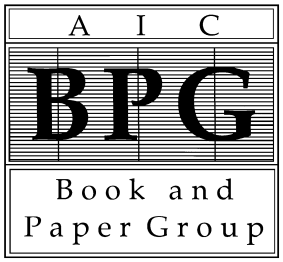

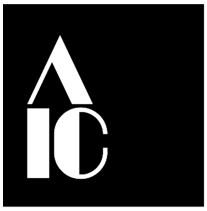

american
institute for
conservation

Preserving Cultural Heritage

Article: Sắc Phong: A Preliminary Investigation of Vietnamese Imperial Proclamations
Authors: Bac-Vu Do, Theresa J. Smith, Fiona T. Beckett, Emily Hamilton, Jiuan Jiuan Chen, Aaron Shugar, and Victor J. Chen
Source: Book and Paper Group Annual 43, 2024
Pages: 1-11
Editors: Roger S. Williams, Managing Editor, and Amy Crist, Assistant Editor
Editorial Office: bpgannual@gmail.com
ISSN: 2835-7418

The *Book and Paper Group Annual* is published once each year by the Book and Paper Group (BPG), a specialty group of the American Institute for Conservation (AIC). It was published in print from 1982 to 2021, and transitioned to a digital publication in 2022. All issues are available online at https://culturalheritage.org.

Print copies of back issues are available from AIC. All correspondence concerning back issues should be addressed to:

American Institute for Conservation
727 15th Street NW, Suite 500
Washington, DC 20005
info@culturalheritage.org www.culturalheritage.org

BAC-VU DO, THERESA J. SMITH, FIONA T. BECKETT, EMILY HAMILTON,
JIUAN JIUAN CHEN, AARON SHUGAR, AND VICTOR J. CHEN

Sắc Phong: A Preliminary Investigation of Vietnamese Imperial Proclamations

INTRODUCTION

In 2022, three paper artifacts from Vietnam were brought to the Garman Art Conservation Department at SUNY Buffalo State University by Bac-Vu Do, a first-year Fulbright graduate fellow, for research. These objects include two Imperial scrolls, known as *sắc phong*, issued by Emperor Khải Định from the Sĩ Mộc collection, and a modern replica purchased from the Zó Project. As part of the Buffalo program's technology project, Bac-Vu Do also attempted to re-create a portion of one of the scrolls to gain a better understanding of the manufacturing process (fig. 1). Given the limited scientific research on the materials and techniques used in creating such manuscripts, a deeper understanding of these materials and their processing is essential for enhancing their longevity through preventive conservation. Over two years at the Garman Art Conservation Department, numerous scientific analyses were conducted by the main author to investigate the materials and manufacturing techniques. It is hoped that this study will serve as a starting point for further research into *sắc phong* and possibly aid in reviving this forgotten art.

BACKGROUND

Sắc phong were composed in Chữ Nôm (Sino-Vietnamese) characters on special yellow handmade paper, adorned with depictions of spiritual animals and imperial symbols. These decrees served as authoritative documents for various purposes, including legal, administrative, and ceremonial matters (Thư Viện Huệ Quang 2024). They embodied imperial authority and conveyed the ruler's commands, carrying significant legal weight in the society of their time. *Sắc phong* played a pivotal role in the governance and administration of Vietnam throughout its history. They were instrumental in conveying orders, codifying laws, acknowledging achievements, and documenting significant events. *Sắc phong* hold a prominent place in Vietnam's cultural heritage, reflecting the nation's historical governance and administrative practices. They are cherished for their artistic and historical significance. These royal edicts reflect the supreme authority of the emperor, who was considered a descendant of heaven sent to the mortal world to govern the people (Thư Viện Huệ Quang 2024). Thus, the emperor

Fig. 1. Bac-Vu Do's attempt to reconstruct a portion of the scroll.

Papers presented during the Book and Paper Group Session, AIC's 52nd Annual Meeting, May 20–24, 2024, Salt Lake City, Utah

Fig. 2. Lại Phú Thạch, one of the last two sắc phong makers of the Lại family (VTV4 2021).

not only ruled over the people in the mundane world but also governed the spiritual world, integrating with religious beliefs and spiritual life (Thư Viện Huệ Quang 2024).

The Lại family in Nghĩa Đô, Hà Nội has been known as the sole family responsible for making this type of paper for more than 600 years (Nguyễn 2024). The technique of making this paper was considered a state secret and has been long lost since the fall of the Nguyễn monarchy in 1945. Lại Phú Thạch and Lại Thu Hà, the 23rd generation of the family, have been working on reviving their ancestor's craft. To make Sắc paper, the maker would order high-quality handmade Dó paper from a reputable papermaker (fig. 2). Each sheet measures about 48 × 20 inches (121 × 50 cm). A sizing made from water buffalo glue was applied. Yellow dye extracted from hoa hòe (*Sophora japonica* sp.) was brushed onto the sized paper to give it the rich golden color, a symbol of the royal family. The paper was then burnished by hammering with a wooden mallet onto a flat, dry stone. The scroll was then decorated with dragons, mythical animals, and sacred symbols using silver or gold pigments. This process was done freehand and required years of training. The technique of making this pigment was considered the Lại family's top secret. The royal family would pay 1.3 ounces of gold for a single sheet of this special paper (Tiểu et al. 2021).

