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**The Occurrence and Detection of Gunpowder in Haitian Vodou Charms;
The Pakèt Kongo.**

Abstract

This paper discusses the ethnographic manufacture and use of a class of Haitian Vodou spirit repositories called pakèt kongo charms, one of which was reported in a singular account to contain gunpowder. Supporting and ambiguous evidence for this claim is discussed through accounts by Vodou priests and priestesses, ethnographers, and with a review of Haitian Vodou literature, which describes gunpowder as a material associated with a class of spirits called *petwo*. This study answers questions of how best to characterize and detect gunpowder within the charms' enclosed bundles by testing the efficacy of x-ray fluorescence (XRF), x-radiography, and the explosive trace detection system (ETDS), finding that ETDS provided unambiguous results that revealed gunpowder in two out of three pakèt kongo charms. The stability of this object is discussed, as well as care and handling guidelines from a conservation perspective that take into account the preservation of intangible attributes as prescribed by Vodou ritual experts.

Preface to the text

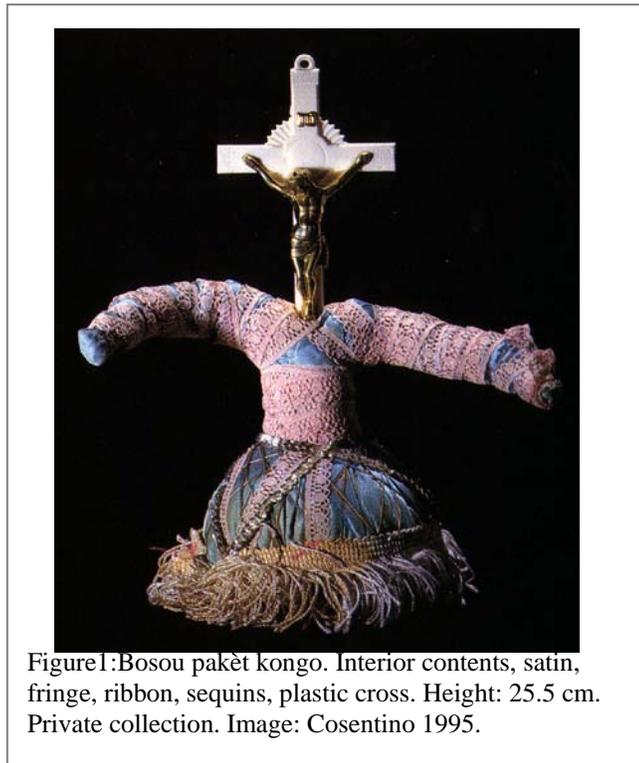
This work is part ethnography and part conservation; therefore a blending of writing conventions has been adopted, such as the use of first person perspective. Additionally this text makes use of words and terms from the orthography of Kreyol, which is essentially a phonetic spelling of French and English terms. There are multiple spellings of the word *Vodou*, such as *Voodoo*, *Vodun*, *Vodu*, as well as the name pakèt kongo, which is also spelled *pacquet congo*. The terms for spirits are spelled *Iwa* or *Loa*. Vodou ritual experts are called *mambo*, also spelled *manbo* if female, and *h'oungan*, or *oungan* if male. For the sake of consistency the Kreyol spelling convention for each term has been adopted throughout the text though all are considered acceptable.

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1.Introduction

Sometimes powerful objects that are also spirit repositories enter museum collections, and while they may contain materials with sacred properties, rarely are they reported to contain gunpowder. These exact attributes are seen within a Haitian Vodou charm called the pakèt kongo, which is the focus of this study. Pakèt kongo charms are small, fabric enclosed decorative bundles containing secret powders and a protective spirit. A much-celebrated ethnographer and professor of Art History at Yale, Robert Farris Thompson, published a descriptive text of his pakèt kongo charm's fabrication. In this text he describes how the enclosed spirit will provide protection for him, but even more compelling is his description of the use of gunpowder within the charm followed by the object becoming extremely hot (Thompson 1995).



It is certainly alarming from a museum collections perspective to read in a work of ethnography that a cultural object contains gunpowder, and since pakèt kongo charms have come to be museum collection items, their care often falls under the jurisdiction of conservators. The manifold aspects of the conservation profession include understanding, as much as possible, the composition of objects to inform their long-term care and survival. In addition, conservators are increasingly aware of intangible attributes, such as

enclosed spirits, that may be just as significant to preserve as physical forms. The pakèt kongo therefore presents an interesting problem; it is a fabric enclosed spirit-containing object for which there is no precedent of appropriate examination, with unknown potentially hazardous interior contents.

Pakèt kongo charms are little studied though they share many qualities with other sealed objects thought of as spirit repositories. This Haitian charm however, has the added interest of potentially containing an explosive element, a possibility that can only be understood through a review of the charms' origin in African culture, and through an understanding of its role in Haitian Vodou.

2. Research Questions and Methodologies

The question of whether or not gunpowder is present within the charm is an important conservation problem and can only be solved by seeking solutions to multiple interrelated questions that are simultaneously material, historic, intangible, and in some cases highly privileged. To begin this process, information was gathered from interviews with Haitian ritual experts, ethnographers, and seminal texts of Haitian Vodou. A more standard conservation approach paralleled ethnographic research by first comparing different methods for the accurate identification of gunpowder. An experimental methodology was then developed to detect the presence of gunpowder in enclosed bundles with X-ray fluorescence (XRF), X-radiography, and the explosive trace detection system (ETDS), which is a forensic method used primarily in control points such as airport security screening. The results of these analyses were evaluated for their ability to support or refute the claim of gunpowder use within these charms and how this might inform their care within museums.

This study afforded an opportunity to begin a dialogue with Haitian ritual experts, more popularly called Vodou priests and priestesses. I wondered if Haitian ritual experts would be willing to act as consultants in answering questions of the intangible, and how museum stewards can care for objects considered spirit repositories. Ritual Vodou experts were asked whether intangible properties and privileged information are

compromised by certain investigative and conservation activities, and these views have been included where appropriate throughout. All of these research questions were aimed at understanding and enriching the care practices of Haitian sacred art in museum contexts, while attempting to convey background information about Haitian Vodou to conservators.

