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### The research and treatment of a Qing Dynasty garment from the Buffalo Museum of Science

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**BUFFALO STATE**  
The State University of New York

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**The research and treatment of a Qing Dynasty garment from the Buffalo  
Museum of Science**

*CNS 695 Master's Thesis*

Nhat Quyen Nguyen

May 22<sup>nd</sup>, 2023

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**ABSTRACT**

The scope of this project was to research, analyze and treat a sleeveless garment from the Buffalo Museum of Science that is thought to be originally from China. The sleeveless garment was donated to the museum by Chauncey J. Hamlin and little information is known about the context or origin of the garment. Research was conducted to gain historical information about the type of garment and why it was made. Analysis was conducted on the fibers, metal wrapped threads and dyes to identify the materials used. The garment was treated with a heat activated adhesive support patch to stabilize the areas of splitting on the main fabric.

*Key words: Qing Dynasty, imperial garment, textile treatment, adhesive treatment, dye analyses, FORS, XRF)*

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## 1. INTRODUCTION

This sleeveless garment is in the collection of the Buffalo Museum of Science. The garment was donated by Chauncey J. Hamlin, the museum's founding patron. There is no record of the garment's historical context or how it came to be a part of Hamlin's collection. Historical context research and analysis of the materials used on the garment was completed to identify the possible origin of this product. Research in Hamlin's collection history was conducted to understand how this garment came to the Buffalo Museum of Science.

After conducting background research into the garment's origin and context, the garment was treated to stabilize the areas of splitting in the main fabric.

## 2. DESCRIPTION

The sleeveless garment follows the structure of the rosy colored scarf known as a *xia-pei*. The garment is made of two different colored fabrics made of silk. The darker fabric has a more open weave pattern and is lined with a sky-blue fabric. The exterior fabric is made of two different colored threads, the horizontal yarns are dark olive color, and the vertical yarns are thinner in diameter and black in color. The black colored yarns are floated over the horizontal thread in a 6:1 float pattern. The garment is made of three pieces of fabric where two of the chevron shaped front pieces are joined at the shoulder to a large chevron piece of the back of the garment. A green colored netting with colorful fringes is attached to the garment's bottom hem.

The garment has no side seams. The sides are joined by ties that are stitched to the sides. The garment has another tie at the center along with two knotted-cord toggle button enclosures, one at the neck and another at the center.

Along the collar of the garment, the embroidered design depicts a design of four scrolled lobes with peonies scattered throughout. The embroidered design on the main fabric follows the terrestrial diagram composition that consists of diagonal bands, rounded depictions of waves of water and prism shaped mountains depicted in varying shades of blue, white, orange, green and yellow. Dispersed throughout this composition are blue clouds, bats, and different types of birds from civil rank such as cranes, pheasant, egret, and mandarin duck. There are flowers present throughout the composition that resemble marigolds and narcissus flowers. There are three dragons. The two dragons at the front are placed in between a flaming pearl of wisdom whereas the singular dragon on the back of the garment is depicted wrapping its body around the flaming pearl of wisdom. Both these imageries are meant to convey the emperor's authority and his search for virtue is represented by the flaming pearl (Vollmer 1980).

There are two square badges attached to the garment with red sewing thread. The square at the front of the garment is divided into two to accommodate for the opening of the front. The badge at the back is one complete square. Both squares have the same designs consisting of the terrestrial diagram composition with a cloud pattern in the background. There are depictions of the Buddhist 'precious things' such as a conch, an infinity knot, etc. The cloud pattern is scattered throughout the composition. The border of the badge consists of bats and two Chinese characters repeating throughout the four sides of the badges. An applique of a golden pheasant embroidered with gold colored metal wrapped thread is attached to the badge above the terrestrial diagram composition. The golden pheasant on the front faces the wearer's right while the golden pheasant

on the back faces the wearer's left. The golden pheasant is positioned to face the sun that is embroidered onto the cloud pattern on the badge.

### **3. HISTORICAL BACKGROUND AND CONTEXT**

#### **3.1 CHAUNCEY JEROME HAMLIN**

Little is known about how this garment came to be a part of the collection at the Buffalo Museum of Science. However, it was noted by the curator that this garment came to the museum as a donation from one of the museum's founders, Chauncey Jerome Hamlin (pers. com. K. Leacock). Hamlin was the son of an affluent Buffalo family. His interest in collecting began when he inherited his late maternal uncle's collection of "treasures" which included a pottery fragment from Pompeii (Leacock 2013). His interest in collecting and the natural sciences led him to join the Buffalo Society of Natural Science (BSNS). Along with being a member and eventually the president of BSNS, Hamlin was also president of American Associations of Museums and the International Council of Museum (54). Hamlin's involvement in BSNS led him to campaign for the building of a new museum dedicated to the natural sciences. During this time, Hamlin traveled extensively to collect for the museum (55). His trips were recorded in various letters to family members and his museum staff. Scans of his letters were available for research at the Buffalo Museum of Science. His letters to his daughter while he travelled to Japan and China gave insight into the possible acquisition of the garment that is the subject of this paper.

The letters showed that Hamlin was in Peiping (now known as Beijing) from May until June of 1936. During his trip, he made multiple appointments with auction houses and sellers to buy jade. He only briefly mentioned the purchase of costumes by his travel companions and not by himself. Interestingly, there were correspondence between Hamlin and the National Library of Peiping in September of that same year where he was asked about his collection of Chinese artifacts. Hamlin only mentioned his jade collection and nothing else. From these records, it is unclear if the garment was purchased during his 1936 trip to Beijing or if it was purchased elsewhere, but these records indicate that Hamlin and his companions did enjoy collecting Chinese costumes, but with a more personal use than for the museum.

#### **3.2 CHINESE COSTUMES IN MUSEUM COLLECTIONS**

The collecting of Chinese artifacts and garments by foreigners began around the fall of the Qing Dynasty in 1911. The group of cities dedicated to imperial silkworks in Southern China released from storage completed garments as well as uncut and untailed yardages of fabric dedicated for imperial court attires. These yardages of fabric eventually became low quality garments and were acquired by Chinese antique shops to be sold to foreign merchants and missionaries (Till 2012). The garments and uncut yardages began circulating among public and private collections from these sales and were rarely catalogued with any information regarding the purchase or production location. Due to this, it is difficult to differentiate the garments and their original intent.

It should be noted that the decadent and extensively decorated garments associated with imperial China that are exhibited in museums are not representative of what common Chinese clothing looked like during that period. For ordinary people, silk was not as common for everyday clothing. Instead, fabrics made of cotton or ramie were used more often. Garments for common

people were simply dyed blue and were locally woven or hand made at home. The common Chinese wardrobe consisted of not more than two sets of winter and summer clothing, and for the well-off citizens, fur and wool would be included as insulation for the colder months. The garments presented in museum collections today are representative of consumer tastes of the middle class and upper-class elites. The middle class includes urban and commercial merchants, teachers, head clerks, shop owners, artisans and clerks. The upper-class elites included wealthy nobility, merchants, scholars, and ranking officials. This group of people comprised 1.9% of the Chinese population in Late Qing dynasty (Silberstein 2020).

### 3.3 CHINESE FASHION DURING THE QING DYNASTY

Before the Qing Dynasty, there were seven previous dynasties with their own traditions and influence on clothing and accessories worn by the imperial court and their subordinates (Yang 2004). Edicts on clothing used by the common people were published and loosely enforced as early as the Western Han Dynasty (205 B.C.- A.D. 25). These edicts assigned colors to correspond with the seasons, therefore limiting the colors that could be worn during a certain time of the year. (4) As different indigenous groups migrated to the region and integrated into the Han culture, new systems of clothing were created in each dynasties from the influence of different cultures and social practices.

For a small percentage of upper-class citizens with close association to the imperial court, the furniture and apparel they wore represent the Confucian ideals of state of order, stability, and harmony (Vollmer 2000). The garments become the identity of the wearer and is crucial to the success of specific political and familial events (13). This idea is reinforced by royal decrees that were passed on as early as the Tang dynasty and carried on throughout the following dynasties. For the imperial members and their associates, edicts and regulations were put in place to dictate garment colors, ornaments, and accessories that they could wear. These rules and regulations limited the color of yellow to be worn only by the emperor. Additionally, five clawed dragons and circle shapes were determined to be representative of the imperial family and their associates that was established in feudal society (Yang 2004).

The Qing dynasty began when a small band of Manchurian warriors were called to quell an army rebellion. When the rebel army was defeated, the Manchurian warriors remained and dethroned the Ming emperor, establishing a new dynasty. The Manchu wanted to retain their identity and distinguish themselves from the Han Chinese that they were ruling over and began calling themselves Qing. The Manchu had a nomadic lifestyle, and their loose clothing was incorporated with that of the existing Han Chinese costumes (Vollmer 1983).

Along with the edicts that regulated the garments worn during the Qing dynasty, styles of clothing were divided between gender and ethnic groups, more specifically between the Han and Manchu population. The system of clothing for men was the same for both the Han and the Manchu males. It consisted of full-length coats with tapered sleeves and trousers and auxiliary surcoats and vests (Vollmer 1983). Whereas, a mix of Han and Manchu systems were implemented for women's clothing. Long gowns were favored by Manchu women while Han women opted for shorter coats and long skirts. (Yang 2004). The clothing of each group was further divided into different occasions such as formal, semiformal, and informal. For those associated with the

imperial court, their garments are specified for either nonofficial attire or official attire (Vollmer 1983).

### 3.4 QING IMPERIAL COURT ICONOGRAPHY

Imperial verdict for the Qing Dynasty for the classification of all clothing, accessories, ritual objects and other implements used in court was publicly proclaimed in 1766 (Vollmer 2007). This served as a standard until the collapse of the Qing dynasty in 1911 (3). Along with decrees to regulate imperial clothing, insignia badges assigned to all those who served the emperor were enforced by legislation. The imperial court consisted of 12 grades of noble and nine each of civil and military officials (17). The noble and military ranks had square badges with various animals and civil officials had square badges with birds (23). Appendix A table lists imagery used on insignia badges of the twelve ranks of the imperial court officials, the military officers and the nine classes of civil officials.

Beside the use of badges to indicate the wearer's imperial ranking, decorative motifs on their clothing dictate their social and political status. Decorations on clothing were reserved for the wealthy elite and not found in common everyday clothes (Vollmer 1983). The motifs present on them followed a structured composition to express specific ideas. Generally, there were six groups of imagery commonly used for decoration. These subjects were imperial, faunal, figural, floral, scenic and emblematic (59). Table 1 describes the aspects that are included in these groups of imagery as described by Vollmer (1983).



Table 1: Description of imagery group based on John Vollmer's *Decoding Dragons*

<b>Imagery group</b>	<b>Description</b>
Imperial	The dragon is the symbol of authority and is presented among the 'cosmic landscape' that includes waves, mountains, and clouds. These represent the elements of water, earth and air and together with the dragon represent the components of the visible universe.
Faunal	This group includes both natural and mythological birds and animals. These are mainly used for the insignia badges but can also be used for decoration on nonofficial garments.
Figural	Symbols that include religious meaning and subjects from theater and literature. These can be used to denote themes that represent specific cultural ideas such as fertility and marriage.
Floral	Flowers are used to show coexistence with nature as well as wishes for social success.
Scenic	Scenic imagery represents the relationship between humans and the environment.
Emblematic	Emblematic imagery represents specific social and cultural ideas of importance.

The imagery listed above acted as identifiers of the garment's role and function. The composition of these imageries, however, showcases the status of the garment and reinforces hierarchal meaning of the symbols in a political, social, and personal context. These compositions were categorized into bordered, dispersed, consolidated, and integrated decorative compositions. They branched off into different arrangements to provide a layout for the placement of the decorative motifs (Vollmer 1983). The arrangements are show in Figure 1 were scanned from Vollmer's *Decoding Dragons*.

