Buttons of San Juan: Preliminary Analysis of Buttons Recovered from San Juan, Batangas 2009 Field Season

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Abstract

The 14 buttons recovered from the 2009 excavation of Structure A, Barangay Pinagbayanan, San Juan, Batangas were morphologically and chemically analysed using Energy Dispersive X-ray (EDS). The objective of the analysis is to determine the raw material of the buttons for classification. Optical microscopy reveals breakage pattern, patina, and manufacturing traces indicative of glass buttons. After EDS analysis, five button types were identified: porcelain or prosser buttons, glass type 1, 2 and 3 buttons, glass shanked button, and a bone button. Based on the known button manufacturing lifetimes, it is suggested that all inorganic buttons were European imports with prosser buttons possibly from a Bapterosses factory in France.

Introduction

Structure A, Site 1 (Edgardo De villa Salud Property) Barangay Pinagbayanan, San Juan, Batangas (IV-2009-F) is a late 19th century two-story household dwelling locally called "Bahay na Bato" (stone-based

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house). It is part of a cluster of abandoned stone ruins that was assumed to have been constructed in the late 1800s. Batangas (Figure 1) is archaeologically rich, with excavations concentrated on the western coastline with various sites such as Kay Tomas and Pulong Bakaw south of Calatagan (Dela Torre 2008; Fox 1959; Ronquillo and Ogawa 1996), Balayan (Santiago 1961), and Lian (Dela Torre 1994). The province is also the location of the underwater archaeological site of San Diego (Desroches *et al.*1996) and an excavation at Verde Island (Legaspi 1964). San Juan figured in archaeological literature via the National Museum's excavations at the jar burial site of Calubcub II dated to 500 AD and 10th to 15th century (Salcedo 1979).

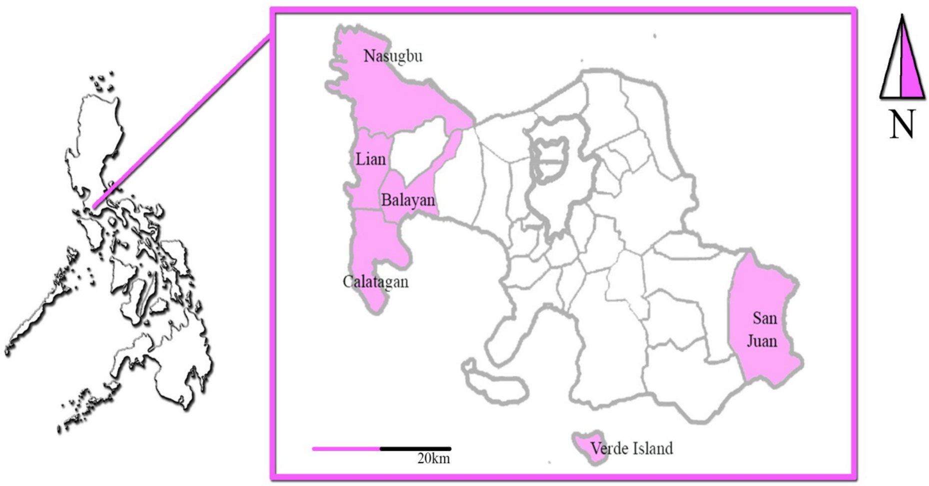


Figure 1: Map of Batangas Province showing areas with archaeological field work.

The Municipality of San Juan, 42 km from the provincial capital of Batangas, is bounded by Quezon Province to the north; Rosario, Taysan and Lobo to the west, and Tayabas Bay to the south and east. According to archival records, Barangay Pinagbayanan was the site of the old town of San Juan politically under the town of Rosario. It was established by the Recollects under P. Fr. Toribio Mateo in 1881, naming the town after San Juan Nepomuceno. The earliest settlers include families from within Batangas and nearby provinces (Garcia 1968). The proximity of the town to the coast resulted to constant flooding (Sastron 1895). In 1886, the town was relocated to Calit-calit, 7 kms away. The town elites disapproved of the relocation. Their investment towards the old town, evidenced by the quality of the material of their houses, was substantial and they refused to abandon their residence (*Erecciones de los pueblos*: Batangas, 1767-1896).

However, the relocation proceeded in 1891. The old San Juan was named Barangay Pinagbayanan which translates to "former town" (Barretto-Tesoro *et al.* 2009).

In 2009, the University of the Philippines- Archaeological Studies Program (UP-ASP) excavated the southern portion of Structure A for that year's annual Field School (Barretto-Tesoro *et al.* 2009). The northern portion was excavated the following year. One of the primary objectives was to carefully examine activity areas of the house through stratigraphy and artefact analysis. The location of the trenches was influenced by the positive structures, i.e. walls, a stone well, and several pillars. Structure A is part of the settlement around the town plaza, which indicates that the house belonged to one of the *principales* of the town (Villegas 1998). Excavation in Trench 1 revealed that it was an enclosed area with large windows facing the modern street. Extensions in Trench 1 recovered the doorway leading into the vicinity (Figure 2). Trench 2 surrounded the stone well (*koloong*) while Trench 3 investigated the tuff stone pillars, which revealed remnants of a stone arch. Both trenches were under what would have been the second floor kitchen. Trench 4 revealed part of the storage area (*kamalig*) based on the raised tuff blocks flooring.

