

Conservation Treatment of “Islamic” Manuscripts at the Library of Congress in the 21st Century

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INTRODUCTION

In the past few years the Library of Congress (LC) has focused resources on the conservation treatment of bound manuscripts in Arabic-based scripts that come out of a Muslim cultural milieu from the Middle East, Africa, and Central, and South Asia to enhance access to these collections through exhibits and digitization projects. The exhibit “A Thousand Years of the Persian Book” and the World Digital Library section on Arab scientific manuscripts are a few of the ongoing projects requiring extensive conservation thought and management to ensure the accessibility of the texts and bindings both as digital and physical objects. While the Conservation Division primarily focuses on preservation strategies, such as local repairs, housings and conservation handling, there are occasions where a full treatment of a bound manuscript is necessary to maintain its integrity.

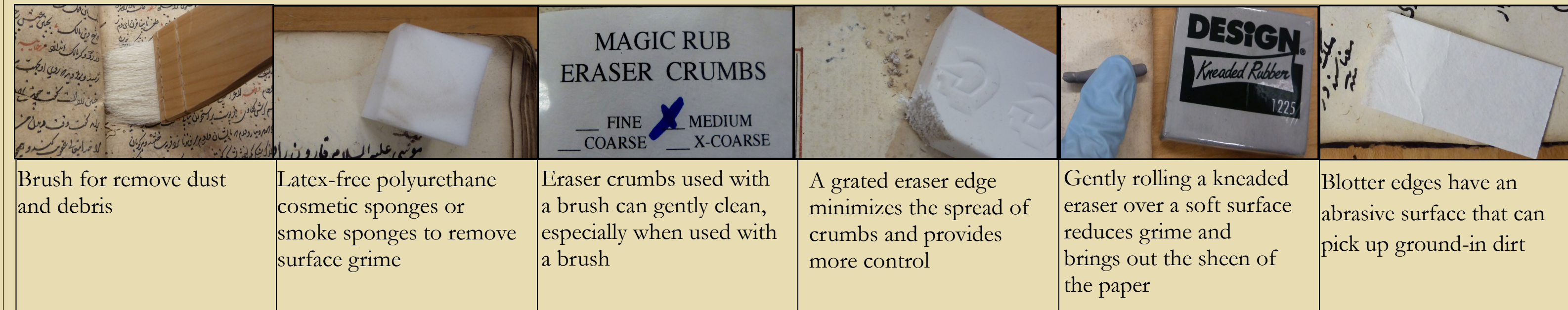
When any handling of a manuscript will cause irrevocable damage to the text or paper support it may receive a full treatment, and the strategy for such treatments is the subject of this poster. If the damage is limited to the binding there are often local repairs that can be undertaken and these will not be addressed here. While disbinding a manuscript is not undertaken lightly, in keeping with the respectful Muslim attitude to Qur’anic text the preservation needs of the text are given a higher value than the binding structure. This is also true for manuscripts on secular subjects, as most manuscripts written in Arabic-based scripts will have some formulaic phrases from the

PAPER TREATMENT

Studies on the characteristics of the paper produced in these geographic regions informs the conservator as the paper substrates of the manuscripts show damage related to their manufacturing processes, storage and use. Surface treatments used to produce “Islamic” paper result in specific damages, as starches used to create a glossy surface resistant to pigmented inks break down in the presence of humidity. The result is that leaves stick together and more commonly insects bore holes into the books, especially in areas rich in starch adhesives, such as the spine folds. Tidelines can be stiff as the fillers, surface size and colorants all move in the presence of moisture. Direct contact with water can solubilize these materials, leaving a thinner pliant fluffy paper substrate behind that is of a different color or hue. Book blocks are often covered with fine particulate dust, and grime from fingers is typically embedded in the lower left and right corners of well-used manuscripts. Oxidizing copper green pigments or copper-containing gold lines lead to cracking of the frame lines especially where the paper flexes the most, namely the lines closest to the spine and the fore edge. In addition, old mends and repairs may increase the vulnerability of the original and lead to further cracking of copper green lines or increase the stiffness of the original paper.

