CC20 programme

The following presentations have been accepted for the 20th international seminar on the Care and Conservation of Manuscripts.

Please note that this list may still be subject to change. The programme of the conference will be announced soon.

Presentations

Ya kabikaj!

Abigail Bainbridge and Nick McBurney

Abigail Bainbridge (Bainbridge Conservation, London)

Nick McBurney (NG McBurney, London)

Abstract

An intriguing inscription is found in the endleaves of many manuscripts in Arabic, Persian, Urdu and Ottoman Turkish: *Ya kabikaj!* (*O buttercup!*) and variants thereof. The invocation, which may refer to the Persian buttercup plant *Ranunculus asiaticus* or to the *djinn* (spirit) of the same name in charge of insects, was used to protect the book from insect damage. This project expands on the codicological work of Adam Gacek, principally his 1987 article, "The Use of '*kabīkaj*' in Arabic Manuscripts" (published in *Manuscripts of the Middle East*, Leiden), which surveyed the possible etymology of such inscriptions in manuscripts held by Leiden. Even with this small corpus, he was able to identify inscriptions in manuscripts copied from the 16th through 19th centuries, from Indonesia to North Africa. We attempt to build a broader corpus of manuscripts with *kabikaj* inscriptions by running a survey of private and institutional collections to establish a broader sense of the geographical and temporal distribution of this inscription in manuscripts from the Muslim world.

We also attempt to identify any plant matter contained within these manuscripts, as well as whether it is indeed possible for buttercup species to have any deterrent impact on pest activity within a book. Many species of the *ranunculus* genus are well-known to be toxic to mammals and some insects when fresh, but toxicity greatly lowers or disappears when dried.

Gacek's article has remained a codicological touchstone in the field for the past thirty years — pairing an expanded version of his initial work with updated research into the chemical properties of this family of flowers may shed greater light on the practical origins of these enigmatic inscriptions.

Conservation and preservation of Jewish sacred collection at The Jewish Theological Seminary: Findings, challenges and decision-making process of conservation treatments on the Esther scroll

Akiko Yamazaki-Kleps

Akiko Yamazaki-Kleps (Rare Book Library, The Jewish Theological Seminary, New York)

Abstract

The Library of The Jewish Theological Seminary (JTS) is one of the greatest Judaic studies libraries in the world. In addition to its 400,000 circulating volumes, the library has an exceptional collection of rare materials, including the world's largest collection of Hebrew manuscripts, 43,000 fragments from the Cairo Genizah, incunables, Ketubot, scrolls and broadsides. Owing to the vicissitudes of Jewish history, a part of the collection reveals a challenging state of conditions. Also, the library suffered a disastrous fire on April 18, 1966, which put extra burden on the collection based on paper and parchment. In January 2022, the library was moved to a newly-built facility and became a 21st-century research library.

In this new library, when the conservator undertakes a treatment on sacred collections, such as a parchment scroll of the Torah, the process may prompt different views on how to approach the treatment. My journey into finding many of these "traditions" began when a librarian asked if "Sinew" was used – Sinew being a type of thread made from the thigh of a kosher animal, which was often used to bind Jewish manuscripts or other objects.

The Esther scroll (S 233), Amsterdam, 1684 was requested for a loan by the Jewish Museum New York. The scroll consists of nine membranes of about 22.8 × 61 cm parchment sheets sewn together at each joint. The initial conservation assessment of a new tear was found on the upper part at the beginning of the scroll, along with weak connections of the sewn joined areas, all of which required conservation treatment. This is a sacred Jewish document, often reproduced in the form of a scroll. The tear is on the first section, and could easily increase as the scroll is handled and rolled in or out, so the tear needed to be mended and some of the original sewn areas needed replacement.

Research on conservation articles on sacred Jewish objects discussed a tear mend, "A tear in a [*Torah*] parchment sheet may not be joined with glue, nor is it permitted to write on a patch, nor may the sheets be sewn together on the written side". This gave the conservator enough warning that the procedure for the conservation treatment was to be discussed at length at the Library. Therefore, Sharon Liberman-Mintz, Curator of Jewish Art, and Dr Marcus Mordecai Schwartz, the Henry R. and Miriam Ripps Schnitzer Librarian for Special Collections, who is also a rabbi, and I had a chance to explore the traditions and new ways of stabilizing tear mends and re-joining options.

My presentation will consist of a tutorial on this unique collection, examples of different conservation treatments of Hebrew manuscripts at the JTS, and the conservation treatment of the Esther scroll, including Hebrew terminologies.

Falling through the cracks: Revisiting "unrepairable" manuscripts in the light of new techniques

Nicole Gilroy, Kate Fulcher and Alice Evans

Nicole Gilroy (Bodleian Library, Oxford)

Kate Fulcher (Bodleian Library, Oxford)

Alice Evans (Bodleian Library, Oxford)

Abstract

MS. Fr. D. 1 (R) is a fourteenth-century English genealogical roll held at the Bodleian Libraries, University of Oxford, UK. It comprises six parchment membranes joined end to end, bearing an illustrated genealogical chart of the kings of England. There is historic fire and water damage with extensive pre-Bodleian parchment repairs. Reader access to the roll has been restricted since the 1980s because of its fragile condition, but conservators and heritage scientists are now working on the roll with the aim of opening up access to the layers of information held within.

In our paper we describe and explain the pigment analysis, decision-making, practical conservation treatment, handling considerations and housing and display options for the 4.8m long parchment roll.

Working as a team of conservators and curatorial staff with different specialisations allowed us to bring together experience of practical parchment conservation with pigment and material analysis to further our understanding of this complex object. The project so far has comprised information gathering in order to inform treatment choices: this includes hyperspectral and multispectral (UV and infrared) imaging of the pigments and inks on both sides of the membranes, and extensive physical mapping and documentation of the roll's structure and condition.

Examination of the copper green pigment and its degradation behaviour has been of particular interest as copper deterioration can cause loss of both image and parchment support integrity. The areas of the roll with copper-based decoration have extensive historic repair, done before purchase by the Bodleian in 1900. Further damage is likely to have occurred from handling and mechanical stress integral to the rolled format. Our treatment plan looks to stabilise the areas of damage, increase flexibility of the parchment, and to assess the functioning of the pre-Bodleian repairs.

The project makes possible further research, with potential for investigation into new techniques and materials in our practical treatment, and opportunities to work with experts in other fields. Working with our colleagues in the Bodleian's imaging department we have digitally captured the full length of the roll for the first time. These high-resolution images are incredibly useful in our conservation work but can also be published on Digital Bodleian, the library's online resource for digitised content. This enables global access to the content and provides high resolution digital surrogates. We have visited other institutions with comparable genealogical rolls, including Cambridge University Library

and the College of Arms in London, and it has been useful to discuss with colleagues their strategies for conservation work, housing and handling of rolls.

This paper summarises the findings of our analysis and the treatment of MS. Fr. D. 1 (R), as well as the broader benefits of working as a multidisciplinary team on such a challenging document.

Geographical varieties of palm-leaf manuscript creation practices in south and southeast Asia: Assessment based on literature analysis, palaeographical and palaeoecological reconstruction

Anastasia Poliakova, Giovanni Ciotti, Agnieszka Helman-Wazny and Jörg Fromm

Anastasia Poliakova (University of Hamburg)

Giovanni Ciotti (University of Hamburg; University of Bologna)

Agnieszka Helman-Wazny (University of Hamburg)

Jörg Fromm (University of Hamburg)

Abstract

Aiming to reconstruct local variations in the production of old palm-leaf manuscripts (ca 14th to the beginning of the 20th century CE), we studied 50 microsamples of palm-leaf manuscripts for phytoliths and plant DNA: 25 samples from manuscripts made of *Barassus flabellifer* L. and 25 samples from manuscripts made of *Corypha umbraculifera* L. The leaves of these two palm species were the most commonly used in the past for the production of palm-leaf manuscripts in South and Southeast Asia. Samples were obtained from the manuscript collections of the Centre for the Study of Manuscript Cultures at the University of Hamburg (CSMC UHH, 3 manuscripts), the State and University Library of the University of Hamburg (SUB UHH, 29 manuscripts) and the Archive of the École Française d'Extrême-Orient in Puducherry, Tamil Nadu, India (EFEO, 7 manuscripts). An additional 11 manuscript samples were obtained from private collectors with the explicit permission of the owners. When permitted, manuscripts were sampled by cutting 1-2 mm strips from the margins, trimming from damaged edges, or from binding holes if the manuscript was intact and well-preserved, or if it was covered with lacquer or natural lac. To minimize damage, fragments that had fallen apart and bore no text were collected when possible; in each case, only the minimum material necessary for study was collected. To investigate geographical variations in the plants used for the creation of these manuscripts, site assignments based on philological analysis of the manuscripts were performed. None of these manuscripts contain a colophon that would inform us about their exact origin; thus, we relied on palaeographical analysis of the texts to identify their broad provenance. Palaeographical analysis suggested that two of the examined manuscripts came from Sri Lanka, three from Burma/Myanmar, five from Indonesia (four from Bali and one from Lombok), four from the state of Kerala, and the remaining 36 from the state of Tamil Nadu (southern India). Palaeoecological reconstruction of the manuscripts' provenance based on DNA analysis of

the plant material used for the manuscripts' creation, phytolith analysis, light-field and SEM microscopy, corroborated the palaeographical analysis in each case. Variability in phytolith assemblages, as well as the results of the plant DNA analysis, did not depend on the palm species used as manuscript support but instead confirmed the geographical origins of the studied manuscripts. In this presentation, we aim to demonstrate how methods from the natural sciences and humanities, when applied together, can enhance our understanding of the provenance of plant-based artefacts. This offers a perspective for reconstructing ancient, poorly described and undescribed artefact creation practices and contributes to our understanding of local cultural customs regarding plant use over time and space.

Fragment bindings and parchment reuse in the Herlufsholm collection

Charlotte Epple

Charlotte Epple (University of Southern Denmark, Odense)

Abstract

The historic book collection of Herlufsholm boarding school, founded in the late sixteenth century, was acquired by the University of Southern Denmark in 1966. It contains many fragments of medieval manuscripts in early modern bookbindings. These remain an understudied reservoir of medieval material that is otherwise relatively scarce in Denmark. As part of the project *A forgotten Heritage: Fragments at SDU and the Latin tradition in the Nordic Countries*, the Herlufsholm fragments are currently being catalogued and digitised with the aim of making them freely accessible online.

This paper presents the ongoing investigation into the approximately 30 fragment bindings (i.e. bindings whose covers are made of reused parchment) in the collection, considering codicological as well as textual and book historical perspectives. The aim of my study is to describe and contextualise the fragment bindings as a part of late medieval and early modern book culture. It has been hypothesised that at least some of the liturgical material was recovered after the Reformation, specifically from the library of St Peter, the Benedictine monastery on whose grounds the school was founded, but its significance for what remains of the Latin literature of the medieval North is yet to be determined.

Focussing on intact fragment bindings as a starting point, I will analyse the binding styles present among the selected items. The relatively large amount of preserved text in most cases allows for approximate dating based on palaeographic features and identification of works and genres. The printing dates of the host volumes narrow down the timeframe for when the parchment was reused. The origin of the reused parchment can be investigated by studying the provenance of the books. Marks of previous ownership such as inscriptions or book labels serve as useful indicators for characterising the nature of the fragment collection. Rather than a coherent corpus of manuscript fragments from a single source continuously reused in one place, we are dealing with a heterogeneous mass consisting of books previously owned by various individuals and institutions. For instance, several thousand volumes were donated by the Danish book collector Otto Thott in the late

eighteenth century. Others, like a collection of handwritten music books from about 1600 in limp vellum wrappers, may have been produced and bound at the school. In at least one case, a fragment was taken from one bookbinding and then transferred to another, reflecting the iterative nature of the reuse process.

Unravelling the different layers of the collection can place the Herlufsholm fragments in their historical context, sketching out their object biographies. Zooming in on the act of reuse will in turn determine their role in the Latin tradition in the Nordic countries and shed light on the origins of waste parchment in this region.

Identifying the artists in the illuminations of an 11th-century manuscript - "Le Beatus de Saint Sever": The contribution of chemical imaging to stylistic analysis

Anne Michelin, Aurélie Tournié, Charlotte Denoël, Oulfa Belhadj and Marie Radepont

Anne Michelin (Centre de Recherche sur la Conservation, Paris)

Aurélie Tournié (Centre de Recherche sur la Conservation, Paris)

Charlotte Denoël (Bibliothèque nationale de France, Paris)

Oulfa Belhadj (Centre de Recherche sur la Conservation, Paris)

Marie Radepont (Centre de Recherche sur la Conservation, Paris)

Abstract

The Beatus de Saint-Sever, currently housed in the Department of Manuscripts of the Bibliothèque nationale de France, is an extraordinarily rich manuscript, both intellectually and artistically, as well as technically. Of imposing dimensions (37 × 29 cm), it includes over a hundred illuminations on the almost 300 parchment leaves of which it is composed. Produced around 1060 in the abbey of Saint-Sever (Landes, France), it is mainly a textual and visual commentary on the Apocalypse of St. John, originally written by an 8th-century monk, Beatus de Liébana.

Its conception was the work of Abbé Grégoire de Montaner, who commissioned several artists to illustrate the manuscript. Studies by numerous historians, first and foremost François Avril, have highlighted the collegiate nature of the manuscript's paintings: a principal artist was assisted by four others whose contributions were varyingly significant. Visual analysis of the colour palette and style has enabled us to attribute the illuminations to each of these artists.

This presentation will show how the experimental sciences can shed light on the manufacturing processes of an 11th-century illuminated manuscript. Thanks to chemical imaging, and in particular reflectance imaging spectroscopy and X-ray fluorescence imaging, it is possible to identify most of the colouring materials and analyse their distribution for a large number of illuminations. The results of the identified materials is then compared with historians' attributions of the paintings to the different artists. In

particular, the artists' collaborations within certain double-pages are examined. Determining simple criteria for identifying different hands through the study of materiality is proving complex, but certain similarities between illuminations by the same artist seem promising. Information on both pictorial techniques and the organisation of work between the various manuscript artists can thus be deduced from these analyses. This study also raises questions about the timeframe in which these illuminations were produced.

Inks, colours and gold: Studying an illuminated Byzantine Lectionary from the Hellenic Parliament Library

Anna-Arietta Revithi, Konstantinos Choulis, Vasiliki Kokla, Georgios Mastrotheodoros and Fevronia Nousia

Anna-Arietta Revithi (Hellenic Parliament Library, Athens)

Konstantinos Choulis (University of West Attica, Athens)

Vasiliki Kokla (University of West Attica, Athens)

Georgios Mastrotheodoros (University of West Attica, Athens)

Fevronia Nousia (University of Patras)

Abstract

The present study examines a Byzantine illuminated lectionary from the end of the 11th century, preserved in the Hellenic Parliament Library Special Collections (reference number [ΧΦ] 7). It is part of an ongoing PhD research project at the University of West Attica.

Based on a note on the front paper pastedown (fly leaf), this codex came into the possession of the Hellenic Parliament Library following the donation made on the 17th of March 1880 by Sofronios Gavallas, then Abbot of the Holy Monastery of Prophet Ilias, Thiras (Santorini).

The manuscript consists of 242 bifolios, divided into a total of 62 quires, written with exquisite calligraphy. It is spectacularly decorated with ornate titles, bands and illuminated initial letters. The text is in double columns, with 14 lines per column. It is written in brown ink, red for its phonetic notation, while parts of the text are entirely written in gold.

Both bibliographical and current studies suggest that it may belong to the same group of famous manuscripts most likely copied by the *Copiste du métaphraste*, among which are *Vat.gr.* 1156, *BL Add* MS 82957, *Laur Med. Palat.* 244 and Ms 105 (Chelandariou Monastery).

