gradually, text-blocks were so consolidated, over-rounded, square jointed, and over-lined with such a reliance upon adhesive that they acted like solid blocks— further restricting the book’s opening and ease of handling.

### Damage

Glancing along a shelf of books one can readily see the characteristics of ‘text-block drag’ – concavity at the head of the spine, and excessive convexity at the tail – which finally damages bands and/or covering material and endleaves at joint areas. Text-block drag within the boards is particularly acute with:

- large format books
- thick books
- heavy text-blocks
- books which are left standing on their own without restriction or support.

Text-block drag can be limited when a book is held tightly closed and has a text-block support filling the tail-square.

The distortion and expansion in the width of spine at the head, and the tendency for joints to break first at the head and spread downwards as the boards move away from the text-block, is exacerbated where the boards are of paste-board which also has a tendency to curl. This is a very common condition and, if caught early, many period bindings can be saved from further damage. It is a problem which has concerned me since the early 1970s.[15] For future preservation the minimal intervention methods suggested below are often combined with a housing which has an in-built text-block support. This would preferably be a bookbox, but it could be a bookshoe [16] if the book is shelved within an architectural feature such as a book-wall or glazed book-cabinet.

### Repair

To operate correctly joints must be straight (see Example V), so the boards must be brought back in line with the backing-shoulder. Also the original spine and text-block shape need to be rescued as far as possible. After this how far the repairs can extend, depends upon the particular binding. One can introduce material to pull the boards back into line and at the same time fix spine shape with firm endbands. Since my rediscovery in 1968 of the two Italian primary sewn endbands –the ‘figure-of-eight’ and the ‘back tie-down’, I have used and taught their use and significance in much of my binding and repair work. [17] Future stresses will often be such that the endband cores must be laced into the boards, because one cannot rely upon the strength of modern covering leather for this purpose. In later periods of binding where headbands are used I disguise this lacing-in of the cores as far as is possible.

After the reforming of the text-block and its spine I must secure it in this position not by relying on adhesive (which will break down in time) but in a physical way. This is best done via quality endbands. If the end panels of the spine’s cover can be lifted I will also paste aero-linen patch-liners

between outer bands (or if not possible, between the kettle) and ends of spine. At present I prefer using the ‘back tie-down’, because it anchors the liner just as firmly as the ‘figure-of-eight’, and I feel it holds the spine shape better. I then prefer to paste the liner over-lays between the board and the covering material, after which the endband cores are firmly laced-in and covering material replaced.

### Example V

As mentioned above, bookboards need to be straight, at least along the joint edges. In a new binding one takes great care to balance the boards; this is usually achieved through building laminated boards. In the paste-board age they seemed to rely purely on the fact of the shrinkage of the board sheet correcting the boards after covering. It is not until later that occasionally one finds a correcting sheet underneath the board-sheet.

### Damage

Common reasons for board distortion:

- Curving outwards; where the board sheets have never been pasted down. Common with bindings of the paste-board period.
- Excessive inward curvature; repairer has replaced board sheets too damp.
- Curving outwards; repairer has placed the previous cover too damp.
- Excessive inward curvature; binder has recovered the book and saved the previous covers by adhering them to the inner face of the boards. However they have been pasted down too damp, resulting in this board distortion.
- Curve outwards; storage atmosphere too dry, a common problem with stiff-board vellum bindings. The natural average environment in which period books were made bound and stored is estimated to have been 60%–65% RH. [18]
- Curve outwards; cover material too damp when binding was first made.

### Repair

The first on the list is a difficult problem, as I feel it is now part of the particular binding; also there are often interesting marks and notes on the inner face of such boards. If the binding were new one could stretch new board-sheets over inner face. But with period items this is usually only a choice to consider if board-sheets have had to be lifted for reasons of major repair. Unfortunately a lifted board-sheet always looks disturbed.

Distorted stiff-board vellum bindings. First consider whether it is purely an environmental problem and if this can be corrected. If so, insert barrier sheets between text-block and boards and humidify at 65% RH (if the item is to be placed in a humidity chamber then wrap the text-block in ‘cling wrap’). When boards have corrected themselves, make repairs and consider housing in a pressure box. If the problem needs more treatment then the board sheets will have to be lifted. At this stage also you may make necessary repairs. Do this before humidifying the covers, unless boards have to be straight before some repairs. When covers have corrected themselves, and if necessary, stretch parchment or paper under board-sheets and dry them before the exterior sides. Leave in the correct storage environment 55%–60% RH for at least a week. If

boards remain straight then paste down board-sheets, if not then correct further.

#### Example VI

The conventional method of repairing wooden boards is by cutting away weak or broken areas and splicing or scarfing in new wood, making sure there is good wood along the spine-edge where the lacing paths are, so that the joints can withstand the squeezing/leverage pressure exerted when the fore-edge is grasped.