Cleaning

Treatment consists of multiple steps. Different methods may be used on the same leaf depending on the condition of the paper and media. Each treatment choice is tested prior to use. The least invasive of the treatments below is gentle brushing with a rabbit fur brush.



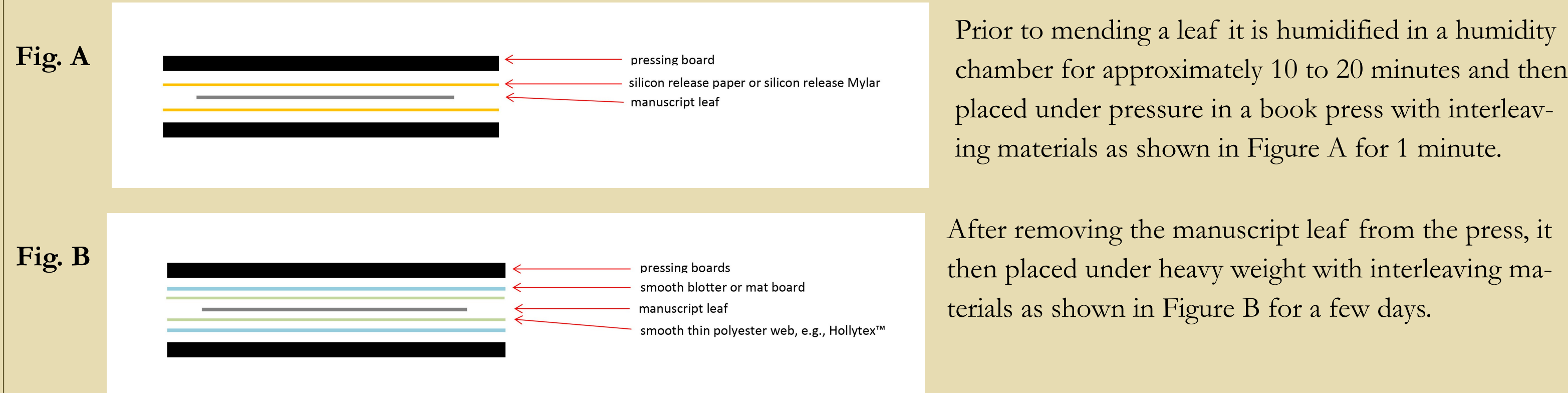
Removal of old repairs

Repairs are only removed where necessary, namely if they are obscuring important text, inhibiting the opening of the volume, or creating a breaking edge due to the stiff overlap of crosslinking adhesive. Where possible old mends are thinned down instead of removed completely. When it is necessary to remove mends various methods are employed, including local applications of water, methylcellulose poultices, Thin cast gel, such as Kelcogel at 2-4% or Agarose LE at 2-4%. The first two methods are rarely used to

remove repairs on top of media as they will cause the ink to solubilize, and methylcellulose can spread. The thin cast gel sheets have good working characteristics and offer a more controlled application of moisture to the repair. Figure 1. shows Kelcogel being used to remove an old mend that is obscuring text. Regardless all methods have the potential to create new tide lines in the paper and require rigorous testing prior to application.

Flattening and Surface Texture

Some Persian, Indian and Turkish manuscripts are often comprised of papers with high gloss that may have dulled over time. These papers were often produced by the application of a starch paste. After drying a large amount of pressure was applied to the papers by burnishing them. During treatment these papers are kept under weight throughout the mending and binding procedure. When there is a need to revive the gloss as was the case with a number of Persian manuscripts treated in the LC labs, then the following treatment is conducted after the media is tested. In cases where the edges of the leaves are soft, a minute amount of thick methyl cellulose is applied to strengthen them prior to this treatment.