THE OBJECTS

The current study comprises the analysis of two *Sắc phong* imperial edicts and Zó Project modern sắc phong paper, brought from Vietnam to the Garman Art Conservation Department in 2022. The Zó Project is a social enterprise based in Vietnam that focuses on preserving and promoting the traditional craft of handmade paper (Zó Project 2024). Both objects are fragments of original scrolls. Based on visual observation, the scrolls appear to be made of handmade Dó paper, with elaborate gilded designs that include swirling cloud motifs and possibly dragon imagery. The text is written in vertical columns, similar to classical Chinese characters, indicating their historical and cultural significance. The edges of the scrolls are frayed and damaged from improper storage and handling. The decoration along the edge of the scrolls shows evidence of relief printing using a woodblock, whereas the dragon and the cloud seem to be painted freehand.

Scroll #1 (fig. 3) was made from a single thin sheet of paper, whereas Scroll #2 (fig. 4) was made by laminating two

Fig. 3. Scroll #1, Sĩ Mộc collection.

Fig. 4. Scroll #2, Sĩ Mộc collection.

sheets of paper to produce a thicker sheet. The two sheets could have been wet and adhered by pressing them on top of each other, as there is no evidence of adhesive. Scroll #1 has been heavily damaged, with missing characters, making a complete translation impossible. However, these two scrolls were compared with two other scrolls, Or. 14631 and Or. 14632, in the collection of Vietnamese manuscripts at the British Library. Based on visual comparison of the decoration style, these four scrolls seem to have been issued by Emperor Khải Định (figs. 5, 6). A Vietnamese translation by Dr. Phạm Văn Tuấn from the Institute of Hán-Nôm Studies helps date and confirm the origin of Scroll #2.

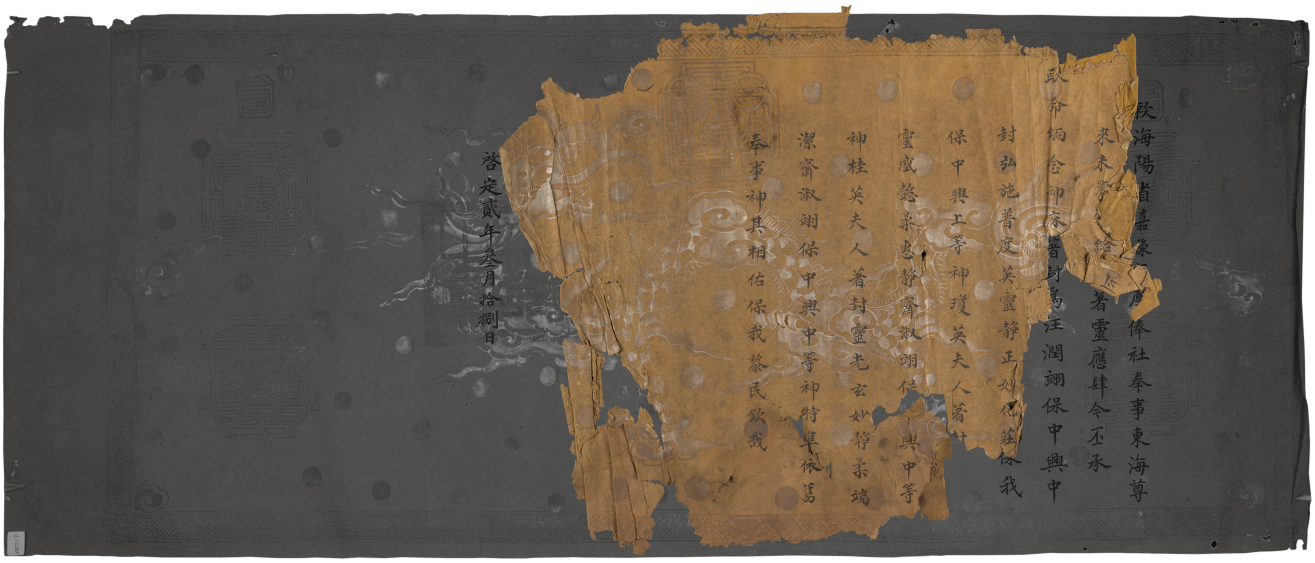

Fig. 5. Digital overlapping between Scroll #1, Sĩ Mộc collection and Or. 14631, British Library.

Fig. 6. Digital overlapping between Scroll #2, Sĩ Mộc collection and Or. 14632, British Library.

English Translation of Scroll #2 Based on the Vietnamese Translation by Dr. Phạm Văn Tuấn

> **Title:** Decree for Mộc Tùng commune in Thanh Liêm district, Hà Nam province, to worship.
>
> Originally awarded the title of "Linh Quang Huyền Diệu Tĩnh Nhu Đoan Khiết Trai Tĩnh Dực Bảo Trung Hưng Quế Anh," the lady protected the nation and sheltered its people, repeatedly manifesting miraculous responses. To this day, she has been granted an official decree for worship. Today coincides with the grand celebration of my forty years birthday, where a precious decree revealing significant grace is bestowed, elevating ceremonial rites. Additionally awarded the title of "Trang Huy Thượng Đẳng Thần." Specifically authorized for worship and recorded on the national holiday in the worship registry.
>
> With deep respect.
> July 25, 1924, the 9th year of Khải Định's reign

SCIENTIFIC ANALYSIS

Microscopy

Both scrolls, numbered 1 and 2, were made from Dó fibers, known to be the primary traditional Vietnamese papermaking material. Dó fiber is collected from the inner bark of Dó (*Rhamnoneuron balansae*), a small tree closely related to other popular Asian hand papermaking plants such as Japanese *gampi* and Nepalese *lokta* (Ojascastro 2023a). Kozo is often mistaken for Dó, and the term is used interchangeably in literature translations within the Vietnamese community. Moreover, the Vietnamese papermaking process shows many similarities to the Japanese technique, including fiber processing, sheet formation, and even papermaking tools (Ojascastro 2023b).

