

## An Investigation and Treatment of an Uncommon Ethiopian Binding and Consideration of its Historical Context

### ABSTRACT

The conventional understanding of Ethiopian bindings is that book design and sewing patterns are more uniform and predictable than their western counterparts. In general, the three major characteristics of Ethiopian bindings are text blocks without a square; wooden boards sewn on with the thread used to attach the sections; and link stitch sewing consisting of even numbered sewing stations. Each two stations utilize one length of thread and two needles. It is the cause and effect of the relationship between the number of needles to sewing holes that presupposes Ethiopian bindings will have two, four, or six stations, dependant on the size of the volume.

MS 93 of the Thomas Kane collection in the African and Middle East Division at the Library of Congress has the hallmarks of a traditionally bound Ethiopian manuscript in all regards with the notable exception of a third sewing hole located in the middle of each section. The anomalous sewing pattern was discovered when the volume came into the conservation lab in 2006 for extensive treatment. The presence of odd numbered sewing stations led to multiple questions that needed to be addressed prior to treatment. Research into these questions led to conversations with other conservators and experts from other fields, including historians and curators. The resulting information and the treatment protocol that was developed as a result are the basis for this paper.

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Within conservation and bookbinding literature there is relatively little information on the treatment of bound manuscripts from Ethiopia. The primary reason for this fact is the scarcity of Ethiopian collections in western libraries. In the United States, few institutions have Ethiopian specialists or an active acquisition program devoted to Ethiopic materials. A probable secondary reason for the lack of conservation

literature is the apparent uniform nature of the Ethiopian binding style. The three most common characteristics are: sewn boards, a method of attachment in which the thread used for sewing the sections is also sewn through board and serves as the connection between text block and cover; text blocks with no square, meaning that the text block and cover boards have the same height and width dimensions; and paired sewing stations. The paired sewing stations in Ethiopian bindings are a result of a needle placed on each end of a piece of sewing thread. The result is separate groupings of link stitch sewing with two sewing stations per grouping, one for each needle. The path of the thread is not all along as is common to the western tradition. Instead, each grouping progresses independently up the spine. For example, in a book with four stations, the most common number found in Ethiopian sewing, there is no thread that connects stations one and two to stations three and four; they are not joined in any way. A book with four stations will be sewn with four needles.

The sections of conservation literature devoted to discussion of Ethiopian sewing emphasize the paired stations. In a 1962 article in the journal *Library*, Berthe van Regemorter (87) states:

An Ethiopian book is never sewn with one thread beginning at the tail of the quire and going up to the head before entering the next quire. The centre of the quires always have an even number of holes. A thread will be passed through number 1 and then go through number 2. Another thread will go through number 3 and number 4,....

Sydney Cockerell's 1977 article (*Ethiopian Binding*, 7–8) reports similar findings as does Sergew Salissie's 1981 publication, *Bookmaking in Ethiopia* (24), and William Bull's 1988 article, *A 17th Century Ethiopic Bookbinding* (44). John Mellors and Anne Parson's 2002 booklet *Ethiopian Bookmaking* (16) reports:

The Ethiopian style of sewing is very different to that now used in the rest of the world. The key feature is the use of

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independent pairs of link-stitch sewing to join the sections together and attach them directly to the outer wooden boards. Each pair is sewn with one thread and two needles.

The exception to these findings appears in Janos Szirmai's 1999 work *The Archaeology of Medieval Bookbinding*. Szirmai (46) states that "Paired sewing stations are the rule." but later notes that he examined one Ethiopian binding with three sewing stations in a private German library (48). In the case of this binding, Szirmai was unable to determine much about the sewing due to the fact that the spine was covered with leather.