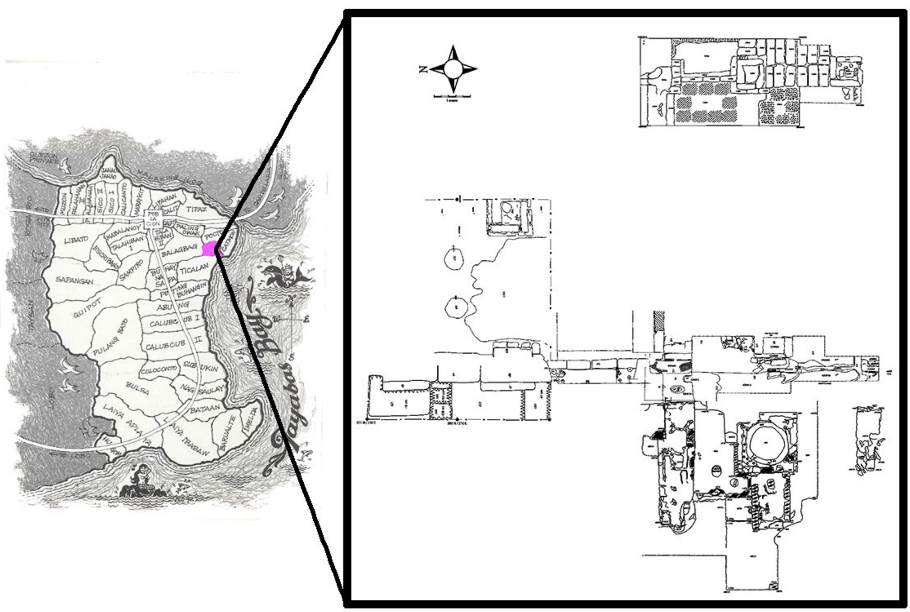


Figure 2: Map of San Juan with highlighted Barangay Pinagbayanan. Inset: Site Map of the southern portion of Structure A (Barretto-Tesoro *et al.* 2009).

Recovery of buttons strengthens the assumption that Structure A had a domestic function at one or more stages of occupation. Buttons were recovered from all trenches in various layers of construction, occupation and even through to the modern times. This study presents the morphological and chemical analysis through Energy Dispersive X-ray (EDS) of the 14 buttons recovered from Structure A. It is supplemented by available patent records and button cards published in the same era to identify the types of button present in the assemblage.

The analysis aims to describe the different button types manufactured and/or used in the late 19th century Pinagbayanan, San Juan. This study is a preliminary analysis of buttons and focuses raw material identification and form description. The buttons are also described according to its production process and possible use based on the layers where it was recovered. A basic classification is presented but the results should be treated as a case study. The importance of the study lies on the preliminary exploration of button artefacts and its contribution to a holistic picture of historic Philippines as represented by Structure A.

Buttons in Archaeology

In Philippine archaeology, attention towards buttons as one of the many types of artefacts recovered from historical sites has not been intensive. There is only one other Philippine historic site where buttons played an active role at site interpretation.

In the excavations at Lumang Bayan Site in Sta. Teresita buttons were used as time-markers. Burials associated with plastic buttons were assumed to be modern, while burials with organic (bone/shell) buttons were early 20th century (Paz 2003).

This is the first study to fully analyse buttons recovered in a Philippine archaeological context to demonstrate that morphological and technological analysis of buttons contribute to its archaeological potential. One of the most important contributions of buttons towards archaeology is its ability to be time-markers. Buttons had been one of the artefact types ubiquitously recovered in rescue archaeology (Venovcevs 2013).

Production process and the time period in which the buttons were made, used, and discarded contributes to the fuller understanding of the button's life history as connected with the possible uses of site.

Furthermore, buttons had been associated with social status and various activities based on their style and manufacture (Lindbergh 1999). Button size and style are closely correlated with its intended function. Smaller buttons of 8 mm to15 mm are used for underclothing, shirts and waistcoats (Linbergh 1999). The smallest buttons of this range are also associated with dolls or baby's clothing (Sprague 2002). Medium buttons of 16 to 21 mm are used to fasten larger items of clothing, such as coats, jackets, and pants (Lindbergh 1999). However, this is not followed strictly, especially since buttons are kept after the garment has been discarded. Archival data on Philippine button manufacture has not been fully investigated. Data on buttons are usually gleaned from button cards that are with collectors. This limits the study in placing the buttons in the Philippine context. It is assumed that buttons were not manufactured in the Philippines. Instead, they are imported into the country as part of the European or American trade system. However, this makes buttons important indicators of trade and access of goods in the historical period.

Button Manufacturing in the Industrial Age

Buttons are considered as clothing-related items, generally, to fasten garments together. However, buttons were originally worn primarily as decorations on clothing without any utilitarian value. It was only in the sixteenth century when buttons gained utilitarian use and, until the nineteenth century, only to fasten men's undergarments (Orser 2002). Men were originally the market for buttons (Lindbergh 1999) but in the 1890s, women's clothing such as shirt waists already used buttons.