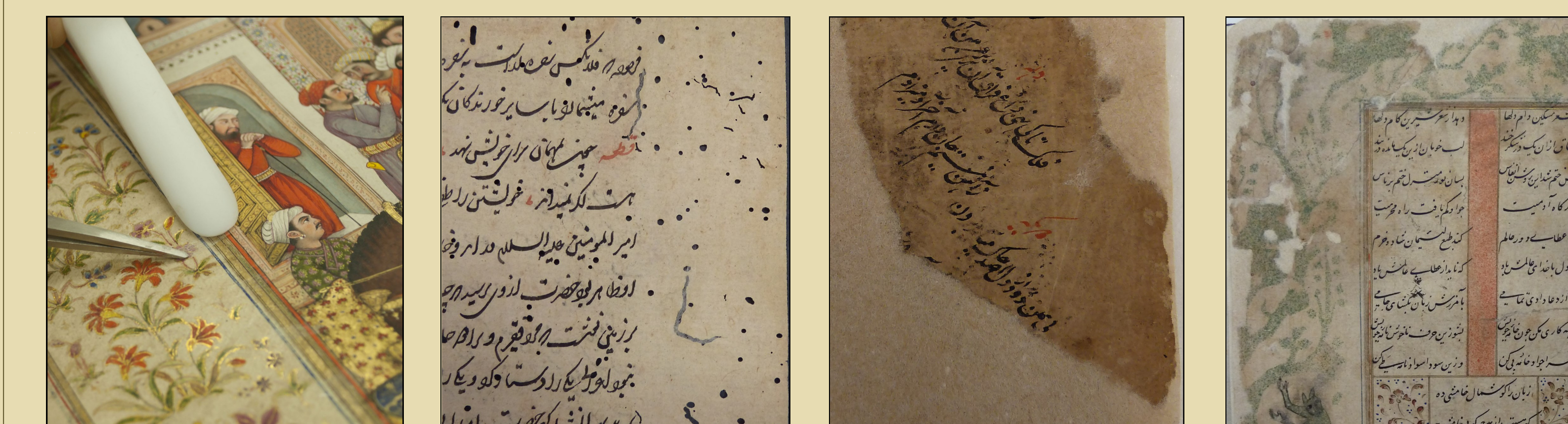


Mending and Guarding

Paper and adhesive selection is made at the same time by the conservator. Conservation tissues made from paper mulberry, specifically Japanese *kozo* and Korean *chamdaek* papers are used at the Library of Congress, Japanese machine-made *kozo* tissues from Paper Nao, such as RK00, RK0 and RK1 are used for linings, mending over media or over paper alone. The thinnest *kozo* tissue, Berlin tissue made by Gangolf Ulbricht, is only used for mends over media. University of Iowa Center for the Book Japanese-style *kozo* tissue is also used in bookbinding but mostly for loose guards and spine linings. Most mending material is toned with acrylics before use. Any mend material may also be prepared as a re-moistenable tissue: the choice depends on how the paper substrate and media react to moisture. The thinnest tissues, such as RK00 or Berlin tissue, often benefit from increased handling qualities (stiffness) when prepared as remoistenable tissues.

Fills are made with laminates of the repair tissues mentioned above, thinned Griffen Mill papers such as Kehribar or Samarkand or leaf cast papers prepared by the conservators that mimic the opacity and drape of the original papers found in Persian, Central Asian or Arab papers. Often, five to six different mending papers are used to complete the paper treatment on a single volume. Wet fills are undertaken only under extreme circumstances.