In 2001 the Library of Congress acquired the Thomas Kane collection of Ethiopian material. Kane was an American lexicographer and linguist specializing in African languages who published multiple books of translations between Amharic and English. His personal library contained many unique items not often found among the collections of western institutions. Among these are approximately 200 rare manuscripts and scrolls including books of incantations and spell casting, astrology, prayers of protection and genealogies. Additionally, examination of one of the volumes in the collection revealed a three-hole binding structure similar to that described by Szirmai. The book is a small manuscript, approximately 9 cm high by 7 cm wide, and was subsequently catalogued as Kane MS 93 (fig. 1). MS 93 was identified by Fentahun Tiruneh, curator of Ethiopian materials at the Library of Congress, as a book of Geez verbs and their meaning, probably dating from the nineteenth century. Geez is the liturgical language of the Ethiopian Orthodox Church, and is no longer used outside of church ritual. The manuscript arrived in very poor condition, exhibiting broken sewing, tears to the spine folds, broken boards, minor water damage, and smoke damage. The anomalous sewing was discovered during the preliminary examination prior to treatment. The subsequent treatment



Fig. 1. Kane MS 93 before treatment

proposal included an in-depth examination of the sewing and investigation of other volumes from the Kane collection to see if similar bindings were present.

Preliminary examination of MS 93 revealed many shared characteristics with other Ethiopian manuscripts. It is written on vellum, the cover boards are flush with the text block, and the boards are attached with the sewing thread. Repairs performed on the manuscript are also in keeping with traditional



Fig. 2. Sewing thread at the center of the section. One length of thread enters the section from the top (hole 1) and exits at the bottom (hole 3), represented by the long black line to the left of the sewing. The other thread enters at the bottom (3), exits at the center hole (2) and links to the previous section, then re-enters the section and exits at the top (1), represented by the two shorter black lines closest to the sewing



Fig. 3. Broken sewing showing the long thread that goes from the top (1), skips the center hole and goes to the bottom hole (3). The shorter thread stops at the middle sewing hole (2) and links down before going to the top (1). Note the repair stitch that enters the section at the head, wraps under the station (1), and returns to the head to exit the section

Ethiopian mending practices. Vertical fissures on the outer boards were repaired in the usual fashion by sewing thread through holes on each side of the break to bridge the gap. The original sewing of the binding was broken between most sections but the binding was held together through a series of simple stitches to cobble the sections together.

After the preliminary examination of the spine, a close inspection of the gutters in the intact center sections revealed one pass of thread going from station one to three, and the other thread going from three, stopping at two, and continuing to one (figs. 2–3). This construction would logically be executed using the traditional two-needle stitch by adding a stop-off point for one of the needles and thereby create a middle station. To confirm this idea I constructed a model using this modified version of two-needle link sewing. The sewing progressed quickly and was simple to execute.

Creating a book model of the sewing did not answer the more difficult question of why this particular volume was sewn so differently from most other Ethiopian codices. Discussions with my colleague Yasmeeen Khan led to the hypothesis that the overwhelmingly liturgical nature of Ethiopian bindings in western collections may contribute to an incomplete understanding of the whole of Ethiopian binding tradition. It seems plausible that the aesthetic quality of illuminated Ethiopian manuscripts have caused them to be collected as much for the artistic features as for their textual component. Thus, the trend in collecting may have created an incomplete understanding of the scope of Ethiopian book-binding by focusing on particular kinds of manuscripts.

To test this hypothesis, I employed two different approaches. I contacted several Ethiopian scholars for their expertise regarding manuscript production and possible reasons for aberrant sewing structures. Concurrently, I surveyed the remainder of the Kane collection as well as several items and collections from other institutions to look for more examples of aberrant

sewing structures and, if found, try to determine if there were common characteristics to all three-hole bindings. I considered such factors as place of origin, subject matter, or date of production as possible reasons for three-hole structures.

