

Of Scrapes and Scratches: A Preliminary Study on the Use-wear of Porcelain Sherds from Structure A, Pinagbayanan, San Juan, Batangas, Philippines

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Abstract

Research conducted by the University of the Philippines-Archaeological Studies Program in San Juan, Batangas began with a survey in 2008. This led to a systematic archaeological excavation of a stone house in Barangay Pinagbayanan, San Juan, Batangas in 2009. Subsequent excavations were conducted from 2010 in the same stone house, in 2011 of a second stone house and in 2012 of the old church ruins. Use-wear or use-alteration analysis was performed on the porcelain sherds recovered from the 2010 excavation.

Specifically, scratches and abrasions probably left by utensils were identified and examined. Porcelains recovered from the site were Chinese, European, and some American white ware. Since ceramics also have non-utilitarian purposes, some preliminary assumptions are offered as to whether these sherds were from a utilitarian or decorative piece.

Use-wear analysis helps in inferring activity patterns within and between different areas of a site (Griffiths 1978). In the Philippines, this is the first use-wear experiment done on porcelain sherds from a historical site. The results show that the specimens investigated were possibly porcelains used for both decorative and dining purposes.

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Introduction

The town of San Juan is located on the southeastern tip of the province of Batangas (Figure 1). The history of this town stretches out even before the colonisation of Spain; this is due to the discovery of burial jars in Calubcub II dating to 100 AD to 400 AD, in Batangas by the National Museum (Barretto-Tesoro *et al.* 2009). A research group from the Archaeological Studies Program of the University of the Philippines conducted a survey in 2008 in Pinagbayanan, San Juan, Batangas which later led to systematic archaeological excavations of stone houses or *bahay na bato* (Barretto-Tesoro *et al.* 2009; Sales 2013; UP-ASP 2010, 2011). The porcelain sherds included in this study were recovered from the 2010 excavation of a stone house officially recorded as Structure A, Site 1.

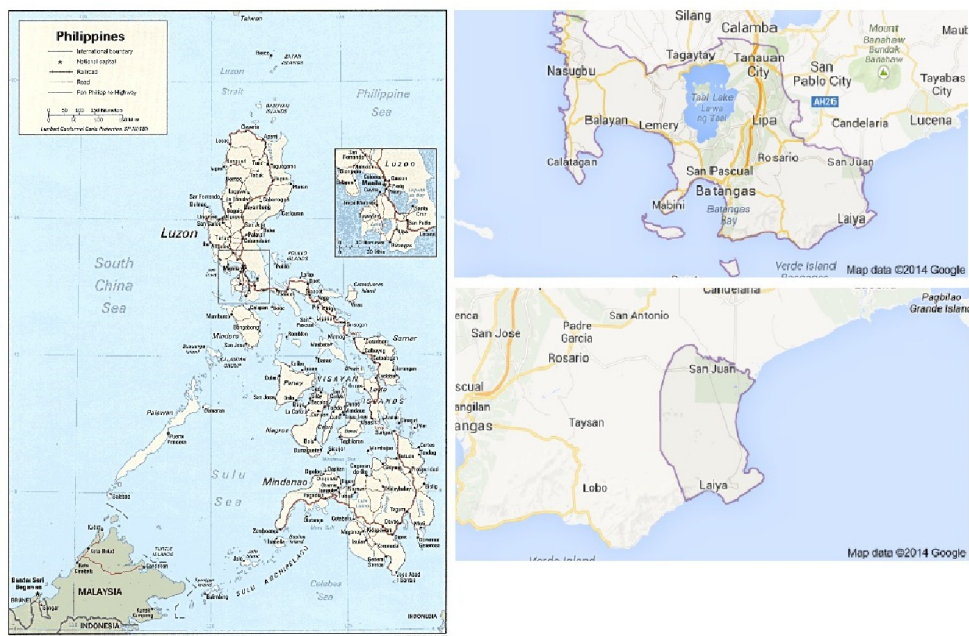


Figure 1: Map of the Philippines with zoomed in map of Batangas and San Juan. (Source: maps.google.com).

The excavation of Structure A was divided into two field seasons owing to time constraints and issue of ownership. The southern section was excavated in 2009 and the northern section in 2010. The 2009 team found mouldings, walls, pillars, water well, and even exposed some of the walls and pillar's foundations. One of the objectives of the 2010 field season was to excavate the northern part of the structure to determine the extent of Structure A. At the end of the 2010 excavation, 12 trenches were opened. The 2010 excavation yielded artefacts similar to those recovered

in 2009 such as square and round nails, metals fragments, glass shards, and ceramic fragments. The 2009 excavation of Structure A yielded 304 porcelain sherds (Barretto-Tesoro *et al.* 2009). The 2010 excavation team retrieved 87 foreign ceramic sherds. The discrepancy is most probably due to the fact that the 2009 team most likely excavated a part of the kitchen whereas the 2010 team excavated the storerooms and patio. The objective of this research is to infer utility of the porcelain sherds through use-wear analysis. Is it possible to infer vessel function through use-wear analysis on porcelain sherds recovered from Pinagbayanan, San Juan, Batangas?

Use-wear analysis was applied to check for scratches and abrasions left by utensils such as spoons, forks and knives. The utilisation of utensils was hypothesised since the site dates to the late 1800s when cutlery was already available and the former owner of the *bahay na bato* has been interpreted to be a *principales* or local elite of the town (Barretto-Tesoro *et al.* 2009). Ethnographic reports from the 2010 excavation team also stated that most of the residents of Pinagbayanan believed that Structure A was a large house and a wealthy family lived there (Fuentes and Kintanar 2010). The kinds of porcelain recovered from the site were Chinese and European, as well as some American white ware. A second hypothesis is that these sherds were from a decorative piece. Use-wear analysis helps in inferring activity patterns within and between different areas of a site (Griffiths 1978). This study hopes to understand the function of these porcelain sherds in the late 1800s within a settlement context.

This research is relevant in Philippine archaeology since it is the first use-wear analysis on porcelain sherds in any site in the Philippines. Use-wear is often used on tradeware ceramics that are more or less whole and not on sherds (Griffiths 1978). Studies have been made regarding the identification of vessel form and function, but few are done on marks made by utensils on porcelain or tradeware, given that use-wear analysis is usually done on stone tools (Adams 1988; Renfrew and Bahn 2008; Shea 1988). Earthenware and stoneware pottery, on the other hand, are usually examined for their function, but only seldom is porcelain studied with a use-wear analysis approach (Schiffer 1989).

