



BOOK AND PAPER

CONFERENCE

**CONSERVATION
UNCOVERED**

**INVESTIGATION AND
DISCOVERY IN TREATMENT
AND ANALYSIS**

TALKS

The 'Graz Mummy Book' (UBG Ms I 1946), the Oldest Direct Precursor to the Codex Form: Holistic Material Investigation and the Scientific Method

The oldest known fragment of a codex-like structure was discovered at Graz University Library and made public in June 2023. Nicknamed the 'Graz Mummy Book', the fragment dated to 260 BCE is made of papyrus and shows features including a central fold, text layout and ink transfer distinctly identifying the fragment as a bifolio. By examining the fragment with the help of scientific equipment, we have reconstructed its history and use. This will be presented using detailed photography and the fragment's context will be explained. The interpretation of the fragment as a bifolio is sensational because this identifies the fragment as the earliest direct precursor to the book, predating existing codices by at least 400 years. Although no comparable material from this period is known, the 'Mummy Book' is evidence for the development of the codex format in the pre-Christian era, substantially changing the history of the book.

In the two years since the discovery was made public, our interpretation has often been dismissed by scholars outside of conservation who rarely provided alternative suggestions to explain all the fragment's relevant material features. We felt the need to defend and justify our methodology. This raised questions about the perceived legitimacy of conservation and codicological research in relation to other academic disciplines and we wondered whether it was the conservation profession as a whole that was ultimately being dismissed. We show that our work follows the scientific method and that research from our profession is indeed a valid and important contribution to understanding cultural heritage objects. What matters is that in working together with other disciplines, our approaches complement each other and all should respect and accept each other's expertise for successful results.

We have not stopped questioning and reviewing our interpretation of the fragment. Scientific analysis (carried out at the Centre for the Study of Manuscript Cultures, University of Hamburg) deepened our initial observations on the fragment's material characteristics. While the material aspects can be analysed using scientific equipment, interpreting this data and attempting to understand the object's structure relies heavily on human experience informed by practical knowledge of craft techniques and material culture. We aim to challenge the prevailing dichotomy between scientific analysis and human knowledge and experience. The former is often perceived as superior whereas the latter tend to be overlooked. In reality, human expertise is indispensable for contextualizing scientific findings and rendering them meaningful.

The possibilities of investigating the materiality of the 'Mummy Book' using scientific instrumentation have now been exhausted. We will focus on experimenting with models and drawing analogies from known material based on our experience of craft practice as we believe this is the best way to deepen our understanding of our fragment and answer the remaining questions about its history. While the data gained from the use of scientific instruments significantly contributes to our understanding of material culture, we maintain that a truly holistic investigation of any object requires informed human experience.



Theresa Zammit Lupi ACR studied art history and book & paper conservation. She received her PhD in London focusing on Renaissance manuscripts and was a research fellow at Harvard University. Since 2021 she is Head of Conservation at Graz University Library, Austria. In May 2023 she discovered UBG I 1946, a fragment that has been interpreted as the oldest precursor to the codex – 'The Graz Mummy Book'.

Lena Krämer is a conservator of books and library materials. After obtaining a BA in History and Philosophy, she completed an MA degree in conservation at West Dean College (UK) in 2021. She briefly worked in private practice and is currently conservator for Graz University Library in Austria.

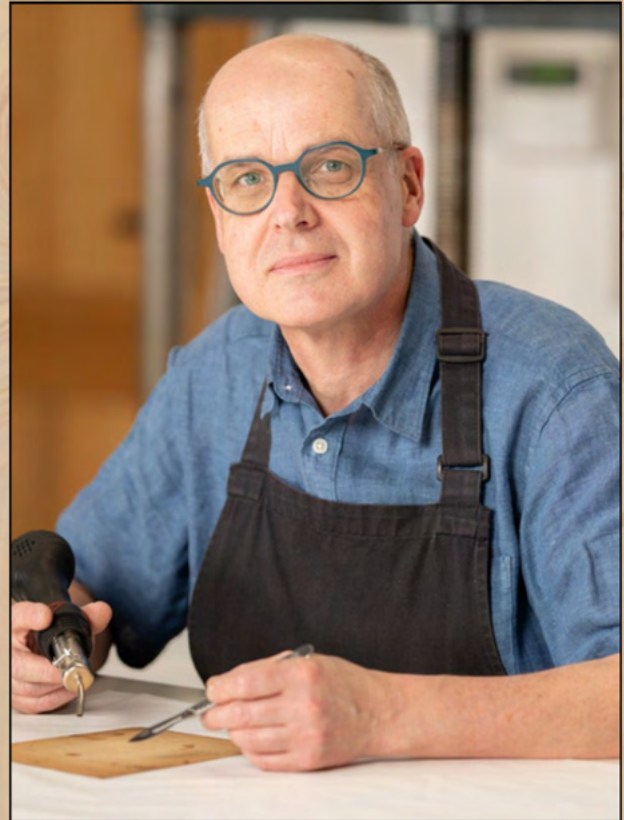
Unfolding Decision-Making and Treatment Techniques in the Conservation of Three Maps from Dunham Massey (National Trust)

Most paper conservators will encounter conservation treatments for oversized, mounted maps. They present their own unique challenges, blurring the boundaries between art and archives. Functionality and readability must be preserved, whilst also considering issues such as areas of damage and loss, yellowed varnish layers and fragile, cloth backings. Maps form an important piece of history that can be used to tell broader stories such as colonialism and conflict. This paper will address these challenges whilst outlining the conservation of a collection of large-format, 18th century maps and the ethical decision-making behind their treatment, storage and eventual display. There are many issues to consider when treating historic maps. There are ethical concerns surrounding historic varnish layers, early linen or cotton backings, and historic methods of display with attached wooden batons. When examining these maps, from Dunham Massey (NT), Cheshire, it became apparent how fragile they were. Informed by the materiality of and the experience of treating previous maps, a treatment plan was created that considered a curatorial desire to maintain the integrity of their original hanging fittings. Constructed from multiple, printed sheets of paper pasted together, the cloth backing was failing and the paper had extensive fractures and areas of damage. The wooden batons were also at risk of detaching through tears and corroded iron nails. It was decided that a high level of intervention was required due to their degraded condition, which was detrimental to the long-term preservation of the paper and prohibited study and display. The Asian conservation technique of temporarily facing the maps was applied, albeit adapted with a starch adhesive, arrowroot, derived from the rhizomes of certain tropical plants, to secure in place the many fragments whilst removing the backings and separating, washing and lining.

