

Newton in the Lab

While William Marshall Bullitt (1873-1957) is best remembered as a successful lawyer and outspoken critic of Alger Hiss, he had two private passions: mathematics and book collecting. In 1936, inspired by a discussion with mathematician G.H. Hardy, Bullitt set out to acquire first edition texts by 25 of history's most influential mathematicians. A decade later, he had assembled more than 300 volumes by 60 mathematicians and astronomers.

Upon Bullitt's death, his collection was donated to the University of Louisville, where it now makes up the William Marshall Bullitt Collection of Rare Mathematics and Astronomy. "The University of Louisville has been committed to providing an unusual degree of access to the rare volumes in this collection," says Delinda Stephens Buie, Curator of Rare Books at the University of Louisville's Archives and Special Collections. "We are determined to offer them through teaching and exhibition, and to scholars in our research room."

Several volumes from the collection recently came to CCAHA for treatment, thanks to a grant from the Stockman Family Foundation. Each of the treatises, which were published between 1537 and 1713, represents an important moment in the history of scientific publication. Two of these texts were written by Sir Isaac Newton.

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ABOVE RIGHT / *Inpainting the spine of Opticks (William Marshall Bullitt Collection of Rare Mathematics and Astronomy, University of Louisville)*

Establishing a Library for American Statesmen

The great collectors often desire to leave the world a physical legacy—whether it's Albert Barnes establishing the Barnes Foundation, Henry Huntington bequeathing his collection to the Huntington Library, or J.P. Morgan amassing the collection that would form the core of the Morgan Library & Museum. Their collecting vision lives on through these great institutions.

David Ridgely was a great American collector of the early 19th century. But unlike the collectors mentioned above, he did not build a private collection—rather, he worked as an employee of the state, building a library for statesmen. Viewed through a collector's eyes, his story is tragic—he built and lost a great collection. Fortunately, his legacy lives on in the Special Collections Room at Maryland State Law Library in Annapolis.

Over the past ten years, CCAHA has worked on two stellar projects for the Maryland State Law Library, neither one of which is typical of the material that you might expect to see in a State Law Library. In 2005 and 2006, CCAHA conservators treated *The Birds of America*, John James Audubon's magnificent contribution to American natural history. And this year, in our conservation laboratory, the CCAHA book conservators are working on Thomas McKenney's and James Hall's *The History of the Indian Tribes of North America*, a vitally important record of biographies and lithograph portraits of great Native American leaders of the early 19th century.

(continued on page 3)

LETTER

from the executive director



1 / *Inpainting the spine of Opticks (William Marshall Bullitt Collection of Rare Mathematics and Astronomy, University of Louisville)* **2 /** *The History of the Indian Tribes of North America (Maryland State Law Library)* **3 /** *a pull-out page of Opticks*

Dear Friends,

From e-readers to audiobooks, the landscape of books is changing before our eyes. At CCAHA, with book conservators and technicians trained to treat books from any period, we are constantly considering the intersections between books and the burgeoning digital world. We don't view the rise of the digital age as a harbinger of the decline of the printed book—rather, we see the two media developing alongside one another. And we're right there with them. We have extensive digital imaging capabilities, from scanning and optical character recognition (OCR) to creating pristine facsimiles that bring fragile books back into circulation.

In this issue of *Art-i-facts*, we celebrate book treatments. One article discusses several seminal volumes from the William Marshall Bullitt Collection of Rare Mathematics and Astronomy at the University of Louisville. We also reflect on our work on rare books at the Maryland State Law Library, many of which, like *The History of the Indian Tribes of North America*, were collected by the Library's first, visionary librarian.

This issue's technical article and High Watermarks offer resources on books and collecting. We also interview one of our veteran book conservators, Richard Homer, who shares his favorite treatments and thoughts on the future of book conservation.

Sincerely,

Laura Hartz Stanton
Executive Director

The Conservation Center for Art & Historic Artifacts (CCAHA) is a nonprofit conservation facility specializing in the treatment of works on paper, photographs, and books through conservation and state-of-the-art digital imaging services. Founded in 1977, CCAHA serves nonprofit cultural institutions, private individuals, and other collecting organizations. CCAHA's preservation services staff present educational programs, conduct preservation assessments, and develop emergency preparedness plans. CCAHA also offers fellowships, fundraising support, and disaster assistance.

