

Splintered: The History, Structure, and Conservation of American Scaleboard Bindings

INTRODUCTION

While books are generally considered in terms of their text rather than their bindings, the study of bookbindings—how books were sewn, covered, and decorated—can provide insight into both the historical book trade and trends in readership. Research on early American tooled decoration, like that conducted by scholar Hannah D. French and conservator Willman Spawn, has begun to suggest how many binders there were in the American colonies, how and where they were trained, and how tools were shared or inherited between shops. Such research also describes historical binding styles and how they changed with time and location, according to prevailing tastes. The quality of a book's binding—in terms of materials, workmanship, and decoration—can also reveal something about how the text within it was perceived. Highly tooled, ornate bindings in expensive morocco leather were often reserved for either high-value texts or for gift books. Utilitarian or ephemeral books often received cheap, nondescript bindings in sheepskin or paper. Because of their lesser value and limited visual appeal, these books have received much less attention from scholars, although they represent the vast majority of texts available to the general public. Their materials and construction methods represent the routine work of publishers, binders, and booksellers from the 17th to the early 19th centuries; documenting them will illustrate the book trade's response to expanding literacy and readership.

Quintessentially American scaleboard bindings—which utilized thin, planed wooden boards—are of particular interest because so little is known about their origins and usage (Pickwoad 2009). Recently, conservator and book historian Julia Miller performed a study of 347 scaleboard bindings during a short-term fellowship at the Library Company of Philadelphia, whose collection specializes in “American history and culture from the 17th through the 19th centuries” (Library Company 2006). The Library Company also has the

second-largest collection of American imprints published before 1820, making it an ideal location for the study of American printing and publishing (Library Company History 2006). According to Miller's unpublished report, the bindings were selected chronologically from the library's catalogued and uncatalogued collections, and the imprints they contained ranged in date from 1684 to 1795. While compiling the data from her study, she found numerous departures from the existing assumptions about scaleboard bindings, which state that such bindings prior to the 1760s were sermons in small formats, stab-stitched and bound in full sheepskin with no decoration, and that after the 1760s they were primers in small formats, stab-stitched and bound in quarter leather with paper sides. She also found that Boston imprints predominated, with imprints from New York, Philadelphia, and smaller publishing centers becoming more common in the 18th century, particularly after 1780 (Miller 2010).

This study sought to expand upon Miller's research, building a wider understanding of the imprints selected for scaleboard bindings and of the binding structures printers and publishers used. Miller's list of imprints bound in scaleboard was compared with similar or duplicate imprints at the Historical Society of Pennsylvania, the Library Company, and the Winterthur Library—all of which focus on Americana of the 17th to early 20th centuries—for further evidence about the extent of scaleboard use. The search resulted in the examination and documentation of an additional 85 scaleboard bindings displaying a wide range of imprint dates, binding structures, and decorative schemes.

SCALEBOARD BINDINGS IN THE AMERICAN BOOK TRADE: A LITERATURE REVIEW

Published information about scaleboard bindings is scarce. Books in thin wooden boards are generally mentioned in passing, in discussions of the American book trade or of more valuable (and rare) early American fine bindings. However, a review of the literature on books during the colonial period makes it clear that scaleboard bindings played a significant

Presented at the Book and Paper Group Session, AIC's 41st Annual Meeting, May 29–June 1, 2013, Indianapolis, Indiana.

role in the development of an American book culture. In 1904, Clifton Johnson, an author who focused on children's literature and rural Americana, first described scaleboard bindings in the context of 18th- and 19th-century schoolbooks. In the early to mid-20th century, bibliographers such as Thomas Holmes and Hellmut Lehmann-Haupt documented American bindings—including a few references to scaleboard—as part of their examination of printed texts and the American book trade. Slightly later, binding historians Hannah Dustin French and Willman Spawn—the former a librarian, the latter a book conservator—wrote extensively about early American bindings, including the use of scaleboard. In his 1994 article “Onward and Downward,” conservator and binding historian Nicholas Pickwoad discussed scaleboard in the context of the time- and cost-saving practices implemented in bookbinding after the introduction of the printing press. Hugh Amory and David Hall, editors of the series *A History of the Book in America*, provided a context for scaleboard in their work on early American printing, binding, and bookselling. By 2010, when the first draft of this paper was written, the only published work dedicated to scaleboard was Julia Miller's 2009 article “The American Scaleboard Binding: Not Just Another Beautiful Book,” in which she describes the scaleboard bindings she observed as a volunteer at the William L. Clements Library in Ann Arbor, Michigan.¹

The origins of scaleboard as a binding material are uncertain, although they were not unique to colonial America. Some authors, including French and Lehmann-Haupt, assume they developed from the heavy wooden boards used during the medieval period, and functioned as an alternative to expensive imported pasteboard (Lehmann-Haupt 1951; French 1967). According to Pickwoad, scaleboard was common across northern Europe from the early 16th century into the 19th century, especially on less expensive books. There, as in the infant American colonies, “wood was plentiful (and . . . quantities of waste paper from which to make boards were harder to find)” (1994, 80). In the absence of the proper conditions for flax production and papermaking, Pickwoad states, northern European binders turned to beech logs “split into thin sheets with a broad wedge-shaped tool called a froe; the sheets were then smoothed, cut and used like other manufactured boards” (1994, 80). Citing other researchers, Miller tentatively identifies American scaleboard as oak, maple, or birch, and suggests that scaleboard might have been produced by apprentice labor or colonial shingle-makers (2009).

Historical references offer further clues, suggesting that scaleboards were planed rather than split and that they may have migrated from the print shop to the bindery—trades that were closely linked in colonial America. The *Oxford English Dictionary* contains two entries related to scabbards or scaleboards; the former term appears to have preceded the latter. “Scabbard” is defined as “Thin board used in making splints, the scabbards of swords, veneer, etc., and by printers

in making register (now called scale-board).” Its earliest usage is from a 1635 patent record; Benjamin Franklin refers to it in a 1753 letter to J. Bowden, saying, “I place them in loose rims of scabboard” (Simpson and Weiner 1991, 1663). “Scale-board” is defined as “Thin board used for hat-boxes, silk hats, veneer, etc., and used by printers for justifying.” Its earliest usage is in a 1711 act concerning the exportation of “Paper Pastboard Mildboard or Scaleboard”; an 1821 customs record describes “202 Scaleboards, from Germany, . . . packed in Bundles, weighting 50 st each Draught” (Simpson and Weiner 1991, 1664). A “scabbard-plane” or “scaleboard-plane” was used to produce scaleboards; “scabbing” refers to the spacing of lines of type (Simpson and Weiner 1991, 1663). Well into the 19th century, scaleboard was being used for a variety of purposes, including book boards. The “board” entry of the 1823 *Encyclopaedia Britannica* describes the importation of “mill and scale-boards, &c. for divers artificers. Scale-board is a thinner sort [of board], used for the covers of primers, thin boxes, and the like. It is made with large planes; but might probably be sawed with mills to advantage” (757).

Whether these thin boards were standard printers' equipment, pressed into usage as book covers when paper goods were expensive and scarce, or a common-sense adaptation of traditional wooden boards for smaller texts, they became far more common in the American colonies than they were in England. They were also used differently, with the wood grain running horizontally. Citing David Pearson's *English Bookbinding Styles 1450-1800*, Miller writes, “European examples of extremely thin wooden covers contemporary with early American scaleboard tend to have a vertical grain. Scaleboard was used in England in the late 18th century for cheap binding, but much less so than in America” (2009, 199).

In the colonies as in northern Europe, the use of scaleboard was likely due to the lack of a local paper supply. The first paper mill in America was established near Philadelphia in 1690, but colonial binders elsewhere had to rely on pasteboard, marbled lining papers, and endleaves shipped from Europe. French writes:

Wood was plentiful where paper and pasteboard were not, and board covers of birch, maple, and oak were used throughout the colonial period, in New England in particular. These boards were planed very thin until they were no heavier than pasteboard and served their purpose admirably. The slim volumes of sermons, tracts, and controversial pamphlets, which together with various printings of the Psalm Book made up the bulk of the products of the earliest presses, called for thin covers where the thick folios of the fifteenth century had called for heavy ones. In the parlance of the day these thin covers were known as “scabboard,” a contraction of “scaleboard.” Although boards were used in Pennsylvania, too, pasteboard came into general use earlier there. Paper manufacturing had flourished since its start in 1690. [According to his account

books,] Benjamin Franklin . . . supplied Philadelphia binders and an occasional New York and Boston craftsman with paper and pasteboard as well as scabboard, milled boards, skins, and gold leaf. (1967, 13-14)

Here Franklin's sale of scaleboards and other binding materials provides evidence of the overlapping roles of printer, bookseller, and binder in the colonies, all of which relied on—or competed with—expensive materials or finished goods imported from England. During the 17th and 18th centuries, the London Stationers' Guild controlled the copyrights, and most books distributed in the colonies were imported from England already bound (Reese 1990; Amory 1993; Amory and Hall 2000). According to Amory, these imports included all of the books that sold steadily, including Bibles, technical literature—such as law books and navigation charts—and chapbooks (1993). By law, American printers could print only locally produced literature and works not covered by copyright, and these were the imprints that found their way into the hands of local binders. While in theory scaleboard might have been used on a few of the imported volumes, Miller notes that its use is far more evident on the products of the colonial American presses: sermons, captivity narratives, and execution-day confessionals in the late 17th century, joined by primers, psalm books, catechisms, music books, almanacs, and literary works by the late 18th century (2009).

Such offerings were by no means confined to scaleboard bindings, although locally sourced, lightweight wooden boards would have been cheaper than imported pasteboards. Colonial binders produced a range of work, from the fine, gold-tooled bindings of John Ratcliff and Edward Ranger in 17th century Boston to ubiquitous blue paper wrappers. French notes that Ratcliff and Ranger bound in imported morocco or “turkey leather” over pasteboard, whereas typical Boston bindings of the period “were blind-tooled native sheep or calf covers over wooden [scale] boards, with plain endpapers, or sometimes with no endpapers at all” (1967, 12). German immigrants continued to use heavy, shaped wooden boards for their Bibles and religious texts. Smaller, less valuable books also received a range of cover treatments. Amory writes,

Pamphlets were issued ‘stabbed,’ in blue-gray cartridge-paper wrappers, sewn through three holes in the sides, for immediate hawking through the streets. From around 1743, about the same period as in England, the wrappers might also bear a printed title or advertisement, and owners at all times bound books for themselves in limp parchment or wallpaper. (Amory and Hall 2000, 54)

Scaleboard bindings apparently offered a middle ground for those who wanted cheap yet durable permanent bindings. Scaleboard is frequently found on Boston imprints from the late 17th century through the Revolutionary War,

and occasionally on books from other publishing centers throughout New England and the Mid-Atlantic colonies. They were so usual in the Northeast that Holmes remarks upon their absence in Ratcliff's 1685 binding of Increase Mather's *A Call from Heaven*. He describes the book as solid and strong but crude and utilitarian, sewn on three sawn-in rawhide thongs, two of which are laced through pasteboards, “not the beech or oak boards then used on the commoner sheepskin bindings of the time and used in Boston for fully forty years later” (1928, 37).