The manufacture of buttons in the beginning of the Industrial Age primarily used metal, e.g. pewter, silver, copper, and brass, until the 18th century. These metal buttons were used in the military both as a decoration, embossed with the army's insignia, and as a functional clothing fastener, usually undecorated. New developments in the Industrial Age made it possible to manufacture buttons using different kinds of raw materials. Cheap glass, ceramic and shell buttons were made available for the utilitarian use of non-elites.

There are two main types of buttons, namely, the sew-through buttons and the shank buttons. The sew-through buttons are considered as utilitarian with one through five perforations to enable the thread to attach the buttons to the garment. On the other hand, shank buttons have no perforations. Instead, it has a loop at the back of the button for attachment to the garment. The earlier shank buttons have a loop made of metal and button base could me made of any material.

Bone Buttons

The oldest known buttons are made of animal bones. Before the industrial age, bone buttons were produced domestically. Introduction of lathe use made production easier and more precise. The lathe is used to cut a circular tube from the bone. Individual buttons are cut from this bone tube and fashioned into buttons. Bone buttons were cheap to make and were used for men's underwear and pants fasteners (Ferris 1986). Women also used bone buttons for shawls and cloaks. By the 1700s, bone button style had evolved to a single holed button base that accommodates fabric-covering (Lindbergh 1999). These buttons are called Dorsets or Cartwheels and went out of fashion by 1830s (Venovcevs 2013). Some bone buttons had one perforation or had a pinshank attachment made of metal. In 1832, horn buttons saw a manufacturing revolution with the introduction of a new technique by T. W. Ingram. This new process involved boiling the horn or bone raw material to a viscous consistency and press moulded into the final button form. Further improvements occurred in 1837 with the introduction of coloured dies to create colourful bone buttons. The most common pressed horn buttons were black and red. By 1850s, only horns or vegetable ivory were used for the pressed horn technique. Bone buttons went out of fashion by this time, except for ornately carved and inlaid button types.

Ceramic Buttons

The main development of 1840 is the introduction of the Prosser Method. This fully industrialised process allowed for the production of buttons using *dust* clay, instead of *wet* clay. The powder is pressed on to a cast-iron mould under 400 tons of pressure. Then, they were fired in a muffle furnace over very high temperature. The process and resulting white ceramic buttons bore similarities with porcelain wares that they were sometimes called *small china* buttons. In button cards, they are commonly called *agate* buttons (Prosser 1881). Another term suggested for these buttons is "prosser buttons" (Sprague 2002: 113), which is the term used by this paper. This Industrial Age innovation allowed for the production of ceramic buttons in very large quantities. Hence, they are the most common button types recovered in archaeological sites dated to the late nineteenth-century (Venovcevs 2013).

Documentary evidence for the beginning of the prosser method is mainly based on the English patent record No. 8548, issued on June 17, 1840 to Mr. Richard Prosser (Albert and Adams 1970). It contains the original dust clay method of manufacture. In the same year, prosser buttons were produced by English factories such as Minton Company at Stoke-on-Trent, Maw, Turley and J.M. Blashfield, and W. Chaberlain and Co. at Worcester, as well as some Birmingham companies" (Sprague 2002). A version of the prosser method was passed in the United States on 30 June 1841 (Patent No. 2199) filed by Thomas Prosser, Richard's brother. The patent was for a similar technique but had some few additions. This included the use of a fly screw-press or similar machines to put pressure on the dies. Prosser button production started at least by 1844 by Charles Cartlidge & Co. of Greenpoint, Long Island, New York (Ketchum 1987). The factory had closed by 1856.

By 1851, English button factories were driven out of the market by the French manufacturers, such as those managed by Jean-Felix Bapterosses (Godden 1982). Bapterosses' patent was approved by the 4th of November, 1844. A law suit by Prosser documented that Bapterosses was able to learn the technique in England when he worked at the Minton factory and brought the technology to France. Bapterosses continuously improved the prosser method over the years with the introduction of a new furnace design in 1847, and the introduction of milk as a lubricant by 1855. Bapterosses opened his factory in 1845 and eventually settled in Briare in 1851. By 1848, the French factories were producing prosser buttons in different colours such as pink, ochre, grey, blue and black (Sprague 2002). With the button's better appearance, the improved techniques for faster manufacture and cheap labour, the French factories were able to sell their buttons at a cheaper price compared with the British buttons. By 1850s, the French manufacturers had completely dominated the European market. The prosser buttons were called agate buttons in the button cards, which the salesman used to introduce his wares. However, the prosser button manufacture had reached its end by the 1950s and 1960s with the introduction of plastic buttons.

Glass Buttons

Manufacture of glass buttons was developed before the prosser method was in place. Mass-production of glass buttons started in the 18th and 19th century (Orser 2002). Production had started in the 1830s where glass was pressed on to a metal frame (Venovcevs 2013). One of the main concerns for the production of glass buttons was the weakness of glass shanks, which easily broke under stress. The solution of glass button manufacturers was to replace the glass shanks with metal shanks instead. Another option was to fashion the shank with a frame where the glass face could be attached. The earliest date for metal shanks on glass buttons are based on the U.S. patent awarded on 28 December 1880 to John A. Deknatel entitled "Glass Button and Mold for Manufacturing the Same". The patent came from developments made by Deknatel's assistant, A. Hamann.