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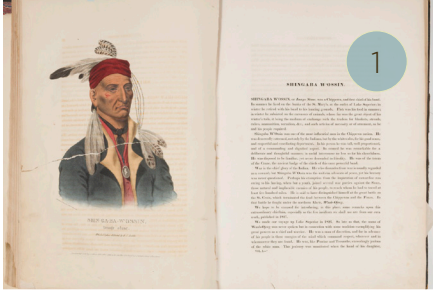
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1 / The History of the Indian Tribes of North America (Maryland State Law Library)

2 / Maryland State Law Library today

3 / The Birds of America on display at the Library

(Establishing a Library for American Statesmen, continued from page 1)

David Ridgely served as the first Maryland State librarian for fifteen years, from 1827 to 1842. Created to support the work of the Maryland General Assembly, the Maryland State Library was originally established with a broad mandate to address “all branches of knowledge.” While law books were certainly of greatest importance to the Assembly representatives, Ridgely embraced the larger mission implied in the mandate.

Nearly 200 years following Ridgely’s development of Maryland’s first state library collection, his personality continues to inform the material that he assembled for ready access by Maryland’s statesmen. While he collected the necessary law volumes, he clearly wanted a library that reflected the full scope of the young country. At the time of the books’ publication, Ridgely sensed the long-term importance of *The Birds of America*, *The History of the Indian Tribes of North America*, and other books, maps, and documents that he recommended for purchase. Through his collecting for the library, he pursued an ambitious, expansive vision.

Asked to conjecture on David Ridgely’s personality, Steve Anderson, Director of the Maryland State Law Library, ventured that he must have been a huge advocate for libraries and learning, adding that Ridgely was described as “zealous” by legislators. For instance, Ridgely pursued special permission to subscribe to Audubon’s *Birds of America* project—a hefty investment equivalent to \$23,000 in today’s currency—because he thought the volumes belonged in a library serving Maryland’s leading citizens. Similarly, the purchase of *The History of the Indian Tribes of North America* speaks to his convictions regarding the breadth of knowledge that Ridgely felt should be available to lawmakers.

Ridgely brought other star pieces to the library as well. He spearheaded the acquisition of the 1838 *Exploring Expedition*, a scientific study of the Pacific Ocean and America’s western coastline; a collection of the Acts of Congress featuring 90 manuscript signatures by Thomas Jefferson; a 1579 work by the important English legal writer Ferdinando Pulton; and the 1607 *Reports of Sir Edward Coke*, printed in three languages: “law French,” Latin, and English.

In 1842, Ridgely lost his position as State Librarian, forcing his immediate departure from the collection that he had so thoughtfully assembled. Serving as a political appointee of the governor, he was at the mercy of state politics. When leadership changed from Whig to Democrat, Ridgely was unceremoniously replaced.

Ridgely’s emotions are vividly apparent in a letter he wrote in 1844, begging for reappointment:

“I trust that the period of my Exile, from my home is near at hand; and that I shall through your kind consideration, be again reinstated in my own dear Library—the creation of fifteen years of my Life’s devoted attention and from which I was so heartlessly ejected.”

Ridgely’s personal story ended unhappily. He wasn’t a private collector, but a professional working for the public. The collection he amassed was not his own, and he was forced to leave it in the hands of others.

But even though Ridgely lost control of the library, the State retained it and has taken good care of preserving it, especially in recent years. In 1978, the Maryland State Library was moved under judicial rather than executive control and renamed the Maryland State Law Library. A secure and climate-controlled Special Collections Room was formally opened in 2005, preserving the core of the collection that Ridgely built. CCAHA conserved the Audubon *Birds of America* ten years ago, and continues to work on treasures from the collection today. As Steve Anderson says, “I think the Special Collections Room and its contents demonstrate that libraries are a crucial part of maintaining our cultural memory.”

Ultimately, the vision of David Ridgely has been respected. The Maryland State Law Library is big enough to accommodate the legal information that must center a law library, while still reflecting the ideals, natural history, and first inhabitants of a young country—Ridgely’s vision of a suitable library to support and guide the leading politicians of his time.

—LEE PRICE

Newton's most famous work is his *Philosophiæ Naturalis Principia Mathematica* (*Mathematical Principals of Natural Philosophy*)—today, simply referred to as *Principia*. Published in 1687, the text answered scientific questions with mathematical answers, laying the foundation for the modern field of physics and shaking the scholarly community to its core.

In *Principia*, Newton proposed three laws of motion. The first law states that an object in motion remains in motion. The second shows that the force on an object can be calculated by multiplying its mass and acceleration ($F=ma$). The third law states that any force on an object is met with an equal and opposite force. Building off of these three principles, Newton also proposed a law of universal gravitation and theory on planetary movement. The publication of *Principia* launched Newton into the stratosphere of 17th-century scientific celebrity. The work's legacy is staggering—some credit the text for single-handedly inspiring the Scientific and Industrial Revolutions.