Several other authors note the use of scaleboard bindings on particular texts, or in the inventories of American binders and booksellers. Amory writes that sermons for special occasions were often issued stitched into paper wrappers or, if sold in a bookstore, in the less common “sheep over scabboard” (1993, 49). Michael Perry, an unsuccessful Boston bookseller who died intestate in 1700, was found to have 10 times more locally printed books than imported books in his shop, as well as bookbinding materials such as calf and sheepskin leather, dyes for sprinkling, paste papers, Bible clasps, and “pasteboard and ‘scale’ or scabboard, a kind of oak veneer used for stiffening covers” (Amory 1993, 36). Willman and Carol Spawn write that Francis Skinner, an 18th-century Newport binder, “often used thin wooden boards for the sides of his smaller books in place of expensive pasteboard” (1965, 58-59).

Many scaleboard bindings were exceptionally plain and very crudely finished. French notes the simplicity of colonial bindings, including those on schoolbooks, which were typically bound in scaleboard:

Many books, and probably the greatest number, were bound in full sheep, or more rarely in calf, with no ornamentation whatever. Some examples of the New England Primer have been preserved, despite the hard use they underwent, in their original sheepskin covers, a mere scrap of leather drawn on and pasted down without benefit of the binder's knife either for paring or trimming. (French 1967, 21)

According to Lehmann-Haupt, such bindings suggest a reliance on colonial rather than imported materials:

Leather manufacturing, one of the earliest industries, was encouraged by local laws. Therefore, we find books bound in sheep or calf, rather than imported morocco or levant. These early books bore little decoration, resembling the typical law-book style of binding, a resemblance which increased when, in the eighteenth century, gilt-lettered red leather labels appeared on the backs. (Lehmann-Haupt 1951, 24-25)

Not all scaleboard bindings were plain. Like books bound in pasteboard, they were often decorated according to the Cambridge style used on theological works in England (French 1967). According to Willman Spawn, the boards of

a typical early 18th-century Boston or Philadelphia binding were usually covered with sheepskin and blind-tooled with double panels created by single-line fillets and a decorative roll. The panels were set off by hand stamps at the corners. Spines and endpapers were plain, and the board edges might be tooled with the same decorative roll. Imported calf and morocco were used occasionally on special bindings. Single panels with hand stamps at the corners were also occasionally used, particularly on smaller books. Sometimes the boards of inexpensive bindings were simply outlined with single or double fillets. In the 1730s and 1740s, gold tooling and a decorative roll run along the edge of the spine inside the spine fillet appeared on Boston bindings, which are more plentiful than Philadelphia bindings from the same period. New York bindings, however, utilize central stamps, wider decorative rolls, and vertical single fillets two or three inches from the spine: characteristics that reflect 17th-century London stationers' bindings more than the Cambridge style of Boston and Philadelphia binders (Spawn 1983).

In her essay "Early American bookbinding by hand, 1636-1820," French also describes a typical colonial binding. In this case, the binding was simply manufactured and decorated, although it was presented as a gift:

The great bulk of the bindings of the seventeenth and the first half of the eighteenth century were of sheepskin over wooden boards in Boston, over pasteboard in Philadelphia. They were decorated with simple but pleasing rolls and fleurons impressed in blind, even the many presentation copies given by their authors or by Judge Sewall or Thomas Prince, both of them book buyers and book givers. A typical example is the copy of Thomas Paine's *The Pastoral Charge* (in the Massachusetts Historical Society), printed for Daniel Henschman and sold at his shop in 1720. According to its Latin inscription, the work was given to Robert Treat Paine by his father. The binding was done with sheepskin, on horizontally grained wooden boards; there were no headbands nor tooling on the board edges. Two leather thongs were stabbed through the book and put down under the covers. Page edges were sprinkled red. A double panel adorned the covers, made by a double blind fillet with the familiar rather large Henschman fleurons at the outer corners of the inner panel. (1986, 128-129)

Most scaleboard bindings, however, were less elaborate. The early scaleboard examples Miller describes are generally untitled, flat-spined, tightback books bound in full sheep or calf, stained dark brown and blind-tooled with simple panel decorations. After 1750, these full bindings gave way to quarter bindings with sheepskin spines and paper-covered sides; in music books the sides might be left bare (Miller 2009).

The *New England Primer*, which was used to teach reading and godliness in Boston from at least 1690 to 1806, provides

examples of both types of scaleboard bindings. In *Old-Time Schools and School-Books*, the primer is described as having covers "of thin oak, that cracked and splintered badly with use, in spite of the coarse blue paper which was pasted over the wood. The back was of leather. Neither back nor sides had any printing on them" (Johnson 1963, 74). According to the author, these plain, fragile, aging quarter-leather bindings were often "protected by an outer cover of sheepskin neatly folded in at the edges and sewed in place with homespun tow. After 1825 this outer covering was apt to be calico, and sometimes there were tie strings attached at the sides" (Johnson 1963, 162).

Whether plain or elaborate, bound in full or quarter leather, scaleboard bindings often made use of simplified binding practices such as stitching or stabbing the text block rather than sewing through the fold. Such practices sped the binding process tremendously and likely lowered the price of the finished volume. French writes, "To Ratcliff belongs the dubious distinction of introducing to the colonies the vicious practice of stabbing through the inner margins of a book and sewing through the holes, thus making a rigid binding and a book which will not open easily. Sometimes the four rawhide thongs which were laced into the boards were likewise stabbed through the margins at intervals between the sewing stitches" (1967, 17). Miller notes that the earliest scaleboard bindings were stabbed with two wide thongs whose ends were adhered to the horizontally grained boards beneath the leather. Both scaleboard and pasteboard bindings were prepared in this way, however, implying that the two types of boards were interchangeable and that their use depended on regional factors.

Such bindings dominated the American book trade for almost a century. Historians agree that Boston was the center of printing and publishing until the beginning of the Revolution, when changing immigration patterns and the establishment of the federal government in Philadelphia led that city to take precedence. After the Revolutionary War, according to Spawn, regional differences in binding styles ceased to exist, with the exception of the unique Pennsylvania German styles (1983). Also by that time, according to French, "pasteboard covers had become the rule instead of the exception. Scabboard was still used, but only on school texts and other cheap books covered with paper or undecorated sheepskin; and pack thread was used to the complete exclusion of leather thongs" (1967, 50).

Although the existing literature has contributed greatly to the understanding of scaleboard bindings, many questions remain to be answered. For example, what were the boards made of? Although several authors have posited that the thin, planed boards were made from oak, maple, beech, or birch—woods traditionally used in heavier medieval bindings—no definitive analysis of the woods used in scaleboard bindings had been undertaken prior to this study. Identifying

the wood species may help answer a further question: Where did scaleboards originate? Were they a product of the furniture industry, the printing industry, or both? Were they imported to the colonies, like so many other necessities of the printing trade—presses, ink, pasteboard—or were they a cheaper, locally produced alternative? The tantalizing clues contained in the *Oxford English Dictionary* suggest that future research must examine the scanty primary evidence of the printing and binding trades as well as the fragile scaleboard bindings themselves.

RESEARCH METHODS: FINDING AND DOCUMENTING SCALEBOARD BINDINGS

This study built on the results of Miller's month-long fellowship at the Library Company of Philadelphia in fall 2010 and pursued several of her suggestions for further study. At the Library Company and the Historical Society of Pennsylvania, scaleboard bindings that post-dated the 1795 cut-off date for Miller's study were examined, as well as duplicate imprints from the Library Company's uncatalogued collections. At the Winterthur Library, imprints from Miller's study were compared with similar or duplicate imprints to see whether they had been bound in the same way. Scaleboard bindings were also compared with a wide range of other books from the colonial period, including similar bindings in pasteboard and exceptionally fine bindings. Harry Alden, a botanist who specializes in wood identification, was also consulted for preliminary characterization of the wood used in nine of the scaleboard bindings examined. Where possible, wood samples were collected for future identification.

At Winterthur, Miller's list of imprints was first compared with the authors, titles, and printers included in the Winterthur catalog. Exact matches and similar imprints—mainly sermons, psalm books, and primers—were used as a starting point for finding more scaleboard bindings. Because most scaleboard bindings are small, the initial search was confined to the shelves where the smallest rare books (octavos and duodecimos) are kept. When these had been thoroughly examined, the search was broadened to books of standard size whose authors, titles, or subjects had previously been found in scaleboard bindings: sermons and theological works, psalm books and music books, school books, histories, classics, and books on home economics, animal husbandry, or gardening. Few additional bindings were discovered in this way, suggesting that binders recognized the inherent weaknesses of scaleboard and reserved it for the smallest and lightest imprints.

The study soon confirmed that, in addition to being small, books bound in scaleboard are usually plainly decorated, with characteristic types of damage. In full leather bindings, the corners of the boards are often chipped and exposed, providing a glimpse of the wood grain (fig. 1a). By contrast,



Fig. 1a. In scaleboard bindings, wood grain is often visible at the corners, along worn edges, or at the hinge when the book is open. (J[ohn] Hill, *The Young Secretary's Guide: or, a Speedy Help to Learning*, 24th ed. Boston: Printed and Sold by Thomas Fleet, 1750. Copy 1. 15.8 x 9.2 x 2.4 cm) Photo by the author, courtesy of The Library Company of Philadelphia



Fig. 1b. Loss to the top of this board gives the leather a surprisingly limp, empty appearance. (J[ohn] Hill, *The Young Secretary's Guide: or, a Speedy Help to Learning*, 24th ed. Boston: Printed and Sold by Thomas Fleet, 1750. Copy 2. 15.9 x 9.5 x 2.9 cm) Photo by the author, courtesy of The Library Company of Philadelphia

the corners of pasteboard books generally bend rather than break. On scaleboard bindings, the leather may also display what Miller has called “the empty sleeve syndrome”: even if it remains intact, it may be limp and floppy over areas of board loss (fig. 1b). If the boards cannot be seen through the binding, opening the book and examining the inner hinge will often reveal either wood grain or the more homogeneous pasteboard. In quarter leather bindings with paper sides, damage to the paper often reveals large sections of the boards, and the fore-edges of the boards often suffer from severe losses, particularly if the wood grain is vertical (fig. 2). Short, wide music books are often bound in scaleboard, although their leather or tawed-skin overcovers make confirming the board material a challenge.