The first Ethiopian scholar I contacted was Dr. Richard Pankhurst, a noted specialist in Ethiopian history, art, and culture. I described the unusual sewing to him and asked him about the drawings at the beginning of the volume. The questions about the drawings prompted him to contact a colleague, Mersha Alehegne. I sent both of them images of MS 93. Neither of them was able to comment on the sewing based on the photographs. However, Mr. Alehegne was certain the volume came from a type of school called Qene and would be used for a type of poetry, also called qene. Qene schools provide a secondary education based in religious instruction. Qene poetry is a complicated system of Geez verse that is noted for multiple meanings of words and phrases. Students often created their own books based on the instruction they received and used them as study aids. According to Mr. Alehegne, MS 93 is probably a type of student’s contextual dictionary that lists the multiple meanings for words in Geez and how they may be used in qene poetry. Mr. Alehegne also noted that he had never seen a contextual dictionary in a western collection; suggesting to me there might be a relationship between the unusual subject matter and origins of MS 93 and the fact that this type of sewing was largely undocumented in conservation literature.

I began surveying bindings by looking for Ethiopian collection materials at other research libraries and by examining the remainder of the Kane collection. The other institutions with Ethiopian holdings I visited were the Walters Art Museum, the Morgan Library, the Newberry Library, Northwestern University Library, and Howard University Divinity Library. In addition I examined bindings from two private collections, one in New York and the other in Washington DC.

Institution or Collection	Number of Bindings or Fragments of Bindings Examined	Number with Paired Sewing	Number with Odd numbered Sewing
Kane Collection at Library of Congress	48	45	3
Walters Art Gallery	5	5	0
Pierpont Morgan Library	2	2	0
Voelkle Collection, New York	6	6	0
Newberry Library	1	1	0
Northwestern University	1	1	0
Tweed Collection at Howard University	29	26	3
Day Collection, Washington DC	9	8	1

Fig. 4. Bindings examined and characterization of the sewing



The vast majority of the bindings fit within the traditional understanding of Ethiopian book construction (fig. 4). In total, I examined 101 volumes, of which 94 had normal, paired sewing stations. Seven bindings had three-hole patterns, representing 6.9% of the total number of volumes examined.

To summarize, the bindings at the Walters, the Morgan, the private collection in New York, the Newberry, and Northwestern University all fit within the traditional style of sewing. All could be described based on their catalogue information as religious or liturgical works. All of the volumes were written on vellum and had wooden boards. The volumes ranged in size from large folios to one binding approximately 5cm in height. Also, based on the catalogue information, the volumes ranged from seventeenth to the nineteenth century.

The physical characteristics of the volumes examined from the Tweed collection at Howard University, the Day collection in Washington DC, and the remainder of the Kane collection were, by and large, the same as those in the aforementioned institutions. The exceptions were three three-hole bindings at Howard University, one in the Day collection, and two more in the Kane collection. Of the three at Howard, two of them were twentieth-century Gospels and the other was a nineteenth-century book of hymns. It was difficult with all three to determine the exact nature of the sewing since all had their spines covered. The sewing was significantly different from MS 93 however. There were two passes of thread between holes one and two and two passes of thread between holes two and three, (diagram, fig. 5). The three-hole binding from the Day collection also appeared to match this style.

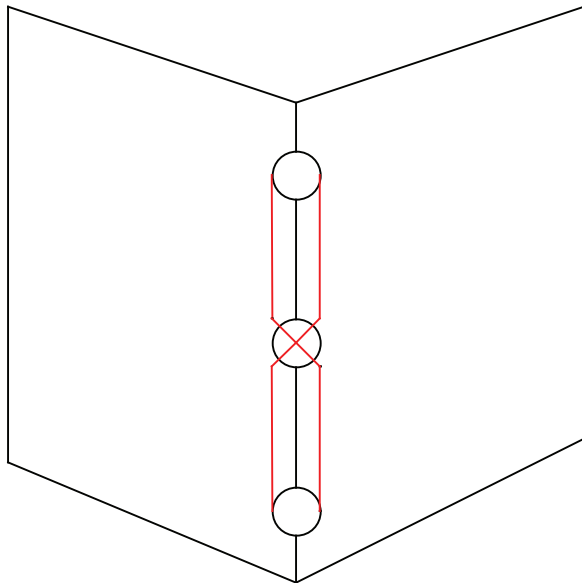


Fig. 5. Diagram of sewing thread visible in the center of the section

The other two volumes from the Kane collection that were sewn with three holes were MS 53 and MS 124. Neither volume has a date. Again, the sewing appears to be the same as the volumes from the Day collection and Howard University with two passes of thread between stations between one and two and two and three. Initially I had assumed this sewing to be all along going from station one to two and then three. However, as I was able to spend more time with each of these volumes and examine them closer, I discovered their sewing pattern was yet another unusual construction. In the sections with intact sewing, it appears to be all along. However, in sections where the sewing is broken, it is apparent the thread coming out of station three originally hooked under the thread coming out of station two (fig. 6).