Adhesives	cellulose ethers	methylcellulose 4M	Preferred adhesive as the adhesive film is flexible
		Klucel G and Klucel M	Used for copper or iron-containing media. Preferred adhesives for re-moistenable tissue
	Starch adhesives	Zin Shofu	Often creates a bond that is too strong and causes damage to the original. Creates tidelines easily as it softens the starch size of the paper. However, the presence of starch means that very little adhesive is required to create a bond between the repair and the paper. May be mixed with methylcellulose to lessen stiffness
		Aytex P Food Grade wheat starch paste	More reversible than wheat starch, but fewer advantages when diluted and similar tideline forming capacity.
		Rice starch	More reversible than wheat starch, but fewer advantages when diluted and similar tideline forming capacity.
	Heat-set adhesives	LC recipe of NARA formulation- 2 parts Avanse MN-100-1 part Plexitol B500: 8 parts water	Only used as a last resort or with late 19 th and 20 th century materials on brittle Western-style papers.



Bridge mends over copper green border are of 2% Klucel G remoistenable RK00 tissue rehydrated with 1% Klucel G in ethanol. The unpainted verso is mended all along the frame lines with RK1.

Judicious mending of losses that catch when turning the leaf of the manuscript using RK2 and a dry wheat starch paste. Small round holes are not mended.

Light mends with RK1 and methylcellulose with fills of leaf cast paper made of recycled Western handmade paper and cotton linters.

Badly water-damaged colophon page mended on the suction table with wet paper pulp and individually cast mends. Also lined on the suction table on the verso with RK00 and Klucel G.

References
Anderson, Priscilla. 2003. Solvent-set tissue repair. *Book and Paper Group Annual* 22.
Cowan, J. and S. Guild. 2001. “Dry Methods for Surface Cleaning Paper”. *CCI Technical Bulletin* 11. Ottawa: Canadian Conservation Institute.
Iannuccelli, S. and S. Sotgiu. 2010. Wet Treatments of Works of Art on Paper with Rigid Gellan Gels. *Book & Paper Group Annual* 29, 25-40.

Kropf, E. 2013. Historical repair, recycling and recovering phenomena in the Islamic bindings of the University of Michigan Library: exploring the codicological evidence. *Suave Mechanica: Essays on the History of Bookbinding*, edited by J. Miller, 1-41. Ann Arbor, MI: The Legacy Press.
Kropf, E. and C. A. Baker. A conservative tradition? Arab papers of the 12th–17th centuries from the Islamic Manuscripts Collection at the University of Michigan. *Journal of Islamic Manuscripts* 4, (1):1-48

McAuliffe, J. D., ed. 2006. *Encyclopaedia of Qur’an*. 2006. Leiden: Brill.
Seheper, K. 2015. *The Technique of Islamic Bookbinding*. Leiden: Brill.
Song, M. and J. Munn. 2004. Permanence, durability and unique properties of Hanji. *Book and Paper Group Annual* 23, 127-136.
Warda, J. I. Bruckle, A. Bezur, and D. Kushell. 2007. Analysis of agarose, Carbopol, and Lapontic gel in paper conservation. *Journal of the American Institute for Conservation* 46, (3): 263-279

Qur’an or at the very least use words that appear there. When the treatment chosen is conservation rebinding the requirements of the media and its paper support guide the book block preparation, sewing, and rebinding with leather. Prior to all treatment, extensive documentation of the manuscript and its condition is undertaken by each conservator to retain in perpetuity as part of the record at the Library.