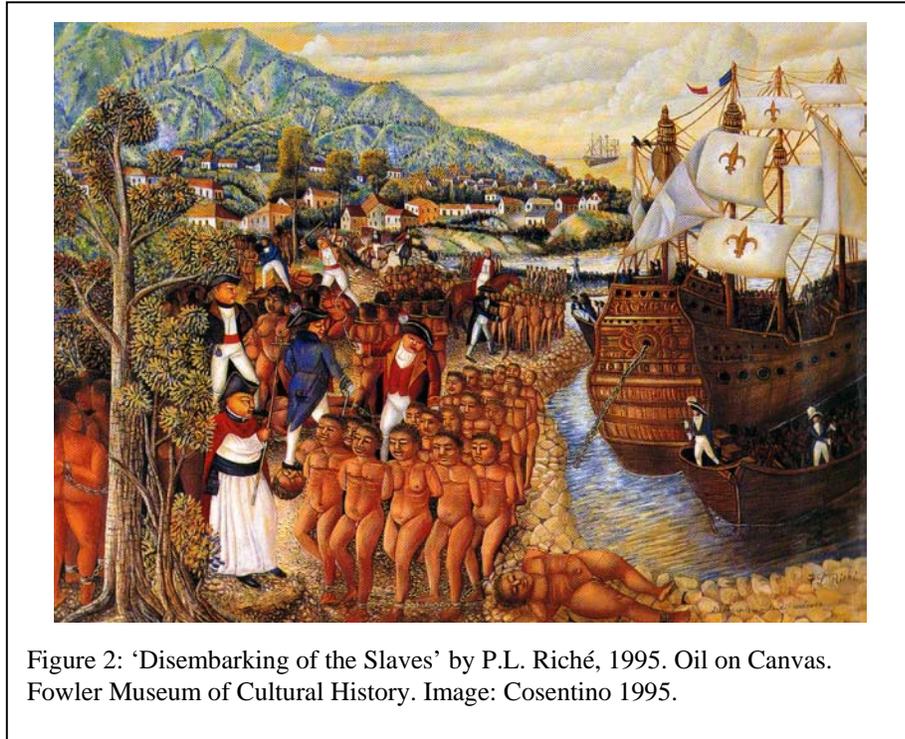


Figure 2: 'Disembarking of the Slaves' by P.L. Riché, 1995. Oil on Canvas. Fowler Museum of Cultural History. Image: Cosentino 1995.

3. The Pakèt Kongo Charm and Haitian Vodou

The fabrication and use of the pakèt kongo is intimately woven into a network of magic and beliefs formed within the lexicon of Haitian Vodou. Vodou is a dynamic and complex religion, and one that cannot possibly be unraveled within one short study. However, a brief history and overview of the religion is first necessary to make comprehensible the form, function, composition and use of this engaging charm.

“Truth is, Vodou is not a nice little religion. It’s not some charming variant of folk Catholicism or some New Age Afro-Wiccan hootenanny. It’s the spiritual expression of some seven million Afro-Creole people who assemble remnants from their glorious and horrid history into intensely corporeal constellations.” (Cosentino 1996)

The history of Haitian Vodou begins with the Atlantic slave trade of the eighteenth century, which forcibly brought together peoples from the West African territories of the

Kongo, Angola, Dahomey, Yorubland, Bamana and Mande (Thompson 1983). These enslaved peoples were brought to the colonial island of Haiti, known then as St. Dominique. Here a deep synthesis occurred between the traditions of Haiti's indigenous population, Catholicism and the main forms and tenets of the classical West African religions, that also fabricated spirit repositories called *nkisi* (*minkisi* pl.) (Thompson 1983, Deren 1970). All of these influences culminated in a Kreyol religion known today as Vodou. The word Vodou is African in origin and is translated to mean god, spirit, or sacred object (Wilmet and Wilmet 1977).

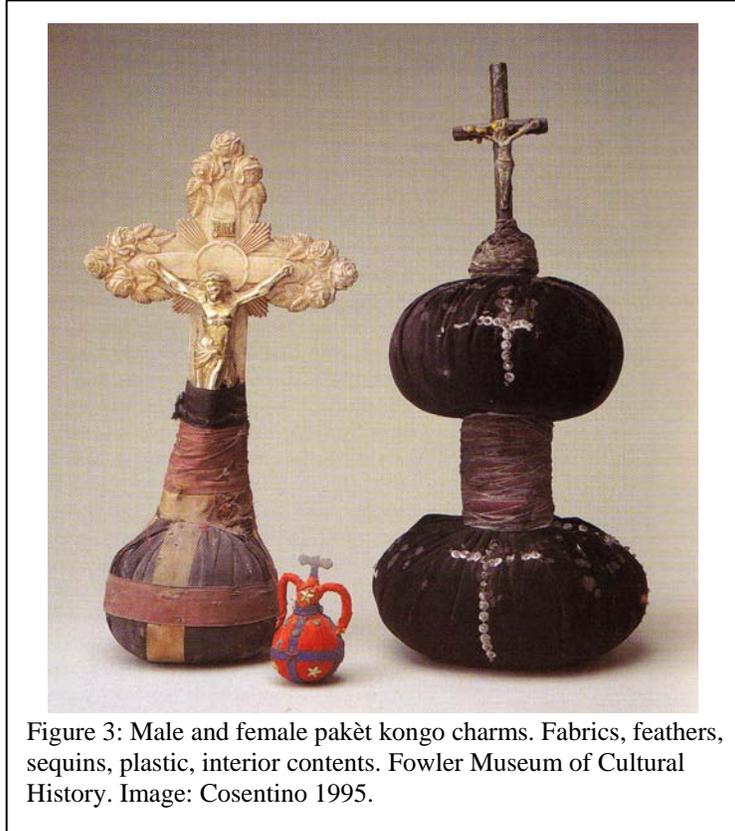
Vodou has distinct “hot” and “cool” sides also called “nations,” representing continuity with African medicinal and spiritual traditions. *Rada* is the cool side of Vodou, and these spirits are associated with the achievements of peace and reconciliation, finding their origin on the coast of what is now the republic of Benin.¹

Of particular interest to this study is the “hot” side of Vodou, called *petwo*. *Petwo* spirits find their origins in the Kongo, and they are reputed to like gunpowder, which is exploded as a call to these spirits, especially when cooler *Rada* cures have failed to work (Metraux 1972, Thompson 1983). *Petwo* spirits are hot, red, powerful, quick, and angry, and may be contracted to serve as patrons or allies for a price (Cosentino 1998). This “hot” side of Haitian Vodou is also considered a New World invention, inspired by resistance and born out of slavery in Haiti (Deren 1970, McAllister 1995).² The spirits of *petwo* power are said to make things burn in a positive sense, and they are associated with the spiritual fire of charms for healing (Thompson 1983). Therefore, it is not uncommon to find a display of *pakèt kongo* charms on *petwo* altars, thereby providing an unambiguous connection of Kongo roots with the hot *petwo* side of Haitian Vodou. These connections between the hot and fiery, gunpowder summoning *petwo* spirits and their

¹ The country, Dahomey was renamed the Republic of Benin in 1975. The name *Rada* is so called after the after the slaving designation for persons abducted from Arada, on the coast of Dahomey (Thompson 1983).

² This last sentiment is echoed in the stories told to children who hear that the Haitian revolution (1791-1803) was begun with a *petwo* ceremony in Bois Caiman. R.F.Thompson, *Flash of the Spirit; African and Afro-American Art and Philosophy*. (New York. Vintage Books, 1983).

Kongo roots, can be seen as further support for the presence of gunpowder in the pakèt kongo charms.