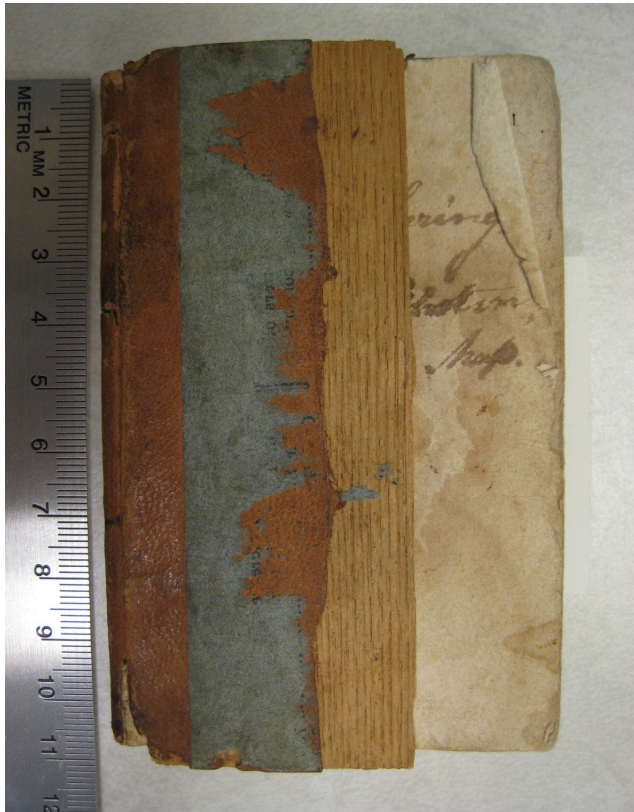


Fig. 2. Vertical wood grain was common in copies of the *New England Primer*, resulting in loss along the fore-edge. (*The New-England Primer*, Greenfield, [Mass.]: Printed by Denio and Phelps, 1816. 10.9 x 7.0 x 0.9 cm) Photo by the author, courtesy of The Winterthur Library: Printed Book and Periodical Collection

The 85 scaleboard bindings identified were documented with the aid of a data sheet adapted from Miller's checklist. The reference number, author, title, date, and publication information, as well as the size of the bound book, were recorded for each volume. The book's covering materials and decoration, scaleboard grain structure and orientation, text block and endsheet construction, inscriptions, and method of text block attachment were also examined and documented. Sketches of the front cover and spine, as well as digital images of selected features, helped record the pertinent details. For the purposes of this paper, the resulting data were analyzed using an Excel spreadsheet.

SCALEBOARD BINDING STRUCTURES: A SUMMARY OF THE FINDINGS

Many of the assumptions regarding scaleboard bindings were borne out by this study, which included imprints from 1686 to 1833. The majority of the books examined were small—duodecimo, octavo, or small quarto imprints—with horizontal-grain, ring-porous scaleboards and stabbed

bindings. In addition, the majority of books printed prior to 1760 originated in Boston, while the majority of those printed thereafter were from New York, Philadelphia, and towns scattered across New England. More than 50 percent of the works bound in scaleboard were theological texts or schoolbooks, but the variety in content increased dramatically over the study period. Simple full-leather bindings prevailed until the 1790s; quarter-leather bindings with paper sides dominated thereafter.

IMPRINTS IN SCALEBOARD

The first English printer and printing press arrived in Cambridge, Massachusetts, in 1638, as part of an effort to educate and convert the Native American population. By 1674, printing had expanded to Boston, which dominated the American publishing industry until Philadelphia took over in the mid-18th century (Lehmann-Haupt 1951). As might be expected, therefore, 257 of the 347 books in Miller's study were printed in Boston. Another 85 books were printed in 22 other cities, from Delaware to Maine, between 1715 and 1795. The earliest non-Boston imprint in scaleboard was from 1690 (Philadelphia), followed by imprints from 1709 (New London, Conn.) and 1715 (New York City). Miller also noted that scaleboard bindings outside Boston became far more common in the 1780s, when Boston binders appear to have moved to quarter bindings with pasteboards. The majority of imprints prior to 1786 were sermons; after 1786, they were educational texts.

In this smaller study, the books originated in 17 cities, from Philadelphia in the south to Montpelier, Vermont, in the north. One 1806 imprint of *The Works of Aristotle* was identified only as having been printed in New England. Boston, New York, and Philadelphia produced the majority of the texts (54, 9, and 8 percent, respectively), with the remainder printed in 14 smaller publishing centers across the northeastern colonies (see table 1). As in Miller's study, the most common imprints were theological texts from Boston, followed closely by schoolbooks printed elsewhere. It is interesting to note that the three copies of the *New England Primer* in the sample set all originated outside the major printing centers. Subject matter varied most widely in New York and Philadelphia. As expected, scaleboard use appeared to migrate away from Boston as its publishing dominance dwindled.

In the Winterthur Library, a number of titles found elsewhere in scaleboard were found to have been bound instead in paper boards or millboard (see table 2). Although the sample set is so small that it is impossible to draw definitive conclusions from it, these alternative bindings suggest that Pennsylvania binders were more likely to use paper boards, given their local supply of the raw material. The later dates of the imprints in paper boards also illustrate the wider availability of American-made pasteboard by the late 18th century. Book purchasers in New England may have been

Table 1. Imprints in Scaleboard by Content and City of Origin

Contents	Bellows Falls, VT	Boston	Brattleborough, VT	Exeter, NH	Germantown	Greenfield, MA	Hartford, CT	Middletown, CT	Montpelier, VT	New England	New London, CT	New York	Newburyport, MA	Philadelphia	Portsmouth, NH	Walpole, NH	Watertown, NY	Worcester, MA	Grand Total
children's theology		1												1					2
classics									1										1
dream interpretation												1							1
dyeing											1								1
etiquette															3				3
history					1							1							2
hymn book		1											1						2
law book		2																	2
literature												2							2
maxims		1																	1
military exercises									1										1
music book		1		1										1					3
poetry											1								1
politics		3												1					4
primer						1							1			1			3
ready reckoner													1						1
recipes	1																		1
satire												1							1
schoolbook		7	1			1	1		1					2			1	3	17
sermon		5						1											6
theology		25										3		1					29
women's advice														1					1
Grand Total	1	46	1	1	1	2	1	1	2	1	2	9	3	7	3	1		3	85

able to specify which type of boards they desired, possibly at different price points, or different materials might have been used interchangeably when binding popular, inexpensive titles for retail sale.

Regardless of where and when they were printed, the books bound in scaleboard were uniformly small. The books examined in this study ranged from 10.5 to 20.5 cm in height, 7.0 to 24.0 cm in width, and 0.9 to 4.5 cm in thickness. The majority were duodecimo impositions, trailed by octavo and quarto imprints (see table 3). The largest books included a ready reckoner—a book of accounting tables with a tall, narrow format—and books of sheet music with a short, wide format. The smallest books were the three copies of the *New England Primer*, all under 12 cm in height and sized to fit a child's hand.

The limited size of the imprints suggests that binders recognized the inherent fragility of the thin wooden boards, which often split and chipped even in the smallest bindings.

TEXT BLOCK CONSTRUCTION AND BOARD ATTACHMENT

As James N. Green, librarian at the Library Company, has noted, in the colonial period “paper was the largest component in the cost of printing,” and few printers would essay upon bound books that required more than 10 folded sheets, or 160 pages in octavo (2007, 266). The paper quality also presumably affected the printer's or publisher's outlay, and scaleboard bindings, with their reputation for cheapness, might be expected to contain the lowest-quality paper stocks.

Table 2. Titles Found in Both Scaleboard and Other Types of Boards

Study	Library	No. Copies	Author	Title	Imprint	Date	Boards	Binding
Miller	LCP	1	William Buchan	<i>Advice to Mothers ... on Their Own Health</i>	Boston: Joseph Bumstead	1809	scaleboard	quarter leather with marbled paper sides
Wolcott	WL	1	William Buchan	<i>Advice to Mothers ... on Their Own Health</i>	Philadelphia: John Bioren	1804	pasteboard	full leather quarto
Miller and Wolcott	LCP	3	Henry Care	<i>English Liberties, or the Free-born Subject's Inheritance</i>	Boston: J. Franklin for N. Buttolph, B. Eliot, and D. Henchman	1721 (3)	scaleboard	full leather
Wolcott	WL	1	Henry Care	<i>English Liberties, or the Free-born Subject's Inheritance</i>	Providence, R.I.: J. Carter	1774	pasteboard	full leather
Miller and Wolcott	LCP	5	Lord Chesterfield	<i>Principles of Politeness, and of Knowing the World</i>	New Haven, CT: A. Morse	1789	scaleboard	full leather
					Boston: Belknap and Hall	1794	scaleboard	quarter leather with blue paper sides
					Portsmouth, NH: Melcher and Osborne	1786 (3)	scaleboard	full leather
Wolcott	WL	1	Lord Chesterfield	<i>Principles of Politeness, and of Knowing the World</i>	Philadelphia: Mathew Carey	1800	pasteboard	quarter leather with marbled paper sides
Miller and Wolcott	LCP	2	Daniel Fenning	<i>The Ready Reckoner</i>	Boston: John W. Folsom	[1785]	scaleboard	full leather
					Newburyport, MA: Edmund M. Blunt	1794	scaleboard	full leather
Wolcott	WL	4	Daniel Fenning	<i>The Ready Reckoner</i>	Reading, PA: Benjamin Johnson	1789	pasteboard	full leather
					Philadelphia: Jacob Johnson	1794	pasteboard	full leather pocketbook
					Newburyport, MA: Edmund M. Blunt	1794	millboard	full leather
					Philadelphia: Henry Sweitzer	1801	pasteboard	quarter leather with blue paper sides
Wolcott	LCP	2	George Fisher	<i>The Instructor: or, American Young Man's Best Companion</i>	Worcester, MA: Isaiah Thomas	1785 (2)	scaleboard	full leather
Wolcott	WL	1	George Fisher	<i>The Instructor: or, American Young Man's Best Companion</i>	Burlington, VT: Isaac Collins	1775	pasteboard	full leather

Table 3. Imposition of Imprints in Scaleboard

Imposition		Total
Duodecimo	12mo	6
	12mo in 12s and 6s	2
	12mo in 6s	42
	12mo in 8s	1
Octavo	8mo	16
	8mo in 4s	10
Quarto	4mo	6
	4mo in 2s	1
	4mo in 8s	1
Grand Total		85

In reality, the handmade white papers in the books from this study displayed a surprising range in quality, from fine laid papers with evenly distributed fibers to coarse laid papers with lumpy surface texture and quantities of blue fibers. Most of the volumes were printed on medium-quality laid paper; several of the high- and medium-quality papers contained watermarks that might be used to trace their origins with further research. Ten volumes were printed on wove paper; the first of these appeared in 1798, just three years after American-made wove papers became available (Lehmann-Haupt 1951). The presence of high-quality and innovative papers suggests that scaleboard bindings were not limited to the most cheaply

printed texts, but were used even for highly respected and expensive imprints, or those that were meant to impress prospective readers. The 13 books printed on high-quality laid paper included the two most elaborately decorated bindings in the group, and more than half of them were sewn rather than stabbed, producing more durable and expensive books.