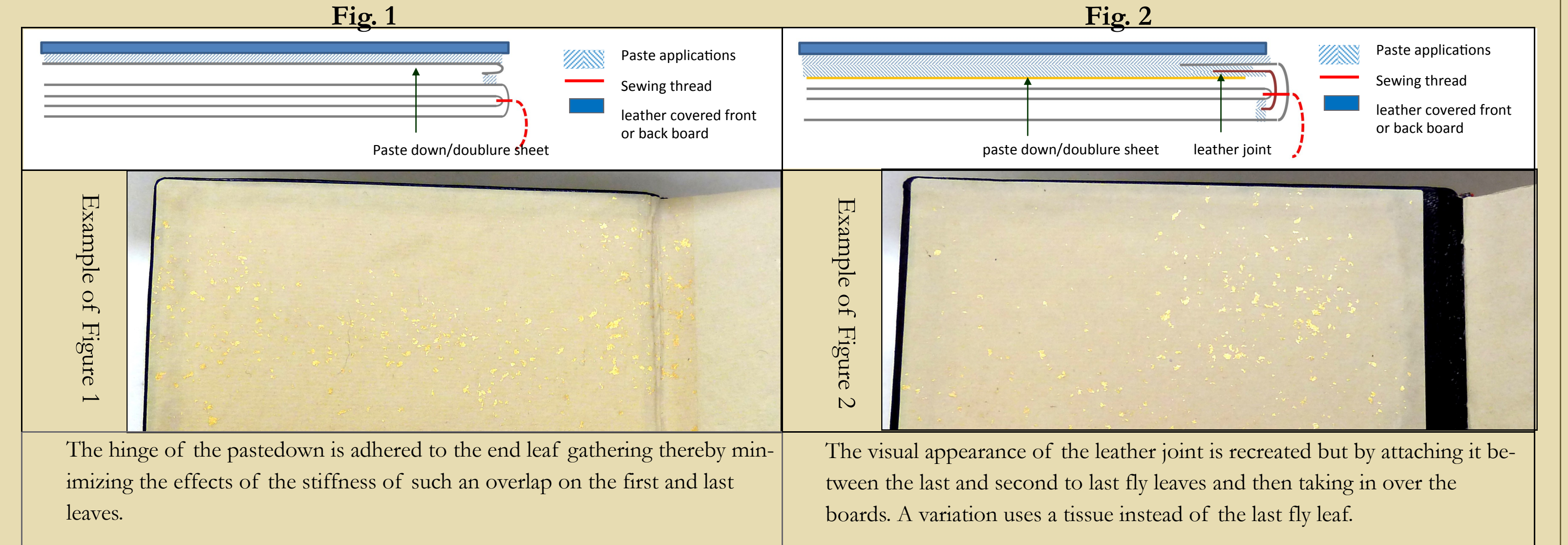
Recent publications by conservators and scholars have shown the extent of variation in bindings in the Muslim world. Personal observation of collections of bound and rebound manuscripts from the Middle East and North Africa illustrate how binders from the different geographic areas have created bindings that best suit their purposes by retaining and improving certain features while discarding others. The resulting expansion of styles and internal elements in bindings coupled with the fact that most of the manuscripts that are treated at the Library of Congress have already been rebound multiple times, provides a certain freedom for the conservator to innovate, adapt and borrow from within the Muslim world where these manuscripts were produced. The poster focuses on paper conservation treatment, book block preparation and sewing. Paper conservation techniques used at LC are listed and described where necessary. Book conservation strategies are articulated based on characteristics of the paper support and book block of the manuscripts.

SEWING

The crucial decision for the book conservators concerns sewing the manuscripts in a manner that will minimize the deterioration of the paper and media. Often manuscripts show evidence of multiple sewings and repair campaigns, especially in the spine folds. The result of water-based adhesives applied to the spine is manifest in cracking copper green lines close to the spine fold or the rippled paper on the inner margin where the moisture was stopped by non-expanding gold frame lines. Issues concerning how to accommodate swelling on the spine due to guarding and mending will not be addressed here. Illustrated below are some of the methods used in reconstructing the manuscripts, including end leaf designs, sewings styles, spine linings and construction, and endbands.