This presentation focuses on the study of the inks, gold and pigments through non-invasive methods, such as microscopic and multispectral imaging and point analyses with X-ray fluorescence (XRF), allowing their identification. The inks of the (few) recycled newer

manuscript guards were also studied and compared to the parchment of the main text, while the parchment surface was analysed as far as its preparation is concerned.

Microscopic imaging allowed the examination of areas not visible to the naked eye. Multispectral imaging provided significant results about manufacturing materials and techniques used in texts and decorations, as well as their preservation state.

Additionally, it was possible, through multispectral imaging (notably in the IR spectrum) to study and evaluate the preliminary drawings of the miniatures by examining the method used by the artist (metal point or compass).

Focus was given to the brown ink used for the text, the red ink used for the phonetic notation and the various colour pigments that alternate in illuminating the miniatures (red, pink, blue, green and black), the initial letters and the overall decoration. The gold (ink, leaf) present throughout the text (in the form of illumination or writing) was also examined.

The main aim of this research was to identify the inks, gold and colour palette (pigments) employed by the *Copiste*'s scriptorium, where the codex was copied, in order to provide a valid reference tool for other similar manuscripts.

Furthermore, the research will allow to determine the best methodology to be applied for conservation treatments, as well as for any other preservation practice.

ZooMS data reveals variation in parchment manufacturing methods over a millennium

Bharath Nair, Ismael Rodriguez Palomo, Laura Cristina Viñas Caron, Sarah Fiddyment, Matthew Teasdale, Élodie Lévêque, Annelise Binois, Jiří Vnouček and Matthew Collins

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Abstract

Biocodicology contributes to the understanding of cultural heritage by revealing how manuscripts were produced and used in different societies. This can shed light on the literary, educational, spiritual and intellectual history of past cultures. This study presents a comprehensive ZooMS analysis of almost 10,000 parchment samples, the biggest dataset analysed so far, collected from libraries across Europe to explore variations in species choice and manufacturing methods during ~800-1800 CE. First, we explored fine-scale variations in the animal species used to produce parchment compared with the type of document, and their provenance. Next, the study focused on examining the effects of lime exposure on parchment collagen, as it is the only treatment likely to significantly increase the deamidation of glutamine (Parchment Glutamine Index or PQI).

We used the R programming language to perform ZooMS spectra processing and analysis, leveraging our in-house MALDIpqi package. Using advanced statistical methods, it calculates PQI from matrix-assisted laser desorption/ionisation-time of flight mass spectrometry (MALDI-TOF) data. The results are contextualised with historical sources delving into parchment manufacturing methods such as La Lande's *The art of parchment making*, which provides detailed accounts of lime treatment and its significance in parchment production. We also explored the historical and regional variations in dehairing, including the rotting of the skin, the use of urine (alkaline), and the role of skin microbiome (e.g. exoenzymes) in the dehairing process where lime was not used. It also influences the physical and chemical properties of parchment and impacts its longevity and durability as a writing material.

Our findings highlighted geographical and cultural variations in PQI, spanning from the methods employed in the preparation of the Dead Sea Scrolls to the industrial processes prevalent throughout medieval Europe. For example, we found low deamidation values in manuscripts from England and France during the period 800-1000 CE, implying the absence of lime exposure. This study also reveals the regional and temporal variations in animal species used. In conclusion, the insights gained from this comprehensive analysis contribute to our broader understanding of the evolution of parchment production practices over a millennium, emphasising the importance of geographical, cultural and historical contexts in assessing the degradation and longevity of parchment.

A Flemish book of hours on black parchment

Christa Hofmann, Birgit Hofer, Sabrina Bee, Junko Sonderegger, Dubravka Jembrih-Simbürger, Federica Cappa, Kathleen Mühlen Axelsson, Dorte Sommer and Maurizio Aceto

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Maurizio Aceto (Università degli Studi del Piemonte Orientale, Vercelli)

Abstract

The book of hours of Galeazzo Maria Sforza, 5th Duke of Milan (Vienna, Austrian National Library Codex 1856), is a rare example of an illuminated manuscript on black parchment. The scribes wrote in silver and gold on parchment coloured with iron gall ink. Worldwide there are seven preserved black manuscripts, all of which can be traced to the Duchy of Burgundy in the second half of the 15th century and reflect the tastes of the Dukes of Burgundy, Philip the Good and Charles the Bold.

The extreme deterioration of the parchment led to the disassembling of folios and binding of Codex 1856 in 1928. The folios with miniatures have been preserved first between glass plates and since 1975 together with all folios between sheets of polyacrylate. In 2023, the condition of the parchment prompted an investigation of the materials with the aim of finding appropriate solutions for conservation and storage. Iron gall ink could be identified as the colourant of the parchment by X-ray fluorescence spectrometry (XRF) and Raman spectroscopy. Further characterisation of the tannin components is in process. The scribes used high quality silver and gold for the preparation of inks and illuminations, as can be seen in XRF-spectra and mappings. The advanced deterioration of the parchment fibres was confirmed by fibre morphology and assessment of the hydrothermal stability.

The former history of the book of hours leaves many questions unanswered. The study of the different components of the presumably original binding and the illuminated folios aims to put the codex in context with the related six black codices and with Flemish manuscripts at the Austrian National Library. This includes the silk velvet binding with metal decoration and the characterisation of the palette of the miniatures.

The presentation will summarise the history of Cod. 1856 and the ongoing investigations. The results will be discussed related to provenance and the concept for conservation. A model treatment and storage solution will be presented.

The Illuminated Manuscripts Project at the Nationalmuseum in Stockholm

Anne-Grethe Slettemoen, Christian Etheridge, Adam Larsson, Ambrose Hickman and Yolanda Bustamante Sampedro

Anne-Grethe Slettemoen (Nationalmuseum, Stockholm)

Christian Etheridge (Nationalmuseum, Stockholm)

Adam Larsson (Uppsala University Library)

Ambrose Hickman (National Library, Stockholm)

Yolanda Bustamante Sampedro (Book and paper conservator)

Abstract

Among the many magnificent treasures owned by the Nationalmuseum, one genre, medieval and Renaissance illuminated manuscripts, has been underrepresented in research in recent decades. These beautiful works of art form a world-class collection of early illuminations. Although not entirely forgotten, there has been a lack of research and no large-scale exhibition of the collection since the late 1980s. In 2021, this situation changed due to a generous donation from an anonymous donor who wished to see research and conservation work done on the manuscript collection. The *Illuminated Manuscripts Project* was thus born and ran during 2022 and 2023.

The project involved an interesting and novel mix of art historians, paper conservators, bookbinders and photographers. Observational and microscopic analysis was used to investigate each manuscript in detail. This analysis thus provided an assessment of the collection that identified each item's conservation needs and spotted those that required more detailed treatment. Many manuscript cuttings had to be released from their old, unsuitable mountings, especially those trapped between layers of glass. The cuttings were then mounted in passepartouts to allow access and display under safety conditions for the items. The entire collection was then photographed and digitised using new techniques to keep the gold leaf on each page consistently luminescent. The images were then linked with a new updated online catalogue using new research and archival analysis. Expert manuscript historians, parchment experts and pigment analysts from other institutions helped the team during the project's lifetime. The success of this project has led to further ongoing projects on the collection.

This paper will discuss how the project was can serve as a template for co-operation between conservators, photographers, art historians and researchers to learn from each other by showing our methods of partnership.

Conserving a divided 15th-century codex: A case study from the Biblioteca Nazionale Marciana

Claudia Benvestito, Letizia Montalbano and Viviana Molinari

Claudia Benvestito (Biblioteca Nazionale Marciana, Venice)

Letizia Montalbano (Opificio delle Pietre Dure, Florence)

Viviana Molinari (freelance conservator)

Abstract

This presentation examines the treatment of two items from the Biblioteca Nazionale Marciana in Venice: a codex and an illustration on a wooden panel, originally part of a single work. Historically separated, these items have undergone different uses, leading to varying types of damage. Specifically, the objects in question are the 15th-century illuminated codex Lat. XII, 68 (= 4519) of *Punica* by Silius Italicus, illustrated by Zanobi Strozzi, and one of the pages stolen in the 18th century. The page, the only remaining one in Italy (with others at the Hermitage Museum in Saint Petersburg), features a miniature of *Mars on a chariot* attributed to Francesco Pesellino.

Commissioned by Pope Nicholas V in Florence, the codex originally had a 15th-century binding that was briefly described in ancient Vatican inventories. In the 18th century, this original binding was replaced with the current one, which is now damaged. The exterior shows wear and the interior reveals cuts related to the 18th-century theft committed by some monks in the library of the convent of SS. Giovanni e Paolo in Venice.

The recent treatment of the codex revealed that the pronounced waviness of the parchment sheets was originally caused by a thick bookmark from the 15th-century binding. Although this bookmark no longer exists, traces of a subsequent treatment for the waviness were also found.

Created between 1447 and 1455, the miniature of *Mars on a chariot* was fully glued onto a panel and displayed for a long time as a small painting. The main issue was the inadequate mounting system, which over time compromised the preservation of the miniature. This caused significant damage to the lower part of the parchment, due to the deterioration of one of the slats in the panel, which resulted in a tear of the illustration and damaged the surrounding paint layer. The surface, characterized by vibrant colours and gold leaf decorations, had suffered significant losses due to prolonged exposure without protection and possibly from an unspecified consolidation treatment. It appeared flattened and greyed, with numerous insect droppings and darkened retouches, especially in the sky area.

The recent intervention involved a team of paper and parchment conservators, wooden support experts and researchers from CNR-INAF (National Institute of Optics). Although the complete removal of the miniature from the wooden support seemed appropriate at first, its firm anchoring to the panel made a less invasive solution preferable, both for the primary support and the paint layer. Thanks to a series of investigations conducted with CNR-INAF and the OPD (Opificio delle Pietre Dure) scientific laboratory – such as Infrared Reflectography, False Colour Reflectography, UV Fluorescence, XRF Mapping, Conoscopy, Multiscanner Vis-Nir, Raman and FTIR – it was possible to reconstruct the technical process of creation, analyse the pigments and the gold and lacquer decorations used by the artist, and study degradation processes such as the deformations of the panel and the parchment.

These objects will be displayed in the autumn of 2025 in the *Angelico* exhibition, organized by the Fondazione Palazzo Strozzi in Florence, which supported the conservation treatments.

Restoration of wax tablets triptych "Wies Chotol Ex libris Erasmus Labor de Drozdowski": preserved "biography" of the manuscript

Virgilija Guogienė, Dalia Jonynaitė and Greta Keraitė

Virgilija Guogienė (Vilnius University Library)

Dalia Jonynaitė (Lithuanian National Museum of Art, Vilnius)

Greta Keraitė (Vilnius University Library)

Abstract

Wax tablets were used until the mid-19th century. Although this writing system was common, only a few of these tablets have survived. It is possible that the triptych of wax tablets now stored in the Manuscript Department of Vilnius University Library is the only surviving example in the territory of Lithuania. The styluses found during archaeological excavations testify the former prevalence of this medium, however.

"Tablica woskowe do kontrolowania paszczyzny pomiantka z Bialorusi zdobr Chotol powiecie Witebskim" (Wax tablets for accounting of serfdom in Vitebsk village, Chotol village, Belarus) is a triptych of wax tablets tentatively dated to the mid-17th to mid-18th century. This triptych presents mixed types of writing systems. The first type is a long-term record indicated by handwritten entries in brown ink on glued paper strips. The second type are short-term records indicated by punching holes in areas of the tablets carved and filled with dark-coloured wax.

Taking into account the diversity of materials and the uniqueness of the wax tablets, detailed studies of the materials and their condition were carried out. The wax was examined by FTIR, photomicrography, IRR and UV photography, and pH and morphological studies of leather, paper and threads were performed.

The application of interventional methods, the replacement of materials, and the complete restoration of missing parts were avoided as much as possible while developing the restoration methodology. The stability of the object had to be taken into account. An Intelligent Mobile Accurate Thermo-Electrical Device (IMAT) was used to achieve this goal. The IMAT heater was created to improve restoration processes, which allowed applying minimal intervention and working almost without using new restorative material. This created a unique restoration methodology – an innovative and safe method of attaching wax parts to a wooden table. This device (developed by the EU-funded IMAT Research Project) is flexible with an ultra-thin heat transfer mat based on carbon nanotubes (CNTs). The IMAT heater features a rapid thermal response, controllable and stable heat regulation, and uniform heat distribution during a conservation treatment.

Natural 100% purified beeswax and the wax modelling machine Waxlectric I were used for gluing the damaged areas of the original wax – cracks, abrasions, cavities and split wax

fragments, but even in this way, the carved indentations in the tablets were neither filled nor restored.

An originally designed case made of archival-quality materials was created to store and exhibit the wax tablets, without removing them from the case.

As a result, decayed materials (wax, paper) were renewed and the wax tablets were stabilized and strengthened. Visually and materially, the object were little changed, and the authenticity, historicity and "biography" of the manuscript were thus preserved.

A typological classification of Coptic bookbinding

Eliana Dal Sasso

Eliana Dal Sasso (University of Hamburg)

Abstract

This presentation will discuss the findings of my doctoral research on the Coptic bookbinding tradition, conducted at the Centre for the Study of Manuscript Cultures at the University of Hamburg. Building upon the foundational works of Theodore Petersen and Janos Szirmai, my research incorporates recent advancements in codicology, new archaeological discoveries, unpublished historical photographic documentation and direct inspections of bindings to develop a typological classification of Coptic bookbinding based on technological criteria—specifically, the sewing methods used to bind the leaves or quires—which illustrates the evolution of the Coptic bookbinding method over time.

First, the presentation will clarify that a binding's defining feature is its sewing technique, and the expression 'Coptic bindings' extends beyond the bindings of Christian texts in Coptic.

Second, it will briefly introduce the developed survey for obtaining homogeneous and detailed descriptions of Coptic binding using the terminology from the Language of Bindings Thesaurus and new terms specific to Coptic binding traditions. The survey was used to examine 147 artefacts relating to Coptic bindings directly. The work conducted in the institutions also determined the current state of preservation for previously documented bindings and identified newly discovered ones.

Third, it will present the four identified typologies of Coptic bindings. Coptic bindings are categorised into two main groups: linking sewing techniques (which connect the quires) and non-linking sewing techniques (which do not interconnect the quires). Each group will be further subdivided based on whether the sewing is performed through the inner margin of the leaves or the central fold of the quire. Within this framework will be the four typologies with examples from direct examinations to illustrate the binding features. Each typology's description will include its usage period, context and any associations with specific text categories. The identified typologies are:

- Typology 1: Stab sewing through the margin

- Typology 2: Sewing through the fold
- Typology 3: Stitching through the margin
- Typology 4: Tacketing through the fold

In conclusion, this presentation will highlight how typological classification helps to understand the historical development of Coptic bookbinding, its relationship with Ethiopian and Islamic binding traditions and how it reflects the evolution of society. The study reveals that Coptic and Ethiopian bindings are fundamentally different, but both exhibit periodic fold patterns, a technique evident in Coptic bindings until the eighth century. This shared method suggests a historical connection between the two until that date. After that, their trajectories diverged, and Coptic bindings started assimilating Islamic binding features, such as all-along chainstitch sewing. The eighth century corresponds to the period after the Arab conquest when Egypt began a slow but progressive 'Arabicisation', a process of cultural and linguistic assimilation, whereas, in Ethiopia, Christian and Islamic cultures remained separate until the present day, identifiably in the form of their books.

Therefore, adopting on Mirjam Foot's concept of bookbinding as a reflection of society, expressed in *The history of bookbinding as a mirror of society*, this study underscores how binding traditions offer insights into cultural shifts and continuity in both Egyptian and Ethiopian societies.