Pakèt kongo charms are made for Vodou practitioners at the higher levels of initiation, which can be seen as bench marks to accessing divinity. Vodou practitioners engage in a series of ritual steps, or initiations that escalate the intensity of an individual's involvement with the spirits, more commonly called *Iwa* (or *Loa*) (Fleurant 1996, Brown 2001).³ The ritual steps are aimed at an exchange where the person commits to the service of the spirits or *Iwa*, and in return the *Iwa* offer relief and protection (Brown 2001). For those who move to the upper levels in initiation, this means mastering the art of possession trance (Brown 2001). The *Iwa* are called during these instances to prescribe

³ These protective and sometime vengeful spirits are divided roughly into three distinguishable groups. One group of spirits is the ancestors, called the *mo*. Then there are the divine twins, called *mawasa*, and the mysteries, *miste*, who are more commonly called the *loa*. Fleurant, G. *Dancing Spirits; Rhythms and Rituals of Haitian Vodun, the Rada Rite*. (Greenwood Press, London. 1996), and Brown McCarthy, K. *Afro-Caribbean Healing: A Haitian Case Study*, Olmos and Paravisini-Gebert (eds). (Palgrave New York, 2001).

treatments for illness, and to advise on planting and marriage, and on affairs in general (Deren 1970). Supernatural insight is marked by these stages of initiation coinciding with a special quality of mind referred to as *konesans* (knowledge), which includes knowledge of rituals, preparation of magical powders, openness to communication with the *Iwa*, and spiritual wisdom (Olmos 2003).



Figure 4: Male pakèt kongo charms. Fabrics, feathers, sequins, interior contents. Fowler Museum of Cultural History. Image: Cosentino 1995.

There are four stages of initiation possible, and it is the last two stages in which the pakèt kongo is made for initiates (Brown 2001). When a person is initiated *sou pwen* (on the point), three pakèt kongo charms are made for them. The fourth and final level is called *assògwe*, literally “with the asson.”⁴ At this stage of initiation seven pakèt kongo are given and the person is licensed to begin practicing as a healer (Brown 2001, Racine Sans Doubt 1999). Once a healer they are called *oungan*, if male, and *manbo* if female. This process of elevated sacred knowledge and the acquisition of empowered objects is a strategy also seen in African communities, where the arts directly relate to privileged knowledge (Nooter 1993).

⁴ The beaded rattle that gives priests and priestesses some measure of leverage in the spirit realm. Brown McCarthy, K. *Afro-Caribbean Healing: A Haitian Case Study*, eds. Olmos and Paravisini-Gebert. (Palgrave New York, 2001).

4. Manufacture and Use of Pakèt Kongo Charms: The Secular and the Sacred

As previously stated, the pakèt kongo charms are made for Vodou initiates, but in contemporary times are also made in secular contexts. Due to their decorative qualities they are made for tourists and thought to contain only earth.⁵ Other pakèt kongo charms are available via online retailers where Haitian music and spiritual remedies are promoted. These charms typically have herbs and spices advertised as their interior contents.⁶ Alfred Métraux an ethnographer of Haitian Vodou working around 1941 described the use and fabrication of pakèt kongo charms in sacred contexts, where he noticed the charms occurring in every sanctuary and was assured that they were used in ‘treatments’ where they are passed over the bodies of the ill (Métraux 1972).

5. Use of Gunpowder in *Nkisi* and Pakèt Kongo Charms: Activating Spirit Repositories.

Métraux’s early ethnographic accounts do not contain reports about the identification of specific powders used in the pakèt kongo. However, great interest has been taken in understanding and identifying a majority of the contents used within related, spirit repository objects called *nkisi* (*minkisi* pl.), believed to be the African predecessor of the pakèt kongo (Figure 5 left). *Nkisi* objects originated in the Kongo, ancestral home of the fiery *petwo* spirits and in fact the name “pakèt kongo,” departs from the classical Kikongo language for *nkisi* (Thompson 1995). Both pakèt kongo and *nkisi* charms rely on animating ingredients and ritual action for entrapping spiritual forces to encourage some form of protection or service to either a community or an individual (Jansen and MacGaffey 1974, Thompson 1995).

⁵ Personal communication with Katherine Smith 10.11.08.

⁶ For reference to use of “herbs, plants, animal essence, objects, etc” see: www.sosyetedumarche.com. Accessed 7.10.2009.



Figure 5: (Left) Kongo *nkisi* with mirror on its belly, and interior contents. Fowler Museum of Cultural History. (Right) Female *pakèt kongo* on a Kongo altar in Haiti. Bureau of Ethnography, Port-au-Prince, Haiti. Images: Cosentino 1995.

The *nkisi* and the *pakèt kongo* charms both have protective and secret medicinal contents concealed in wrapped bags, cloth, or other containers located at the navel of an anthropomorphic figure, and they both have been cited to contain gunpowder (Figure 5). Further links between the two objects can be seen in the methods of animating the spirit within. The *nkisi* is brought to action by agitating it with explosions of gunpowder, reminiscent of the methods undertaken to invoke *petwo* spirits in Haiti (Mellor 1997).⁷

The *pakèt kongo* charm is not agitated into action, but rather waved over open flames as a final step in activating the entrapped spirit.⁸ Music and other methods to activate spirit repositories are described in Vodou literature, though the most striking account is by ethnographer Robert Farris Thompson, who in 1970 had a small *pakèt kongo* made for him by an *oungan* named Loudovique Elien while possessed by a *petwo* spirit Danje-Male (Lord of Danger-Disaster) (Thompson 1995). He described the process as follows:

⁷ The *nkisi* are also annoyed into action by the use of derogatory remarks about its mother-in-law, as the *nkisi* are considered members of the community. Mellor, Stephen P. "The Exhibition and Conservation of African Objects: Considering the Non-Tangible." *Journal of the American Institute for Conservation* 31 (1997):3-16.

⁸ Personal communication: Mama Lola 5.29.2009.

“Helpers brought in red cloth, black thread, a coin and three powders. They spread the powders in three neat piles upon the table. Danje explained the French coin ‘to bring me money.’ He laid this piece of silver at the center of the square of red. He mixed the three powders (apparently sulphur, saltpeter, and nitre)⁹ and tightly bound them with the cloth with the black thread, using the coin as the base and center. Then he vigorously bound up a tiny stem at the top of the charm, wrapping and wrapping it with strong black thread. He finished with a flourish, the binding of the stem, biting of remaining thread and making a final tie. Meanwhile, the combination of the three ingredients within the bag had started a chemical reaction generating heat. Danje held this literally “hot point” within his right fist tightly. Vapors emerged from the cracks between his fingers....Then he gave the *pwen* to me. Not having submitted to Kanzo, the Vodou initiates’ learning to handle heat, the burning was too much for me....Then blessing me, he told me “this is *pwen cho*, he will protect you. Feed him perfume every Monday” (Thompson 1995).

Thompson goes on to describe how the smell of gunpowder, honey and medicine remained. This description of the use of gunpowder, and of the physical heat emanated by the charm, insinuated that the materials within the bundle are explosive. The knowledge that over fifty of these objects are in storage at the UCLA Fowler Museum, as well as several other cultural institutions¹⁰ raised concern for the stability of this object in addition to its safety within a collection.