Structure A is a historical site dated to be from the late 1800s. The ceramics include Chinese porcelain from the Qing dynasty (1644-1912) and European wares such as English Flow blue wares that were produced

around the 1820s to 1940s. Since the sherds recovered are relatively small, it must be noted that the identification of what piece the sherd came from is not absolute. It was difficult to interpret the use and form of the original pieces where the sherds came from. "The smaller the portion of a vessel under consideration, the less that can confidently be stated about the object of which it once formed a part," (Griffiths 1978: 28). It must be noted that the analysis of use of a sherd will not offer us the identification of what part it was from, nor will it guarantee us the identification of form, but it will only tell us if the sherd came from a utilitarian or decorative piece.

This preliminary work deals with the possibility of a wider practice of use-wear analysis on historical ceramics, since it centres on the use of utensils including serving spoons and forks. Residue analysis will not be part of the analysis since the ceramics had already been pot-washed while in the field. The measurements of the depth of the scratches were not recorded and studied thoroughly since the microscope for that purpose was not available in the laboratory at the time of analysis.

The Archaeological Specimen Inventory Record from both the 2009 and 2010 excavations were the primary documents used for the accession numbers and preliminary descriptions of the sherds. Also, the location or trenches where the sherds were found are written there. The 2009 site report of the excavation of Structure A (Barretto-Tesoro *et al* 2009) ostensibly served as a staple resource material for the excavation results of the southern section. In the 2009 report, considerable information on foreign ceramics can be found, as well as their photographs and their accession numbers (Barretto-Tesoro *et al.* 2009).

Related Literature

Dorothy Griffiths' article (1978) entitled "Use marks on historic ceramics: A preliminary study" is the most relevant reference for this paper. It is an experiment done on ceramics from the historical period with regards to marks left by utensils. Other research done on the subject of use-wear focuses more on prehistoric pottery e.g. Bray's 1982 article on use-wear analysis on Mimbres Black-on-white wares (A.D. 1000-1130 in the American Southwest); while Hally (1982) focused on the study of surface alteration which were results of use of pottery vessels from the 12th-13th centuries in the American Southwest. Both articles studied use-wear in terms of soot and oxidation due to heating practices. The study of

use-wear on ceramics conducted on American southwest pottery was meant to provide a clear understanding of how a vessel was used and with that, socioeconomic and ideological inferences are made (Skibo 1992). Through use-wear or use alteration research, anthropologists and archaeologists were able to reconstruct prehistoric social organisation in the region (Skibo 1992).

For the identification of sherds, publications on blue-and-white ceramics were consulted (Carswell 2000; Gotuaco *et al.* 1997). Gotuaco *et al.* (1997) discussed the variety of Chinese and even Vietnamese wares found in the Philippines, where Batangas was mentioned as an area where blue-and-white porcelain were found. Another Chinese porcelain book that helped in this research is He Li's *The Chinese Ceramics: The New Standard Guide*.

The Process

The ceramics were classified, identified, and compared with ceramics from the 2009 excavation as information on provenance and decoration were taken from the 2009 reports and results. Since use-wear was to be analysed, old scratches and abrasions were distinguished from the new scratches on 25 sherds that include body, mouth, and foot rim sherds. All the 25 sherds were preliminarily identified as Chinese porcelain. Only 25 were studied since, admittedly, the usage of the microscope was only for a limited time.

Also a distinction was made between knife cuts and spoon and fork scratches by differentiating the intensity of the cut. Stirring marks from spoons will come out as very light scratches compared to cut marks from a knife. This is important because the scratches will tell us if the sherd belonged to a ware used for dining, serving, storing, or as a decoration.

The samples taken were mostly foot rims and mouth rims since they are more diagnostic (Griffiths 1978). The foot rims were studied for the possibility of it being a decorative piece, since being in storage or 'sitting' for a long time on a shelf leaves abrasions at the bottom. Mouth rims may show us spoon marks from stirring, and even from the act of scraping the food from the plate or bowl.

Some body sherds were also analysed just to see if there were any marks. A portable microscope, which was plugged to the researcher's

laptop via USB with a 50-60x magnification was used to locate scratches and abrasions. A scratch is a mark or incision which is made on the surface, it is more linear than an abrasion which refers to a place where the surface is rubbed off or worn off due to friction. A cut, on the other hand, is an opening or a cleft, a deeper incision which was made by an edged or sharp instrument, in this case, a knife.

Photographs were taken to illustrate the marks on the sherds. Pictures found in Griffiths' 1978 article that show scratches and abrasions were compared with the sample from Structure A to be able to identify similar marks. Photographs of ceramics from published materials (Carswell 2000; Gotuaco *et al.* 1997) were used to identify the form of sherds recovered from Structure A. Data is presented using charts, tables, and photographs.

Types and Parts of the Porcelain Sherds found in Structure A

Blue-and-white porcelain which originated from China, is, to this day the best known type of Asian ceramic, where blue cobalt oxide is painted on white clay to come up with a beautiful underglaze design (Carswell 2000; Gotuaco *et al.* 1997). In 1603 the Dutch East Indie Company sent Chinese porcelain to Amsterdam and from there the Europeans tried to copy Chinese porcelain art (Moore 1908).

Since then, new types of blue-and-white porcelain emerged such as the European Flow Blue and transfer print (Carswell 2000; Moore 1908). The difference between Chinese and European porcelain are quite easy to differentiate based on the shade of blue and design.

Besides Chinese and European porcelain, American white ware and sherds from modern ceramics were also collected from the site. American white ware came into circulation in the early 20th century (Wilby 2004). This is easily distinguishable from Chinese white ware since the glaze of American white ware does not have a jade-like texture resulting from the clear glaze that also contains small amounts of iron (Miller and Miller 2000; Wilby, 2004).

The majority of the porcelain sherds from the 2010 excavation were Chinese blue-and-white porcelain, proposed to be from the late Qing dynasty; and this is not surprising to know considering the popularity and prestige of the ware.

There were also some sherds from modern pieces and this was easily identified due to the engraved initials 'S.C.D.' which was later found out to be Susana Castillo Dimayuga (the wife of the property owner) (UP-ASP 2010). The modern sherd resembles the bowls and plates seen and used today, even as prizes in annual town fairs or *perya*. Anghel and Susana Dimayuga, owners of the lot where Structure A stands had been married since 1960.

The engraved initials can be a good dating material for the different phases of the structure. The other modern ceramics are distinguishable since the fabric and designs are technologically different from that of the 19th and early 20th century wares. Figure 2 is a graph showing the types of sherds from the 2010 excavation.