The GreenBOOK Project: Eco-Friendly Bioleather for Book Conservation

Elodie Lévêque, Theanne Schiros, Simon Raffin and Elias Dolton-Thornton

Elodie Lévêque (Paris 1 Panthéon-Sorbonne University)

Theanne Schiros (State University of New York)

Simon Raffin (Paris 1 Panthéon-Sorbonne University)

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Abstract

The GreenBOOK project, "Generating Renewable Eco-friendly and Nano Bioleather for Book Preservation," aims to develop a sustainable biofabricated leather alternative specifically designed for book conservation. This initiative is dedicated to creating a material that aligns with sustainable development principles while addressing the preservation needs of historical manuscripts.

The conservation of books has deep roots in craftsmanship, particularly in bookbinding. Traditionally, damaged book covers were replaced with similar materials, predominantly leather. However, contemporary concerns regarding the environmental impact of leather production have driven the search for sustainable alternatives.

Leather production, a byproduct of the livestock industry, is a leading source of deforestation and greenhouse gas emissions: the tanning process, especially chrome tanning, results in considerable chemical pollution. The fast fashion industry has initiated the development of alternative materials, but these often fail to meet the rigorous standards required for book restoration. Synthetic leathers derived from petrochemicals are non-biodegradable and release microplastics, posing significant ecological and health risks. The reliance on imported Japanese paper, although environmentally friendly, does not withstand the mechanical stress of book handling.

The primary goal of the GreenBOOK project is to create an innovative, eco-responsible biosynthentic leather alternative suitable for book restoration. This material must adhere to the principles of a sustainable circular economy and meet the long-term preservation needs of books: renewability, low-toxicity, low-carbon manufacturing processes, exceptional mechanical performance, natural degradation equivalent to animal leather, stability and minimal toxicity, minimal gas emissions.

Inspired by the work of Theanne Schiros and Helen Lu, who harnessed microbial biosynthesis of nanocellulose coupled with paleo-inspired green processing to demonstrate a lecithin-tanned bioleather with improved mechanical and superior flame-retardant properties, low environmental impact, and natural soil degradability, GreenBook explores the use of microbial nanocellulose (MC), a regenerative biopolymer with superior mechanical properties produced by *Acetobacter xylinus* bacteria for book conservation. The MC has high biosorption capacity to incorporate natural dyes during biosynthesis, eliminating the need for water-intensive dyeing processes. This approach reduces the toxicity associated with traditional leather tanning and dyeing methods. By using natural dyes, we ensure that the bioleather remains environmentally friendly and safe for long-term use in book restoration.

Our initial tests have yielded promising results. We have successfully tested the strength of our bioleather against traditional leather, confirming that it meets or exceeds the mechanical performance needed for book conservation. Additionally, we conducted colourfast tests to UV to ensure the material's resistance to fading over time, which is critical for maintaining the aesthetic integrity of restored books. The adhesion properties of the bioleather were also evaluated, showing excellent compatibility with various adhesives commonly used in bookbinding.

Given the promising performance of microbial nanocellulose in fashion, footwear, and interiors, GreenBOOK is anticipated to meet or exceed the mechanical and aesthetic standards of traditional leather. The project's success will address the critical shortage of high-quality materials for book conservation, offering a locally producible, environmentally friendly solution.

A note on the decorative programme of a late-medieval Gaelic manuscript

Fenella G. France, Pádraig Ó Macháin and Meghan Hill

Fenella G. France (Library of Congress, Washington, D.C.)

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Abstract

The examination of a significant number of Gaelic manuscripts was undertaken as part of the Inks&Skin interdisciplinary research project, where the focus was on increasing our understanding of the materiality of the late-medieval Gaelic manuscript. Along with commonalities, the differences observed in some manuscripts, compared to their contemporaries, has added to this investigation, as we use a range of heritage science techniques to delve below the surface and better understand the meaning behind these differences. The *Leabhar Breac* (Royal Irish Academy MS 23 P 16) is a Gaelic manuscript written on calfskin by a single scribe (Murchadh Riabhach Ó Cuinnlis) in county Galway c. 1408-1411. It contains 142 folios, measuring 38 × 25 cm and of calfskin. It is densely written in double columns (like all other manuscripts of this size) and contains mostly religious prose in the Irish language with some in Latin.

This paper will discuss the general decorative programme of the manuscript and will then focus on a particular feature of that programme involving the decoration of a small number of the initial letters. These appear as lightly drawn and coloured, with a marked absence of the usual preliminary ink outline, and this occurs in at least nine of the initials. They are worthy of notice (a) as being in marked contrast to the majority of 'fully-completed' letters in the book; and (b) as being unique in Gaelic tradition. Generally, initial letters were outlined before the main text was written, and then coloured afterwards.

Examination techniques used in the research comprised a combination of complementary non-invasive instrumentation. These included the analysis of scribal practice, fiber optic reflectance spectroscopy (FORS), multispectral imaging (MSI) and X-Ray fluorescence spectroscopy (XRF). This enabled identification of pigments – organic and inorganic, as well as the exploration of creation techniques. We are exploring a number of possibilities that may account for the contrast in the decorative programme. These include the specific “letters” being capitalised, the location in the folios is also random, and the identification of the pigment palette being used across the outlined and non-outlined initial letters. This manuscript also contains a few examples of the common practice of leaving blanks for later insertion of initials, with or without guide-letters. The non-outlined initials are unique in Gaelic/Irish tradition, and this examination explores comparisons from other manuscript traditions.

Ethiopian manuscripts in Lalibela: A first assessment

Isabelle Scappazzoni and Francesco Siri

Isabelle Scappazzoni (Archives nationales, Paris)

Francesco Siri (École nationale des chartes, Paris)

Abstract

Situated in the Amhara region at an altitude of around 2,600 m, Lalibela is one of the most important Christian religious centers in East Africa. According to tradition, in the early 13th century, the eponymous king Gebre Mesqel Lalibela ordered the excavation of the eleven monolithic churches, now listed as a World Heritage Site by UNESCO. This architectural and artistic heritage also houses a rich collection of manuscripts and other artefacts made of parchment, paper and leather. As part of the *Sustainable Lalibela* project run by the French Center for Ethiopian Studies, survey missions carried out in 2022 and 2023 have enabled us to begin to understand Lalibela's written heritage, with a twofold objective. On the one hand, to establish the state of conservation of the manuscripts on display in the church museum, as well as recommendations for better preservation of this heritage; on the other hand, to propose an appropriate training plan for the staff in charge of this heritage with a view to its conservation and digitisation. In our contribution, we present a few elements from our experience, which has been nurtured by exchanges with local actors: part of the community continues to produce and work on manuscripts using ancestral techniques, despite Western intervention in the second half of the twentieth century.

Setting up a book and paper conservation studio in the early 20th century: The case of the National Archives in Florence

Giada Genua and Irene Zanella

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Irene Zanella (Archivio di Stato di Firenze, Florence)

Abstract

The early years of the conservation studio at the National Archives of Florence were largely unknown: information about the year of its opening, who the first conservators were and what materials and techniques they employed were an unexplored field.

Two book and paper conservators, currently working at the Archives for a private company, started to study the historical documents of the National Archives (the so-called "*archive of the Archives*") in order to find more information about the conservation studio's history. What they found was a unique, very early collection of documentation, including catalogues, samples of materials for conservation, notes of conservators attending conferences and training courses, reference to machines still found in the present conservation workshop, professional correspondence.

From the annual reports on the activities carried out inside the Archives, they discovered that in 1912 the National Archives in Florence was among the first institutions in Italy to open a modern and scientific conservation studio, following the guidelines and principles of the first international conference on the preservation of manuscripts, held in Saint Gall

few years earlier. While exploring the account books of the Archives they found receipts of conservation supplies, and reading the folders about people working in the Archives they discovered their training and backgrounds. Through these documents, it was possible to identify part of the technical supplies dating to those early years still present in the conservation studio storage.

Such documents represent a unique source and cast light on the process of decision making with a scientific approach in conservation practice. The results of this research allow us to go deeper into the knowledge of materials and techniques in book and paper conservation at an early stage in the modern scientific treatments, and to realise that some materials, which are still considered essential in contemporary practice, were already in use more than a hundred years ago.

Not quite *ultima Thule*: A voyage into the colorants of medieval Icelandic manuscripts

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Cheryl Porter (independent scholar)

Abstract

The assumption that Icelandic scribes and craftsmen primarily used local materials for book-making throughout the Middle Ages has long been a dominant perspective in the scholarly discourse. This study challenges this assumption by analysing the colourants used in a selection of Icelandic manuscripts preserved at The Árni Magnússon Institute for Icelandic Studies in Reykjavík, covering the period from the earliest records dating back to the 12th century until the end of the 14th century.

In addition to examining the most notable examples of book painting, the analysis also encompassed other minor decorative elements, such as pen-flourished initials, as well as rubrics. This approach aimed to provide insight into the material employed at various stages of book production.

The analyses have been entirely non-invasive, employing UV-visible diffuse reflectance spectrophotometry with optic fibers (FORS), X-ray fluorescence spectrometry (XRF) and optical microscopy.

The results collectively suggest that only approximately half of the colourants could have been of local origin and production. This can be hypothesised for ochres and earths (mostly red ochre, yellow ochre and green earth), copper pigments (malachite mines are known to exist in Iceland) and, potentially, orchil, a dye made from lichens, which at any rate would indicate a knowledge of its production technique. Nevertheless, a considerable number of the identified colourants could not have had a local origin, due to the lack of both mineral and vegetal sources, such as all lead pigments and indigo/woad respectively. Among the imported colourants that have been identified, the following stand out as particularly noteworthy:

- lapis lazuli, the semiprecious stone coming from Afghanistan, found only in a few instances in particularly lavish manuscripts;
- iron phosphates, rare pigments which could be characteristic of specific scriptoria;
- vegetal pigments such as indigo or woad;
- iron gall inks, perhaps the most remarkable point: given that all the manuscripts analysed in this study, even the oldest, were written with black ink of this type, questions arise concerning the provenance of the raw sources, namely gum Arabic, vitriols and gallnuts.

These findings challenge the romanticised notion of medieval Iceland as an isolated place situated in the far North, which out of necessity would have had to rely on local materials for manuscript production. Instead, the evidence indicates that Iceland should be considered within the wider context of the trade routes that ran between Europe and the East throughout the Middle Ages.

The study ultimately situates Iceland within the broader Western European context of book production, providing an unprecedented and invaluable source of data for comparative analysis with neighbouring writing traditions.

Archaeometric philology for the understanding of deteriorated and multi-layered manuscripts: Two case studies from early Qur'anic fragments on parchment.

Giuseppe Marotta, Alba Fedeli, Claudia Colini and Sowmeya Sathiyamani

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Claudia Colini (University of Hamburg)

Sowmeya Sathiyamani (University of Hamburg)

Abstract

A multidisciplinary approach involving archaeometry and philology can often be mutually beneficial in the field of manuscript studies. When forms of degradation occur, the manuscript text can in some cases be puzzling for manuscript scholars. On the other hand, archaeometrists need the support of philological analyses to select regions of interest that raise research questions to which archaeometry and philology together can answer. Among the various traditions in which the two disciplines can find a common ground of research, this contribution aims to present a successful application of the combined approach in the case of deteriorated and multi-layered early Qur'anic manuscripts.

In this study, advanced non-destructive techniques such as X-ray fluorescence (XRF), μ-Raman spectroscopy, and infrared reflectography (IRR) were employed to examine the chemical composition and materiality of two distinct and different Qur'anic fragment on parchment produced at the beginning of Islam (Hamburg Staats- und Universitätsbibliothek Cod. in scrinio 153a and Österreich Nationalbibliothek A. Perg 2). In the one case (Cod. in scrinio 153a), the philological and palaeographical analysis of the deteriorated pigments employed for adding dots to mark the vowels, could make sense of the results obtained from the material analyses, thanks to their interpretation based on the content and writing system based on a colour code known from the literature on the topic (al-Dani, d.1053). In the other (Österreich Nationalbibliothek A. Perg 2), the separation of layers of textual sections coexisting on the same folio produced as an exercise to write the Qur'an, could give some interesting insights of the production phases and context of use and reuse of the same object.

The non-invasive material analyses, in continuous dialogue with palaeographic and philological observations, allowed for a comprehensive assessment of the writing materials, identifying the nature of the deteriorated colours and separating ink layers.

In both cases, a multidisciplinary approach involving archaeometry, codicology, philology, history of the text and conservation turned out to be crucial to shed light on the manuscript texts and their production contexts.

Treatment decisions for an annotated Ptolemaic atlas

Katherine Kelly and Jennifer Evers

Katherine Kelly (Library of Congress, Washington, D.C.)

Jennifer Evers (Library of Congress, Washington, D.C.)

Abstract

The rapid expansion of print in the late 15th century included cartographic books, chief among them Ptolemy's *Geographia*. This classical text, originally written in the 2nd century, was first printed in 1475, and later editions from 1477, 1478 and 1482 began to include printed maps. Among the Library of Congress's extensive collection of Ptolemaic atlases is a heavily annotated 1486 edition printed in Ulm, Germany. This copy, which uses the same woodcut plates as those in the earlier 1482 edition, has extensive hand colouring on both the maps and the large initials throughout the text. Although similar editions of this volume exist in other collections, the Library's copy is remarkable because of the many iron gall ink annotations throughout. These annotations, written in Spanish, are thought to have been inscribed more than a century after the book was printed, and provide a commentary on and corrections to the maps.

During the 500 years of this volume's existence, it has been rebound, questionably repaired, damaged by mould and water and chewed on by rodents and insects. Inherent vice in the form of heavy vellum guards on the maps has also caused significant damage and cracking along the gutter of many pages. Taken in combination, the annotations, damage and evidence of previous restoration campaigns tell a fascinating story of geographic knowledge and book ownership and use spanning half a millennium; however, serious condition issues made it nearly impossible to access the maps and their associated annotations without causing further damage.

The conservators will describe their decision-making process as they disbound the volume, removed disfiguring guards, revealed previously concealed annotations and repaired and rebound the text. This complex treatment required extensive documentation and reassessment throughout the course of the project. Alternate treatment options were carefully considered and following a straightforward treatment plan was not always possible as new information or condition issues came to light. As the treatment of this atlas evolved, the conservators adjusted their techniques while maintaining the focus on the goal of the treatment, to allow the story of this atlas to unfold, now and in the future.

Moving the manuscript parchment in the UK Parliament Archives

Jillian Harrold and Zofia Wyszomirska-Noga

Jillian Harrold (The Parliamentary Archives, London)

Zofia Wyszomirska-Noga (The Parliamentary Archives, London)

Abstract

The archive of the UK Parliament includes over 30000 parchment manuscript documents in a variety of formats, such as the original Acts of Parliament and Royal Commissions approved with the Royal Seal. The oldest of these documents dates to 1497, and they have been held as a collection since that date. These are key constitutional documents such as the Death Warrant of King Charles I, the Act for the Abolition of Slavery 1833 and Acts that reform the electoral system. The 20 000 historic original acts of Parliament, dating from

1497 to 1850, are all handwritten in iron gall ink. Although they were initially written on flat membranes, from 1535 they were in roll format with skins sewn head to tail. They vary in size from a single membrane of prepared animal skin to the so-called 'longest act' which is a staggering 757 membranes and measures approximately 348 m long. Many of these documents bear the signatures of the Kings and Queens of England and the United Kingdom.

The Victoria Tower, part of a World Heritage Site, was designed by architect Charles Barry after the Great fire of the Palace of Westminster in 1834 as one of the first purpose-built archival repositories. This state-of-the-art fireproof Victorian engineering gem became home to the Parliamentary archival collections since 1860.