Fig. 6. The broken sewing reveals that the thread exits the bottom hole, wraps under the sewing at the middle hole, and returns to the bottom

By deconstructing and then making a model, I found that stations one and two were probably sewn in the tradition with needles at each end of the thread. Station three is sewn with a single needle that passes underneath the thread exiting the center hole. The needle then returns to the third sewing hole and exits, linking down with the previous section. The model was sewn in this manner with the blue polyester thread used for the third sewing station (figs. 7–8).

As I was constructing the model, I realized that this same hook stitch was utilized to join sections together where the sewing was partially broken in the Ge'ez grammar compendium, MS 93 (fig. 3, top). This finding suggests to me that a stitch traditionally used as a repair technique might also be employed as a method of sewing a new volume. One reason for doing so might be a shortage of resources including thread and needles. Whether the bindings from the Day and Howard University collections replicate this pattern remains to be determined, though I think it is highly probable that they do.

One aspect all six volumes had in common—and unlike MS 93—is a religious component. Though the sewing was different between MS 93 and the other volumes, the liturgical nature of the texts seemed to suggest that subject matter alone would not account for variations in binding technique. Broadly speaking, none of the volumes had any noteworthy aberrant attributes. Three had a covering material, all had red and black manuscript ink, and the three that have dates attributed to them are nineteenth and twentieth century. In short, though they shared some characteristics, they are still somewhat disparate, and there are not any obvious shared traits with MS 93 beyond the very basic.

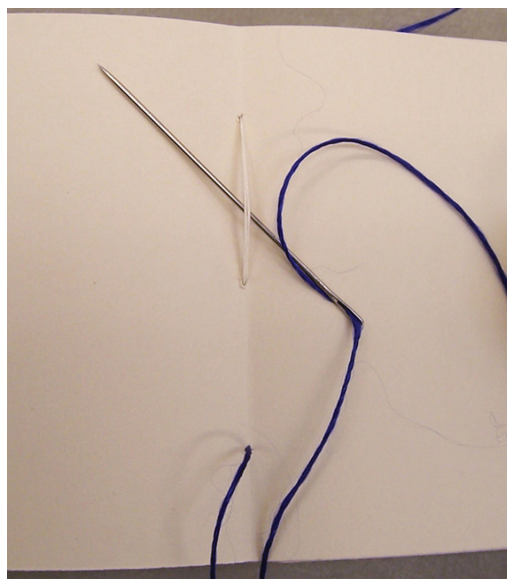
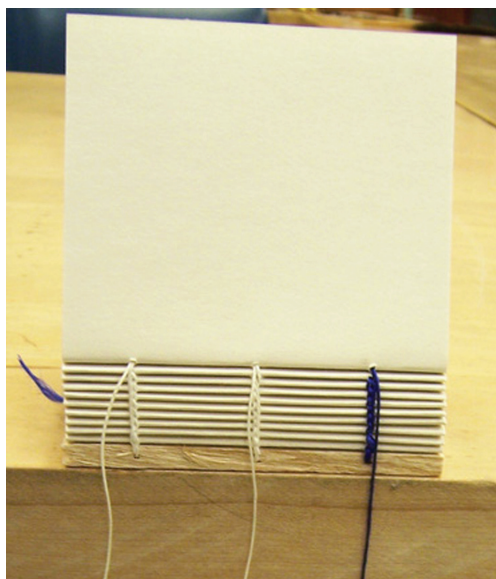
A small break in the search for more information came after I read through a catalogue from 2007 entitled *A Catalogue of Previously Uncatalogued Ethiopic Manuscripts in England*. I contacted one of the authors, Dr. Steve Delamarter, and asked if he had studied bindings during the course of his work and if so, if he had noticed odd numbered sewing patterns. Dr. Delamarter responded that he had examined sewing and was aware of three-hole patterns. As part of his research he has examined and documented Ethiopian bindings across several centuries and is in the process of condensing the data to look for trends that emerge over time. His belief is that three-hole sewing begins emerging in late nineteenth-century bindings.