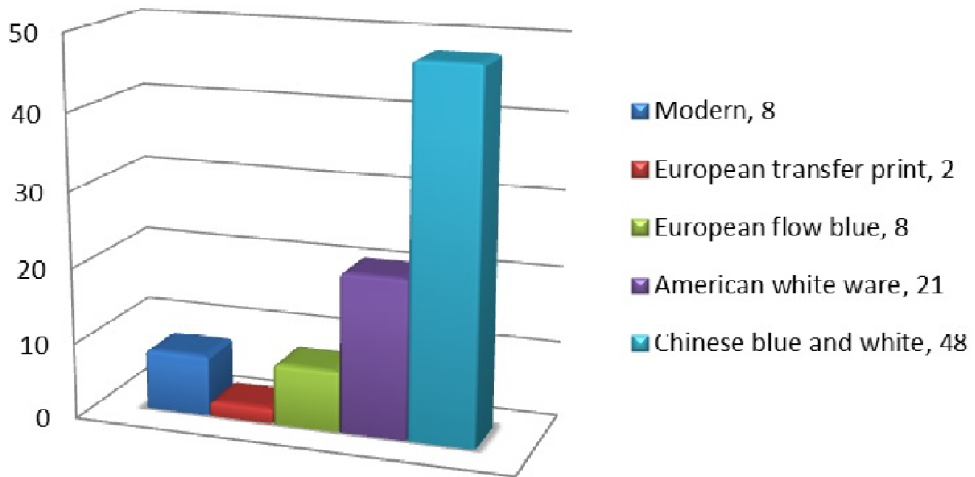


Figure 2: Types of sherds from the 2010 excavation of Structure A.

For the analysis, only eight body sherds were studied under the microscope for two reasons: a.) due to time constraints; and b.) these sherds had the most practical dimensions for use-wear analysis. While the researcher was doing use-wear analysis, it was discovered that ideally the material being studied is whole, but if sherds should be analysed, these should not be smaller than 8-10 cm.

The reason being, scratches and abrasions are more visible and analysable on bigger surfaces. Although Griffiths (1978) stated that foot rims show evidence of abrasions and mouth rims show evidence of stirring or scraping, the researcher still included body sherds in the analysis so that marks from there can be compared with those found in

mouth rims. Another reason is that it is more probable to find knife cuts in body sherds.

Eight mouth rims and seven foot rims were studied under the microscope. Figure 3 illustrates sherd parts from the whole excavation. Provenance was not recorded at the time of classifying sherd parts, but information on the types and provenance of all the sherds may be seen in Figure 2.

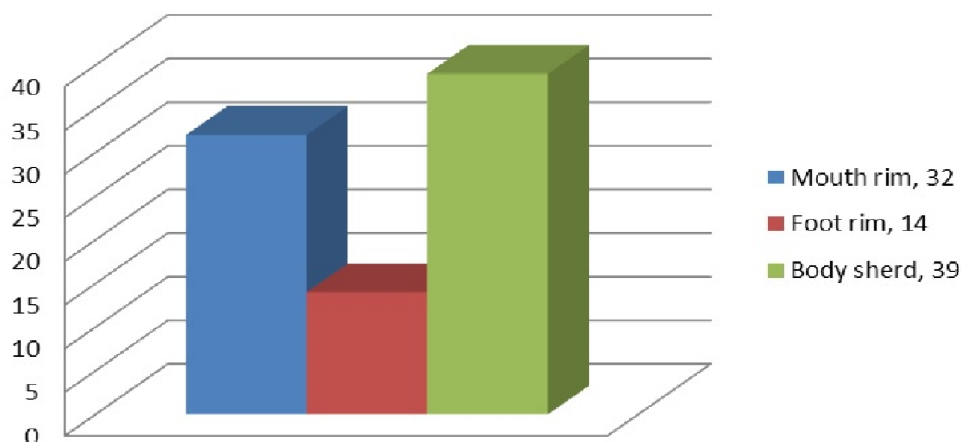


Figure 3: Types of sherds from the 2010 excavation, provenance not stipulated.

Horizontal and vertical distribution of sherds in the site

In all trenches excavated in 2010, tradeware ceramic sherds were found, although Trenches 9 and 10 only had relatively few pieces. Trench 6 yielded the most sherds, which is very significant since this trench is located near the excavation site in 2009, an excavation wherein more sherds were collected (Barretto-Tesoro *et al.* 2009).

It was mentioned that the 2009 excavation included the kitchen area of the structure and perhaps the amount of sherds found in Trench 6 may lead us to identifying the function of this part of the structure.

Since Trench 6 is found nearest the proposed kitchen area excavated in 2009, this could explain the abundance of sherds collected from that trench. However, since sherds were distributed in all trenches, this alone cannot be used to infer the definite functions of the proposed rooms.

This may be said because Trenches 8 and 10 are located outside the structure. Also Trench 11, known as the Test Pit trench, yielded nine sherds, more than the four sherds found in Trench 9, which was an interior trench. See Figure 4 for the table of the distribution of sheds per trench.

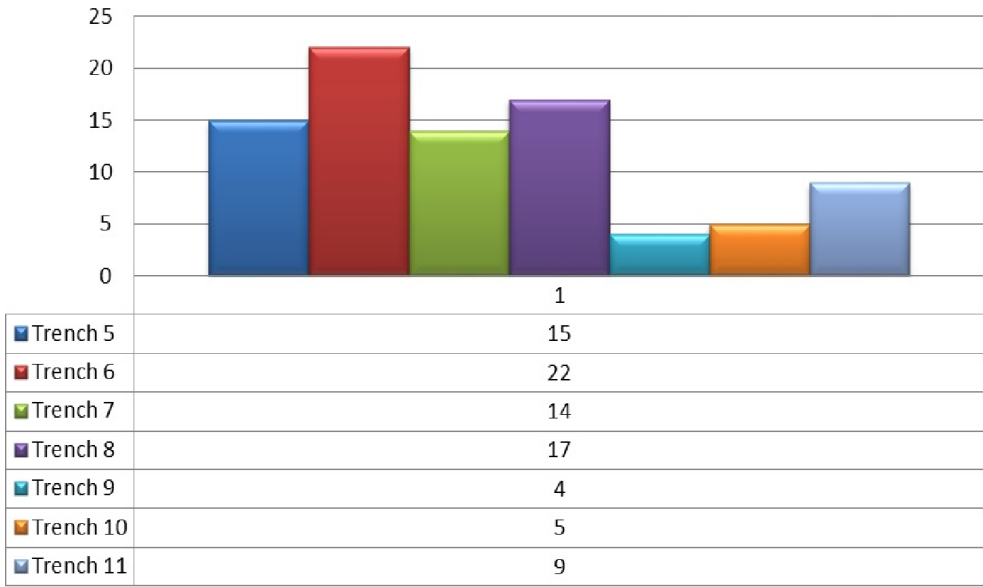


Figure 4: Distribution of sherds in trenches (2010 excavation).