As I could not understand how the charm was not completely consumed by the heat described by Thompson, I consulted with ethnographers, including Thompson, as well as *manbo* and *oungan* concerning the use of gunpowder in *pakèt kongo* charms.

6. Interviews with Manbo’s, Oungan’s and Ethnographers

A *manbo*, named Racine Sans Bout Satela Dagenin, offered the following response to questions about the use of gunpowder and if heat is generated within the charm once it is created.

⁹ Saltpeter and nitre are both names that refer to potassium nitrate, KNO₃. Charcoal is needed to produce gunpowder.

¹⁰ These charms are in museum collections at the Museo Nacional de Antropología, Madrid, Milwaukee Art Museum, The Historical Museum of Southern Florida, Musée d’art Haïtien du Collège St.Pierre, The Museum of Haitian Art, Haiti, and in many private collections.

“Gunpowder is sometimes used in Vodou magic, and if combined with certain other substances a chemical reaction can result. The *oungans* don't know what the chemical reaction is, they probably don't even know what a chemical reaction is. But they know what this particular reaction does, so they use it.”¹¹

Erol Jouse is an *oungan* working in Miami, who when asked about the use of gunpowder inside of the *pakèt kongo* provided the following: “If they use gunpowder, I don't think it's a lot. They might be using it because the *petwo* societies are very hot spirits. But for myself, as a *oungan* priest I can say nothing about the inside of the *pakèt*.”¹²

Mama Lola, a much-celebrated *manbo* working in Brooklyn, NY. denied quite vehemently the use of gunpowder in the *pakèt kongo* charms that she makes, stating that she uses “magical powders” that she prepares for seven days.¹³ UCLA ethnographer Katherine Smith said, “in some instances people may not give the name directly of an herb or thing, because it's too powerful. So they will give the name of something else that may be related somehow.”¹⁴ It is unknown to me if gunpowder is one of these powerful words, but the question of its presence within the charm elicited general discomfort.

Questioning Thompson about the physical heat produced by the charm once it was bound resulted in a rather surprising answer from the ethnographer: “The *oungan* laughed at my mortal inability to handle spiritual heat. The heat was internal there was no fire.”¹⁵

Despite the fact that there was no actual fire, rather an intangible spiritual fire, the citation by Thompson and others as to the use of gunpowder within the charms informs the second part of the research, which is to identify and characterize gunpowder, followed by understanding how best to non-destructively detect it within an enclosed bundle.

¹¹ E-mail correspondence with *manbo* Racine Sans Bout Satela Dagenin 1.26.09.

¹² Personal correspondence with *oungan* Erol Jouse 2.2.09

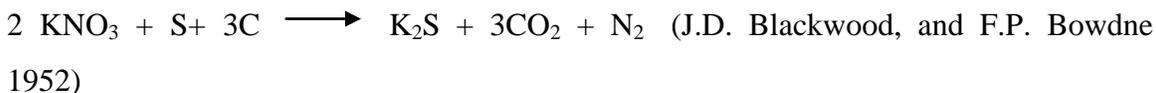
¹³ Personal correspondence with *manbo* Mama Lola 6.3.09

¹⁴ Personal correspondence with ethnographer Katherine Smith 10.27.09

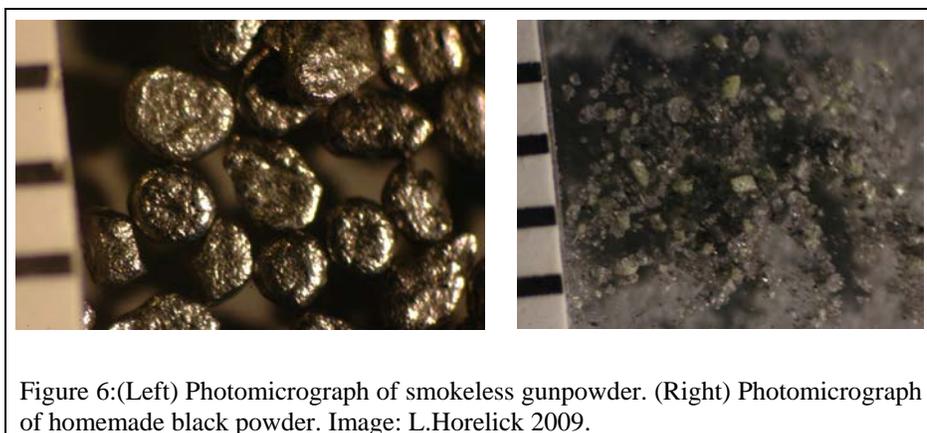
¹⁵ E-mail correspondence with ethnographer Robert Farris Thompson 1.26.09

7. Black Powder and Smokeless Gunpowder: Analysis and Results

Two types of gunpowder exist, one is generally referred to as black powder and is roughly what Thompson (1995) describes in the fabrication of his pakèt kongo. Black powder is made by grinding together a mixture of 70% potassium nitrate, 10-12% sulphur, and 1-12% charcoal in the stoichiometric proportions to satisfy the equation:



In the 19th Century smokeless gunpowder came to replace black powder due to its greater force at propelling bullets, and complete combustion into gasses while producing very little smoke (Wilkinson 1966). This material is composed primarily of nitrocellulose and additives such as graphite, calcium carbonate, potassium nitrate, tin, bismuth and lead (www.reloadbench.com). The resulting mixture is shaped by extrusion, and the granules produced are screened to ensure consistency (M.Heramb and Bruce R. McCord 2002).



Samples of both pure smokeless gunpowder and black powder were acquired for characterization. Smokeless gunpowder was purchased through an ammunition retailer, and the author made black powder with the aforementioned ingredients in the appropriate proportions, referred to hereafter as homemade black powder. Both explosives were examined with polarized light microscopy (PLM), X-ray diffraction (XRD), Fourier Transform Infrared spectroscopy (FT-IR), X-ray fluorescence (XRF) and micro-chemical spot testing. The analysis aimed to find the most diagnostic methods to characterize this material. Access to samples is implied throughout this testing. The analysis did not attempt to identify these materials in a mixture with other powders, which is how they

would most likely be distributed within pakèt kongo charms. The results of this analysis are summarized in table 1.

Table 1: Summary of techniques and results of analysis of two types of gunpowder.

Technique	Homemade black powder	Smokeless gunpowder
Visual inspection of particles.	Irregularly shaped crystalline and small granular particles ranging from black to light yellow.	Individual rounded non-crystalline pellets with shallow surface texture and metallic luster.
PLM	Difficult to distinguish between KNO_3 and S in dispersion. Charcoal is identifiable.	No results: can't be crushed for dispersion due to process of molding and extrusion to create uniform pellets.
FTIR	Detection of KNO_3 Characteristic frequencies at 1500-1250 and 850-700 cm^{-1} . Sulfur and charcoal have bands detectable with Rama, but this was unavailable for this study.	Match with cellulose nitrate. Characteristic absorption bands between: 800-890, 900-1300, 1625-1660 cm^{-1} No absorption between 3200-3600: no water present in gunpowder.
XRD	Identifiable peaks for KNO_3 and sulfur. Charcoal is too amorphous for detection.	No results: non-crystalline material.
XRF	Al, S, K, Ca, Fe, Cu	Al, S, K, Ca, Fe, Cu
Diphenylamine spot test for nitrates.	Strong positive: blue precipitate.	Strong positive: blue precipitate.
Iron II Sulfate micro-chemical spot test for nitrates.	Not possible to determine, as the dark black of the charcoal obscures observation of positive indicator (brown ring around sample).	Positive: brown ring around the sample.

