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The *Book and Paper Group Annual* is a non-juried publication. Papers presented at the Book and Paper Session of the annual meeting of the American Institute for Conservation of Historic and Artistic Works are selected by committee based on abstracts. After presentation authors have the opportunity to revise their papers before submitting them for publication in the *Annual*; there is no further selection review of these papers. Independent submissions are published at the discretion of the BPG Publications Committee. Authors are responsible for the content and accuracy of their submissions and for the methods and/or materials they present. Publication in the *Annual* does not constitute official statements or endorsement by the BPG or by AIC.

Abstracts presented during the Book and Paper Group Session

American Art/Italian Paper: The Partnership between the Japan Paper Import Company of New York City and the Historic Paper Mills of Fabriano, Italy

Sylvia R. Albro, Paper Conservator in Private Practice

My presentation looks at the relationship between these two entities beginning in 1901 and lasting close to 100 years in various forms. The personal relationships that sustained this long-lasting business partnership across changing histories and fluctuating economies will be examined through correspondence preserved in the historical archive of the Foundation associated with the Fabriano paper mills, among other sources. Technical records documenting the formulas for high-quality artists' papers made by hand and machine in the 20th century with a wide variety of new ingredients will be revealed. Papers commissioned in New York City, produced in Fabriano and favored by prominent American artists, printers, and designers in a variety of media will be illustrated. Advertising samples of these same papers from the Harrison Elliott Collection of Paperiana at the Library of Congress will be compared. (Elliott represented Japan Paper Co. from 1925 to 1951).

The Fondazione Fedrigoni Fabriano (FFF) historical archive contains formula books, receipts, and samples of special orders of many types of papers designed and made for the American market, including Ingres, Roma, Rosaspina, Tuscany, Murillo, Lombardia, Umbria, and Fabriano Artistico watercolor paper. Appreciation for aesthetic qualities of many of these imported papers will be highlighted by the numerous works by American artists and printers who used them, from the collections of the Library of Congress, the National Gallery of Art, and the Phillips Collection in Washington, DC.

Evidence of industrial changes in methods of fabrication and ingredients used in 20th-century papers provides important information to conservators charged with preserving iconic works by American artists and printers, now in the collections of many museums and private owners. They include dyes and pigments, fillers, pulp furnish of a variety of sources, whiteners, and both internal and surface sizing agents. Awareness of the numerous components in modern artists' papers and their identification is essential to a conservator's

decision-making process when considering the treatment, long-term housing, and/or display of these artworks.

Plastic Findings in Book Bindings: Surveys of Materials, Structures, and Condition for the Care of Changing Collections in Australia

Cancy Chu, National Archives and Records Administration; Francesca Zilio, South Australian Museum; Julianne Bell, Grimwade Centre for Cultural Material Conservation, The University of Melbourne; Melanie Barrett, Singapore Art Museum; Petronella Nel, The University of Melbourne; Sarah Bunn, Art Gallery of New South Wales

Commercial bookbinding techniques have changed over the past century to include components composed of semi- or fully synthetic polymeric materials, commonly known as plastics. As identified in collection surveys at the Victoria and Albert Museum and the British Museum in the 1990s, certain plastics are known to be comparatively unstable and potentially harmful in close contact with other materials. These plastics are referred to as 'malignant.' Two recent surveys at the New York University Library and National Library of the Czech Republic further identified common plastic types in archives and libraries, including the presence of the four malignant plastics. Although a recent questionnaire indicates that plastic-containing book bindings are likely found in more than 90% of Australian archives, there is limited information available on the structures of plastics found in books, common deterioration concerns, and available strategies for prolonging use and stability. This knowledge gap hinders the capacity for conservators to identify and care for recent and incoming book collections in libraries, archives, and other paper-based collections.

This project aimed to formulate storage strategies for plastic-containing books in Australia. Three paper-based collections were surveyed in a collaborative project to determine the types, structures, and condition of plastics in books, namely at the South Australian Museum, the Art Gallery of New South Wales, and the Grimwade Centre for Cultural Materials Conservation at the University of Melbourne. Fourier-transform infrared spectroscopy with attenuated total reflection (ATR-FTIR), a noninvasive contact-based technique, was used to identify plastic polymer types. Documentation of structures and condition was achieved

with a standardized template to ensure the consistency of data collection, using hierarchical fields to document relational links.