Although glass buttons were able to provide more options for decorations and had the ability to copy precious stones, the glass button shanks became a problem for the non-elite consumers who were concerned with durability. They were also over looked over prosser buttons, which had the advantage of having no sharp edges to affect threading (Sprague 2002). Their limited demand contributed to the rarity of glass buttons in archaeological contexts (Ferris 1986). Glass buttons came in a wide range of colours. Black buttons became very popular at the second half of the nineteenth century, after the death of Prince Albert in 1861. Queen Victoria's mourning attire included jet buttons, which the black buttons imitated for the masses (Lindbergh 1999). An analysis of the button industrial production process makes button invaluable chronological markers for post-industrial sites. Each button type prospered and faded as production closely followed what is fashionable. An graphic representation of each button type's *terminus post quem* (Figure 3) demonstrates the ability of button artefacts, once properly identified, to aid in building a more holistic site interpretation.

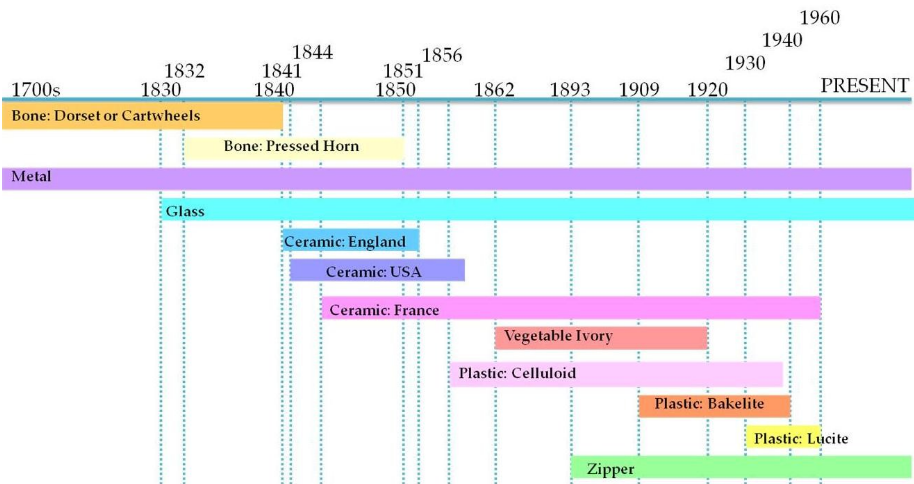


Figure 3 : Button lifetimes per Button Type.

Methods

Sample Preparation

The buttons were catalogued using National Museum accession numbers on site. Buttons with the same accession number were given an arbitrary number for analysis. Initial button sorting was conducted into organic and inorganic buttons. All inorganic buttons were cleaned in the Archaeological Studies Program laboratory using tap water then allowed to dry.

Morphological Analysis

The button dimension was taken according to maximum diameter (MD), maximum thickness (ML) and maximum perforation diameter for at least one perforation. The measurements were taken using a digital calliper (Mitutoyo, Japan). Apart from button dimensions, other concerns were button form, opacity and colour. A hand-held lens of 10x magnification was used for initial surface examination to determine the possible button raw material. The aim of the morphological analysis was to characterise the buttons and develop a working classification for further stages of the analysis. One of the more interesting questions is whether porcelain buttons are present in the assemblage. Sprague (2002) noted a propensity in misidentification of porcelain buttons due to its similarity with the surface features of glass button types.

Optical Microscopy

All buttons underwent optical microscopy using a NIKON SMZ-745E stereo microscopy at the Plants and Sediments Laboratory at the UP-ASP. A camera attachment, NIKON D-5000, was used to take the images. The objective of optical microscopy was to identify physical features on button surfaces that provide clues on the raw material. This study focuses on the following:

> *Seams* are an important indicator of using moulds. The presence of moulds indicates a highly industrialised process. This is true not only for buttons but also for other historical artefacts, e.g. bricks, nails, etc. For buttons, seams are a feature of both glass and ceramic buttons. Both button production processes used moulds to be able to manufacture a great number of buttons for every firing.
>
> *Orange peel surface* on the back of a button suggests that a button is porcelain. This feature is not present on glass or any other button

type. This feature could have been produced through two methods (Sprague 2002): when the clay is removed from the mould; or it is an impression from the mould while the button was waiting to be fired.

Breakage observed, if any, also contributes to the evidence towards porcelain or glass raw material.

Patina is caused by the decay of a glass material. It appears to be a translucent film that had developed on the surface of glass. Only glass materials are able to develop patina.

Other surface features, such as traces of manufacture, are also documented.

Elemental Analysis

To supplement the morphological analysis and optical microscopy, the study used elemental analysis to contribute towards the identification of the raw material of the buttons. A representative sample of each inorganic type, based on morphological analysis, was randomly selected for Energy Dispersive X-ray (EDS) analysis. The non-destructive EDS analysis was conducted at PhiLab, Makati under their own laboratory protocols. No treatment was performed on button the surface.

