

# Binding

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THE NEED TO COMMUNICATE with each other is as old as the existence of man. Our early ancestors drew pictures on walls, the Babylonians created a form of alphabet and drew their records on clay tablets which they baked for permanency. The Egyptians were the first ones to develop a thin material known as papyrus and which is generally considered the forerunner of paper. Scrolls of papyrus or parchment could hardly be called "bindings." Such continuous strips of records were not easy to handle, that is, to find or retrieve information. With increased record keeping, it was necessary to find a better solution. Rewinding scrolls was eliminated by arranging the strips into accordion folds. Later, stitches were run through the folds and over leather or vellum straps to fasten the folds on the back margins. These created the forms of "binding" without covers.

The first bindings with "boards" originated in the fourth century.<sup>1</sup> Leather thongs were laced through plain oak boards to protect the valuable contents. As the art and skill of bookbinding developed, binders started to conceal the thongs and spine. Later the boards were covered entirely with leather, setting the stage for rich decoration of the covers. All of these bindings had one thing in common. The boards were an integral part of the book, that is, they were laced on by means of cords or thongs which were extensions of the sewing process. Even after the invention of movable type and printing, the method of binding did not vary greatly until the nineteenth century. It is in this period when some

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of the finest examples of bindings originated. Those works, book covers magnificently decorated with gold-leaf impressions, have never been surpassed in appropriateness in both artistic conception and execution.

As the demand for books increased, bindings sewn on cords and bound in leather proved to be too expensive, difficult to execute, and impractical for edition works. Binders started to sew books on sunken cords, which is many times faster than carefully lacing linen thread once or twice around a raised cord. Boards were no longer attached to the book block. Instead, the covers were made as a single, separate unit, setting the stage for case bindings. Leather became scarce and expensive, and binders started to use cotton instead. Cloth bindings were produced as early as 1812 at the John Clark's Sons Edition Bindery in Philadelphia.<sup>2</sup> The binders had to prepare the cloth themselves to make it suitable for binding. With the introduction of calico as a binding material and of a heavy-duty hot-stamping press, binders started to produce edition book covers imitating earlier masterpieces, lavishly decorating them with genuine gold leaf and blind-embossing false, raised cords on the spine.

The Industrial Revolution started to affect edition binders in the latter part of the nineteenth century. Guillotine cutters replaced the slow plow and press. The first sewing machines employed wire stitches instead of thread and were followed by thread sewing machines. Around 1890, the slow process of hand sewing became obsolete. Further improvements in machines and materials followed rapidly, resulting in speedier book production from decade to decade.

Today's edition bindery is capable of producing hardcover bindings at the incredible speed of 100 books a minute. Binding 30,000 paperbacks an hour is common with sophisticated perfect-binding equipment. Some book production lines include printing as well. Printing and hardcover binding from a mill roll of paper to the finished, jacketed book is no longer utopian. There are no human hands employed in such operations, except those tending the complex machinery. This author had the privilege to manage the set-up of such a sophisticated facility, the world's first complete, in-line book production system, in 1973. This belt press, connected to an automated binding line, is located in Fredericksburg, Virginia.

As we get closer to the twenty-first century, binding plays an important part in our increased need for communication. Soon we will have "printing on demand," personalized books and periodicals featuring geographic and demographic materials of interest to the individual reader. A bindery today must implement computers and optical

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scanners to cope with these increasingly difficult but challenging assignments.

### **Contemporary Methods of Binding**

The heart of a library is the written word contained in a book. Despite extensive advances in electronic communication, the book is here to stay as one of the most efficient information storage tools. Libraries have accumulated large quantities of written material. The primary function of any library is to provide materials for its patrons in the form they want them and at the time they need them.<sup>3</sup> Thus, the starting point for a sound maintenance-of-materials program requires constant appraisal and reappraisal of the condition of the collection. Printed material must be evaluated, and types of bindings selected on the basis of the end use of the volume and its condition. For most members of the library profession, the art of binding is a rather elusive matter; most lack an understanding of binding processes. Yet all libraries, large or small, have a need for binding periodicals, archival restoration, prebinding new edition books, and rebinding worn, circulated materials. There are many methods of binding, and the purpose of this article is to categorize them in an understandable manner and explain their function.