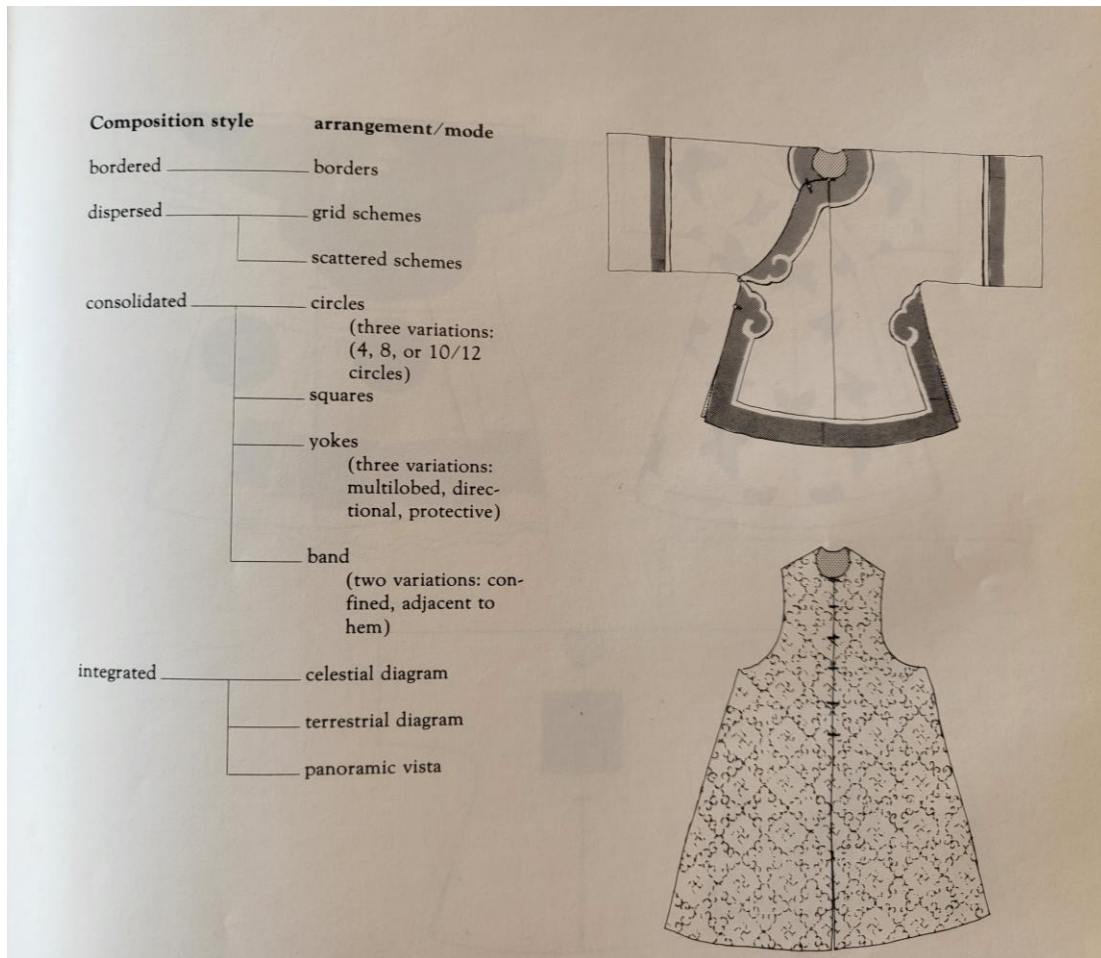


Figure 1: Diagram of composition style.

Courtesy of John Vollmer from *Decoding Dragons*

From the categories that were mentioned, the garment that is the subject of this thesis follows the integrated design decorative composition. The arrangement of the diagonal lines (Figure 2) along the bottom of the garment combined with the 'rounded billows' of water and prism shaped rocks show that the decorative composition is representing the visible universe of the terrestrial diagram (139). The arrangement of the terrestrial diagram was eventually regulated by an edict passed in 1759 and began a trend where extraneous imagery such as auspicious bird and animal symbols as well as punning symbols (164). The bats, cranes, peacocks, egrets, and mandarin ducks observed throughout the garment represent the trend of adding extraneous imagery to the terrestrial diagram composition (Figure 3).



*Figure 2:* Detail of the back of the garment showcasing the terrestrial diagram



*Figure 3:* Detail of the back of the garment showcasing the extraneous designs that were added

### 3.5 THE XIAPEI

The garment that is the subject of this thesis is known as a *xiapei*, which translates to rosy cloud scarf. It was first used as early as the 3<sup>rd</sup>-4<sup>th</sup> century CE during the Northern and Southern dynasties as an embroidered collar (Xun and Chunming 1984). They increased in popularity

throughout that Sui and Tang Dynasties, 4<sup>th</sup>-8<sup>th</sup> centuries and was officially named *xiapei* during this time (Yang 2004). Throughout the centuries, the *xiapei* involved with the fashion of the time and changed its shape greatly from the Ming dynasty to the Qing dynasty. For the Ming dynasty, the *xiapei* took shape of a scarf with adornments at the end. For the Qing dynasty, the *xiapei* became more of a waistcoat shape that was lengthened to the calf of the wearer. The *xiapei* for the Qing dynasty also included a space of badge to indicate the ranking associated with the wearer, usually the woman's male relative's ranking. The insignia badge used for the *xiapei* would depict a bird, for the civil ranks, facing the woman's left (Till 2012). From the UMMA Exchange, it was stated that the direction the bird faces creates a harmonious image when the woman is seated next to her husband. The *xiapei* would be worn on top of the outer most layer and would correspond to the color of the outermost coat. For example, a dark blue *xiapei* would be paired with a broad-sleeved red coat (Yang 2004). They were originally reserved for wives and daughters of court officials, but eventually, women in the common class can wear *xiapei* during important events such as funerals and weddings (Xun and Chunming 1984).

#### 4. MULTIMODAL IMAGING

The garment was visually documented through six different imaging techniques with a Nikon D810 UV-VIS-IR modified camera and a Nikon UV-VIS-IR 60mm 1:4 APO Macro lens. The filters and lighting conditions used to conduct these imaging techniques are listed in table 2.

Table 2: Filters and cameras used for multimodal imaging

Technique	Visible Light	UVA-induced visible fluorescence	Reflected UVA	Reflected near IR	IR Luminescence
<b>Lens Filtration</b>	X-Nite CC1	X-Nite CC + PECA 918 + Kodak Wratten 2E	X-Nite CC1 + B+W 403	Kodak 87B	Kodak 88A
<b>Lighting Conditions</b>	Profoto Tungsten, EHC 500W/120v, 3200K x2	Wildfire Longthrow High Pressure Mercury UVA with IronArc 250W metal halide LMP-250D bulb, peak at 365nm and Wildfire VioStorm 60W LED, 40o Flood, peak/365nm	Wildfire Longthrow High Pressure Mercury UVA with IronArc 250W metal halide LMP-250D bulb, peak at 365nm and Wildfire VioStorm 60W LED, 40o Flood, peak/365nm	Profoto Tungsten, EHC 500W/120v, 3200K x2	Powersmith Work light LED 50W (5000 lumen), filtered with two 6 ½ x 6 ½ inches 3mm thick BG38 filter

The visible light imaging technique provided visual documentation of the garment's condition before and after treatment. No new information was provided by reflected UVA, reflected near infrared (IR), and IR luminescence. However, different dyes used for the embroidered design on the garment reacted under UVA-induced visible fluorescence (Appendix C) showing how the different materials look under UVA settings. With this technique, it was noticeable that the blues used throughout the embroidered designs were made of two different blue dyes: one that is not affected by UVA and another that is excited by UVA to produce visible fluorescence. This technique also highlighted other fluorescent dyes used for this object.

## 5. MATERIALS ANALYSIS

### 5.1 FIBER IDENTIFICATION USING POLARIZED LIGHT MICROSCOPY (PLM)

The samples were collected from areas with lifting threads that were easily accessible. Scissors were used to remove a small sample from the areas and placed on a labeled microscope slide. Deionized water was delivered to the sample via pipette. Needles were used to tease apart the thread bundles and a slide cover was placed on top of the sample. The samples were viewed under polarized and cross polarized light at varying magnifications and their appearances were compared to reference samples of silk, nylon, and polyester threads.

*Table 3: Identification of threads used on garment*

<b>Sample</b>	<b>Fiber identified</b>
Blue lining	Silk
Ground fabric-horizontal yarn	
Ground fabric-vertical yarn	
Dark orange embroidery thread	
Olive green embroidery thread	
Yellow embroidery thread	
Core of metal wrapped thread	Cotton

### 5.2 METAL THREAD COMPOSITION IDENTIFICATION USING X-RAY FLOURESENCE (XRF)

Bruker ARTAX XRF was used to perform metals analysis on the variety of threads on the garment. The instrument was operated via a PC laptop using the software Artax 4.7. After a thirty-minute warm up, the garment was placed on a table underneath the arm of the instrument. The arm of the instrument was manually positioned over the garment with the tube facing the back of the room. The camera on the software was used to position the XRF head directly over the test spot to be scanned. The scans were conducted with the following settings: 40 kV, 50 keV, 1000  $\mu$ A, for 60 seconds using a 1.5 mm collimator with air as the atmosphere.

Table 4: Identification of metal composition of dyes and metal wrapped threads on garment

Location of Sample	Metals Identified
Green tassel	Calcium
Red tassel	Iron
Peach tassel	Iron, rhodium
Silver tassel	Calcium, iron, rhodium
Orange tassel	Iron, lead, rhodium
Lime green tassel	Calcium, iron, potassium
Blue tassel	Calcium, iron
Body of crane	Iron, gold, lead
Peacock wing	
Dragon tail	
Dragon claw	
Cloud collar	
Brocade edge	
Infinity knot	
Diagonal line on insignia	Iron, gold
Body of gourd	Iron, silver
Dark diagonal line	
Outline of gourd	Iron, gold, calcium
Mountain lines	
Insignia border	
Metal knot on fringe	Silver, calcium, iron
Thick mountain lines	Iron, silver, lead
Wing tip of pheasant	Copper, iron, silver, gold
Body of pheasant	
Outline of the sun	
Light blue dye	Calcium, iron, lead
Mid blue dye	
Sky blue dye	
Orange red dye	
Orange petal	
Leg of dragon	
Green leaf	
Background of insignia	
Center of sun	Iron, lead
Middle of sun	
Light blue cloud	
Dark blue cloud	
Border of cloud	
Leg of crane	
Infinity knot	
Ground fabric	
Throat of pheasant	Copper, iron, lead
Outer sun border	Bromine, iron, lead

### 5.3 DYE IDENTIFICATION USING FIBER OPTIC REFLECTANCE SPECTROSCOPY (FORS)

FORS is non-invasive and non-destructive. It provides spectral information in the visible region (color) through the near-infrared (chemical information / functional groups). An ADS FieldSpec4 Hi-Res FORS was used for analysis. This is a portable spectroradiometer with the ability to report on a spectral range of 350–2500 nm and has a spectral resolution of 3nm @700 nm and 8nm @1400/2100 nm. The illumination source was an Ocean Insights HL-2000 providing output from 360-2400 nm through a VIS-NIR fiber optic cable. The fiber optic cables were held in a reflection probe holder, positioning the reflection probes at 45° and 90° to a flat surface. The system was calibrated on a white 98% reflectance standard prior to data accumulation. Data was collected over 350-1000 at 60 seconds.