There was informed discussion with stakeholders about the issues of safely displaying and storing the maps. Due to their oversized nature, it is challenging to frame them, as well as store or display them flat. Rolling maps comes with its own risks and potential damage too. Informed by experience with previous display solutions, a plan was devised to retain the historic wooden batons whilst protecting the paper element of the maps with isolating layers with acrylic strips and aluminium, barrier foil. The studio hosted a meeting of stakeholders this summer to discuss options for storage and display.



Mhairi Boyle is a Paper Conservator with an MA in Cultural Materials Conservation from the University of Melbourne and is interested in adapting traditional Asian conservation techniques for the treatment of works on paper. She joined Artworks Conservation Ltd in 2023.



Richard Hawkes ACR has been Director of Artworks Conservation Ltd since 2004. He received an MA Conservation of Fine Art (Works on Paper) from the University of Northumbria at Newcastle and previously worked at the Ashmolean Museum, Oxford and Museum Conservation Services Ltd, Cambridge.

Red Rotting Leather Bindings: Understanding Deterioration

Deaccessioned samples from the Natural History Museum, London were used to further understanding of deterioration in leather-bound books. Deteriorated leathers display greater spatial inhomogeneity of spectral features than undeteriorated leathers when examined non-destructively with attenuated total reflectance Fourier transform infrared (ATR-FTIR) spectroscopy. A new ratio of peak heights was developed as a way of numerically categorising the level of deterioration that is applicable to whole leather-bound tomes or strips and scrapings. In addition, ATR-FTIR spectroscopy can be used to distinguish between types of tannins in leathers in a non-destructive way. This could impact on conservation methods and allow identification of the geographic origins of tannins used in the leather trade in the past centuries. Complementary scanning electron microscopy (SEM) analysis revealed for the first time that the characteristic red rot powder is made of short and thin collagen fibres. SEM analysis did not show the grain pattern that could identify the animal origin of a tome. Furthermore, the aspects of red rot deterioration observed with SEM, such as surface erosion, tangling of fibres, and loss of matrix cohesion, appeared very similar to non-red rot deterioration (hydrolysis, oxidation and gelatinisation). Both FTIR and SEM analysis showed that a thick top layer of dye can disguise signs of deterioration, but the fibres below this layer show expected deterioration.





Marysia Tarnowska is a heritage scientist. Most recently, they worked at the British Library as a conservation scientist. Prior to that, they worked as a postdoctoral researcher at the Biodiscovery Institute, University of Nottingham on AI assisted drug discovery. A chemist by training, Marysia discovered heritage science during their PhD (University of Nottingham) and won an EPSRC IAA grant to expand their thesis on the synthesis of handcuff rotaxanes and other interlocked supramolecules to include red rot in leather in collaboration with the Natural History Museum, London.

Wren Montgomery, Konstantina Konstantinidou, Innes Clatworthy, Long Jiang

Sense and Wisdom of the King Brought to Light: Conservation and Scientific Analysis at The British Library

The Shahnameh, or The Book of Kings, is a monumental Persian epic composed by Ferdowsi around 400 AH / 1009–1010 AD, chronicling the mythological and historical past of ancient Iran. Among the numerous illustrated copies produced over the centuries, the British Library holds a significant late 16th century manuscript from Shiraz, Iran (I.O. Islamic 741), attributed to the scribe Hidāyat Allāh Shirāzī. Divided into two volumes, this manuscript features early Safavid-style paintings likely by two distinct artists, alongside evidence of later repainting and poor restoration. In 2024, volume one of the manuscript underwent major conservation treatment to address structural vulnerabilities and risks associated with handling, with the aim of ensuring its long-term preservation. The binding, compromised by the over compensated guards, prevented the manuscript from lying flat, posing challenges for safe access, digitisation and display. These structural issues created excessive spacing between the single sheet pages, resulting in warping and a lack of flexibility when turning or opening, leaving the text block very vulnerable. The decision-making process was shaped by the need to restore functionality while preserving historical integrity. The pages were repaired and extended using Japanese paper, and remade into bifolia and sections. Subsequently, the sections were re sewn and rebound in an Islamic-style binding, to restore flexibility and support the text block. The manuscript features extensive painted decoration: script borders, illuminated headings, decorative carpet pages and full-page illustrations. Conservation revealed significant deterioration within these areas, including pigment flaking, oxidation, fugitivity (particularly after historical silk gauze linings), offsetting and splits in the paper in relation to pigments. These issues were addressed through paper repair and selective pigment consolidation. The recent upgrade of the scientific laboratory facilities in the British Library Centre for Conservation provided a unique opportunity to conduct scientific analysis on the paintings. In collaboration with conservation scientists, ten paintings were analysed using X-Ray Fluorescence (XRF), Fibre Optic Reflectance Spectroscopy (FORS), Narrow Band Multispectral Imaging (MSI), and digital microscopy. These analyses provided an insight into the colour palette, pigment and dye composition, degradation pathways, and the skilful application of gold and silver, now tarnished. The findings highlighted both the diversity and complexity of the materials used, raising important questions about the history and provenance of the manuscript, workshop practices, and later interventions. MSI revealed underdrawings and evidence of intricate designs that were altered or left unfinished, and identified areas of retouching and overpainting, including the presence of Indian Yellow in two folios.