Even a work as monumental as *Principia* will have errors, however. Printing in the 1680s was a lengthy process. If discrepancies were discovered after the main text was printed, an "errata" sheet was commonly added to the volume. It is this errata sheet that makes the University of Louisville's *Principia* particularly notable.

The errata page of Principia, with Newton's handwritten emendations (William Marshall Bullitt Collection of Rare Mathematics and Astronomy, University of Louisville)

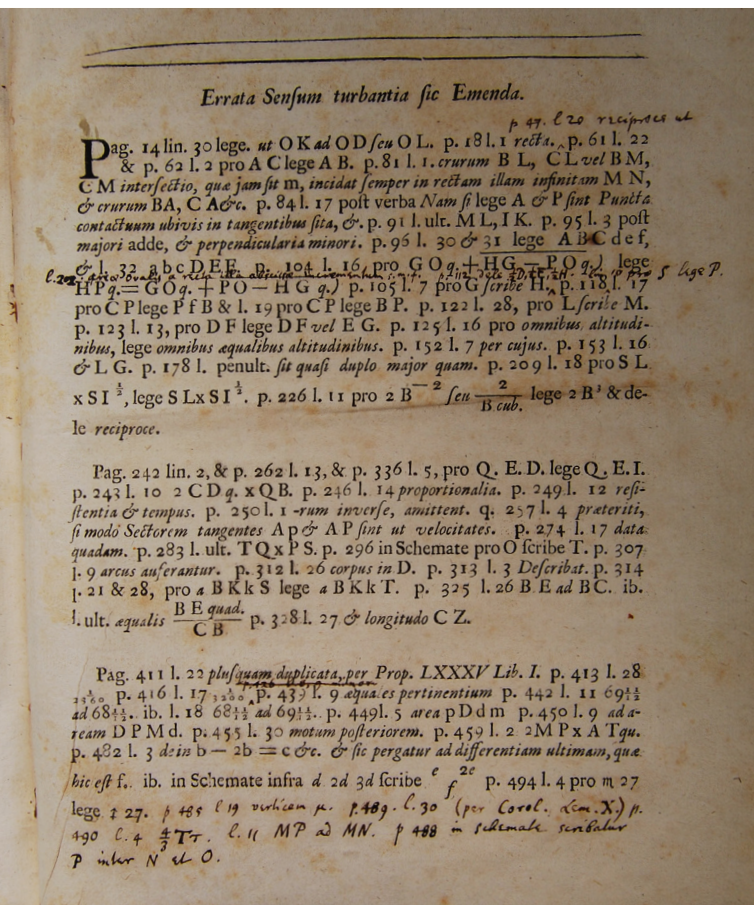
In 17th-century England, influential academics often had patrons—wealthy benefactors who provided the means for the scholars to carry out their work. One of Newton's patrons was the Earl of Halifax, a wealthy aristocrat who met Newton at the University of Cambridge. Impressed with Newton's ingenuity, the Earl supported the mathematician's scholarly pursuits. It was most likely gratitude, therefore, which moved Newton to add several lines of handwritten emendations to the errata page of the copy of *Principia* that he presented to Halifax. Written in Newton's neat hand, these lines, as well as a few interlinear notations, ensured that Halifax received the most up-to-date iteration of the first edition. In order to prepare the book for display, CCAHA conservators cleaned the pages, mended the cover, and reattached disengaged pages.

The University of Louisville also brought Newton's treatise on optical science to CCAHA. In the third century BCE, philosophers hypothesized that "pure" light, like that from the sun, was white. This theory held until two millennia later, when Newton proposed that light is actually composed of various hues. He published these views in a revolutionary text called *Opticks*—the first scientific text to be published in English instead of Latin. Newton illustrated his points with beautiful foldout diagrams of prisms and refractions. Though not all of Newton's assertions from *Opticks* are still accepted as scientific fact, the work remains a significant turning point in the history of understanding light.

The 1704 first edition that came to CCAHA needed repair. "The book's text and lovely plates were in exceptional condition but its early 18th-century binding was so badly compromised that we reluctantly withheld it from study and exhibition for some years," says Buie. When the volume arrived at CCAHA, both cover boards were detached, and the text block and spine had split into two pieces. Book Conservator Renée Wolcott removed the existing spine—weak, powdery leather from a previous restoration—and cleaned the exposed spine of the text block. She then added new sewing supports of linen cord, reinforced the book's broken sewing, and rebaked the book with cotton cloth and mulberry paper. After mending the rest of the cover with mulberry paper, she toned the new spine and mended areas with acrylic paints to blend with the original leather. She also cleaned the leaves and plates of the volume, fixed dog-eared pages, and mended tears with thin mulberry paper and wheat starch paste.