In this study, microscopic examinations were conducted to differentiate between the two fibers. A sample of Honmino paper sold by Hiromi was compared with a sample of Dó paper made by Ngô Đức from Dương Ổ, Bắc Ninh. A Leica polarized light microscope equipped with a SPOT Insight CMOS camera was used, and images were processed using SPOT basic imaging software. Both fibers share characteristics of bast fibers, but kozo fibers tend to have more pronounced nodular structures, with the lumen appearing as a fine line (fig. 7). Kozo fibers come in two primary forms: thick fibers with pointed ends, and ribbon-like fibers that are twisted and encased in a thin, transparent cuticle with broad, rounded ends (Smith 2019). Kozo fibers have an average width of 30 μm and a length of 10 mm (Smith 2019). However, not all kozo fibers have the same width; variations may occur depending on the cultivated regions and possibly subspecies (Niwa 2024). For instance, Nasu-Kozo grown in the northern region of Japan may have narrower width compared to kozo grown in Mino (Asano and Sato 2016).

Dó fibers are extremely thin and smooth, resembling silk fibers, with faint nodes and X marks (fig. 8). The width of Dó fibers ranges from 5 to 12 μm. Although both kozo and Dó fibers originate from the bast (phloem) region, the trees belong to different families: Kozo is in the Moraceae family, whereas Dó is in the Thymelaeaceae family, along with mitsumata, gampi, and daphne, despite being from different genera (Mayer 2023). Dó fibers exhibit a "snake that ate a mouse" appearance, characterized by irregular widths with swollen sections, and inherently contain more lignin than kozo fibers

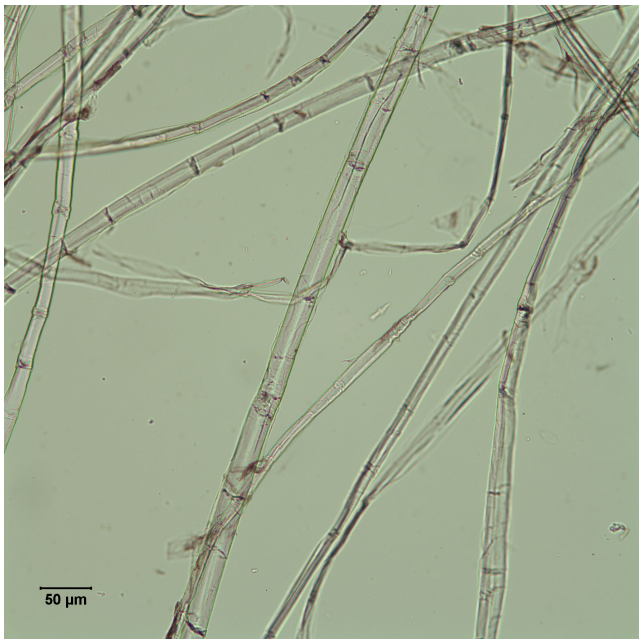

Fig. 7. Kozo fiber, Hon-mino, Hiromi, PPL.

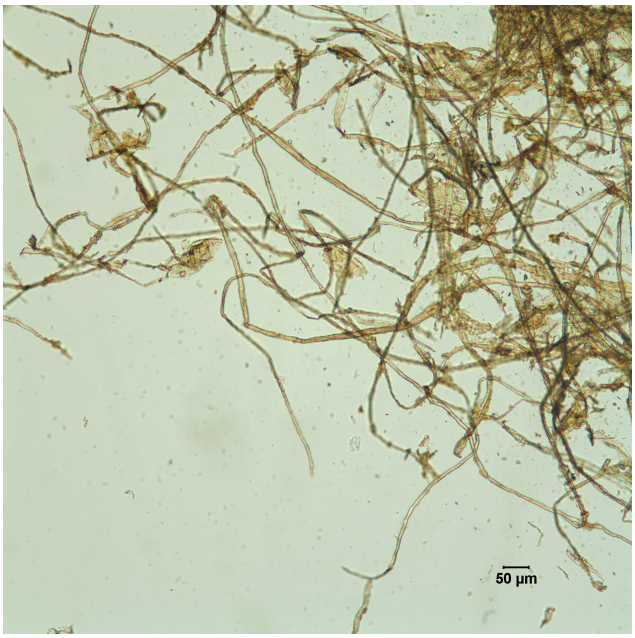

Fig. 9. Fiber sample of Scroll #1, PPL.

(Mayer 2023). Both kozo and Dó fibers have similar birefringence and extinction angles under cross-polarized light.

Fiber samples were taken from damaged areas on the two scrolls to further investigate the manufacturing technique. Both samples show signs of deterioration with short and broken segments of fiber (figs. 9, 10). Under plain polarized light, the dye appears as small yellow irregular crystals physically bound to the fibers, while the fibers retain their natural yellow-tan color (fig. 11). This confirms that the dye was applied by direct brushing on top of the paper, reacting with the alum sizing and forming these crystals. However, the fiber taken from the Zó Project replica has been dyed completely yellow. This was later confirmed by HPLC analysis as a modern synthetic dye. Together with Dó fibers, which appear to be thin with sharp ends, cotton fibers were found to be present in the Zó Project sample, characterized by wider fiber width, random twisting, and collapsed lumens (figs. 12, 13).

