

AKIH24

**The Conservation Treatment
of the Diary of John B. Minor
and the Faculty Chairman's
Journal 1861 – 1864**

Andrea Hall
2013 Summer Conservation Intern

This summer, I was chosen as the fourth annual Conservation Intern at the University of Virginia. I was selected to treat two items from the Albert and Shirley Small Special Collections Library, the Diary of John B. Minor, written from 1843 to 1873 and the Faculty Chairman's Journal 1861-1864. Both books are regularly used by researchers, faculty and students at the University of Virginia. Each had their own conservation issues and were very interesting to work with.

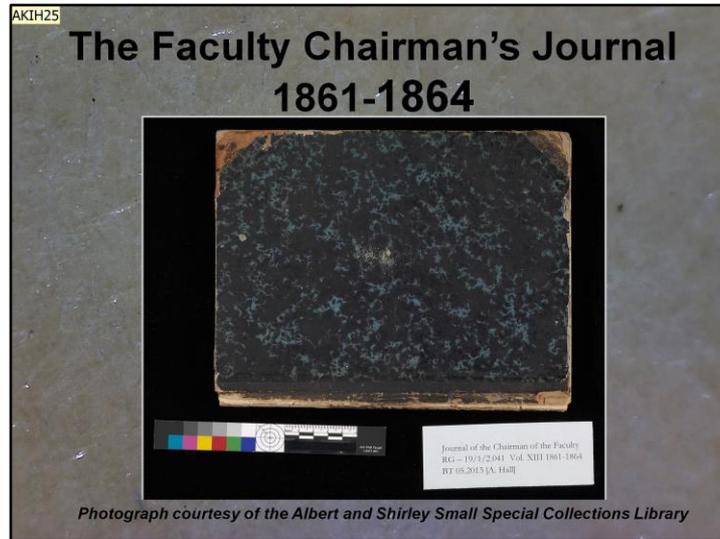


In order to be selected for an internship of this caliber, I had to come to the table with a very competitive application. All aspiring conservators who intend to go to graduate school have to complete courses in basic and organic chemistry, art history and the studio arts. In addition to this high level of education, “pre-program” hands-on conservation experience under the supervision of a senior conservator is required. I myself have just over 3,000 hours of experience, having worked on paintings, archaeological objects, books, art on paper, and natural history specimens. Most recently, I have worked as a Conservation Technician at a private conservation lab that specializes in books and paper.

Internship Goals

- **Make the items safe for handling**
 - Stabilize the items physically
 - Increase longevity through conservation treatment
- **Continue to develop my portfolio in preparation for applying to graduate programs in art conservation**

There were two main goals of this internship. First and foremost, the items needed to be made safe for handling once more. When each item came to me, they were no longer functional for safe use by faculty, students and visiting researchers. Through conservation treatment, the aim was to increase the stability and longevity of the items. Additionally, I had the personal goal of developing my portfolio with the two high level treatments in preparation for applying to graduate school. Happily, both of these goals were realized.



This is a “before treatment” image taken by the Library’s Digital Services unit. All conservation treatment is documented in writing and with photographs as a permanent record of condition and the process of treatment. As you can see from this “before” image, the Faculty Chairman’s Journal was in poor condition. One of the cover boards was detached and the sewing had broken in a number of places. Additionally, the decorative paper and leather on the cover boards was worn and lifting.

Treatment Plan

- *Remove original spine piece*
- Disbind textblock
- Clean pages with vinyl eraser crumbs
- Guard pages with Japanese tissue
- *Resew textblock*
- *Reattach boards and original spine*

A treatment plan was developed in consultation with Eliza Gilligan, Book Conservator and Edward Gaynor, the curator for the collection. The items in italics will be discussed further in the following slides.

AKI16

Facing and Removing the Spine



This is a close up of the original spine leather on the Faculty Chairman's journal. There were two remnant pieces that were quite worn. However, in order to access the textblock to dis-bind it and replace the sewing, the original spine pieces had to be lifted out of the way- a process called "facing".

AKIH7

Facing and Removing the Spine



Facing involves applying a reversible adhesive to the surface of the spine piece and attaching a physical support. In this case, I used plastic wrap. The plastic wrap provides structural support on the top layer of the leather while the piece is mechanically separated from the textblock with the use of a scalpel or microspatula. Given that there were two remnants of the original spine leather, the plastic wrap facing also keeps the pieces in their original orientation so they can be put back in the proper place.