As a general rule, more scaleboard bindings were stabbed than sewn. As Miller also noted, the majority of the text blocks—whether sewn or stabbed—were notched along the spine as if for recessed sewing (see fig. 3). Both V- and U-shaped notches were observed, sometimes in combination with horizontal slits at the kettle stations, suggesting that the notches might be cut by knife or by saw. The number of notches varied: two, three, and four notches were most common. One 1785 Worcester schoolbook was unique in that some of its fold-out diagrams were evidently notched for recessed sewing, although the rest of the text block was not; the book was bound on five raised cords. Similarly, the handwritten music bound into the back of a 1798 Philadelphia songbook was notched along the spine, while the original printed text was not; the entire book appears to have been oversewn. This evidence suggests that printers or binders notched the spines of text blocks or insertions as a matter of course, perhaps long before the books were bound.

In stabbed bindings, two vertical slits were pierced or slit in the spine margin of the text block, generally 6 to 7.5 cm apart. Tawed-skin thongs, leather thongs, or woven tapes were threaded through the slits, and their ends were attached to the spine edge of the scaleboards, either on the inside beneath the pastedowns or, far more frequently, on the outside beneath the covering material. (Miller's study also identified several bindings from 1690–1704 with tawed supports that had been laced through scaleboards lined on the inside with paper, a binding structure that has not been described elsewhere.) As Miller noted, the materials used in stabbed bindings, and their method of board attachment, could usually be determined by examining the bindings' inner hinges and the spine edges of the boards. Fifty-five percent of the full-leather bindings and 57 percent of the quarter bindings appeared to have been stabbed rather than sewn. Particularly in the latter case, the thong or tape slips were often clearly visible beneath the paper sides or pastedowns (see fig. 4). The imprints bound in this way included all of the primers and all but four of the religious texts printed in Boston. The stabbed structure—by far the fastest method of bookbinding—was used on the earliest and latest imprints in the study group and throughout the 18th century.

Two variations on the usual stabbed-binding format were identified. One 1763 Boston imprint displayed four vertical, pierced slits in the spine margin; although only the outermost slits contained thongs, the narrower inner slits also showed signs of use. This suggests that the book may have been sold stitched through the central slits and then rebound. Similarly,



Fig. 3. The split front hinge of this stabbed binding reveals a text block spine notched as if for recessed sewing, although the book was bound using two tawed-skin thongs stabbed through slits in the spine margin and adhered beneath the cover leather. (Benjamin Wadsworth, *A Dialogue Between a Minister and his Neighbour, About the Lord's Supper*. Boston: Printed by S. Kneeland, for Benj. Eliot, 1724. 14.0 x 8.3 x 1.9 cm) Photo by the author, courtesy of The Historical Society of Pennsylvania

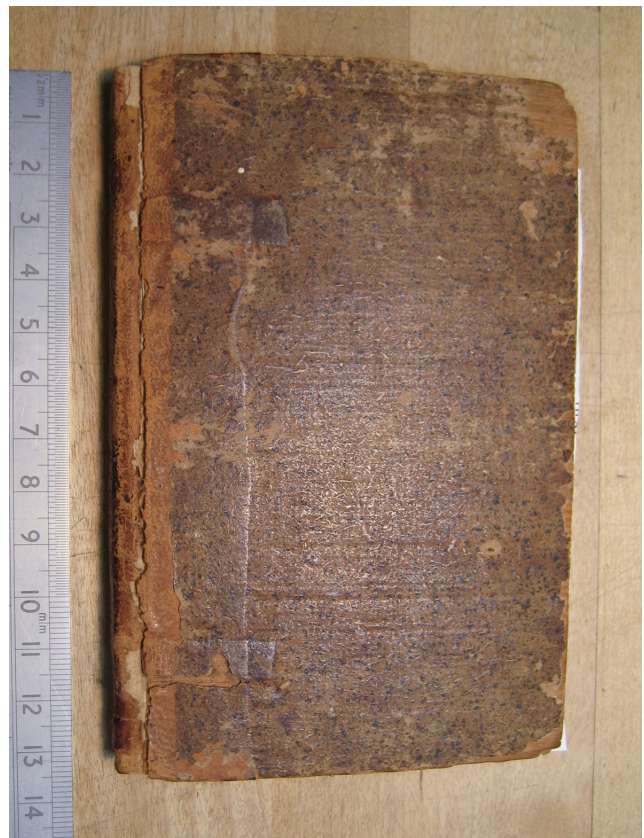


Fig. 4. The thong slips are clearly visible beneath the leather spine and sprinkled paper sides of this stabbed binding. (Jedidiah Morse, *Elements of Geography*, 2nd ed. Boston: Printed by I. Thomas and E.T. Andrews, 1796. 13.5 x 8.5 x 1.7 cm) Photo by the author, courtesy of The Library Company of Philadelphia



Fig. 5. For fast processing, this *Ready Reckoner*—a tall, narrow book containing sets of accounting tables—was sewn on four recessed cords using an abbreviated sewing structure, and only the outermost cord slips were used to attach the boards. (Daniel Fenning, *The Ready Reckoner*, 11th ed. Newburyport, [Mass.]: Printed by Edmund M. Blunt and sold by Messrs. Thomas and Andrews . . . , 1794. 20.0 x 9.2 x 2.7 cm) Photo by the author, courtesy of The Library Company of Philadelphia

a 1772 Boston imprint featured three additional pierced holes in the spine margin, suggesting that the book was issued stitched—possibly as a pamphlet—and later rebound.

Imprints in sewn bindings dated from 1713 to 1832, and may have been used more often for less ephemeral titles, since sewing—particularly on raised cords—would have been more labor intensive and thus more expensive. Sewn imprints included all three copies of a book on etiquette, as well as several of the more varied texts from the turn of the 19th century: a book of advice for women, a book of satire about women, *Arabian Nights Entertainments*, Alexander Pope’s *Essay on Man*, *The Works of Aristotle*, a book on dyeing, and a book of infantry exercises.

About one-third of the books were sewn on recessed supports—cords, tawed-skin thongs, or leather thongs (listed in order from most to least common)—and 15 percent were sewn on raised cords. Regardless of the book’s final structure, the binders generally used abbreviated sewing for the sake

of speed (see fig. 5). Binders also took time-saving measures when attaching the boards. When books were sewn on more than two cords, some of the cord slips were often trimmed flush with the edges of the spine, and only two or three were used to secure the text block to the binding. Tawed-skin or leather thongs always finished on the outsides of the boards, while cord slips usually finished inside.

Only one book—a badly deteriorated binding of William Little’s 1798 *The Easy Instructor*, a music book—may have been oversewn, without the use of sewing supports. No vertical slits could be found along the spine edges of its tattered leaves, and no cord or thong slips could be located beneath the pastedowns or the thick leather overcover. The damaged centerfolds of the folios, which possessed holes in the center, might mean that the book was once sewn through the fold. Since it was bound, however, the book has undergone multiple repair campaigns, and it is difficult to assess its original structure.

Regardless of their structure, the completed text blocks were generally left unshaped. As in Miller’s study, most of the books had flat spines; very few were rounded, and only one was backed.

ENDSHEET AND ENDBAND MATERIALS AND CONSTRUCTION

In scaleboard bindings, endsheets served to attach and reinforce the thin boards and to indicate the binding’s value: the more paper used in the endsheets, and the higher its quality, the more expensive the binding was likely to be. All but five of the books examined had separate endsheets of some kind, from pastedowns of printed waste to double folios of fine watermarked paper. Almost half had single-folio endsheets; one-third had double-folio endsheets; and one-fifth had pastedowns only.

Single-folio endsheets appeared on 38 bindings, of which roughly two-thirds were stabbed rather than sewn: a correlation between speedy text-block assembly and simple endsheet construction. The endleaves were usually made of laid paper rather than printed waste and notched for sewing. They were generally stabbed or sewn with the remainder of the text block, but occasionally they were tipped in afterward. Even in stabbed bindings, sewing thread could sometimes be seen in the hinges of the book, indicating that the folios might have been sewn on over the thongs as an added precaution. In sewn bindings, despite the abbreviated sewing within the text block, the endleaves were usually sewn all-along for added strength.

Double-folio endsheets were found on 25 bindings, and occurred far more frequently in sewn bindings than in stabbed bindings (see fig. 6), another indication of the sewn volumes’ superior quality. Their materials ranged from fine white laid papers with watermarks to coarse white wove papers with blue fibers. Double-folio endsheets also appeared with five variations, all of which supplied at least one flyleaf and one



Fig. 6. Sewn scaleboard bindings were more likely to have complex endleaves (here, a double folio with two stubs, a pastedown, and a flyleaf), and the thong slips were often visible beneath the pastedowns. ([James Buchanan,] *The British Grammar*. Boston: Printed by Nathaniel Coverly, 1784. 19.5 x 13.1 x 4.2 cm) Photo by the author, courtesy of The Library Company of Philadelphia

pastedown; the number of stubs, board linings, and flyleaves varied. The most common variation included a cut or torn stub, a pastedown, and two flyleaves; the stub was put down on top of the turn-ins, suggesting that the thong or cord slips alone were used to attach the board before covering. The least common variations were also the simplest, involving either a pastedown and three flyleaves or two stubs, a pastedown, and a single flyleaf.

The two remaining variations were more complex and appeared only on sewn bindings; in both cases, the boards were apparently attached using the cord slips as well as the outermost endleaves, which were used to line the boards. This practice may have resulted in more dimensional stability during covering.² A full-leather binding was applied over the lined boards, and the turn-ins were folded over on top of the board linings. The pastedown, or a stub and pastedown, was then adhered on top of the turn-ins, leaving one or two flyleaves free. Bindings with these endsheet structures appeared on imprints dating from 1781 to 1796, one of which—a book on etiquette—was printed on high-quality laid paper. The relatively high endsheet paper quality, and the additional time required to bind books with more complex endsheets, suggests that these bindings were more costly.

In the 16 bindings that had pastedowns alone—a brief nod to aesthetics on the binder's part, indicating fast and inexpensive work—most were of white laid or wove paper. Occasionally the grain direction of the paper was opposite to that used in the text block, making it clear that the pastedowns were from another source. One quarter binding containing a 1792 New York imprint had hooked pastedowns of printed waste, apparently from an almanac. Although the book was

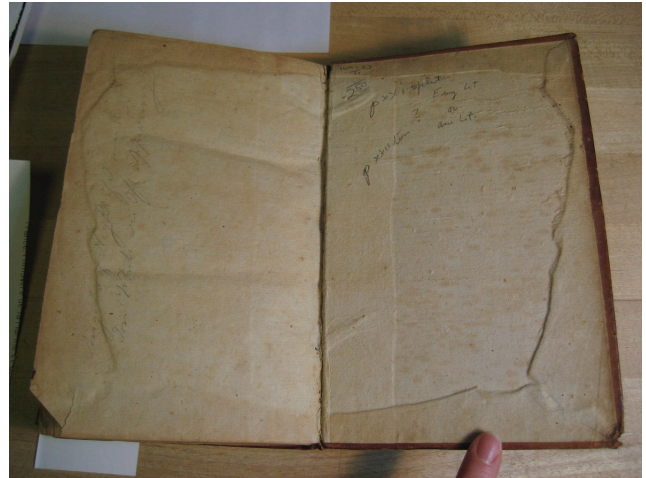


Fig. 7. Stabbed bindings often lacked endleaves or had simple, inexpensive endleaves, such as this partial lining or stub of printed waste. (John Flavel, *A Token for Mourners*. Boston: Printed for N. Boone, 1725. 13.8 x 8.4 x 1.6 cm) Photo by the author, courtesy of The Historical Society of Pennsylvania



Fig. 8. Detail of the plain worked endband found on one binding (George Fisher, *The Instructor: or, American Young Man's Best Companion*, 30th ed. Worcester, Mass.: Isaiah Thomas, 1785. Copy 3. 17.6 x 11.1 x 4.5 cm) Photo by the author, courtesy of The Library Company of Philadelphia

sewn on recessed cords, no cord slips could be detected beneath the pastedowns or paste-paper sides, suggesting that they were cut flush with the shoulders of the text block and that the pastedowns alone were used to attach the boards.