Distinguishing Scratches and Marks

Even before looking for knife cuts and utensil marks, it was imperative to first identify “new cuts” or marks made recently by troweling, by the soil, or by bagging the artefact. The difference of new and old marks is quite easy to see. Figures 5 and 6 show the new and old scratches on the sherds.

In Figure 5, the scratches on the left are new scratches simply because the cut is fresh and shallow, while the scratch on the centre can be easily seen as old because the mark is deeper and possible soil deposits have already been localised. This is evidenced by the discolouration inside the cut which resembles the colour of soil or the sediment.

Figure 7 also shows two kinds of scratches with measurements. Measurements were made so that it may be diagnosed if the cut was made by a knife. The difference between cuts, scratches, and abrasions was explained above.



Figure 5: Pointing out a new mark (57.5x magnification). Exterior part of a Chinese porcelain sherd.

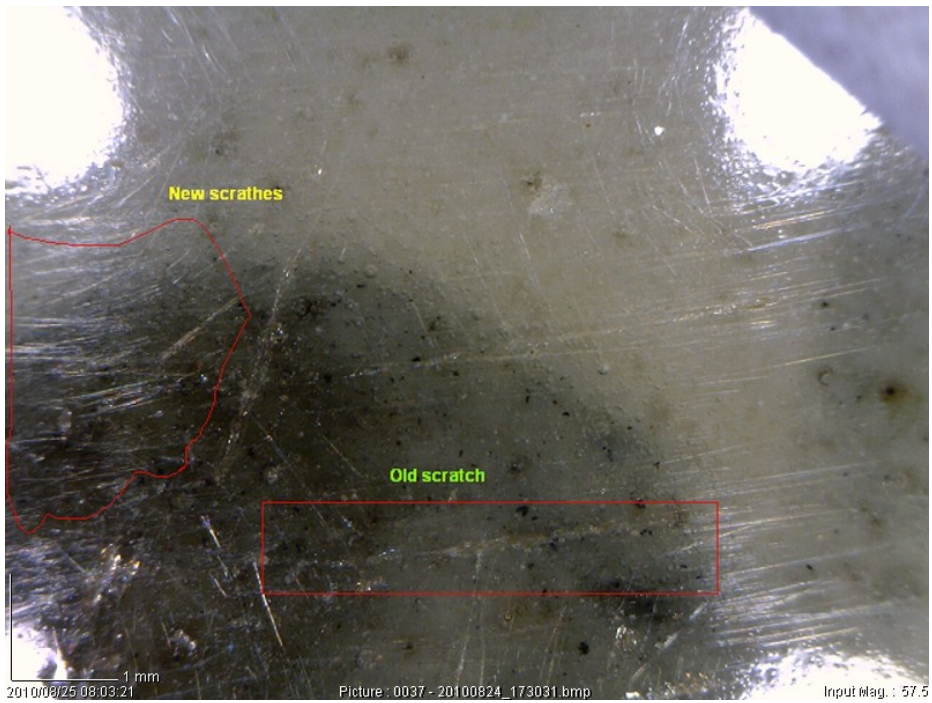


Figure 6: New and old scratches, (57.5x magnification). Interior part of a Chinese porcelain sherd.

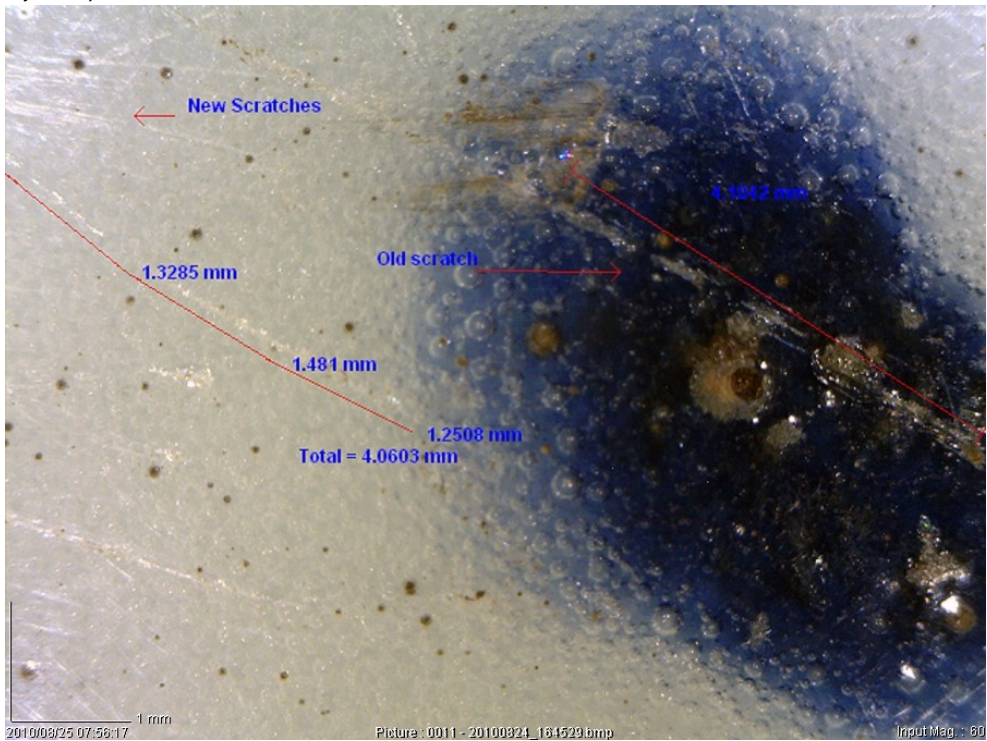


Figure 7: Old and new marks with measurements (57.5x magnification). Interior part of a Chinese porcelain sherd.

Porcelain uses and marks

In her article, Griffiths (1978) identified distinct marks on her samples which indicated the different functions of each ware. She mentioned that in dinner plates, there are two varieties of use-marks. Knife cuts are usually longer and deeper than spoon and fork marks that might illustrate scraping. In soup plates, one can only find spoon and fork marks.

Knife cuts are the heaviest as they cut most deeply into the glaze and they tend to have distinct little tears along the edges of the cut where flakes of glaze have been chipped off by the knife blade. These cuts usually form fairly straight lines of various lengths, depths, and widths, occasionally ending in a tiny hook. Generally, says Griffiths, they are scattered all over the plate centre. On the other hand, the fork or spoon scratches are much lighter than the typical knife cut and, more often than not, they cover the plate centre often extending on the plate sides, with a haze of short random lines. On some occasions, the marks curve in longer, sweeping lines over and around the plate centre and short zigzag lines are also common.

