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*Contextualizing the Nontangible:*  
**The Research and Treatment of a Collection of African Medicine**

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**Abstract**

*This paper discusses the research, assessment and stabilization of a collection of African medicine from the Buffalo Museum of Science. As examples of traditional African medicine with nontangible healing and protective properties, the objects represent the diverse medicinal practices of several African cultures and reflect early 20<sup>th</sup> century collectors' interests in the "exotic." To contextualize the treatment of the medicine this paper also describes the treatment of a Japanese mermaid that had been accessioned with the African objects. The overall aim of this project was to add to the understanding of issues in the conservation of objects with nontangible attributes through the research and treatment of the collection.*

## 1. Introduction

The Buffalo Museum of Science has in its collection 68 examples of African medicine. Virtually all of these are from two main sources: the Reverend L.A. Taylor's missionary trip to Liberia and the African Village of the 1901 Pan American Exposition. A smaller number of the objects are from several other sources: the collections of W.P. Melville, the Reverend E.A. Johnston, J. Allingham and the Royal Museum of the Congo. The objects were presumably created as medicine or parts of medicine, and as such have healing and/or protective powers.<sup>1</sup>

The assembly of artifacts from different cultures into a deceptively homogenous group such as this is the product of turn-of-the-century colonialism as well as the practices of Western collectors. The interest in African peoples, crafts and cultural artifacts as "exotic curiosities" is exemplified through the inclusion, in the Pan American collection, of one object that is certainly not African in origin, the Japanese mermaid. The mermaid was purchased with the collection of medicine from the Pan American Exposition and may have been displayed there.

In order to prevent further mechanical deterioration and to allow for possible exhibition Jean Linn, Collections Manager at the Buffalo Museum of Science, suggested the collection be examined, stabilized and re-housed. Upon initial examination it was clear that several of the objects would benefit from immediate treatment. Additionally, historical/cultural research and analysis of materials would both improve the museum's understanding of the collection and inform the treatment strategies.

The first stage of this project was to conduct cultural research and analysis with the goal of developing a handling and treatment protocol. These steps were carried out with the help of specialists in the fields of XRF analysis and African culture. Although not initially planned, the XRF data collected from this study was sent to KeyMaster

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<sup>1</sup> Further discussion of the term medicine is given in section 2.1 of this paper.

Technologies<sup>2</sup> to develop better calibration curves toward the quantification of arsenic residues. Curators, conservators and anthropologists were contacted to identify any relevant cultural restrictions that might limit the treatment and exhibition of the objects.

The second stage of the project was to conduct a condition assessment of the collection. This was aimed at identifying those objects most in need of treatment with the ultimate goal of stabilizing the entire collection. Treatment and analysis were carried out on objects identified as needing stabilization beyond re-housing. Finally, the entire collection was re-housed.

As the project progressed, the overall aim of this project became two-fold: to add to the understanding of the methods of handling and conservation of different types of cultural objects and to inform the development of a better means of pesticide testing and quantification.

## **2. Research**

### **2.1 Description of Medicine**

Traditional African medicine operates within a holistic view of the world. Medicine, in protecting, enhancing one's abilities, and curing both fears and ailments, deals with the full spectrum of life issues: the physical, social, mental, psychosomatic and spiritual.

It is important to stress that belief systems, including ideas of medicine, vary from culture to culture. While a discrete description or definition of “traditional medicine” is considered problematic, in the context of this collection it can be described broadly as: non-figurative physical, social and spiritual remedies or divination tools.

An alternative definition, given by the World Health Organization, describes traditional medicine as “including diverse health practices, approaches, knowledge and beliefs

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<sup>2</sup> Keymaster, an XRF company, was acquired by Bruker AXS in 2006.

incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises....”<sup>3</sup>

Called *bo* by the Fon and *nkisi* by the Bakongo, medicine is created by diviners or healers as both protection and cure for a specific person or thing. A *nkisi* is a force (or spirit) from the land of the dead that aids in divination, protection and healing. In divination a specialist can carry out a number of actions, such as: heal a physical illness; assuage a fear; and prevent an unwanted event from occurring. The diviner identifies and heals through a performance that may include a song, dance, or other action as a spirit inhabits the specialist. Associated material may include musical instruments, costumes, special enclosures and *nkisi*-objects. The term *nkisi* actually encompasses both ritual and the related object(s). If present, the *nkisi*-object is the habitation of the *nkisi* force.<sup>4</sup> The same is true of *bo*. Non-figural objects like *minkisi*<sup>5</sup> and *bo* are highly personalized and are either worn on or are located close to the person or thing for which they’re made. An example of medicine currently in use in Nigeria includes the amulets and painted symbols Ijaw militants wear to protect themselves from bullets.<sup>6</sup> Another example of "general" protective medicine is illustrated below (fig. 1).

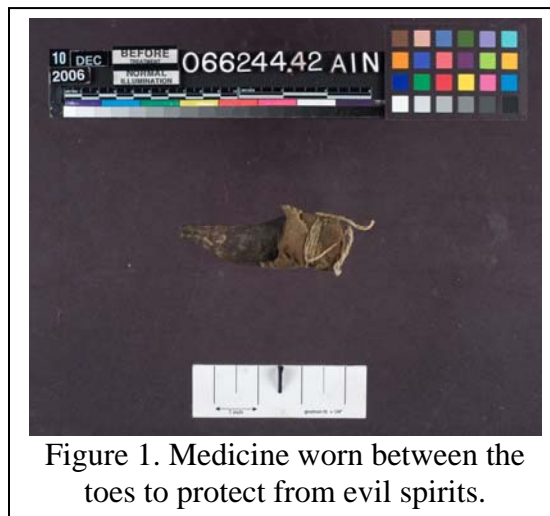


Figure 1. Medicine worn between the toes to protect from evil spirits.

Non-figural medicine exists in a variety of forms including: necklaces, vessels, amulets,

<sup>3</sup> <http://www.who.int/mediacentre/factsheets/fs134/en>. Accessed 25 April 2007.

<sup>4</sup> MacGaffey, Wyatt. *Art and Healing of the Bakongo*. Bloomington, Indiana: Indiana University Press, 1991 (5).

<sup>5</sup> *Minkisi* (plural of *nkisi*).

<sup>6</sup> Junger, Sebastian. "Blood Oil," in *Vanity Fair* February 2007, 112-122.

carved horns, and small wrapped bundles. The medicine from the Buffalo Museum of Science is composed of a variety of materials, including: ceramic, horn, textiles, feathers, hair, bone, skin, seedpods, and other plant materials. Some of the objects are fragments and may have once adorned figures. Objects in the collection are embellished with pigments, shells, textile strips, grass decorations and coated with organic medicinal ingredients. Every material in the object's construction is significant to its power.

## 2.2 Nontangible Attributes

"...I will be the only one who will know what I did.  
If someone did not do it, he cannot know...One cannot  
say it is such and such a thing just in seeing it." (Blier, 113)

Nontangible attributes are non-physical qualities intrinsic to the object and include magic, sacredness, and power. Medicine bundles, amulets, and horns, like their constituent materials, do not merely symbolize power, but are the physical manifestation of power. In the cultural context, if any part of the object is altered, the power or usefulness of the object is lost.

Stephen Mellor described the consideration of nontangible attributes as they pertain to the treatment and exhibition of African figurative objects in his article for JAIC (1992). Mellor notes that it is important to understand the nontangible attributes of an object and to treat the physical object with respect. Further, he observes that the nontangible attributes are dynamic—they are “activated by behavior” such that the objects embody different attributes depending on the context of their cultural use and function.

Difficulty arises when an attempt is made to assign a specific use to medicine out of cultural context. As art historian Suzanne Blier explains in *African Vodun* (1995), “no one except the maker can know an object's specific identity or properties.” Medicine is not meant to be understood by anyone other than the practitioner and its significance is actually achieved through this obscurity. In the context of this project, this enigmatic attribute makes identification of use impossible. In the context of this collection, the lack

of use information and the consideration of post-use inactivation are considered the key details for determining a treatment approach.

### **2.3 Historical Background**

Early European explorers, ignorant to their significance, called medicine objects “fetishes” and “witchcraft.” Both the government and mission authorities repressed the practice and use of medicine during periods of colonialism. So, from the earliest of sightings, it was misunderstood as simply "heathen magic." This perception continued into the late 19<sup>th</sup> and early 20<sup>th</sup> century when collectors of African objects sought out such objects as representative of “exotic” cultures. It can be argued that this sentiment resulted in a loss of context for the objects as most collectors did not record use, culture, or even region of origin. Today these objects are referred to as "medicine" or "medicinal objects." This term is a modern attempt to classify a group of broad range of objects whose exact cultural significance has all too often been lost.

### **2.4 Collections**

As previously mentioned, the Buffalo Museum of Science's objects come from a number of sources. Virtually all of the objects are from Sub-Saharan western African; specifically what are now the Democratic Republic of the Congo, Liberia, and Angola.

The largest group of objects (36 total) was purchased by the Buffalo Museum of Science from Xavier Pené, the organizer of the African Village in the 1901 Pan American Exposition in Buffalo. The African Village was a “living museum” where over 80 men, women and children from various parts of Africa lived and worked for 6 months. The objects shown in the African Museum were collected from different cultures of western Africa before the 1900s. Little attention was given to culture or region of origin during collection and so, little is known about the intended use of most of these objects.

The other large portion of medicine (23 objects) was donated to the museum by a retired



missionary. Traditional medicine was forbidden from being practiced in areas under the authority of the church. In the case of this collection, when the Holy Cross Mission was informed that locals were practicing what the church saw as "magic," all of the related objects were confiscated. Fortunately, in this case, notations were made as to the use of most of the objects.

The rest of the objects (10 in total) are from the Royal Museum of the Congo and private collections. These are mostly small objects collected from Angola and what is now the Democratic Republic of the Congo.

## **2.5 Collaboration**

In order to establish a suitable approach to the handling, conservation and exhibition of the objects a series of questions was posed to specialists of African cultures (see Appendix A). It was not possible to contact someone intimate with such objects' use within the culture of origin because of a lack of documented cultural information. Instead, a group of curators, anthropologists and conservators were contacted. Images of the objects were provided with the objective of making cultural attributions.

Through research and consultation with Wyatt MacGaffey, author of a book on the subject,<sup>7</sup> it is believed that many objects were made by the Bakongo people. It was not possible to identify the cultural origin of all of the objects. Many appear to be fragments of medicine, a fact that further complicated attribution.