Five stabbed bindings—including two Boston theology books and three schoolbooks or primers—had no added endleaves, and were presumably the fastest and cheapest to bind. In three of them, the boards were left bare. In the fourth, a partial lining or stub of printed waste was applied to each board beneath the turn-ins, leaving the remainder of the board bare (see fig. 7). These partial linings may have served to stabilize the boards against dimensional change during the adhesion of the thong slips and full leather cover. In the fifth binding without added endsheets, the first and last printed leaves of the text block were used as pastedowns.

Endbands—which also served as indicators of quality due to the time required to make them—were found in only three scaleboard bindings, two of which had obviously been rebound. The other, a 1785 Worcester printing of George Fisher’s *The Instructor: or, American Young Man’s Best Companion*, featured primary endbands worked in plain white thread, tacked down only at the beginning, middle, and end of the text block (fig. 8). This binding, one of seven in which the boards were lined with the outermost endsheets as part of the binding process, shows no evidence of later rebinding. The carefully executed endsheets and endbands suggest that this was a more expensive binding, perhaps presented as a gift.

BOARD SHAPING AND GRAIN DIRECTION

The scaleboards examined in this study had smooth surfaces with no visible tool marks and ranged in thickness from 1 to 2 mm. In several cases—perhaps from uneven pressure applied during planing—the boards tapered toward the fore-edge, where they were particularly vulnerable to breakage. The squares were often uneven, and the boards were often flush with the text block at one or more edges. One exception was a 1771 Germantown binding, which had perfectly even 2-mm squares at head and tail and a 1.5-mm square at the fore-edge. As in Miller’s study, only a few boards were back-cornered to accommodate the turn-ins over the spine (see fig. 9).

Most of the boards had horizontal grain. Vertical-grain boards were used on only five books: 1686 and 1713 imprints from Boston and New York, respectively; the 1771 Germantown imprint mentioned above, bound in the traditional German style with raised cords and clasps (see fig. 19); and two copies of the *New England Primer* from 1814 and 1816. This suggests that vertical-grain boards, which were traditional on medieval and European scaleboard bindings, were used early in the American scaleboard-binding period, perhaps by immigrant binders or before the bindings’ weaknesses had been assessed. They may also have been used in bindings where a traditional approach was paramount, as in the German binding, and in later, cheap bindings where durability had ceased to be an issue, as in the primers. In all other cases, binders recognized the virtue of horizontal-grain boards, which continue to protect the text block even when split or chipped.

One of the books examined, a 1744 Boston imprint of Experience Mayhew’s *Grace Defended* (see fig. 18), was bound with a pasteboard front cover and a scaleboard back cover. The pasteboard was much heavier than the scaleboard, and it was also longer than the scaleboard by approximately 5 mm. The mismatch—on a fairly ornate binding with a stenciled, sprinkled double-panel design—might suggest that wooden and paper boards could be used interchangeably, even on more expensive bindings. Alternatively, the binder might have run out of the pasteboard specified for the book—a rare



Fig. 9. Detail, back-cornered board. The board also has a blind-tooled double-fillet border, an exceedingly common design feature. (John Wise, *The Churches Quarrel Espoused*, 2nd ed. Boston: Sold by Nicholas Boone, at the Sign of the Bible in Cornhill, 1715. 14.0 x 8.8 x 2.7 cm) Photo by the author, courtesy of The Library Company of Philadelphia

commodity in Boston?—and substituted scaleboard without the buyer’s knowledge.

In each of the bindings, the end grain of the boards was examined to determine the character of the wood and its species, if possible. The majority of the scaleboards were made from radial slices of ring-porous hardwood for maximum dimensional stability. Their vessels, which often formed tightly spaced rings indicating slow growth, were generally visible to the naked eye at the corners, fore-edge, or spine edge of the board (see fig. 10). The scaleboards often had no discernible rays on the tangential surface; in a few cases, visible rays created a checkered or iridescent appearance like that seen in maple. Two scaleboard bindings featured diffuse-porous woods with no visible pores and a fine, even texture. Loose wood fragments were taken from six bindings at the Library Company of Philadelphia and the Historical Society of Pennsylvania for future species identification.

During this study, wood expert Harry Alden inspected several scaleboard bindings with exposed end grain and identified nine bindings as having ash boards. These bindings contained



Fig. 10. Detail of radially cut, ring-porous hardwood visible through a tear in the leather binding of Joseph Morgan's *The Portsmouth Disputation Examined*, a 1713 New York imprint featuring vertical-grain scaleboards. (Printed and sold by William Bradford; 16.1 x 10.5 x 1.7 cm) Photo by the author, courtesy of The Historical Society of Pennsylvania

imprints ranging in date from 1790 to 1832, and they were printed in Philadelphia, New York, Massachusetts, and Vermont, suggesting either widespread use of ash to produce scaleboard or far-reaching trade in the finished product. Ash is a ring-porous wood with barely discernible rays on the tangential surface, similar to chestnut in appearance but far harder and more rigid; today it is used to make baseball bats (Alden 2011). Although ash is found in Europe as well as in North America, it has never before been linked to book boards.

According to furniture conservator Mark Anderson, colonial shingle-makers—who have been posited as one source of scaleboard—used cedar or white oak rather than ash, which does not possess the same rot resistance. In addition, while most of the scaleboards were radial in character (and might thus have resulted from splitting or riving wood), others were tangential to the point where they split through their thickness along the growth rings. This suggests that scaleboards—which also lacked the rough surface of split shakes—were not a byproduct of the shingle industry. Planes, however, can cut wood in any direction, and oversized planes seem likely to have been the tool used to produce scaleboards. To Anderson's knowledge, only furniture makers might have used thin, smoothly finished ash boards like those seen in scaleboard bindings (2011). However, it is easy to imagine that printers would also have appreciated ash's hardness and rigidity if they were using scaleboard to register their type.

COVER MATERIALS

As in Miller's study, almost 75 percent of the scaleboard bindings examined were tight-backed books in full brown leather (see fig. 11). Forty-three were from Boston; the remaining 19 originated in cities from Philadelphia to Montpelier, Vermont. The imprints they contained dated from 1686 to 1820, and—with one exception—all the books printed prior

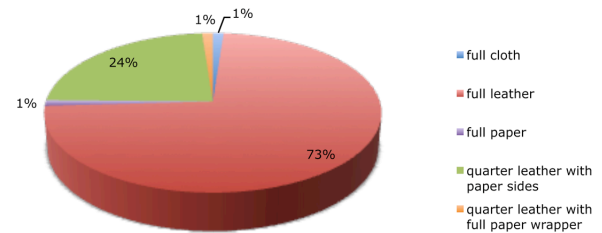


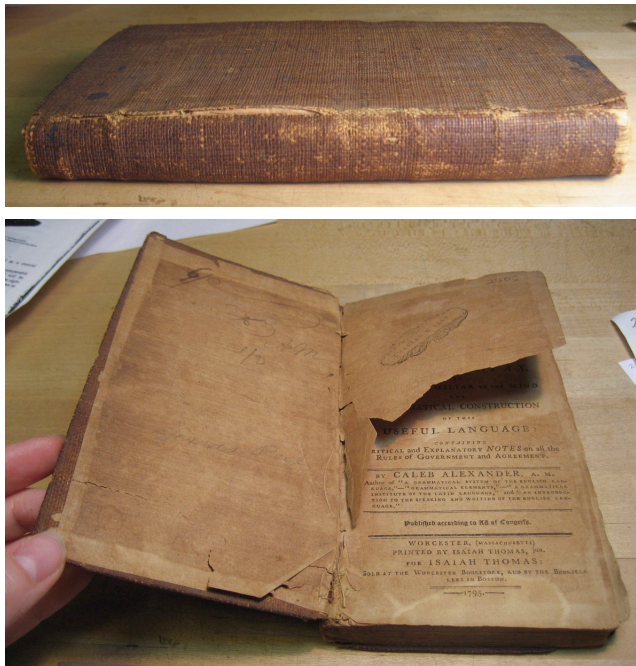
Fig. 11. Covering materials of scaleboard bindings

to 1790 were bound in full leather. Thereafter, the leather coverings began to be replaced by quarter-leather bindings with paper sides. A 1766 Philadelphia religious imprint was the first, with a sheepskin spine and marbled paper sides; the rest were printed between 1790 and 1833. The remaining books from the study group—a 1795 Worcester schoolbook, an 1803 Middletown book of sermons, and an 1820 Bellows Falls recipe book—were bound in unique ways: in full plain-weave canvas, full paste paper, and full printed blue paper over a sheepskin spine, respectively.

The books examined supported the notion that colonial binders made use of locally produced materials. In both full and quarter bindings, the leather usually displayed a wavy, linear follicle pattern and a tendency to delaminate, suggesting that it was sheepskin. Calfskin—another leather that could be produced in the colonies—also appeared to be present, but only in four of the bindings examined. Further study of the binding leathers would be required for definitive species identification.

The leather also underwent varying degrees of preparation prior to binding and during the process of fitting it to the boards. Sometimes it was quite thick and poorly pared, producing heavy endcaps; in the case of a 1742 Boston imprint, these caps were lower than the board edges and did little to protect the head and tail of the text block. The corners of full-leather bindings were also trimmed very little as a rule, with the turn-ins merely folded over one another like wrapping paper on a package. Such corners, which appeared in 58 percent of the leather bindings, were recorded as “lapped” corners. In corners that were mitered, the amount of leather left at the corner varied dramatically, and the turn-ins might meet each other or reveal the bare board between them. The turn-ins themselves were almost always irregularly trimmed, and varied from 2 mm to 3 cm in depth. The turn-ins at the head and tail were generally worked first, with the fore-edge turn-ins lapped over them. Many of these binding trends continued in the full bindings in cloth or paper, as well as the later quarter bindings.