Victoria Tower underwent some modernization and restoration programs in the past, becoming the most modern repository in UK in 1960s after air-conditioning units were installed and again at the beginning of 21 century, when this was replaced by newest air conditioning system to meet BS 5454 standard for preservation of archival collections. Further improvements were not feasible due to the nature of the historic building and in 2015 collections began to move to the offsite storage units to decant the tower prior to its restoration. Current storage is adequate for current usage, both in the search room and as part of Parliamentary Estate.

Although there have been various projects over the years to improve storage of individual parts of the collection, a full-scale move was not anticipated (aside from wartime evacuations), and the housing had never been considered in the light of transport aside from loans for exhibitions. For example, rolled Original Acts were stored on open metal shelves with no secondary enclosures, as they had been for decades. They were in good condition, having been in a relatively stable environment, but were not suitable to be crated and transported.

As we prepare for the move, we see this as an opportunity to assess, survey and rehouse our collections. As conservators, we had to embrace new ways of thinking, considering the collection in its entirety, to develop packing methodologies and to carry out temporary stabilisation to guarantee the safe transition of the documents. We are adopting a flexible approach, emphasising sustainability and the reuse of materials not just for the short term but also for long-term storage. For example, we are exploring adaptable, modular housing solutions for parchment documents and wax seals. We carried out research by running several pilot projects to establish methodologies for the different formats of parchment manuscripts we hold. In this paper, we will discuss the assessment journey and its practical outcomes using case studies of various collections we have worked with, including the Subsidies of the Clergy, the Royal Commissions, flat Original Acts and the Large Parchment Collection.

Naked Parchment: Visual analysis techniques to deepen our understanding of parchment in medieval manuscripts

Jiří Vnouček, Lara Artemis and Madison Bennett

Jiří Vnouček (Royal Danish Library, Copenhagen; Beasts to Craft (B2C) project)

Lara Artemis (Lambeth Palace Library, London; Courtauld Institute of Art, London)

Madison Bennett (University of Cambridge)

Abstract

Over the last decade, innovative methodologies have been developed for the visual assessment and scientific analysis of parchment, a material transformed by skilled craftsmen into a writing surface that represents and records characteristics of the animal, the parchment maker and society as a whole. The parchment used in manuscripts can now be examined from the perspective of the animal skin itself, irrespective of text or decoration. An evaluation of this "naked parchment"—including choice of animal species, visibility and orientation of anatomical features, as well as methods of production and finishing—offers key insights into the general production of manuscripts within particular scriptoria.

This talk—introduced by Jiří Vnouček, and followed by case studies provided by PhD students Madison Bennett (University of Cambridge) and Lara Artemis (Courtauld Institute)—serves as the first comprehensive step-by-step presentation of this evaluation.

Introduction (Methods of Visual Observation): Jiří will introduce the basic tools and methodologies needed for thorough analyses of parchment, which include observing manuscript folios in transmitted light to reveal information about animal anatomy not visible under normal light conditions, measuring animal dimensions using micrometers, and classifying the traces (e.g. tool marks, imperfections or damage) during parchment production. Much of this comes under the umbrella work of the ERC-funded project *Beasts to Craft* (2018–2024), which Jiří includes in the wider discussion regarding benefits of complementing codicological research with bio-codicological (protein, microbiome and DNA) data to enable a deeper understanding of medieval manuscript production through animal, time and place.

Case 1 (Material & Making): Madison will present a detailed case study of illuminated late Anglo-Saxon Gospel Books found in UK libraries. This case study demonstrates the practical application of the visual analysis techniques outlined above. It highlights the specific findings from these manuscripts, such as insights into the production techniques, material composition and historical context gleaned from the visual and scientific examination.

Case 2 (Connecting & Meaning): Lara will then shift focus to giant Romanesque Bibles from the Anglo-Norman period produced in Great Britain and Ireland, illustrating how the same analytical processes can yield different insights when applied to a distinct group of manuscripts. By connecting time and place, Lara underscores the versatility and depth of visual manuscript analysis. She will also describe how much this might influence decision making in the conservation of illuminated parchment manuscripts.

Global technologies of notetaking: Shedding a new light on the production processes of 17th-century writing-tables

Katerina Williams

Katerina Williams (The National Archives, Kew)

Abstract

Research into the materiality and construction methods of bound volumes, particularly of those frequently overlooked or easily lost to time, is integral to ensuring not just the object's physical longevity, but also to that of the practice of the bookbinding methods themselves.

This ongoing project will explore a small collection of ten curious 17th-century notebook bindings, colloquially called *writing-tables*, belonging to The National Archives' (TNA) Prize Papers Collection, containing items that were taken as bounty from captured enemy ships and eventually became court evidence. A majority of these books were once owned by Danish seafarers and comprise either printed leaves for the purpose of currency conversion, blank white and black prepared leaves for manuscript, or both. The full-leather covered writing-tables each possessed wooden boards with fore-edge flaps, small pockets on the recto and verso of the right boards, marbled paper decoration and the most peculiar stone styli attached to only a few of the bindings.

While some content-based information can be gathered about the books from their catalogue entries and record specialists, very little can be said about their materiality and structure. To understand the roles the writing-tables played in the lives of their users it is important to gain an artefactual understanding of the bindings themselves.

The goal of the research undertaken is not just to understand more about the origin of these "notebooks", but to assess their unique and characteristic "erasable" features. In doing so, terminology and nomenclature for these understudied structures will be developed, building a reference base for future researchers and historians. The project also aims to map the industries and trading routes between certain countries during that time, by analysing and identifying the materials found throughout the objects and their origin, such as paper production from the Low Countries, lumber mills for the wooden boards from the Nordic countries and leather production from Italy.

As a starting point for the project, analysis was undertaken within the Collection Care Department (CCD) to identify the colourant used to prepare the black pages of the bookblocks and the material makeup of the stone styli. Utilising basic analytical methods such as X-ray Fluorescence (XRF) and Fourier Transform Infrared Spectroscopy (FTIR), iron gall ink and the mineral, likely to be leucite, were found as the predominant components.

Further analysis, including Reflectance Transformation Imaging (RTI), Scanning Electron Microscopy (SEM) and (Computed Tomography) CT-Scanning will be incorporated into the analytical toolkit to digitally reconstruct the bindings and the content of the erasable pages, from the molecular level up.

This presentation marks the first steps in a multi-institutional, cross-disciplinary, globally spanning foray into documenting and building a research base for writing-tables. Work specifically on the materiality and construction of these unique writing-tables will be the first of its kind and adds to TNA's recent work on the in-depth and ever-expanding world of conservation documentation and knowledge building.

The thread that binds: Sewing stabilization of two Byzantine manuscripts from Dumbarton Oaks

Katherine L. Beaty

Katherine L. Beaty (Harvard Library, Cambridge, Massachusetts)

Abstract

Two important Byzantine manuscripts from the Dumbarton Oaks Research Library and Collection presented similar conditions issues, while having distinctly different structures. Lacking their bindings, both volumes had historic sewing, which was fragmentary with large sections of loss. The conservation approach aimed to maintain original sewing remnants through extensive in situ repairs to the parchment textblocks. Stabilization and repair to the sewing structure sought to rebuild missing sewing elements, while incorporating the original sewing components.

The Benton Gospels (Dumbarton Oaks MS 6, BZ.2017.001) is a manuscript dated to the 10th century containing the four gospels in Greek. While there was evidence of previous binding, the manuscript was currently only sewn, with what sewing remained fragmentary. The extensive damage to the folds of the parchment required several layers of repairs to the folds with goldbeater's skin and fish gelatin. The repairs had to be situated between the sewing supports and intact sewing thread. Originally, this manuscript was sewn in two halves, and thus the sewing was started from one side and finished at the centre point, marked by the X. Then the manuscript was flipped over and the other half of the sewing repair was completed. The original sewing thread was left in the gutter.

The Menaion in Georgian (Dumbarton Oaks MS 2, BZ.1952.1) is dated to the 11th century from Middle Byzantine. The acquisition history states that this Menaion was first documented at the Georgian Monastery of the Holy Cross, Jerusalem. While this manuscript was written in Georgian, the sewing structure and binding evidence pointed to a structure more similar to Syriac binding, with an impression of the previous board attachment in the endleaves. The current sewing was more similar to Armenian sewing structure, however, with a herringbone stitch over double cord supports and sewing holes which were notched in the gatherings with a v-shaped groove. Though the history of this book will likely remain a mystery, conservation was particularly challenging due to the poor condition of the thin sheepskin parchment. Due to past exposure to moisture, the condition of the parchment primarily along the tail edge, but also throughout, proved to be pulpy, weak and crumbly. In areas, the amount of loss to the backs of the folds was considerable and required that the repairs did not extend fully to the corner. The direction of the herringbone stitch

predetermined the direction of the resewing, which proved challenging when manipulating an already bound textblock. After the initial sewing reconstruction was started, the textblock was flipped and herringbone pattern was sewn upside down, which was a more comfortable position for the conservator.

Both books were retained as unbound manuscripts and not given a binding, but instead were housed inside custom fitting chemise bindings with magnetic fore-edge clasps. While the approach was similar, the different sewing structures of the two manuscripts provided distinct challenges.

Addressing historic conservation techniques and acceptable loss on a 1732-1796 church register

Jessica Henze and Kathryn Boodle

Jessica Henze (Northeast Document Conservation Center, Andover)

Kathryn Boodle (Northeast Document Conservation Center, Andover)

Abstract

On occasion, there are challenging conservation projects in which treatment seems inadvisable despite the potential to improve the object in a meaningful way. In such cases, a clear definition of what is considered acceptable loss for the object needs to be established to conduct safe, ethical treatment. With this in mind, NEDCC's book and paper conservators took on the daunting task of treating a historically significant 18th-century church register. The volume was not an unusual object considering its structure, materials and age; however, it was so brittle and extensively damaged that it was deemed inaccessible, despite three previous conservation efforts.

These previous treatments were all attempts to address the brittle, fractured paper and severely degraded iron gall ink. Prior to 1930, paper patches had been applied to major fractures and weak areas; then, in 1936, all 250+ leaves had been lined with silk as part of the Works Progress Administration's (WPA) preservation efforts; and finally, in 2009, forty-nine leaves had undergone a treatment that ended with them being lined on both sides with wet-strength tissue. The conservator in 2009 stopped treatment as they felt that there was "no way...to remove the silk chiffon and apply another support without what [they] consider[ed] to be more loss than benefit."

NEDCC's conservators worked together to create a treatment plan to improve the accessibility and stability of the Register. The plan needed to address the challenges presented by the previous treatments, take into account the potential for loss of information, and allow the conservators a way to avoid project burn out.

A key component of the plan was the creation of a high-resolution digital record of every page before starting the treatment. Using these images, and assessing each leaf via transmissive light prior to aqueous treatment, provided a way to predict and monitor

levels of loss to ensure that the results were within the previously defined ”acceptible” range. Mechanical and aqueous methods to remove the silk and tissue linings were adjusted and refined as the project progressed from leaves with the least risk of loss to those with the greatest. After stabilizing the leaves through calcium phytate treatment and sizing with gelatin, they were assessed again to determine which would undergo minimal mending and which needed to be lined with a lightweight tissue.

To ensure that the maximum amount of information was represented in the digital record, a second set of high-resolution images was taken after mending and lining, capturing improvements in legibility and areas reconstructed during treatment. The leaves were then encapsulated and post-bound in two volumes, providing full access to the Register.

Overall, this project threw common conservation approaches into sharp relief, forcing a re-evaluation of treatment biases and methodologies while encouraging a nuanced view of what it means to complete a successful treatment on a complex object.

The conservation of the Sri Guru Granth Sahib Ji: Challenges and outcomes of a community oriented project

Laura Caradonna-Snow and Mark Furness

Laura Caradonna-Snow (John Rylands Research Institute and Library, Manchester)

Mark Furness (John Rylands Research Institute and Library, Manchester)

Abstract

The conservation of the 17th-century Guru Granth Sahib manuscript, a sacred Sikh text, required a collaborative effort to address its unique challenges. This groundbreaking project involved a core team of conservators, curators specializing in non-Western manuscripts and decolonizing collections, as well as the Imaging team. The project's success hinged on the inclusion of external expertise, however, particularly that of Sikh conservator Jasdip Singh.

By consulting with Jasdip Singh, the team ensured that the conservation process was conducted with utmost respect for the text's cultural significance. Through careful consideration of materials and techniques, they minimized damage to the manuscript while maintaining its religious integrity. The collaboration with Jasdip Singh also facilitated a deeper understanding of Sikh traditions, leading to improved decision-making and enhanced cultural sensitivity.

This project demonstrates the importance of interdisciplinary collaboration and the value of external expertise in the conservation of culturally significant objects. By working closely with experts of the Sikh community, the team was able to effectively navigate the unique challenges posed by the Guru Granth Sahib and ensure its preservation for future generations.

Preaching to the quire: Collations in fourteenth-century Icelandic manuscripts

Lea D. Pokorny

Lea D. Pokorny (University of Iceland, Reykjavík)

Abstract

The arrangement of sheets of parchment into gatherings is an important step in manuscript production. In medieval Europe, two general traditions are differentiated by scholars: the insular practice, whereby the sheets are arranged so that hair-sides face flesh-sides in an opening, and the continental practice, in which like faces like, also referred to as 'Gregory's rule'. Medieval Icelandic book production has hitherto been said to have followed, although not always faithfully, the latter practice.

This paper re-examines the construction of gatherings in fourteenth-century Icelandic manuscripts. More specifically, it addresses two questions:

- How were hair- and flesh-sides arranged within gatherings in fourteenth-century Icelandic manuscripts?
- How large were these gatherings?

To answer these questions, 21 so-called 'folio'-manuscripts of Icelandic origin that exceed 40 folia and are dated to between 1300 and 1400 AD were researched. 32 manuscripts in the Arnamagnæan collection fit these criteria. Of those, seventeen were analysed, or 53% of the AM corpus. Furthermore, three additional manuscripts from other collections were included (see list below). The analysis was carried out in collaboration with Vasarė Rastonis, conservator at the Árni Magnússon Institute for Icelandic Studies in Reykjavík, and Natasha Fazlic, chief conservator at the Arnamagnæan Institute in Copenhagen. Using different microscopes (DinoLite digital microscope, stereo microscope) and magnifying glasses, manuscripts were analysed in-situ by identifying hair follicles on the writing support. The information on whether hair follicles were found on the recto or verso of a leaf was combined with the collation and foliation in excel sheets.

The results of the analysis bring forth new evidence that large-formatted Icelandic manuscripts dated to the fourteenth century do not, in fact, follow Gregory's rule, but rather the insular tradition. Gatherings arranged in the insular manner, as well as gatherings that follow neither tradition but show "mixed" patterns, surpass the number of gatherings arranged in the continental manner significantly. Iceland's book production is thus moved into closer vicinity to the manuscript culture of the British Isles. The most frequently used size of gatherings in the analysed corpus is the quaternion. Arranging hair-sides facing flesh-sides started to subside on the British Isles by the tenth century. Furthermore, there was a general European development towards larger gatherings of five or six bifolia by the fourteenth century. This indicates that Icelandic book production missed some of the developments happening in Western Europe and held on to older traditions.