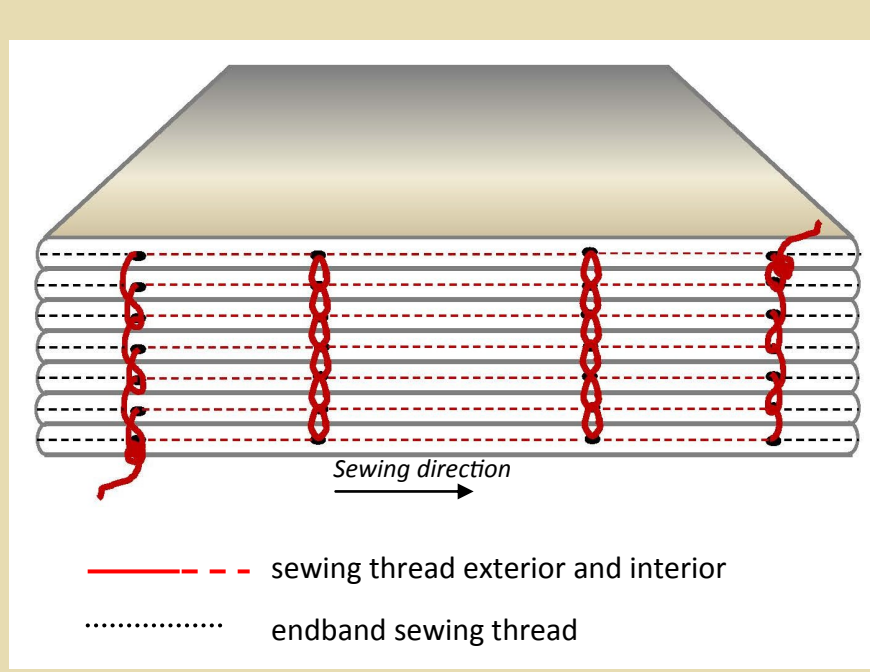
End leaves

Most manuscript bindings from the Library’s collection have one of three types of end leaves. Fig. 1 illustrates the most common type where the paste down extends over the joint onto the verso of the first leaf. Figure 2 has a leather inner joint that is often adhered between the fly leaf and first leaf of text. Another type (not shown here) seen in more recent bindings has a bifolio tipped on to the first leaf of the text where half the sheet is the paste down and the other half is the fly leaf. To recreate the visual look of the this type of end leaf in a conservation binding, the initial leaf of the sewn-on end leaf gatherings is pasted on to the front and back boards, respectively.

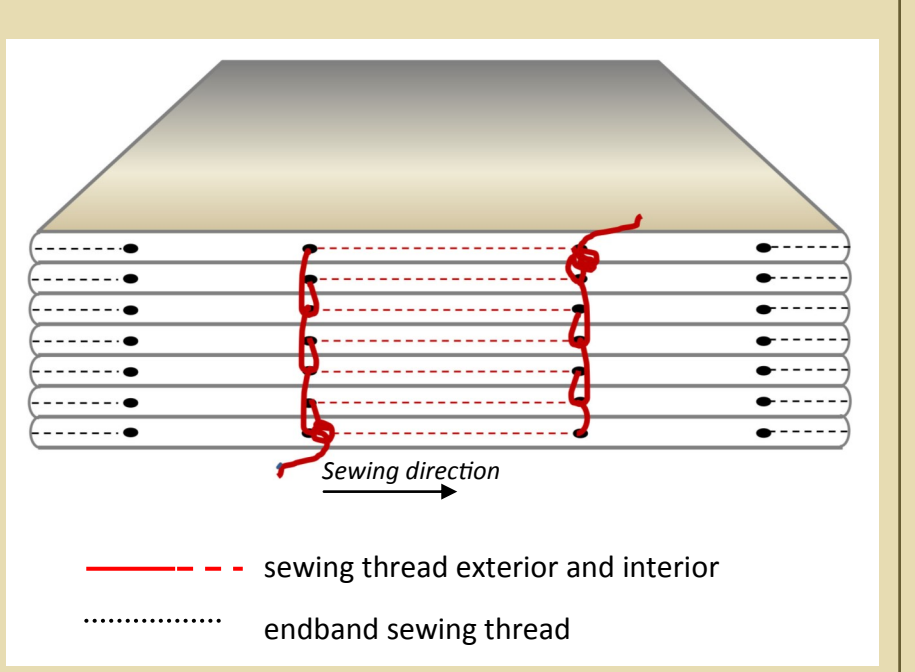


Sewings

The chain stitch with kettles is often used for rebinding. It uses both the sewing and endband holes. With the endband primary sewing, this style ensures that there is thread all along the fold to equalize the tension on the book block and paper.