Results from 165 books dating from 1949 to 2019 identified six polymer types, including two malignant plastics. A total of 36 unique binding structures were documented and summarized as 10 binding types to aid in the visual identification of plastic components. Plastics were identified in book cloth, spines, covers, jackets, and adhesives. Visible deterioration was grouped into four categories based on hypothesized cause, then addressed with proposed storage strategies for decreasing the probability of damage. Results are compared with and supplement existing literature on plastics conservation, book conservation, and studies on plastics in paper-based collections. Proposed strategies are low-cost, accessible techniques in line with sustainability principles.

This project recognizes the changing nature of materials used in traditional formats, framing plastics conservation within a book collection context. Results increase the current understanding of plastics in book collections, equipping conservators with possible plastic types and deterioration patterns to guide decision making if similar materials are encountered. Identified conservation storage practices highlight the need for the continued challenging of assumptions to address novel material combinations. Overall, this project demonstrates the benefits of interdisciplinary collaboration between specialties in managing changing collections.

Funding: This work was supported by the University of Melbourne under the Melbourne Research Scholarship, the Australian Government under the Research Training Program Scholarship, and the Australian Research Council's Linkage Projects funding scheme under project LP160100160.

Application of a Large-Scale Working Rack for an Oversized Silk Painting Conservation during the Pandemic

Ting-Fu Fan, San-Jian Art & Conservation; Yi-Chiung Lin, San-Jian Art & Conservation Co. Ltd.

Regular-sized Eastern painting and calligraphy can usually be treated on a conventional-sized red lacquered working table. However, for a silk painting that exceeds 2.4 m in height, 66 m in length, and weighs 32 kg, it is apparently impossible to carry out its treatments and backing, which we found especially true during the pandemic between 2020 and 2021.

How to arrange the practical working schedule to meet limited requirements for conservators and related team members, and furthermore to efficiently use the conservation laboratory space to complete the treatment, backing, and flattening of this super-sized artwork? A helpful and convenient large-scale working rack would be the best solution.

Our conservation team used an off-the-shelf industrial storage rack system, redesigned it according to the treatment

requirements, and built a set of large-scale working racks for this giant painting conservation project. The set of artwork supports made this 66-m-long painting not only easy to roll and unroll but also able to have stepless control in adjusting sections undergoing treatment. Therefore, while protecting the artwork, it also allowed us to reduce the number of art handlers and comply with the government's pandemic regulations.

With three height-adjustable tabletops, the system can maximize the three-dimensional use of small working spaces, take condition pictures, and allow conservators to treat multiple fronts and backs locally at the same time. In addition, multiple adjustable bridges across the artwork are helpful for conservators to carry out treatments on top of the painting and complete two layers of kozo paper backing. The final stage of drying and flattening on this racking set reduces the rent, air-conditioning costs, and environmental control expenses for a super-large space. This set of large working racks that can assemble and install repeatedly can ship to different locations for artwork treatment when necessary.

Finding the Forest amongst the Trees: Unlocking the Hidden Layers of a Kashmiri Birch Bark Codex

Mary French, Boston Public Library; Rebecca "Bexx" Caswell-Olson, Northeast Document Conservation Center

When an exceptionally fragile 16th to 17th century Kashmiri birch bark codex from the Chapin Library at Williams College was brought to the Northeast Document Conservation Center (NEDCC) for conservation and digitization, its contents were largely inaccessible. Each text leaf in the manuscript consisted of two to four layers of naturally and/or artificially laminated birch bark, and most leaves had moderate to severe delamination, creases, and loss. The leaves had long horizontal splits in the fore edge and sewing stations that made it impossible to open the text block without abrading vulnerable areas, and whole sections of the text block were crumpled, tangled, and interlocked together. Scholarly interest in both the unknown text and the understudied Kashmiri binding structure created a unique opportunity for a multidisciplinary project that integrated scientific analysis into the conservation and research process.

As a non-western binding structure rarely encountered by conservators in the United States, understanding the historical, cultural, and design aspects of the Kashmiri binding was an important part of creating an appropriate treatment plan. The task of recontextualizing this manuscript was of significant scholarly interest to the Book and the Silk Roads project, which also helped to coordinate the scientific analysis of the object. Radiocarbon dating established the age of the manuscript to approximately 1500 to 1640 CE. Micro-CT scanning informed the conservation process by offering a rare chance to study the book's internal structure and original condition

even in areas not visible to the human eye without disturbing the historic binding. To further assist in the conservation process, a binding model was constructed based on a study of the manuscript and a thorough literature review was also conducted to ensure that the treatment plan was culturally, historically, and materially appropriate. Following conservation and digitization, images of the manuscript were sent to an expert in the Śāradā script, who was able to identify the text and assist the conservator in determining the exact locations of loose fragments of text. Some fragments were able to be reunited with the main body of the text, and the remainder were housed in a complex custom-encapsulated post binding.