‘The Graz Mummy Book’: The oldest known fragment of a codex-like structure from 260 BC, discovered at Graz University Library, Austria

Theresa Zammit Lupi and Lena Krämer

Theresa Zammit Lupi (Graz University Library)

Lena Krämer (Graz University Library)

Abstract

The oldest known fragment of a codex-like structure was discovered at Graz University Library and made public in June 2023. The so-called ‘Mummy Book’, made of papyrus, shows features including a central fold, text layout, ink transfer and holes, distinctly identifying the fragment as a bifolio from a codex-like structure. By examining the fragment under magnification and using other scientific equipment, we are able to reconstruct its history and use. The significant characteristics will be described and our interpretation explained with the help of detailed photography. The results are sensational because they identify the fragment as the oldest known bifolio, predating similar examples by at least 400 years. Although no comparable material from this period is known, the Mummy Book is evidence for the existence of pre-Christian codices, substantially changing the history of the book. Feedback from an experts’ meeting held in February 2024 will also be included in this presentation, as well as scientific analyses carried out at the Centre for the Study of Manuscript Cultures, University of Hamburg, in August 2024.

The Evangeliarium of Hugo of Oignies: A goldsmith and illuminator in the thirteenth century

Lieve Watteeuw

Lieve Watteeuw (KU Leuven)

Abstract

Hugo of Oignies was one of the most talented goldsmiths of the Meuse valley in the first half of the 13th century. His renowned oeuvre includes a singular manuscript: a Gospel book with a precious binding adorned with silver, gold, precious stones, pearls, intaglios, cameos, niello and enamel (32.5 × 23.2 cm). The reverse side of the thick oak boards with images of the Crucifixion is made of prepared and red-painted oak, while the wood on the reverse side of Christ in glory is covered with red-painted parchment.

This binding, housed in the treasury of the Soeurs de Notre Dame in Namur, was separated from the book block after seven centuries in the early 20th century. The binding remained permanently on display in the treasury, whereas the manuscript was relegated to storage.

In 2020, a collaborative project between the laboratories at KU Leuven and KIK-IRPA was initiated to study the relationship between the precious binding and the manuscript. The project aimed to reconstruct the binding's and restoration history and to determine if Hugo of Oignies was also the illuminator of the Gospel book, given the presence of a self-portrait

with an inscription on the cover and a self-representation of Hugo in an illumination inside the codex. The project entailed a comprehensive examination of the textile parts, such as reading ribbons, endbands and sewing threads, as well as the gilded and chiselled edges and the precious covers using X-ray and MA-XRF. Additionally, the manuscript itself was analysed using Raman spectroscopy and multispectral imaging. Although the two parts were not physically reunited, detailed book archaeological research confirmed their strong connection and conservation history.

Material analysis of written monuments: The case of the censier of Jean de Genelart, abbey of Saint-Germain-des-Prés (1372-1373)

Louis Genton and Lucie Moruzzis

Louis Genton (École des hautes études en sciences sociales, Paris)

Lucie Moruzzis (Archives nationale de France, Paris)

Abstract

Over the last fifty years, historians have increasingly questioned the materiality of their sources, recognising them as both textual and archaeological documentation. This trend, initially more prevalent in literary studies, now extends to archival documents. Re-examining these documents in terms of their materiality allows us to contextualise the act of writing in the context of a social, political, economic and cultural study of past societies. Current research into monastic writings exemplifies this revival, enabling us to understand the changes in the monks' documentary practices through a threefold strategy: defending their lands, maintaining the stability of their institution and asserting the individuality of community members, such as abbots, officers and other monks.

In rare instances, rich documentary collections, specific to individual community members, have survived the ravages of revolutionary disposal. Studying these archives reveals how the materiality of the documents has been integral to the complex personal and institutional trajectories, highlighting the written word’s capacity to preserve the memory of the past. Conservation and restoration strategies that have allowed these documents to endure must be understood within this long history of the written word.

The two speakers will address these issues by tracing the biography of one of the many 'monuments' in the writings of Saint-Germain-des-Prés. Specifically, they will examine a register, catalogued as LL 1103 in the Archives nationales' Monuments ecclésiastiques factice series - a censier kept by Jean de Genelart, the pitancier of Saint-Germain-des-Prés from 1372 to 1373.

This manuscript, used to record the cens (the income owed by tenants for the usufruct of land and property), was part of a broader documentary network. The speakers will first explore certain aspects of this medieval documentary context. Today, this register, though fragmented, remains stable and archaeologically rich in appearance and materiality. The speakers will analyse the material aspects of the register and its place in the documentary

history of the abbey over time. In 2019, conservation work was carried out on the censier aiming to balance the textual and physical aspects of the document, thus providing new generations access to all facets of the object. This project has prompted reflections on the different values (memorial, administrative, institutional) of the censier, and has led to designing a treatment suited to its exceptional characteristics. Lastly, this paper will examine the benefits of an interdisciplinary dialogue between historians and conservators in understanding of a 'monument' of the written word, considering both its historical uses and its current significance.

Redefining fineness: Parchment thickness as a key measure of manuscript materiality

Madison Bennett

Madison Bennett (University of Cambridge)

Abstract

The Paris Bibles of the 13th century are renowned for their exceptionally thin parchment, often referred to as "ultrafine parchment" or erroneously as "uterine vellum" in academic literature and catalogue records. For those who have handled these manuscripts, the ethereal quality of their pages is unmistakable, characterised by a unique blend of opacity, suppleness and, most notably, ultrathinness.

What do we truly mean when we label parchment as ‘ultrathin’ or ‘ultrafine’? In an era of increased digitisation, the haptics of a manuscript and what we learn through touch and interaction with the physical material is often lost. How can we accurately represent this critical aspect of materiality? Why is it important?

One of the best underutilised ways of assessing parchment quality lies in the consistency of its thick- or thin-ness. It can inform the animal species used to make the parchment, the manuscript’s provenance, unknown production methods, even conservation treatments. This paper presents a novel measurement technique I developed to analyse ultrathin parchment for my MPhil dissertation in Archaeological Science at the University of Cambridge as part of the Beasts to Craft Project. Based on the analysis of six Paris Bibles, it offers a new definition for what is considered ‘ultrathin’ parchment. The methodology involves taking systematic micrometer measurements in key areas of the parchment folia. Subsequent statistical analysis generates variables such as average thickness, intra-folio variation and inter-folia variation, which capture aspects of the haptic experience typically lost by digitisation. The approach is both cost-effective and accessible to conservators, librarians, scholars and care professionals.

Paris Bibles, which mark the transition from monastic to commercial manuscript production, serve as an ideal corpus to pilot this methodology because of the consistency of parchment across like-manuscripts and the scale to which these manuscripts still exist. Yet this methodology can be applied to any manuscript. It offers a means to enhance digital records, assess material for appropriate conservation treatment and deepen our understanding of medieval parchment.

Ibn Sina - Avicenna, The Book of Healing Vol. 1 – A journey into the material past of a manuscript through science

Marcela Szekely, Elisabetta Boaretto, Samuel Thrope and Ido Pinkas

Marcela Szekely (The National Library of Israel, Jerusalem)

Elisabetta Boaretto (Weizmann Institute of Science, Rehovot)

Samuel Thrope (The National Library of Israel, Jerusalem)

Ido Pinkas (Weizmann Institute of Science, Rehovot)

Abstract

A couple of years ago the Islamic curator of the National Library of Israel raised a question on precise ways to date a specific manuscript. The manuscript in question was Ibn Sina's *The Book of Healing* volume 1, which was dated to the 11th century in the NLI catalogue. Recently, new codicological analysis had raised questions on the dating, proposing to date it about 300 years later, making it crucial to establish its correct date. The proximity of the catalogue date of writing to the lifetime of the author makes it one the earliest existing copies of the book.

Ibn Sina, or Avicenna as he was known in the West, was a philosopher and physician from the late 10th-early 11th century CE, who served in various courts of Iranian rulers and is considered the father of modern medicine. The manuscript forms part of one of the core collections of the library – the Islamic and Middle East collection. It is usually stored in the rare books storage room, and it has been exhibited in the permanent exhibition of the library since the opening of the new library building at the end of 2023.

The dating question marked the beginning of a journey into the manuscript, which led to a thorough investigation of its material aspects. The manuscript is bound in a partial leather binding and is written in Arabic in two types of ink – black (predominantly) and red.

A series of analyses and observations were conducted on the item, which included the type and thickness of the paper, identifying the paper fibres using a polarized microscope, Dino-lite for the black ink to begin to recognize its components, Fourier Transform Infrared spectroscopy, SEM and Raman spectroscopy to determine the composition of the paper and ink (both types) and radiocarbon dating to determine its age.

The results led to a better comprehension of the manuscript itself, adding to a broader understanding of manuscript production of its time and geographical place.

Digitisation of Dutch manuscripts: Preparing a collection

Margot Terpstra

Margot Terpstra (National Library of the Netherlands, The Hague)

Abstract

In 2023, the National Library of the Netherlands in association with Metamorfoze began a large-scale project to digitise most of the manuscripts held in several cultural institutions, churches and monasteries in the Netherlands. As a part of this project, the conservation studio of the National Library started to prepare its own collection for digitisation. Around 1200 manuscripts dating from the 9th century to 1550 were selected to be digitised. This is a massive undertaking, as all the preparations need to be concluded within two and a half years. These preparations include a condition check of each manuscript in the form of a checklist, photographic documentation, restoration and in some cases checking and consolidating the pigments of illuminations. Due to the short timeframe in which all the preparations had to be done it was important to have a clear and structured plan. During the presentation I will discuss the challenges we faced, how we dealt with the sheer volume of manuscripts that had to be prepared and the choices we had to make.

In the first stage of the preparations, a checklist is made for each manuscript in which the general condition is described and directions are given on how the book should be handled during digitisation. This standardised checklist was already drafted by Metamorfoze. A slightly adapted version was made for this project. The checklist is meant to give the person handling the manuscript during digitisation a quick overview of the current condition of the book. For instance, the maximum angle of opening is noted, as well as any fragile areas that need extra care or support when handled. Manuscripts that are damaged in a way that would endanger them during the digitisation process are restored beforehand. This mainly includes small repairs to the joints or spine of the books. Loose boards and folia are not (always) restored, in part due to time restraints. Sometimes, anyway, a loose board or detached spine allows the book to be opened further and lay flatter, making the digitisation easier and safer. Any damage that has not been restored is also noted down, both in the checklist and in the studio database. Further conservation treatments can then be undertaken after the digitisation is completed.

During the condition checks, some of the manuscripts with illuminations were set aside for a more thorough check. Of the 1200 manuscripts that are to be digitised, ±345 of them are considered to be illuminated manuscripts. This includes miniatures, decorated initials and borders and full-page illuminations. The illuminations are first checked under magnification. Illuminations that showed cracks or any other sign of damage or losses to the pigment or gold areas are further checked under the microscope at a higher magnification. Loose pigments were then consolidated using sturgeon glue or issenglass. This proved to be the biggest challenge of all, since the conservation team, consisting of only four conservators, had only two years to check all 345 manuscripts.

Physical evidence in the *Codex Mellon*: A proposed history of manufacture and use

Maria Fredericks

Maria Fredericks (Morgan Library & Museum, New York)

Abstract

The *Codex Mellon* in the Morgan Library & Museum is an early 16th-century architect's model book whose contents meticulously record plans, elevations and decorative details of ancient and Renaissance buildings in Rome, including the Colosseum, the Pantheon and St. Peter's Basilica. The drawings were made with pen, ink and ink wash over blind lines laid out with a compass and straight edge, and in most cases were drawn directly onto the leaves of an existing blank book. The work has been variously attributed to Domenico Antonio de Chiarellis, a member of a family of stone carvers associated with Bramante, or to sculptor and architect Domenico Aino da Varignana.

The worn condition of both the binding and the text block speaks to the book's life as a working document that was heavily used by its makers. While it remains in a binding that seems typical of 16th-century Italian work, close examination of physical evidence, combined with study and re-creation of comparative examples, shows that the book was in fact re-bound, probably soon after the drawings were made. A reconstruction of the addition, subtraction and re-arrangement of gatherings and bifolios for the second binding reveals a chronology of creative intent on the part of the maker, as well as illuminating differences in approach and technique from one binder to the next.

Expect the unexpected: Treating 2,000-year-old Buddhist birch bark scrolls in Pakistan

Vania Assis and Mary Hamilton French

Vania Assis (EXPM - Keeping History Alive)

Mary Hamilton French (Boston Public Library)

Abstract

The Gandhari Manuscript Project (GMP) was created as a collaboration between the Federal Department of Archaeology and Museums (DOAM) and the University of Sydney to conserve, digitise, study and publish on the museum's collection of Buddhist birch bark manuscripts. The scrolls, dating from the 1st century BCE to the 2nd century CE, come from ancient Gandhara (modern-day northwest Pakistan and northeast Afghanistan) and are some of the oldest Buddhist texts known to exist.

At the project's inception, there were no trained birch bark conservators or a paper conservation facility in Islamabad. Instead of moving the scrolls to a country where these resources existed, the GMP instead decided to build a conservation lab within the Islamabad Museum. Conservators Vania Assis (EXPM - Keeping History Alive) and Mary Hamilton French (Boston Public Library) were brought into the project to help set up the lab and treat the materials due to their extensive prior experience with treating historic Himalayan birch bark.

The establishment of a new lab was more than just a practical necessity. A central objective of the GMP is building local capacity for the ongoing preservation of Pakistan's cultural heritage. To this end, the next phase of the project involves using conservation treatments on the remaining scrolls as an opportunity to provide skills, knowledge and hands-on training to local conservators. This will ensure that the expertise and resources required to preserve such manuscripts are available within Pakistan.

Unhoused scrolls were treated first because they were vulnerable and their contents were inaccessible. Conservation proved challenging; the bark was often extremely fragile or resistant to treatment. Some bark layers were stuck together, making separation difficult. Others were tightly rolled, rigid and brittle. These were particularly unresponsive to treatment, and the conservators had to adapt traditional humidification methods to meet the unique needs of the scrolls and unroll them without causing further damage.

All of these items would have been hard to treat even in ideal conditions, but there were many unexpected challenges. Due to construction delays and customs issues, the lab had no work benches or a sink and many pieces of equipment were missing. Jet lag, illness, protests, supply chain issues and unexpected holidays disrupted workflow in near-constant unexpected ways.

Despite challenges faced on the ground, this approach to treating cultural heritage locally was successful. The long-term impact of this project extends beyond the preservation of the Gandhari manuscripts. Establishing a framework for conservation and empowering local professionals supports the retention and repatriation of Pakistan’s Buddhist heritage. This effort is particularly important given the historical significance of these texts, which provide invaluable insights into early Buddhist practices and the cultural exchanges that occurred in the region during antiquity. We hope that this project will provide inspiration and practical advice for other conservators and institutions embarking on similar projects.

Pigments and mixtures of the Great Mongol *Shahnama*

Matthew L. Clarke

Matthew L. Clarke (Smithsonian Institution, Washington, D.C.)

Abstract

An in-depth study was performed into the illustrations of the Great Mongol *Shahnama*. This particular volume of the Ferdowsi’s book of kings was created in the 1330s in Tabriz, Iran, while the region was under Mongol rule. The book was disbound in the early twentieth century, and the folios dispersed. While the Great Mongol *Shahnama* has been the subject of many treatises, the materials used in its paintings have not been treated to such intense research. Though pigment research based on microsamples had previously been performed on some of these folios, such studies have limitations. Recent investigations showed that in order to more fully understand the large range of colours and mixtures present, a non-sampling, minimally invasive methodology would become necessary and would aid in the data collection and interpretation. Several primarily image-based

techniques were selected and utilised for the study into the fourteen illustrated folios in the National Museum of Asian Art's collection.