AKIH8

Facing and Removing the Spine



Photographs courtesy of Eliza Gilligan, Conservator for University Library Collections

In the photo on the left, you can see the application of the adhesive and plastic wrap. On the right is an image of the spine, after it has been removed from the textblock, with the facing still attached.

AKI19

Facing and Removing the Spine



The spine is adhered to a piece of Japanese tissue and the facing is removed

Once the original spine pieces were removed from the textblock, it was adhered to a piece of Japanese tissue and the facing was removed

AKIH10

Resewing the Textblock

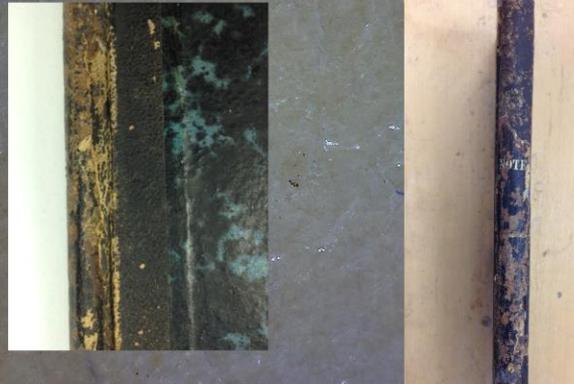


Photograph courtesy of Eliza Gilligan, Conservator for University Library Collections

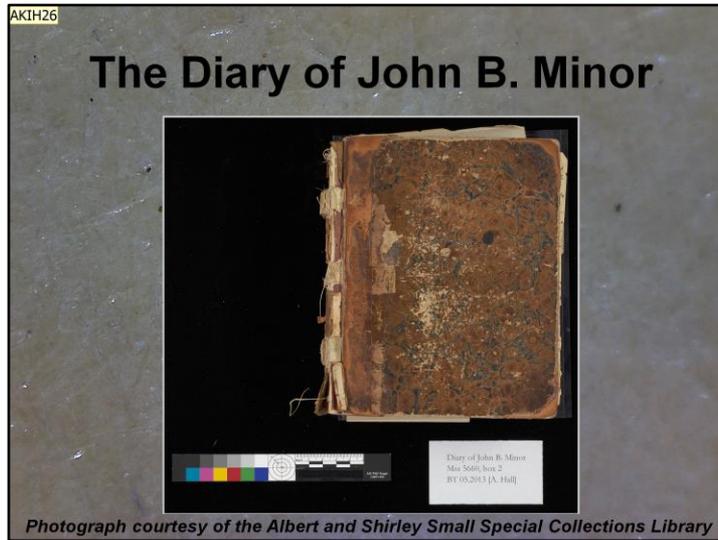
After the spine leather was removed, the book was dis-bound, cleaned and mended. The re-sewing of the textblock took some careful consideration. In its original state the book had very irregular sewing holes. There was evidence of an erroneously placed set of kerfs (sawn-in sewing holes) next to the ones actually used. In addition, the book was sewn on sawn-in cords, which offered a level of support not necessary to a textblock as thin as the Faculty Chairman's Journal. Sewing supports are normally used on larger books with heavier textblocks. Generally, the conservator attempts to recreate the original conditions of the book. However, in this case, I re-sewed the book using the original sewing holes but with an unsupported (just thread) chain stitch.