In general, it was felt that without specific cultural attributions, treatment and handling should be limited. There was general agreement that objects out of their cultural context are often viewed as inactivated, meaning that without use by a ritual specialist their non-tangible significance is lost. One curator of African art explained that he did not object to stabilization of objects without attributions as long as the intention was to preserve their

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<sup>7</sup> MacGaffey, Wyatt. *Art and Healing of the Bakongo*. Bloomington: Indiana University, 1991.

physical properties.<sup>8</sup> Dr. Enid Schildkrout cautioned that the African situation is so far not at all like the situation with American Indian objects in the sense that there is often limited interaction between museums and African peoples. Furthermore, she noted that she was not aware of any museum that has dealt with restrictions based on African cultural sensitivities.<sup>9</sup> This points to a need for further research.

In contrast to the curators' focus on attribution, conservator Steven Mellor felt that most indigenous people were receptive to treatment and exhibition with the understanding that we treat the objects as best we can, coming from a Western perspective. Furthermore he stressed that we just might not know all of the meanings, nuances and attributes of an object and therefore it is always important to remain respectful and to proceed conservatively to ensure the availability of information for the future.<sup>10</sup>

The question of cultural sensitivities brought up the point that sensitivity is not just a matter of specific behavior toward or with objects but it is also the acknowledgement of cultural identities, nuances that might be implied, and an awareness of past actions and even presumptions about current indigenous beliefs and ways of life.<sup>11</sup>

### **3. Pesticide Testing**

#### **3.1 Description of Testing**

The objects were analyzed for the presence of any potentially hazardous pesticide residues. Arsenic was of primary concern because of its high frequency of use and toxicity. Testing was performed with the non-invasive technique of x-ray fluorescence (XRF) using a portable KeyMaster TRACeR III-V and an arsenic filter. An average of 3 different areas on each object were analyzed in "Soil Mode" for a total of 60 seconds at 40 kV and 7 mA. A total of 183 spectra were collected.

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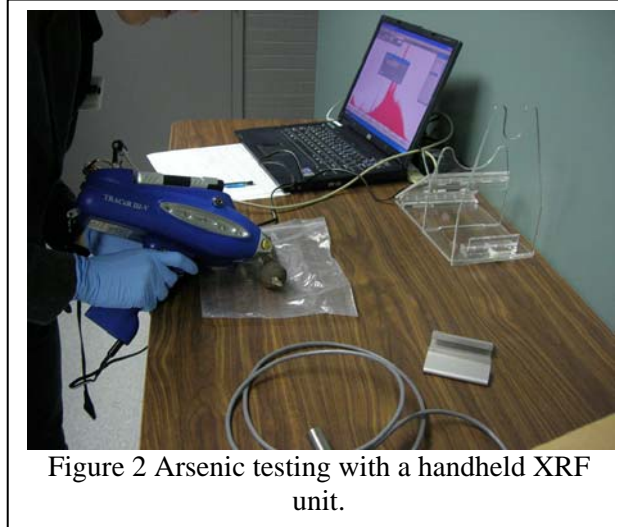
<sup>8</sup> Nii Quarcoopome, e-mail message to author, December 8, 2006.

<sup>9</sup> Dr. Enid Schildkrout, e-mail message to author, January 16, 2007.

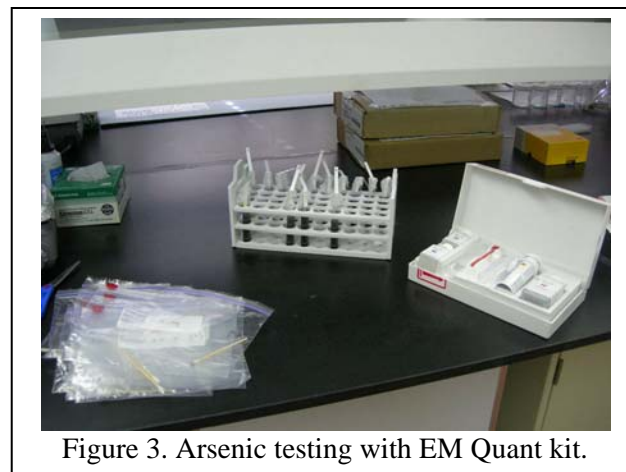
<sup>10</sup> Steven Mellor, e-mail message to author, December 22, 2006.

<sup>11</sup> Steven Mellor, e-mail message to author, January 2, 2007.

A Röntex ArtTax XRF spectrometer was used to analyze areas inaccessible to the portable XRF and also to verify ambiguous results from the portable XRF unit. Areas were analyzed for 60 seconds at 50 kV and 700 mA.

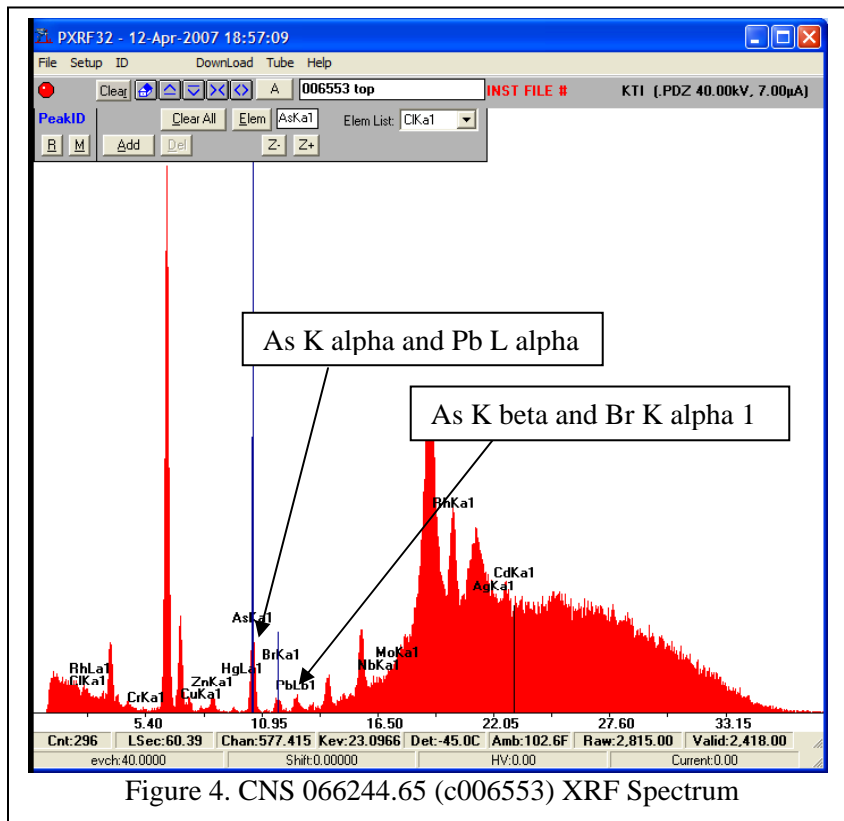


The EM Quant Arsenic Kit (a microchemical spot test) was used to test 17 of the 69 objects (including both the medicine and mermaid) analyzed by XRF. Spot tests were carried out on a random sampling of objects in order to interpret the XRF results. A known positive and negative were tested for comparison purposes and to confirm the test was working properly. Objects found to be contaminated with arsenic residues were placed in sealed plastic bags and labeled as contaminated.



### 3.2 Results

X-ray fluorescence analysis is dependent on the instrument's limit of detection. In the spectrum shown below, both of the peaks for arsenic are present and above the instrument's limit of detection. It can be said that arsenic is present, but the data should not be judged so simply. The spectrum illustrates a complicated situation where iron, lead, zinc and bromine are also present. The L alpha peak of lead and the K alpha peak of bromine both overlap with the arsenic peaks. This overlap makes interpretation and quantification difficult.



It was found that approximately 25% of the objects were contaminated with arsenic. This figure includes objects with arsenic residues and arsenic within the matrix of the object. Although arsenic was the primary focus of this project, other elements commonly used in pesticides were identified including: bromine and lead (see Appendix E).

It is important to note that the results were specific to collection (see Appendix B, fig. 2) signifying changing approaches to pesticide application over time. Most of the contaminated objects were from the Pan American Exposition; this was to be expected considering the frequency of arsenic use at the date of their accession. On a side note, it appears that many of the objects contaminated with arsenic suffered from insect damage; however, it is unknown whether the damage occurred before or after application of the arsenic.

The correlation between the XRF and the spot test data was only 47%. One explanation for this discrepancy is that the spot test lacks sensitivity. Another explanation is that some of the arsenic present in the XRF spectra may actually be in the matrix of the object and was not removable as a residue in the spot test.

### **3.3 Quantification**

Attempts were made to quantify the results (in ppm) using a calibration curve for arsenic developed by KeyMaster Technologies. The calibration curve initially used to quantify the results was not developed for objects with possible interferences from other elements such as lead, bromine, iron, and zinc. In spite of this a linear correlation was found between intensity and concentration when outliers were removed (see Appendix B1).

The 183 spectra were sent to Bruce Kaiser at KeyMaster as a large pool of data representative of the types of materials and densities typical of ethnographic objects. Using the spectra and related artifact information the company prepared new standards and calibration curves. As of the date of this report, the spectra have not yet been run through the newly developed curves.

It should be repeated that the results are not indications of the level of hazard the contaminated objects present to one's health: a medical toxicologist can only determine this. In lieu of such information, it is recommended that the objects be handled as little as necessary and always with the use of proper personal safety gear.

## 4. Condition Assessment

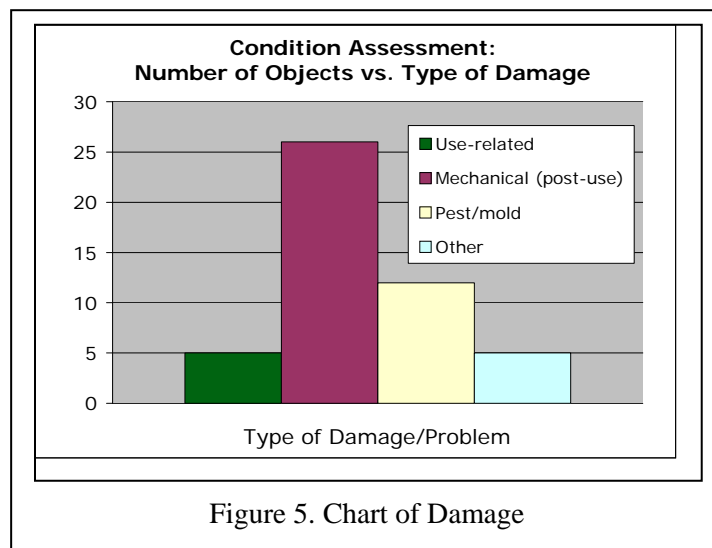
### 4.1 Description of Assessment

Following pesticide testing, a condition assessment was conducted in which each object was examined and documented by both written and photographic means. The primary aim was to provide an overall assessment of the condition and causes of any damage in order to inform the stabilization and treatment of the collection.