Results

Morphological Analysis

Analysis of the 14 buttons (Table 1) reveals that all but one button are classified as sew-through buttons with two to four perforations. One button is described as shanked. Nearly all buttons are inorganic, with one organic button. The most common sew-through buttons are ones with three perforations. Only one button has a single perforation in the centre, while there are four buttons with two perforations and two buttons have four perforations. For sizes, nearly all buttons are small, with two buttons being medium sized. There are 11 buttons that are described as white or off-white. Two buttons are coloured, a black sew-through and a blue decorated shank button. The organic button appears plain or unpainted. All inorganic buttons are opaque, except for the shanked button, which is translucent. Overall, most buttons are in good condition, except for the shanked button with an incomplete shank.

Table 1: All buttons collected from Structure A with Maximum Diameter (MD), Maximum Length (ML), and Maximum Perforation (MP), comments pertaining to size, colour and opacity.

ACCESSION #	# of Perforations	MD	ML	MP	COMMENTS	COLOUR	OPACITY
IV - 2009 - F - 1023	3	7.59	2.29	1.01	small	white	opaque
IV - 2009 - F - 1310	2	12.8	3.38	2.06	small	off - white	opaque
IV - 2009 - F - 1021	1	16.11	4.97	3.17	medium	white	opaque
IV - 2009 - F - 1298	3	7.01	2.77	1.7	small	white	opaque
IV - 2009 - F - 1298	3	7.55	2.16	1.04	small	white	opaque
IV - 2009 - F - 1298	2	12.27	2.92	1.44	small	off - white	opaque
IV - 2009 - F - 1296	3	6.09	2.15	0.98	small	white	opaque
IV - 2009 - F - 1022	2	13.56	3.66	2.32	small	off - white	opaque
IV - 2009 - F - 1309	3	6.13	1.83	0.96	small	off - white	opaque
IV - 2009 - F - 1390	3	6.93	2.54	1.04	small	white	opaque
IV - 2009 - F - 1394	4	8.42	2.79	1.25	small	black	opaque
IV - 2009 - F - 1392	2	12.71	3.05	1.76	small	off - white	opaque
IV - 2009 - F - 1191	4	16.28	2.47	1.81	medium	n/a	n/a
IV - 2009 - F - 1392	shank	12.1	2.78	0	small	blue	translucent

Optical Microscopy

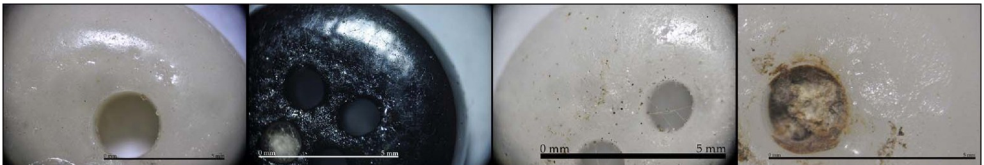
Seams are present only for the small sew-through buttons (Figure 4a) with three perforations and on the sew-through buttons with two perforations (Figure 4b). It is absent on all other button types, including the one-holed sew-through button (Figure 4c).

Orange peel surfaces are difficult to determine with no reference photo. The surface on the back of buttons has pock marks gathered towards the area of the perforations (Figure 5). However, this could also be usewear. Only one button shows a possible orange peel surface (Figure 6).

Breakage is observed on three buttons. The one-holed sew through and the shanked button (Figure 7a and 7b) both have similar concave break wave markings. This type of breakage, with concave/convex pattern is a characteristic of glass. On the other hand, the three-holed sew-through button does not exhibit this wave pattern (Figure 7c). Instead, it appears to be amorphous.

4a 4b 4c

Figure 4: Optical microscopy of buttons investigating SEAMS on (a) IV-2009-F-1390, (b) IV -2009-F-1022, and (c) IV-2009-F-1021.



IV-2009-F-1022 IV-2009-F-1394 IV-2009-F-1296 IV-2009-F-1021

Figure 5: Optical microscopy of buttons investigating Orange Peel Surface on several button types.