Comparing photos from Griffiths' article with results from the microscopic analyses of 25 samples made it possible to identify some marks. The researcher took a sample from a base sherd (or foot rim) from the 2010 excavation, and interestingly, the sample yielded the marks described by Griffiths. Figure 8 is a photograph taken from Griffiths' article, placed here for reference. Figure 9 depicts "deep cuts," or knife cuts seen in IV-2009-F-2050 (the sherd that bears the engraved initials of S.C.D.). The term "deep" is used to refer to the force that the user employed when cutting the food. Although Figure 9 is a modern sherd, the abundance of marks should not be disregarded. Other sherds depicted lighter marks which corresponded to spoon and fork marks. Figure 10 is a photograph of IV-2009-F-2200 retrieved from Trench 11. It is a Chinese blue-and-white foot rim sherd with light marks. The knife marks found on these sherds may tell us the kind of food that was eaten by the household or owners of the structure. Normally and traditionally (in western perspective) knives are used for meat. By identifying this kind of mark, there is an opportunity for archaeologists to deduce economic status, kitchen practices, as well as the variety of food. Meat consumption is connected to power and dominance, or higher social status (Fiddes 1991, 1994). If knife marks were manifestations of the consumption of meat, this is additional data that can support that the people who resided in Structure A were elites.



Figure 8: Centre of a soup plate showing heavy use, evidenced by spoon scratches and some knife-cuts on a 20th century white earthenware (Griffiths 1978: Figure 7).

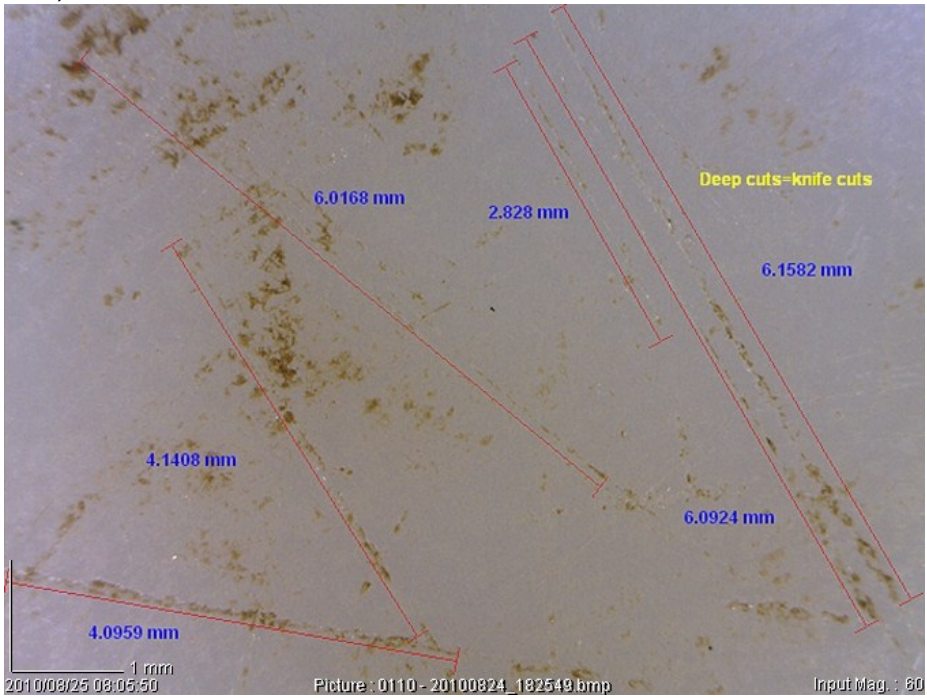


Figure 9: Interior of porcelain sherd (IV-2009-F-2050) with knife marks (60x magnification). Modern sherd, with 'S.C.D.' engravings on the opposite side.

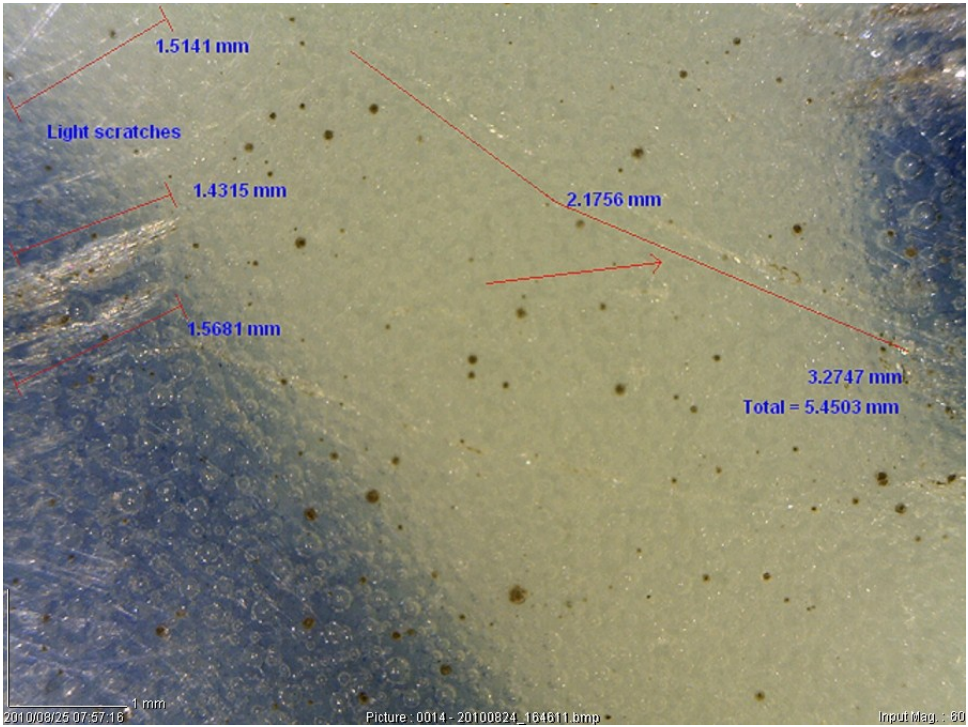


Figure 10: Interior of a Chinese porcelain sherd (IV-2009-F-2200) with old but light scratches (60x magnification).

Marks on foot rims

Griffiths also mentioned that foot rims have veritable marks to yield. Use-marks on the foot rim take the form of simple abrasions, dulling the brilliance of the glaze or scratching it with short, haphazard, criss-cross lines (Griffiths 1978). As a general observation, the use-marks on the centre of the plate should agree with the foot rim to indicate use. The abrasions found on the foot rim indicate storage or being placed on the dining table. There are some cases wherein plates with few or no cutlery marks do not normally exhibit worn foot rims. But, in the event that they do not match, it may indicate one or several types of use or storage.