*Table 5* Identification of dyes on garment

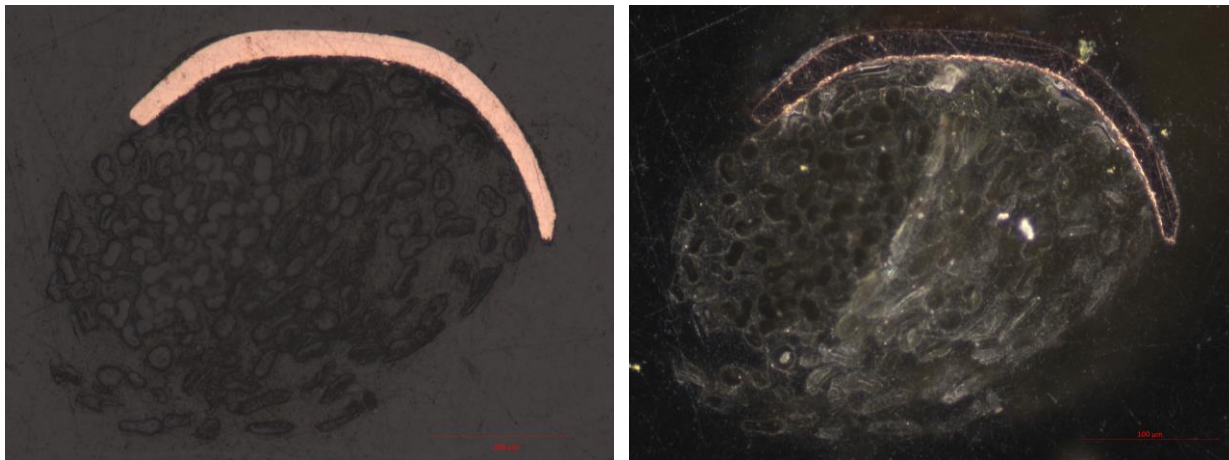
Location of Sample	Dyes identified
Orange flower	Inconclusive
Orange flame	
Dragon belly	
Yellow/green embroidery	
Olive green embroidery	
Blue fringe	
Green leaf on insignia badge	
Green crane leg	
Green fringe	Possibly saffron and indigo
Red center of sun	Possibly madder
Pink pheasant neck	Cochineal mordanted with iron
Blue flower	Possibly indigo
Blue mountain with no fluorescence under UVA-induced fluorescence	
Blue circle with no fluorescence under UVA-induced fluorescence	
Blue mountain with fluorescence	
Blue circle with fluorescence	
Blue cloud on insignia with no fluorescence under UVA-induced fluorescence	Possibly logwood
Red fringe	Possibly madder
Yellow fringe	Possibly weld

### 5.4 CROSS SECTION ANALYSIS OF METAL WRAPPED THREADS

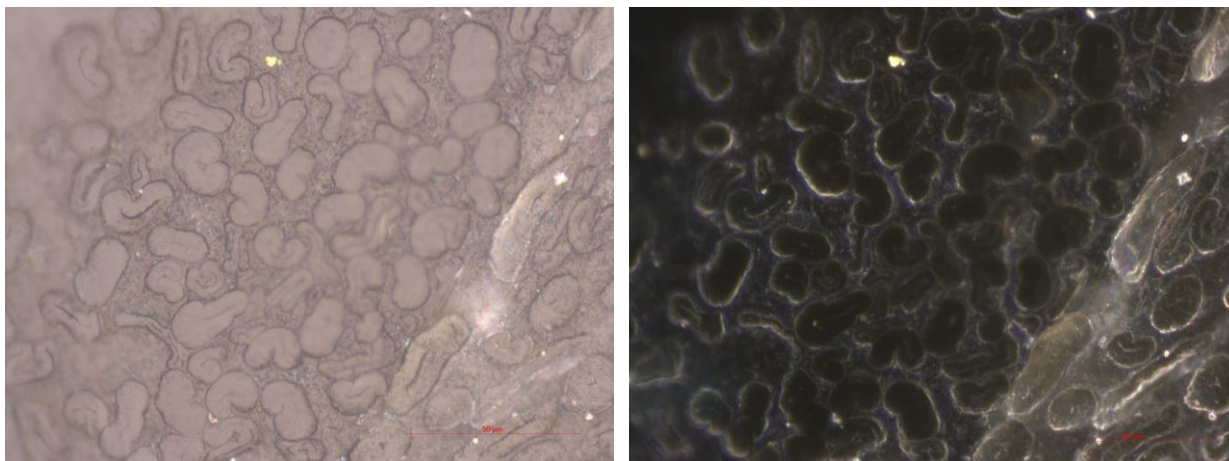
Three metal wrapped thread samples were collected from the pheasant, the border of the cloud on the insignia and the crane. The samples were mounted together in one tab using Solarez UV-cured polyester casting resin. The tab encasing the samples were mounted into a mold and EpoxiCure, a two-part epoxy resin, was poured into the mold and left to set for 24 hours. Afterwards, the cured epoxy resin was polished and sanded down in preparation to be viewed under the Zeiss optical microscope. The samples were analyzed using a Zeiss Axio Imager A1m equipped with illuminators for reflected light, transmitter light and fluorescent microscopy. The

images were taken using the ZEN 2.6 software. The samples were viewed under brightfield and darkfield and images were taken between 20x and 100x in reflected light microscopy.

*Figure 4A-B* Cross section of metal thread from cloud on insignia at 20x magnification under brightfield (left) and darkfield (right)



*Figure 5 A-B* Detail of cross section from *Figure 4* showing the cotton thread core at 100x magnification under brightfield (left) and darkfield (right)



*Figure 6A-C* Cross section images from metal wrapped thread on crane embroidery shown at 10x (left) and 20x (center) in brightfield and 20x (right) in darkfield

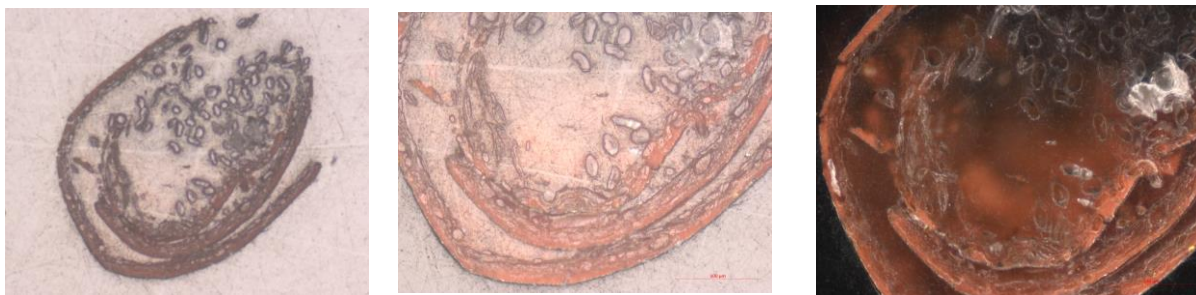
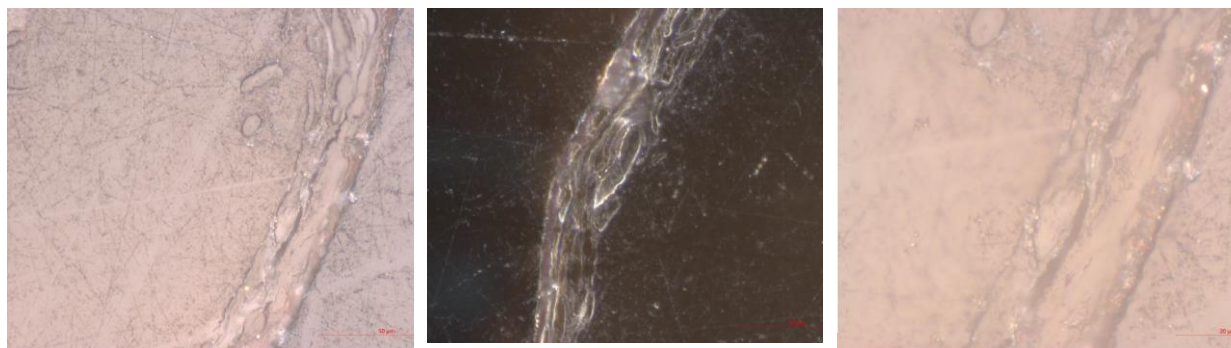




Figure 7A-C Cross section images from metal wrapped thread on pheasant embroidery shown at 50x in bright field(left) and darkfield (center) and 100x (right) in brightfield



## 6. RESULTS AND DISCUSSION OF MATERIAL ANALYSES

Most of the threads used in the garment were identified as silk due to its glass tube morphology. However, the fiber sample collected from the core of the metal wrapped thread shows that the fiber has a twisted morphology with a flat shape indicating that it is cotton instead of silk. This shows that the main fabric, blue lining fabric, fringe and embroidery thread were all made from silk, while cotton thread was used as the core for the metal wrapped threads (MFA Cameo 2023). This is represented in the cross sections seen in figures 4 (A-B) and 5 (A-B). Where the ends of the cotton fibers are shown as cashew shapes caused by the collapsed lumen at the core of the fibers.

Fiber optics reflectance spectroscopy (FORS) was used to analyze the various dyes on the textile. However, this method requires the data to be compared to a set of known references. The spectra for the blue colors (Appendix G & H) on the garment show a possibility that indigo was used for the majority of the blue colors. The spectra for the non-fluorescent blue colors on the garment shows an absorption band at 660nm as well as reflection peaks falling into between 430-480 nm. These correspond to the reference (Fig 9) given by Gulmini et al through their experimentation. Whereas the fluorescent blues show the absorption peak for indigo at 660 nm but does not show the reflection peak. This could be an indication that the blue is not entirely dyed with indigo and that there is another factor causing their fluorescence under UV-visible induced fluorescence. However, one spectrum from the blue colors does not fit into the data presented for indigo.

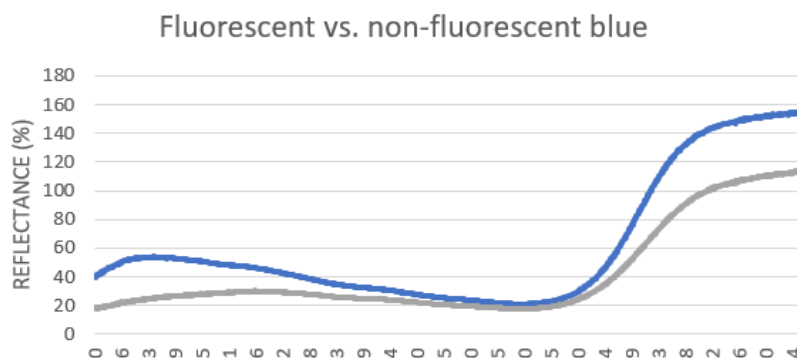


Figure 8 FORS spectra of the two blue dye with blue line representing non-fluorescent blue dye and gray line representing fluorescent blue dye

X-ray fluorescence was conducted on the metal wrapped threads, the embroidery threads and the main fabric. The spectra for the main fabric picked up signals for calcium and iron. Different levels of calcium and iron were detected throughout all spectra, but it is unsure why these two elements were picked up from the fabric. It could also be attributed to user error since there were no barriers used when

conducting XRF on the main fabric and the calcium and iron could have been picked up from another metal thread on the other side of the garment. From the interpreted XRF spectra, metal wrapped threads with the same chemical compositions were grouped together to determine the possibilities that the same metal threads were used throughout. From the data collected and interpreted, the body of the crane, the wing of the peacock, the dragon's tail and claw, and the collar yoke were most likely made of metal wrapped thread that consisted of iron, gold and lead metal elements. The body and wing of the pheasant, and the outline of the sun on the insignia badge contained copper, iron, silver and gold. The presence of silver was confirmed on the metal wrapped thread used for the pheasant because silver tarnish could be seen in the cross section (Figures 7 A-C). Iron, lead and sometimes calcium was detected through XRF for the different colors in the embroidered areas. It is uncertain what the combination of calcium, iron and lead means for dyed threads, but these elements were used as mordants in the past to bind natural dyes to the fibers. However, the author could not find literature with examples of the three elements being used together at the time of conducting research for this thesis. Further research and analyses are needed to understand the different metal compositions and relate them to the types of materials that were available throughout the Qing dynasty for metal wrapped threads.