Canvas was a relatively rare material for bookbinding prior to the introduction of impermeable, manufactured bookcloth in the 19th century, and its survival is always remarkable. Although the plain-weave canvas covering on a



Figs. 12a, 12b. Top: full canvas binding over raised cords on a 1795 schoolbook. Bottom: The canvas cover and outermost leaves are discolored and brittle, suggesting that the wood used in the scaleboards was unusually acidic. (Caleb Alexander, *A New Introduction to the Latin Language*. Worcester, [Mass.]: Printed by Isaiah Thomas, jun. for Isaiah Thomas, 1795. 17.4 x 10.6 x 1.9 cm) Photo by the author, courtesy of The Library Company of Philadelphia

1795 Latin textbook is now seriously discolored, apparently due to the acidity of the wood used in the scaleboards, the cloth in this case has proved to be almost as durable as leather (figs. 12a, 12b). The cover is plain, the corners are lapped in the usual way, and the canvas was not tied down over the raised cords on the spine. The rounded, backed spine, however, is unique. The unusual canvas cover suggests that the book might have been bound for the bookseller rather than the purchaser, or that parents buying schoolbooks commonly selected the cheapest permanent binding available (Leighton 1949).

In another experimental binding, paste paper alone was used to cover an 1803 book of sermons; losses along the spine and over the thongs indicate the weakness of paper as a covering material, at least without additional reinforcement at the spine (fig. 13). As in quarter bindings, the corners were lapped, perhaps to provide additional reinforcement for the fragile boards. Such a binding would have been less expensive and less durable than a full- or quarter-leather binding, although it was probably considered equally permanent.

Tight-backed, quarter-bound books with leather spines and paper sides were far more usual, particularly as the 18th century progressed. In this study as well as in Miller's, quarter bindings were found to utilize a variety of paper covering

materials, from the ubiquitous plain blue paper (see fig. 2) to various decorated papers. Printed waste on blue and white papers was used face-down to cover two children's books: a form of recycling for the binder, indicating the cheapest work. In general, the more expensive paste, marbled, and Dutch gilt papers were reserved for religious books and other literature, while cheap blue and brown papers were commonly used on schoolbooks, primers, and music books.

The latter—the three music books from the study group were all bound in quarter leather with blue paper sides—represent a special type of quarter binding. Because of the extreme width of their boards, books containing sheet music were particularly susceptible to damage and were provided with overcovers of thick leather or tawed skin. These covers often appeared homemade, with imperfect processing of the skin or amateurish blind tooling (fig. 14). In two cases, the overcover was folded over the boards and stitched in place with thread or string, with paper pastedowns adhered on top. In the third case, the stitching was absent, and the turn-ins of



Fig. 13. Full paste-paper binding: The decorative paper spine has largely worn away from the stabbed text block, and the tawed thongs are clearly visible beneath the paper. (Robert Russel, *Seven Sermons on Different Important Subjects*. Middletown, [Conn.]: Printed by T. & J. B. Dunning, 1803. 14.3 x 9.1 x 1.6 cm) Photo by the author, courtesy of The Library Company of Philadelphia



Fig. 14. The thick leather overcover on this music book, originally bound in quarter leather with blue paper sides, features amateurish blind tooling. (William Little, *The Easy Instructor*. Philadelphia: 1798. 14.0 x 23.5 x 3.7 cm) Photo by the author, courtesy of The Winterthur Library: Printed Book and Periodical Collection



Fig. 15. For this trade binding, a printed blue paper cover was adhered over a leather spine, which provided extra protection to the stabbed text block. (Thomas Fessenden, *Husbandman and Housewife*. Bellows Falls [Vermont]: Printed by Bill Blake and Co., 1820. 16.3 x 10.5 x 1.9 cm) Photo by the author, courtesy of The Winterthur Library: Printed Book and Periodical Collection

the overcover were secured with woven textile pastedowns. The scaleboards could often be detected on these books only through tears in the pastedowns or cuts in the overcovers, which indicate the owners' care for the much-used books.

Finally, a unique binding on an 1820 recipe book features a leather spine as for a quarter binding, but is fully covered in printed blue paper. The front cover is printed with the title page from the book, with an added border that resembles the tooling on a fine leather binding (fig. 15). The spine is printed with two labels displaying the book's title and price (50¢), suggesting that this book was bound prior to retail, with details that imitated the look of fine binding without the associated cost.³

COVER DECORATION

Full leather scaleboard bindings were decorated in a variety of styles, all fairly simple and modest. In general, the leather

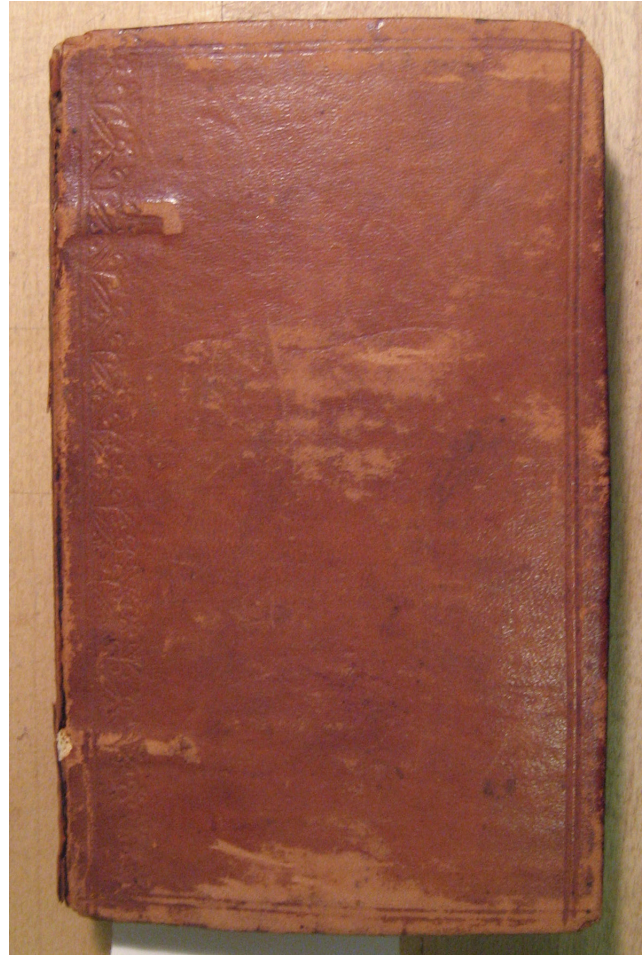


Fig. 16. Bordered panel with decorative roll along the spine edge (Henry Care, *English Liberties*, 5th ed. Boston: Printed by J. Franklin, for N. Buttolph, B. Eliot, and D. Henchman, 1721. 16.0 x 9.9 x 3.1 cm) Photo by the author, courtesy of The Library Company of Philadelphia

itself was plain (42 percent), sprinkled with stain (44 percent), or polished (16 percent). One binding was marbled with stain rather than sprinkled, and two bindings were both sprinkled and polished. The edges of the text block were sometimes left plain, but they were more often colored or sprinkled with dye or stain. These would have been relatively simple, quick methods for embellishing bindings, appropriate for books at the lower end of the market. The edge coloration suggests that the text edges were generally trimmed with a plough to create a smooth surface.

More than 30 percent of the full leather bindings had plain, untitled, and untooled covers, indicating their inexpensive, utilitarian manufacture. The remaining bindings were simply and often crudely blind-tooled. One Boston imprint with an otherwise plain cover had a decorative roll run along the spine edge of each board. Most frequently, the boards were bordered with double or triple fillet lines. Variations on

this theme included the use of a decorative roll rather than a fillet to produce the border (on a 1718 Philadelphia school-book), or the addition of extra fillet lines or rolls close to the spine edge in Massachusetts imprints, producing asymmetrical panels (see fig. 16). In six bindings, the board edges were also blind-tooled with a decorative roll.

In most cases, the books had flat or slightly rounded spines that were more often tooled than left plain. Usually, the binder tooled the spine with the same fillet used on the boards, either marking the endcaps only or dividing the spine into panels. Although each panel division was generally marked by a single tool strike, two tooled lines were occasionally used, and sometimes multiple fillets were grouped according to a pattern. In a spine with four panels, for example, the binder might employ single fillets at the endcaps, two fillets at the next station, and three fillets at the center of the spine. On some books, as Miller also found in her study, the fillet lines were markedly crooked.

When books in full leather were sewn on raised cords, the raised bands on the spine were treated in a variety of ways. In three of these books, the leather was not tied down over the cords, and the spine was perfectly plain. In a like number of cases, the leather was tied down over the cords but the spines were left untooled. Finally, the raised bands might be emphasized by tooled lines in blind or gold; the latter appeared on only three of the bindings.

While two-thirds of the full leather bindings examined were untitled or newly titled, 25 imprints—dating from 1713 to 1806—bore contemporary spine labels of gold-tooled leather or hand-written paper or vellum. One 1785 Boston imprint had an inscription (now illegible) inked directly onto the spine. Many of the books from the collection of the Historical Society of Pennsylvania possessed hand-written paper or vellum spine labels, apparently dating to the original bindings. In several cases, the labels overlapped the spine edges of the boards, and the rolls or fillets used to border the covers were impressed in the labels as well as the leather. The earliest labeled imprint from the study group is the 1713 New York printing of Joseph Morgan's *The Portsmouth Disputation Examined*; this imprint predates the earliest spine label mentioned in the literature by 13 years (French 1986).

None of the quarter bindings were titled on the spine, although one theological text had an illegible inscription in iron-gall ink on the front cover. Seventeen of the bindings featured plain spines. One 1766 Philadelphia imprint had blind-tooled oak leaves stamped in each panel between the raised cords, which had been tied down but not offset with tooling. Two 19th-century flat-spined bindings—one book of stories and one spelling book—had single gold-tooled fillet lines dividing the spine into panels: an unusual touch of elegance on otherwise unremarkable books for children.

Two full-leather bindings stood out because of their relatively sophisticated decorative schemes. The cover of

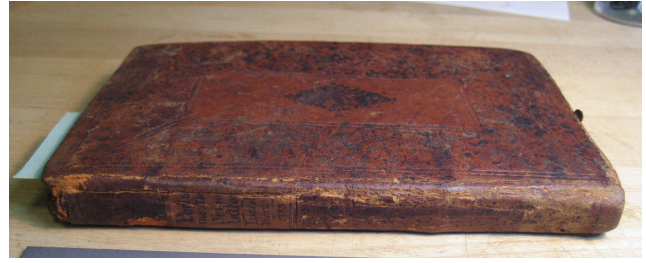


Fig. 17. Stenciled, sprinkled mitered panel with central lozenge from a 1713 New York imprint of Joseph Morgan's *The Portsmouth Disputation Examined*, printed and sold by William Bradford (16.1 x 10.5 x 1.7 cm) The grain of the scaleboard is vertical rather than horizontal. Photo by the author, courtesy of The Historical Society of Pennsylvania

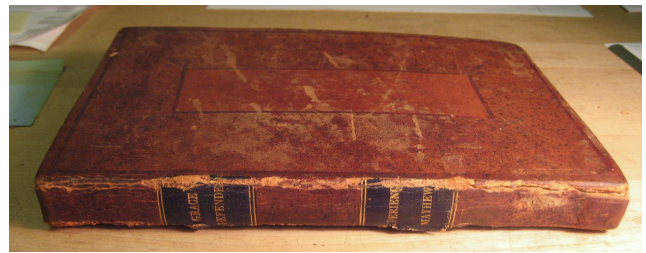


Fig. 18. Stenciled, sprinkled double-panel binding from a 1744 Boston imprint of Experience Mayhew's *Grace Defended, in a Modest Plea* (printed by B. Green and Company for D. Henchman in Cornhill; 20.5 x 13.6 x 2.9 cm) The front board is pasteboard rather than scaleboard and 5 mm longer than the back board. Photo by the author, courtesy of The Historical Society of Pennsylvania

the 1713 New York imprint mentioned above was tooled with a mitered double panel; a stencil was used to create a sprinkled outer panel and central lozenge (fig. 17). As Willman Spawn has noted, New York binders were the only colonists who placed central stamps on their bindings (1983). The cover of a 1744 Boston imprint of Experience Mayhew's *Grace Defended, in a Modest Plea* featured a blind-tooled double panel with fleurons stamped at the corners (fig. 18). The outer panel was sprinkled, but the inner panel was masked off and left plain. While these are not fine bindings, lavished with gold tooling, they represent an unusual investment in time on the part of the binder and of money on the part of the buyer.