Librarians who are concerned with the physical preservation of printed material should distinguish the following methods of binding:

#### Hand binding:

- Archival restoration
- Job binding
- Design and custom binding
- Protective box making

#### Edition binding:

- Paperback binding
- Hardcover binding, including "reinforced" library editions
- Religious
- Limited and deluxe edition binding

#### Publication binding:

- Magazines
- Saddle-stitch
- Adhesive-bound

Textbook binding:

Sidesewn

Smyth-sewn

National Association of State Textbook Administrators (NASTA)

Single-sheet binding:

Loose-leaf

Mechanical

Library binding:

Oversewn

Sidesewn

Sewn through the fold

Adhesive

Cleatlacing

### Hand binding

Good, well-trained hand bookbinders are a rare species. One must be skillful with his hands, should have complete coordination between his mental process and his actions, and must possess an appreciation of quality, design and fine workmanship. Hand binding is considered irreplaceable training ground for fine craftsmanship in all bookbinding. Bookbinding workshops specialized in hand binding utilize all modern labor-saving tools, such as guillotine cutters, board shears, leather-skiving machines, and others.

*Archival restoration* and binding requires extensive knowledge of all old-time and contemporary hand-binding techniques. Bibliophile works may not be entrusted to any binder. It is the duty of a rare book librarian to investigate the capability and reputation of a hand binder thoroughly. Librarians must advise the binder what is of value, what is to be restored, and what may just be rebound for protection. *Restoration* means to save a valuable book or document. While binding such a bibliophilic item, the hand binder must be extremely careful to do as little damage as possible. If the original sewing of a rare book is not severely damaged, the volume should not be taken apart. Instead, the original method of fastening pages should be retained, and old, brittle glues removed with utmost care. To reattach loose boards and construct the proper endpapers and hinges requires advanced skills. The archival binder has many options which may differ for each volume to be restored. Only Japanese paperstrips, acid-free reversible materials, and adhesives may be used. If a book is to be taken apart and resewn, the decaying paper may be deacidified. Parts of an old leather cover on the

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spine or boards must be carefully removed, preserved and remounted. Binders entrusted with such delicate, valuable work should have extensive knowledge of contemporary preservation techniques.

*Job binding* means that a hand binder does miscellaneous bindings of various sizes and styles. This may be individual volumes or small, special edition works and other unusual articles. Such hand-bound books are constructed in a manner to protect the text with a certain degree of permanence. No time is spent on special design, decorating bindings or "restoring" the original volume. This work is similar to that of a library binder, except that it is mainly handwork, whereas library binding is mechanized.

*Design and custom binding* requires that no time, cost or trouble is spared to custom-design each volume and bind it into a superb example of the bookbinder's art. The design and execution of such bindings are of the highest form of craftsmanship, and are to be considered equal to that of fine jewelry or cabinetmaking. Today's materials, most often exotic leather, cost a small fortune for one book alone. There is no leeway for errors when the covers are sculptured, decorated with genuine gold leaf, colored inlays and onlays, or with semiprecious stones. A fine binder must be sure in his conceptions and meticulous in their execution. Contemporary design binders experiment with plastics, acrylics and other materials to practice binding as an art.<sup>4</sup>

*Protective box making*-A set of single sheets, maps, drawings and similar items are not adapted to binding. Rare objects such as these also need protection from the elements in our environment and from careless handling. The making of protective boxes is a considerable part of the hand binder's work. There are many styles of slipcases and boxes, too numerous to permit a thorough discussion here. Basically, the binder is required to cut boards accurately, assemble the pieces with fast-setting adhesives, and cover them with cover materials. The lining may be a soft flannel or, most often, an acid-free paper. Slipcases for hand-bound books are usually custom-fit for individual volumes. More elaborate slipcases are sometimes made partially covered with leather. However, a slipcase offers only partial protection, since the spine is exposed to damage and the bleaching effect of light. One of the favored protective boxes requested by librarians is the "clam-shell" construction. Its simplest form consists of three-sided boxes, one made to fit over the other, contained within a cover. The more complicated versions are constructed with fillets and do not overlap, but their edges meet when closed. Some boxes have rounded spines, imitating the shape of a book. Portfolios, pockets and scroll cylinders are just a few other protective

“containers” hand binders may construct for libraries interested in preserving their collection by all possible means.