## 7. CONDITION OF GARMENT

When the garment arrived at the conservation department at SUNY Buffalo State University, it was in good condition aesthetically and fair condition structurally. There was extensive damage to the main fabric's weave pattern at the top of the shoulders and the at the sides of the garment. This damage could be from abrasion and handling to the main fabric, causing the weave pattern to separate and the yarns to split and lift off the fabric surface. The ties at the sides and the center of the garment was made of the same material as the main fabric. These ties were showing extensive damage through use and handling causing splitting in the fabric. The ties at the sides were no longer in their original position, but through past interventions, the ties were stitched to another area along the sides of the garment which caused tensioning issues to the front of the garment.

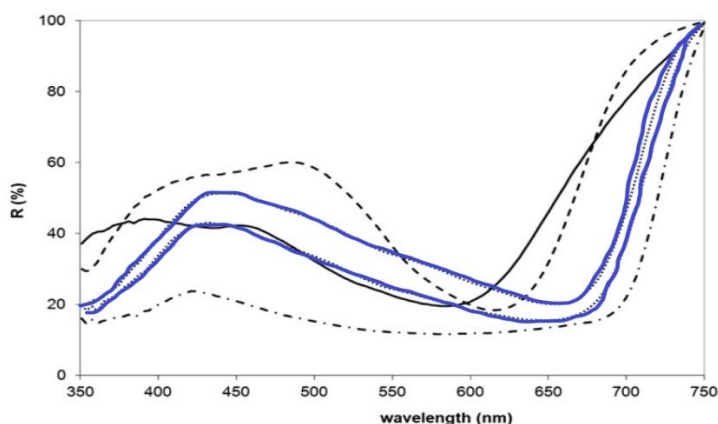


Figure 9 FORS spectra of blue dyes. Courtesy of Gulmini et al from *Identification of dyestuffs in historical textiles: Strong and weak points of a non-invasive approach*.

## 8. TREATMENT AND HOUSING

### 8.1 THE USE OF ADHESIVE IN TEXTILE CONSERVATION TREATMENTS

The use of adhesives in textile conservation started in the 1950s (Hillyer, Tinker, and Singer 1997). Thermoplastics such as polyethylene glycol, polyvinyl alcohol (PVOH) and polyvinyl butyral (PVB) along with other materials such as paraffin and nitrocellulose were used in adhesive treatments with fragile textiles that were not suitable for a stitching treatment (Tímár-Balázs and Eastop 2011). However, these materials eventually degraded causing additional condition issues. For example, polyethylene glycol caused the colors of the textile to darken. PVOH and PVB stiffened over time making the adhesive brittle and susceptible to cracking which led to damage to the supported textile from the sharp edges of these cracks (305). Due to the unstable properties of these early adhesives, textiles conservators have discussed at length the advantages and disadvantages of adhesive treatments for fragile textiles.

In the past 60 years, through collaborations with other specialties and the advances in the stability of materials used in adhesive treatment have made the method more approachable (Hillyer, Tinker, and Singer 1997). However, criteria were created to selective choose the correct adhesive needed for specific treatment. The different criteria were reversibility, flexibility over time, ageing properties, status of chemical components over time, visual stability, ease of application and handling, and its heat-sealing temperature (Tímár-Balázs and Eastop 2011). In addition to these considerations, the method of application needed consideration. The most common method had been to cast the adhesive on a support fabric, commonly Stabiltex or silk crepeline, and apply the set adhesive patch to the damaged area via heat, pressure, or solvent (305-6).

### 8.2 TREATMENT OF GARMENT

The garment was surface cleaned with a HEPA filter vacuum on low suction to remove accumulated dirt and dust from the fabric surfaces of the garment. Silk crepeline was cast onto silicon release mylar and a mixture of 3:1 Lascaux 498 and Lascaux 303 was used for the adhesive treatment. Patches in varying sizes to fit the areas of damage were cut from the casted out crepeline. The patch was wrapped around a spatula end covered in silicon released mylar. The adhesive patch was placed by inserting the spatula end between the main fabric and the lining in areas where the woven yarns of the main fabric have split. The spatula was removed leaving the adhesive patch with the adhesive side facing up. Insect pins were inserted to keep the patch in place while the horizontal yarns are realigned. Once the yarns were aligned, the adhesive was heat set with a heated spatula with a silicone mylar barrier layer to keep the heat from direct contact with the object. Once the adhesive patch was sealed and the horizontal yarns were supported by the inserted patch, Skala thread was used to secure the lifting ends of the yarns in a running stitch. The stitches were spaced to be similar to the weave pattern of the main fabric to seamlessly blend with the weave pattern of the fabric.



*Figure 10* The silk crepeline adhesive patch is inserted in between the exterior fabric and the lining to secure the lifting threads

The stitching treatment were used in areas where yarns were lifting on the edge of the garment but have not completed separated from the lining to require an adhesive support patch.

The splitting in the fabric of the ties at the sides and the center of the garment were addressed using silk crepe-line to encapsulate the fragile fabric. For the ties at the center, a template was made using mylar to match the shape of the ties. The template was used to cut the shape of the ties out of silk crepe-line. The cut-out shape was stitched on a sewing machine with Skala thread. In order to retain the shape of the silk crepe-line when using the sewing machine, the silk crepe-line was stitched to a piece of tissue paper to ease the tension during sewing. The tissue paper was removed from the silk crepe-line tubes, and the tubes was turned inside out and pulled onto the ties to encapsulate the fragile fabric. A running stitch was used to secure the silk crepe-line tubes to the ties using Skala thread.

The stitching acts as further support for the fragile areas on the ties as well as preventing the silk crepe-line encapsulation from being removed during handling. For the ties at the sides, stitches from previous intervention were clipped and removed. Silk crepe-line was used to encapsulate the ties. The fabric was stitched to the ties using Skala thread to support the fragile areas on the ties and to secure the silk crepe-line to the ties.

There was an area by the right shoulder of the garment where the losses of couching stitches have caused the metal wrapped thread to lift from the main fabric. Since this area will be handled often, Skala thread was used to couch down the lifting area to prevent further damage to the metal wrapped thread.

### 8.3 RECOMMENDED PREVENTIVE MEASURES

The garment is stored in a customized enclosed box with padding to support the fold in the garment. The garment is stored folded due to limited storage space at the Buffalo Museum of Science. The garment should always be housed with its padded shoulder support and the pillow to support the fold. If the garment can be stored flat in the future, only the padded shoulder support is needed.



*Figure 11* The adhesive patch is activated to tack down the lifting yarns



*Figure 12* The damaged ties are encapsulated by stitching a silk crepe-line tube to the ties

The adhesive patches will likely lead to a change in the appearance of the garment's surfaces as well as attract pests if exposed to dust and dirt. Therefore, it is recommended that the garment remains stored in its enclosed box. If the garment is to be displayed in the future, it should be mounted with a shoulder support and in a enclosed case as opposed to open display. This will reduce the collection of dust during exhibition, limit the need to vacuum the garment after exhibition, and prevent the garment from being handled by visitors while on display.

## 9. CONCLUSION

The background research conducted provided additional information on the garment that was not associated with it before. The garment was identified as a *xia-pei* intended for a female member associated with a second-class civil court official from the Qing Dynasty. Based on the design composition of the garment, it is posited that this garment was made after 1759. However, based on the misplaced insignia that was meant for a male garment, it can be suggested that this garment's original intent was changed at some point and different components were pieced together to appeal to the foreign market where it was eventually bought and brought to the collection at the Buffalo Museum of Science.

The adhesive treatment conducted on the damaged areas on the exterior fabric provided support to the fragile exterior fabric. The adhesive side of the support patch faces upwards and is acknowledged that this can cause dust accumulation on the garment. Therefore, it is suggested that the garment is housed in an enclosed box and when it is displayed, it should be in an enclosed case to reduce the chances of dirt and dust accumulation.

## 10. ACKNOWLEDGEMENTS

The research and treatment conducted for this garment would not be possible without the help and support of the staff and faculty at the Patricia H. and Richard E. Garman Art Conservation Department at SUNY Buffalo State University. A special thank you to Professor Jiuan Jiuan Chen for assisting in imaging and interpretation of the images captured. Thank you to Dr. Aaron Shugar for his help in the scientific analyses and interpretation of the data. The author wants to express her gratitude to Deborah Trupin, for sharing her expertise and advice on the treatment of this garment. Thank you to Professor Emily Hamilton for facilitating the project. Kathy Leacock, Buffalo Museum of Science's deputy director, for sharing the museum's resources for research.

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## 12. AUTOBIOGRAPHICAL STATEMENT

Nhat Quyen Nguyen is part of the SUNY Buffalo State Garman Art Conservation Program where she is focusing on the conservation of textiles. Nhat Quyen earned a Bachelor of Science in Art History at Portland State University in 2018. That summer she interned with a private painting conservator in Portland, OR and attended the UCLA/Andrew W. Mellon Opportunity for Diversity in Conservation workshop. Following these experiences, she interned at various textile labs in her pre-program at the George Washington University Textile Museum and Colonial Williamsburg. She spent a summer in the textile lab at the Cleveland Museum of Art as a graduate textile intern. During her time in the program, she treated a variety of artistic materials including but not limited to an Objive beaded bag, a civil war silk flag and the subject of this thesis, a sleeveless garment from the Buffalo Science Museum. Nhat Quyen will be spending her third year at the Philadelphia Museum of Art working in the textile lab before graduating with a M.A and M.S in Art Conservation in 2024.

## 13. LIST OF ILLUSTRATIONS

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## 14. MATERIALS AND SUPPLIES

Crepeline (silk).

Talas. 230 Morgan Avenue. Brooklyn, NY 11211.

Lascaux 498 HV and 303 HV (dispersion of methyl methacrylate and butyl acrylate thickened with acrylic butylester).

Talas. 230 Morgan Avenue. Brooklyn, NY 11211.

Guterman Skala Sewing Thread (100% polyester).