One more full-leather binding deserves special attention because of its unusual construction (fig. 19). Although this 1771 Germantown imprint is bound in 2-mm-thick, vertical-grain scaleboard rather than shaped wooden boards, in all other ways it is a traditional German binding. The thick, solid text block of fine laid paper was sewn on five raised cords, and the spine was given a slight round and supplied with a textile spine lining, now visible at the torn head and tail caps. When the book was bound in scaleboard, the black, polished sheepskin cover was tied down over the cords. Thick



Fig. 19. Christopher Saur's 1771 Germantown imprint of Johann Philip Schabale's *Die Wandlende Seel, das ist: Sesprach* is a traditional German binding on vertical-grain scaleboard rather than shaped wooden boards, complete with raised cords, even squares, fore-edge clasps, and a thick text block with a slightly rounded spine (17.0 x 10.0 x 4.4 cm). Photo by the author, courtesy of The Library Company of Philadelphia

leather straps with metal hooks on the ends were nailed to the fore-edge of the lower board, and copper-alloy clasps were nailed to the upper. Notwithstanding its thin boards and plain cover, this sober and well-made book would have been relatively time-consuming and costly to produce. Like the two decorative bindings mentioned above, it illustrates the higher quality of some bindings in scaleboard.

DAMAGE AND REPAIRS

In scaleboard bindings, the usual weaknesses of paper and leather are compounded by the fragility of thin wood and the mechanical stresses produced by abbreviated binding structures. In addition to the damage normally associated with heavy use, such as torn endcaps and split hinges, scaleboard bindings often exhibit chipped corners, split boards, and insect damage. Ring-porous boards with more tangential character are particularly prone to splitting, often displaying limp leather over areas of board loss. Text loss is also common, particularly in stabbed bindings, which demand both flexible paper and flexible thongs in order to open well. With increasing age, rigidity, and use, the supports break at the hinges and sever the text-to-binding attachment. In an effort to combat these weaknesses, libraries and private owners have employed a variety of repair strategies, illustrating the enduring importance of these small, unpretentious books.

Failure of the binding leather is a common problem in scaleboard bindings, particularly at points of flexion (over the joints and spine), abrasion (at board corners and edges), and misuse (as at the headcap, which readers often use to pull books from the shelf). The leather joints in about one-third of the scaleboard bindings had failed partially or completely due to wear or to red rot, a condition in which sulfuric acid produced by environmental pollutants and tanning agents renders the leather weak, friable, and rust-red in color. The endcaps were missing or torn in approximately one-quarter of the books. Five books had been professionally rebacked,

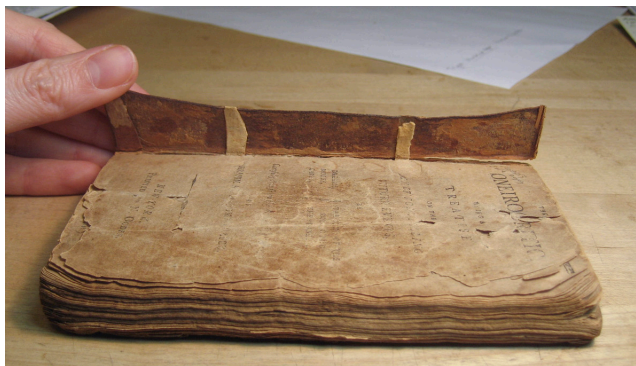
and the spines of others had been reinforced with cloth, paper, new leather, or synthetic materials. The split leather overcover of a music book had been repaired (or perhaps first assembled) by stabbing holes along the edges of the slit with an awl and sewing through them. Although the thread has since vanished, the repair provides evidence of the desire to protect and preserve the volume.

When paper was used to cover scaleboard bindings, it often abraded and tore; the colored papers were also prone to fading when exposed to light. The single full-paper binding in the survey suffered almost complete loss of the material over the spine, and the color of its paste paper is now difficult to discern (see fig. 13). The paper sides of several quarter-leather bindings displayed similar damage, with remnants of blue paper adhered only in scraps and tatters over the boards. The turn-ins and lapped paper corners, protected from abrasion and light damage on the insides of the boards, were more likely to remain intact. It is interesting to note that the single full-canvas binding—a precursor to the durable bookcloth case binding developed in the 19th century—fared comparatively well (see fig. 12a).

In stabbed bindings, the leather joints, inner hinges, and text-block supports were particularly susceptible to failure, resulting in partial or complete board detachment. In one book, the front board was entirely lost, leaving behind only the thong slips and leather spine that once secured it (fig. 20a). In music books, whose wide boards and text blocks increased the leverage along the joint and the likelihood of thong breakage, the heavy leather overcovers were probably designed to reinforce the board attachment. Even in smaller scaleboard bindings, board detachment had occurred in eight cases, not including the professionally rebacked books. Previous owners reattached boards in various ways, either tipping them to the flyleaves or, more surprisingly, punching holes in the thin wood with an awl and using thread to secure the boards to the text block.

Stabbed bindings were also particularly vulnerable to textual loss. If the thongs broke at the hinges or within the text block, the leaves could become detached; some books had experienced serious losses. In a case where the supports had broken at the hinge and the leather had pulled away from the spine of the text block, the book was in danger of falling out of its binding entirely (fig. 21). Past readers have reinforced the text-to-binding attachment in a number of ways, from reinforcing the hinges to running new supports through the leaves and securing them to the binding. Loose leaves or covers were often held in place with sewing thread or pins, sometimes with multiple repair campaigns and extensive stitching. These laborious homemade repairs show how deeply the books were valued by their owners, despite their plain bindings.

Of course, the thin, brittle scaleboards possessed their own vulnerabilities and vices. Chipped corners, split boards,



Figs. 20a, 20b. The front board of this quarter binding has become detached from the spine leather and thongs; loss of the paper over the sides may have contributed to board breakage and loss. ([Havez,] Ibrahim [Ali Mahomed]. *The Oneirocritic*. New York: Printed for N. Ogden, [1790.] 14.0 x 8.6 x 2.0 cm) Photo by the author, courtesy of The Library Company of Philadelphia



Fig. 21. This stabbed text block has pulled away from its tight-backed leather binding. (James Janeway, *Invisibles, Realities*. Boston: Reprinted by Tho. Fleet, for J. Blanchard, 1742. 14.0 x 8.8 x 2.4 cm) Photo by the author, courtesy of The Historical Society of Pennsylvania



Fig. 22. Two horizontal splits in the front board of this spelling book have been stitched back together with thread and then reinforced with straw paper; the tail has been oversewn to the spine leather. (Noah Webster, *Elementary Spelling Book*. Watertown, New York: Published by Knowlton and Rice, 1833. 17.6 x 10.8 x 2.0 cm) Photo by the author, courtesy of The Library Company of Philadelphia

and minor breakage were common in both full and quarter bindings, although paper loss over the boards of the latter dramatically increased the risk of substantial wood loss (fig. 20b). Books with vertical-grain boards sometimes lost half their covers, and insect damage was common. Acidic woods used in scaleboard may also result in damage to covering materials and the paper of the text block, as witnessed by the brittle, discolored canvas and endleaves in the full-cloth binding (fig. 12b). Book owners often repaired or reinforced broken boards by adhering twine or heavy paper over splits or stitching across the breaks. As in the stitched board reattachments, these efforts were often surprisingly successful (fig. 22).

IMPLICATIONS FOR THE CONSERVATION OF SCALEBOARD BINDINGS

In many ways, scaleboard bindings present familiar conservation problems: delaminating sheepskin, abrasion and wear at the corners, split hinges and joints, and the threat of textual loss. The two exceptions are the scaleboard itself, with its tendency to chip, fracture, and split, and the stabbed binding structure, which limits the opening of the book and places the text block in jeopardy. Despite the aggressively minimal way in which these books were bound, however, the majority—at least in this study group—were in surprisingly good shape. Even in dilapidated bindings, structural intervention is rarely called for. These rare and historic bindings, which represent the reading materials of the common people during the colonial period and the infancy of the United States, contain not only important texts but evidence of the tools and materials with which their binders worked. Their value as artifacts calls for a minimal, conservative approach to conservation, focused on preventive care, safe handling, and appropriate housing.

Proper care for scaleboard bindings begins with identification. As time allows, libraries with collections of early Americana should survey their holdings for small, plain books with the characteristic damage associated with scaleboard bindings: chipped corners, limp leather over split or broken boards, and visible wood grain in abraded areas, at the inner hinges, or under the pastedowns. Finding and identifying these hidden bindings—particularly if they are catalogued as such after discovery—will open new avenues for scholarly research as well as ensuring optimal treatment for the books.

By far the most effective way to protect scaleboard bindings is through proper storage and housing. Many of the bindings examined were sturdy and physically stable, and could be shelved upright without injury. However, the books' small size makes them vulnerable: they are easy to lose sight of, particularly in mixed ranges of books, and they may be shoved to the back of a shelf without notice. Whenever possible, scaleboard bindings should be shelved with other rare books of a similar size. Particularly small or damaged bindings should be provided with custom-made, hard-sided archival enclosures. In this study, many such books were shelved either tied with twill tape or housed in open paper envelopes. While this served the purpose of keeping the pieces of the book together, a rigid enclosure would provide more support. Very small scaleboard bindings may be housed in boxes larger than themselves, with custom-made inserts to hold the books securely and permit their safe removal (figs. 23a, 23b). Such boxes are also easier to locate and retrieve for library patrons.