A general assessment form was created to aid in the examination of the collection. Each form includes a photograph of the object, a description of the object, and a checklist of condition issues. A treatment proposal was also prepared and included a scale of the relative need for treatment, a checklist of proposed treatment steps, and a section for more detailed notes (see Appendix C). The forms were created in Filemaker Pro 8.5, a software program for preparing databases.

### 4.2 Summary of Results

The collection as a whole was found to be in stable condition. The chart below illustrates the types of damage found (see figure 5). Much of the damage found was likely the result of poor housing. The objects had been stored, one on top of another, in cardboard boxes.



Upon completion of the condition survey, 12 of the 69 objects were selected for further examination, analysis and treatment. Objects were selected for treatment based on either a need for stabilization beyond re-housing or to make them "readable."

## **5. Treatment/Analysis of Medicine**

Research and discussion determined that the objects' intended significance lies in their intangible healing and protective properties. And as previously mentioned, in some cultures, this attribute is often viewed as inactive when out of "use-context."

The significance and value of the objects are culturally defined. It follows that any alteration of the materials by another culture such as that of Western museums would change the objects' significance and value. Another thing to consider is that these objects were created as ephemera, and were never intended to be shown in a museum. The situation becomes even more complicated by the group of objects exhibited at the Pan American Exposition; one could argue that since any information about their original use and origin was lost, the most significant "value" they have is historical. In other words, without cultural context their importance today comes from the fact that they were exhibited in the West as "fetishes."

With all of this in mind, it was clear that handling and treatment should be focused on the preservation of both their original context in Africa and their "new" context as museum objects. It was felt that with treatment in the form of stabilization with minimal intervention was necessary to achieve the preservation of overlapping contexts. A summary of the treatments is presented in the following sections.

Materials were examined analyzed using non-destructive techniques such as UVA-induced visible fluorescence, XRF and microscopy. Small samples were taken when regarded as essential to the understanding and/or preservation of the object. Techniques for the analysis of samples included: XRF, FTIR, microchemical tests, and polarized light microscopy.

Analysis often provided insight into the fabrication of the object and also helped to delineate an object's treatment. For example, a horn (066244.18) had been suspected by previous examiners to be suffering from mold contamination; however, upon analysis of a small sample with FTIR spectroscopy, it was determined that the white, compact material was a surface coating and had probably been applied during use (see Appendix D, fig. 3). In the case of another object (066244.6), natural resin (probably applied as an adhesive)—not the suspected grime or waxy corrosion product—was found on the brass tacks inserted into a gourd (see Appendix D, fig. 4).

### 5.1 Cleaning

Much of the treatment entailed surface cleaning to removed dust, insect debris and mold. Surface cleaning methods were chosen based on the specific object and in all cases required the use of magnification to prevent damage to complicated surfaces. Chemical sponges were used to clean ceramics and horn soiled with "museum dust." A gentle blotting motion was applied to remove only loosely adhered dirt. Cleaning was not carried out in cases where it appeared that intervention would disrupt the underlying surface. Tweezers and a variable speed HEPA filtered vacuum were used to remove insect accretions and mold. A nylon screen and HEPA vacuum were used to reduce dust from textile elements.



Figure 6. CNS 066244.7 (c1574)  
Before cleaning, detail



Figure 7. CNS 066244.7 (c1574)  
After cleaning, detail



Attempts were made to identify pests. This was not always possible because in many cases insufficient evidence remained. Webbing clothes moths, carpet beetles and other dermestids were identified.

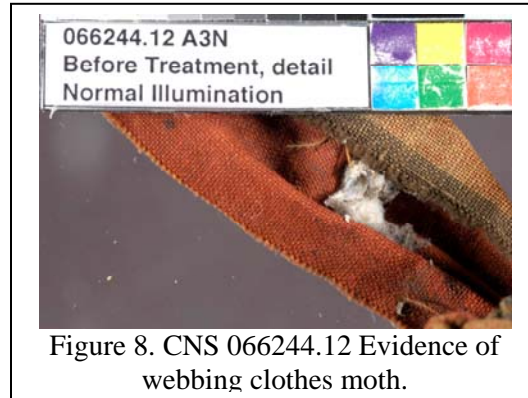


Figure 8. CNS 066244.12 Evidence of webbing clothes moth.

## 5.2 Stabilization/Reinforcement

Weakened materials that could not be stabilized by re-housing were reinforced with toned Japanese paper and either Paraloid® B-72 or methyl cellulose. Concentration and solvent depended on the material. In the case of the medicine below, the raffia decoration around the ceramic was weakened where it had become bent from storage; several pieces had also become detached. The weakened raffia strands were reinforced with toned Japanese paper and methyl cellulose (see figs. 9 and 10).



Figure 9. Medicine with raffia decoration.



Figure 10. Detail of reinforced area.

### 5.3 Reattachment

Detached or loose fragments were reattached whenever possible using either Paraloid® B-72 or methylcellulose. Adhesive was selected based on the material and strength of repair required.

#### 5.3a. 066244.27 Medicine Necklace

A simple reattachment repair is illustrated below (see figs. 11 and 12). In this case, the medicine is an amulet worn around the neck. One of the coated textile cords at the top of the amulet had become detached (see fig. 11) and a piece at the bottom of the amulet had broken off entirely. The cord had become stiff and could not be returned to its original position. After testing the solubility of the coating, the cord was locally humidified with blotters dampened with deionized water applied over a small piece of Gore-Tex®. The cord was then easily aligned to its original position and secured in place with a 50% solution of Paraloid® B-72 in xylenes and the application of light pressure. The other detached piece of cord was reattached using the same adhesive and light pressure. Losses to the cord and applied patina were not replaced.



## 6. Treatment of Japanese Mermaid

The Japanese or “Feejee” mermaid was accessioned with the medicinal objects from the Pan American Exposition although it is not African in origin. Japanese mermaids had been crafted by Japanese and Indonesian fisherman for hundreds of years prior to their popularization in the West by P.T. Barnum. Traditionally they are constructed from the upper body of an ape and the tail of a fish. By the mid-1800s mermaids were produced in Philadelphia by a taxidermist named William McGuigan.<sup>12</sup>

Objects like these were indicative of 19th century interests in exoticism. Japanese mermaids were shown in sideshows and also collected for Victorian-era curio cabinets. Because this object was only intended for display the same cultural sensitivities necessary for the medicinal objects do not apply. In contrast to the treatment of the collection of medicine, the treatment of the mermaid was extensive and involved reconstruction of lost pieces.

Upon initial examination, the mermaid was in poor condition with many detached pieces and extensive losses. The head and proper right arm were detached. The proper left arm, the bottom jaw, the caudal fin and part of the dorsal fin were lost. There are also scattered losses in the paint layer. Pest damage was also evident especially along the dorsal fin.

### 6.1 Analysis

Materials were analyzed prior to treatment. The paint is likely a copper acetoarsenite pigment (see XRF spectrum in Appendix E) as its morphology and composition closely matches that of the group of copper acetate arsenite pigments. The particles are very fine and either plate-like or spherulitic (see fig.13). Fourier-transform infrared spectroscopy was used to find a match for the binder and ground. The binder was identified as a starch and the ground spectrum matched that of calcite with quartz.

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<sup>12</sup> Wolff, Karl. “The FeeJee Mermaid: The Milwaukee Taxidermied Treasure and Others.” Thesis. University of Wisconsin. Available online: [www.showhistory.com/Feejee.Wolff2.html](http://www.showhistory.com/Feejee.Wolff2.html)



Figure 13. Pigment particles (40x objective)

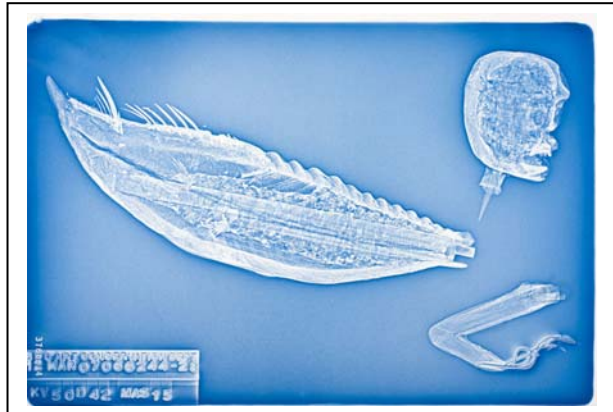


Figure 14. Xero-radiograph

Dr. Randal Snyder, an ichthyologist from the Biology Department of Buffalo State College, was contacted to identify the species of fish used to fabricate the mermaid's tail. Unfortunately the losses were too extensive to identify the species of fish. Dr. Snyder also noted that the lower ventral fins had been moved during construction of the mermaid.

## 6.2 Treatment

The treatment was aimed at returning the object to its original appearance so that it may be understood as a whole. Treatment involved surface cleaning the object, reattaching pieces and restoring lost pieces. A new arm was modeled in Araldite HV 1253 over an aluminum armature. The position of this arm was based on a similar mermaid from the collection of the Peabody Museum at Harvard. Fingernails were modeled in pigmented B-72.



The arm was inserted and adhered to the original joint using high tack fish glue. Minor losses to the body and jaw were isolated with 10% B-72 in xylenes and filled with Golden Acrylic Molding Paste. The caudal fin was replaced with Japanese paper cast from a silicone rubber mold of a trout tail. It was decided that losses to the dorsal fin would not be filled because this was not necessary to achieve a sense of the original. Furthermore, a certain degree of damage is to be expected of such an object and is noted in the mermaids found in other collections.<sup>13</sup> The surface was matched to the original using Japanese tissue and methyl cellulose. The losses were inpainted with Golden Matte Fluid Acrylics.



<sup>13</sup> Other collections with mermaids include the Milwaukee Public Museum and the Peabody Museum at Harvard.

## 7. Re-housing

It was necessary to re-house the objects in order to prevent further mechanical damage. The objects were separated based on their collection and material type and then re-housed. Supportive "cut-outs" were made in either Volara® or Ethafoam® to the specific shape of each object. The supports were then covered with Tyvek® and placed within custom-made blue-board boxes. Re-housing stabilized the majority of the collection.



## 8. Recommendations for Handling, Storage and Exhibition

It is suggested that latex or nitrile gloves be worn when handling these objects to avoid possible exposure to pesticides. Because there is no known method of decontaminating surfaces with arsenic residues, objects labeled as contaminated should be kept in sealed and labeled polyethylene bags and handled as little as possible.

Light-related deterioration of organic materials is well established; because the collection is largely composed of organic materials, it is recommended that exhibition light levels be kept to a minimum (50 lux).

While it was not possible to make cultural attributions for every object, specialists contacted during this project agreed that this is a common problem with minimally documented early twentieth century collections. In spite of this, some objects were

identified as possibly from the Bakongo people. There are no known cultural restrictions in terms of the handling and exhibition of medicinal objects from this culture.