Some of the proposed reasons why the foot rim might exhibit more usage than manifested by the plate centre are: "a.) the use of cutlery that was not hard enough, or sharp enough; b.) the plate or bowl could have been a serving dish, cake plate, pie dish among others; and c.) the manner of storage could have been in stacks without the use of a buffer material" (Griffiths 1978: 74). When examining plates and bowls, it is important to compare the foot rim with the mouth rim and centre of the same piece.

This is done so that it can be deduced if the ceramic was heavily used for dining, or not. Griffiths showed a photograph of a worn foot rim, and it is included in this paper, for comparison with sherds from Structure A. Figure 11 is a photo taken from Griffiths' article exhibiting a worn out foot rim with heavy abrasion marks. A foot rim sherd taken from Trench 8 exhibits one that has already lost the luster of the glaze. Figure 12 is a photograph of IV-2009-F-1532, an undecorated modern white ware. The magnification used was higher than those for the scratches, i.e. 65x. Significantly, this would mean that the piece could have been stacked without a buffer or the table where this was used did not have a table cloth.

Another foot rim that seemed very much worn out would be IV-2009-F-1845, a Chinese porcelain foot rim sherd retrieved from the top soil of Trench 5 (Figures 13-14). The foot exhibits signs of discoloration. When the interior base of the same piece was examined, heavy marks indicating the cut of a knife were seen. It can then be proposed that IV-2009-F-1845 (or this particular sherd) might have come from a utilitarian piece or a dining plate. IV-2009-F-1845 is highly possible to be a utilitarian material and not a decorative plate or bowl.

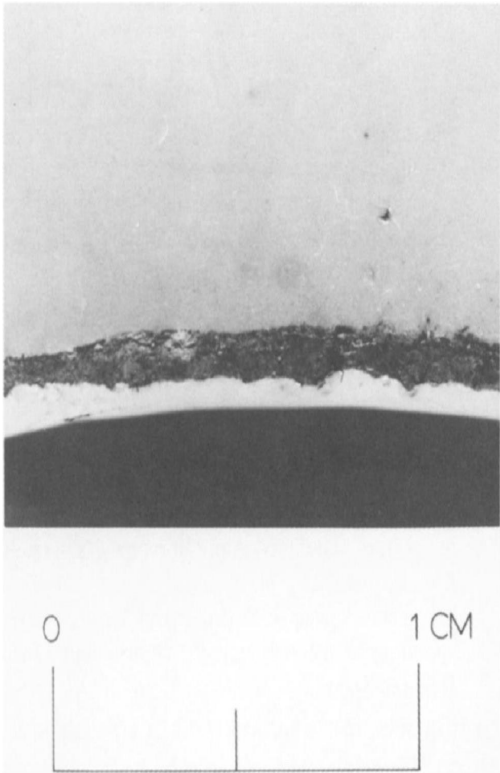


Figure 11: Worn out foot rim (Griffiths 1978: Figure 12).



Figure 12: Worn out foot rim of a white ware (IV-2009-F-1532).



Figure 13: Chinese porcelain foot rim sherd (IV-2009-F-1845) with abrasions and discolouration (60x magnification).

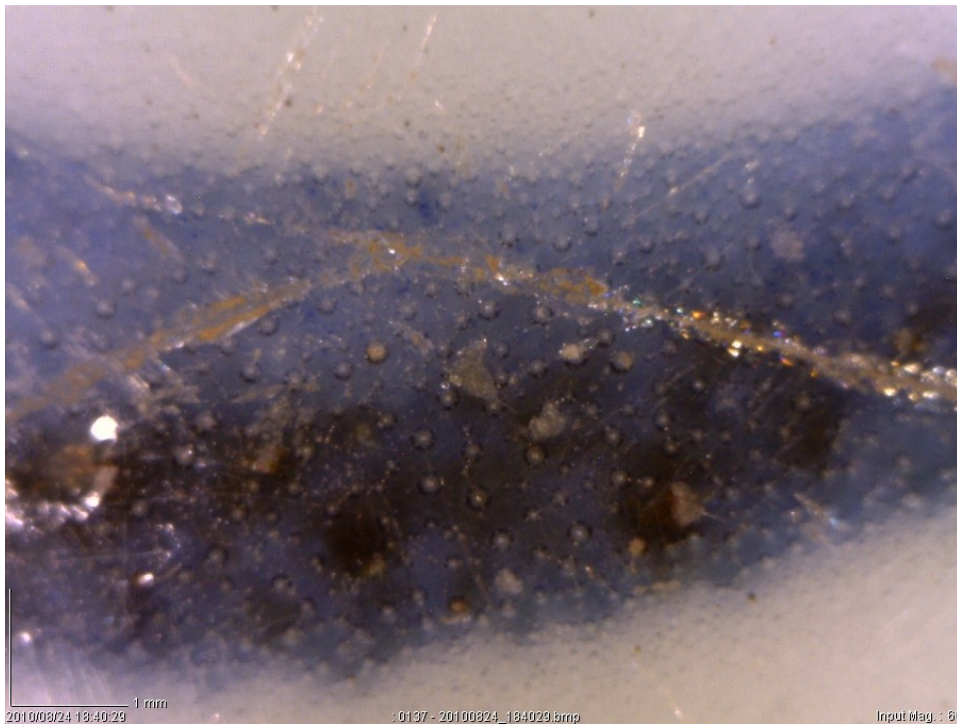


Figure 14: Knife marks found on the same porcelain as in Figure 13 (IV-2009-F-1845), matching worn out foot rim.

Also significantly included in foot rim examination is, if in the event that a plate or bowl is whole and only one side of the foot rim has abrasions, then the plate or bowl could have been decorative. Even nowadays, there are households that place ceramics in an upright position wherein the surface of one side of the foot rim is parallel to the wall and the one side of the mouth rim is perpendicular to the base or shelf. This will of course happen if and when the plate has a precise drawing or adornment. "A distinctive pattern of uneven abrasion will result if the picture or design on the plate-centre is displayed upright," (Griffiths 1978: 74). In the same article, a photograph was shown to illustrate a decorative pattern familiar even today (Figure 15).