Scaleboard bindings may be particularly vulnerable to fluctuations in temperature and humidity, which could promote expansion, contraction, and cracking of the thin, reactive wood. Ideally, they should also be stored in constant conditions of 18–20°C (64–68°F) and 45–55% relative humidity

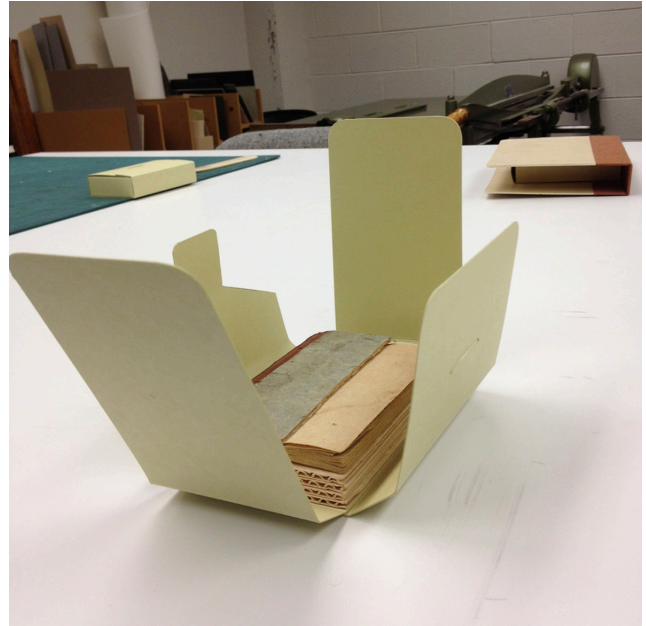


Fig. 23a. For very small books, a tuxedo box of alkaline cardstock built up with alkaline corrugated board provides rigid support.

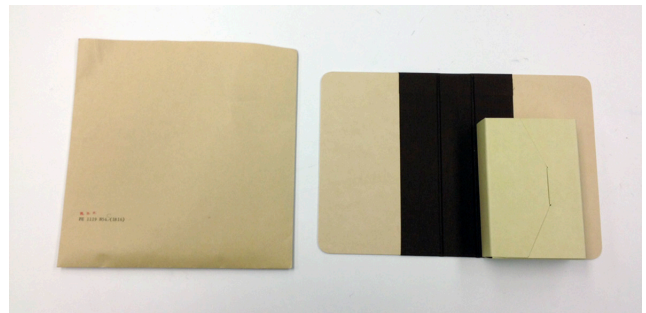


Fig. 23b. Adhering the tuxedo box within a pamphlet binder allows the book to be shelved upright: a sturdy, safe replacement for paper folders used as housings.

(Canadian Conservation Institute 1995). In private collections or small institutions where such tight environmental controls are impossible to maintain, the books should be stored in an interior space rather than against an outside wall; attics and basements should also be avoided because of their fluctuations in temperature and their increased risk of leaks. In such situations, protective enclosures would be doubly helpful, providing not only structural support but protection against environmental changes, light, atmospheric pollutants, insects, and dust.

Appropriate handling is also important for the long-term protection of these bindings. Stabbed books may open poorly, particularly if the paper of the text block is stiff and inflexible, if the book was stabbed too far into the spine margin, or if it was repaired with rigid materials at the hinge. Readers should be trained to open the books with care, never forcing the boards

or pages farther apart than they will easily go. They should also provide the book with appropriate support while reading. Many of the scaleboard bindings, such as the primers, are so small that reading them cradled within one hand may be safer than trying to use a standard book cradle and book weights. However, most may be safely used with small book cradles or cushions. Music books, with their longer boards and text blocks, are in particular need of support while reading.

If a scaleboard binding is selected for exhibition, it should be secured in a custom-made cradle that does not strain the fragile binding structure. If necessary, the leaves may be strapped with polyethylene strips to keep the book open, but the angle of display should not put stress on the spine. The page opening should be changed regularly, and the book should not be kept on prolonged display. Light levels should be low—50 lux or less—and ultraviolet illumination should be eliminated to protect the paper and media from photo-oxidation and fading.

Digitization projects, which are becoming more and more common as libraries attempt to increase Internet access to their collections, may present particular challenges where scaleboard bindings are concerned. Because the books often open poorly, flatbed scanners are not appropriate for digitizing them. Whenever possible, overhead scanners that can accommodate for the angle of the book opening should be used instead. Because of their historical importance, the books should not be disbound for imaging. If necessary, the processing of scaleboard bindings should be delayed until more flexible imaging equipment is available.

In some cases, minor aesthetic or structural conservation treatments may be desirable. Red-rotted leather—particularly common in 19th-century bindings—makes books dusty and difficult to handle. Torn endcaps and split joints can also increase the risks of handling or display. When necessary, the leather on scaleboard bindings may be consolidated or repaired with appropriate adhesives and mending tissues. Red-rot cocktail—a blend of equal parts dilute Klucel G in isopropanol, isopropanol, and SC6000, an acrylic-wax emulsion—is often chosen as a leather consolidant because of its apparent penetration and long-term flexibility, although it can darken the leather. Mending tissues employing Lascaux 498 HV, an acrylic dispersion that remains soluble in ethanol and isopropanol, provide a modicum of reversibility and protection against discoloration of the leather. In cases where less intervention is called for, the affected books should be provided with custom-made boxes or wrappers, both to contain any detached pieces and to protect other library materials from the fine red dust produced by the disintegrating leather.

Split or broken scaleboards may be similarly contained, or they may be mended using an appropriate conservation adhesive. Hot hide glue or gelatin is traditionally used for repairing wooden furniture, and it may also be used to mend

split boards. The repair campaigns of the books' prior owners also indicate that reinforcing the boards with paper may be sufficient to stop a crack from propagating or to keep a split board intact. A remoistenable tissue employing a thin, strong, translucent Japanese paper and an equal blend of methyl cellulose and wheat starch paste can be used for local, visually discreet board reinforcement, with or without an internal hide-glue or gelatin mend. This adhesive mixture, which can be reactivated with a blend of alcohol and water, limits the amount of moisture to which the boards are exposed, since absorption and drying could cause the wood to deform.

The thongs and cords used as binding supports, which are so often broken over the hinge or within the text block, should generally be left untouched, as replacing or repairing them makes the history of the binding difficult to decipher. Although damaged supports place the text block at risk, housing the affected books in archival boxes will prevent outright loss of information. In cases where books are heavily used, and their intellectual content is thought to outweigh their historical context, broken supports may be replaced by new alum-tawed thongs, cords, or linen or ramie tapes. Sewing over recessed cords, even where historically inaccurate, may be preferable to re-establishing a stabbed binding, as it places less strain on the text block; the existing spine notches may be utilized for this purpose. In any major treatment, of course, the historical structure of the book should be thoroughly documented before it is dismantled, and the original materials should be retained with the book.

In part because the books are so small and utilize high-quality handmade papers, the text blocks are usually in good condition, with few tears and losses. Like many books of this period, however, they are subject to iron-gall ink corrosion from the owners' inscriptions and annotations. If necessary, ink-damaged areas in scaleboard bindings may be reinforced with a thin solvent-activated mending paper, such as Berlin tissue coated with 2% Klucel G hydroxypropyl cellulose in ethanol (Pataki 2009). The adhesive on this fine, transparent repair material can be reactivated with small amounts of ethanol, limiting swelling of the cellulose during mending and reducing the stress on paper oxidized by the iron-gall ink. Although more invasive aqueous treatments for iron-gall ink exist, such as bathing the affected paper in a calcium phytate solution, this approach is not recommended for these rare, historically important books.

SCALEBOARD BINDINGS: CONCLUSIONS AND NEXT STEPS

This study of 85 scaleboard bindings from three library collections lends credence to existing scholarly research on these early American books while raising intriguing new questions. While most of the examined books were small and plain, with stabbed text blocks—reinforcing the notion that scaleboard

bindings were a cheap, utilitarian format—others made use of sturdy sewing structures, substantial endsheets, and elaborate decorative schemes. The care with which a few of the books were finished shows that scaleboard bindings could be elegant as well as crude. The overall progression in binding styles—from full leather and quarter bindings to innovative canvas, paste paper, and printed paper bindings—also illustrates the final evolutions in a chain of simplification and economy that began with the printing press and ended with the complete mechanization of the binding trade by the late 19th century.

The increased variety in content over the study period, which spanned from 1686 to 1833, clearly reveals both readers' changing tastes and the freedom offered by the expansion of printing from Boston and New England to the mid-Atlantic colonies. In addition to the expected schoolbooks and sermons, books in later decades also contained poetry, advice, etiquette, literature, and trade information. Sewn binding structures and double-folio endsheets were more common on these less ephemeral texts, suggesting that readers were willing to pay more for them.

Most surprisingly, the boards in nine bindings were identified as ash—a wood that has never before been identified with bookbinding and that may suggest linkages among bookbinders, printers, and the colonial furniture industry. However, multiple wood types were clearly represented in the scaleboard bindings examined, from diffuse-porous woods with very fine, even texture to ring-porous woods with distinct ray patterns. Further wood identification—coupled with study of historical records that document the early American printing, binding, and furniture industries—may help to establish the manufacturing origins of these thin, finished boards and to explain observed patterns of use.

Despite their fragile materials and rapid assembly, many of these books were designed to impress their buyers or recipients. Laborious homemade repairs also show how deeply the books were valued by their owners, despite their plain covers. These rare and historic bindings, which represent the reading materials of the common people during the colonial period and the infancy of the United States, contain not only important texts for average readers but evidence of the tools and materials with which their binders worked: a glimpse of the complex, changing intellectual and material contexts of the book in the transatlantic economy of the late 17th to early 19th centuries. Further identification, documentation, and preservation of such bindings will spur scholarly research and appropriate care for these unassuming but important books.

ACKNOWLEDGMENTS

Many generous souls helped with this research. Julia Miller provided enthusiastic support and guidance, as well as sharing her remarkable fund of existing data on scaleboard bindings. Emily Guthrie, Helena Richardson, and Chela

Metzger—Winterthur librarians and library conservator—spent hours with the author in the rare book stacks, searching for books in thin wooden boards. Book conservator Jennifer Rosner and other staff from the Library Company of Philadelphia combed the stacks of two institutions for scaleboard bindings Miller had not had time to examine, and allowed the author to work alongside the conservators in the Library Company bindery. Alice Austin shared her experiences with recreating scaleboard bindings, and showed the author the results of her labors. Mark Anderson and Stephanie Aufret performed initial assessments of the wood used in scaleboards, and Harry Alden donated his valuable time to make definitive identifications. Rebecca Smyrl valiantly and ably edited this manuscript. Finally, a George Stout Grant from the Foundation of the American Institute for Conservation made the presentation of this research possible.

NOTES

1. Julia Miller has since published a summary of her later research, which mirrors the results of this study: "Not Just Another Beautiful Book: A Typology of American Scaleboard Bindings," *Suave Mechanicals: Essays in the History of Bookbinding*, vol. 1, ed. Julia Miller (Ann Arbor, Mich.: The Legacy Press, 2013), 246–318.
2. Those who have attempted to recreate scaleboard bindings using thin plywood laminates—which should be more dimensionally stable than the veneer-like boards used in original bindings—still complained of the wood's reactivity to moisture when the leather was applied. Thanks to Alice Austin of The Library Company of Philadelphia for this piece of information.
3. According to the Federal Reserve Bank of Minneapolis, 50 cents in 1820 is the equivalent of \$8.35 in today's currency: a relatively inexpensive price for a book (www.minneapolisfed.org/community_education/teacher/calc/hist1800.cfm, accessed 10/05/2013).

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