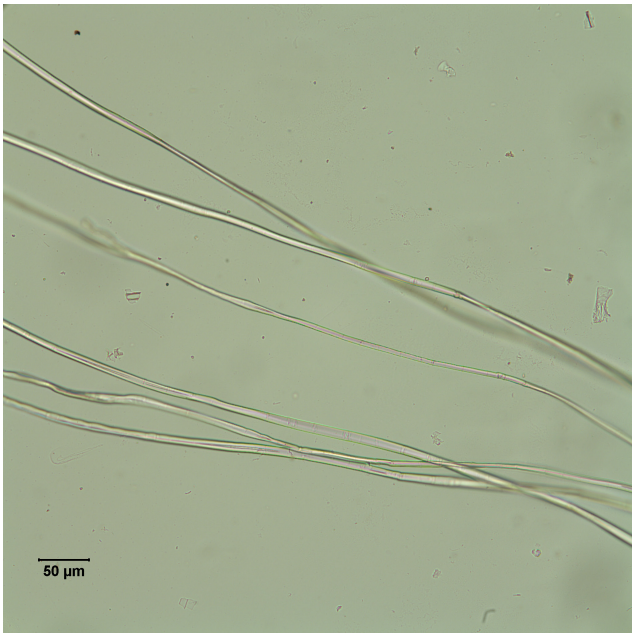

Fig. 8. Dó fiber, Ngô Đức handmade paper, PPL.

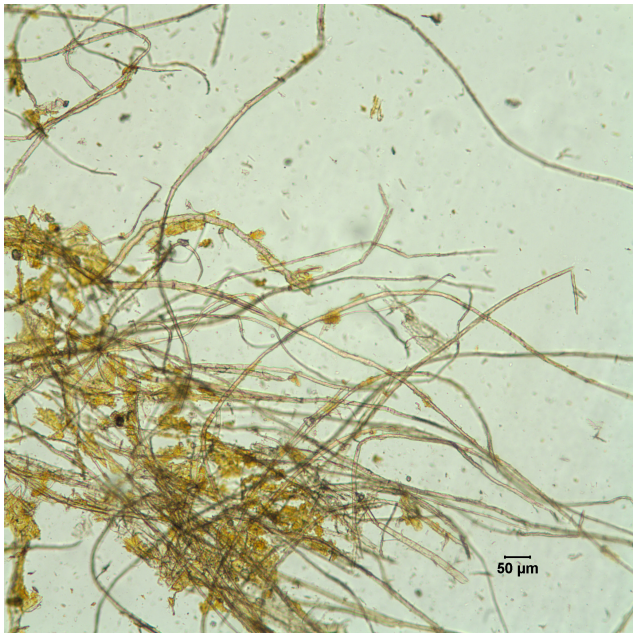

Fig. 10. Fiber sample of Scroll #2, PPL.

Fig. 11. Photomicrograph of Scroll #2, PPL.

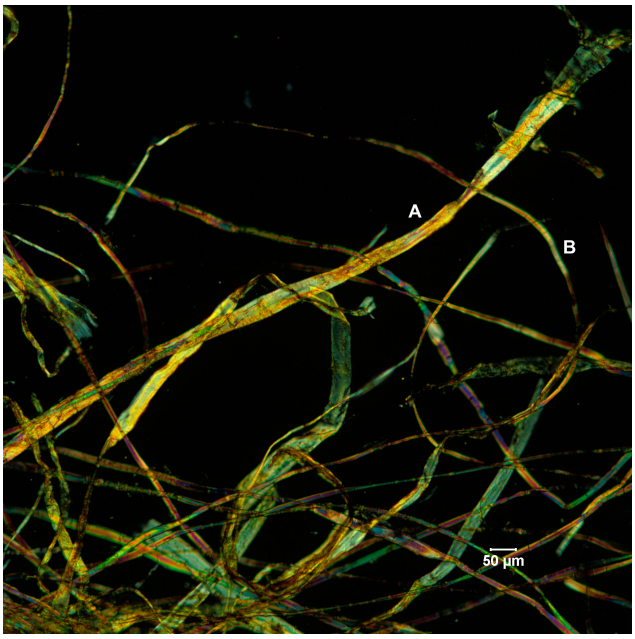

Fig. 13. Zó Project sắc phong paper, XPL, A: cotton fibers, B: Dó fibers.

Multispectral Imaging

The decoration on the back of the two scrolls was heavily abraded, and only traces of the original design can be seen under visible illumination. The Multispectral Imaging System for Historical Artifacts (MISHA) developed at the Rochester Institute of Technology was used to conduct further imaging analysis of the abraded gilding decoration on the back. The system is equipped with 16 LEDs to illuminate objects using different wavelengths ranging from 365 to 940 nm, including two in the ultraviolet spectrum and two in the infrared spectrum. The images were stacked to form a data cube and further processed using the Spectral Analysis App developed by the MISHA team. A false-color image was generated with the results from principal component analysis of the data cube, highlighting the original gilding materials as green, as in figure 14. This area indicates that the gilding was done freehand with precise and elegant brush strokes.