Testfabrics, Inc. 415 Delaware Ave, West Pittston PA 18643 USA



## 15. APPENDICES

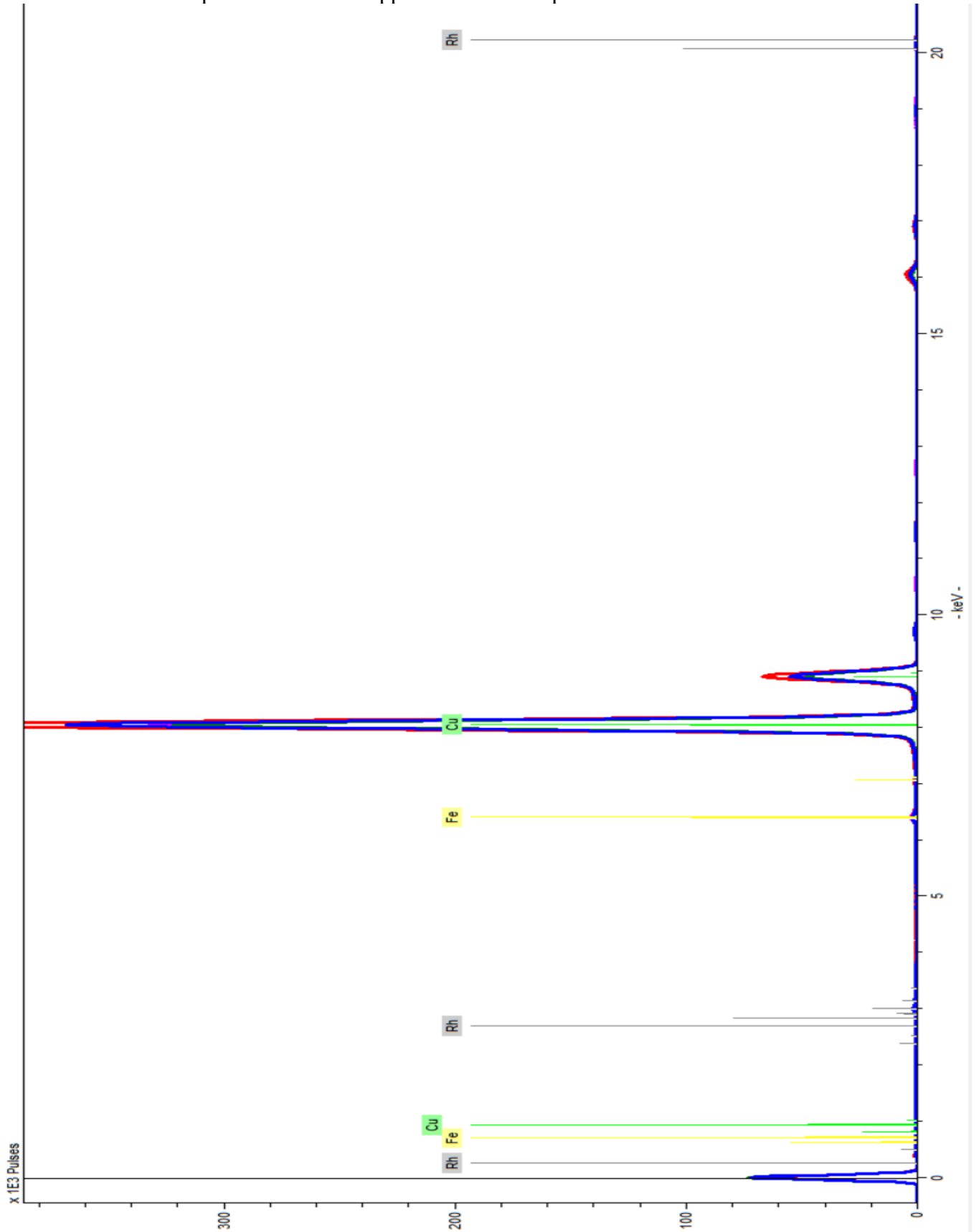
APPENDIX A: List of the imperial, civil, and military ranking classes (Vollmer, 183, 22-23)

<b>Ranking Class</b>	<b>Insignia Imagery</b>	<b>Color of “mandarin” coat</b>
1 <sup>st</sup> degree prince	Four medallions; two front facing and two profile facing 5-clawed dragons	brown
2 <sup>nd</sup> degree prince	Four medallions, four profile facing 5-clawed dragons	brown
3 <sup>rd</sup> degree noble	Two medallions; front facing 4-clawed dragons at chest and back	blue
4 <sup>th</sup> degree prince	Two medallions; profile facing 4-clawed dragons	blue
5 <sup>th</sup> degree noble (duke)	Two squares; front facing 4-clawed dragon at front and back	blue
6 <sup>th</sup> degree noble (marquis)	Two squares; front facing 4-clawed dragon at front and back	blue
7 <sup>th</sup> degree noble (earl)	Two squares; front facing 4-clawed dragon at front and back	blue
8 <sup>th</sup> degree noble (sons-in-law of 1 <sup>st</sup> degree princes)	Two squares; front facing 4-clawed dragon at front and back	blue
9 <sup>th</sup> degree noble	Two squares: ch’i-lin	blue
10 <sup>th</sup> degree noble	Two squares: lion	blue
11 <sup>th</sup> degree noble	Two squares: leopard	blue
12 <sup>th</sup> degree noble	Two squares: tiger	blue (blue)
1 <sup>st</sup> degree official	Two squares: Manchurian crane for civil, Ch’ilin for military	black (blue)
2 <sup>nd</sup> degree official	Two squares: golden pheasant for civil, lion for military	black (blue)
3 <sup>rd</sup> degree official	Two squares: Malay peacock for civil, leopard for military	black (blue)
4 <sup>th</sup> degree official	Two squares: goose for civil, tiger for military	black (blue)
5 <sup>th</sup> degree official	Two squares: silver pheasant for civil, bear for military	black (blue)
6 <sup>th</sup> degree official	Two squares: egret for civil, panther for military	black (blue)
7 <sup>th</sup> degree official	Two squares: Mandarin duck for civil, rhinoceros for	black (blue)

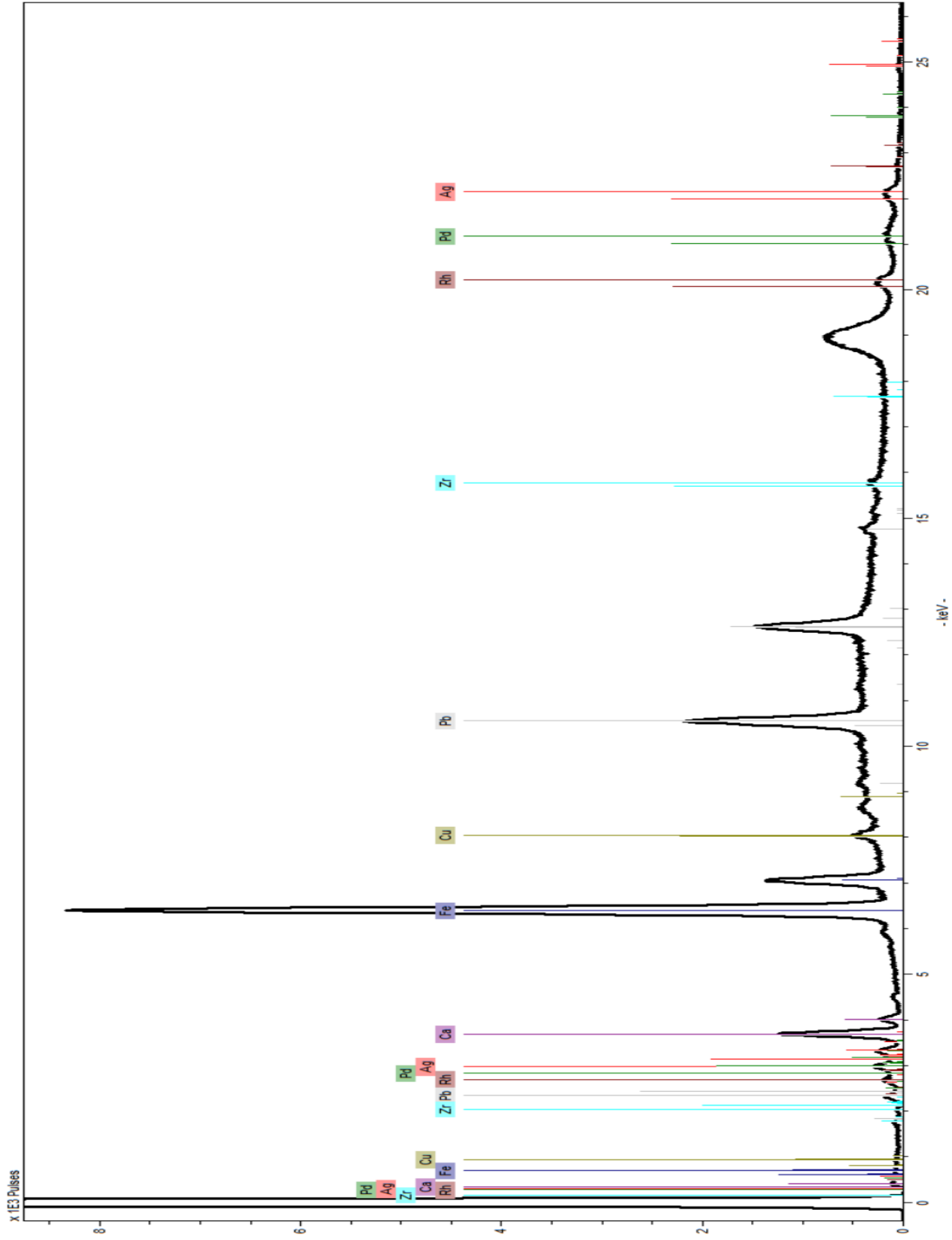
---

military		
8 <sup>th</sup> degree official	Two squares: quail for civil, rhinoceros for military	black (blue)
9 <sup>th</sup> degree official	Two squares: paradise flycatcher for civil, sea horse or possibly seal for military	black (blue)

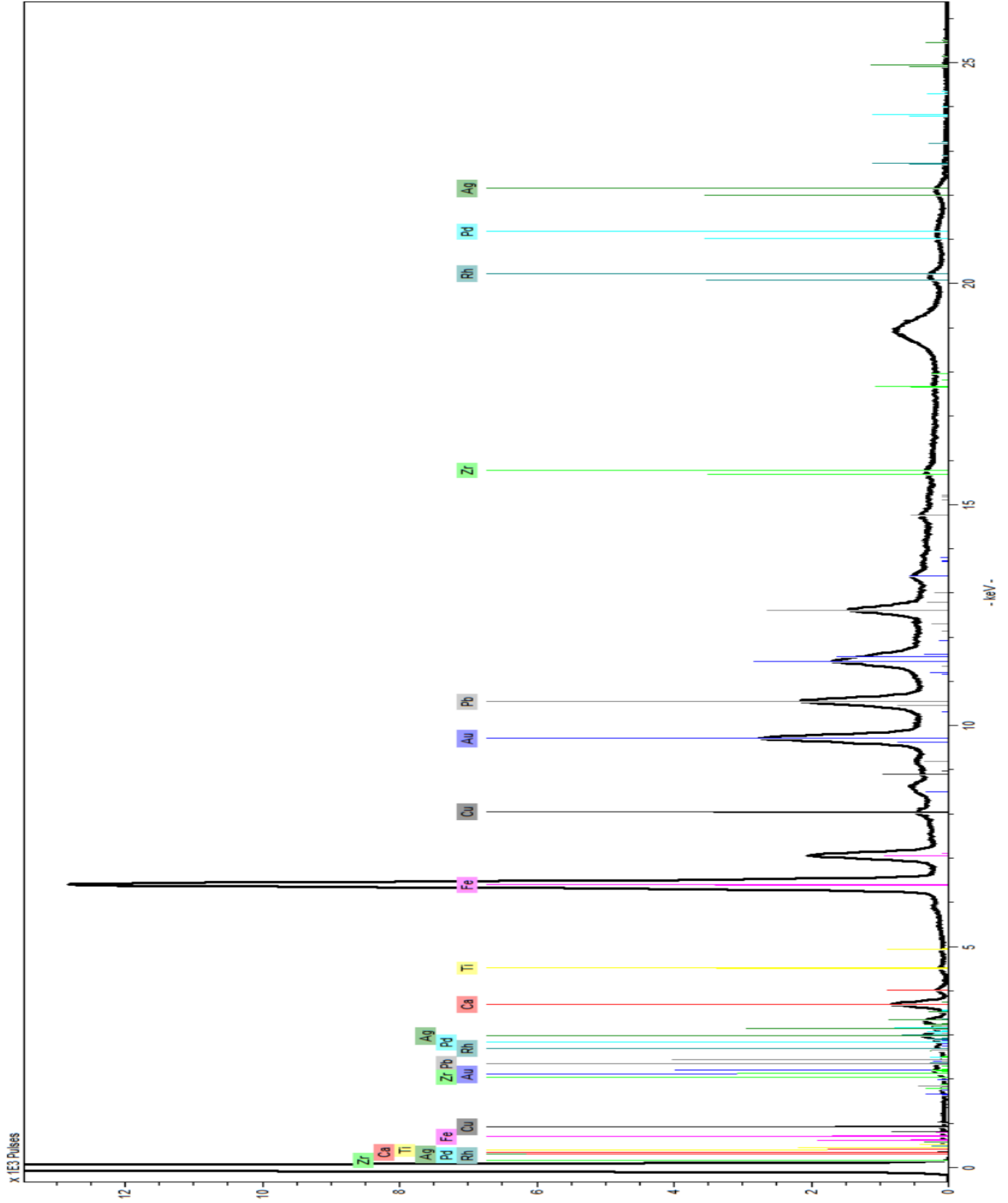
APPENDIX B: XRF spectra of metal wrapped threads from pheasant