## **9. Further Work/Research**

There are several aspects of this project that warrant further research. Most important would be to continue research in order to make cultural attributions for all of the objects. If it is possible to ascertain the culture of origin, traditional healers or cultural representatives should be contacted in order to identify the most appropriate means of handling, treating and exhibiting the objects.

Further quantification of the XRF data will be performed and shared with KeyMaster Technologies and the conservation community. Dr. Aaron Shugar will present the most recent findings at "Mobile XRF in Museums: Applications for Anthropology and Natural History," an XRF symposium hosted by the Field Museum in Chicago in the summer of 2007.

## **10. Conclusion**

Through the research, documentation and stabilization of two types of cultural objects it was possible to explore, identify and preserve the nontangible and physical properties of both. The consideration of all an object's attributes and contexts is crucial to the responsible conservation of the object. Although it was not possible to make direct cultural attributions for every object, further research may yield valuable information. With limited cultural information, preservation of the objects as well as their past and present contexts was essential to make the objects available for future interpretation.

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Ruth Norton (Field Museum)  
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Dr. Randal Snyder  
Jonathan Thornton

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## List of Illustrations

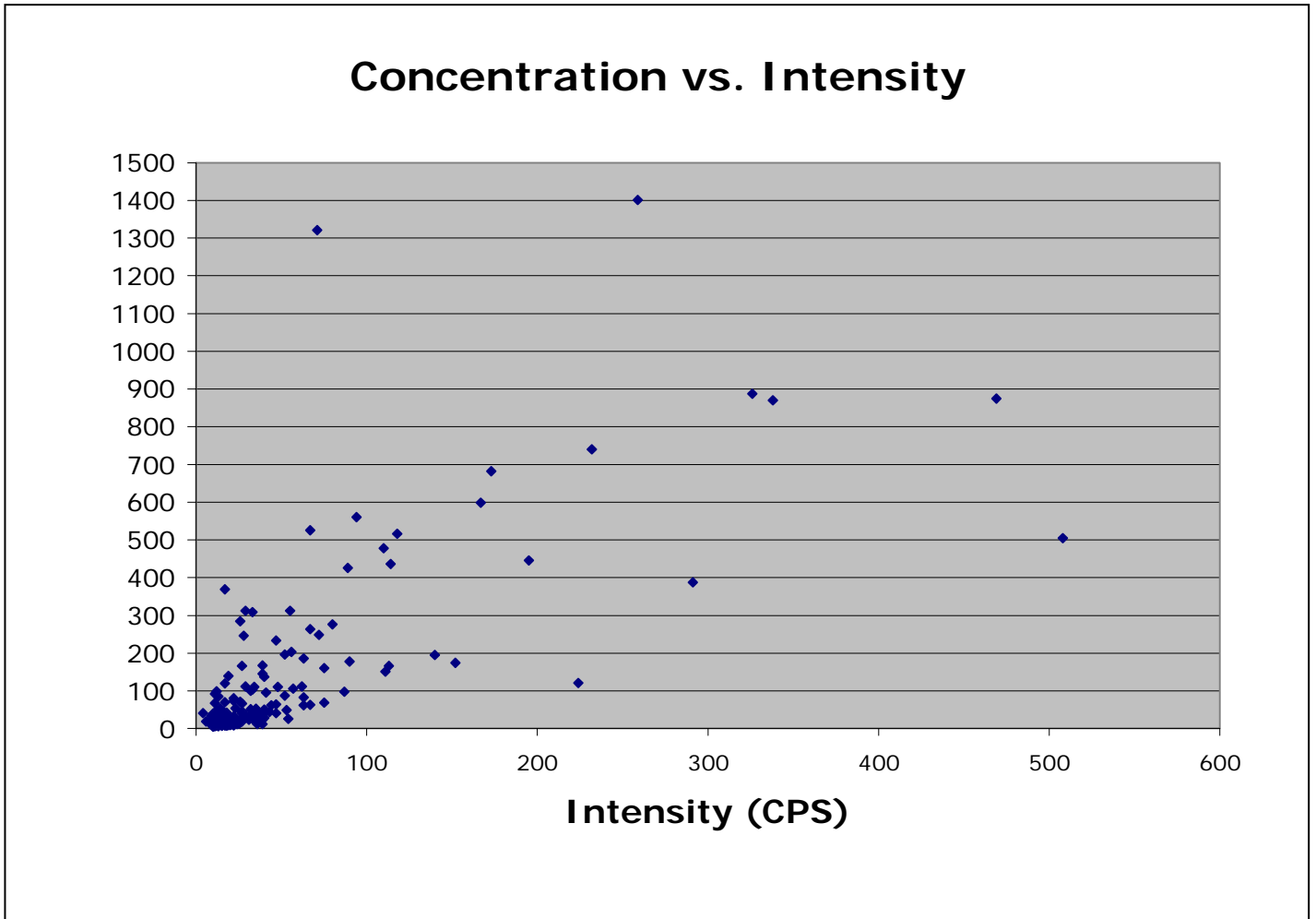
- Figure 1. Medicine
- Figure 2. Arsenic testing with handheld XRF unit
- Figure 3. Arsenic testing with EM Quant Arsenic Kit spot test
- Figure 4. Example XRF spectrum
- Figure 5. Chart of damage
- Figure 6. Before cleaning detail
- Figure 7. After cleaning detail
- Figure 8. Webbing clothes moth evidence
- Figure 9. Ceramic with raffia decoration
- Figure 10. Detail of raffia after reinforcement
- Figure 11. Detail of amulet before reattachment
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- Figure 13. Pigment particles
- Figure 14. Xero-radiograph of mermaid
- Figure 15. Mermaid after cleaning and filling
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- Figure 17. Mermaid after treatment
- Figure 18. Example of re-housing

## Appendix A: Questions

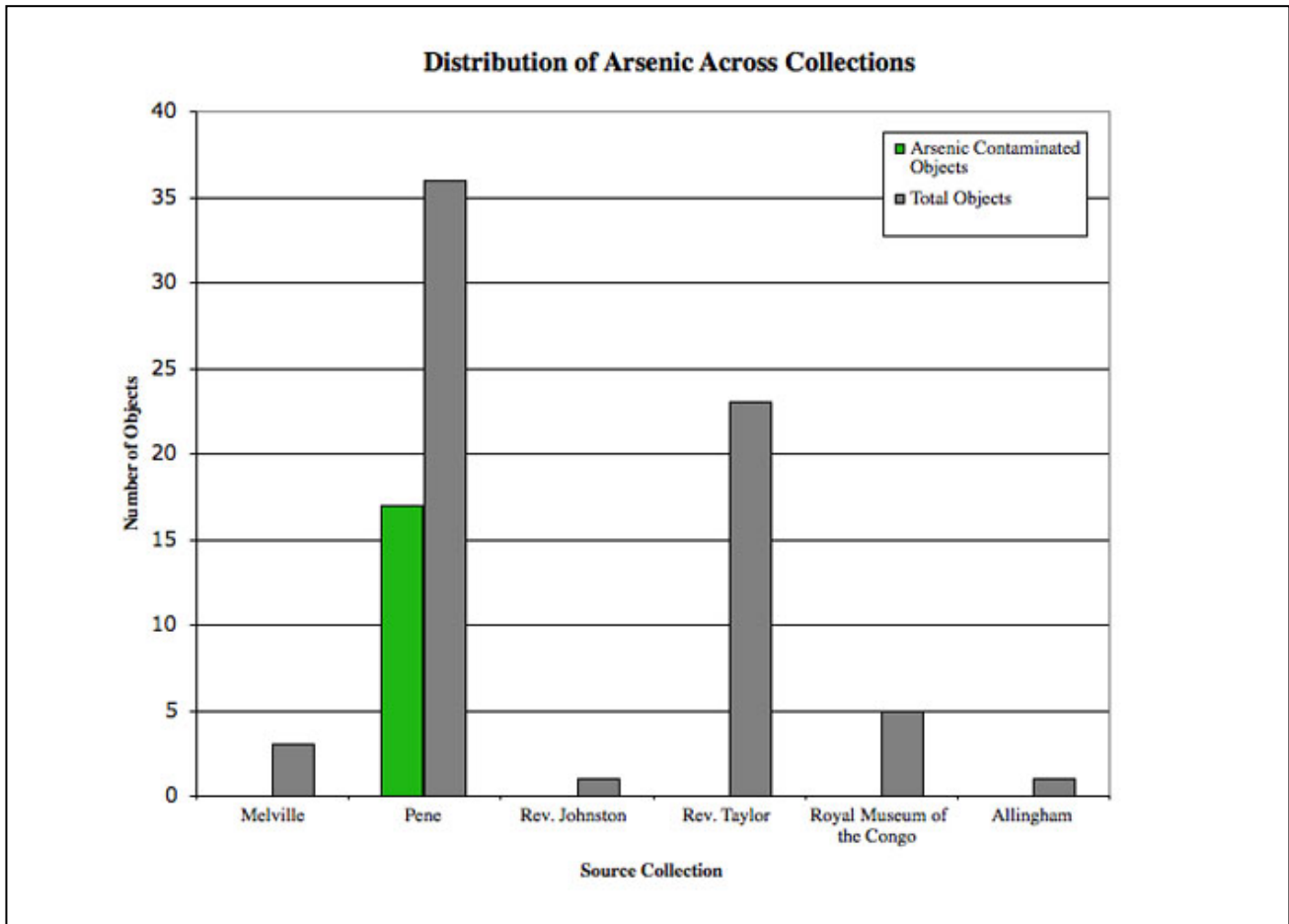
The following questions were sent to a group of curators, conservators and anthropologists.

1. What is the significance of healing and/or protective objects when they are no longer in an indigenous context? In other words, what is the perception of these objects as “museum objects” by the communities from which they originate (assuming the origin is known)? Do they maintain the same “powers” outside of their original context?
2. Are there any cultural restrictions to be aware of in terms of the handling and exhibition of these types of objects? If so, what are they?
3. Are there any cultural objections to x-radiography of such objects? Are there any objections to sampling (for example, removal of a fiber from a textile) for analysis in order to benefit research?
4. Are there any objections to treatment? (see below for more specific examples)
  - a.) Should pests or mold be found are there any cultural objections to treatments such as freezing or placing them in anoxic environments (assuming this is appropriate for the material(s))?
  - b.) Are there objections to the reattachment of pieces that have become detached in storage (assuming the original location can be accurately determined)?