This article will discuss how a conservation treatment plan was designed and carried out to restore access to the manuscript, address the logistics of managing a project with multiple institutional partners across two countries, and highlight the benefits of an interdisciplinary approach to the care and treatment of manuscripts.

Paper, Metal, and Liquid: Bronzing Degradation in a Nineteenth-Century Lithograph

Meredith French, Aaron Shugar, Jiuan Jiuan Chen, Rebecca Ploeger, and Theresa J. Smith, Patricia H. and Richard E. Garman Art Conservation Department, SUNY Buffalo State

Lithographs featuring religious subject matter were common in 19th-century America. The print that is the focus of this research, however, is an unconventional version of the Irish-Catholic patron-hero, St. Patrick. He is depicted standing on three snakes in a landscape with a steepled building in the background. Stenciled matte black paint frames the scene and fills the space behind him. A shiny, green-gray design borders the print and identifies the subject as St. Patrick. All color was painted freehand or through stencils, and the print bears no information about the artist, publisher, or date. The object displayed excessive dirt and debris within the frame, planar deformations throughout the sheet, and a disfiguring dark stain from a liquid event in the lower left region. Furthermore, the tide line of the stain was curiously deformed with bumps protruding from the interior of the paper sheet. St. Patrick was a popular subject for 19th-century American and European lithographs; however, the black background is not a common aesthetic feature. Although this research did not uncover similar backgrounds in other lithographs, the steepled building was found in another print featuring St. Patrick by the prominent American lithographic firm Currier & Ives. Investigating the technologies, materials, and body of work created by Currier & Ives and similar American firms provided a rich, cultural context for the subject of this treatment, and the two prints are likely related. Scientific analysis and multimodal imaging identified the pigments and revealed that the shiny, green-gray border was in fact degraded brass

powder. Bronzing, the historical technique of applying metallic powder to a print, would have given the media a golden appearance. XRF mapping of the brown stain showed that whereas some copper from the brass powder remained on the border design, nearly all of the zinc relocated to the tide line. This could indicate dezincification of the alloy. Additionally, XRF revealed a surprising abundance of metals in the stain, including iron, lead, aluminum, potassium, calcium, and manganese. Grenz radiography identified the nature of the protrusions in the tide line: dense dendritic crystals. Analysis of the crystals using SEM-EDX spectroscopy indicated they are primarily composed of sulfur and magnesium. Although the full meaning of these results is unclear, some conclusions about metal in paper can be drawn. Even though an aqueous treatment was designed for this project, the discovery of numerous metals in the stain and the solubility of some media changed the course of treatment. Instead, the object underwent surface cleaning, minor structural repairs, inpainting of insect grazing and abrasions, as well as optical inpainting to reduce the appearance of the brown stain and foxing. Originally envisioned as a complex stain reduction treatment, this project evolved into the historical research of early lithographic-print houses, printing technology, and the analysis of water-catalyzed degradation of brass powder in paper.

Ammonium Citrate as a Washing Additive for Paper

Ute Henniges, Staatliche Akademie der Bildenden Künste; Antje Potthast, University of Natural Resources and Life Sciences, Vienna; Crystal Maitland, Canadian Conservation Institute; Irene Brückle, Staatliche Akademie der Bildenden Künste; Philine Venus, Staatliche Akademie der Bildenden Künste; Theresa J. Smith, SUNY Buffalo State

Major goals of aqueous treatment in paper conservation concern reducing unwanted discoloration and improving paper permanence. Both goals are met in most established washing treatments that involve the use of mildly alkaline (deacidification) solutions with calcium compounds. Further brightening may be achieved by bleaching, although this more invasive treatment carries the risk of cellulose damage. Lately, ammonium citrate is being used by practitioners as another method of “enhanced washing,” viewed as a more powerful brightening agent than washing and less aggressive than bleaching. However, there are few studies backed with analytical data to clarify the chemical effects of ammonium citrate on paper’s cellulosic backbone. Some publications reveal the astonishing cleaning effect, whereas others warn against stripping calcium carbonate from paper, compromising its stability.