APPENDIX C: XRF spectra of metal wrapped threads from border of clouds on insignia



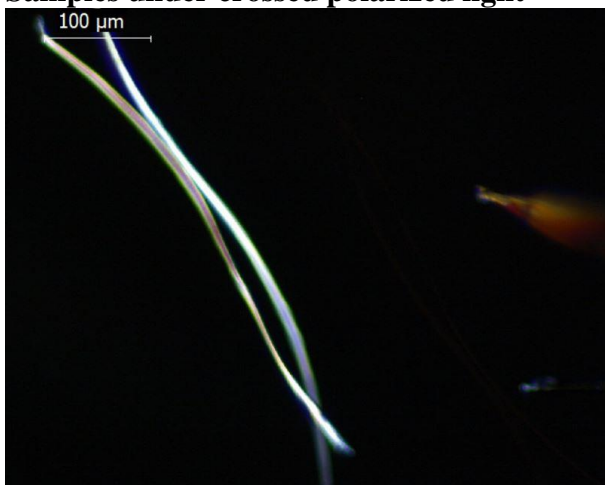
APPENDIX D: XRF spectra from metal wrapped threads on crane



## APPENDIX E: Photomicrographs of fibers from garment

**Samples under polarized light**

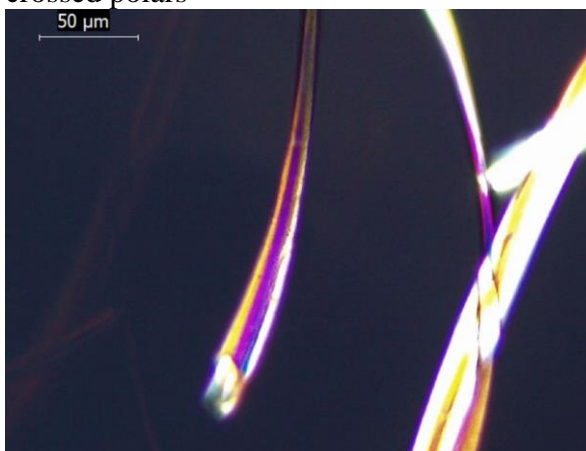
Blue lining at 200x magnification

**Samples under crossed polarized light**

Blue lining at 200x magnification under crossed polars



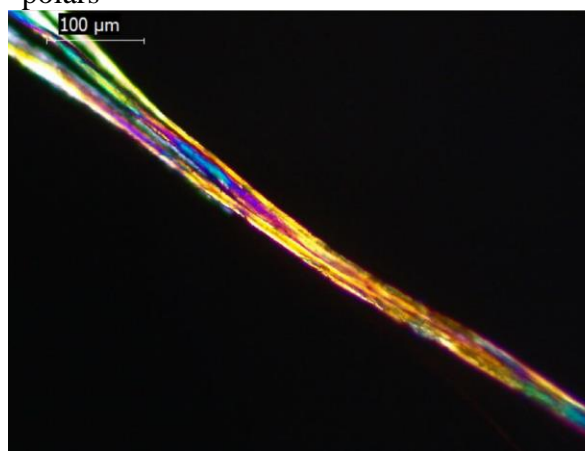
Fringe at 400x magnification



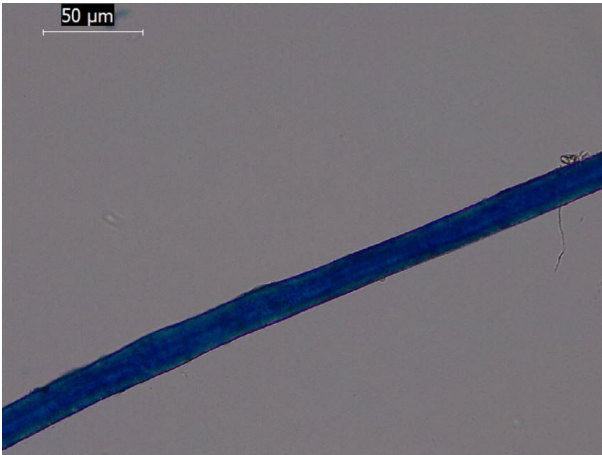
Fringe at 400x magnification under crossed polars



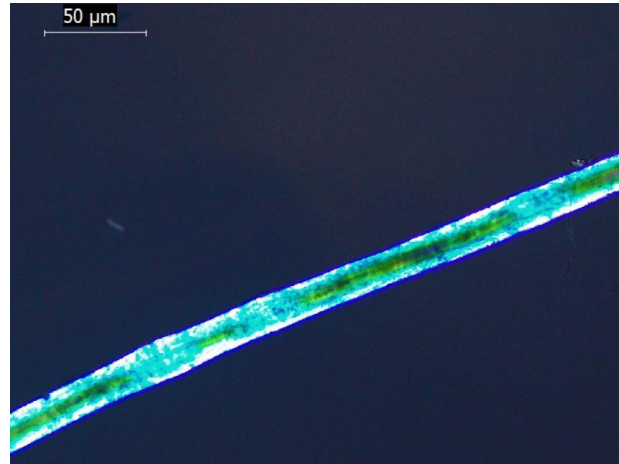
Horizontal thread from main fabric at 200x magnification



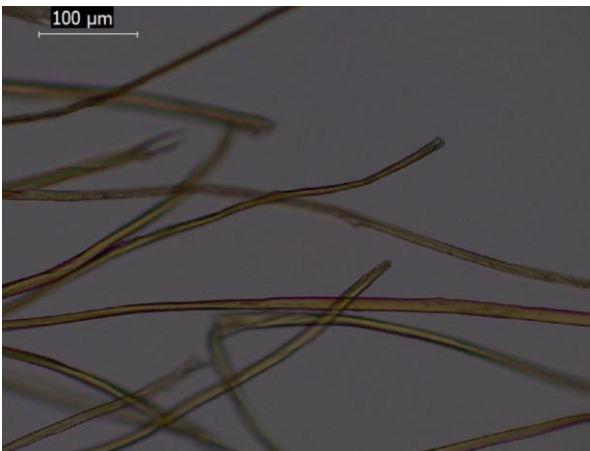
Horizontal thread from main fabric at 200x magnification under crossed polars



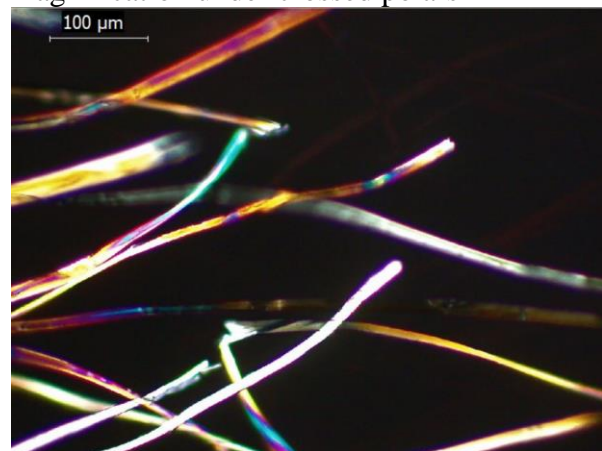
Vertical thread from main fabric at 400x magnification



Vertical thread from main fabric at 400x magnification under crossed polars



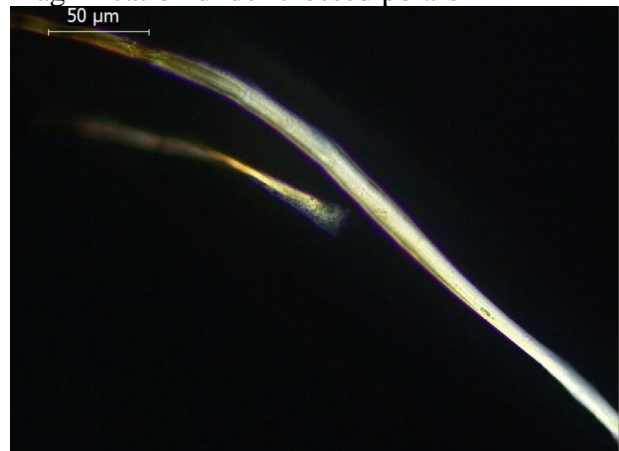
Dark orange embroidery thread at 200x magnification



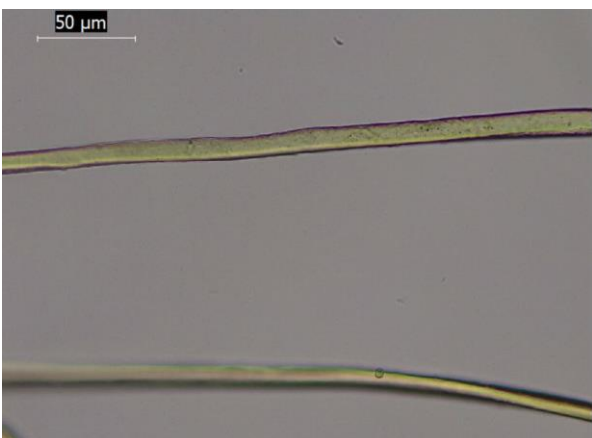
Dark orange embroidery thread at 200x magnification under crossed polars



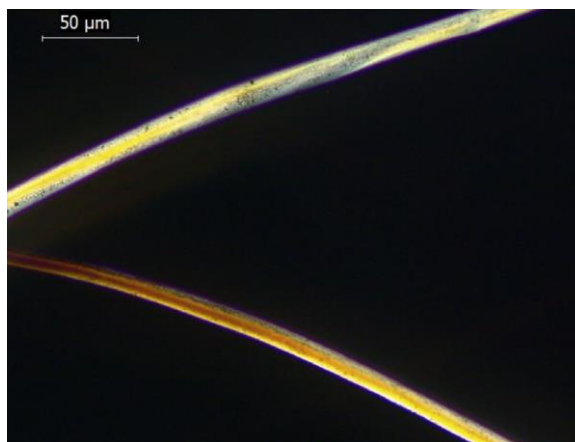
Olive green embroidery thread at 400x magnification