**Appendix B: Pesticide Testing Results and Graphs**

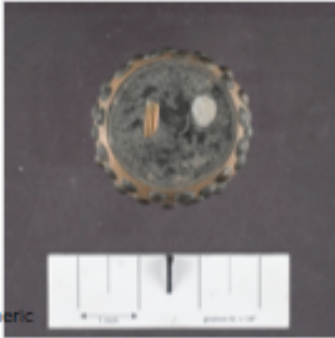


1. XRF Analysis: Concentration (ppm) vs. Intensity (CPS)



## 2. Arsenic Distribution

Appendix C: Sample Condition Assessment and Treatment Proposal

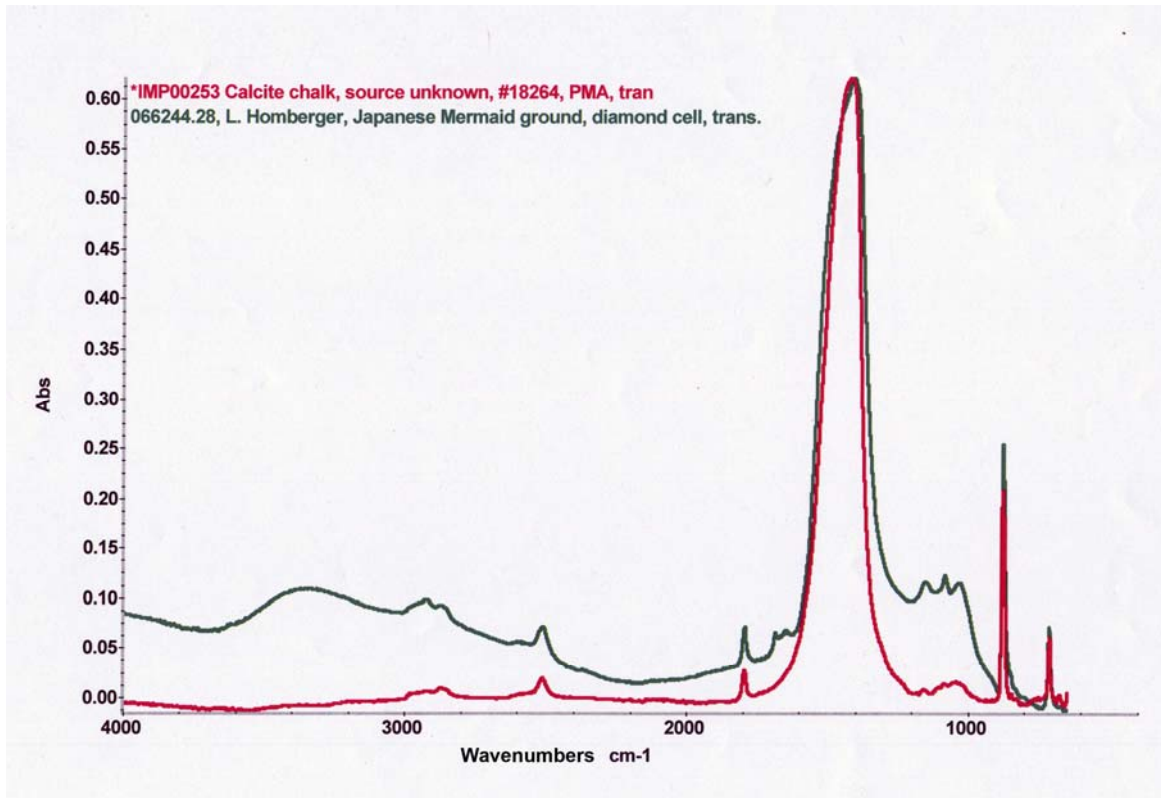
Condition Report		The Conservation Department, State University College of Buffalo Archaeological Lab, 1400 Tonawanda Avenue, Buffalo, NY 14222	
<b>Survey:</b> African Medicinal Objects	<b>Owner:</b> Buffalo Museum of Science		
<b>Date:</b> 3/2/2007	<b>Museum Cat. #:</b> c1573		
<b>Examiner:</b> Liz Homberger			
<b>Buffalo State College CNS #:</b> 066244.6			
<b>Collection:</b> Xavier Pene (Pan American Expo)			
<b>Origin, date:</b> West Coast (Congo), before 1901			
<b>Description:</b> medicine: gourd filled with natural non-cellular polymeric material (resin); brass tacks inserted into gourd			
<b>Materials/media:</b> <input checked="" type="checkbox"/> Visual ID <input type="checkbox"/> Microscope ID			
<input type="checkbox"/> horn <input type="checkbox"/> hair <input type="checkbox"/> wood <input type="checkbox"/> adhesive <input type="checkbox"/> antler <input type="checkbox"/> fur <input type="checkbox"/> bark <input checked="" type="checkbox"/> natural non-cellular polymeric <input type="checkbox"/> bone/ivory <input type="checkbox"/> skin <input type="checkbox"/> stem <input checked="" type="checkbox"/> Other... <input checked="" type="checkbox"/> shell <input type="checkbox"/> feather <input type="checkbox"/> seed/pod <input type="checkbox"/> glass <input type="checkbox"/> clay/ceramic <input type="checkbox"/> textile/thread <input checked="" type="checkbox"/> metal <input type="checkbox"/> plant fiber <input type="checkbox"/> pigment <input type="checkbox"/> wool <input type="checkbox"/> other plant material <input type="checkbox"/> dye			
<b>Dimensions:</b> 2 5/8 x 2 inches (d x h)			
<b>Markings/Inscriptions:</b> "2786/c.1573" handwritten twice on gourd	<div style="border: 1px solid black; padding: 5px;"> <p align="center"><b>Overall Condition</b></p> <input type="checkbox"/> Stable  <input type="checkbox"/> Unstable  <input checked="" type="checkbox"/> Cannot be determined without further analysis           </div>		
<b>Labels:</b> None	<b>Notes/Cultural Restrictions:</b>		
<b>Condition:</b>			
<b>A. Storage/housing</b>	<b>C. Surface</b>		
<input type="checkbox"/> bubble wrap <input checked="" type="checkbox"/> polyethylene bag <input checked="" type="checkbox"/> sealed <input type="checkbox"/> not sealed <input type="checkbox"/> polyethylene foam <input type="checkbox"/> none <input type="checkbox"/> Other...	<input checked="" type="checkbox"/> soiling <input checked="" type="checkbox"/> dust/grime <input checked="" type="checkbox"/> unknown <input type="checkbox"/> abrasions <input type="checkbox"/> powdery/friable <input type="checkbox"/> discoloration <input type="checkbox"/> corrosion <input checked="" type="checkbox"/> Other...		
<b>B. Structure</b>	<b>D. Biological deterioration</b>		
<input checked="" type="checkbox"/> no structural damage <input type="checkbox"/> damaged or broken element(s) <input type="checkbox"/> detached element(s) <input type="checkbox"/> loss(es) <input type="checkbox"/> tears <input type="checkbox"/> hole(s), puncture(s) <input type="checkbox"/> fraying <input type="checkbox"/> crack(s) <input type="checkbox"/> brittle/fragile/weak <input type="checkbox"/> planar distortion(s) <input type="checkbox"/> shrinkage <input type="checkbox"/> rigid <input type="checkbox"/> Other...	<input checked="" type="checkbox"/> none apparent <input type="checkbox"/> pest damage: <input type="checkbox"/> holes/losses <input type="checkbox"/> accretions/debris <input type="checkbox"/> insect, explain: <input type="checkbox"/> mold <input type="checkbox"/> Other...		
<b>E. Arsenic testing</b> <input checked="" type="checkbox"/> XRF <input type="checkbox"/> Chemical spot test			
date tested: 11/20/2006			
area(s) tested: bottom, interior material			
arsenic present? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no			
explain:			
<b>Describe damaged/broken/lost element(s):</b>	<b>F. Previous treatment</b>		
	<input checked="" type="checkbox"/> none evident <input type="checkbox"/> stable previous treatment <input type="checkbox"/> unstable previous treatment		

1. Sample Condition Assessment Form (Filemaker Pro document)

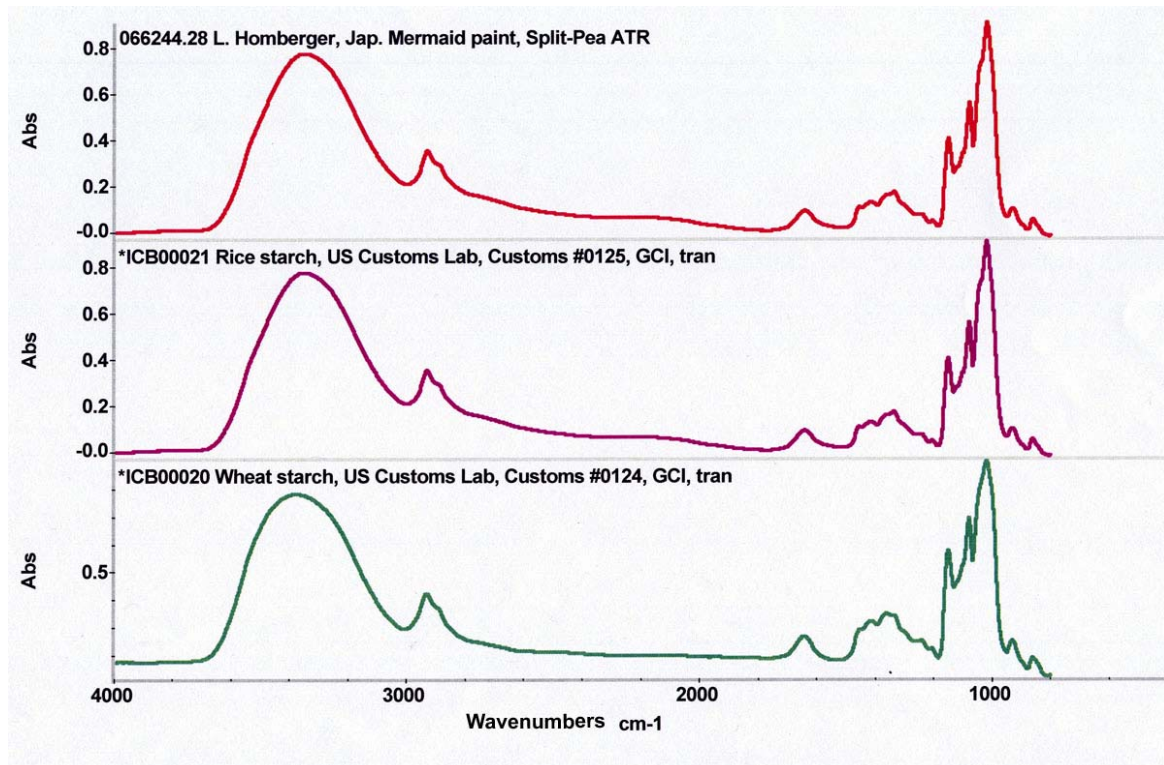
<b>Treatment Proposal</b>		Art Conservation Department, State University College of Buffalo Reber Hall 220, 100 E. Broadway Ave., Buffalo, NY 14222	
<p><b>Survey:</b> African Medicinal Objects</p> <p><b>Date:</b> 3/2/2007</p> <p><b>Examiner:</b> Liz Homberger</p> <p><b>Buffalo State College CNS #:</b> 066244.6</p> <p><b>Collection:</b> Xavier Pene (Pan American Expo)</p>	<p><b>Owner:</b> Buffalo Museum of Science</p> <p><b>Museum Cat. #:</b> c1573</p>		
<p><b>Description:</b> medicine: gourd filled with natural non-cellular polymeric material (resin); brass tacks inserted into gourd</p>	<p style="text-align: center;"><b>Treatment:</b></p> <p> <input type="checkbox"/> Treatment highly recommended  <input type="checkbox"/> Treatment recommended  <input type="checkbox"/> Treatment not recommended  <input checked="" type="checkbox"/> Further examination/analysis required                 </p>		
<p><b>Condition Notes:</b> Good condition overall.</p> <p style="margin-left: 40px;">-edges of copper alloy tacks exhibit a whitish green residue (possibly corrosion? possibly adhesive?)</p>	<p style="text-align: center;"><b>Treatment time estimate:</b></p> <p> <input type="checkbox"/> Less than 1 day  <input type="checkbox"/> 1 day  <input checked="" type="checkbox"/> Several days                 </p>		
<p><b>Proposed Action(s):</b> <i>Treatment actions are to be carried out with the goal of stabilizing the objects such that they can be handled and/or to restore visual integrity such that the objects can be understood.</i></p>			
<ul style="list-style-type: none"> <li><input type="checkbox"/> Detailed examination</li> <li><input checked="" type="checkbox"/> Analysis of materials (explain): FTIR to identify residue (corrosion?), XRF of metal tacks</li> <li><input type="checkbox"/> Research</li> <li><input checked="" type="checkbox"/> Photodocumentation</li> <li><input type="checkbox"/> Consolidate powdery/friable media</li> <li><input type="checkbox"/> Surface clean to remove dust/accretions</li> <li><input type="checkbox"/> Remove mold</li> <li><input type="checkbox"/> Insect eradication</li> <li><input checked="" type="checkbox"/> Reduce corrosion</li> <li><input type="checkbox"/> Reduce planar distortions</li> <li><input type="checkbox"/> Stabilize breaks, cracks, fissures</li> <li><input type="checkbox"/> Stabilize losses, holes</li> <li><input type="checkbox"/> Reduce stains/discoloration/accretions</li> <li><input type="checkbox"/> Repair/reattach elements</li> <li><input type="checkbox"/> Reinforce weakened elements</li> <li><input type="checkbox"/> Construct mount</li> <li><input checked="" type="checkbox"/> Rehouse</li> <li><input type="checkbox"/> Other...</li> </ul>			
<p><b>Proposed treatment details:</b></p> <ol style="list-style-type: none"> <li>1. Photograph.</li> <li>2. Identify residue on tacks--corrosion? adhesive?</li> <li>3. If residue is identified as active corrosion is identified as active, reduce mechanically.</li> <li>4. Rehouse.</li> </ol>			
page 2			