We designed an experiment with two historic papers and one laboratory filter paper that were immersed in solutions of 3% ammonium citrate (pH 5.5 and pH 8.5), and, for

comparison, 3% citric acid (pH 2.5), ammonium hydroxide (pH 9.0), and calcium hydroxide (pH 9.0). One set of papers was washed exclusively in these solutions, and the other subsequently received an alkaline reserve (calcium hydrogencarbonate). We determined the CIE L*a*b* values for all samples before and after the treatment and after accelerated aging (heat-moist aging at 80°C and 65%RH for three weeks) to capture color changes. A selection of 36 samples underwent molar mass determination by GPC-MALLS-RI.

Testing revealed clear differences between the samples in contact with citric acid and ammonium citrate compared to the other treatment solutions. Specifically, both historic papers brightened and maintained their brightness after accelerated aging. One historic paper sample and the filter paper underwent molar mass determination (the other historic paper was already too degraded for this analysis). The molar mass data clearly indicate that both the filter paper and the historic paper degraded in the aging conditions chosen for this experiment. The other significant finding shows that deacidification following the treatments helped to maintain the molar mass of the two tested papers during the harsh aging conditions. The test treatments themselves did not cause differences on a molecular level.

In conclusion, our findings show that the application of ammonium citrate may be considered as a method of enhanced washing, and the mildly acid variant (pH 5.5) brightens the papers tested in our study without compromising its molecular integrity as long as the treatment solution is thoroughly washed out and an alkaline reserve is added. We noted that, as with other washing treatments, the hue of the treated papers changed and this color change should be taken into consideration. For long-term stability, it is crucial to rinse the treated papers and remove the substances used for enhanced washing and to add an alkaline reserve.

Heroes Behind the Chinese Albums: Two Cases of Qing Dynasty Functional Brocade Boxes

Jia-Yu Hu, Tainan National University of the Arts, Graduate Institute of Cultural Relics; Hsin-Kuan Liao, National Palace Museum

Traditionally, the way to contain and store a Chinese album was to make a tailored brocade box to protect it. The brocade box is made of cardboard overlaid with brocade using thickly applied paste. It is a special packaging method; rather than a fixed box, it can fully unfold and lay flat on the table. When it is folded, it will interlock tightly and become a firm box because of its unique structural design. The purpose of this design is to offer a convenient way to take the album out of the box. However, to make the box foldable, the edges are only two layers of brocade and silk, which causes it to abrade and tear easily.

Brocade boxes typically will not be displayed in exhibitions because they were considered as protection for Chinese albums and thus were less important than the albums themselves. But from a historical viewpoint, they are worthy of restoration, not only to preserve the historical information but also to preserve the spirit of protecting cultural artifacts. This study will include two conservation cases from the Qing dynasty (17th–20th century) brocade boxes. The albums inside contained Buddhism stories with detailed embroideries lined with paper. The boxes were seriously damaged. They had torn into individual pieces, and some brocade was lost. In addition, the broken pieces had been improperly taped together. As well, because the cardboard is water sensitive, it caused yellow stains on the brocade. Heavily stained brocade cannot be washed until it is separated from the cardboard underneath.

The restoration treatment balanced functional, historical, and aesthetic values, and it integrated paper and textile conservation materials. We used the original brocade that was folded underneath and Japanese tissue paper to fill losses; we also used Japanese tissue paper as well as silk crepe line to strengthen the structures, while protecting the edges and corners to prevent further tear and abrasion. Because of the thinness and transparency of Japanese tissue paper, it visually merged with the brocade and made a perfect reinforcement. After treatment, the two brocade boxes maintained accurate size to fit the albums, thus restoring the protecting function.

In this changing society, not only the most valuable objects are worthy of preserving but also what might seem less valuable but has historical significance. Although the brocade boxes seem like mere appendages, they have been protecting the albums for centuries. The value is not just artistic value but the spirit of preservation. These conservation projects can convey a message to future generations and inspire continuation of protecting our cultural memories.