Olive green embroidery thread at 400x magnification



Yellow embroidery thread at 400x magnification



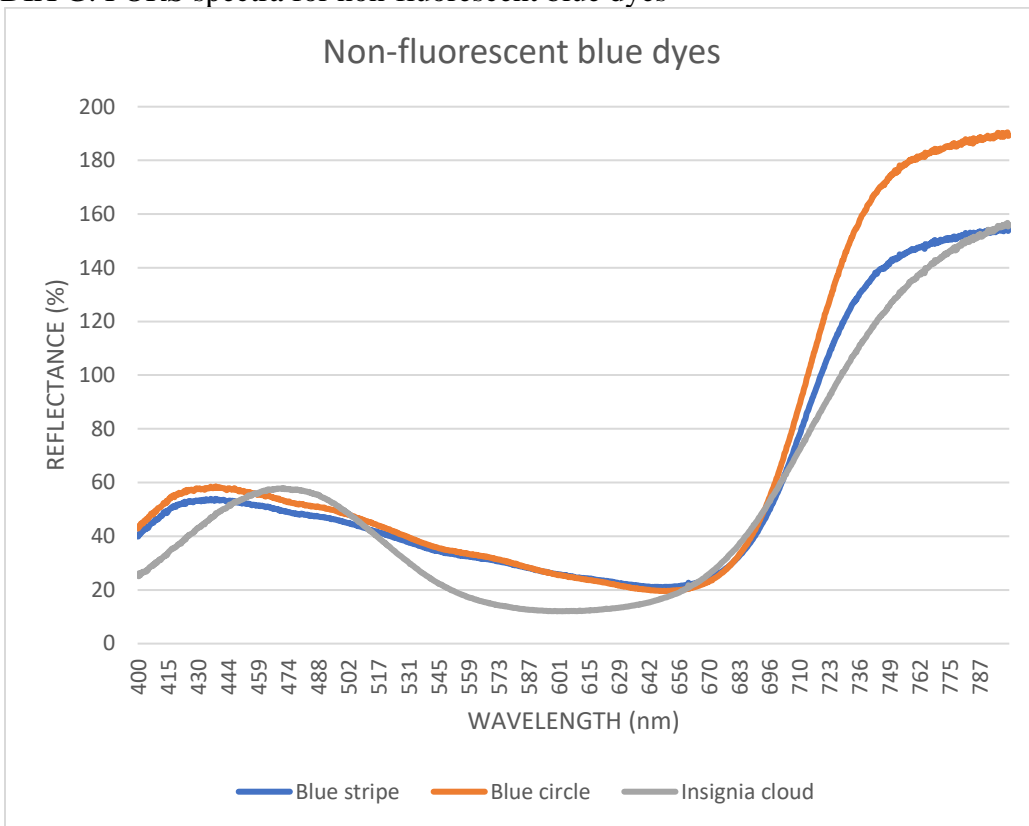
Yellow embroidery thread at 400x magnification under crossed polars

APPENDIX F: Normal illumination (left) and UVA-induced visible fluorescence (right) images of garment

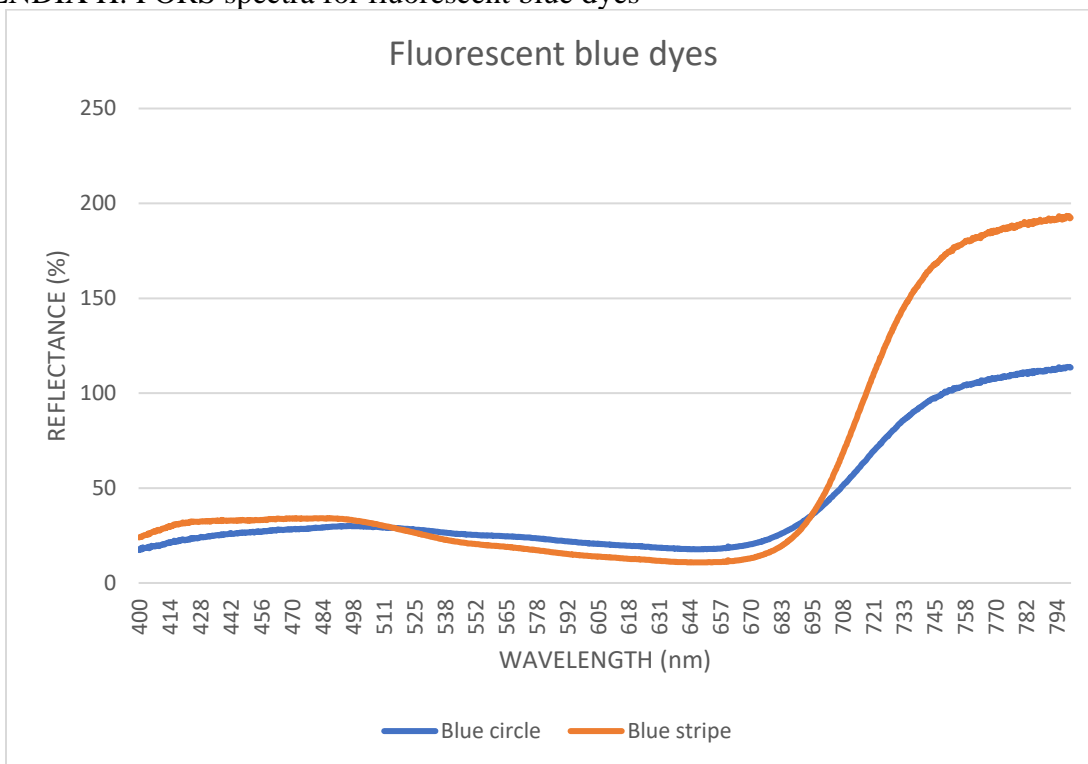




APPENDIX G: FORS spectra for non-fluorescent blue dyes



APPENDIX H: FORS spectra for fluorescent blue dyes





**OBJECTS EXAMINATION REPORT**

**CNS 228033**

PAGE 1 OF 8

**OWNER/AGENT**

Buffalo Museum of Science

OWNER'S ID NR.  
DATE RECEIVED

**EXAMINER**

FACULTY SUPERVISOR(S)  
DATE OF REPORT

Emily Hamilton  
December 12<sup>th</sup>, 2022



**ARTIST/MAKER (Owner Attribution)**

SIGNATURE and its LOCATION  
TITLE (“”) or DESCRIPTION  
DATE  
DIMENSIONS (H x W x D)

N/A  
Sleeveless tunic

Overall  
L: 41 1/2” (105.5 cm) with fringe  
L: 36 3/4” (92.5 cm) without fringe  
W: 17” (43 cm) at shoulder, 24 5/8” (61.2 cm) at the bottom hem  
Fringe:  
L: 6 7/16” (17 cm) including netting  
Embroidered square:  
L: 11 3/16” (28.5 cm)  
W: 11 1/2” (30.2 cm)  
N/A

**ACCESSORIES**

**LABELS/DISTINGUISHING MARKS**

An accessions tag from the museum is stitched to the interior lining on the left side of the collar. The tag reads: C16995

**1. OBJECT DESCRIPTION**

● **PHYSICAL DESCRIPTION**

This is a sleeveless tunic with fringed ends. There are two knotted buttons: one at the collar and one below the embroidered square. There are three ties throughout the garment: two at the side next to the embroidered dragons, and one at the center below the knotted button.

The ground fabric of the tunic is embroidered symmetrically with various designs in thread and metal wrapped threads. The designs include orange peonies, clouds, peacocks, pheasants/phoenix, cranes, orange bats, linear lines forming a chevron, semi circles, and two 5 clawed dragons chasing a flaming orb.

There is a separate square embroidered fabric that is attached to the tunic on the front and back underneath the collar. The square embroidered fabric is stitched to the front in two separate pieces and as a whole piece on the back of the tunic. The designs are the same on both sides and it depicts a golden phoenix facing the sun.

The phoenix is flying above semicircle shapes, clouds, and diagonal linear lines. There are depictions of clouds and stylized versions of the 8 Buddhist symbols usually found on Chinese imperial clothing in the background of the golden phoenix.

- **FABRICATION**

Overall

The tunic is made of three different fabrics. The main fabric black plain weave fabric with two distinctly different yarns. The horizontal yarns are a dark olive-green color, and the vertical yarns are thinner and black in color. This fabric is cut in three pieces, two rectangular pieces with chevron ends for the front and one singular rectangular piece for the back. The tunic is lined overall with a sky-blue plain weave fabric. The lining for the front is cut to the same shape as the front pieces for the main black fabric. However, the lining for the back is made up of three pieces: a narrow rectangular at the center and two triangular pieces stitched to either side of the rectangle to accommodate the increasing width of the tunic. The lining is attached to the main black fabric with stitched along the side. It is likely that the tunic was handstitched from the irregular width of the stitches observed on either side of the garment.

The tunic has trims at the bottom hem made of a brocade fabric that is woven with flat strips of metal. The trims for the front are cut into two strips. The strips are joined at the center and stitched to the chevron ends of the front panels of black main fabric. The back main fabric has a continuous strip of the same fabric along its bottom hem. The same fabric is used for the binding at the collar and the knot buttons. The square insignia with the golden phoenix design is made of a black fabric with satin weave and lined with the same blue lining as the main tunic. The square insignia is stitched to the center of the garment in red thread.

Fringe

The tassel fringe and netting are attached to a beige color thread and this thread is whip stitched onto the lining of the garment to attach the fringe to the tunic. The net has a diamond pattern and a tassel in different colors of red, silver, peach, blue, green, and yellow is attached to the net at alternating rows. The tassel is made of one metal knot and another knot of the same pattern but in blue thread is below it. The tassel is built around a core of a beige colored sphere made of an unknown material. The tassel is created by braiding several strands of the thread around the sphere.

Embroidered design

Most of the embroidered designs are made of satin stitches to create a smooth area of colors. The bodies of the crane, phoenix, and peacock on either side of the torso of the tunic is made of knotted stitches. The metallic embroidered designs throughout the tunic are created by couching down the metal strips with either matching or contrasting thread.

- **CULTURAL CONTEXT**



The garment is called a *xia-bei* and is meant to be worn underneath a *pufu* which is a three-quarter length over coat (Till, 29). This is a non-official attire only to be worn by women associated with a male ranking official, either the woman's husband or father (Vollmer 1983). The insignia badges, called a *buzi*, that is displayed on the front and back of the garment is an indication of the rank of the woman's male counterpart (*ibid*). The square shaped insignia is reserved for lower ranking aristocrats because the shape is associated with earth where the members with this badge are manifesting imperial rule on earth. Members of the imperial family will have circular *buzi* because the shape is associate with heaven and their direct relation to heavenly orders (Vollmer 2002).





Decorated clothing is charged with meaning for imperial China. This idea appeals to the Confucian ideals of state where apparel and furnishing show display of the owner's virtuous conduct. Garments identify the wearer, and it is crucial to the success of specific political and familial events. This idea is further reinforced in the Qing Dynasty were edits and regulations towards clothing of court officials were issued to link the image of the emperor to Confucian ideals of inner integrity, righteousness, conscientiousness towards others (Vollmer 2002). This regulated the imagery used on official court clothing and the standardized symbols, motifs, and colors to be associated with ranks within the Imperial court. There are several repeating motifs






that are used in clothing for auspicious reasons (Till 2012) that could be seen on the garment from the Science Museum. Their description and meaning are defined in table 1.


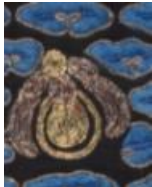


The embroidered motifs on the *buzi* clues as to who this was intended for. The golden bird at the center of the *buzi* is an indication of rank in the 9 classes of civil official. Out of the 9 classes, the only mention of a golden bird is that of the golden pheasant for the 2<sup>nd</sup> degree civil court official (Vollmer 2007). There are two things that stand out about the golden pheasant on the *buzi* that could give this garment more context. The first is that that bird is attached to the *buzi* as opposed to being embroidered directly on it. This practice was carried out later in the Qing dynasty when court officials could bribe their way up the ranking classes and therefore need to be able to change out the identifiers of their rank quickly (Till 2012). Second, the position of the bird could also be an indicator of who the garment is intended for. If the bird is facing the wearer's left, the garment is intended for men, but if the bird is facing the wearer's right, the garment is intended for women (Till 2012). However, the golden pheasant on this garment from the Science Museum is facing left, but it is attached to a garment intended for women. This anomaly gives a possible explanation for the origin of this garment. After the collapse of the Qing dynasty, the last of the imperial rule over China, imperial clothing houses felt that they needed to sell off the remaining of their stock to make up for the deficit in losing the business of the imperial court. Therefore, garments intended for court officials and imperial family members were sold to those outside of the imperial circle. This meant that tourists and auction houses were receiving imperial garments (Till 2012). The addition of the *buzi* to this garment might have helped it be more appealing to buy and therefore the direction of the golden pheasant was no longer associated with the ranking of the wearer or their gender.