The link stitch is found on many of the bound manuscripts from the Middle East and Persia in LC collections. As it can place too much tension on the paper especially in a non-adhesive construction, it is rarely used by LC conservators for rebinding.



Spine linings and supports

The choice of spine linings and/or supports is where conservators must use judgement and weigh the condition of the manuscript and the historical requirements of the binding. Selection of the type of sewing and spine treatment takes into account where future damage may occur in the book block, and often this is related to tendency of the spine to become concave over time. Rarely is the original spine lining recreated. Below are an array of possible spine linings and sewing supports that have been used for manuscripts. In general paste is used to consolidate the spine, however, Lascaux 498 HV and polyvinyl acetate adhesives (PVAc) are used to create a barrier in cases where moisture should not enter the manuscript leaves through the spine.

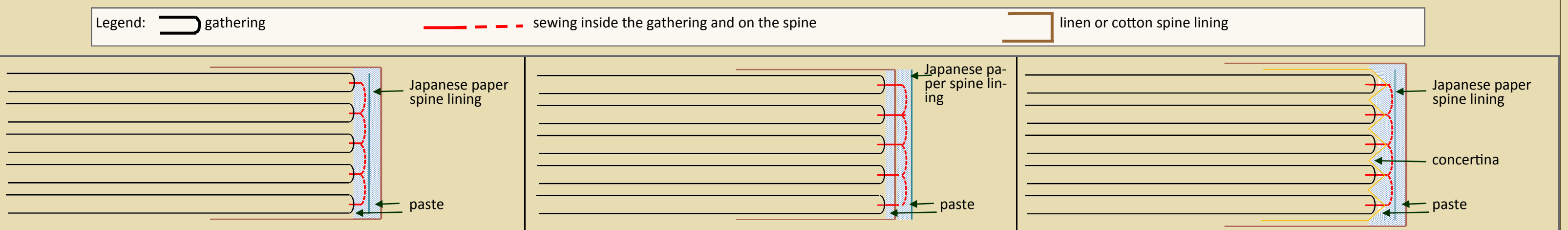


Fig 1. A thin Japanese paper spine lining is adhered to the spine of the sewn book block before adhering the fabric spine lining. The manuscript paper cannot be too moisture reactive.

Fig 2. In thicker book blocks comprised of robust paper, sewing is done through the fabric spine lining. Paste is used to consolidate the spine through the lining, and a second application of paste is used to apply Japanese paper to lock in the sewing on the spine.

Fig 3. The book block is sewn with a concertina guard (leporello). A thin Japanese paper spine lining is adhered to the sewn spine before adhering the fabric spine lining. Used for manuscripts that need to open well and where the paper substrate is stiff. Paste or Lascaux 498 can be used.