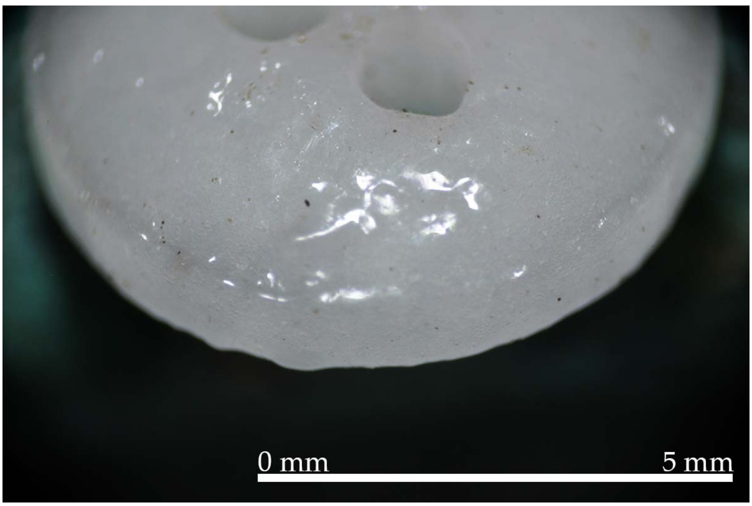
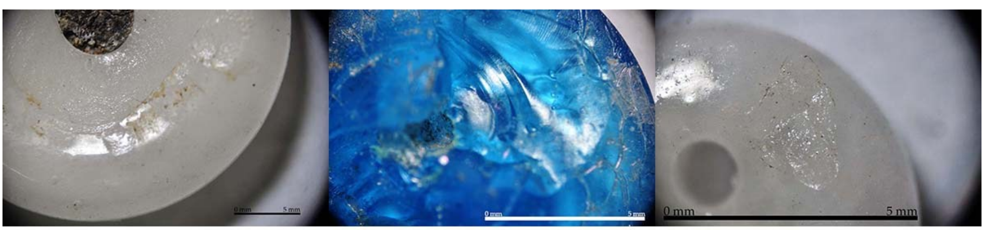


Figure 6: Optical microscopy of button investigating Orange Peel Surface on IV-2009-F-1298.



7a 7b 7c

Figure 7: Optical Microscopy of buttons investigating breakage patterns on (a) IV-2009-F-1021, (b) IV-2009-F-1398, and (c) IV-2009-F-1390.

Patina is observed only on the surface of the shanked button (Figure 8). The patina has developed around the decoration but it does not cover the button entirely. Only glass buttons would be able to develop a patina.

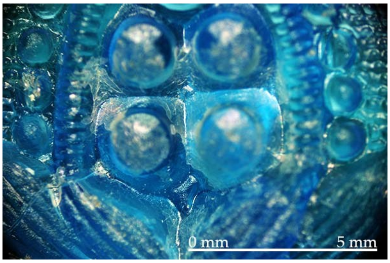


Figure 8: Optical microscopy of button investigating patina on IV-2009-F-1392.

Only one other feature is observed. It is the only manufacturing trace on the buttons. A piece of material can be seen protruding from the top of one of the buttons (Figure 9). It is possible that this happened when the material was still in its liquid state. A piece of material had overflowed from the mould. It is possible that the raw material used had a viscous to liquid state when placed in the mould suggesting that glass was used.

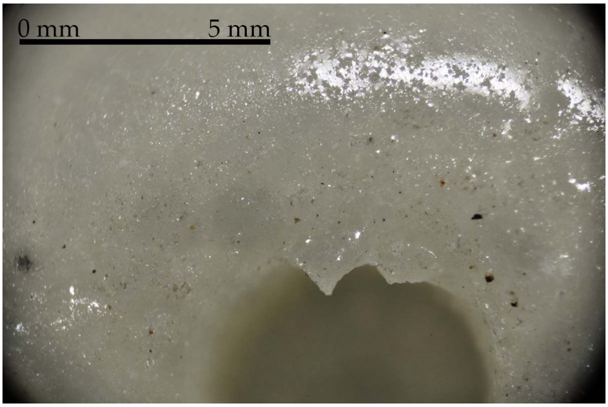


Figure 9: Optical Microscopy of buttons investigating manufacturing traces on IV-2009-F-1298.

Elemental Analysis

The following buttons were sent for EDX analysis: IV-2009-F-1390, IV-2009-F-1022, IV-2009-F-1021, IV-2009-F-1392, IV-2009-F-1394 (Figure 10). Elemental analysis reveals that button IV-2009-F-1390 has no evidence of silica (Si). Instead, it has traces of iron (Fe) and nitrogen (Ni). This suggests that this type of button is made of porcelain. Three buttons, IV-2009-F-1021, IV-2009-F-1022, and IV-2009-F-1394, have varying degrees silica (Si) ranging from 13% to 18%. Button IV-2009-F-1392 also has no silica but retains similar chemical characteristics as other glass buttons. It is believed that the patina and the limitations of the machine have affected the results. Nonetheless, this button type is considered as glass.

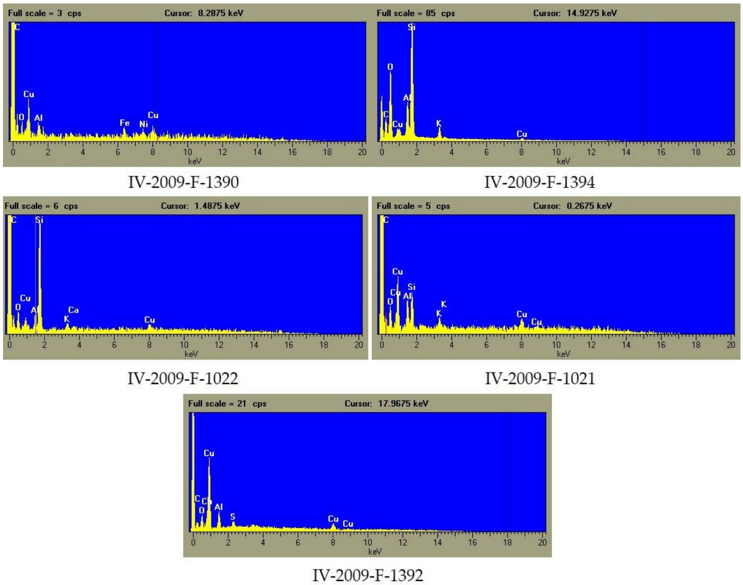


Figure 10: Results of EDS analysis.