One product of this research is a digital repository of manuscripts, the SGD collection. At the time I conducted my research, the collection contained about 400 items, 229 of which were books. It has grown considerably since then. The materials come from multiple sources in this country and abroad including university collections and private libraries that Dr. Delamarter has been working with for several years.

I examined each of the 229 digitized volumes and felt confident that I could characterize the sewing of 221 (fig. 9). Of those, I found fourteen that clearly had three-hole sewing structures, representing 6.3% of the collection; very close to the 6.9% of three-hole bindings I found in the physical collections. Just as with physical collections, I was not always able to determine the path of the thread in the sewing. The differences between the four-hole and the three-hole were obvious, but my best guess is that ten of the fourteen volumes have the three-hole pattern that utilizes two threads. Three appear to have the same structure as Kane MS 93. Despite expanding my search criteria for covering materials, illuminations, and mahdars, the traditional satchel sometimes used to carry Ethiopian books, there does not seem to be a common trait among the fourteen; though the high percentage that come from the Eliza collection is worth investigating further.

After examining the collection I contacted Dr. Delamarter again to see if he had any additional thoughts on the variations in sewing. Though he has not uncovered any concrete evolution of sewing patterns, he did have several insights into trends changing over time. For example, he has noticed differences in margin size, the colors used to write Mary's name, and the use of full stop symbols when these aspects of manuscript production are examined from different time periods. One binding characteristic he has noticed is that the height to width ratio of text blocks in general terms changes from the seventeenth to late nineteenth century. From the volumes that can be attributed to the sixteenth and seventeenth century there is often a 1:1 ratio in height to width. By the late nineteenth century there is a shift to a 1.5:1 ratio in height to width.

Once I was comfortable in my understanding of the structure and its significance I began the treatment of man-



LEFT TO RIGHT

Fig. 7. Blue polyester thread used to sew the station on the right

Fig. 8. The blue thread exits the station and wraps under the thread at the middle station, then returns to the original station and exits the section

Catalogue Number	Date	Covered	Illuminations	Mahdar	Hook Stitch Sewing
Alwan 16	?	Yes	Yes	Yes	?
Delamarter 1	20 <sup>th</sup> c	No	No	No	?
Eliza 27	19 <sup>th</sup> c	Yes	Yes	No	?
Eliza 29	19 <sup>th</sup> –20 <sup>th</sup> c	No	Yes	No	?
Eliza 21	?	No	Yes	No	?
Eliza 33	20 <sup>th</sup> c	Yes	Yes	No	No
Eliza 35	20 <sup>th</sup> c	No	No	No	Yes
Eliza 5	20 <sup>th</sup> c	No	No	Yes	Yes
Eliza 36	18 <sup>th</sup> c	Yes	Yes	Yes	Yes
Marwick 30	?	No	No	No	No
Weiner 18	?	No	Yes	Yes	Yes
Weiner 7	?	Yes	Yes	No	Yes
Trinity Western 2	19 <sup>th</sup> –20 <sup>th</sup> c	No	No	No	No
Subers 2	?	No	No	No	No

Fig. 9. Three-hole bindings examined from the SGD Digital Collection

uscript. I first documented the sewing both with images and diagrams. The lack of adhesive in Ethiopian bindings can help make their treatment relatively straightforward. The biggest obstacle with MS 93 was the first two leaves. At some point the leaves were exposed to a liquid or sticky accretion resulting in them fusing together and to the front board. Fortunately, the first leaf had also fused partially to the repair thread holding the front board together so that there were small pockets of air within the otherwise attached area. These pockets allowed for a micro spatula to be inserted and the first leaf mechanically separated from the board.