Multiple imaging methods, using different energies of the electromagnetic spectrum, were employed and compared to characterise the many components of these works. X-ray radiography revealed areas of paint loss that were later retouched. In several cases, the use of zinc white was suggested by ultraviolet-induced luminescence (UVL). Infrared imaging reflectography showed cases of design changes from the initial drawing. Mapping X-ray fluorescence (XRF) analysis provided elemental maps, which were useful understanding the distribution of inorganic materials. Reflectance spectral imaging (RIS) in the visible-near infrared and short wave near infrared regions allowed for analysis of many of the pigments presents. Lastly, Raman spectroscopy at select points, guided by the imaging techniques, allowed for more specific assignments of pigments and mixtures.

Combined these techniques (with a particular focus on the XRF, RIS and Raman data) show a rich palette of pigments and mixtures. Lapis lazuli with and without the addition of azurite (in varying amounts) was found in many blues. Such blues could vary in hue and are not readily assigned by visual observation. Indigo mixed with orpiment provided the greens of the foliage and robes, while copper-based greens were used sparingly. Purples were found as mixes of an organic red with indigo or lapis lazuli. Browns were often constructed from mixtures that contain several pigments such as lead-based white, vermilion, orpiment and carbon black. An amorphous arsenic sulphide, indicating a synthetic preparation, was found on several folios. These findings aid comparisons across the folios and can provide new information for the interpretation of the painting compositions.

From study to conservation of a masterpiece of Persian art: The Panj Ganj manuscript at the Cini Foundation in Venice

Melania Zanetti and Alfonso Zoleo

Melania Zanetti (University of Padua)

Alfonso Zoleo (University of Padua)

Abstract

The codex 2522/35 held at the Fondazione Giorgio Cini in Venice, Italy, is an illuminated paper manuscript from the 17th century perpetuating the most famous works of the Persian poet Neẓāmi Ganjavi, the five classical poems known as Panj Ganj or Kahmse, originally composed between the end of the 12th century and the beginning of the 13th century.

The volume entered the Cini collection in the 1960s. Despite its importance and the elegance resulting from the close symbiosis of text, calligraphy and decoration, it was rarely consulted and studied until the 2000s due to the poor condition of the paper. The green copper-based pigment used to delimit the columns for writing had induced serious

degradation processes, causing a number of extensive tears that affected both the text and the full-page miniatures. In addition, further problems were associated with oxidation of the paper and countless repairs carried out with inappropriate materials and techniques. As a result, simple handling of the paper caused tears, cracks and fragments.

This contribution presents the results of the complex conservation project of the codex, developed in the years 2019-2020 involving the Giorgio Cini Foundation, the Ca' Foscari University Venice and the CIBA, the Interdepartmental Research Center "Study and conservation of archaeological, architectural and historical-artistic heritage" of the University of Padua.

The research focused on the historical, literary and artistic aspects, the codicological examination, the physical-chemical investigations (in particular with spectroscopic analysis and multispectral imaging techniques) aimed at characterising the materials and the manufacture processes. Then, the conservation treatment was carried out, balancing historical instances and the need to counteract the processes of decay that were endangering the work.

The multidisciplinary approach had highlighted the genuine Persian manufacture of the codex, including its bookbinding and repairs. Book archaeology studies of Islamic Middle Eastern codices are rather "young" and aimed at investigating the relationship between the structural characteristics of the artefacts and the material culture that presided over their production. In such a context, each exemplar may represent an important source of knowledge to broaden our awareness about the Islamic book tradition.

On this basis, the conservation of the Panji Ganji manuscript was developed according to minimally invasive methods, working in situ on the sewn leaves as well as on the bookbinding and preserving every single historic element.

The assessment of the storage environment at the Cini Foundation, and in particular the control of the microclimate (with respect to temperature and maximum relative humidity), played also an important role in the decision-making process regarding conservation steps.

Finally, the valorisation of Neẓāmi's work is also not to be underestimated. Cautious but safe access to the original is now allowed. Moreover, the digitisation of the manuscript post-conservation treatment and the publication of a commentary comprising the essays of the many scholars involved in the project will make this masterpiece known in all of its various interesting aspects.

Codex Xolotl

Michael Maggen

Michael Maggen (retired, former Head of Paper Conservation, The Israel Museum, Jerusalem)

Abstract

The Codex Xolotl is part of the Mesoamerican collection of the Bibliothèque National in Paris, and is recognized as a remarkable 16th-century Aztec document offering a rich tapestry of genealogical chronicles, property records, royal rituals, festive ceremonies, and annual celebrations. Written on ten leaves made of amate (tree bark), this codex is believed to contain the largest repository of Aztec illuminated and coloured glyphs.

Recent palaeographic and analytical scientific research reveals new dimensions of the codex's origin and evolution. These revelations contribute to a deeper comprehension of the Texcocan-Acolhua indigenous cultural group, enriching our understanding of their complex heritage. Some scholars suggest that the Codex emerged during the early years of the Spanish occupation, a transformative period during which indigenous artists assimilated new technologies and materials brought by the foreign conquerors.

The Latin alphabet, European languages, paper, ink and new pigments, novel to the indigenous artists, found a place in their repertoire. The Xolotl Codex emerges as a rare hybrid document, combining Aztec pictography with the Latin alphabet. Unravelling the mystery of whether inscriptions preceded the paintings or vice versa presented a challenge to scholars. Using cutting-edge technology, including the Hirox® 3D digital microscope, and various imaging methods across different spectral wavelengths, their research has yielded significant insights.

This paper delves into aspects that range beyond deciphering the script; they explore the original format and past restoration of the Xolotl Codex. As an invaluable historical document, the Codex is a testimony to rich cultural phenomena, encapsulating pivotal events that remain ripe for investigation. The juxtaposition of Aztec and European influences within this codex paints a vivid portrait of an era of transition, providing a glimpse into the dynamic interplay between tradition and innovation. The Codex Xolotl beckons researchers to navigate its intricate pages, offering a journey into the heart of a cultural legacy that continues to unfold its secrets to us.

Clever craftsmen tricks in the making of Venetian sunk-panel bindings of the 16th century

Miriam Rampazzo

Miriam Rampazzo (University of the Arts London)

Abstract

Based on the assessment of a corpus of 128 Venetian sunk-panel bindings from several collections worldwide I performed as part of my doctoral research, this paper aims to present clever tricks that craftsmen adopted to deal with issues related to the complexity of this bookbinding structure and its decoration. Venetian sunk-panel binding is one of the most elaborately decorated examples of luxury bookbinding ever produced in Venice. Their manufacture was developed in the late Renaissance when Venetian craftsmanship reached the highest quality in the imitation of Islamic designs and crafts. In the context of 16th-

century bookbinding, this phenomenon created sumptuous bindings combining Western book structures, Venetian elements and Middle Eastern decorative techniques.

The examination of both damaged and intact examples under raking and UV lights revealed a more complex combination of techniques than expected. Clever tricks were used by craftsmen to cope with both the covering and decoration of the surface with sunk panels. At first, the covering appears as a single piece of material, but a closer examination reveals the use of a different technique intentionally hidden by tooling, gilding and painting. Similarly, onlays of tanned skin could be adhered to the bottom of the sunk panels and be difficult to notice. When inserts of mother-of-pearl or of textile were added to the board surface, in addition, craftsmen developed specific tricks to facilitate the covering procedure.

The analysis of the central medallions shows that, in the absence of intaglio tools capable of specific designs, craftsmen could combine or adapt tools they owned to obtain a particular subject or to match the size and shape of the sunk panel they wanted to decorate.

As the dating of these bindings can often be deduced from the year reported in the eschatocol of the document they contain, it is also possible to observe the evolution in the decoration. Interestingly, it was noticed that the introduction of new tools, for example new intaglio blocks, corresponds to the abandonment of specific tricks or techniques.

In conclusion, the clarification of the clever tricks adopted by craftsmen eventually increases the consciousness of conservators aiming to preserve as much as possible of the original components of this binding style. In addition, this examination allows to understand to what extent Venetian sunk-panel binding imitates Islamic binding and offers new elements to the study of other Venetian objects produced in the same cultural *milieu* and imitating Islamic techniques and patterns.

The degradative effects of Verdigris on Islamic manuscript

Nadira Salsabila, Raeesa Bhamji, Mohammad Tariq, Mariana Costa Folena and Hanan Farhat

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Abstract

Verdigris, a copper-based pigment, has been widely used in manuscripts and artwork across cultures, with origins tracing back to the 2nd century. Its degradative effects on manuscripts pose a significant risk to the preservation of cultural heritage, as the pigment

catalyses the deterioration of cellulose fibres in paper substrates. The copper acetate in Verdigris promotes oxidation processes, leading to an accelerated breakdown of cellulose. In severe cases, this degradation can cause irreversible and irreparable perforation of the paper. Extensive studies have been conducted on the degradation of metallic pigments in European manuscripts. The degradative processes in Islamic manuscripts remain underexplored, however, despite the critical differences in pigment formulations and paper production techniques between the Islamic and European traditions. Differences in pigment and paper recipes between the West and East influence the degradation profiles and mechanisms. This study recreates Verdigris pigment using traditional Arabic Islamic recipes and methods, providing a culturally relevant basis for evaluating its degradative impacts. Additionally, it examines the role of starch sizing, a common treatment in the preparation of paper in the ancient Islamic world, which may affect the degradation profile of Verdigris pigments. Paper samples were subjected to artificial aging conditions in an environmental chamber set at 50 °C, 65% relative humidity, and exposed to UV light. These conditions were chosen to mimic the natural degradation processes. Over a period of 30 days, the degradation profile of the samples was monitored periodically. A few analytical techniques were employed to monitor structural, chemical, and pH changes in the paper and pigment. Scanning Electron Microscopy (SEM) provided visual insights into surface morphology and deterioration patterns. Fourier-Transform Infrared Spectroscopy (FTIR) and X-Ray Diffraction (XRD) were used to characterize chemical alterations and identify degradation products, particularly focusing on changes in crystal structure.

Conservation, digitization and exhibition of Islamic and Arabic books and manuscripts at the National Museum of Ras Al Khaimah

Nagmeldeen Morshed Hamza

Nagmeldeen Morshed Hamza (Department of Antiquities and Museums, Ras Al Khaimah)

Abstract

The collection of Arabic and Islamic manuscripts and books at the National Museum of Ras Al Khaimah, UAE, faces many challenges. This project promotes its preservation and a strategy for research and education, providing practical tools and building capacity to achieve sustainable development in preservation for future generations.

The collection consists of manuscripts, books and daily life notebooks. The collection includes copies of the Holy Quran, Islamic books and manuscripts on Fiqh and Sunnah books, copies of manuscripts of the most famous imams and Muslim scholars, the well-known Arabic language dictionary called "Al-Qamoos Al-Muheet" and daily life notes for Emirati people, especially the sailors in Ras Al Khaimah. Significant watermarks were recorded from the collection, giving more information about different European paper mills and studying the changes in manuscript design and the role of Arabic and Islamic culture in relation to changes in the manufacture of paper itself. The research approach encompasses not only the physical attributes of the manuscripts but also their socio-cultural significance.

The collection was stored in the museum from 1995 to 2022 without any assessment or treatment. Conservation strategy was planned in a meticulously designed and multidisciplinary process to ensure the effective preservation of manuscripts and books through comprehensive study, research and materials analysis, followed by a structured implementation process.

The project applied an integrated approach with an interdisciplinary methodology of study, employing techniques such as digital imaging, investigation and analysis for understanding the history of papermaking, ink, pigment and text. The preservation strategy intends to achieve a sustainable plan for museum collections as valuable resources for understanding history and culture as well as for research, education and inspiration. Adopting integrated preservation approaches, using technology and the right methodology of preservation and conservation will extend the lifespan of collections and make them more sustainable.

Byzantine Bookbindings of the *Michael Apostolis* 16th c. workshop: Conservation, preservation and identification.

Nikolas Sarris

Nikolas Sarris (National Library of Greece, Athens)

Abstract

The erudite, teacher and scribe Michael Apostolis (c. 1420 – after 1474 or 1486), a resident of Constantinople, found refuge on the island of Crete after the fall of Constantinople in 1453 and established there one of the most prolific scriptoria for Greek texts and binding workshops of the fifteenth and early sixteenth centuries to have been identified. Cardinal Bessarion himself was his patron and is known to have commissioned Michael Apostolis to seek and produce Greek manuscripts to be sent to Italy during the development of Renaissance humanism.

Several manuscripts attributed to Michael Apostolis or his son Aristovoulos Apostolis (1465-1535) and related scribes who were working for their scriptorium or collaborating with them are known to have been copied for Bessarion and other prominent patrons, of which many survive today. The famous scriptorium has been closely linked to a bookbinding workshop to which numerous bindings are attributed and which survive scattered among European libraries. They form one of the largest identified groups of Byzantine bindings and represent a characteristic style of Greek manuscripts bound during the 15th-early 16th century, with local Cretan characteristics.

This paper discusses the evolution and binding phases of this prolific bookbinding workshop with evidence gathered from numerous surviving bindings from several libraries. It will also present the conservation of a 12th-century Greek parchment manuscript from the Historical Public Library of Kefalonia, Greece, on which remnants of an earlier binding from the *Apostolis* workshop were identified. This multi-layered structure, with three different periods of interventions and rebindings, imposed a series of

conservation dilemmas, in an attempt to improve the condition of the structure, while preserving and highlighting evidence from the *Apostolis* binding.

Structural features of 15th-century Ottoman textile bindings: Examples from palace workshops

Nil Baydar

Nil Baydar (Manuscript Institution of Türkiye, Istanbul)

Abstract

The establishment of workshops for manuscript preparation for the Ottoman palace dates to the second half of the 15th century. The similarity in the structural, technical and decorative features of the bindings and illuminations of manuscripts prepared for Sultan Mehmed II and his vizier in the 1460s indicates that they were produced in the same workshops.

The outer covers of the manuscripts are covered with fabric, while the doublures are covered with fabric or paper. The fabrics used are checkered or striped, woven with cotton and silk threads. For the doublure, European papers with watermarks or similar fabrics are preferred. The bindings covered with embroidered or plain velvet fabric on the outside use leather doublures. Some leather doublures are decorated with filigree work, while others are tooled with hand tools.

This study discusses the structural features, construction techniques, and the joining of the text block with the bindings of 19 fabric-bound manuscripts prepared in Ottoman palace workshops between 1462 and 1472 which have been preserved with their original bindings.

Care and conservation of Islamic manuscripts in Heritage Conservation Centre (HCC) – National Heritage Board (NHB), Singapore

Nor Aini Omar

Nor Aini Omar (National Heritage Board, Singapore)

Abstract

This paper aims to present some of the challenges and learning points in the journey to plan, develop and implement the strategy to care for the Islamic manuscripts collection at the Heritage Conservation Centre (HCC) in Singapore.

The HCC is the centralized storage and conservation facility of Singapore in charge of managing, preserving, documenting, conserving and supporting access to more than 230,000 works of the National Collection of Singapore. The collection belongs to the eight

major collecting institutions of the city. The Conservation Services department of HCC employs approximately 36 conservators, organized by support based on six sections: PPDM (Paper, Photograph and Digital Media), Painting, Textile, Organic object, Inorganic object and Conservation science.

In the National Collection, it includes Islamic Manuscripts collection comprising a mixture of Qur'ans, manuscripts, rare books and calligraphy ranging from the early 9th century to the 20th century. The collection is ranked into four categories: National Treasure (NT), High value (HV), Permanent collection (PC) and Community collection (CC) and is used for display and research purposes. In 2016, the conservation department at the centre assessed its state of conservation competencies in relation to the risks and priorities of the growing national collection. From the exercise, the key focus areas for the PPDM section were identified and the Islamic manuscript collection was identified as one of the key focus areas for the PPDM section to work on as a conservation project.