Discussion

The 14 buttons retrieved from the excavation can be classified into three (3) main types according to material, namely, porcelain, glass, and bone. Glass buttons have the highest quantity with 50% of the collection, followed by porcelain buttons at 43%, and bone buttons at 7% (Figure 11). Of the three types, only glass buttons showed variation in form, colour, shape and decoration. They are divided into four types, namely, Glass Type 1, Glass Type 2, Glass Type 3 and Shanked.

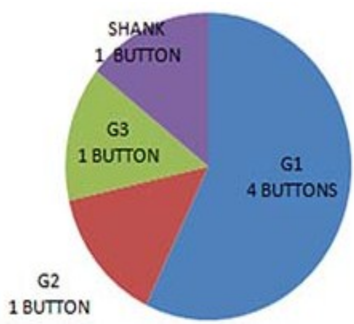


Figure 11: Types of glass buttons and quantity recovered.

Porcelain Buttons

All porcelain (P) buttons are all sew-through buttons with three perforations (Figure 12a). It shows unique physical characteristics in terms of breakage pattern and the distinctive orange peel surface at the back of the button. All factors combined suggest that these buttons are prosser buttons. Compared with data from button collectors, they are examples of the dish-type buttons, where the surface is bevelled and the under-side curves outward. These buttons are distinctively minute. It is suggested that these buttons may have been used for baby or doll's clothing (Sprague 2002).

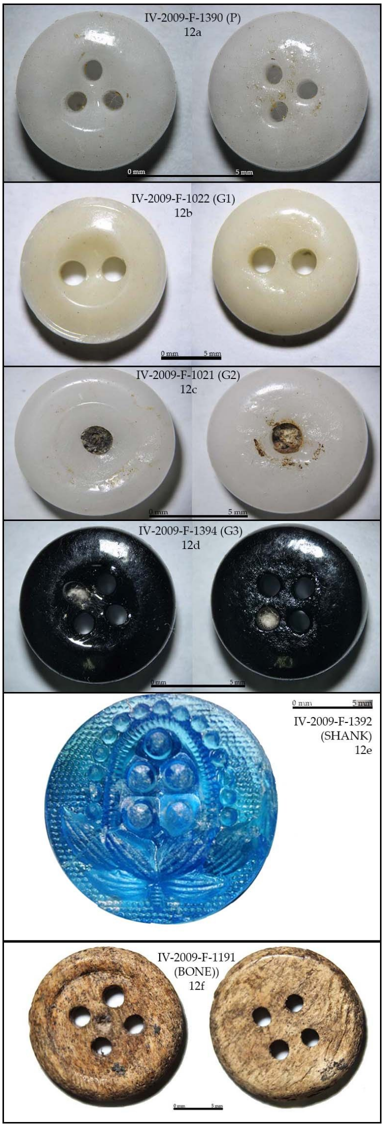


Figure 12: Button Types recovered from Structure A.

Glass Buttons

The four main types of glass buttons are arbitrarily labelled as Glass Type 1, Glass Type 2, Glass Type 3 and Shank. The glass buttons come in four different colours, with two different ways of attachment onto a garment. None of the glass buttons are considered flat discs, which seems to be a characteristic of modern buttons, a change in form for advances in sewing equipments.

Glass Type 1 (G1) is collared with a central dip where the two perforations are located (Figure 12b). The consistency of the dimensions of the glass buttons indicates that they were moulded. It is a technique where glass, in its plastic form, was poured into dies. This type of button is considered as a single piece, wherein the buttons were made as a single object, without any attachments of the same or another material. Two holed buttons were used for fastening work shirts and pants and described as “trouser” or “suspender” buttons (Lindbergh 1999).

A single button represents Glass Type 2 (G2). It is the only button with a single perforation, or one “eye”, located in the centre dip (Figure 12c). This type of button requires a self-shank sewing technique, where the button serves as a lock for the garment. This type of attachment might have also accounted for its size as the biggest button in the assemblage. It bears the collar decoration also found in Glass Type 1 buttons. The brown to red stains on the surface of the button seems to be damage resulting from high temperatures, e.g. burning, and not a part of the production process. The button is not completely flat, resembling the concave-convex morphology of the glass and porcelain buttons. This is the largest inorganic button in the collection and may have been used to fasten coats, jackets or other larger outer garments.

Glass Type 3 (G3) is one of the two coloured buttons in the assemblage (Figure 12d). Also of moulded glass, Glass Type 3 had four perforations or eyes which are located in the central dip. The morphology is similar to the ceramic buttons, except for the size and the number of perforations.