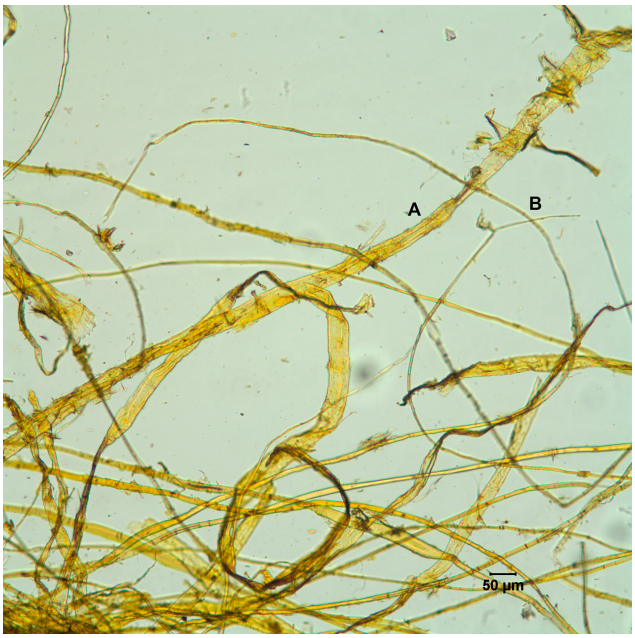

Fig. 12. Zó Project sắc phong paper, PPL, A: cotton fibers, B: Dó fibers.

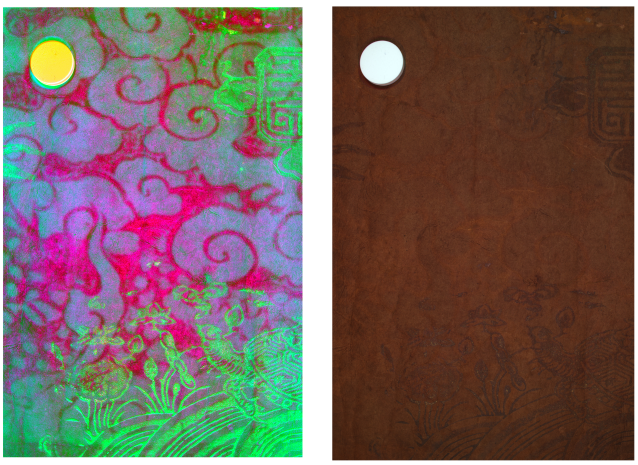

Fig. 14. Detail of the gilding on the verso of Scroll #2. Left: A false color image of principal component analysis results generated with the images acquired through MISHA. Right: Visible light detail of the area shown on the left.

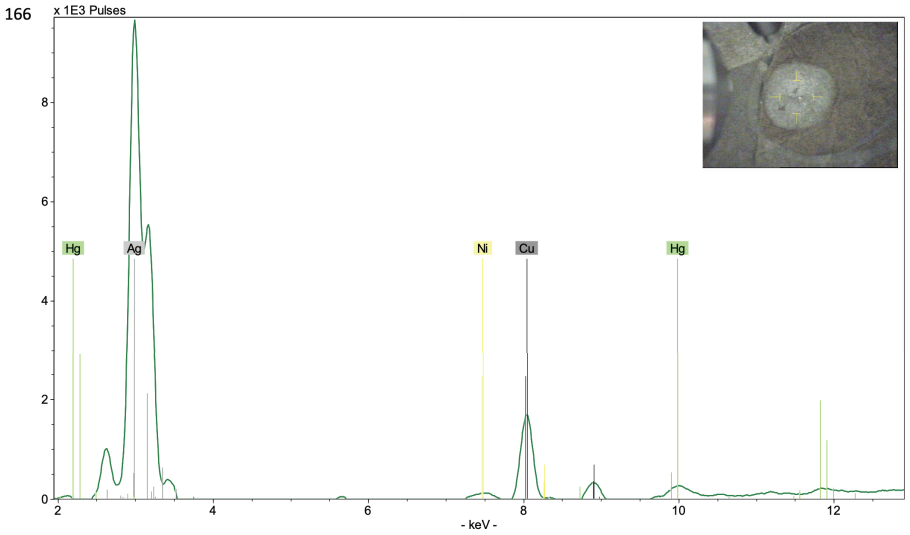

Fig. 15. XRF spectra of the gilding near the dragon's eye on Scroll #1, with background subtraction revealing prominent peaks of silver (Ag) and copper (Cu).

XRF Analysis

X-ray fluorescence spectra were collected using a Bruker Artax 400 energy-dispersive x-ray spectrometer system. The excitation source was a Rhodium (Rh) target x-ray tube with a 0.2 mm thick beryllium (Be) window, operated at 40 kV and 1000 μA current. The x-ray beam was directed at the artifact through a masked aperture of 3 mm in diameter. X-ray signals were detected using a Peltier-cooled XFlash silicon drift detector with a resolution of 146.4 eV. Spectral interpretation was performed using Artax Control software 7.8. Spectra were collected over 30 seconds of live time. No filter was used.

The XRF spectrum with a subtraction of the background of the gilding area near the eyes of the dragon on Scroll #1 reveals the presence of silver and copper, with trace amounts of mercury and nickel (fig. 15). For a long time, silver was known to be the only pigment used in the making of sắc phong. In this case, copper was used as an underlayer to create tonal variations. There are no vermillion or other pigments containing mercury or nickel, which can be interpreted as anomalies adhering to the surface due to direct contact with other works or poor storage conditions. However, the XRF spectra of the gilding area on Scroll #2 reveal the presence of a high amount of copper and zinc (fig. 16). Silver was also present but in much lesser amounts. The copper-to-zinc ratio suggests that this was a brass pigment, possibly used to reduce manufacturing costs while still achieving the rich yellow color of gold. This is evidence of the influence of Western materials explored by traditional craftsmen in the early 20th century.