Scientific data identified pigments most susceptible to deterioration or cause mechanical stress, directly informing conservation strategy. This project demonstrated the value of interdisciplinary collaboration, showing how scientific research can complement conservation practice to ensure both the physical preservation and scholarly understanding of Persian manuscripts.



Heather Marshall is an Accredited Book Conservator at The British Library. She graduated in 2003 with a Masters in Book Conservation from Camberwell College of Arts. She takes particular interest in historical binding methods, and developing conservation techniques from this. She finds most joy in the decision making and technique development involved in practical book conservation. She has gained experience working at various Institutions and private practice. She also currently works as a Book Conservator at The College of Arms.

Lucia Noor Melita is the Lead Conservation Scientist at the British Library, where she manages the analytical and imaging labs, guiding the technical examination of the Collection and supporting the scientific and conservation research programme. She completed her PhD in Materials Science at UCL. She has expertise in the analysis of a wide range of materials, both traditional and modern, and of museum objects, including paintings, works on paper, photographs, plastics and decorative art. Prior to joining the British Library, Lucia worked as a scientist on modern materials at the V&A and held post-doctoral positions at the British Museum and in the Material Studies Laboratory at UCL.

Application of Jin-Shofu Starch Nanoparticles for the Consolidation of the Paint Layer of a 19th-Century Tempera Artwork on Paper

In 2017, a large-format tempera painting on paper by Edoardo Marchionni (Florence, 1837–1923) was rediscovered at the Opificio delle Pietre Dure (OPD) in Florence. The artwork, a full-scale preparatory model for the hardstone panel *Vase of Flowers* (1878) now exhibited at the OPD's museum, was found in an advanced state of deterioration. Severe structural damage to the paper support and widespread detachment of the paint layer rendered the artwork unmovable and unsuitable for immediate conservation intervention. To address the critical flaking issues typical of delicate tempera magra techniques, a dedicated research project was undertaken within a graduate thesis at the OPD's Higher Education School, completed in 2024. The study aimed to develop an innovative consolidation methodology tailored for fragile matte surfaces, with particular attention to identifying the most effective consolidant and the optimal application method.

The experimental phase involved a comparative evaluation between Funori, a traditional consolidant, and Jin-Shofu starch nanoparticles (SNPs), a novel material synthesized by the Center for Colloid and Surface Science (CSGI) at the University of Florence. Extensive mock-up testing, replicating the original artwork's technical characteristics and degradation patterns, was carried out. Consolidation effectiveness was assessed through rubbing and peeling tests, colorimetric analyses, and gloss measurements to ensure minimal alteration of the surface's optical properties. The results identified a 1% aqueous dispersion of SNPs, applied in two to three layers using a pressure airbrush with a 1 mm nozzle, as the most effective treatment. This approach restored inter-pigment cohesion while preserving the matte appearance and the original color palette. Based on these findings, the conservation treatment was successfully completed, including dry cleaning, structural stabilization of the paper support and aesthetic reintegration. This project marks the first application of SNPs in the consolidation of an actual artwork, demonstrating their significant potential for stabilizing extremely fragile matte surfaces. The methodology developed offers a scientifically validated, innovative alternative to traditional consolidants, opening new perspectives for the conservation of similarly delicate materials.



Selene Chersicla is a freelance conservator specialized in the preservation of paper, parchment and photographic materials. In 2024, she graduated with top honors (110/110 cum laude) from the Higher Education School Opificio delle Pietre Dure in Florence, completing her studies in the conservation of paper, books, parchment and photographic materials (2018–2024). Since then, Chersicla has contributed to the conservation of contemporary artworks at Atelier Simona Calza in Paris, collaborated on the PNRR Digital Libraries Project at the National Library of Florence and the Uffizi Galleries, and worked in paper conservation at the Charta Laboratory led by Livio Nappo. She also collaborated on the preparation of the exhibition "From Paper to Stone. The Vase of Flowers Model by Edoardo Marchionni" that took place at the Opificio delle Pietre Dure Museum.

Light, Legacy and Colour: Technical Investigation of J.M.W. Turner watercolours at the National Galleries of Scotland

The Henry Vaughan Bequest of 1900 to the National Galleries of Scotland (NGS) comprises 38 watercolours by J.M.W. Turner, with the stipulation that they be exhibited all together, but only during the month of January to limit light exposure. This has been observed ever since 1901, with few breaks. For 2025, marking Turner's 250th anniversary and coinciding with a bequest exchange with the National Gallery of Ireland (NGI), the works were unframed for the first time since the 1980s, enabling technical examination and analysis. The Vaughan Bequests in both Edinburgh and Dublin comprise two extraordinary collections of Turner watercolours, spanning the artist's career from the 1790s to the 1840s. Carefully selected by Vaughan, these works range from highly finished compositions to rapid sketches, reflecting Turner's innovative depiction of landscape, light, and atmosphere. Despite the large number of watercolours by Turner in UK public collections, comprehensive technical imaging for his works on paper remains limited, and many have never had technical examination. Today's non-destructive imaging and improved analytical techniques can provide new evidence and a clearer picture of Turner's working methods and materials with minimal impact on the works. Building on earlier research at Tate and the Vaughan Bequest at NGI, the NGS watercolours were examined with stereo microscopy and viewed in ultraviolet light to select a representative smaller group for more detailed investigation. Infrared reflectography was applied to the 38 works. The combination of handheld X-ray fluorescence spectroscopy, microfading, and hyperspectral imaging applied to many of the works enabled the identification and distribution of a number of inorganic pigments, indicated the range of organic pigments that might be present, and assessed their light sensitivity. Microfading of both protected and exposed areas of the same colour was used for suspected organic pigments in particular. The detection of faint but precise underdrawings and compositional changes as part of Turner's working process, which have never been captured before, provides new insights into the evolution of his watercolour technique. The analysis also confirmed his known practice of using newly-invented pigments in watercolour as well as oil medium. Vaughan's light exposure stipulation, observed since 1901, has been instrumental in preserving the vibrancy and condition of these delicate works from overexposure for the past century. The variations in artificial light conditions over this period are the subject of further investigation at NGS. Their exposure whilst in Vaughan's collection was also limited: he kept them in portfolios or framed. This paper will summarise the technical findings, how they have enhanced the understanding of the collection and how they will be incorporated into future displays. Following the successful Turner Vaughan Bequest exchange, curators and conservators at NGS are working together to integrate the technical research findings as in-gallery and digital content for future January Turner displays, enhancing the museum's public programme and visitor experience.



