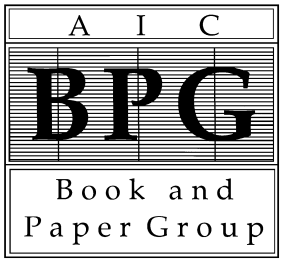

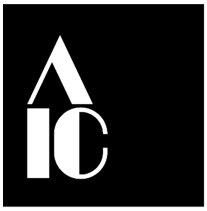

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Abstracts presented during the Book and Paper Group Session

An Investigation into the Stability of Thermal Copying Records in the U.S. National Archives Produced from the 1950s to the 1970s

Henry Duan, Lisa Isbell, and Jennifer Herrman, The U.S. National Archives and Records Administration

This work addresses outstanding questions related to the preservation and conservation of records made from thermal recording media from the 1950s to the 1970s. Although there is available literature about the developmental trajectory of thermal recording media, there is little published research about safe approaches to conservation treatment of the different generations of technologies. Conservation practice would benefit from information about the residual heat sensitivities, solvent sensitivities, and acidity of the media.

Thermofax and associated thermal recording technology were invented during the early 1950s, and were developed and commercialized as an office copying method and process later in the decade. Across the 1960s, newer generations of the technology arose, leading to the commercialization of more stable thermal recording media. The use of thermal recording technology for office copying lasted well into the mid-1970s and was gradually replaced by toner-based electrostatic photocopying.

Federal agencies were among the earliest to adopt the thermal copying technology. As such, many federal government records from the late 1950s to the 1970s were produced using thermal copying media of different technological generations, and were ultimately accessioned into the National Archives. Problems with the stability of these records from early generations, such as Thermofax, were noted in the 1980s. They yellowed and even turned dark brown, so there was diminished tonal contrast between the text and its background. In addition, for some of these records, the tensile strength of their support paper decreased and the sheet became brittle. Concerns arose about the prospect of irretrievable losses, especially from records made with earlier generations of media. However, reports of in-depth research about these materials are rare. Specifically, there is a lack of understanding why some media grow dark and brittle, resulting in image degradation, whereas others are aging in line with nonthermal recording media of the same era. Due to these variations in stability across different generations of technologies, it is highly uncertain during conservation treatments if heat or solvents may be used, for example, to remove adhesive tape, or to clean a contaminated record.

This presentation will provide an overview of the developmental path of thermal printing technology from the 1950s through the 1960s, discuss the image-forming chemistry based on research of historical patents, and compare it with results from instrumental analysis. We will also report on experimental results that identify which types of thermal copying media remain heat sensitive and which are sensitive to a range of organic solvents in a simulated conservation treatment. In addition, we will report on the acidity of these media, which may help predict future storage stability and mitigate risks for museum display and conservation treatment.

Based on these findings, we will provide a risk assessment for potential losses of information on printed thermal recording media during long-term storage, their vulnerability during conservation treatments, and propose a risk-mitigation strategy for institutions holding these records.

Beyond the Manila Folder: Sharing Heritage Data

Andrew Forsberg and Fenella France, Library of Congress

This work is on developing a web-based data analysis platform to support scientific researchers' work with heterogeneous data types, and to assist scientists and cultural heritage partners engaging with the results. We began work on the platform to manage diverse records for the Mellon Foundation funded project, Assessing the Physical Condition of the National Collection (ANC: https://nationalbookcollection.org/). This project was outlined at AIC in August 2020, and involves comparing the physical, chemical, and optical characteristics of 500-plus "identical" books, published between 1840 and 1940, from five large research libraries in distinct regions of the United States. We selected a representative stratified random sample of titles from their shared holdings to better identify "at-risk" time periods and paper types for the project, and undertook visual assessments and a range of objective paper testing analyses.

This data platform already allows us to import analyses from various instruments (FORS, FTIR, SEC, Tensile

Papers presented during the Book Abstracts presented during the Book and Paper Group Session, AIC's 49th Virtual Annual Meeting, May 10-June 25, 2021

testing, XRF), and researcher compiled spreadsheets for pH and spot tests (aluminum, lignin, protein, rosin, starch). The analyses are minimally processed into data structures for storage in CouchDB (a JSON document store), along with sampling and nonscientific data for each book. The analytical data is stored as close to "raw" as is practical. Given some of the challenges with algorithm bias, our intention was to leave our options open—to be able to closely compare the "same" book across institutions; optionally filter and then plot all the samples' data for arbitrary axes (e.g., pH, Mw, Publication Date on *x*, *y*, *z* axes); test combinations of multiple transformations on the data; and, in short, acknowledge from the beginning that we do not know what we do not know just yet.

This "store raw, transform on demand" approach has been working very well for us, servicing many different data visualization, comparison, reporting, sharing, and exporting tools. Most importantly, we can quickly scaffold and then refine services for new research avenues as they present themselves, without having to locate and retrieve (or worse, attempt to reconstruct) the original data.