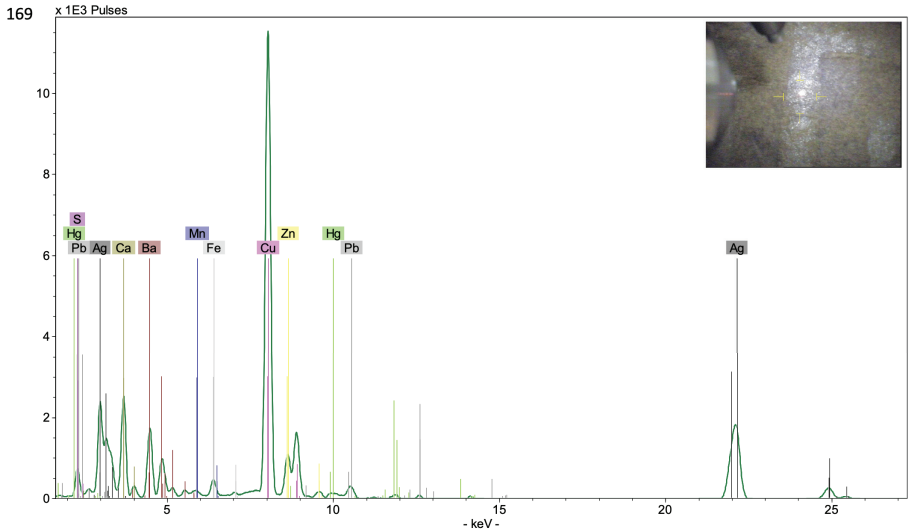

Fig. 16. XRF spectra of the gilding on Scroll #2, showing strong peak of copper (Cu), silver (Ag), calcium (Ca), zinc (Zn), and barium (Ba).

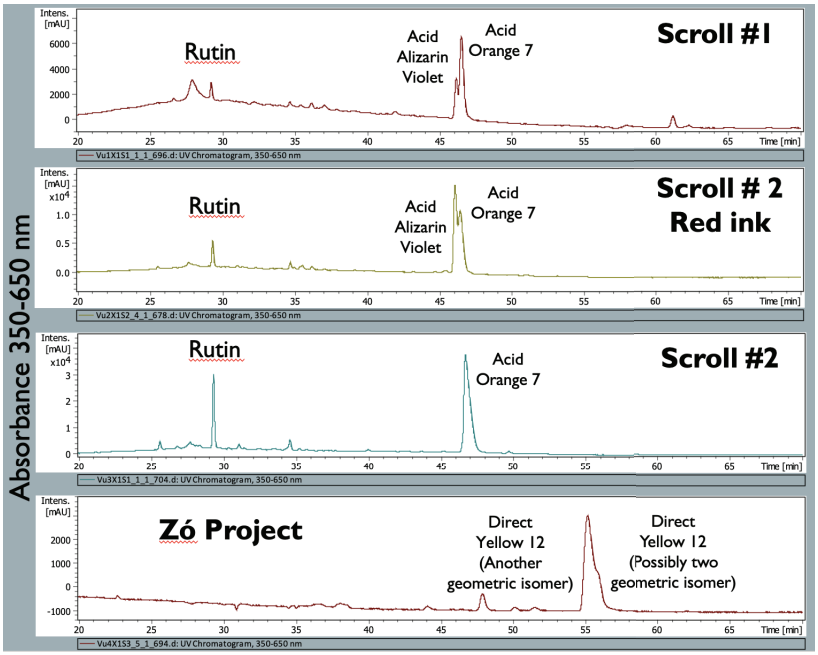

Fig. 17. Absorbance chromatograms of four samples show the presence of rutin, and acid orange 7 in all scroll samples, whereas the Zó Project sample contains only Direct Yellow 12.

The remainder of the elements found are associated with the paper substrate or also due to improper storage conditions. These artifacts were stored directly on top of each other without interleaving layers.

Liquid Chromatograph-Diode Array Detector-Mass Spectrometry

Dye samples were analyzed using Liquid Chromatograph-Diode Array Detector-Mass Spectrometry (LC-DAD-MS). A methanol-water mixture containing oxalic acid was used for all extractions. The paper used per volume of solvent for samples 1 through 4 were 3.7, 6.5, 5.0, and 2.5 mg/mL, respectively (fig. 17). Rutin was found in both scrolls, indicating the use of natural yellow dye extracted from the flower of hoa hòe (Thư Viện Huệ Quang 2024). In Vietnam, there are several native plants that produce similar yellow colorants, such as hoàng dằng (*Fibraurea tinctoria Lour*), hoàng bá (*Phellodendron amurense*), and vàng đắng (*Coscinium fenestratum*) (Do Quyen 2024). Although these plants are popular in traditional cooking and medicine, dyes extracted from them have not been fully studied or compared to *S. japonica*. Surprisingly, synthetic red dyes were found in both scrolls: acid alizarin violet and acid orange 7. In an interview with Lại Phú Bàn, the last sắc phong maker who served the Nguyễn emperors, he mentioned adding a red colorant (*đỏ đơn*) to the Sophora flower's dye to create a warmer yellow tone on paper (Tiểu et al. 2021). Scroll #2 does have a red undertone, which aligns with our findings. Moreover, the layer of red colorant was applied on top of the gilding of Scroll #2 (fig. 18). Dye analysis also shows that the modern replica sắc phong paper from the Zó Project contains Direct Yellow 12, a modern synthetic dye.