Clara de la Peña Mc Tighe



Clara de la Peña Mc Tighe has been Lead Paper Conservator at the National Galleries of Scotland since September 2022, previously holding key roles at the Royal Collection Trust and Royal Museums Greenwich. Previously, she worked as a postgraduate fellow at The Metropolitan Museum of Art and The Morgan Library and Museum. Clara has contributed to the conservation profession through research projects, publications, and specialized treatments, including the Van de Velde Drawings project at RMG and the ongoing study of pastel works. Recent research projects include the technical study of watercolours by JMW Turner at NGS.

Dr Joyce Townsend FIIC ACR has been Senior Conservation Scientist at Tate for over three decades. Her analytical skills include optical and electron microscopy, X-ray fluorescence, and microfading. She is author of *How Turner Painted: Materials and Techniques* (Thames and Hudson 2019) and many other publications on British artists and has led or participated in numerous technical studies at Tate on 17th-20th century British artists and international artists of the earlier 20th century.

Kirsten Dunne ACR is Senior Projects Conservator at the National Galleries of Scotland, where she has worked since 2005. She currently focuses on Time Based Media, Microfading and the application of Technology to Conservation practice. Kirsten holds an MA in Conservation of Fine Art, Works of Art on Paper from Northumbria University and an MA in History of Art from Edinburgh University.

Stuck in the Middle with Glue: Mounting Contemporary Chinese Paper Cuts

In 2021 Tate acquired a group of eight paper cuts by contemporary queer Chinese artist Xiyadie, who uses bao bun food-dyes to colour large sheets of xuan paper and then cut intricate compositions depicting graphic scenes and traditional folk forms and iconography. Three of the works, which measure 1500 x 1500 mm, were folded into sixteenths by the artist to fit into a small flight case for international shipping; heavily creasing and tearing the paper supports. To make them displayable, the delicate hand dyed paper, which was highly sensitive to water, had to be gently opened up, flattened and repaired. However, the most challenging aspect of the treatment was devising an unobtrusive conservation double-sided mounting and framing system to display the work safely. Keeping in mind Tate's very active exhibition and loans programmes, we wanted to design a mounting and framing system that could withstand numerous journeys, and act as the long-term storage solution for the works of art.

Paper cutting is a form of Chinese folk art commonly used to decorate surfaces such as windows, walls and doors. When paper cuts are framed, they are often shown sandwiched between glass, relying on the rigidity of the glazing to hold the work in place. Due to their size, sandwiching the work between UV filtering glass would have made the overall framing very expensive, heavy and hard to handle, as well as being a potential health and safety risk, as glass is more prone to breakage. Borrowing from traditional papyrus conservation mounting, the paper conservation and technician team came up with techniques to mount and frame the works between UV filtering acrylic panels, in a way that would ensure the work would not drop once upright. The acrylic itself posed its own set of obstacles to be overcome, mainly due to its inherent flexibility and being prone to static build-up. A bespoke frame was designed to hold the panels in place and allow for the work to be hung from the ceiling. The technician team had experience creating double sided frames, but nothing near this scale. This meant devising a totally new design to house the frame package securely.

A different mounting approach was taken with the smaller cutouts which were made on another type of pre-dyed paper, and were hinged to mountboard supports and framed in single-sided frames. Though very different in aesthetic, these mounting and framing solutions showcase different ways in which one can display paper cuts, ranging from small to very large format.



Photo © Tate (Kathleen Arundell)



Emily Williams



Simon Philpott

Emily Williams obtained her BA in Conservation from Camberwell before receiving a postgraduate diploma in Art History from the Courtauld and a dual MA/MSc in Conservation from UCL. She has interned and worked at several institutions in the UK and USA. She has been working as a Paper Conservator at Tate for the past six years, with a particular interest in contemporary art and sustainable practices in conservation.