This platform has led to a focus on the need for active data that meets the FAIR principles (Findable, Accessible, Interoperable, Reusable), and the events of the past months have shown the dire need for this approach to data. An expanded project includes a much larger array of analytical procedures and scientific instrumentation, our stores of research on sample databases (see CLASS-D: https://www.loc.gov/preservation/scientists/projects/class.html), and incorporates a more thorough integration of events and the temporal dimension within the platform, including the first implementation of our Linked Open Data model for sharing scientific cultural heritage data. Our intent is to share the platform (sans data) as a community resource on GitHub prior to AIC 2021. This presentation will discuss the approaches and directions assessed, issues, and challenges.

Tango with Cows: Balancing Access and Preservation in a Research Collection

Melissa Huddleston and Rachel Rivenc, Getty Research Institute

Tango with Cows (1914) is widely considered a seminal example of Russian avant-garde book art. The book consists of 12 poems written and designed by Russian futurist Vasily Kamensky in collaboration with brothers David and Vladimir Burliuk. They were part of a group of artists and poets who reimagined the book as a new art form during the years leading up to the Russian revolution. The group developed their own descriptive terminology. For example, Kamensky referred to several of the poems in Tango With Cows as "ferroconcrete," meaning "reinforced concrete," describing design layouts that related his poetry to modern Moscow's urban infrastructure.

Tango with Cows exists in multiple copies. It was printed on pages cut out of cheap wallpaper, every opening revealing a poem opposite the colorful printed floral pattern of the wallpaper. The words and letters are arranged pictorially using several different typesets and design compositions. The copy that was acquired by the Getty Research Institute came to the collection unbound in a stack of single sheets. The book was originally bound with a stapled stab binding.

Currently, *Tango with Cows* is housed in a portfolio. The pages are individually encased in transparent Mylar sleeves intended to provide access with minimal contact. Consequently, the visual and tactile quality of the book is diminished when viewed this way. Readers often request to remove the fragile pages from the sleeves and hold them side by side, emulating the book as if it were bound. Efforts to protect the book have inadvertently introduced excessive handling, making it even more vulnerable to damage.

In discussion with Getty Research Institute curators, scholars of the period, and conservators from other institutions who hold copies of the book in their collections, a range of solutions were explored. Mock-ups were created to visually aid discussions on the aesthetic, practical, and conceptual implications of potential decisions including several binding alternatives and a variety of creative housing solutions. On the one hand, binding the book would allow it to function as originally intended while also ensuring that the pages stay together in the proper order. It would also prevent the pages from shifting out of alignment, which could cause edge bends and tears. On the other hand, rebinding is an intrusive intervention that could introduce stress to the fragile paper and erase aspects of its history.

This predicament aptly illustrates the challenging balancing act of providing access while preserving the materiality, history, and function of an object.

From Prints to Paintings: The Transformation of Maria Sibylla Merian's Counterproofs

Catherine Stephens, The Conservation Center at the Institute of Fine Arts, New York University

Maria Sibylla Merian (1647–1717) is famous today as a painter, a printmaker, and an early pioneer in the fields of entomology and scientific illustration. For the latter part of her life, Merian supported herself by selling her illustrated books about insect metamorphosis and her opaque watercolor paintings on parchment, which elegantly portray specimens of South American insects and plants. In 1705, Merian published her widely acclaimed folio of 60 etchings, Metamorphosis of the Insects of Suriname, and, at about the same time, she produced three sets of watercolor paintings that bore striking similarities to her Metamorphosis etchings. For three centuries, these 137+ artworks were believed to be typical opaque watercolor paintings with hand-drawn underdrawings; in

fact, they are hybrids created through an extraordinary combination of printmaking and painting. Rather than laboriously copying 137 underdrawings by hand, Merian made counterproofs of her Metamorphosis etchings onto sheets of fine white parchment. (A counterproof is made by transferring the ink from a fresh print to another surface.) Merian was quite adept at reproducing designs by hand, but a counterproof requires far less time and effort than a typical underdrawing, and traces of printmaking ink are just as readily obscured with layers of opaque watercolor. A straightforward counterproof will mirror its "parent" print exactly, yet Merian developed a technique for rearranging the imagery of her counterproofed "underdrawings" so that each composition was unique. Through my reconstructions in a printmaking studio, I have found that Merian's counterproofing method is deceptively simple, so much so that it begs the question as to whether she was the only artist employing this labor-saving technique at the time. Although Merian's ingenious methods allowed her to speed up the production of her sought-after watercolor paintings, they also may have constituted art fraud, by modern definitions. In 1706, Sir Hans Sloane paid 200 Guineas to Merian for her Metamorphosis "originals," the hand-drawn and painted models (*modelli*) upon which her etchings were based. Instead of honoring their agreement to the letter, Merian sent him one modello and 59 overpainted counterproofs on parchment. Sloane apparently never discovered (or admitted to) the substitution, perhaps because Merian's technique produced multiple sets of unique paintings that cleverly belied their mechanical origins. Today, microscopic examination and imaging software allow for the identification of such transformed prints. A casual observer, however, may not immediately see the difference between a painting with an authentic underdrawing and one based on a counterproof. In this presentation, I will discuss previous scholars' research on this topic and my reenactment of Merian's workshop practices in a printmaking studio. I will also describe two noninvasive methods, one of which can be performed remotely, for the identification of overpainted counterproofs.