Only one shanked type of button was recovered from the excavation (Figure 12e). It is a single piece moulded glass button. The shank is incomplete with only a small portion protruding from the back making it difficult to determine the type of shank it used to have. There was no indication of a missing metal shank attachment. The decoration seems to be a flower motif with a leafed bottom surrounded by a criss-crossed design, for texture, embossed onto the face of the button. Glass buttons with a metal shank is rare. In 1870s, glass buttons were mounted on sturdier metal shanks (Venovcevs 2013).

Bone Button

Only one organic button was recovered from site. It is hewn from bone with four complete perforations with a faux perforation in the middle (Figure 12f). Unlike the other perforations, middle perforation did not go through to the other side and, thus, was not functional for attachment. Instances of faux perforations on organic materials is usually the result of manual perforations wherein the faux perforation serves as a guide for the placement of the functional perforations (Lindbergh 1999). This type of perforation is usually hidden and not located on the exposed surface, suggesting that the face of the button was hidden from view, maybe by textile attachments. Another evidence for having a textile attachment on the face of the button is its flat morphology. It is the only true flat button recovered. Furthermore, the face of the button has no other signs of decoration, e.g. varnish.

Site Distribution

Buttons are well represented in that they were recovered from all of the trenches and in various layers, from the layer associated with modern times to the layer contemporary with the construction of the old stone house (Table 1).

The "modern" layer still yielded modern materials, such as plastic wrappers. The layer below the topsoil, as with Trench 1, is associated with the destruction of the house. The layers under it reveal several occupational phases suggesting improvements and repair. A midden deposit, where the storage area should have been, above the primary occupational layers suggests the house's evolving purpose. Non-living layers also yielded buttons of similar type to the living layers.

The oldest buttons are Glass Type 1 and Shank. According to historical data, especially patents, single piece shank buttons were produced as early as the mid-1700s and ceased production after the late 1800s, when they were replaced with metal shanks creating 2-piece buttons. Associated with the shank button are Glass Type 1 buttons. The two oldest buttons were part of the fill used for construction indicating that they were discards. The custom of saving buttons may or may not have been in place by the time of construction or buttons were not regarded as important enough to be saved.

The oldest buttons associated with a living floor are prosser buttons. However, prosser buttons appear on most levels, suggesting that at the time of construction, use and destruction, prosser buttons were readily available, at least more than glass buttons or organic buttons.

The single organic button and glass type 2 were recovered in the same depth, but of different contexts. The wooden button was recovered from what is believed as flood deposits. Associated with this layer are sorted ceramics, glass, and metal of various weight and size.

Glass type 2 is the only button recovered from the midden deposit that was truncated by a natural destruction layer. The midden is composed of marine shells, and a wealth of metal artefacts. There might have been burning in the area of the midden causing the stains on this unique button type.

The natural destruction layer, which lies below the final destruction layer, is only found in Trench 4. This depicts a possible period of abandonment prior to the final destruction of the *kamalig* area. Prosser buttons are ubiquitous in this layer, with a lone Glass Type 1. The buttons may have been unintentional discards that has not been collected because people did not use the space as frequently.

The layers before and after the final destruction rubbles yielded only Glass Type 1 and the singular black Glass Type 3. There's a great difference between the two buttons in terms of morphology and period of production. Glass Type 1 is recovered from older layers, while Glass Type 3 was only recovered from the layer after the destruction. Furthermore, black buttons gained popularity only at the late 1800s while glass buttons started production as early as the late 1700s. The black button, together with the associated artefacts, such as the bone toothbrush, may indicate a period of high European or western influence just after the final destruction layer.

The modern layer still had a prosser button. It is possible that prosser buttons were deposited in other areas outside the excavation but were transferred there due to flooding or other taphonomic processes.

Conclusion

Although there are no archival data on the presence of buttons in historical Philippines, it is assumed that buttons were a European or American import. At the end of the 18th century, the Spanish involvement in commerce had significantly declined. The players in Philippine commerce were the British and Americans (Skowronek 1998), followed by the Spanish. Even style had been influenced by the economy. As early as 1792, Spanish creoles and *peninsulares* sported the European style. British and American entrepreneurs had started to invest in the economy, even migrating to the Philippines seeking to influence the cultural and commercial realm.

By 1899-1908, the Philippines had a marked increase in commercial dependency towards the U.S. (Jenkins 1945). In 1909, this was supported by the Payne-Aldrich Act of 1909 enabling free trade. Some of the industries established include the production of pearl buttons. There was no mention of local Philippine production of inorganic buttons.

With this in mind, the possible origin of the prosser buttons is the Bapterosses factory in France. It could also be traded in from British trade or part of fasteners on European clothing. Glass had been continually produced in various areas and it is difficult to determine its production origin. This is the same with bone buttons. It seems that the 1800s-1900s residents of Pinagbayanan belong to the more opulent class, having access to European style clothing.

The study demonstrated the importance of buttons for relative dating, and for interpretations. Morphological analysis was able to give clues into the raw material of the buttons. Breakage pattern, patina, and manufacturing traces were able to give vital evidence towards the possible button raw material. On the other hand, seams and orange peel surfaces were inconclusive. For this study, chemical analysis was invaluable for determining the button raw material.

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