2. Sample Treatment Proposal Form (Filemaker Pro document)

Appendix D. FTIR Spectra

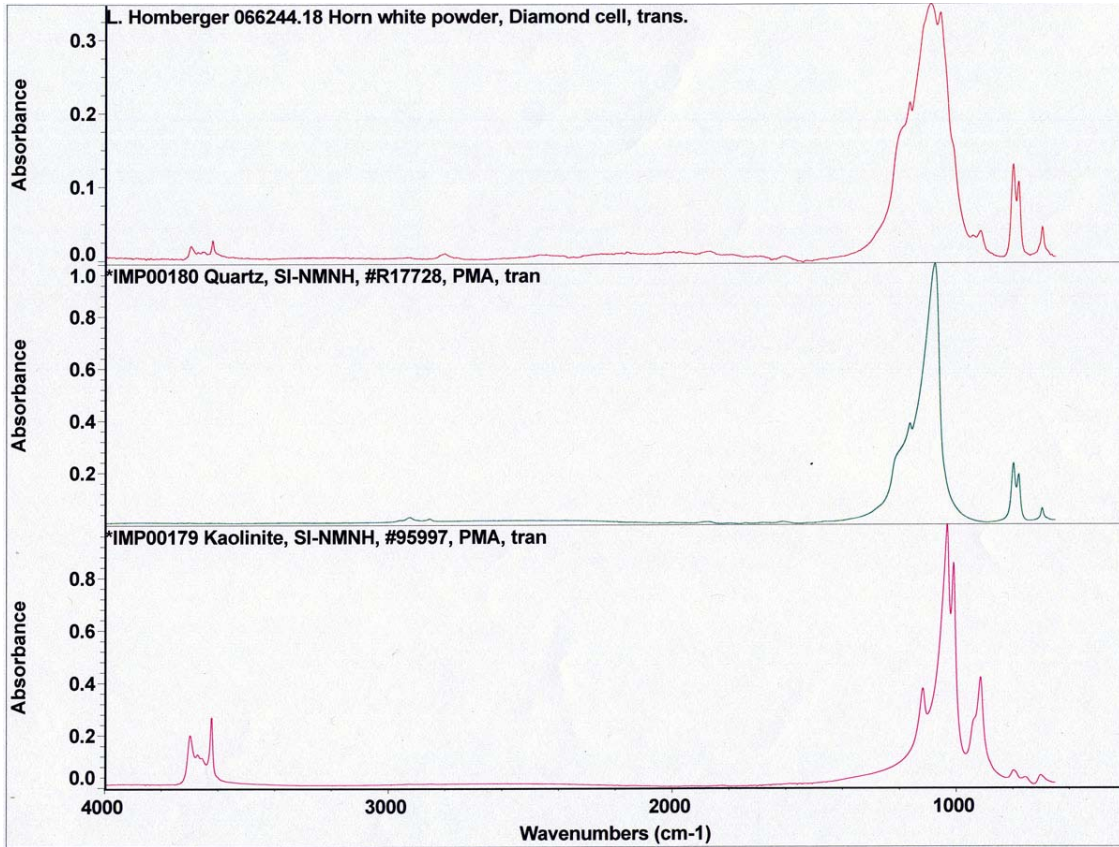


1. Spectrum for Japanese mermaid ground.

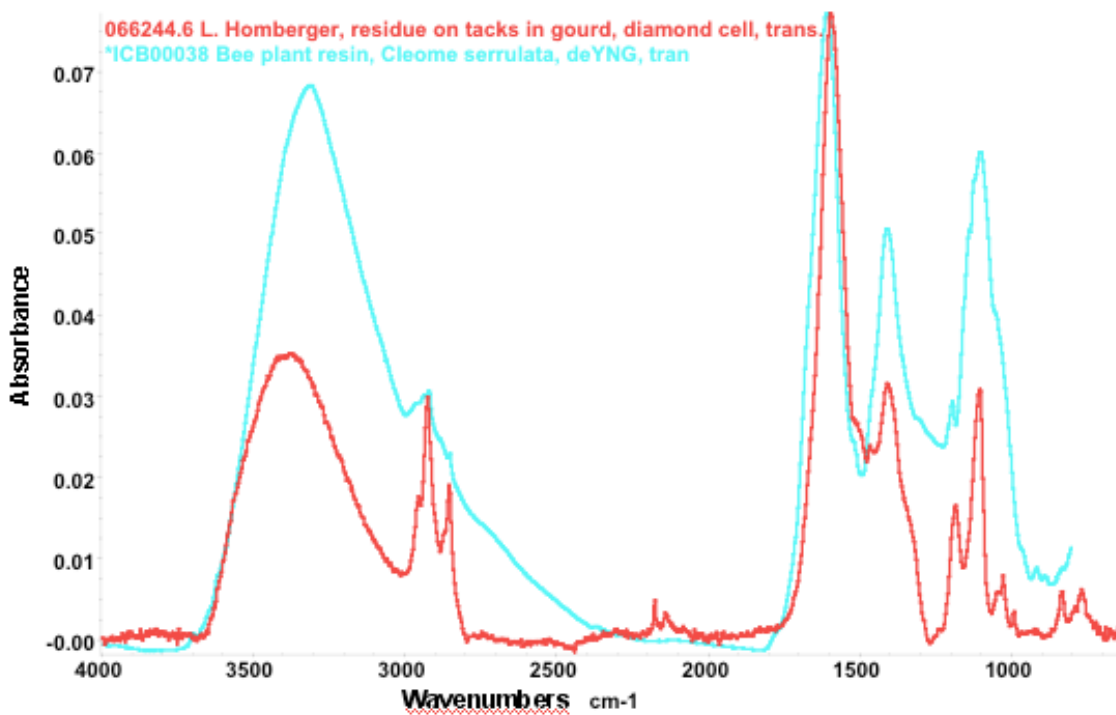


2. Spectrum for Japanese mermaid binder.