Controlled Anarchy: Technical Study and Treatment of Lygia Pape's *Tecelares*

María C. Rivera Ramos, Art Institute of Chicago

In 1959, artist Lygia Pape wrote, “The problem of chance does not exist in the sort of printmaking I do. All of it is controlled: from the choice of material . . . to the final print.” Pape (1927–2004) was one of Brazil’s foremost contemporary artists, and throughout most of the 1950s she used printmaking as the vehicle for her Concrete and Neo-Concrete explorations. Scholars have argued that her predilection for woodcut reflects her desire to subvert long-established hierarchies in the visual arts which privileged painting. But Pape also subverted paradigms of printmaking itself. Her techniques aligned with traditional Latin American craft and the use of prints, broadsides, and posters to address sociopolitical

issues, yet her largely unique prints explore formal concepts. The woodcuts made between 1952 and 1960, which she named *Tecelares* (Weavings in Portuguese), represent an important time in her career when she manipulated printing matrices in anticipation of making three-dimensional work. Close examination of both extant matrices and impressions from the *Tecelares* yields insight into how Pape exploited her materials to conceptualize form and space.

Even during the earliest years of her artistic production, Pape grappled with aesthetic, formal, material, and technical challenges, solving them in innovative ways. Such solutions speak to an ethos of experimentation, as well as command of her craft. The artist favored gossamer-thin Japanese papers, which were exceedingly difficult to use when printing the sharp relief of hardwood and metal matrices. However, successful impressions on such translucent papers gave her the freedom to privilege the verso of a print over its recto. Throughout her printed oeuvre, Pape repeated, reworked, and reformatted her compositions—sometimes in incredibly subtle ways—to discover new resonances within groupings of hand-carved, geometric forms. She invented her own language of making by incorporating the vocabulary of craft.

This presentation will detail conservation-related research into Pape's materials and process carried out in anticipation of the exhibition *Lygia Pape: Tecelares*, on view at the Art Institute of Chicago from February to June 2023. During a year-long study, the author collaborated with the exhibition's curator to examine more than 100 prints and matrices. To the author's knowledge, this is the most extensive direct investigation of Pape's work through the eyes, sensitivity, and intellectual questioning of a paper conservator. A key element of the artist's practice involved wrapping incredibly thin papers around rigid supports for presentation purposes. As a result, many interventions of structural stabilization were crucial. Other conservation issues associated with long-term storage conditions included significant losses due to insect activity, extensive discoloration of the delicate supports, and staining related to poor-quality mounting materials. Due to the fragile condition of many of the prints, 75 works required treatment to make them stable enough for exhibition. This presentation will touch on conservation issues associated with Pape's work and the approaches to treatment that were ultimately selected. Housing and display considerations will be discussed.

Conserving and Exhibiting NYPL's 1799 Copy of Albrecht Dürer's Triumphal Arch

Denise Stockman, New York Public Library

One of the largest prints ever made, Albrecht Dürer's Triumphal Arch is a wall-sized (about 10 × 12 ft.) architectural

woodcut intended as imperial propaganda commissioned in 1515 to convey Emperor Maximilian I's magnificence and illustrious lineage. The 1799 printing was a reprint from the majority of the 190-plus wood blocks, with a few lost or damaged blocks recreated as etchings. The New York Public Library's copy was on long-term display in the library's Astor Hall from the 1930s until 1984, when it was removed due to its "advanced state of deterioration." The muslin mounting onto which the more than 80 individual pieces of the print were adhered was cut apart, and the print remained in storage until 2019, when it was brought to conservation to be prepared for New York Public Library's Treasures exhibition.

Treatment included removing the muslin backing, washing, light bleaching, lining, and filling losses, including digital fills. In addition to preparing the print for exhibition, the goals of treatment included planning for ease of storage, accessibility, and digitization. The presentation will describe how the print was mounted, transferred, and installed into the main gallery of the Library's iconic 5th Avenue building for exhibition (short-term this time).

The Frederick Douglass Collection at Northwestern Libraries: Stewardship, Research, and Treatment

Roger S. Williams, Brown University Library

Northwestern University Libraries holds a small but historically significant collection of manuscript documents by and about the 19th-century abolitionist, activist, orator, writer, and public intellectual Frederick Douglass. These were treated in 2021 in preparation for digitization. Although the treatment itself was straightforward, the significance and historical nature of the materials made research and analysis vital for informing the treatment decisions. Archival research, along with micro-FTIR analysis of old mending adhesives, was used to decipher the origins of the papers that had been applied to the documents.

The Douglass documents at Northwestern University Libraries were previously part of a collection entitled African American Documents, which was made up of materials donated to the Libraries in the early 20th century by a private collector who was a patron of the university. The conservation department's work with this collection required thoughtful consideration of provenance and stewardship, which ultimately led to a reparative description effort led by the Libraries' Archivist for the Black Experience and an exhibition curated by a PhD student. The exhibition included a description of the conservation process, creating a dialogue around the Libraries' custodianship of slavery documents.