AKIH11

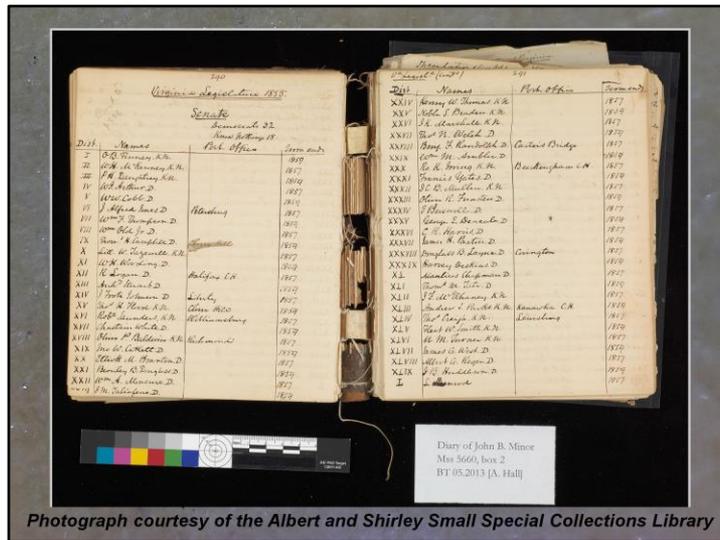
Reattaching the Boards and Spine Piece



The final step of the treatment was to reattach the original cover boards and the spine pieces. Because there was only a small portion of the original spine left, airplane linen was used to line the spine of the textblock and it was toned with acrylic paint to blend in with the leather of the original spine pieces and the cover boards.



As you can see in this “before treatment” image, the Diary of John B. Minor was also in poor condition. The original spine leather was missing, the cover boards are detached, and the sewing is broken in several places. Numerous pages were detached and their edges had crumbled away resulting in loss of text. There were also accompanying materials tucked into the back of the book.



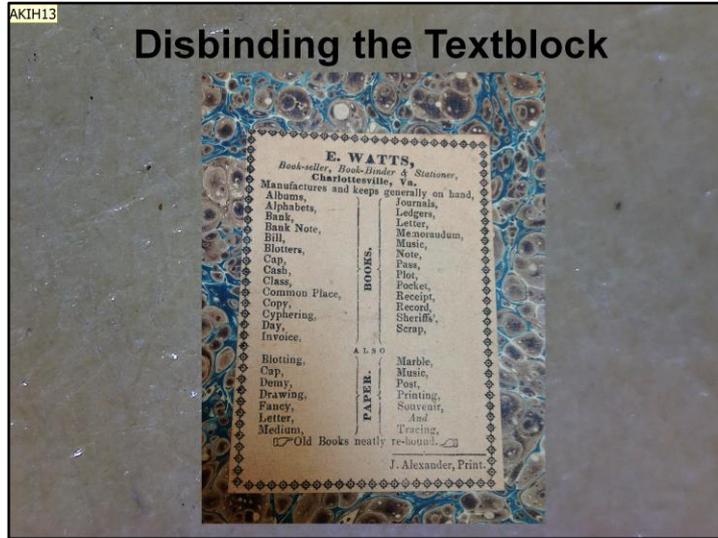
A “before treatment” image showing the broken sewing and the condition of the paper and ink.

Treatment Plan

- *Disbind textblock*
- Clean pages with vinyl eraser crumbs, hake brush, and HEPA filter vacuum
- *Wash pages with phytate treatment and alkalizing bath*
- Encapsulate pages in mylar

As with the Faculty Chairman's Journal, a treatment plan was developed for the Diary, also in consultation with Eliza Gilligan and Edward Gaynor. The items in italics will be discussed further in the following slides.

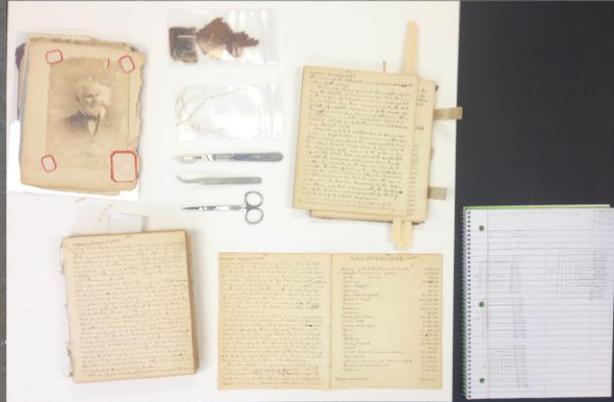
Disbinding the Textblock



In this case, the binding was important to the history of Charlottesville as well. Ebenezer Watts was a well-known bookbinder and stationer in Charlottesville. He also published Charlottesville's first newspaper, the Central Gazette in 1820. Because of the importance of the binder, the sewing structure was diagrammed for documentation and the original boards will be stored with the diary.