### **Edition Binding**

High-volume binding for publishers is much different than that of just a decade ago. Publishers and book manufacturers alike are caught in a tight squeeze of high material and labor costs in an intensified, competitive market. Expensive money promotes “printing on demand,” which means that publishers no longer fill their warehouses with unsold books. Rather, they pay a premium to the manufacturers and have small orders printed and bound. It is difficult to say at this point how this factor has affected libraries. It may explain undue delays when orders for certain titles are placed.

Approximately 70 percent of all books published are now marketed in paperback bindings. From a marketing point of view, it is difficult to understand why there is such a trend toward paperback binding. The difference in manufacturing cost between a paperback binding and a hardcover binding is only twenty-five to forty cents, according to Robert R. Hackford, president of the Book Manufacturer’s Institute. The prices publishers charge for hardcover binding, however, is two to three times that for paperbacks.

*Paperbacks* are printed usually on high-speed web presses in two-up impositions. This means that the direction of the paper grain is in most cases transverse to the binding edge. The result is poor “openability” and “waves” on the fore-edges. If illustrations are placed at the exact center, the book was imposed “coming and going,” i.e., the printer was able to do the job with half the number of plates and twice the press run, as compared to other methods. Paperbacks are almost exclusively adhesive-bound with hotmelts. The type of paper and the materials used are not expected to last beyond a few readers. More desirable paperback books are printed on coated paper stock in multiple color, are sometimes sewn instead of adhesive-bound, and are covered with a higher grade of cover material.

*Hardcover bindings* have changed from sewn volumes to that of adhesive binding. It is estimated that approximately 80-85 percent of all hardcover books are now adhesive-bound, either in single sheets or by utilizing new techniques such as burst- or perfo-binding. The trend has been generally away from cloth. Ten years ago, there were eight cloth mills in the United States; now we have two, and one is primarily involved in the making of window shades. There are high-quality

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nonwovens on the market, such as Type II papers (reinforced by saturation with resinous materials) and Type III papers (which are of synthetic nature). Unfortunately, most publishers now use the least expensive colored Kraft papers for their hardcover bindings. To save further on costs, publishers have increasingly begun to use low-density cover boards. A decade ago, most book papers used to be free of groundwood pulp. Today, the trend is away from high-quality paper to cheaper grades and lighter basic weights. The only good news in edition hardcover binding is that hotmelts are being replaced with cold-emulsion polyvinyl acetate (PVA), a thin, water-based translucent film applied to the spine and carried deep into the structure of the paper stock, therefore achieving a better linkage of paper fibers than the hotmelt process.

Publishers' "reinforced" library editions are no match to books bound according to the rigid specifications of the Library Binding Institute Standard. There are no specifications set for publishers' "library bindings." Some may reinforce the endpapers, use better grades of cover materials, and best of all, charge a lot more for these than for the regular editions. Many publishers have abandoned the once-lucrative market of "library editions." The best advice I can offer librarians is to obtain the regular edition and have it bound in accordance with the LBI Standard.