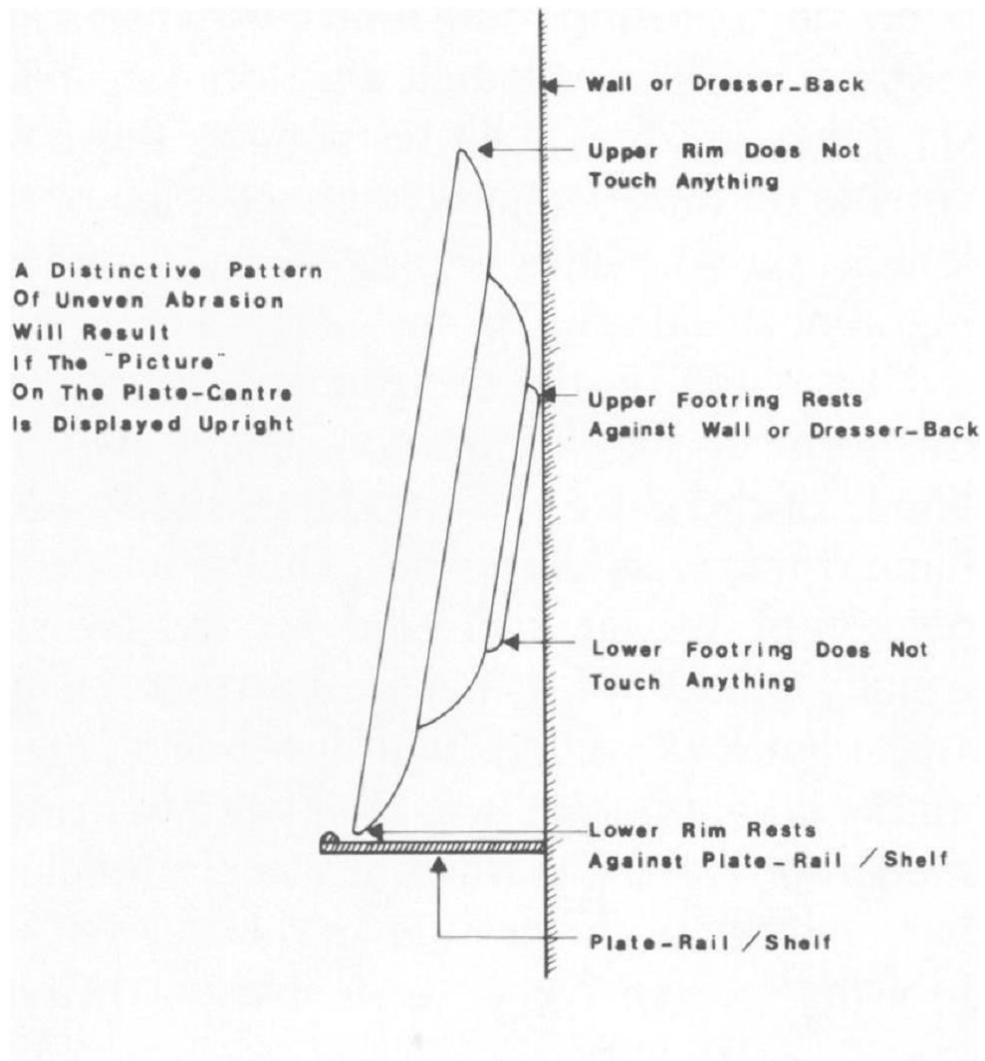


Figure 15: Illustration of a plate display explained in Griffiths (1978: Figure 8).

Naturally, some sherds did not exhibit heavy use or abrasions. It should not be readily assumed that these wares were not used at all. A plate stand is another probable or alternative manner of decorating plates or bowl. Although the history or origin of plate stands is currently not yet available, perhaps further research can be done in the future. Nonetheless, below are examples of the use of the plate stand for decorative purposes (Figures 16a-16b). The researcher had this possibility in mind, and upon encountering sherds that did not exhibit heavy abrasions, a guesstimate can be made that the owners could have used plate stands similar to the decorative pattern which Griffiths proposed. In fact, a certain European foot rim sherd (IV-2009-F-2022) showed that it was not heavily weathered or “abraded” (Figure 17).

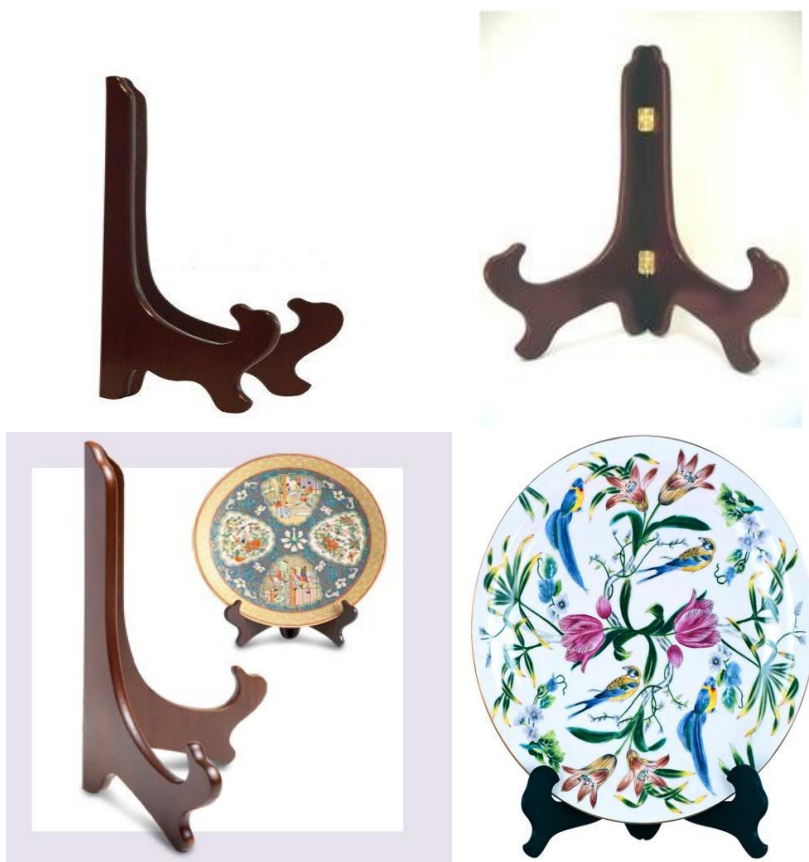


Figure 16 (Clockwise from the top left): a: Plate Stands of Australia. 2013. (http://www.platestands.com.au/image/129/Classic-Wood-Plate-Stands_129) b: Plate-Stands.com 2013. (<https://plate-stands.com/classic.html>) c and d: Plates with stands (Lamps Plus. 2013. http://www.lampsplus.com/products/floral-porcelain-decorative-plate-with-stand_v2651.html).



Figure 17: Slight abrasion on a European Transfer print foot rim (IV-2009-F-2022).

Conclusion

Use-wear analysis on the sherds from Batangas is not entirely conclusive, but can however give veritable information, as object function can still be identified. It could be inferred or estimated that the sherd could have come from a dinner plate/bowl, soup plate/bowl, serving plate or decorative plate. Also significant is that the “level” of use can also be determined. But of course, caution must be taken when analysing, for the reason that most of the sherds collected from 2010 are too small, and it must be noted that it was once part of a larger object, where most probably the marks or scratches can be found on its other pieces.