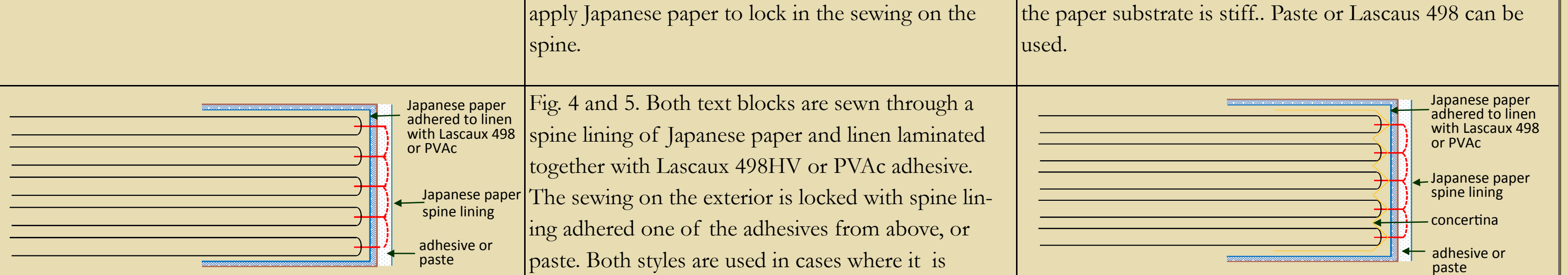
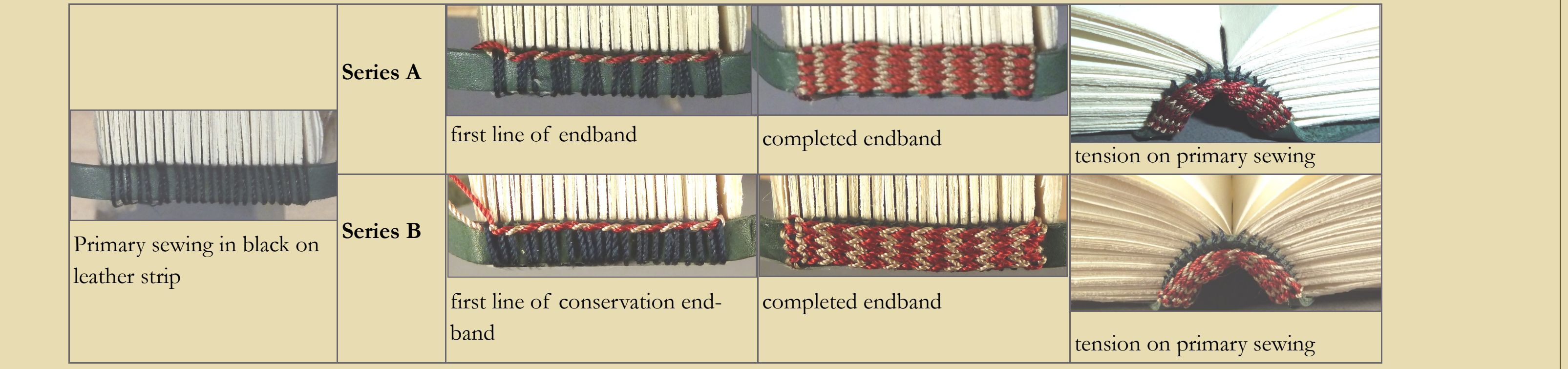


Fig 4 and 5. Both text blocks are sewn through a spine lining of Japanese paper and linen laminated together with Lascaux 498HV or PVAc adhesive. The sewing on the exterior is locked with spine lining adhered one of the adhesives from above, or paste. Both styles are used in cases where it is imperative to protect the media (copper green or gold frame lines) in the book block from moisture seeping in through the spine folds of the gatherings and in extreme cases through the sewing thread itself. A concertina guard is added in Fig 5 to minimize the flexing of the leaves in cases where the leaves are too weak or stiff.

Endbands

The more commonly found endband in the Library’s collection is shown in Series A. For conservation rebinding the endband shown in Series B is used. Both start the same way with loops of thread going over the core and through each section to create the primary sewing. However, a different number of threads are picked up to create the pattern of the secondary sewing. Series B creates less pull on the primary sewing and does not encourage the tendency of the book block to become concave.



CONCLUSION

This poster is an attempt to present the outlines of treatment methodology used at the Library of Congress in treating “Islamic” manuscripts. There is no standardization of treatment protocols. Each manuscript is viewed individually and often new treatment methods and protocols are proposed and discussed. This poster is aimed at stimulating further discussion and critique with conservation and curatorial colleagues in the field.

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