The best characterizing methods for gunpowder, when access to samples is permissible, are visual inspection of particles, and the spot test for nitrates using diphenylamine.¹⁶ XRF yielded identical elements for both types of gunpowder, though the peak counts differ and the elements identified are not exclusive to gunpowder.¹⁷

9. Study Collection of Pakèt Kongo Charms

In a condition and typology survey conducted of fifty-one pakèt kongo charms at the UCLA Fowler Museum, it was noted that only two objects had significant tears in the

¹⁶ Procedure consists of mixing a reagent solution of 0.9 mL of concentrated sulfuric acid to 1mL of water. 0.05g of diphenylamine is added and a drop of this solution on the sample will give a strong blue color if nitrate is present. Odegard, Carroll and Zimmt. *Material Characterization Tests for Objects of Art and Archaeology* Second Ed. (Archetype Publications, 2005).

¹⁷ The presence of calcium and iron found through XRF are most likely impurities from the charcoal in the homemade black powder. The presence of these elements in the smokeless gunpowder is not unusual, as there are many additives in this material. The presence of copper is most likely due to the copper filter on the XRF used throughout the spectra acquisitions to enhance the detection of lighter elements.

fabric thereby exposing interior contents. These survey results stressed the importance of finding non-invasive methods to detect gunpowder in the enclosed bundles. To begin this testing a collection of charms was assembled from the secular and non-secular contexts from which the charms can be made.

Three *pakèt kongo* were loaned from the UCLA Fowler Museum upon completion of the survey (Figure 7).

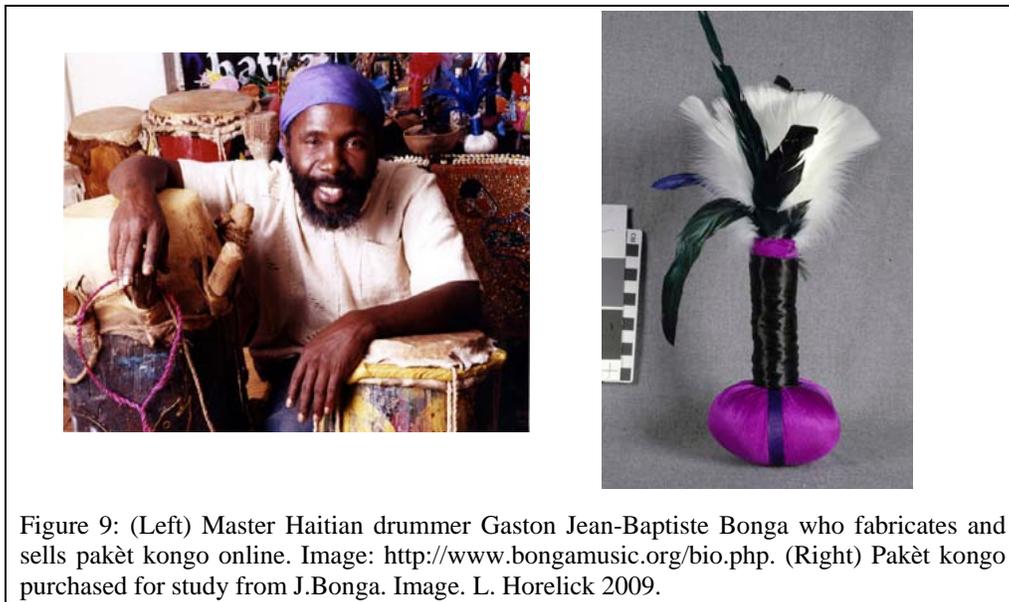
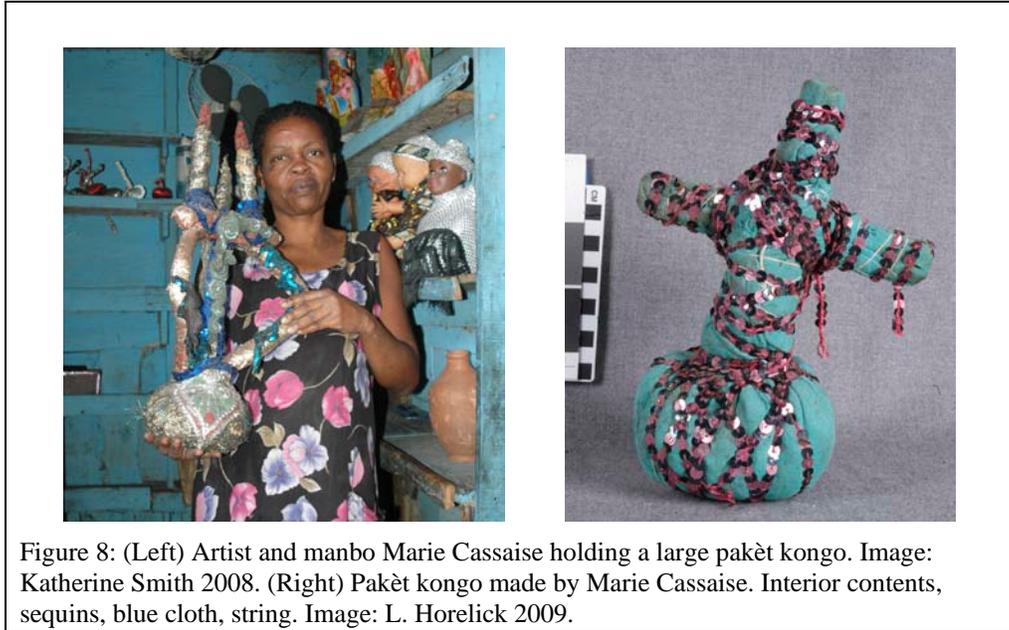


These three UCLA Fowler Museum objects were purchased for the 1995 “Sacred Arts of Haitian Vodou” exhibition from *oungan* Silva Joseph, who lives and works in Port-au-Prince. Silva Joseph's charms represent collection material from non-secular contexts. Two of the charms were part of his *petwo* altar and one was from his *bizango* altar.¹⁸ The choice of two red charms was informed by the accounts of reds in association with the hot *petwo* spirits and two objects [x93.42.15 and x94.60.41] have partial or total breaks to the fabric thereby exposing interior contents.

Katherine Smith, a UCLA ethnographer of Haitian Vodou, purchased a blue sequined studded charm in Port-au-Prince's Iron Market in 2008 from artist and *manbo* Marie

¹⁸ “Bizango” also called Sanpwèl is a secret society in Haiti. Cosentino, D. (ed.) *The Sacred Arts of Haitian Vodou*. (Los Angeles, UCLA Fowler Museum Press, 1995).