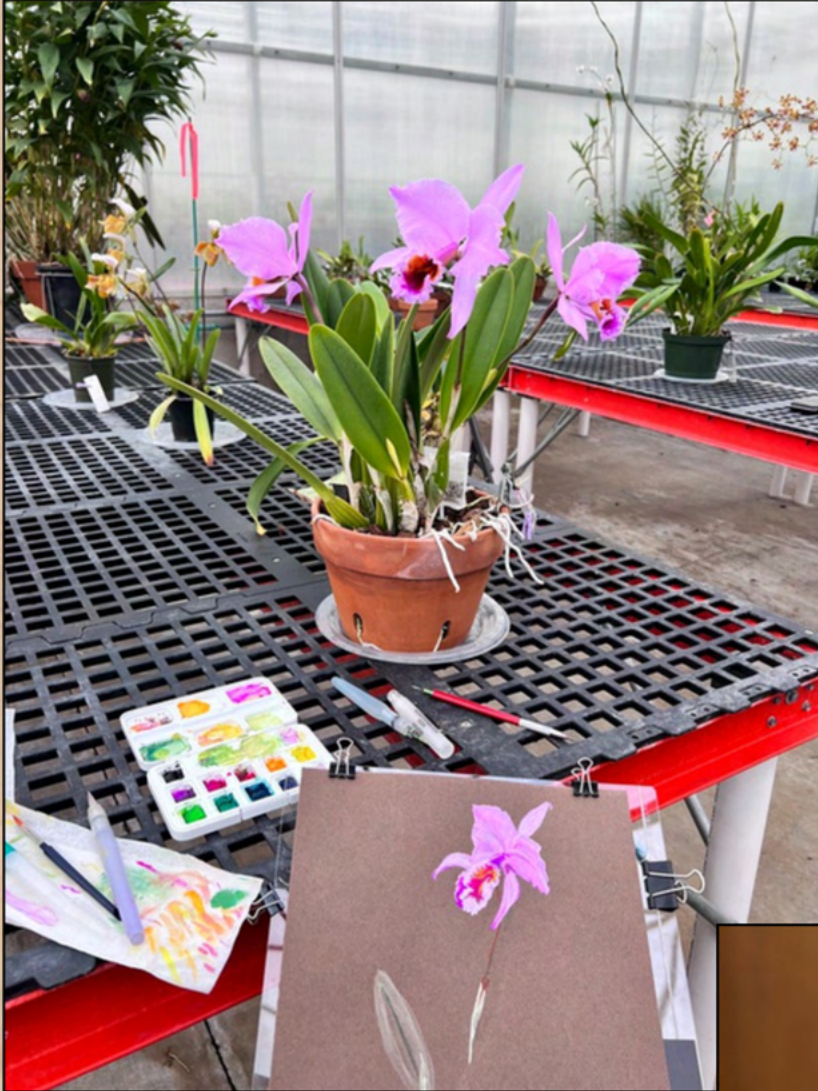
Simon Philpott is Senior Conservation Technician (Paper and Photographs) at Tate. He currently manages a small team of technicians who prepare works on paper and photographs for Tate Britain, Tate Liverpool, Tate St Ives and the busy loans-out program, as well as working closely with acquisitions conservators on projects including preparing works for safe storage. Simon has a MA in Contemporary Fine Art and before joining Tate nine years ago, he had worked primarily in artists' studios fabricating artworks.

Vivian Yip is Paper Conservator for Tate Loans-out programme and Exhibitions and Displays for Tate St Ives. Graduated with MA Conservation (UAL, UK) and MArtAdm (UNSW, Australia). She has been working at Tate for the past seven years, with special interest in microfading, hydrogels and sustainable casing for transporting artworks on paper.

Botanical Studies – Discovering Curation through Conservation

What makes a conservator turn curatorial? One might argue that we have a natural tendency to dive deep in order to complete a satisfying result of one's applied knowledge and skill. But what if research and prior evidence shows that feat to be nearly impossible? Why would one return again and again to muse over the few most problematic works out of a suite of hundreds of paintings by a relatively unknown artist? A reflective long view shares the paradox of how sometimes giving up, or saying "not yet", pondering possibilities can perhaps be the best way forward to improve outcomes. This project began with the author having been challenged to recover from another's treatment-gone-wrong on a gouache artwork on an incredibly brittle paper. This one painting represents a subset of extremely difficult treatment within a larger, more straight-forward and generally successful campaign, three decades and two generations of conservators ago. Yet this one remained in the lab, waiting for a future hope. When this author examined the work, further research showed that: a) there perhaps was no hope for this particular object based on its materiality, but b) sparked a deep and abiding interest in why this one type of colored paper had aged so differently among its fellows, but c) that newly emergent and adaptive techniques could both solve a sticky issue, providing both interventive and preventive options.

As for many of our colleagues, this project adds curation to conservation. The usually dry study of the artist's materials and methods revealed much about the once-renowned and then-unusual woman artist and world traveler, Adelia Sarah Gates (1825-1912). A growing curiosity, encouraged by researchers' inquiries, was informed by conversations with, and progress and publications by colleagues from Australia, France, Germany, the United Kingdom, Taiwan, and across the United States. The technical study transformed the author into an accidental botanist, as it crept into multiple side quests while on holiday, from the discipline of painting outdoors in that most unforgiving of media, watercolor and gouache in the field. It even extended to learning how to prepare a traditional foodway used for nomadic journeys in the desert and as food medicine, learning from historic sources, and culture bearers in multiple languages on YouTube. Whilst our institution launched a massive field books project, with online Transcription Center for archives, manuscripts, and natural history objects, as well as enhancing data on women in science, the project's possibilities grew in scope. Following clues led to connecting collections and researchers across the country on new platforms. More than twenty years after this author laid eyes on the work, and century since they were exhibited at this institution, we are preparing the entire collection for digitization, and in parallel creating content that will add context and value for the next generation. We look forward to publishing broadly, to include conservation insights on the problematic papers so that the next generations may benefit from our conversations across the world, as did Gates in her artistic, educational and social pursuits.



Nora S. Lockshin, Senior Conservator for the Smithsonian Institution Archives, Smithsonian Libraries and Archives provides treatment, guidance, research, training and advocacy, and consultation for caregivers of collections throughout the Smithsonian's museums, education and research centers. She quite enjoys botanizing and painting again, thanks to Adelia Sarah Gates.