The second leaf was more strongly bonded to the first and for that reason I decided it would be worth considering humidification to separate them. I took samples of the vellum and wet it out under magnification to see how the fiber bundles reacted to moisture. Somewhat surprisingly, the fibers maintained their shape even after 20 minutes of humidification. Having determined it was safe to introduce moisture, I put the first and second leaf in a humidity pack, confining the humidity to the fused area. The leaves stayed in the pack for approximately 10 minutes and were removed so that the area could be worked with a micro spatula. These steps were repeated three times until the leaves were completely separated.

The sewing from the remaining folios was then removed. It was quickly evident that the damage to the folds was more widespread than originally hoped. Several sections had become misshapen, presumably from sliding out of place over time as the sewing weakened and broke. In order to return the text block to a manageable shape for re-sewing I had to flatten the damaged sections. I achieved the best results by putting them in a Gore-Tex pack while still folded, humidifying the spine area for approximately 12 minutes, then drying them, beginning with light weight and adding pressure over the course of several hours. Given the degree of damage, particularly in the areas that had smoke damage, the flattening worked very well.

Mending and guarding material was made by taking sheets of goldbeater's skin and Japanese paper and laminating them together. I chose this method for several reasons. Goldbeater's skin is a thin membrane of animal intestine. Though not strong enough on its own to sew through, it adheres nicely to vellum. The Japanese paper could be toned to match to the vellum and provide additional support to handle the weight of the sewing thread. The laminate was made by brushing out sheets of Uso-Mino Gami with a layer of PVAC and allowing it to dry. The goldbeater's skin was placed on top and then



both pieces were put in a heat press to activate the thermo setting qualities of the PVAC.

The leaves of the text block were given a light dry cleaning before the mending and guarding process. Mends and guards were adhered with a 12% gelatin solution. The extensive damage required guards or partial guards to every folio. The goldbeater side of the laminate was attached to the vellum and the toned paper side appears on the outside of the spine.

When work on the text block was complete, I addressed the question of whether or not to reuse the boards. There were multiple reasons both for and against, including protection of the text block, the unique nature of the object, and how to safeguard the boards if not re-used. Ultimately I decided it was best to keep them as part of the original object, unaltered as much as possible but stabilized to the point that they would protect the text block. Following the advice of Catherine Magee, objects conservator and consultant at the Library of Congress, the vertical splits in the boards were strengthened with pin drop size applications of PVAC, approximately 1 cm apart, along the length of the crack (fig. 10).

Once the cracks had stabilized I drilled new holes into the board face and through the side of the board using a manual handheld drill (fig. 11). It was necessary to move the sewing holes slightly farther away from the board edge to avoid weakened areas on the front and back of the board. This decision also ensured that the original holes on the board face remained undisturbed and kept for their evidentiary value.

The final step was the sewing. I chose 25/2 thread because it offered the best balance of strength while still being thin enough to be wrapped twice through the holes in the boards. I utilized all of the original sewing holes in the text block. As a result, the spine looks somewhat chaotic to my eye, but the location of the holes on the first and last section line up exactly with the original holes in the boards, so I think this is a fairly accurate representation of how the spine looked before all of the damage occurred (fig. 12). Finally, the finished volume was housed in a clamshell box.

Whether the presence of three-hole sewing can be attributed to a regional difference, a time period, an outside influence, changes in social customs, or is simply a randomly occurring aberrant subset within the thousands of Ethiopian bindings produced over the centuries is still unclear. I was gratified to find other examples, however, and the variations within the small number of three-hole bindings confirms for me that Ethiopian bindings are not as uncomplicated or uniform in structure as is often assumed. As Ethiopian collections in the United States are likely to become larger and better catalogued over time I feel it is inevitable that more three-hole binding structures and other unusual sewing patterns will continue to be uncovered.



Fig. 10. Inserting a drop of PVAC into the split in the board



Fig. 11. Drilling sewing holes in the board



Fig. 12. Kane MS 93 after treatment

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