*Religious* books come in an array of binding styles. Large pulpit Bibles are bound with heavy embossed covers. Other books, mainly Bibles, are bound limp style, i.e., flexible covers in imitation or genuine leather. Lately, some books have been bound in "bonded" leather, which is recycled leather fibers cast into sheets of "leather." Many of these books are gilded, mostly with imitation gold, on high-speed, fully automated gilding machines. Other flexible covers may be furnished with zipper closings or with wide, overlapping edges; these are called "divinity circuit binding." The most expensive binding style in this category is a flexible, leather-lined binding. High-quality leather, either top- or plate-grained, is lined with thin leathers (skivers) on the inside. No boards or papers of any kind are used inside or between the leathers. A leather-lined cover is made only from leather; the outer leather is turned in over the leather lining. Most of these binding styles have rounded corners. The covers are usually gold stamped with florentine borders which reflect beautifully off the gilded edges. Today, some pin-seal morocco leather-lined Bibles command prices of up to a hundred dollars. Such work requires the highest form of craftsmanship in any edition work. There are only a few qualified establishments capable to do such work.

*Limited and deluxe edition* bindings were always produced on a small scale. The popularity of owning beautiful custom-bound books increased when the Franklin Mint in 1975 offered a fine collection of luxury bound books. These "Masterpieces of American Literature" are reproductions of regular editions, but are impeccably crafted, bound in full- or half-grain leather, gilded and lavishly decorated with 22 karat gold. The endsheets of each volume are of fine moiré fabric. These "collector items" were produced 40,000 books at a time, 150,000 a month! Special machinery embossed the raised hubs on the spine, another machine formed a head cap. The gilded book blocks and the beautifully gold-stamped leather cover were joined on a regular three-wing casing-in machine. In 1979, Easton Press offered a competitive version of similar bindings at a much lower price, "sumptuously bound and decorated with graceful golden accents." These bindings were praised as being bound "with a beautiful material made of bonded-leather-fibers...achieving the look, smell, and feel which can come only from the pure leather fibers which are its principal ingredient. This luxurious material effectively achieves the prized qualities of expensive top grain cowhide."<sup>5</sup> (In other words, they did not want to say that these books were bound in recycled leather scraps!)

### **Publication Binding**

This type of binding requires substantial investments in sophisticated machinery to allow high-speed, economical and mechanized production. Pamphlets may be small catalogs, annual reports or small periodicals. They may consist of a folded flyer, a saddle-stitched signature, or a number of saddle-stitched signatures inserted into each other, with or without separate covers.

*Magazines* may be saddle stitched if fewer than ninety-six pages or less than one-quarter inch thick. Thicker publications should be side stitched or adhesive-bound. Magazines and periodicals have made a great comeback. There are more specialized publications than ever before. Modern, computerized technology allows the insertion of geographic and demographic materials, and even personalized messages. If the U.S. Post Office would permit it, we could even insert invoices and renewal notices into a subscriber's copy. This could be done automatically from continuous computer printouts.

*Saddle stitching* is the least expensive form of binding. Signatures are automatically opened in the center and fed on to a chain where they are laid on top of each other. Cards and other supplements are tipped into position on the chain-gatherer. Wire stitches in various weights are

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then driven through the bindfold and clinched. The saddle-stitched publications then move into an automated three-knife trimmer, where the folds are cut open. Thereafter, loose cards may be blown in, addresses are ink-jet printed to the covers; and stacks are automatically sorted by zip code.

*Adhesive bound* publications are increasingly popular because they allow more freedom to "customize" a magazine with all sorts of gimmicks. Material to be bound no longer requires a bindfold to put stitches through. Adhesive binding has been the fastest-growing binding method in recent years. It is generally expected to continue its growth, at the expense of other binding techniques. A good example is *TV Guide*, which is changing from saddle stitching to adhesive binding to allow more efficient handling of the various editions and the insertion of promotional materials. Computers assist bindery managers to cope successfully with this trend.

### **Textbook Binding**

There are considerable differences in the quality of textbook binding. College textbooks have no standards to follow and may be adhesive-bound, furnished with the least expensive cover materials, and may be cased in, tight- or loose-back. Sometimes it seems that publishers deliberately choose inexpensive paper-hardcover binding quality to reduce the resale of used books on campuses. To the contrary, el-hi books are produced in most states with rigid standards to assure good quality and long life expectancy.