Cassaise, which was generously donated for study (Figure 8).¹⁹ One pakèt kongo was purchased online from master Haitian drummer Gaston Jean-Baptiste Bonga who fabricates and sells pakèt kongo charms (Figure 9). I made two replica objects with known quantities of gunpowder and one was made containing only earth.



¹⁹ Personal correspondence with Katherine Smith (4.6.2009). The Art of Marie Cassaise and Pierrot Barra is discussed in Donald Cosentino's book "Vodou Things" 1998 University Press of Mississippi, Jackson."

Aside from Thompson's description of the contents of the pakèt kongo there is very little published information concerning what materials are used in this charm. The Vodou priestess of Brooklyn, Mama Lola, offered a vague reference to "magic powders", and Katherine Smith witnessed earth being inserted into pakèt kongo charms made for tourists. Mambo Racine Sans Doubt stated: "they are made of pounded spices and other items", and this is "information owned by the initiates of any particular peristyle"²⁰ which is another term for a place of worship. These statements support the ideas of secrecy and privileged knowledge in Haitian Vodou, but what can be extracted is the knowledge that each pakèt kongo is made according to individual sets of instructions, hence the need to examine each with analytical means to identify the presence of gunpowder.

10. Analytical Techniques Used to Determine the Presence of Gunpowder within Enclosed Bundles

Elemental analysis using X-ray fluorescence (XRF), imaging with X-radiography, and ion detection using the explosive trace detection system (ETDS), were the three analytical techniques experimentally used to try to detect gunpowder within the charms.

10.1.XRF

Surface analysis was conducted with a Bruker[®] handheld XRF on four sides of each pakèt kongo in the study collection. Areas were analyzed for 300 seconds at 15kV and 12 μ A. The results of this analysis revealed elemental similarities throughout. These results are summarized in table 2. Sulfur and potassium, which are elements shared with both types of explosives occur at random throughout the entire collection including the charm purchased on-line from Gaston Jean-Baptiste Bonga who informed me that gunpowder would not be used in the charm.²¹ However, we can see that both potassium and sulfur

²⁰ Manbo Racine Sans Doubt went on to say "I am not going to list all the ingredients for you, if you want to know, you become a Vodou initiate in my house and then I will teach you everything." E-mail correspondence 1.28.09

²¹ I was told that no gunpowder would be added as I was not going to be initiated. Personal communication with Jean-Baptiste Bonga 10.15.09.

occur in this charm despite the fact that it does not contain explosives. This result was also obtained in the replica containing only earth.

Table 2: Summary of results from surface analysis using XRF in different locations throughout the pakèt kongo bundles. Elements have been transcribed with respect to their atomic weight from lowest to highest. Elements, such as potassium (K) and sulfur (S) that are shared with gunpowder are in bold.

Location	X94.60.41 	X93.42.15 	X94.60.27 	K. Smith 	J. Bonga 
Bottom	Al, Ca, Ti, Fe, Cu	Al, K , Ca, Ti, Fe, Cu			
Side 1	K , Ca, Fe, Cu	K , Ca, Fe, Cu	K , Ca, Fe, Cu	Cl, Ca, Cr, Fe, Cu	Al, S , K , Ca, Ti, Fe, Cu
Side 2	K , Ca, Fe, Cu	K , Ca, Fe, Cu	K , Ca, Fe, Cu	Al, S , Cl, K , Ca, Cr, Fe, Cu	Al, S , K , Ca, Ti, Fe, Cu
Side 3	Al, Cl, K , Ca, Ti, Fe, Cu	X	Al, Cl, K , Ca, Ti, Fe, Cu	Al, Cl, K , Ca, Ti, Fe, Cu	Al, S , K , Ca, Ti, Fe, Cu
Opening	X	S , K , Ca, Fe, Cu	X	X	X

The problem of overlapping elements found in explosives as well as “magic powders” illustrates a fundamental issue of using XRF to identify the presence of gunpowder. This technique does not provide unambiguous identification of explosives, though characteristic peaks are present. The ambiguity of the results stressed the need to use other methods of analysis commonly used by conservators to help identify gunpowder within the charms.

10.2. X-radiography

Radiography was chosen next because it is also a non-invasive and non-destructive technique that can reveal information hidden from visual examination (O’Connor and Brooks 2007). However, it is unknown if this technique would amount to a type of desecration of the object, as things intentionally hidden within the bundles would be revealed. Due to this concern, *manbo*, *oungan* and ethnographers were asked if it was

acceptable and ethical to X-ray the charms to see what is inside with the express purpose of attempting to determine if the particles of gunpowder could be distinguished within the bundles.

“The *Iwa* are considered to be living entities, like you and me, and I don’t see why they shouldn’t be subjected to the same things that we are; we get X-rayed, so they can too.”²²

This was the response given by ethnographer Don Cosentino when asked about whether or not it is ethical to take X-rays of pakèt kongo charms. Ethnographer Katherine Smith stated that knowing what’s inside does not mean you know the secret to how it works; rather it’s the magic that makes it powerful.²³ This sentiment was echoed by Max Beauvoir, an *oungan* in Haiti, who felt that “X-rays should not harm the pakèt kongo since the energy used by these pakèts are spiritual and not material, it should be indifferent to matters of wavelengths.”²⁴ Mama Lola gave a quick response of “totally acceptable,” concerning the use of X-rays.²⁵ *Oungan* Erol Jouse did not give a direct response, but he indicated that the contents are secret and only the *oungan* making them can know what’s inside.²⁶

Although radiography proved to be acceptable to Vodou, it was not diagnostic for identifying gunpowder. In a comparison between a layer of smokeless gunpowder and the homemade black powder, two very different radiographic images resulted (Figures 10.A and 10.B). The polymeric nature of the smokeless gunpowder revealed homogeneity in particle density and shape at a low Kv of 22, but became invisible at 25 Kv. The homemade black powder revealed variation in particle density, and became invisible at 25 Kv as well. The point at which the gunpowder is no longer visible coincides with a lack of penetration of the bundle, with the exception of locations around the edges

²² Personal communication with Max Beauvoir 5.21.09

²³ Personal communication with Katherine Smith 5.21.09. This statement was informed by accounts written by ethno botanist Wade Davis, who was researching powder used for making zombies in Haiti. Apparently his informant never believed that Davis could re-create the powder devoid of the magical element. Davis’ work was later turned into a Wes Craven horror film, “The Serpent and the Rainbow.”

²⁴ E-mail correspondence with Max Beauvoir 5.25.09

²⁵ Personal communication with Mama Lola 6.3.09

²⁶ Personal communication with Erol Jouse 2.19.09

(Figure 11.A and 11.B) At these edges it is possible to distinguish individual particulates, though there is no evidence to identify these shapes as either type of gunpowder.