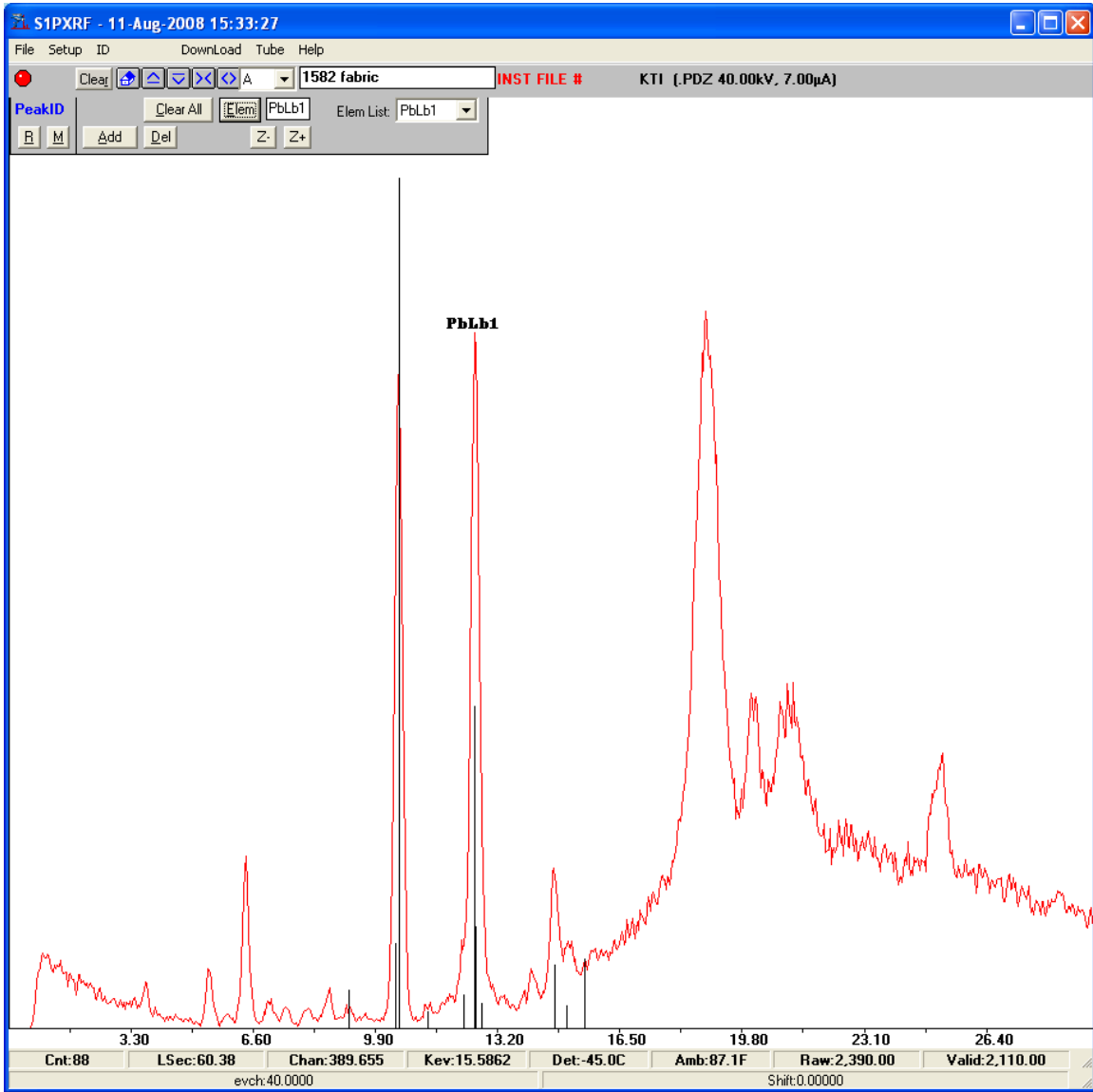


3. Spectrum for residue on horn.

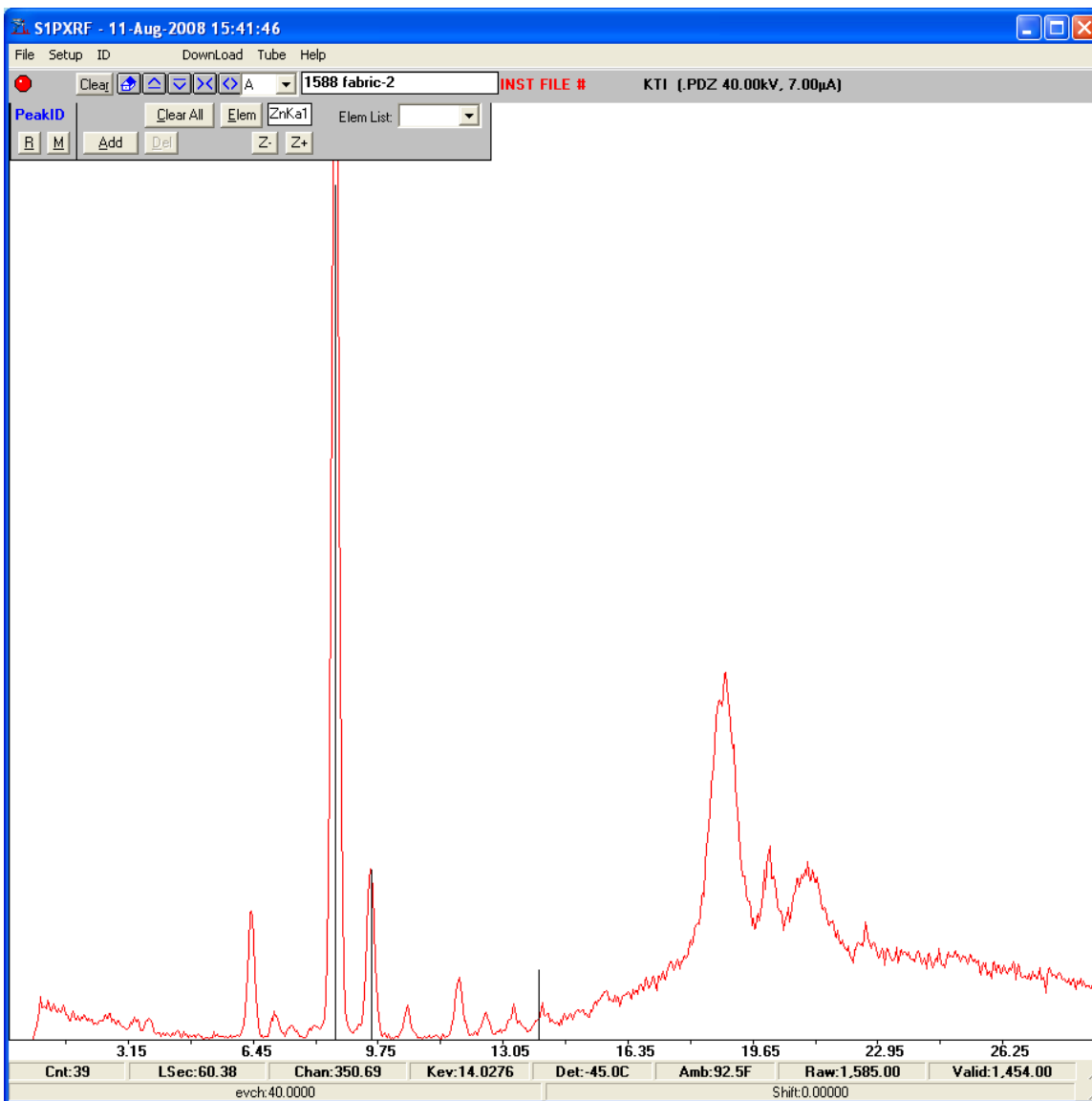


4. Spectrum for residue on tacks.

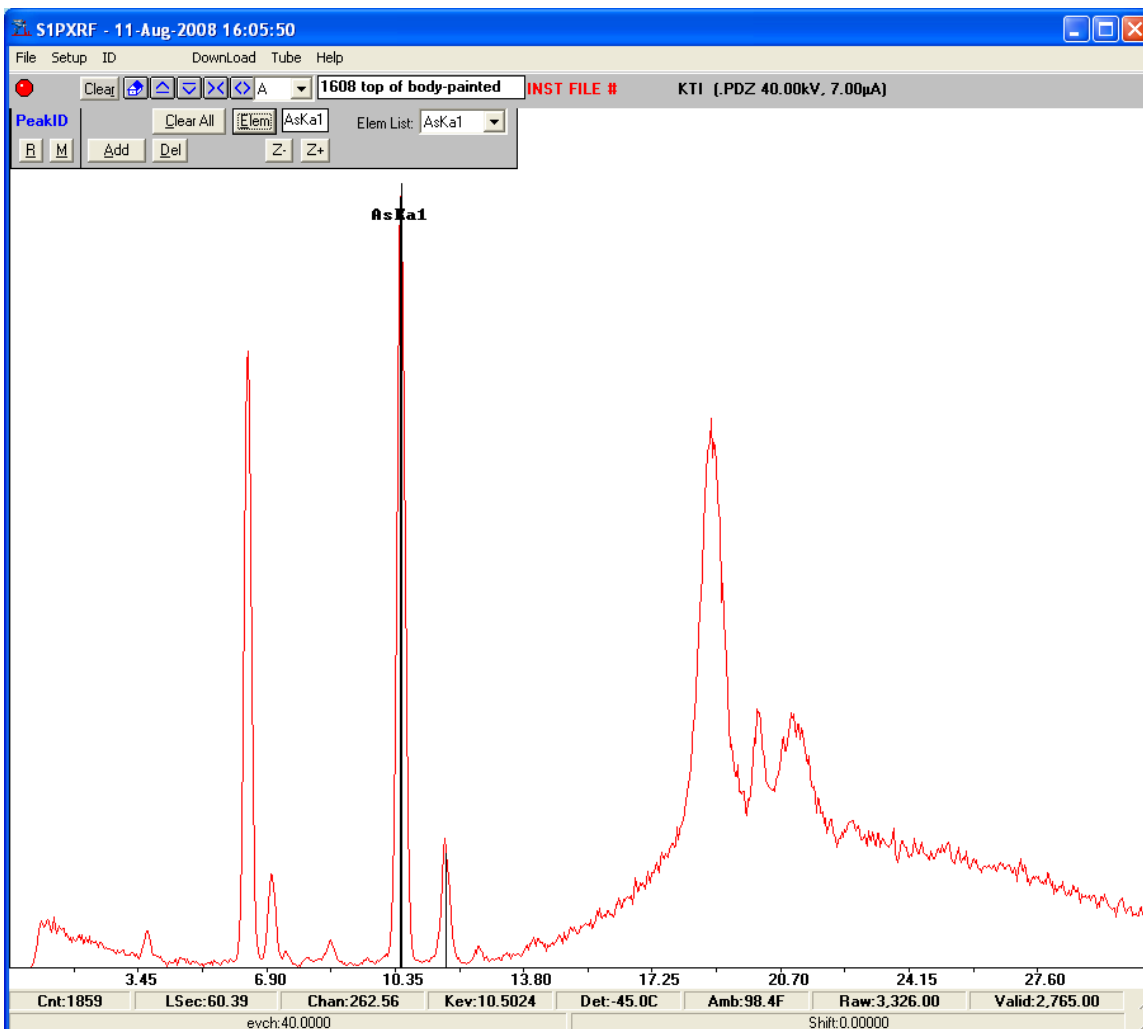
Appendix E: Examples of Collected XRF Spectra