*Sidesewn* books have muslin-reinforced endpapers. The book blocks are usually side-wire-stitched when coming off a gathering machine. Depending on the thickness of the book block, they are either Singer-sidesewn or McCain-sewn. Singer sewing machines sew directly through the paper. The stitch is locked on the underside by passing the bobbin thread through a loop made in the needle thread. Thicker volumes are sewn on a McCain or Moffett sidesewing machine which employs rotating drills and vertically-operating hook needles. Since the entire book block is drilled and laced through the side, "openability" is jeopardized. This method requires margins of one inch or more. Side-sewn books must be cased in "tight-back," that is, the spine is also glued to the cover.

*Smyth-sewn* bindings offer good openability because the signatures are sewn individually next to each other. This technique is similar to that of hand sewing except that its process is fully mechanized. The signatures are opened at the center and placed over a saddle. A series of

holes are punched through the bindfold. Sewing needles pull the thread through the fold, and with the aid of hook needles and loopers, one signature is sewn to the other. The sewn book blocks then must be glued to secure the thread. On textbooks, the first and last signatures, including the endpapers, are reinforced with cambric cloth.

*NASTA* textbook specifications were issued by the National Association of State Textbook Administrators to assure textbook manufacture of the highest quality. These specifications cover paper, minimum margins, endsheet construction, reinforcements, sewing, lining-up, cover boards, cover materials and cover coatings. The various classifications cover hardcover textbooks, nonconsumable softcover texts, and ancillary materials. *NASTA* bound textbooks may be sidesewn, Smythsewn, and, on a trial basis, also adhesive-bound. All books without exception must be cased in "tight-back."

### Single-sheet Binding

Individual sheets of paper may be secured by mechanical means. There are many styles and methods available to fasten single leaves. Basically, one must divide them into two categories: (1) the mechanical binding systems, in which single sheets are fastened into what is essentially a permanent system; and (2) the loose-leaf binding systems which allow the contents to be changed at will. These bindings are being used for manuals, cookbooks and the like. The advantages of these binding systems are that they open flat and allow the binding of stiff materials. The disadvantages of these bindings are that plastic pins or combs become brittle and wire bindings become bent.

*Loose-leaf* binding systems allow single sheets to be exchanged. Ring binders with two or three rings give little control to the leaves. Constant turning of the sheets will result in torn leaves. Multiple rings give better sheet control and are well worth the additional cost.

Post binders are made of various materials and can be lengthened by addition of other sections. Openability, however, is jeopardized, and wide margins are essential for these binding methods. There are many other types of loose-leaf binding systems, such as thong metal, velobind, ledger binders, prong binders, magazine and directory binders, etc.

*Mechanical* binding styles are spiral, twin wire or plastic comb. These binding elements secure the pages and make an exchange of pages difficult, if not impossible. Some systems allow the punching of T-shaped slots for the addition of extra materials without opening or destroying the mechanical element.

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Spiral binding is the least expensive method. Wire or plastic is formed into a spiral of the proper diameter and length. The sheets must be punched and the spiral is then inserted and “tucked-in” at the ends. When a spiral bound volume is opened, a vertical shift may be noticeable.

Twin wire is double-looped wire that is premanufactured. The sheets must be punched with holes or slots and are then permanently sealed into the binding element.

Plastic combs are perhaps the most widely used mechanical binding style. The combs are premanufactured in the desired diameter and color. Elongated slots are punched into the sheets. The flexible plastic comb is then held open with a special device, and the punched sheets are inserted and the comb closed.

### **Library Binding**

It has already been noted that printed material is bound for the purpose of its end use. Publishers and book manufacturers produce books to sell them—not for increased circulation. Most edition work is therefore geared for the individual reader. Today’s hardcover bindings no longer assure durability. This physical collapse of bindings leaves librarians with tremendous problems. No matter how much worse edition books will get, one basic fact remains clear for librarians: books destined for circulation must last long enough to provide low-cost readership among the number of readers. Library books, like all other products in the public interest, must find a level guided by sound economics. This level has been established by the number of times bound books and magazines must circulate to provide the lowest reasonable cost per reader.