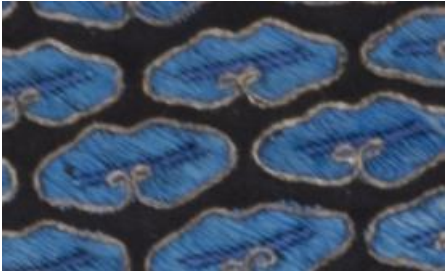

Table 1: Defining the embroidered designs

Symbols	Meaning
<p data-bbox="354 1041 686 1075">Dragon with flaming pearl</p> 	<p data-bbox="862 1041 1393 1108">Dragon representing high rank and power (Bartholomew, 43)</p>
<p data-bbox="282 1413 758 1446">5 clawed dragons chasing flaming orb</p> 	<p data-bbox="862 1413 1390 1480">Imagery for Chinese imperial coat of arms (Williams, 151)</p>
<p data-bbox="480 1848 561 1881">Peony</p>	<p data-bbox="862 1814 1393 1911">Emblem of affection, symbol of femininity, represents the spring, wealth and honor (Bartholomew, 123)</p>

	
<p>Peacock</p> 	<p>Beauty and dignity (Williams, 307)</p>
<p>Crane</p> 	<p>Longevity (Bartholomew, 107)</p>
<p>Bat</p> 	<p>Good luck, longevity, happiness, (from word fu, meaning bat but also good luck) (Williams, 61)</p>
<p>Waves and rocks</p>	<p>Unification of the kingdom, land under one rule (Bartholomew, 253)</p>

	
<p>Dharma wheel</p> 	<p>"crushing effect" of Buddha's teaching over superstition and delusions, sovereign rule and authority (Williams, 399)</p>
<p>Endless (Mystic) knot</p> 	<p>One of the eight Buddhist symbols, longevity (Williams, 284)</p>
<p>Jar</p> 	<p>One of the eight Buddhist auspicious symbols (Williams, 240)</p>
<p>Umbrella</p> 	<p>One of the eight Buddhist auspicious symbols (Williams, 390)</p>
<p>Canopy</p>	<p>One of the eight Buddhist auspicious symbols (Williams, 77)</p>

			
	<p>Shell</p> 		<p>One of the eight Buddhist auspicious symbols, royalty (Williams, 104)</p>
	<p>Fish</p> 		<p>One of the eight Buddhist auspicious symbols, "freedom from all restraints" (Williams, 193)</p>
	<p>Lotus</p> 		<p>One of the eight Buddhist auspicious symbols (Williams, 255)</p>
<p>Golden pheasant facing the sun</p>	<p>2<sup>nd</sup> ranking civil court official</p>		

	
<p>Combination of peacock, crane, pheasant</p> 	<p>Blessing to rise through the three ranks in imperial civil court (Bartholomew, 122)</p>
<p>Clouds</p> 	<p>Fortune, high rank (Bartholomew, 105)</p>
<p>Circular <i>shou</i> character</p> 	<p>Blessing of longevity (Bartholomew, 222)</p>

**2. CONDITION**

Overall

The garment is in good condition. The embroidered design and the metal threads are stable and remain attached to the main fabric.

Fabric components

- The main fabric itself is failing at the shoulders and at the sides around the center of the tunic. This is due to the weakening of the yarns in the fabric substrate causing separation of the yarns from the woven pattern. As a result, the horizontal and vertical yarns are splitting and breaking causing losses in the main fabric. The lining of the tunic is stable, there are some discolorations from stains, but they are not visually distracting. A prominent gray stain is visible on the opening of the left side of the lining.



- The ties at the center and sides of the tunic have the same condition as the main fabric substrate. This is causing splitting in the fabric and the broken yarns are fraying at the edges of the ties at the center. On either side of the tunic are two ties knotted together to form a bow. These ties have the same condition as that of the main fabric and are also splitting in its weave structure. Due to the splitting, the ties have broken off from their original location, but was reattached to the lining of the tunic. However, the ties were not returned to their original location during this repair campaign. This has caused tensioning issues in the fabric around the ties.

#### Decorative components

- The embroidery on the tunic is structurally in good condition. In areas where the main fabric substrate is splitting at the shoulders, the embroidery remains intact and not splitting or breaking off from the tunic. However, in areas of splitting in the main fabric along the sides of the tunic, the embroidered decorations are lifting from their attachment points of the main fabric. This is evident from the front of the tunic in the blue flower at the left side above the ties, and the dragon on the right side.
- The insignia badge on both sides is in good condition. All threads remain attached to the fabric substrate. However, on the front of the insignia badge's right side, the copper-colored thread at the bottom edge of the chevron design is lifting off from the couched area but is not visually distracting or at risk of being snagged during handling.
- The fringe and netting is in good condition. The netting remains attached to the bottom hem of the tunic. Some fringes have broken off threads. It is unsure what caused the threads to break off from the fringe, but careful handling is considered for the fringes.

### **3. HEALTH AND SAFETY**

In order to keep the metals from corroding, it is recommended that gloves should be worn when handling areas with metal wrapped thread decoration.

### **4. REFERENCES AND SOURCES**

- Batholomew, Terese Tse. 2006. *Hidden Meanings in Chinese Art*. San Francisco: Asian Art Museum.
- Till, Barry. 2012. *Silk Splendour: textiles of late Imperial China, 1644-1911*. Victoria: Art Gallery of Greater Victoria.
- Vollmer, John E. 1983. *Decoding dragons: status garments in Ch'ing Dynasty China*. Eugene: University of Oregon.
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- Vollmer, John E. 2007. *Dressed to Rule: 18th Century Court Attire in the Mactaggart Art Collection*. Edmonton: University of Alberta Press.
- Williams, C.A.S. (1974). *Chinese Symbolism and Art Motifs: A comprehensive handbook on Symbolism in Chinese Art through the ages*. North Clarendon: Tuttle Publishing Co.



**OBJECTS TREATMENT PROPOSAL**

**CNS 228033**

PAGE 1 OF 1

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<b>OWNER/AGENT</b>	Buffalo Museum of Science
OWNER'S ID NR.	
DATE RECEIVED	
<b>EXAMINER</b>	Nhat Quyen Nguyen
FACULTY SUPERVISOR(S)	Emily Hamilton
DATE OF REPORT	December 12 <sup>th</sup> , 2022

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<b>ARTIST/MAKER (Owner Attribution)</b>	Possibly Qing Dynasty, China
TITLE ("") or DESCRIPTION	Sleeveless tunic
DATE	Possibly late 18 <sup>th</sup> century-20 <sup>th</sup> century

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- 1) Perform written and photographic documentation before treatment.
- 2) Dry surface clean exterior and interior of tunic using HEPA filter vacuum.
- 3) Reinforce the areas where the main fabric is splitting with a similar color support fabric and adhesive treatment.
- 4) Reincorporate the lifting embroidery threads and splitting yarns in the main fabric to prevent them from further damage during handling.
- 5) Discuss housing options with curator to build interior supports and storage to properly house the garment after treatment.

***FACTORS INFLUENCING TREATMENT***

The treatment of applying a supporting fabric to the areas of splitting in the main fabric depends on accessibility of the treatment location. The supporting fabric will have to be inserted underneath the areas of splitting to properly support the main fabric, but if manipulation of the damaged area is a risk to the overall structure of the garment, this treatment step will be reconsidered. Once the supportive fabric is in position, the adhesive will be reactivated with heat. Mockups will be created to test out different adhesives to see what will best fit the treatment for the garment.

***ANTICIPATED RESULTS OF TREATMENT***

It is anticipated that the treatment will reinforce weak areas of splitting in the main fabric and reincorporate loose embroidery threads to prevent future damage to the garment.



## OBJECTS TREATMENT REPORT

CNS 228033

PAGE 1 OF 2

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### **OWNER/AGENT**

Buffalo Museum of Science

OWNER'S ID NR.

DATE RECEIVED

### **EXAMINER**

Nhat Quyen Nguyen

FACULTY SUPERVISOR(S)

Emily Hamilton, Deborah Trupin

DATE OF REPORT

May 4<sup>th</sup>, 2023

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### **ARTIST/MAKER (Owner Attribution)**

SIGNATURE and its LOCATION

TITLE (“”) or DESCRIPTION

Sleeveless tunic

DATE

Late 19<sup>th</sup> century

DIMENSIONS (H x W x D)

Overall

L: 41 ½” (105.5 cm) with fringe

L: 36 ¾” (92.5 cm) without fringe

W: 17” (43 cm) at shoulder, 24 5/8” (61.2 cm) at the bottom hem

Fringe:

L: 6 7/16” (17 cm) including netting

Embroidered square:

L: 11 3/16” (28.5 cm)

W: 11 ½” (30.2 cm)

LABELS/DISTINGUISHING MARKS

An accessions tag from the museum is stitched to the interior lining on the left side of the collar. The tag reads: C16995

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## **I. OBSERVATIONS DURING TREATMENT**

When the object was vacuumed, evidence of pest activity was found. There were several carpet beetle shells and a wing of a clothes moth embedded into the main fabric and the ties. After these were removed, there were no other signs of pests indicating that the pest activity is no longer active.

## **II. TREATMENT PERFORMED**

1. Conducted written and photographic documentation before, during, and after treatment.
2. Performed dry surface cleaning of the exterior and interior of the tunic using HEPA filter vacuum.
3. Reinforced areas of abrasion and broken yarns on the main fabric using silk crepeline<sup>1</sup> casted out with heat activated Lascaux solution of 3:1 Lascaux 498<sup>2</sup> and Lascaux 303<sup>3</sup>.

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<sup>1</sup> Crepeline (silk). Talas. 230 Morgan Avenue. Brooklyn, NY 11211.

<sup>2</sup> Lascaux 498 HV (dispersion of methyl methacrylate and butyl acrylate thickened with acrylic butylester). Talas. 230 Morgan Avenue. Brooklyn, NY 11211.

<sup>3</sup> Lascaux 303 HV (dispersion of methyl methacrylate and butyl acrylate thickened with acrylic butylester). Talas. 230 Morgan Avenue. Brooklyn, NY 11211.

4. Realigned and secured lifting yarns in the damaged areas of the main fabric with a running stitch using polyester Skala<sup>4</sup> thread to attach the lifting yarns to the silk crepeline support patches adhered in the area.
5. Reversed past intervention conducted on the side ties that were distorting the overall structure of the object. The stitches attaching the ties in the wrong location were clipped and removed. The ties were untied and separated from each other to return them to their original location.
6. Encapsulated the ties at the side and the center with silk crepeline of a similar color to the object to protect the ties from risk of damage.
7. Compensated for losses in the couch stitches of the metal thread design by the right shoulder (from object's side) by using Skala thread to couch down the lifting metal thread embroidery.
8. Created an enclosed box housing for the garment from single wall corrugated blue board.<sup>5</sup> Polyester batting filled Tyvek<sup>6</sup> pillows were created to support the shoulders and central fold in the garment. Acid free tissue was used to line the box and cover the garment.

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<sup>4</sup> Guterman Skala Sewing Thread (100% polyester). Testfabrics, Inc. 415 Delaware Ave, West Pittston PA 18643 USA.

<sup>5</sup> Blueboard: an acid-free corrugated cardboard (paper board that is folded/shaped with parallel alternative ridges and grooves); University Products, 517 Main St., P.O. Box 101, Holyoke, MA 01041.

<sup>6</sup> Tyvek® Styles 1059B and 1073B: Du Pont; 71 Southgate Boulevard, New Castle, DE 19720; 1-800-448-9835.