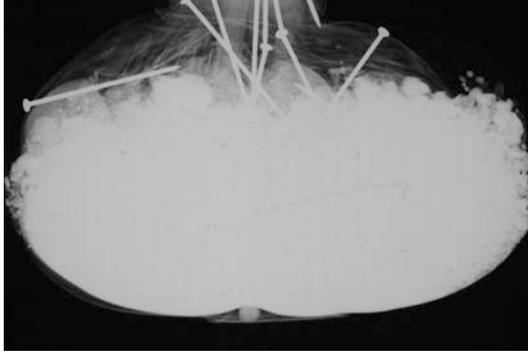


Figure 10.A. Pakèt kongo replica containing smokeless gunpowder imaged at 22Kv, 60s, 4.8Ma. Note small particles visible at the edges, compared with the image at right of a layer of smokeless gunpowder at the same Kv.

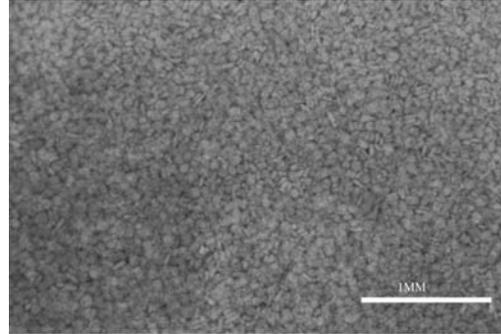


Figure 10.B. Photomicrograph of radiograph of smokeless gunpowder imaged at 22Kv, 60s, 4.8Ma. Note the homogeneity in size and density of this layer.

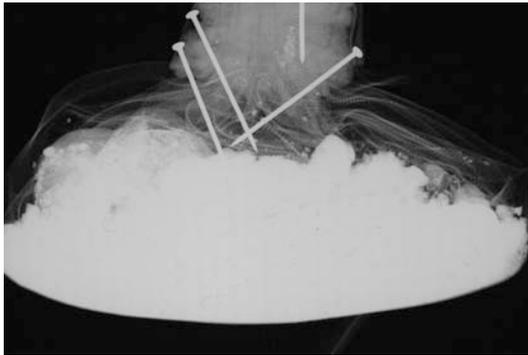


Figure 11.A. Pakèt kongo replica containing homemade black powder imaged at 22kv,60s,4.8Ma. Particles are barely visible through the bundle at this Kv.

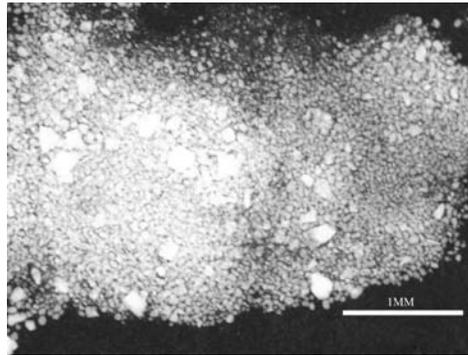


Figure 11.B. Homemade black powder imaged at 22kv,60s,4.8Ma. The particles show variation in density at this Kv, though at one higher they all become invisible. Images: L.Horelick 2009.

Based on the lack of concrete results from both XRF and X-radiography, a forensic technique called the explosive trace detection system (ETDS) was considered for use.

10.3. Explosive Trace Detection System (ETDS)

ETDS works on the principle of ion mobility spectrometry (IMS), which is coupled with mass spectrometry (MS). ETDS is capable of non-destructively detecting the presence of

gunpowder within concealed objects. It is commonly used as a sensitive screening technique deployed in control points such as airports and checkpoints and often makes an appearance on Crime Scene Investigation (CSI) television programs.



Figure 12. Sadly, no pakèt kongo charms have been featured on CSI. Image: L.Horelick 2009.

This technique presented an excellent opportunity for technology transfer to determine the presence of gunpowder within the pakèt kongo charms from the study collection. An organization wishing to remain anonymous was willing to assist with this project by providing the necessary equipment and conducting analysis on three different proprietary instruments.²⁷ Due to security and liability concerns, specific information concerning instrumentation and results, including spectral graphs and ion times of flights were not given, though a summary report was provided.

The anonymous source for conducting the EDTS analysis provided several sample trap swabs, which were described as a swatch coated with Teflon. This swatch is rubbed across the fabric of the object and then introduced to a proprietary instrument that heats the sample trap whereby the captured material is sublimated and ionized.²⁸ The mobility of the ionized molecules towards a target is measured under atmospheric pressure, and

²⁷ TSA was initially contacted, but my request was humorlessly denied. I did find that sending Belgian chocolates to the anonymous organization helped in fostering a relationship.

²⁸ Personal communication with anonymous source 2.18.09

will have a specific drift time or time of flight. These drift times are fundamentally related to the ion's shape and size which can then be characterized as specific to certain chemical species (Arnaud 2008). If the resulting ions are found in great enough quantity this will create a signal (either strong, medium or weak) for the presence of an explosive element.²⁹

It was recommended that each object be sampled multiple times for analysis with three different instruments of varying sensitivity: Instrument A possessed an intermediate sensitivity, instrument B has the greatest sensitivity, and instrument C is the least sensitive.

Table 3: Results of testing for the presence of gunpowder with ETDS. The pakèt kongo made by J.Bonga was not included as it was already known to not contain gunpowder. The replica pakèt kongo charms worked as controls for this study.

Object	Sample Number	Detection	Signal strength and Instrument Sensitivity A=Intermediate, B=Strong, C=Weak
	X94.60.41-1	No	None (A)
	X94.60.41-2	No	None (B)
	X94.60.41-3	No	None (C)
	X93.42.15-1	Yes	Weak (A)
	X93.42.15-2	Yes	Weak (B)
	X93.42.15-3	No	None (C)
	X93.60.27-1	No	None (A)
	X93.60.27-2	Yes	Medium (B)
	X93.60.27-3	No	None (C)
	K.Smith-1	Yes	Weak (A)
	K.Smith-2	Yes	Weak (B)
	K.Smith-3	No	None (C)

²⁹ Personal communication with anonymous source 2.18.09

Although the anonymous source could not provide hard data, the results from this testing confirm the presence of gunpowder in two out of three charms from the UCLA Fowler Museum collection. No positive results were obtained from the ETDS identified as the weakest instrument. The presence of gunpowder within the charm collected from the secular context of Haiti's iron market is a surprise, though equally compelling. The replica that contained the smokeless gunpowder (not pictured in table 3) returned a strong positive and strong signal, which did not result with any of the Haitian examples. Therefore it may be possible to infer that the smokeless type of explosive was not used in the study collection of pakèt kongo charms. While this is only an inference, it supports the use of black powder as described in the ethnographic account by Thompson (1995). Additionally, the UCLA Fowler Museum charms with positive signals are "dressed" in red fabrics, the color representative of *petwo* spirits.

What this study does not prove is how much gunpowder is used or how ubiquitous it is. Since these objects are part of museum collections and some may contain an explosive ingredient, do those that have gunpowder present a hazard? The remaining questions in this study revolve around determining if the objects are safe within a collection, and how best to care for them while taking into consideration their intangible attributes. This later question is answered through a collaborative approach in which Vodou ritual experts were consulted and asked questions about handling, storage and cultural restrictions.