As part of the Islamic manuscripts' conservation project, a survey on the collection categorised under National Treasures (NT) and High Value (HV) collection was conducted in the months of February to April 2017 and December 2019, respectively. Through the survey and condition assessment, the common deterioration issues seen in Islamic manuscripts were identified. It revealed that damages typically found on Islamic manuscripts are conditions such as tears, losses and stains for single sheet manuscripts. Similar damages were also observed on bound manuscripts, and, in addition, there was the occurrence of loose bindings, distorted text block and damaged covers. There were loses in the media such as inscriptions and illuminated images as well.

The findings from the survey will enable us to understand the current state of the collection, priorities and identify areas of improvement in terms of care and conservation of the Islamic Collection, such as conducting suitable conservation treatment and appropriate re-housing methods for long-term preservation. Further work is planned for the formulation of treatment methodologies, scientific analysis, identification of materials used, strategies and best practices to preserve sensitive collections, such as the Islamic manuscripts in the National Collection.

An Ottoman treasure binding: Its manufacture, conservation and storage

Paul Hepworth and Abdulbari Demir

Paul Hepworth (independent manuscript conservator, formerly Istanbul University Rare Books Library)

Abdulbari Demir (Istanbul University Rare Books Library)

Abstract

Two bindings in the collection of the Istanbul University Rare Books Library exhibit the extensive use of gold wire in their decoration, as well as some distinctive but unidentified materials. Awareness of the existence of this type of binding has been previously restricted

to only a few scholars, and the methods of manufacture for the bindings have never been studied or described before. This paper will introduce this type of binding and how it is made as an example of a larger group of rare but important bindings which fall outside the common view of the Islamic binding repertoire and are hardly represented at all in western collections. They could only have been made in the context of imperial workshops (Ottoman in this case), probably in the 16th century, where artisans working in different media—binders, embroiderers, jewellers—could collaborate on such a project.

An understanding of how the bindings were made raises particular challenges for conservation treatment and storage. The complexity of the binding structures and the materials they incorporate require new treatment strategies, which will be discussed. Additionally, the treatment protocol must be balanced within the context of their presence in a non-western collection, where the aims and limitations of conservation need to be effectively articulated. The storage of the manuscript in a clam-shell box is perceived by some as a western imposition since, from this viewpoint, the slipcase is a "traditional" Islamic enclosure and is, therefore, appropriate for any Islamic manuscript regardless of the potential dangers it poses to the binding. This paper will also describe the discovery and treatment of several varieties of clam-shell boxes in the Ottoman imperial collection. Making the local manuscript community aware of these enclosures helps to broaden the options available for conservators, since they clearly had the sanction of the Sultan and fit within the traditions established at his court.

Treating two Shakespeare folios

Rachel Bissonnette and Kathryn Kenney

Rachel Bissonnette (Folger Shakespeare Library, Washington, D.C.)

Kathryn Kenney (Folger Shakespeare Library, Washington, D.C.)

Abstract

In June 2024, the Folger Shakespeare Library opened after a four-year renovation. A central goal of the renovation was the construction of a new public wing with 12,000 square feet of space housing two exhibition halls. The curation of the reopening exhibition in the newly minted exhibition halls sought to showcase some of most valuable items from the collection. In keeping with this objective, a Second and Third Folio were selected. Printed in 1623, the First Folio is the first edition of Shakespeare's collected works, without which eighteen of the plays attributed to Shakespeare would have been lost. The Second and Third Folios, printed in 1632 and 1663/64 respectively, are subsequent imprints that reflect the popularity and dissemination of Shakespeare. The Second and Third Folios chosen for display had similar condition issues that required extensive intervention including leather damage, detached boards, and historical repairs that compromised access. An added complication of the renovation meant these items were stored offsite and not available to the conservators until six months before the reopening date.

This created a tight timeframe in which to study the books to determine an appropriate treatment plan, execute and fully document the treatment, and mount the books for exhibition all while preparing the other 300+ items included in the exhibition and supporting the return of the collection. When it became clear that the treatments could not be completed to our satisfaction before the exhibition, we decided to display the items in a stabilized condition mid-treatment instead of compromising the quality of our work.

In this paper, we will discuss the treatments we performed, how we came to our decisions, and how this experience has shaped the way we will approach tight exhibition deadlines going forward. If presented with similar challenges in the future, we will design treatment plans with multiple acceptable stopping points to assess feasibility and intentionally pause treatment until after display.

A fifteenth-century Gothic manuscript binding: Codicological research, diagnostic campaign and conservation treatment of a fifteenth-century medical manuscript with a Gothic binding from the National Archive in Turin

Rebecca Taldo, Gaia Petrella and Marco Fagiolo

Rebecca Taldo (book and paper conservator)

Gaia Petrella (Accademia di Belle Arti di Brera, Milan)

Marco Fagiolo (ALES S.p.A.; Archivio di Stato di Torino, Turin)

Abstract

The 15th-century medical manuscript J.B.VII.6, housed in the Ancient Library of the Archivio di Stato in Turin, underwent a conservation treatment as part of my graduation thesis in Paper and Book Conservation at the Brera Academy of Fine Arts, conducted in the Institute's Conservation Workshop. The manuscript still retains all its original materials; aiming to adopt a minimal intervention approach while ensuring access to the text, the binding underwent an archaeological conservation, codicological research and diagnostic campaign.

Codicological research and data comparison were carried out among various institutions and compared to available online resources and paper-bound bibliography, aiming to date and localise the manuscript through its paper, binding technique, content, palaeography and materials. The codicological research resulted in unprecedented reports that provide unique data collection regarding the collection of an important historical 16th-century jurist from the Aosta region, Italy, Bonaventure Philibert Bornyon. Watermark analysis, contextualized with statistical research on Italian and European paper production, suggests that the book's paper originates from the same paper mill as the Gutenberg Bible. A codicological analysis of the Gothic binding structure traced it back to the Provence region, aligning with the dialect of the medical topic. With the support of the Institution and the Diagnostic Department of Italian Conservation School CCR *La Venaria Reale*, the constituent materials were identified through a multi-technique diagnostic campaign and compared to

the codicological research conducted. Furthermore, chemical analysis of the ink, combined with palaeographic and linguistic identification, allowed the determination of up to ten different writers within the same time range, leading to the attribution of the manuscript to the University of Montpellier.

The data gathered were used to create multiple comprehensive mock-ups as close as possible to the original in size, materials and techniques, recreating and describing the original sewing and endband weaving, functioning as a reference for scholars and a tool to test the conservation techniques. Moreover, the endband weaving was studied and the technique proposed in detailed passages, not being able to find any specific bibliographical reference.

The innovative approach of the minimal intervention presented great challenges in the consolidation and conservation of the original structure, which was carried out with minimally visible results. It was possible to keep the spine exposed and the sewing visible, restoring the binding with an archaeological approach that guaranteed access to the historical references, while enabling the structural consolidation of the binding. This decision was made possible with the design and creation of a drop-spine cradle book box, specially crafted to accompany the manuscript's consultation and ensure the safe handling of the object. The joint effort of many professionals in the conservation and archival fields allowed an efficient and close-knit team to achieve the best compromise between historical preservation and contemporary use.

Overcoming challenges in the conservation of Arabic documents and manuscripts: Language, material and historical context

Reem Al-Omairi

Reem Al-Omairi (National Records and Archives Authority, Muscat)

Abstract

Restoring Arabic manuscripts involves various obstacles that necessitate a thorough understanding of the language, materials and historical context. The Arabic language has a distinctive and complex system of writing and scripts, including Kufic, Naskh, Thuluth and Diwani, making it difficult for non-native speakers to comprehend the writings. Documents suffer from aging and fragility. Arabic manuscripts are ancient and have been exposed to the environment throughout time, making the paper used exceedingly brittle. The ink used may fade over time or react with adjacent materials, causing degradation. Furthermore, writing materials range from handcrafted paper to leather and metals, each requiring specialist restoration processes. To protect the manuscripts from additional degradation, preserving these historic materials necessitates a thorough understanding of material sciences as well as current restoration procedures. Furthermore, previous storage conditions that manuscripts have been subjected to must be considered. Many of these documents have been subjected to extreme environmental conditions or stored in suboptimal conditions with insufficient temperature and humidity, which might add to

their deterioration. Understanding the historical and cultural context in which these records were produced helps us understand the texts and ensure their restoration in a way that preserves their history and authenticity.

This study will highlight the obstacles that specialists face when conserving Omani Arabic manuscripts, as well as how to overcome them through practical application of the manuscripts of the National Records and Archives Authority of the Sultanate of Oman.

Investigation of Islamic manuscripts in the collection of Tartu University Library: Bridging historical techniques and modern Qur'an design

René Haljasmäe and Jaanika Leiter

René Haljasmäe (Pallas University of Applied Sciences, Tartu)

Jaanika Leiter (Pallas University of Applied Sciences, Tartu)

Abstract

Bismillahir Rahmanir Raheem. The aim of this presentation is to explore the fine bindings of Islamic manuscripts housed within the Tartu University Library (TUL), with a particular emphasis on the religious regulations that have historically guided the art of Islamic bookbinding. By delving into the structure, materials and techniques used in these bindings – along with the historical evolution of their design – this study highlights the intricate interplay between religious devotion and artistic craftsmanship that is central to Islamic manuscript preservation.

Otto Friedrich von Richter (6th August 1791, Vastse-Kuuste – 13th August 1816, Smyrna), a distinguished philologist and explorer, amassed a remarkable collection of manuscripts during his extensive travels. In 1815, he journeyed through Egypt and Nubia, and in 1816, continued his explorations in Constantinople and Asia Minor, where he tragically succumbed to an infectious disease. His father, Otto Magnus von Richter (1755–1826), later donated these rare and invaluable antiquities to the University of Tartu. This donation played a pivotal role in establishing oriental studies at the Imperial University of Tartu upon its reopening. Today, the Tartu University Library holds ten Islamic manuscripts from this collection, featuring texts in Arabic, Persian and Turkish. Most of these manuscripts retain their original goat- or sheepskin leather bindings, showcase fine paper with intricate miniatures, and some have been overbound. Among these treasures is a notable Qur'an.

The TUL collection encompasses Qur'ans, Hadiths and secular texts, each governed by distinct religious guidelines. This study investigates how Islamic teachings regulate these various categories, with a particular focus on the Qur'an. A significant aspect of this project involves the design of a Qur'an binding that incorporates sustainable new materials, while strictly adhering to Islamic jurisprudence. It is essential to recognize that innovation in this context must harmonize with the perspectives of seventh-century Islamic teachings, rather than seek to redefine them.

The study concludes that true freedom is found within the limitations set by Islamic teachings. These constraints are not merely restrictive; they are designed to foster the best possible outcomes, allowing for creative expression within a defined framework. In Islam, tradition is inherently innovative, with sustainability at its core. While the sanctity of the scripture is meticulously preserved, creativity is encouraged in its visual representation, demonstrating that the heart of Islamic tradition is a balance between preservation and innovation.

Conservation, preservation and access: Creating access for digitisation through the removal of degraded rubber bands from iron-gall ink documents

Rhys Briggs and Joanna Thompson-Baum

Rhys Briggs (The National Archives, Kew)

Joanna Thompson-Baum (The National Archives, Kew)

Abstract

The National Archives (TNA) holds a prominent position in UK archive sector leadership with responsibilities under the Royal Warrant of the Historical Manuscripts Commission (HMC). Its core purpose is to ensure sustained or improved preservation of and access to the nation's archive collections across the private, public and voluntary sectors. One of the most significant aspects of this purpose is the commitment to preserving and improving access to the collection. As such, TNA has an ambitious and successful programme to digitise a large proportion of a mostly paper-based collection, making these available from anywhere across the globe through instant digital access.

To support this programme, TNA employs a team of conservators and technicians dedicated to enabling the safe transport and handling of these documents as they travel through the digitisation process. Projects can vary from a few hundred documents to several thousand, so the team's treatment decisions often need to be highly repeatable, economical and efficient. The central challenge for the team revolves around making hundreds of assessments and treatment decisions each day within the digitisation framework.

Many treatments, processes and imaging solutions have been developed over the years to resolve common problems. While preparing manuscript documents containing iron gall ink as part of the American Civil War (1861-1865) digitisation project for Gale-Cengage, we were presented with a challenge that appeared to be previously unexplored. The collection contained degraded rubber bands that had been wrapped around loose, folded and bundled documents. The rubber bands had become solid and had adhered to the paper, concealing text and binding multiple pages together.

We expected the rubber to be easily removable with mechanical action (and in places where the paper was blank, this was sometimes the case). However, where the rubber covered areas of IGI text it was firmly adhered and could not be removed mechanically

without significant risk of further damage and loss of text. The issue was widespread enough in the project to require an approach and treatment to be developed.

With tests confirming the presence of iron (II) ions, the challenge was to develop a treatment method that sufficiently dissolved or swelled the rubber in a controllable manner so that the solidified rubber could be removed mechanically without adversely affecting the ink or paper. After analysis, research and methods testing we developed a treatment using a solvent gel to deliver small amounts of solvent to the interface between the rubber and paper. The use of a solvent gel also met the criteria required of conservation for digitisation: preparation was time and cost effective and repeatable on a large scale.

This presentation will further discuss the role of conservation for digitisation at The National Archives, UK, and provide an overview of the treatment development process, its challenges and successes.

Poison green and sulphur yellow: Are book or manuscript users at risk of poisoning?

Robert Fuchs

Robert Fuchs (TH Köln, Cologne; Georg-August-Universität Göttingen)

Abstract

Many medieval illuminations contain colourful toxic pigments. Last year, overcautious librarians realised that these pigments were present in their collections and that bindings in particular were also painted with Schweinfurt green. This led to entire collections being blocked for use in some libraries in Germany. The lecture will deal with the dangers of arsenic-containing pigments in medieval manuscripts and will attempt to present the historical and scientific investigations in an understandable way. Suggestions for the careful handling of these collections from a conservation point of view will be presented.

Harmonizing heritage, tourism and conservation of parchment codices in the monasteries of Lake Tana, Ethiopia

Shimels Ayele Yalew, Natalia Ortega Saez and Tim De Kock

Shimels Ayele Yalew (University of Antwerp)

Natalia Ortega Saez (University of Antwerp)

Tim De Kock (University of Antwerp)

Abstract

The aim of this paper is to highlight the context and challenges of codex conservation in the monasteries of Lake Tana, Ethiopia. The monasteries on the shores and islands of Lake Tana are home to many ancient and medieval parchment codices. Debre Mariam, Kibran,

Tana Qirqos and Daga Estifanos are the main monasteries that have codices in their collections. Although there was an earlier start to codex conservation through digitization in this area, its progress is still slow. The research conducted so far in these areas has focused more on their historical background and tourism potential than on developing their conservation. It was therefore necessary to study the actual conditions in which the codices are conserved. Data from field observations and archives were used to assess the state of conservation of the codices. As a result, promising practices were observed, such as the digitization carried out in the 1970s and 1980s, the inventory made by various stakeholders, and the recent efforts to build harmonized museums.

Current conservation practices are fraught with pitfalls, however. These can undermine the preservation of the heritage. The shelving of codices on top of each other, the inappropriate use of labels, harmful tapes, shelving together with metal and textile objects and displaying without support are the most common obstructions. In addition, the building and room enclosures are not suitable. The precious historical codices are shelved in old, cramped and poorly ventilated museums. The problem is exacerbated by the lack of temperature and RH monitoring. In addition, the rooms have limited capacity to host tourists, resulting in overcrowding. All these conservation challenges have the possibility of causing tearing, surface dirt, mould, adhesion and denaturation. Careful consideration should be given to the use of appropriate enclosures, less harmful adhesive tapes, the use of appropriate inventory methods and the monitoring of the number of visitors. The long-term preservation plans should include standards for preventive conservation (museum standards).