Binding for a library can never be done on a mass-production basis. Judgment, knowledge and experience must enter the process at every stage. A library binder is still a craftsman and, above all, a manager. No other binder could cope with such a mixture of individual bindings, follow exact specifications in the preparation of materials, and bind books so economically. The Library Binding Standard, developed and constantly improved since 1915, is now undergoing several changes to cope with new technology and materials.

*Oversewing* was developed out of the necessity for binding and rebinding books for heavy-duty end use. This form of sewing is practically indestructible and has become the foundation of the Library Binding Standard. An oversewing machine sews single leaves of signatures obliquely through small sections, itself forming a lock stitch with

each separate section and independent lock stitches the length of the back. This type of sewing is much different from side sewing, where a heavy thread is laced through the entire book block at once. Oversewing requires extensive training. To sew books in this fashion is time-consuming. The advantage of overcasting by hand or oversewing by machine is that there are no folds to be reinforced or repaired. Endpapers are sewn to the book block through the inner leaf and reinforcing cloth strip. This method of sewing through the edge in sections allows for reasonably good "openability" and maximum strength. Oversewing should only be used on volumes where extending the life potential is the principal objective. A minimum of one-half inch margin space is required so as not to infringe on the print. There are many arguments for and against oversewing. Piercing or perforating holes in the edges of an archival volume is aesthetically wrong. For these books, more expensive hand-sewing methods should be used.

*Side sewing* is used on small books which bulk less than one-half inch. Singer sewing machines side stitch with heavy thread, the sewing extending the full length of the volume and through the reinforcing fabric. The difference between a Singer sidesewn edition or textbook binding and that of a library bound volume is in the construction of the endpapers. A library bound volume requires a reinforced endpaper that is folded back flush so that it will hinge from the binding edge and not pull on the sewing. Most small, prebound library books are sidesewn and are almost indestructible, an important factor when binding books for small children.

*Sewing through the fold* may be done if folded signatures are present. This method of binding may be done by hand on a sewing frame or by machine. Hand sewing is time-consuming and therefore expensive. This process is mainly used on rare books or on music books where good openability is essential. A substantial amount of saddle-stitched periodicals can now be sewn on the National sewing machine. This heavy-duty sewing machine is able to sew through 160-180 pages, depending on paper thickness and quality. Properly sewn with special spine-strengthening tapes and glued-off with specially formulated polyvinyl acetate adhesives, this "sew-through-the-fold" method assures excellent openability, copyability, and leaves the option to rebind again (and again) at a later date if necessary. This method of binding is truly a conservation-oriented process.

*Adhesive binding* is the fastest growing commercial binding process, as mentioned earlier. This process is used for many periodicals. Paper prices have quadrupled since the 1960s. Publishers increasingly

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save paper by reducing margins. Such narrow-margin materials are not suitable to be side- or oversewn for circulation. The library binder has no choice but to adopt an adhesive binding method which will tolerate even the smallest margins. Double-fanning the sheets in both directions and applying a special water-based, internally plasticized, copolymer polyvinyl acetate emulsion adhesive is now the accepted method for rebinding and prebinding narrow-margin library material. This method—again time-consuming—gives the highest quality obtainable in adhesive binding. The double-fan adhesive-binding process allows the adhesive to be applied between the pages while fanning/gluing each individual sheet—first one side, then the other—to provide extra strength and durability. Some of the factors which may influence the quality of double-fanned binding are: paper quality, grain direction, format of the book, thickness of the volume, etc. Unfortunately, a library binder has little or no control over these critical factors. Librarians have noted the excellent copyability of a double-fanned library bound book.

*Cleatlacing* is the newest method of binding developed especially for library binding. Operating a cleatlacing machine is simple and does not require extensive training as does oversewing. Books to be rebound must be prepared the same as for oversewing, that is, all old glue must be removed and the pages separated. The volume to be bound is then inserted into a clamp, and thereafter everything is fully automatic. Parallel dovetail slits (cleats), approximately one-eighth inch wide and one-eighth inch deep, are cut into the backbone at opposite angles. The machine determines the proper number of cleats throughout the height of the book to be laced. After cutting the dovetail cleats, a thread carrier then separates thin sections of the backbone in order to lace (not sew) a single pasted thread through and around the cleats, one at a time, in a figure eight. This pattern is repeated for each pair of dovetail cleats. No piercing of paper is taking place.