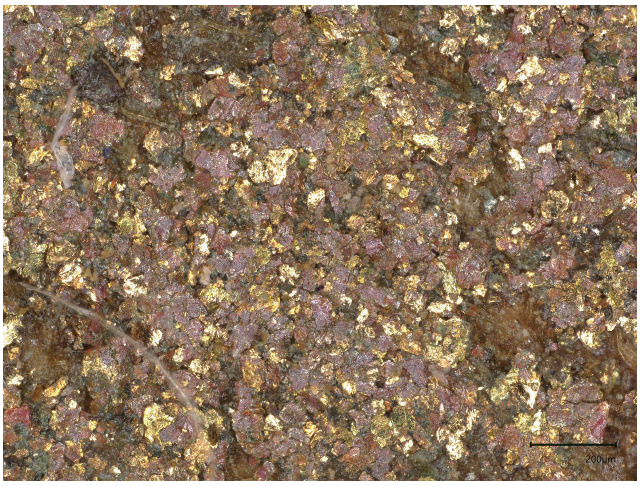

Fig. 18. Detail of Scroll #2 showing that the red colorant was applied on top of the gilding, with a 200 µm scale bar.

Test for Protein Using Amido Black Stain

Many sources have mentioned the use of *keo da trâu* (water buffalo hide glue) as a sizing medium in making sắc phong (Thư Viện Huệ Quang 2024). Amido black stain was used to test for the presence of protein glue in all samples. The samples were observed under a microscope to detect any color changes. Both Scroll #1 and Scroll #2 tested positive, whereas the Zó Project sample showed a negative result. An albumen print was used as a positive control, and tengujo was used as a negative control. Further studies are needed to determine the specific type of glue

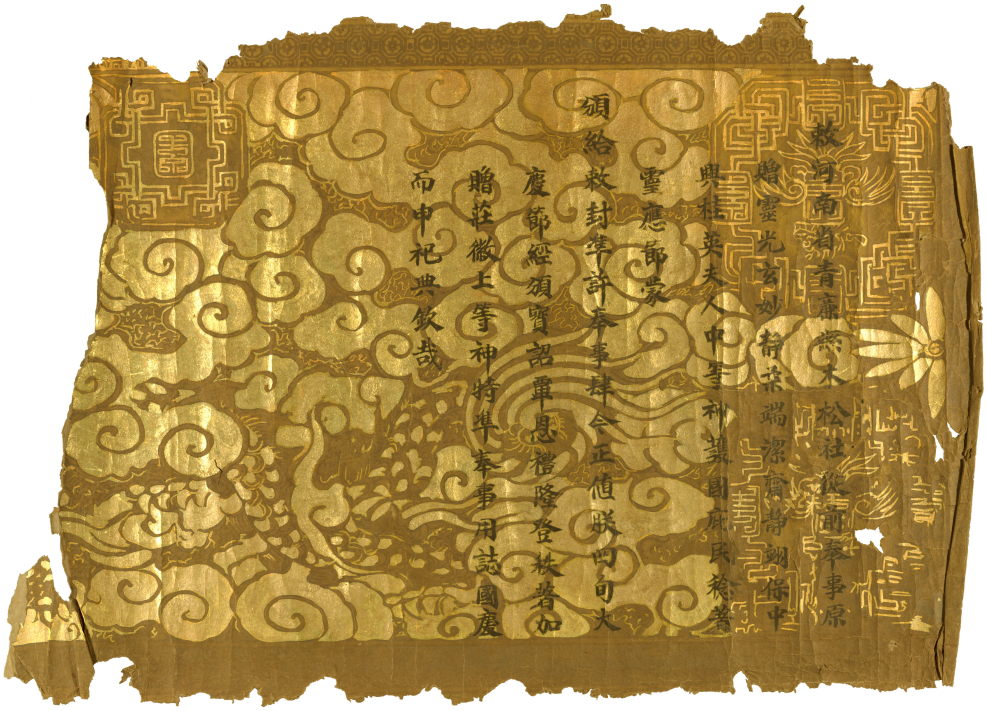

Fig. 19. Digital restoration of Scroll #2 based on recent research findings. Courtesy of Xuân Lam and the author.

used. According to Nguyễn Thị Thu Hòa, a Vietnamese folk painting expert, *a giao* (donkey hide glue) imported from China was often used by traditional painters and printmakers in Hanoi.

PREVENTIVE CONSERVATION

One of the advantages of Dó fiber is its natural insect-repellent properties (Ngô 2022); hence, insects were not noted as a significant issue. Controlling temperature and relative humidity can be challenging in Vietnam. Special attention must be paid during seasonal transitions, such as in March and the summer months when temperature and humidity can change drastically over short periods. In periods of higher humidity, there is the risk of mold growth. Since the paper was made using various organic colorants, it can be sensitive to light and needs to be protected from ultraviolet radiation with limited display periods.

Most of these objects are often stored rolled in wooden boxes and occasionally will be presented during religious ceremonial events. Handling may cause creases and damage to the paper support, particularly with thicker sắc phong, which is made from thick paper sheets or by laminating two sheets of paper. A common mistake, although often done with good intentions, is to laminate the scrolls between two sheets of heat-seal plastic or clear packaging tape; these protective measures may cause damage that is often irreversible.

It is best to store the scroll in a box made of acid-free material with silica gel and a reliable relative humidity indicator. Scavenger fabric materials, such as Pacific Silvercloth, are also recommended to shield the object from exposure to air pollutants. The gilding, composed of silver and copper, can tarnish when reacting with airborne sulfur and chlorine-containing compounds. It would be ideal to check the object frequently, such as once a week, to create air circulation and ensure optimal storage conditions.

CONCLUSIONS

Given the limited published scientific research on the materials and techniques used in the creation of this type of manuscript, gaining a deeper understanding of these materials and their processing is crucial for enhancing their longevity through preventive conservation. Our findings indicate that the scroll was produced using a combination of woodblock printing and freehand drawing. While Dó paper is unique, it shares bast fiber characteristics with kozo fiber. Several natural and synthetic dyes, including rutin extracted from the dried flower buds of the Sophora tree, were identified as key components for paper dyeing. XRF analysis revealed significant levels of copper and zinc, suggesting the use of brass pigment and possible Western influence. The Zó Project replica of sắc phong paper, although advertised as authentic, was not made using traditional methods and materials. This study aimed to provide a foundation for further research into sắc phong and potentially aid in reviving this forgotten art (fig. 19).