Bullitt's generosity parallels that of Halifax, some three centuries later. Both took an interest in mathematics, physics, and the works of Newton. We have Halifax to thank for the exciting, handwritten errata page of this text of *Principia*, and Bullitt to thank for donating the volume to be shared with the public. With CCAHA's help, the University of Louisville will be able to display both of the Newton texts for years to come.

—AMY HEUER





A GUIDE TO

BOOK STRUCTURE TERMINOLOGY

A BOOK HAS TWO BASIC PARTS: THE **TEXT** AND THE **COVER**.

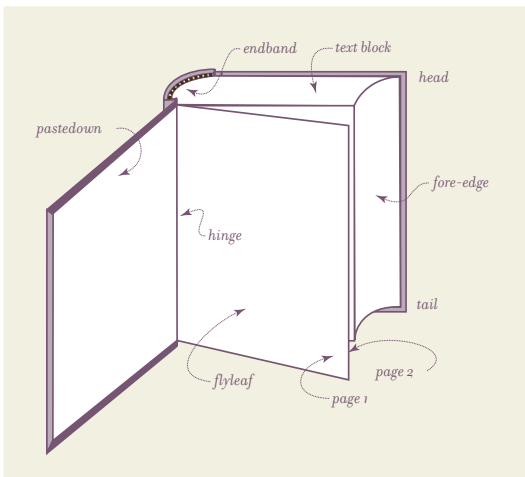


fig. 1 The bound book or codex

The hand-written, printed, or blank leaves of a book are known as the **TEXT BLOCK** or **BOOK BLOCK**. As you flip through the text block, you are turning the leaves of the book. Each **LEAF** has two sides; each side is a **PAGE**. The top of the book is known as its **HEAD**; the bottom is known as its **TAIL**. The edge of the book opposite the spine, where the leaf edges are, is called the **FORE-EDGE**.

ENDLEAVES, (also known as **ENDPAPERS** or **ENDSHEETS**) are extra sheets of folded paper or parchment that help protect the text block and attach it to the book cover. The leaf attached to the inside of the cover is known as a **PASTEDOWN**. The extra blank leaves before and after the text block are known as **FLYLEAVES**.

The material covering the gap between the board and the text block on the inside of the binding is known as the **HINGE**. Medieval binders often added additional sewing supports at the head and tail of the spine, known as **ENDBANDS**.

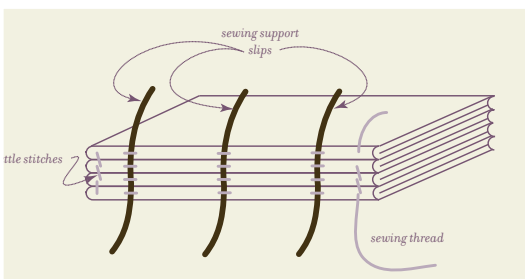


fig. 2 Text block sewn all-along on three raised cords

There are many methods of binding. Traditionally, three-dimensional sewing supports—including the endband slips—stood raised along the spine of the text block, and the sewing thread was looped around each one in turn. This is called **ALL-ALONG SEWING**. In the sturdiest books, each section in turn is sewn through the spine fold with the sewing thread looped around **SEWING SUPPORTS** of alum-tawed skin, leather, parchment, linen cord, or woven tapes. The free ends of these sewing supports are known as **SLIPS**, and they are used to attach the book cover boards. The unsupported linking stitches at the head and tail of the spine are known as **KETTLE STITCHES**.

—RENÉE WOLCOTT



QUESTIONS

for Richard Homer

Book Conservator / Education: Bookbinding Program at North Bennet Street School / **Years at CCAHA:** 15

How did you get into book conservation?

I was the editor of my high school's literary arts publication, which combined my interests in art and English. But I didn't have the focus to create as an artist or a writer. Bookbinding—and, to a greater degree, book conservation—allowed for a fusion of various intellectual and material disciplines, and channeled my interests by linking them to pre-existing needs.

Where did you first train as a book conservator?

I have a diploma from the North Bennet Street School bookbinding program. The program focuses on a variety of historical book structures and offers plenty of hands-on experience making models, repairing books, and learning conservation principles.

What is the best part of being a book conservator?

The broad array of work. We have books come to us from families, large institutions, and collectors, so we get to work on items from many time periods with different needs and we meet with a great mix of people with a range of concerns.

What are some of your favorite projects from your time at CCAHA?