The cleatlacing machine is three times faster than an oversewing machine. The result is a more economical binding. The final strength, however, must come from a heavy coat of PVA adhesive. Cleatlaced books are not as strong as oversewn volumes and therefore the method is adopted for lesser-used library materials which are not subjected to rough treatment.

### **Summary**

What binding, then, is best for library usage? Which volumes should be bound to last? Is there material in the collection which should

be bound for occasional use only? What is an inexpensive, good storage binding? Which binding style is best to be used on the copy machine? These and many other questions should be answered by librarians. It is they who must decide what is best for their collections. A sound binding program should be part of an overall library effort to prolong the useful life of materials which by nature deteriorate.

Books and periodicals have a wide variety of sizes, shapes, methods of binding, kind of paper used, margins, etc. These represent some of the problems both the librarian and the library binder must face today. In addition, librarians and binders alike are faced with tremendous economic challenges. Librarians want to maintain their materials in the best and most economical fashion possible, and binders want to produce as economically as possible for the library. Experience indicates that books either rebound or prebound according to the Library Binding Standard will provide a hundred or more circulations. With approximately 80 percent of all new hardcover bound books now being adhesive-bound, new edition bound volumes will probably last only ten to fifteen circulations. Thus, library binding is a cost-saving device because it reduces the cost per circulation.

The library binding industry has dramatically changed over the past several years with the introduction of new materials, new methods of binding, and sophisticated new machinery. For example, on a recent visit to five certified library binderies on behalf of LBI's Quality Control Program, I found that four of these binderies used computerized hot-stamping equipment! Years ago, when paper was less expensive, most margins were adequate for oversewing. Unfortunately, this is no longer the case, and the result has been a significant growth of adhesive-bound library volumes. However, oversewing is still the basic method of affixing pages to build strength into a library binding, and it is used whenever possible. Reinforced-paper and synthetic cover materials are now competing successfully with cloth. How do librarians and library binders cope with these new trends? Are some of these new materials and binding methods equal in strength and performance to those of books bound according to the present LBI Standard? To answer these and many other questions, the Library Binding Institute established a Book Performance Testing Laboratory at the Rochester Institute of Technology. This unique, educational testing laboratory is part of RIT's School of Printing bindery management training facility, which houses some of the most sophisticated bindery machinery available. This includes equipment such as computerized cutters, perfect binders, folding machinery, inserter-saddlestitch-three-knife-trim combination

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machines, etc. The adjoining LBI Book Testing Laboratory utilizes gadgets and testing machinery such as a Tumbletester, a Universal Book-tester developed by the Barrow Laboratories, an aging-oven, a Stoll abrasion tester, and an array of sophisticated page-pull and page-flex testers. Testing is constantly done to evaluate the performance of new materials and methods of binding. Graduate students find the testing laboratory extremely useful for conducting tests and basic research. The evaluation of strength and openability of three binding methods used in library binding—oversewing, cleatlacing and double-fan adhesive binding—on three different kinds of paper was part of a master's thesis. The results are to be published in *Library Scene*.<sup>6</sup> Another test, the scanability of hot-stamped ISBNs on cover materials, is underway. OCR-coded identification on book covers could aid librarians in checking out books and other materials. Other tests and evaluations done for various certified library binders will ultimately result in specifications for alternative methods of affixing pages, bindings which are not subjected to the normal rigors in library use. Thus, librarians will know exactly what is being sold, and what kind of quality and performance they may expect from a certain category of binding.

To aid in the preservation of library collections, which should include a sound program of book maintenance, librarians are invited to contact the Library Binding Institute for information on their free examination service, the Book Testing Laboratory, publications on binding and preservation, etc.<sup>7</sup>

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