FT-IR spectroscopy and paper in 17th-century Icelandic manuscripts

Silvia Hufnagel and Patrick Layton

Silvia Hufnagel (The Árni Magnússon Institute for Icelandic Studies, Reykjavík)

Patrick Layton (Akademie der Bildenden Künste, Vienna)

Abstract

One of the main aims of the project “Life of Paper”, funded by the Icelandic Research Fund, is to determine when and where paper used for 17th-century Icelandic manuscripts was produced. The principal method to determine the age and place of production of paper is watermark analysis, but in some cases this is not possible, for example if the manuscript is written with carbon ink, if there are no comparable watermarks found in databases or if there is no watermarked paper.

In cases where we cannot use watermark research, we will use infrared spectroscopy. This method measures molecular vibrations induced by a specific amount of energy; based on the resulting spectrum one can determine the chemical components and thereby the molecular decay of the material. There exist several techniques in IR spectroscopy, including MIR (Mid Infrared) spectroscopy External Reflection, which works contactless with a relative broad measuring area but a relatively lower accuracy, as well as using

Attenuated Total Reflection, which is performed by softly pressing a crystal on the surface of the sample. Accuracy is higher, but a certain pressure is applied making this technique problematic for very fragile samples. For our "Life of paper" project, we will use MIR spectroscopy. Comparisons of our measurements with other, already dated material will hopefully give us a relatively precise date of paper production.

In this presentation, we will explain the methods applied to our analysis, as well as the conservational aspects and pragmatic reasons behind some decisions. We also aim to highlight our interdisciplinary approach by presenting aspects of engineering, paper conservation and book and paper history.

Domesday in ResearchSpace: Synthesising and sharing codicological, conservation and heritage science research

Sonja Schwoll and Dominic Oldman

Sonja Schwoll (The National Archives, Kew)

Dominic Oldman (Kartography CIC)

Abstract

There is no adequately designed knowledge system for conservation documentation in the heritage sector. In the Collection Care Department (CCD) at The National Archives (TNA), we have explored the potential of semantically driven and empirically referenced Linked Data and based on our findings we adopted ResearchSpace for this purpose. This is an open-source knowledge base that allows experts to collaboratively build information, integrating knowledge about process and context, rather than simply storing administrative information. It creates the means to answer questions about conservation and research practice and addresses issues of ethics, significance and relevance. Through ResearchSpace, we connect with external organisations for collaboration, education and engagement.

The knowledge generated through our work on our collections is always in motion and the design of any system needs to support change. The TNA conservation knowledge base is an ongoing research project rather than being a traditional static system. In ResearchSpace, we capture and extend knowledge about our collection items, their history, conservation practice, Heritage Science research and further participation. It allows for advanced imaging and is integrated to our catalogue. We continuously develop specialised ResearchSpace tools for CCD and aim to provide an exemplar for the conservation profession and Heritage sector. Currently, we are concentrating on the integration of our Heritage Science analytical data as well as our codicological research.

The case of the Domesday Books, held at The National Archives, UK, mirrors the general developments of the changing approaches to book conservation and better understanding through heritage science analysis. The most iconic English manuscripts, Great and Little

Domesday Book, hold the official write-up of an extensive enquiry into the landholdings of England commissioned by William the Conqueror and completed in 1086.

Book conservation must be agile, always evaluating new findings and innovations that will influence the next preservation and conservation approaches. At any point in time, assessments and discussions around the Domesday volumes have been conducted by specialists and to the highest standards. Comparing the early 1980s with the early 2000s, the book conservator for their assessment and decision-making could refer to newly available technologies, a new parchment assessment framework and new thinking in conservation ethics, significance and value assessment. While the visual assessment alone led to the assessment that Domesday was in good and stable condition, the instrumental analysis has shown accelerated surface gelatinisation and calcite formation, which lead to loss of ink and pigments. Based on these findings, it was decided that these volumes will not undergo another treatment campaign and be stored in a strictly controlled adequate environment.

Databases do not allow us to capture all these research findings, expand categories of knowledge, their relationships, or allow meaningful sharing and reuse of this knowledge. In this presentation, we will discuss and illustrate how our ResearchSpace knowledge system allows us to bring codicological description, conservation records and Heritage Science data together, for decision-making, risk assessment and transdisciplinary use and present the outcomes using human and computer readable knowledge graphs.

Preserving what is already lost: Finding and recording evidence from the original binding as part of the conservation of the ninth-century Landévennec Gospel at the New York Public Library

Ursula Mitra and Simon Raffin

Ursula Mitra (New York Public Library)

Simon Raffin (Paris 1 Panthéon-Sorbonne University)

Abstract

The Landévennec Gospel, a 9th-century Breton manuscript in the collection of the New York Public Library since 1928, was removed from its 19th-century damaged velvet-covered binding in the 1960s and housed as single leaves and gathered sections in a drop spine box.

Other than an exhibition note mentioning the removal of the manuscript from the damaging and damaged binding and a piece of purple velvet in the curatorial files, no documentation about the treatment or examination of the manuscript could be found. To protect the fragile edges of the leaves, the friable paints on the miniatures and the ink of the text during handling, it was recently decided to re-bind the manuscript.

This paper describes how using spectral imagining techniques and detailed analysis of the physical evidence contained in the leaves lead to convincing conclusions about the binding history of the manuscript and the likely structure of the original Carolingian binding.

It shows the process of the re-binding of the manuscript and illustrates the decision-making process used in choosing the type of conservation binding structure. Additionally, a historical model which closely resembles the original binding was created to accompany the manuscript for educational purposes.

Session: Traditional care practices for books: Connecting local knowledge to global care

Organizer: Melissa Moreton (Institute for Advanced Study, Princeton)

Session abstract

Traditional care practices for books, such as exposing manuscripts to air and sun once a year, greeting them in the language of the community who made them, providing ritual offerings or wrapping them appropriately in textiles or skin carrying cases to keep them together and keep out dirt and insects, are all ways in which communities of origin have for centuries cared for and preserved the heritage of the book. Traditional care can be parallel to European care models, but often diverges from it in critical ways. Books, understood as more-than-human relations by many communities, are closely connected to their users and caretakers. In many traditions, books have spiritual as well as physical needs. They are a part of regular rituals that provide for their care and protection, and bond them with their community.

This panel presents research being facilitated by the Mellon Foundation-funded project, *Hidden Stories: New Approaches to the Local and Global History of the Book*, a project based at the University of Toronto (Canada) and Institute for Advanced Study, Princeton (USA). The project has begun a series devoted to traditional care, which connects knowledge keepers, manuscript scholars and conservators with traditional knowledge across several *Hidden Stories* research areas to share information on the handling, display, care and storage of books and book-adjacent objects (such as Indigenous wampum belts, Himalayan prayer flag texts and Ethiopic amulet scrolls). The series will be a transformative resource for a broad public of book users and caregivers to improve the care, handling, display and storage of these heritage objects in galleries, libraries, archives, museums (GLAMs) and book conservation labs, as well as for collections held by their communities of origin.

Global book traditions make use of a wide variety of materials, including palm leaves, non-western papers, birch bark, amatl, coated and painted sheet material, cord, wampum shell beads, cloth coverings and wrappers and were created under a wide range of climatic conditions. The environmental conditions that books were created in can differ from those of climate-controlled spaces in Europe and North America - from the cool Ethiopian highlands and temperate areas of Nepal, to eastern woodlands of North America which experience extremes in seasonal temperatures. Taken out of their places of production and

often now living within institutional repositories, books and book-adjacent objects are generally stored at a uniform temperature and humidity. For many repositories, this standard was set decades ago and generally tailored to the care of medieval European parchment books with leather-covered wooden boards. This 'one size fits all' approach does not always provide for the range of environmental needs that diverse book traditions require to remain healthy.

The *Hidden Stories* project is keenly interested in traditional practices of production and care and aims to share these with a broad audience of public readers, scholars and researchers, book conservators and care professionals. With the goal of integrating traditional care practices into the non-traditional GLAM spaces and conservation labs, project collaborators hope to both improve the care of books and integrate ritual into these spaces and better connect these book relations to the origin communities who created and traditionally cared for them. The first video of the series, filmed with Eyob Derillo (British Library) and Ethiopic manuscripts at the Thomas Fisher Rare Book Library (Toronto), is viewable at https://hiddenstories.library.utoronto.ca/exhibits/show/traditional-care-practices/videos, with more to follow throughout the duration of the *Hidden Stories* project (through 2026).

The goal of this panel is to share knowledge about the traditional care book and book-adjacent objects and hear from conservators about the challenges and possibilities of integrating traditional care into today's conservation and care spaces.

1. Models of care: The Traditional Care Practices project

Melissa Moreton

Melissa Moreton (Institute for Advanced Study, Princeton)

Abstract

The project *Hidden Stories: New Approaches to the Local and Global History of the Book* (University of Toronto and Institute for Advanced Study, Princeton) has begun a series devoted to the traditional care of books. This aspect of the global book history project connects conservators and care professionals with traditional knowledge across several *Hidden Stories* research areas to share information on the handling, display, care and storage of books and book-adjacent objects (such as Indigenous wampum belts, Himalayan prayer flag texts, Ethiopic amulet scrolls).

The Traditional Care of Books has several initiatives:

- supporting knowledge keepers, manuscript scholars and conservators from communities of origin to share knowledge of traditional care (through conversations, videos and other materials) hosted on the Hidden Stories digital hub,
- connecting care professionals (conservators, librarians, archivists, curators, knowledge keepers) from within and outside communities of origin to begin conversations about how best to integrate aspects of traditional care into GLAMs (Galleries, Libraries, Archives, Museums) and conservation labs,

- supporting relationship-building between communities of origin and library and museum staff to shape shared best practices for this work and build long-term relations and connections to books and objects in GLAMs. This presentation seeks to share information on traditional care and begin a conversation with care professionals on how to implement care within European and North American collections.

2. Traditional care practices for Ethiopic manuscripts

Eyob Derillo

Eyob Derillo (SOAS, University of London)

Abstract

Manuscripts, part of a centuries-long tradition of scribal and book production, are revered within the Ethiopic cultural community in Ethiopia and Eritrea, as well as within the Ethiopic diaspora more broadly. How are codices and scrolls used, handled, displayed and cared for within and outside of Ethiopia and Eritrea? Amulet healing scrolls, manuscript books, their mahdar (skin carrying and storage case) and textile coverings all require special attention for storage, use and display. As in many traditions, prayer books and liturgical manuscripts are often greeted before use, which may include kissing them. The mahdar, viewed by traditional practitioners as the womb of the Virgin Mary, should be closed after removing its book. Water, which can diminish the efficacy of an amulet healing scroll, should not be kept near the scroll. In the Hidden Stories video - the first in a series on traditional care practices - I share some guidelines for the handling and use of Ethiopic manuscripts: https://hiddenstories.library.utoronto.ca/exhibits/show/traditional-care-practices/videos

Another aspect of care is the display of Ethiopic manuscripts and scrolls in museum and library spaces. They are traditionally made on parchment, which can range from very thin (in the case of the manuscripts from Maqdala) to very thick and may have different requirements for temperature and humidity than European parchment books. Simple traditional care practices, incorporated into the storage, display and use of books outside their cultural homelands, are of great importance to the Ethiopic community, and this presentation highlights some of these practices, provides guidelines for care, as well as discusses the storage and display of Ethiopic manuscripts within libraries and museums.

3. Sambhal seva: The care and maintenance of sacred codices in the Sikh tradition

Jasdip Singh Dhillon

Jasdip Singh Dhillon (Pothi Seva; Oxford Conservation Consortium)

Abstract

Practices of care were historically integral to all traditions of sacred book production. The advent of modernity and commercialized mass production has largely eroded the aura of sanctity which was once present in many global book traditions. There are, nonetheless, a

number of living examples where this aura of sanctity has been retained, and the Sikh tradition is one of these. This presentation will chronologically detail textual, visual and material evidence for traditional methods of preventive and interventive conservation, which all contribute to the care of sacred Sikh codices. This will include physical evidence for the history of repair and restoration, excerpts from manuals detailing protocols for display and handling, anecdotes from the biographies of saints, paintings showing the care of codices and finally contemporary lived practices in Sikh Gurdwaras. Examining and sharing this historical evidence is an important mechanism for ensuring that the care of codices is understood to be embedded in an indigenous tradition rather than being a foreign or imported idea.

4. Traditional care of books in Nepal: The Newa Hindu-Buddhist tradition

Bidur Bhattarai

Bidur Bhattarai (University of Hamburg)

Abstract

The multicultural and multilingual country of Nepal is home to unique manuscript cultures, innumerable texts on subjects such as poetics, philosophy, medicine, folklore, religion and yoga, within the Hindu and Buddhist traditions. They not only constitute a considerable gateway to the history and culture of Nepal, but to the subcontinent and beyond. Traditional care methods are embedded within the production of texts, their use and archival storage. The skills and knowledge of their care, shared within communities of bookmakers, users and caretakers, are often directly or indirectly connected to religious rites and beliefs and related to the particular local materials that books are made from. This paper will demonstrate some of the aspects of traditional care practices for manuscripts and artefacts that are visible in the region by presenting selected cases and examples of such accounts.

5. Lost beads, missing stories: A preliminary study of the effects of relative humidity on the deterioration of wampum beads

Amanda McLeod

Amanda McLeod (Sagkeeng Anicinabe Nation; independent curator and conservator)

Abstract

Wampum was commonly thought of as a form of currency between First Nations and European settlers in a historical context; in a cultural one, it is a sacred medium of great importance. Between and within First Nations, wampum in belt form served as a mnemonic, communicative and record-keeping device and had multiple uses: it was viewed as a form of gift-giving, as an incentive to maintain peace or declare war, to strengthen relationships, to encourage marriage proposals. It was also used as victory prizes in sports and games, as tributes, as payments for services, for burials, as ransoms, as compensation for crimes and as ornamentation.

In a conservation context, inorganic materials such as shells, minerals and rocks are generally viewed as relatively stable within museum environments; however, once their structures have been altered, they may become more susceptible to environmental conditions. With wampum beads, manufactured from the northern quahog mollusc shell and in the context of wampum belts, incidents of bead breakage with the threading materials still intact indicate a failure of the beads themselves. This can lead to a loss of important textual information embedded within the belts. What is causing this damage? This presentation examines one possible source, taking into account common museum storage conditions for composite objects.

6. The Popol Vuh and its Quiché relations: A conservator's experience of collaborative care of a Mayan belonging

Giselle Simón

Giselle Simón (The University of Iowa, Iowa City)

Abstract

The Popol Vuh is the creation account of the Quiché Mayan people and revered by the community as a relation or elder. Translated variously as the "Book of the Council", "Book of the Community", "Book of the People" or "The Sacred Book" - "Popol" is defined as "woven mat" and "Vuh" (Vuj) as "book". One Popol Vuh manuscript, part of the Newberry Library (Chicago) collection since 1912, is perhaps the earliest surviving copy of this text, transcribed between 1700-1715 in Chichicastenango, Guatemala, by the Dominican priest Francisco Ximénez. Between 2008 and 2011, with careful consideration among many curators, librarians, conservators and scholars, the manuscript underwent a complex conservation treatment that included separation from texts containing a grammar and *Tratado segundo* (not originally bound with the Popol Vuh), digitization and preparation for a visit by Quiché elders and spiritual leaders. In September 2011 - after over a year of preparation - a Guatemalan delegation from Chichicastenango visited the Popol Vuh in the Newberry Library conservation lab, performing a ritual welcoming ceremony, blessing of the conservator's hands, the lab, and the space where the manuscript is kept on the shelf. This paper shares the experience, from a conservator's perspective, of one approach to care of this community's belonging, positive outcomes, as well as some of the institutional challenges faced and solved in order to connect in this way.