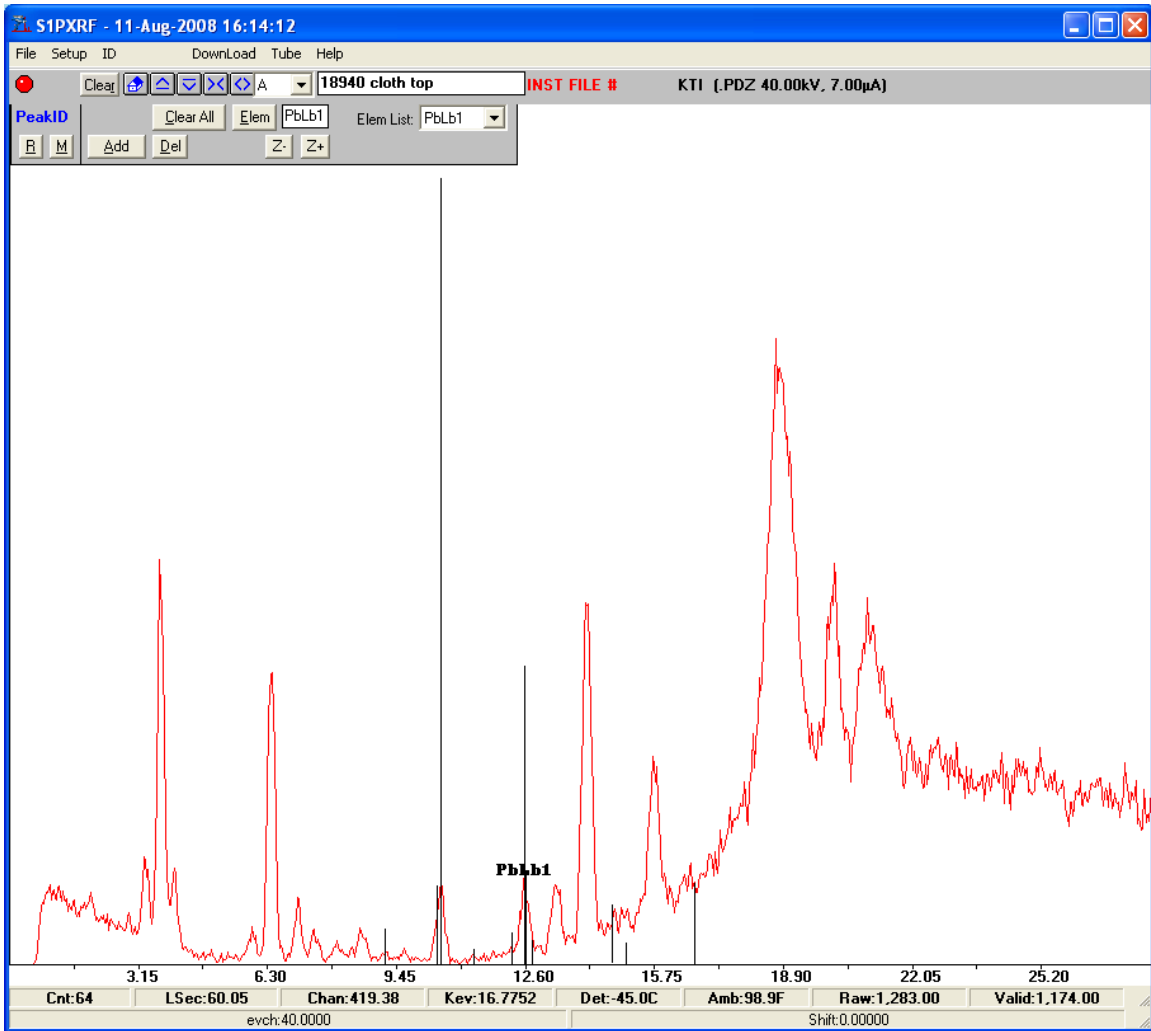
1. XRF spectrum of fabric attached to horn (066244.12).



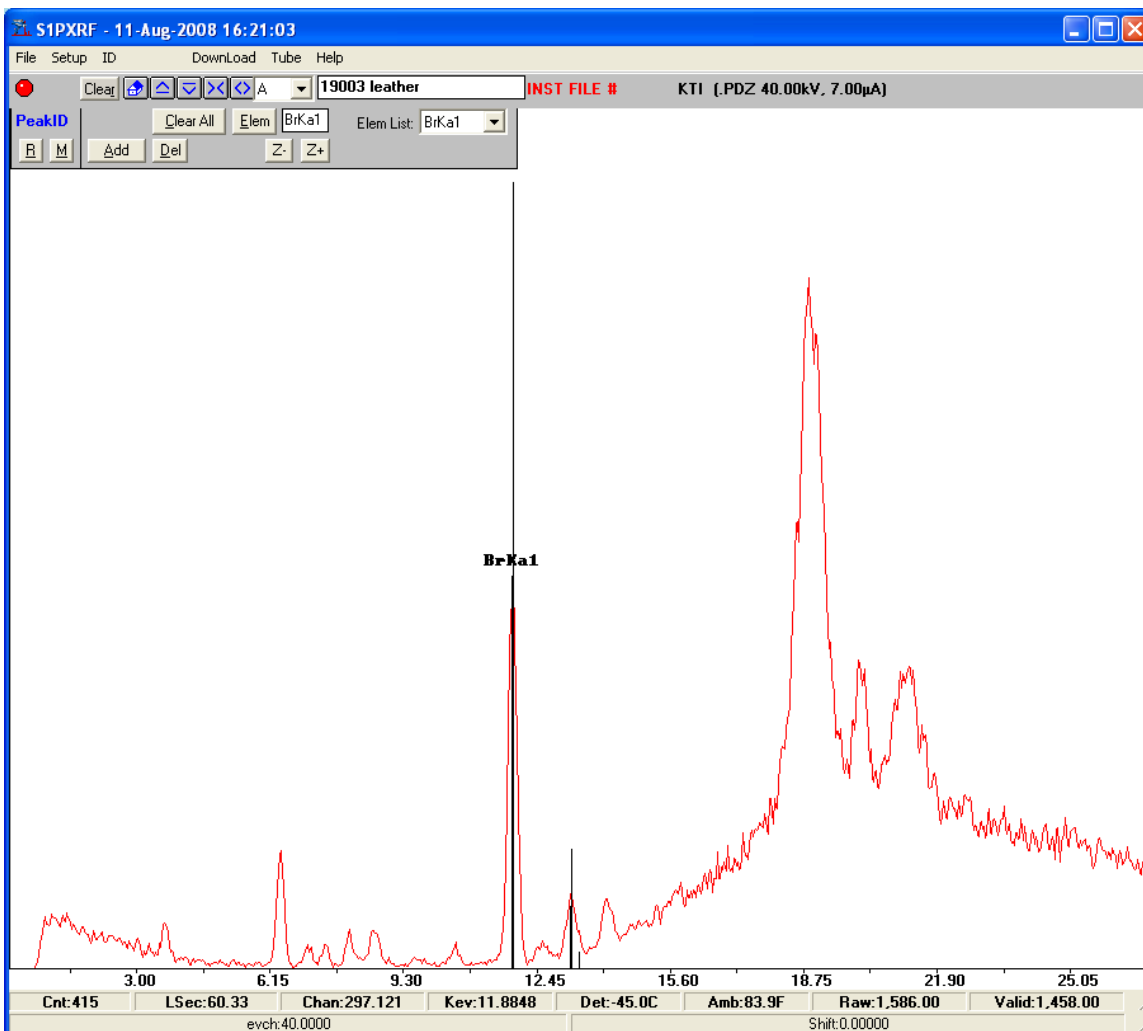
2. XRF spectrum of horn medicine (066244.15). Note large zinc peaks.



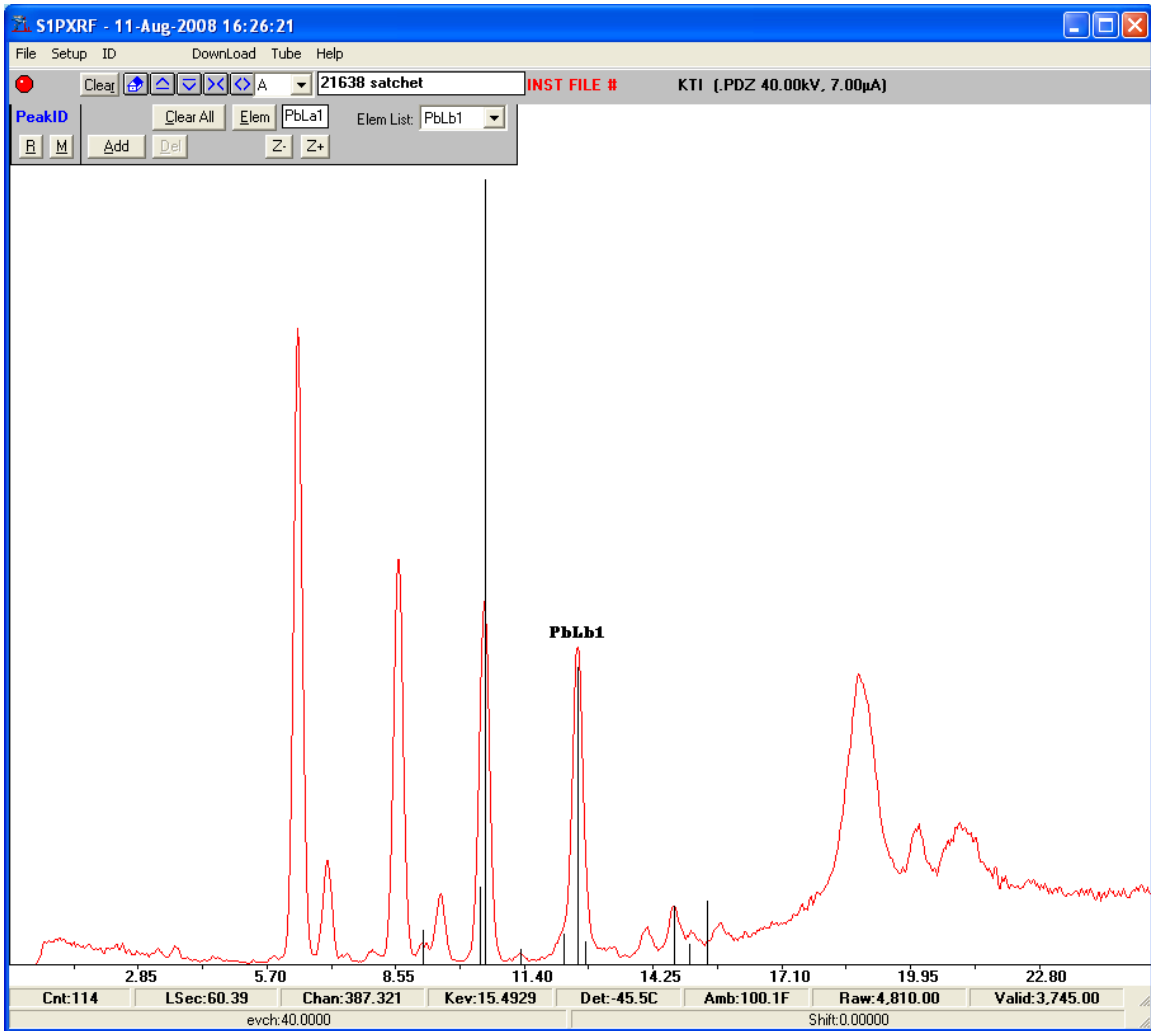
3. XRF spectrum of mermaid (066244.28). Note large arsenic and iron peaks.



4. XRF spectrum of fabric on horn (066244.40). Note lead and absence of arsenic.



5. XRF spectrum of leather on shell bracelet (06244.60). Note bromine peaks.



6. XRF spectrum of necklace (066244.62). Note high levels of lead, iron, zinc.