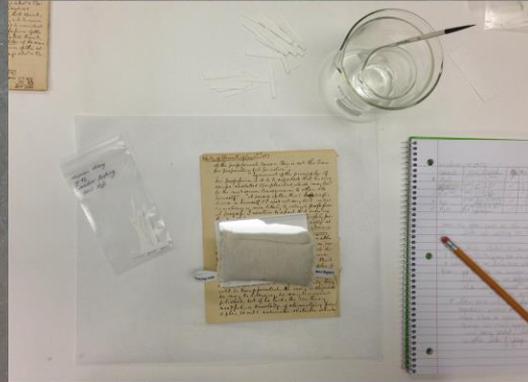
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Disbinding the Textblock

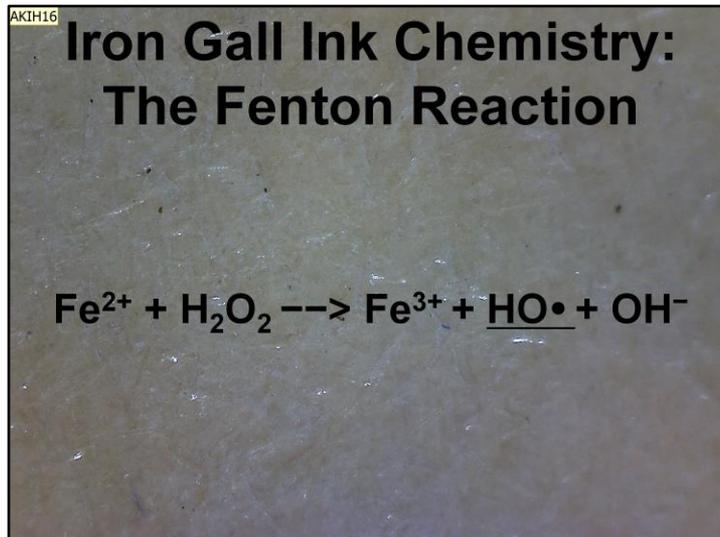


In this photo, you can see the textblock as it is being dis-bound as well as the mapping that is done during dis-binding. In the notebook on the right, I drew a diagram for myself to indicate which pages belonged in which signatures. This can be very helpful during washing when pages can be placed to dry out of order and then need to be reassembled. John B. Minor made the task of mapping a bit easier for me by hand numbering the pages. In the upper left of the image, you can see the accompanying materials, including an albumen print photograph of John B. Minor.

Preparing for Washing: Media Testing



Before a document can be washed, the media has to be tested to make sure it is insoluble. Using a very small brush, solvents such as water and combinations of ethanol and water were applied to specific areas of the ink. The behavior of the ink was then monitored. From testing, it was determined that all but one section of the book, which was penned in a different ink, could be safely washed in water.



The majority of the ink used to write the diary was iron-gall ink. This type of ink was very common until the mid-19th century. Unfortunately, as it ages, iron-gall ink can cause a lot of damage to the paper it has been applied to. There are three types of iron present during the creation and aging of iron-gall ink: ferric pyrogallate, iron (III) ions, and iron (II) ions. Ferric pyrogallate is a stable form iron which has complexed with gallic acid during the creation of the ink. It is the form of iron responsible for the dark brown-black color of iron-gall ink. Iron (III) ions which were not complexed with gallic acid are also present. These iron (III) ions, which are insoluble, oxidize to the third type of iron found, iron (II) ions, which are water soluble. It is the iron (II) ions which are responsible for the reaction seen here. The Fenton Reaction creates a hydroxyl radical (see underlined) which is very unstable and is very likely to abstract, or capture a hydrogen ion from the cellulose chains of the paper. This begins a process of radical oxidation which can severely degrade the paper over time.

AKIH17

Iron Gall Ink Degradation



- Corrosion
- Haloing
- Drop out

As you can see here, iron-gall ink degradation can be dramatic. Washing with phytic acid is a method of preventing some of this potential damage.

Washing with Phyte

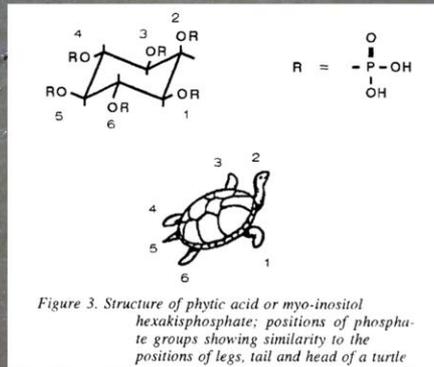


Figure 3. Structure of phytic acid or myo-inositol hexakisphosphate; positions of phosphate groups showing similarity to the positions of legs, tail and head of a turtle

Neevel, J.G., http://www.iada-home.org/ta95_093.pdf

Phytic acid, or myo-inositol hexakisphosphate, is used to chelate, or bind with, insoluble iron (III) ions present in the iron-gall ink. The goal is to chelate the entirety of the un-complexed iron (III) ions to prevent the Fenton reaction from occurring.