Reconstructing Codex Lippomano: A Technical Study of the Earliest Plaque Binding

In 2023, the Morgan Library & Museum acquired Codex Lippomano (PML 199044), the earliest known plaque binding from the Italian Renaissance. This manuscript binding features a unique, multilayered decoration that combines elements of Classical antiquity and Islamic style. Although it is recognized as the earliest surviving example of plaque bindings, it had not previously undergone a thorough technical study. While the binding has suffered significant losses on the spine and some decorative elements, which makes it difficult to visualize its original appearance, these losses also give an opportunity to observe the inner structure. This project investigates the binding's structure and the materials used in its cover decoration through historical research, visual examination, scientific analysis, and model-making.

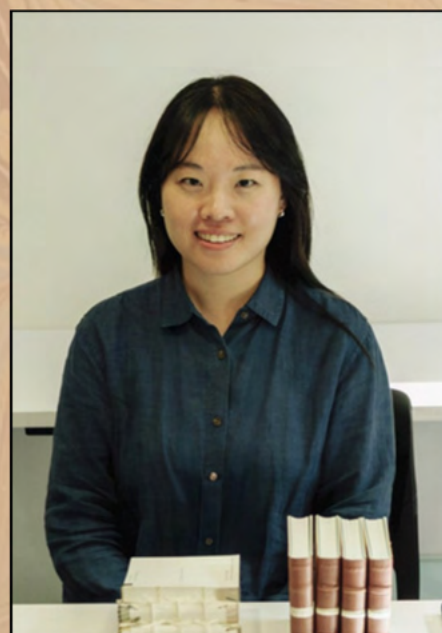
Created around 1480, Codex Lippomano reflects the humanist intellectual climate of the period. The binding, attributed to Felice Feliciano, exhibits Classical and Islamic decorative motifs within a contemporary Italian binding structure. The cover includes a central plaque relief, likely depicting a profile of Antinous, surrounded by leather filigree cutouts backed with green silk and blue paper. A few red beads remain in the plaque, suggesting that the profile's background was originally fully filled with them. Visual examination revealed a typical late fifteenth-century Italian structure: parchment leaves sewn on three alum-tawed supports, laced into beveled wooden boards and reinforced with nails. Multispectral imaging (VSC8000-HS), X-ray imaging, X-ray fluorescence (XRF), and polarized light microscopy (PLM) were used to identify materials, including metal threads in the endbands, azurite in the blue pigment, and bast fibers in one of the backing layers.

Diagrams and a physical model were created to better understand the individual layers and construction of the cover decorations. The model involved cutting the filigree decoration by hand, replicating the plaque using a silicone mold, and brushing on gold paint. This process not only deepened appreciation for the craftsmanship of the original binding but also offered insight into historical methods—highlighting what was technically feasible and what may have required specific tools or lost techniques.

Despite extensive wear and losses, the binding remains structurally sound. Rather than pursuing interventive treatments such as rebacking, which could obscure original details, a custom enclosure was created to protect the binding. The book model now serves as a research and access tool, reducing direct handling of the original while allowing close study of its structure.



Yungjin Shin is an independent book and paper conservator based in Athens, Ohio, in the United States. She was recently a Pine Tree Foundation Fellow in Book Conservation at the Thaw Conservation Center of the Morgan Library & Museum. Prior to the Morgan, she completed a conservation project for the Gwendolyn Brooks Papers Collection at the University of Illinois at Urbana-Champaign Library. She holds a graduate degree from the Winterthur/University of Delaware Program in Art Conservation, majoring in Library and Archives Conservation Education. Yungjin previously interned and worked at various conservation labs in library institutions, including the University of Chicago Library, the Weissman Preservation Center at Harvard University, the New York Academy of Medicine, and the Frick Collection. She also earned a BA in History of Art and an MS in Library and Information Science from the University of Illinois at Urbana-Champaign.



A Joint Effort: The Conservation of Oversized Architectural Drawings in the Case Study of MAIRE Historical Archive

This presentation outlines the coordinated conservation, restoration, and digitization project of the MAIRE Historical Archive, managed by the MAIRE Foundation - ETS. The collection, spanning nearly 10 linear kilometers and declared of historical interest by the Piedmont and Aosta Valley Archival and Bibliographic Superintendency, contains documentation from the former FIAT Building Division, later Fiat Engineering (1939–2004). This archive represents a unique resource among Italian corporate archives and an exceptional collection among the world's major engineering companies. The presentation will address methodological challenges in planning conservation treatments for 111 large-format architectural drawings and tracings (some up to 4 meters in length), developing a methodology that progresses from particular to general analysis with subsequent reverse verification, compensating for the absence of specific pricing standards and parameters for book and paper treatment proposals. The conservation treatment, even though reduced to "only" 21 drawings, required complex logistical management of laboratory spaces and workflow coordination to handle oversized artifacts requiring multiple operators. Operational phases included: controlled unfolding of the drawing stored in historical containers ("tombolelli"); gradual removal of adhesive tapes using mechanical, thermal, and chemical techniques; differentiated humidification and flattening systems; tear suturing and losses mending using compatible Japanese papers and tissues, employing both traditional paper conservation color-matching techniques and adapted oriental traditional methodologies specifically modified for paper conservation purposes. New housing systems include folders for large formats and tubular containers for optimal preservation of the oversized documents. The drawings were digitized at the Italgas Heritage Lab and became the subject of study during the workshop "Methods of Archiving and Conservation of Photographic Heritage" in collaboration with ISIA Urbino. This

This project (2023–2025) demonstrates how interdisciplinary approaches can effectively address the challenges of industrial archival heritage conservation. The methodology developed offers a scalable model for large-scale conservation projects, addressing both technical challenges in paper conservation treatments and the organizational complexities inherent in managing extensive collections of oversized archival materials.