Some of my favorite projects have been full of problem-solving, which can be quite rewarding. Other projects are special because the material itself is amazing—a joy to handle and examine. I was especially happy to be able to treat a set of three 18th-century volumes by Sir William Hamilton, the *Campi Phlegraei*, which detailed the eruptions of Vesuvius in the 1770s. The volumes include many dramatic, hand-colored engravings of volcanoes, and only slightly less-dramatic views of the excavation of Pompeii.

What is the most challenging project you've done at CCAHA?

A couple of projects spring to mind. An art museum brought in a small book that had belonged to a Dada artist. It had been printed in Germany in the 1920s, which means that it was made with poor quality paper that was extremely brittle. The artist/author had collaged the outside of the book, but, during treatment, we had to think carefully about how to repair the binding without compromising the artwork on the cover. Another particularly challenging project was treating the gigantic elephant folios of Audubon's *Birds of America*. We had to use a number of non-standard tools and techniques to complete our work.

What is the most surprising aspect being a book conservator?

When people think about book conservation, I suspect they often visualize the work that is needed on the cover of the book—reattaching covers, repairing the spine, and so on. But we often have hundreds of pages within the book to treat as well. So in addition to being book conservators, we are often acting as paper conservators. The multitude of mends throughout the leaves of the book can often take significantly longer than the more noticeable improvements on the binding.

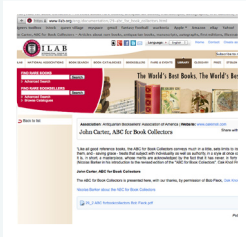
Where do you see the field of book conservation heading?

It is clear that digitization is providing increased accessibility to a large body of material that would have been either too fragile or too rare for most people to enjoy. Book conservation needs to adapt to these changes by increasing respect for the book as an artifact without completely closing off the possibility that people will still want physical access to books. The culture may become more starved for a different tactile experience than stroking glass. So the balance between preservation and accessibility is still an ongoing concern in book conservation, even though technology has reshaped that concern.

—AMY HEUER

HIGH WATERMARKS

In each newsletter, CCAHA highlights several books or websites we think will be of interest to collectors, conservators, and collections managers.



ABC FOR BOOK COLLECTORS

John Carter published the first edition of *ABC for Book Collectors* in 1952. Seven editions later, the book has retained its

place as a perennial resource for beginning and experienced book collectors alike. With almost 500 alphabetized entries on book-collecting terminology, the three-hundred page volume covers people, concepts, and terms from “Advance Copy” to “Zinco.” The book is available for free, online, through the International League of Antiquarian Booksellers’ website.

>> www.ilab.org/eng/documentation/29-abc_for_book_collectors.html

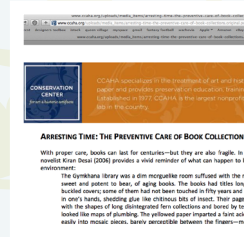


THE ARCHIMEDES PALIMPEST

The *Archimedes Palimpsest* website chronicles the conservation, research, and imaging of the manuscript known as the Archimedes Palimpsest. The book, which

resides at the Walters Art Museum in Baltimore, is ostensibly a 13th-century Byzantine prayer book. The manuscript was constructed, however, with recycled pages torn from seven treatises by ancient mathematician Archimedes. The Archimedes Palimpsest Project is the initiative to research and image the important mathematical treatises contained within.

>> www.archimedespalimpsest.org

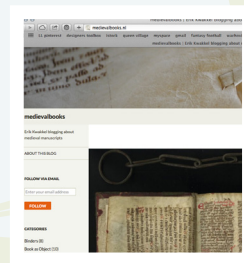


ARRESTING TIME: THE PREVENTIVE CARE OF BOOK COLLECTIONS

CCAHA’s Resources page features several guides for book preservation, including “Arresting Time: The Preventive Care

of Book Collections.” This six-page resource offers basic preservation guidelines for book collections, covering such topics as light levels, humidity, pest management, storage, and handling.

>> www.ccaha.org/uploads/media_items/arresting-time-the-preventive-care-of-book-collections.original.pdf



MEDIEVAL BOOKS BLOG

Erik Kwakkel is a book historian at Leiden University in the Netherlands. His Medieval Books blog has garnered attention across the internet for its entries on

interlinear notations, illustrations, and binding techniques. With posts like “Medieval Speech Bubbles,” “The Medieval Origins of the Modern Footnote,” and “Medieval Selfies,” the blog has something for everyone.

>> medievalbooks.nl



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CALENDAR

of events

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Throughout the year, CCAHA offers a number of programs to provide staff at collecting institutions with the knowledge and skills to support their collections care efforts. To register for any of these programs, please visit our website at

www.ccaha.org/education/program-calendar