#### Repair

Last year at West Dean College we had a 15th-century binding which had only fragments of its covering material remaining, exposing extremely split and worm-damaged boards and a spine corner missing. My colleague David Dorning and I decided that replacing damaged areas of the wood would destroy the historical integrity of the object, so we looked for a method of stabilising and strengthening the binding which would be as discreet as possible. This was finally achieved by impregnating with Paraloid B72 acrylic resin. [19] The breaks in the boards, bisecting lacing paths, were joined and strengthened by drilling and inserting silver steel rods which were glued using Araldite 20/20 epoxy adhesive. Missing areas of wood were rebuilt using a mixture of Paraloid B72 acrylic resin and inert glass micro-balloons. [20–24] The mixture was cast into the missing areas, supported on the rods, thus forming a very light filling which was then shaped and tinted to a sympathetic colour with acrylic paints. Some aspects of the treatment, such as the insertion of steel rods into the boards, constitute major intervention, but result in an aesthetically minimal effect.

### Other types of damage & possible repair techniques

#### (a) Broken or yawning head- and tail-caps

When possible I insert thread or fine braid into the cap and paste or lace the ends to the board, making sure the repair moves with the flow of the book's spine. I often carry out this technique during the repair of a joint or reattachment of a board.

#### (b) Application of new leather patch repairs

I do not use split or thinned grain layers, as the flexing and tear strength is in the corium. Instead, I edge-pare the new leather, fit and mould it into place, and while still damp I press and mark the silhouette of the period leather onto the new leather. When dry I grind away the new leather from the grain side using a flexi-drill with various shapes of diamond dust bits until the old leather fits into the ground recess.

#### (c) Broken endbands

Broken endband cores can often be repaired by piercing through their centres with fine threads (60/3) attached to a flexible beading needle (a blunted and polished tip will often follow the curve more easily than a sharp tip). The threads can be pasted to the board under the covering material. Finer threads can be used to reattach the endband

more firmly to its text-block.

- (d) Lifting an area of a fragile and tenacious period leather spine  
This can be extremely difficult, especially if its grain layer is flaking or friable. A facing of lens tissue adhered with a solution of Paraloid B72 in acetone (20%), or other facing methods, [25] is often a way to keep it together while one attempts to lift the spine with a one-sided bevelled knife or shaped dental tool, dry or by applying minimal amounts of solvent.

#### On Completion

Please note that although a repair may appear successful directly after it is completed, no judgement should be made until all is bone dry. The book should then be handled so that one is sure that the repair moves with the flow of the leaves, spine, joints, etc.

It is worth adding that documentation must include not only descriptions and diagrams of the techniques employed but also samples of all materials used, so that future generations can compare the materials used for repair with the control samples.

### Conclusion

Admittedly, some of the above examples may appear more major than my title suggests. However, the main purpose of this paper is to convey my approach to trying to save the original integrity of bindings and their contents. I hope I have emphasised and demonstrated that it is essential to have a good understanding of the book as a three-dimensional, mobile object and an appreciation of how a repair to one part of the functioning structure can effect others, before one can effectively simplify, adapt, and minimise treatments.

### Notes and references

- 1 Hanna Jedrzejewska, 'Ethics in Conservation', (Stockholm, 1976).
- 2 Christopher Clarkson, *Limp Vellum Binding and Its Potential As a Conservation Type Structure for the Rebinding of Early Printed Books* (Hitchen, 1982).
- 3 Christopher Clarkson, 'An Historical Study Collection: A Fundamental Tool for the Training of the Book-Conservator' (Florence, 1994).
- 4 Christopher Clarkson, 'The Conservation of Early Books in Codex Form: A personal Approach: Part 1'. *The Paper Conservator*, 3 (1978), 34–38.
- 5 Jiri Vnoucek, 'Can we manage to restore medieval books without any loss of information', *IADA 7th International Conference*, (Uppsala, 1991).
- 6 'Preservation' meaning 'preventive measures' of all kinds; environmental, protective, supportive, handling training for staff and readers, display requirements etc.
- 7 For repair work one requires materials of the widest possible variety, highest qualities, weights, substances, etc. My attitude is that I must never stop collecting all forms of textiles, such as linen cloths, threads, braids, cords, etc.; papers, such as Japanese and European handmade paper, including fibre mixes and pulps; and skin materials, such as alum-tawed skins, tanned leathers, and parchments.

I sometimes alter these basic materials in various ways, trying to make them more sympathetic to the item I am working upon – not simply in terms of colour or tone but in substance. An example of this would be creating semi-tans or -taws from parchment (a raw hide) to repair joint areas of a vellum binding. I do not reuse any period materials, such as old end leaves, or metal pins or rivets from old covers. Such confusion of the evidence (at best) and faking (at worst) does not belong in the world of conservation. With a fragmentary item I much prefer a straightforward and undisguised repair.

The question of a guaranteed life expectancy of new materials used should be considered very seriously. There is a serious ethical obligation to contribute in every way possible to the improvement of the materials we use.

I use a variety of binder's, model-maker's, artist's and dental tools, plus specific tools such as: syringes, flexible drill used with diamond dust burrs, stretch bandages, violin-maker's cramps, spade drills made from needles, knives tailored to shape made from high-speed steel; and essential equipment such as a non-traditional sewing frame, an ultrasonic humidifier, steam gun, and a humidification chamber.