Washing with Phytate

- Two water baths of deionized water to remove water soluble degradation products
- Phytate bath to chelate uncomplexed iron(III) ions
- Two rinse baths of deionized water to remove excess phytic acid and chelated iron(III)
- Alkalizing bath in saturated calcium bicarbonate solution

Washing with phytic acid involves many steps. Generally, washing involves two water baths and an alkalizing bath. The phytate treatment requires quite a few more baths, though. These many baths are critical to wash out the water soluble iron (II) ions, chelate the iron (III) ions, and then thoroughly rinse the excess phytic acid and chelated iron (III) from the paper.

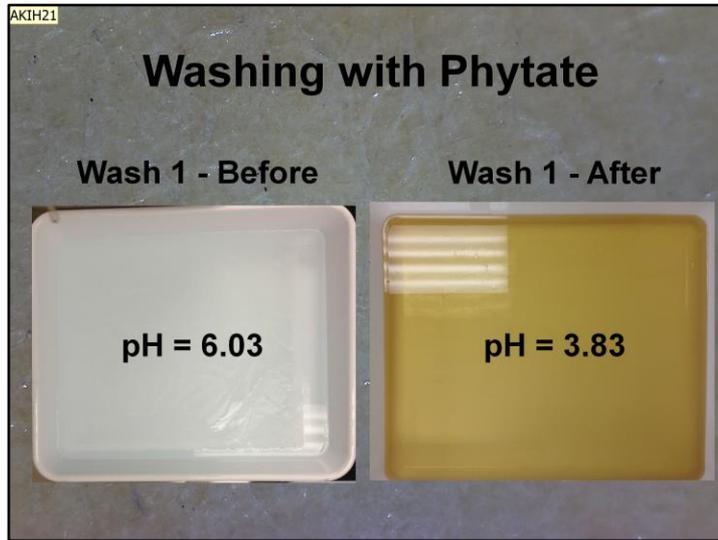
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Washing with Phytate



Photograph courtesy of Eliza Gilligan, Conservator for University Library Collections

The pages are transferred from bath to bath between layers of Hollytex, a non-woven polyester support material used in conservation.



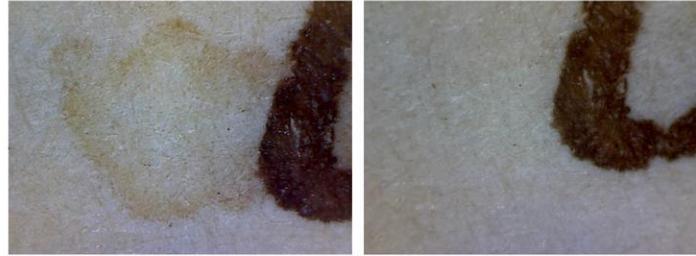
The amount of acidic degradation product washed out of paper during a bath can be staggering. You can see a dramatic color difference between the before and after images here. A drop of 3 pH points indicates a 1,000 fold increase in hydronium ions in solution. Reducing these degradation products during washing really increases the flexibility of the paper, in addition to brightening it up.

AKIH22

Washing with Phytate

Before washing

After washing



You can also see a difference on the micro level. The washing successfully removed embedded dirt and degradation products but left the ink layer intact, which is exactly what is hoped for!

End Result

- **Both items are now safe to handle again**
- **Their longevity has been increased through physical stabilization and chemical treatments**
- **Digitization efforts will increase the longevity of these items further**

Both books will be returned to the Special Collections, digitized and made available for research.

Acknowledgements

- **Eliza Gilligan, Kara McClurken, and the staff of Preservation Services at UVa**
- **Bruce Hunter, UVa Volunteer**

Questions?

Andrea Hall

akihall@gmail.com

Akihall.wordpress.com