ACKNOWLEDGMENTS

A special thank you to collector Sĩ Mộc for entrusting us with these artifacts for scientific research in the United States. I am deeply grateful to Ellen Chase, Donna Strahan, Blythe McCarthy, Akiko Niwa, Matt Clark, Arial O' Connor, Grace Jan, Kesha Talbert and other staff members of the Department of Conservation & Scientific Research at National Museum of Asian Art, Smithsonian Institution for their invaluable assistance and expertise in this project. I also extend my sincere thanks to the Fulbright program for providing the opportunity and funding that made this endeavor possible.

REFERENCES

Asano, Yoshinao, and Yukiyasu Sato. 2016. Development of Cultivation and Control Technology for Highquolitize Mino-Washi Material (I)—Quarty Appraisement of Kozo Material Suitable for Japanese Paper Making. *Reports of Industrial Technology Center, Gifu Prefectural Government*. https://www.gitec.rd.pref.gifu.lg.jp/files/reports/2015/paper_2015_18.pdf.

Do, Quyen. 2024. Personal correspondence.

Mayer, Debora D. 2023. Personal correspondence.

Ngô, Thu Huyền. 2022. Personal correspondence.

Niwa, Akiko. 2024. Personal correspondence.

Ojascastro, James. 2023a. Personal correspondence.

Ojascastro, James. 2023b. "Prints, Pleats, and Preservation: Vietnamese Handmade Dó Paper and Its Applications." *Guild of Book Workers Journal* 52: 19–31.

Smith, Theresa J. 2019. *Japanese Paper Characteristics*. Technology and Conservation of Works of Art on Paper I—Lecture and Lab.

Thư Viện Huệ Quang. 2024. "Nghề làm giấy Sắc phong ở Hà Nội—Một nghề truyền thống cần được khôi phục và gìn giữ." https://thuvienhuequang.vn/blogs/bai-viet/nghe-lam-giay-sac-phong-o-ha-noi-mot-nghe-truyen-thong-can-duoc-khoi-phuc-va-gin-giu.

Tiểu, Vũ, Lâm, Tuệ. Báo Pháp Luật. 2021. "Dòng họ duy nhất tại Hà Nội được phép làm loại giấy sắc phong dưới thời chúa Trịnh." https://baophapluat.vn/dong-ho-duy-nhat-tai-ha-noi-duoc-phep-lam-loai-giay-sac-phong-duoi-thoi-chua-trinh-post384072.html.

VTV4. 2021. "Nghề làm giấy sắc phong tại Hà Nội." Tinh hoa nghề Việt. https://www.youtube.com/watch?v=g9jQlbKVWxY.

Zó Project. 2024. Sắc phong paper. https://www.zoproject.com/product-page/sac-phong-paper-60x120cm.

FURTHER READING

Hoa, Dinh Q. 2015. "Sưu tập sắc phong thời Lê—Nguyễn ở Bảo tàng lịch sử Quốc Gia." National Museum of History Vietnam. https://baotanglichsu.vn/vi/Articles/3096/18447/suu-tap-sac-phong-thoi-le-nguyen-o-bao-tang-lich-su-quoc-gia.html.

Hunter, Dard. 1947. *Paper Making in Indochina.* Chilicothe, OH: Mountain House Press.

SOURCES OF MATERIALS

Hon-mino paper
Hiromi Paper Inc.
9469 Jefferson Blvd. #117
Culver City, CA 90232
310-998-0098
https://hiromipaper.com

Pacific Silvercloth
SilverGuard
321 Kissing Oak Dr.
Austin, TX 78748
512-326-9777
https://silverguard.com

Sắc phong paper
Zó Project
189 Trích Sài
Bưởi, Tây Hồ, Hà Nội 100000
Vietnam
+84 366 602928
https://www.zoproject.com

AUTHOR INFORMATION

BAC-VU DO
Vietnam Fulbright Graduate Fellow
Garman Art Conservation Department, SUNY Buffalo State University
Buffalo, NY
dovb01@buffalostate.edu

THERESA J. SMITH
Associate Professor of Paper Conservation and Program Coordinator, Library and Archives Conservation Education (LACE)
Garman Art Conservation Department, SUNY Buffalo State University
Buffalo, NY
smithtj@buffalostate.edu

FIONA T. BECKETT
Associate Professor of Painting Conservation
Garman Art Conservation Department, SUNY Buffalo State University
Buffalo, NY
becketft@buffalostate.edu

EMILY HAMILTON
Assistant Professor of Objects Conservation
Garman Art Conservation Department, SUNY Buffalo State University
Buffalo, NY
hamiltes@buffalostate.edu

JIUAN JIUAN CHEN
Associate Professor of Conservation Imaging/Technical Examination and Documentation
Garman Art Conservation Department, SUNY Buffalo State University
Buffalo, NY
chenj@buffalostate.edu

AARON SHUGAR
Professor and Bader Chair in Art Conservation
Department of Art History and Art Conservation, Queen's University
Kingston, Ontario, Canada
shugar@queensu.ca

VICTOR J. CHEN
Conservation Scientist Volunteer
Indianapolis Museum of Art at Newfields
Indianapolis, IN
vchen@discovernewfields.org