- 8 Christopher Clarkson, 'A Conditioning Chamber for Parchment and Other Materials', *The Paper Conservator*, 19 (1995), 27–30.
- 9 Christopher Clarkson, 'Thoughts on Sewing Frame Design for the Book Conservator', *The Paper Conservator*, 19 (1995), 41–54.
- 10 Christopher Clarkson, 'Rediscovering Parchment: The Nature of the Beast', *The Paper Conservator*, 16 (1992), 5–26.
- 11 Christopher Clarkson, 'The Safe Handling and Display of Medieval Manuscripts and Early Printed Books'. *Ljubljana Book and Paper Conservation Conference Postprints* (Slovenia, 1996), 141–188.
- 12 Christopher Clarkson, 'Board Slotting - A New Technique for Re-attaching Bookboards', *IPC-Manchester Conference Postprints*, (Leigh, 1992), 158–164.
- 13 Edward Simpson, 'Setting up a Board-Slotting Programme', *The Paper Conservator*, 18 (1994), 77–89.
- 14 see reference [10]
- 15 It is a problem which I first began to address at the Library of Congress in 1972. Further developments were made in The Bodleian Library, most recently and publicly in Duke Humfrey's Library, because here Thomas Bodley introduced the bookshelf into England, and in Arts End he created probably the first architecturally conceived book-wall.
- 16 Christopher Clarkson, 'The Book Shoe: description & uses'. *Libraries Bulletin (Oxford University)*, No. 42 (Trinity Term) 1984, pp. 4–7. For a good explanation of the book shoe in use see Pascale Regnault 'Putting shoes on Duke Humfrey. A Passive Conservation Measure in the Bodleian Library, Oxford. *8th. IADA Congress Pre-prints, Tübingen, September 1995, 21–28.*
- 17 see reference 2
- 18 In a room of thick stone or brick walls with no ingress of water, this environment can be stable throughout the year. In England, it was as late as the 1960s that institutions started to dramatically alter their environments by installing central heating systems.

19 Obviously, direct application of a pure epoxy resin to a wooden object results in a dramatic and irreversible change in the characteristics of the wood. However, inert fillers can be added to these resins so that the resistance to compression of the resultant material is below that of the surrounding wood and its surface adhesion to a substrate very slight.

- 20 D.W Grattan & R. L. Barclay, 'A Study of Gap Fillers for Wooden Objects', *Studies in Conservation*, 33 (1988), 71–86.
- 21 P. Hatchfield, 'A Note on a Filler Material for Water Sensitive Objects', *Journal of the American Institute for Conservation*, 25 (1986), 93–96.
- 22 W. W. Phillips & J. Selwyn, 'Epoxy in Wood Repairs for Historic Buildings', *U.S. Department of the Interior, Heritage Conservation and Recreation Service Publication*, 1, (Washington, 1978).
- 23 D.W Grattan & R. L. Barclay, 'A Silicone Rubber/Microballoon Mixture for Gap Filling in Wooden Objects', *ICOM Committee for Conservation—Proceedings of 6th Triennial Conference*, (Sydney, 1987).
- 24 R. L. Barclay & C. Mathias, 'An Epoxy/ Microballoon Mixture for Gap Filling in Wooden Objects', *Journal of the American Institute for Conservation*, 28, (1989), 31–42.
- 25 Anthony Cains, 'A Facing Method for Leather, Paper & Membrane', *IPC-Manchester Conference Postprints*, (Leigh, 1992), 153–157.

## Acknowledgements

I wish to thank Edward Adcock, Dana Josephson, and my wife Oonagh for reading through this text and making valuable contributions.

## Biography

**Christopher Clarkson.** Graduated from the Royal College of Art, London (ARCA) 1964, Clarkson worked on restoration of early printed books and manuscripts for S. M. Cockerell, Cambridge, and later with Roger Powell, Froxfield. He also taught graphic design, wood-engraving and fine bookbinding to diploma level at leading London art colleges.

He was sent to Florence with the English team after the flood in 1966, and worked and taught in Italy and England till 1972. He went to The Library of Congress, Washington DC, to design, set up and run the first Conservation workshop for Special Collections. During that period he acted as a consultant to the Smithsonian Institute and The National Gallery of Art. In 1977 Clarkson moved to The Walters Art Gallery, Baltimore, as Conservator for their manuscript collection; he also worked on binding descriptions for the new manuscript catalogue.

In 1979 he moved back to England to accept a post as Conservation Officer at The Bodleian Library, Oxford. He helped to organise, design and run the Book and Manuscript Programmes for Oxford University.

Concerned about poor training in the field of the conservation of books and manuscripts, in 1987 Clarkson moved to The Edward James Foundation, Chichester, West Sussex,

where he ran an internship programme and worked on many medieval manuscripts. When this workshop closed in 1998, he returned to private practice in Oxford and is presently conservation consultant to the Bodleian Library and Hereford Cathedral Mappa Mundi & Chained Library.

## Contact address

Christopher Clarkson  
31 Stanley Road  
Oxford OX4 1QY  
England