Paola Fagnola is an Italian book conservator and teacher. Moving the first steps into bookbinding at the age of 16, she learnt bookbinding at the Centro del Bel Libro in Ascona (CH). She graduates in Conservation (library cultural heritage: book and paper, photographic material, time-based media) at ICPAL, Rome, in 2016. She has taught bookbinding and book conservation in Design as well as Conservation Schools, holding lessons and workshops in Turin, Rome, Milan, Alessandria, Spoleto. She's in charge of Conservation, Education and Communication in the family-owned studio Bottega Fagnola in Turin. She's currently enrolled as a PhD student at Brera Academy of Fine Arts (Milan, Italy) with a research in the history of Italian bookbinding in the industrial era.



Paola Fagnola

Sofia Pregagnoli is an Italian book and paper conservator graduated in Conservation (library cultural heritage: book and paper, photographic material, time-based media) at the University of Tor Vergata, Rome, in 2021. She has completed an extracurricular internship of one year at the Central National Library of Florence and then one of six months at Bottega Fagnola in Turin, and still collaborates with them. In 2024, she has carried out an annual project of research and conservation at the CRPR of Palermo. She is currently involved in restoration projects in Rome.

Elena Mazzoni is specialized in the conservation and restoration of cultural heritage, with a focus on managing complex projects. Currently involved in the digitization, reconditioning, and restoration of paper materials at Insaid - Document Management Services, a cooperative dedicated to preserving archival documents, photographs, and film reels. Previously, she worked as Museum Conservator and Head of the Historical Archive and Library at the Officina della Scrittura in Turin. Since her graduation Conservation (library cultural heritage: book and paper, photographic material, time-based media) at ICPAL, Rome, in 2021, she collaborated in conservation planning and treatments of paper and photographic artifacts.

Fragile Foundations: Investigating the Conservation of Butter Paper Drawings through Research and Practice

The conservation of preparatory drawings in contemporary art conservation presents complex challenges, particularly when executed on non-traditional supports such as butter paper. This case study examines the conservation of three large-scale preparatory drawings created by a contemporary Indian artist on butter paper—a translucent, cellulose-based material rarely intended for long-term use or conservation. Measuring approximately 2 to 3 meters in length, these artworks incorporated a range of materials including various paints, stains, adhesive tapes, and mixed media, which further complicated the conservation process due to their unstable and heterogeneous nature. Butter paper, unlike conventional conservation-grade paper, has a delicate surface, limited tensile strength, and an inherent tendency to embrittle and curl over time. Its semi-transparency and non-absorbent properties also posed significant challenges for surface cleaning, tear repair, and structural stabilization. The primary conservation concerns included the restoration of flexibility, safe surface cleaning, stabilization of extensive tears and brittle zones, and full lining to provide physical support—all while preserving the original aesthetic and material qualities of the drawings. To address these challenges, a collaborative, research-driven approach was undertaken. Book and paper conservators worked in close consultation with conservation scientists to analyze the chemical composition of the butter paper and associated media. Fiber analysis and microchemical spot tests helped inform treatment choices, particularly in selecting adhesives that would provide structural support without compromising transparency or introducing unwanted visual changes. Mock-ups and test samples were created to evaluate the compatibility of different lining papers, adhesives, and humidification techniques. Given the large format and fragility of the drawings, these tests were crucial to mitigating risk during treatment. The most complex phase of the treatment involved full lining, necessary for supporting the artwork's structural integrity. However, the fragmented nature of the sheets, with numerous tears and losses, made lining a formidable task. Modified Japanese tissue techniques and low-moisture lining methods were explored, with a custom-built lining station designed to handle the oversize format. A paste-free adhesive mixture was developed through testing, allowing for a low-tension, reversible lining process. Each fragment was treated individually based on its condition, with customized mends and support tailored to the scale and needs of each section. Throughout the process, ethical concerns regarding the level of intervention were paramount. Decisions were guided by the principle of minimal intervention while ensuring long-term stability.

The goal was to preserve both the material and conceptual integrity of the works, recognizing the significance of the drawings not merely as preparatory studies but as independent works of art with interpretive value. This project exemplifies how contemporary artworks challenge traditional conservation frameworks and necessitate interdisciplinary collaboration and innovation. By combining investigative scientific methods with hands-on treatment, this case study highlights the importance of research-supported decision-making in addressing the evolving needs of modern and contemporary works on paper. It underscores the essential role of conservators as adaptive problem-solvers who must constantly reevaluate and expand their methodologies in response to the dynamic nature of artistic materials and practices.



Negotiating Fragility

*Investigating the Conservation of Butter Paper Drawings
through Research and Practice*



Rattan Kaur Rainu is an Assistant Conservator at the INTACH Conservation Institute, New Delhi. She holds a Master's degree in Art and Heritage Conservation from the National Museum Institute. Her work encompasses the preventive and remedial conservation of wall paintings, manuscripts, arms and armour, and composite objects. She has contributed to national conservation projects, integrating scientific analysis with traditional practices. Her research interests include risk management, material deterioration, and sustainable conservation.



Ritwika Basak holds a Master's degree in Conservation, Preservation and Heritage Management from Ambedkar University Delhi. Her practice focuses on the hands-on conservation of material heritage, with experience in paper, paintings, and textiles. Alongside practical conservation, she has a strong academic background in intangible cultural heritage, oral histories, and textile research. She is particularly interested in interdisciplinary approaches that bridge tangible and intangible heritage, and in developing context-sensitive conservation strategies rooted in research and community engagement.