In addition to indicating the possible “level” or kind of use which past users employed on the ceramics, decorative practices or styles can also be determined. This analysis has rendered helpful results for the benefit of archaeological studies in the Philippines as it opens the doors to archaeologists studying economic status, household or kitchen practices, as well as the kinds of food consumed of the group of people being studied.

Recommendations

Use-wear analysis is not all about scratches and marks. In Griffiths' article, she mentioned the possibility of studying cracking of the fabric and/or crazing of the glaze of vessel resulting from localised contact with heat or intense thermal shock. Also, a very interesting and promising approach could be investigating the spalling of the surface of the vessel (usually the interior), possibly resulting from the "crystallization of salt impurities carried into the fabric of a vessel by various liquids and left behind, to form crystals, when the liquid medium evaporates" (Griffiths, 1978: 80).

Since scratches and scrapes are not entirely conclusive, any archaeologist or researcher should bear in mind that residue analysis will also help. Thus, sherds and ceramics alike should not be washed after being collected from a site, especially if your objective is use-wear analysis. Other ways of analysing is checking for etching which happens to the glaze when it is attacked by various acidic liquids stored in the vessel. Griffiths also mentioned that deposits (such as wood stains) on the fabric and/or glaze could be seen resulting from long storage, insufficient cleaning, or high temperature cooking of contents. For further studies, the researcher looks forward to conducting an experiment to determine characteristics of use marks produced by different utensils and other tools. Perhaps on a different research and different site, the researcher will want to investigate on chopstick marks, as this may shed more light on kitchen and dining practices, the owner of the house, as well as social class and ethnicity.

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References

- Adams, J. L. 1988. Use-Wear Analyses on Manos and Hide-Processing Stones. *Journal of Field Archaeology* 15(3): 307-315.
- Barretto-Tesoro, G., P. Piper, A. C. Pineda, P. G. Basilia, J. Ceron, T. Reyes, E. Lim, K. Maguire, K.A.B. Manalo, L. Sioco, A. Ramirez Jr. 2009. An archaeological investigation of 'Structure A' in San Juan, Batangas. *Unpublished report*. Quezon City: University of the Philippines-Archaeological Studies Program.
- Bray, A. 1982. Mimbres Black-on-White, Melamine or Wedgewood? A ceramic use-wear analysis. *The Kiva* 47:133-149.
- Carswell, J. 2000. *Blue and White Chinese Porcelain Around the World*. London: British Museum Press.
- Fiddes, N. 1991. *Meat, A Natural Symbol*. London: Routledge.
- Fiddes, N. 1994. Social aspects of meat eating. *Proceedings of the Nutrition Society* 53:271-280.
- Fuentes, R. B. and N. E. Kintanar. 2010. "Appendix K: Ethnography of Zone 4 Barangay Pinagbayanan, San Juan, Batangas," in An Archaeological Investigation of 'Structure A' in San Juan, Batangas: The Second Season. *Unpublished report*, pp. 166-169. Quezon City: University of the Philippines-Archaeological Studies Program.
- Gotuaco, L., R. Tan, and A. Diem. 1997. *Chinese and Vietnamese Blue and White Wares Found in the Philippines*. Makati City: Bookmark, Inc.
- Griffiths, D. 1978. Use marks on historic ceramics: A preliminary study. *Society of Historical Archaeology* 12:68-81.
- Hally, D. 1983. Use Alteration of Pottery Vessel Surfaces: An Important Source of Evidence for the Identification of Vessel Function. *North American Archaeologist* 4:3-26.
- Kintanar, N.E. 2010. Site Report on Structure A, Site 1, Pinagbayanan, San Juan, Batangas Field School 2010. *Unpublished report*. Quezon City: University of the Philippines-Archaeological Studies Program.
- Lamps Plus. 2013. Floral Porcelain Decorative Plate with Stand. Accessed 10 November 2013. From http://www.lampsplus.com/products/floral-porcelain-decorative-plate-with-stand_v2651.html.

- Li, He. 1996. *Chinese Ceramics: The New Standard Guide*. London: Thames and Hudson.
- Miller, J. and M. Miller. 2000. *Miller's Pottery, Antiques Checklist*. London: Octopus Publishing Group Ltd.
- Moore, N. H. 1908. *Delftware: Dutch and English*. New York: Frederick A Stokes Company.
- Peralta, J. 1982. *Kayamanan, Pottery and Ceramics from the Arturo de Santos Collection*. Manila: Central Bank of the Philippines.
- Plate Stands of Australia. 2013. New Products Wooden Stands 1. Accessed 10 November 2013. From http://www.platestands.com.au/image/129/Classic-Wood-Plate-Stands_129.
- Plate-Stands.com 2013. Leeds Display. Accessed 10 November 2013 from <https://plate-stands.com/classic.html>
- Renfrew, C. and P. Bahn. 2008. *Archaeology*. London: Thames and Hudson.
- Sales, A. M. P. 2013. Building in the Past: A Preliminary Analysis of the Construction Materials and Methods Used in Structure A in Barangay Pinagbayanan, San Juan, Batangas. *Hukay* 18:1-30.
- Schiffer, M.B. 1989. "A Research Design for Ceramic Use-Wear Analysis at Grasshopper Pueblo," in *Pottery Technology Ideas and Approaches*. Edited by G. Bronitsky, pp. 183-205. San Francisco and London: Westview Press.
- Schiffer, M.B. 1996. *Formation Processes of the Archaeological Record*. Utah: University of Utah Press.
- Shea, J. J. 1988. Spear Points from Middle Paleolithic of the Levant. *Journal of Field Archaeology*, 15(4): 441-450.
- Skibo, J. M. 1992. *Pottery Function: A Use-Alteration Perspective*. New York: Plenum Press.
- The Oriental Ceramic Society of the Philippines. 1993. *Chinese and South-East Asian White Ware Found in the Philippines*. London: Oxford University Press.
- University of the Philippines-Archaeological Studies Program. 2010. An Archaeological Investigation of 'Structure A' in San Juan, Batangas: The Second Season. *Unpublished report*. Quezon City: University of the Philippines-Archaeological Studies Program.

University of the Philippines-Archaeological Studies Program. 2011. An Archaeological Investigation of 'Structure B' in San Juan, Batangas. *Unpublished report*. Quezon City: University of the Philippines-Archaeological Studies Program.

Wilby, J. K. 2004. *Decorative American Pottery and Whiteware: Identification and Value*. Kentucky: Collector Books.