11. Are These Objects Safe In Storage?

Research suggests that pakèt kongo charms do not present a risk of combustion due to many factors. First, black powder, as well as a smokeless gunpowder, are ignitable only if exposed to a flame, electric spark, shock, friction, or by heating to 270-300°C (518°F-572°F) (Schwartz and Salter 1904). Black powder can be prevented from exploding by the addition of fine powders, dust and incombustible substances, such as sand or powdered glass (Schwartz and Salter 1904). Gunpowder mixtures are quite stable at temperatures below the melting point of sulfur at 120°C (248°F), as at least one liquid phase is essential to initiate an ignition reaction (Blackwell and Bowden 1952).

From the ethnographic accounts of the fabrication of the pakèt kongo, we know that cemetery earth is often included, as well as an assortment of powders, which incidentally contribute to the inhibition of gunpowder combustion.

12. Storage and Handling Recommendations

Composite items are best stored in a well-controlled environment at fifty percent relative humidity, plus or minus ten percent (Rose 1992:152). A temperature range of 20-24°C (68-77°F) with light levels for display between 30-50 lux (3-5 foot candles) and no UV is recommended as general guidelines for composite objects (CCI Notes 2007). The objects should be stored on shelves lined with low-density polyethylene foam to prevent movement and abrasion of the fabrics while in storage. Gloves are recommended for handling these objects, and care should be taken to avoid being pricked by any pins. These are the guidelines from a standard conservation approach not taking into account the intangible. For this aspect of the long-term care, I turned again to consulting with Haitian Vodou ritual experts.

13. Collaboration: Preservation of the Intangible.

Haitian ritual experts, as well as ethnographers specializing in Vodou were given a survey of seven questions aimed at establishing ethical parameters for handling and examining Haitian sacred art with a special emphasis on the pakèt kongo charm. The list of questions can be found in Appendix A along with a brief description of those who participated in the survey. Only three ritual experts were contacted for this survey specifically, therefore there is certainly room for more inquiry.

The results of the survey showed much agreement among the participants who, on the whole, felt that museum standards of care, handling, and storage are “totally acceptable to Vodou.”³⁰ This sentiment includes no restrictions on handling and viewing by non-initiates, nor are there any gender restrictions. Max Beauvoir, considered in Haiti as the “Pope of Haitian Vodou,” indicated that when the charms are in their original context

³⁰ E-mail correspondence with Max Beauvoir 5.25.09

non-initiates should not handle the pakèt kongo, but once they enter the museum the “charm” is gone anyone can handle it as its desacralized; in Vodou this is called “*Biki*.”³¹

Beauvoir specified that the charms should never be held by their feathers, which he felt could be replaced with the appropriate colors if necessary. There was consensus as to how to care for the objects if the fabric is torn compromising the aesthetics. All participants indicated that a new “suit of clothes” with appropriate colors could be placed over the old fabrics. Erol Jouse stated that sometimes the interior contents can be “refreshed” and the pakèt is then “re-dressed”, but only ritual experts can do this. Further questions as to the appropriateness of conservation activities such as taking samples to answer research questions, or placing the objects in anoxic environments in the event of insect infestations was given the O.K by Beauvoir, but these questions were largely avoided by other participants, perhaps due to factors such as language barriers or the foreignness of the request.

All three Vodou ritual experts indicated that the charms should be protected from dust and direct sunshine. Erol Jouse stated that in Haiti, the charms and other ritual objects are sometimes temporarily moved from altars and placed in an enclosure called a “mal zinc” described as a large wooden trunk or box.³² All participants took no issue with the current storage conditions at the Fowler Museum, where they are stored in a climate-controlled environment in the dark, and on lined shelves.

One of the most striking discussions with the participants related to questions of the intangible attributes of the pakèt kongo charm. While Beauvoir indicated that the objects are “*biki*”(desacralized), both Mama Lola and Erol Jouse stated that the spirits could come back to the charm if the objects are shown respect. “Light a candle for them and pray to them” was the advice of Mama Lola, further echoed by Erol Jouse. He also suggested that the objects be taken out of storage at least twice a year and have candles lit

³¹ E-mail correspondence with Max Beauvoir 5.25.09

³² Personal correspondence with Erol Jouse 2.2.09

for them. Both Mama Lola and Erol Jouse indicated that the spirits can “walk away or evaporate” if not shown respect.

All of these activities to bring the spirit back to the charm rather exceed what museum conservators are trained to do. However, all the ritual experts contacted expressed an interest in participating in the care of these objects: either by contributing prayers or re-dressing and re-freshing them. This willingness to collaborate may contribute to the growing body of information on the preservation of both tangible and intangible attributes of Haitian sacred art in museum contexts.

14. Conclusions

The thrust of the study was inspired by the observation of ethnographer Robert Farris Thompson who witnessed the placement of gunpowder within a pakèt kongo being made for him. Experimental means of non-invasive analysis using XRF, X-radiography and ETDS were undertaken to investigate this claim, finding that ETDS provided unambiguous detection of gunpowder. While it is unknown how much gunpowder may be in the charms, research suggests that these objects do not possess a threat to themselves or surrounding collection material due to the combustion parameters of gunpowder in these composite objects. The preservation of intangible aspects of Haitian sacred art were discussed, finding that once spirit-containing objects enter museum collections, the spirit will leave, but can return through continued ritualized behavior.

Appendix A: Survey Questions and Participants

1. Do you find it objectionable to take x-rays items of Haitian sacred art, such as the pakèt kongo?
2. Should the pakèt kongo, or other objects considered spirit repositories, be viewed and or handled by non-initiates or practitioners?
3. If a charm is created for a specific person, and it is sold to a museum collection does it still maintain the function that it was imbued with when originally created? Can the charms original function be restored to it when not in its original context?
4. Would you find it objectionable to take samples of material for analysis to answer research questions? An example would be removing feathers from the charms to determine bird origin.
5. Should ritual experts be consulted when issues of the physical stability of pakèt kongo is in question? An example would be if the fabric is torn and the interior contents are coming out.
6. How would repairs, or aesthetic re-integration (such as mending or adding feathers) by individuals outside of the religion be viewed. Should aesthetic repairs only occur in the context of the originating culture?
7. Many museum objects are stored on shelves in the dark with a controlled climate. Do you find this to be an acceptable way to store Haitian cultural objects?
8. When museum collections are found to have insect infestations, materials are placed in an oxygen free environment for some time to kill the insects at all life stages. If the pakèt kongo were placed in an oxygen deprived environment to stop insect infestations, would you find this acceptable or unacceptable.

Survey Participants:

Mama Lola was born in Haiti and now lives in New York where she is known as the Vodou priestess of Brooklyn. She is the subject an extensive ethnography by Karen McCarthy Brown.

Max Beauvoir is known in Haiti as the Pope of Vodou. He was educated in the United States and is an *oungan* in Haiti where he runs the Temple of Yehwe.

Erol Jouse is a Haitian born *oungan* who now lives and works in Miami.

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