Unfolding Histories: Material Characterisation of Chinese Export Wallpapers at the Royal Pavilion, Brighton

This research, part of an ongoing PhD project, investigates the material composition and historical context of the Chinese export wallpapers at the Royal Pavilion in Brighton. This Chinese export wallpaper collection (which form part of the decorative interiors at the Royal Pavilion, Brighton) were produced between c.1770 and 1820. This collection, largely undocumented until recently, offers a key resource for understanding global trade, art, and material culture of the period. The primary focus of this research is to unravel the materials and techniques used in the production of these wallpapers, with particular attention to pigments, colorants, sizing agents, and fibers. A range of non-invasive scientific methods—X-ray fluorescence (XRF), Raman spectroscopy, microfadometry, Fourier-transform infrared spectroscopy (FTIR), and fiber-optic reflectance spectroscopy (FORS)—are being employed to investigate various properties, including pigment composition, lightfastness, and the presence of organic and inorganic materials. These methods are critical for providing a comprehensive understanding of the chemical composition of the wallpapers, which informs both conservation efforts and broader historical analysis. To date, conservation-based research into the material make-up of the Chinese wallpaper, and the links to the wider global context of trade during this period of this study (c1770-1820), is limited. Through this project, the physical examination and scientific analysis of the wallpapers in the RP archive will inform information about the production of pigments and paper used and application of use in Chinese export wallpaper. From this information, the production of these wallpapers will be placed within a specific date range, and the trade and production of these materials during this specific date range will be explored. There is little documentation about the workshops of the craftspeople who made these wallpapers, and through this research and the pigment analysis conducted on the RP wallpapers the research will provide new scholarship in this area. The conservation implications of this research are also of significance. Identifying the materials used in the wallpapers allows for more targeted conservation strategies, ensuring that the appropriate methods are employed to maintain the integrity and appearance of these objects. Beyond the Royal Pavilion, the findings will have broader conservation implications for other collections of Chinese Export wallpapers, as well as related decorative arts from the same period. By expanding the knowledge of material usage and degradation patterns, this research offers valuable insights into the best practices for conserving similar objects in public and private collections globally. It also enhances the understanding of the trade networks that brought these materials to Europe and how the economic and cultural context shaped the production and conservation of such items. Through ongoing collaboration between Brighton & Hove Museums and The National Archives, this research highlights the importance of interdisciplinary approaches in heritage conservation. The integration of scientific analysis with conservation expertise offers new opportunities for understanding material culture from both a technical and historical perspective.



Amy Junker Heslip



Marc Vermeulen

Amy Junker Heslip is an Accredited Paper Conservator with over 20 years of experience in the museum sector. In 2024, she began a CHASE-funded collaborative PhD with Brighton & Hove Museums and the University of Sussex, focusing on Chinese export wallpapers from the Royal Pavilion, Brighton. Her research explores the material composition of these wallpapers, including pigment analysis in collaboration with The National Archives. Since 2020, Amy has received multiple research grants from the Paul Mellon Centre and the Wallpaper History Society to investigate the production and interpretation of Chinese export wallpapers. Before joining Brighton & Hove Museums, she worked at major institutions in London including the British Library, British Museum, Courtauld, Tate, and Wellcome Collection. She has received both Kress and Anna Plowden scholarships and regularly teaches at West Dean College and the Universities of Brighton and Lincoln.

Marc Vermeulen is Head of Heritage Science and Conservation Research at The National Archives (UK). He holds a PhD in Chemistry from the University of Antwerp (2017). Prior to joining TNA, he was a Mellon Senior Fellow at The Met, where he studied pigments and colorants in Hokusai's prints to build a production chronology. As a Research Associate at NU-ACCESS (2019–2022), Marc led projects on colonial-era painting materials, Caribbean art, and arsenic-based pigments in bookbindings, while also contributing to open-access tools for scientific data analysis. At TNA, his current research explores how materiality can inform historical context, using scientific evidence to illuminate the cultural and social dimensions of heritage materials.

The Role of Textiles in Uncovering Hidden Histories in Armenian Manuscripts

In the course of an initial digital survey investigating textile use in Armenian manuscripts and printed books, a pattern began to emerge: textiles used as binding elements offered a wealth of information previously overlooked in both cataloguing and conservation. These materials, often dismissed as incidental or purely functional, revealed their significance through methodical cross-referencing and classification. As part of a broader project exploring the role of textiles in Armenian codicology, the research began by evaluating the usefulness of online images for identifying and interpreting textile features. Over 700 of digitized manuscripts were examined, with particular attention to image quality, resolution, and framing in relation to textile visibility. While many items were photographed primarily for their textual content, a notable number included glimpses of structural textiles.

These fragments were further analyzed by classifying textile materials and mapping their functional uses. Through this framework, weave types, fiber characteristics, and patterns were re-evaluated and began to correlate with known regional trends and historical conservation strategies. These observations shifted the perceived value of such textiles. Once considered negligible, they now serve as material evidence of conservation practices and institutional repair habits. This shift in interpretation has immediate implications for conservation decision-making. Rather than overlooking textiles in manuscripts, conservators are now encouraged to document and preserve them as integral components of a book's historical narrative. These materials are no longer merely structural supports but are increasingly recognized for their codicological and cultural significance.

Aldona Jedrusik is a conservator and researcher specializing in the preservation of textile heritage. Beyond conservation practice, she has led interdisciplinary research projects integrating biotechnology, mechanical engineering, artificial intelligence, and 3D design into textile conservation. Her work includes exploring the use of microorganisms for cleaning historic textiles, investigating the mechanical properties of low-density Japanese tissue papers, and assessing the potential of digital technologies in conservation. She initiated development and implementation of new textile conservation strategies at the Auschwitz-Birkenau State Museum. Currently, she is affiliated with the University for Continuing Education Krems (Austria), where she researches the role of textiles in Armenian manuscripts and printed books.