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## 9 THE UGLY DUCKLING: INSIGHTS INTO ANCIENT MAYA COMMERCE AND INDUSTRY FROM POTTERY PETROGRAPHY

*James Aimers, Elizabeth Haussner, and Dori Farthing*

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*In this paper we discuss ongoing research on a utilitarian Late Classic pottery type, Coconut Walk Unslipped, from sites on Ambergris Caye. Ordinary pottery types have received far less attention than more elaborate types (e.g., polychromes and molded-carved). The long production history and widespread distribution of types like Coconut Walk Unslipped add complexity to our understanding of the production and distribution of ordinary ancient Maya pottery, and draw attention to some basic issues about how we characterize and study Maya pottery. We highlight the relevance of pottery petrography to our understanding of this pottery and Maya commerce and industry more generally.*

### Introduction

In this paper we discuss ongoing research on a utilitarian Late Classic pottery type, Coconut Walk Unslipped, from the sites of San Juan, Ek Luum, and Chac Balam on Ambergris Caye. The long production history and widespread distribution of types like Coconut Walk Unslipped add complexity to our understanding of the production and distribution of seemingly ordinary ancient Maya pottery.

### Coconut Walk Unslipped

Coconut Walk Unslipped (Figure 1) is, in Aimers' opinion, the ugliest pottery the Maya ever made. Vessel shapes are irregular and it is very difficult to take diameters from the rim sherds, which in our sample were small. Surface finish is rough and irregular even on well-preserved sherds. Vessels are coarsely tempered with fabrics that range greatly from orange to tan, gray, and black even in a single deposit. Many sherds are fragile and we know of no intact vessels. We chose to discuss Coconut Walk given the 2014 Belize Archaeology and Anthropology Symposium theme of domestic economy because we assumed it was made locally for domestic use.

We also wanted to study this type because although ordinary pottery types dominate archaeological collections, they receive far less attention than their more decorative but rarer relatives like polychromes and molded-carved. But, like the Ugly Duckling who surprises his tormenters by maturing into a gorgeous swan, Coconut Walk Unslipped surprised us by revealing it was much more than it seemed at first. Finally, we were interested in it as part of

a ceramic system because Satoru Murata and I had found thousands of similar sherds while working with the ceramics from Wits Cah Ak'al or Mile 12 just south of Belize City (Aimers, et al. 2015).

Elizabeth Graham (1994:153-156) first published a description of this pottery from Early Classic to Late Classic (or Middle Classic) contexts in the Stann Creek area with the typological designation of Coconut Walk Unslipped Ware. Later she identified this style at the site of Marco Gonzalez in the Late Classic. For the Ambergris Caye sites of Ek Luum, Chac Balam and especially San Juan, Valdez et al. (1995:97-99) referenced Graham's ware identification in a type they called Coconut Walk Plain in Late and Terminal Classic contexts. Coconut Walk Unslipped is now the type name most commonly, or at least recently, given to this pottery type (e.g. Andrews and Mock 2002). Finally, this pottery is very similar to Punta Ycacos Unslipped defined by Heather McKillop and associated with salt making (McKillop 2002).

Not only is this pottery widespread, it is long-lived. It is part of a pottery tradition (or sequence as it is more formally called in type-variety terminology). This tradition or sequence (Gifford 1976:12) of related types has antecedents from at least the Early Classic period and probably the Late Preclassic, and extends into the Terminal Classic and Postclassic periods (Aimers, et al. 2015). Further, this quartz-tempered technostylistic tradition appears to spread inland rapidly at the end of the Early Postclassic to sites as distant as Lamanai, the upper Belize Valley, and the Petén

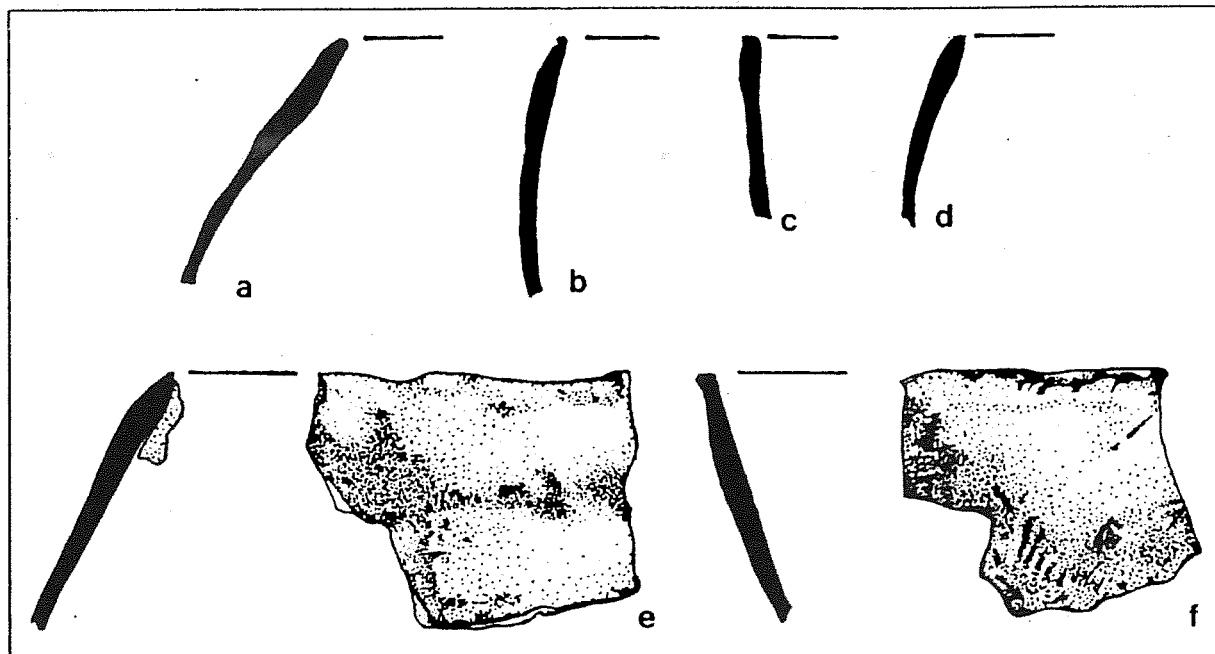


Figure 1. Coconut Walk Unslipped sherds from Colson Point. Modified from Graham (1994: Fig. 5.8). No scale bar was provided in original but the diameter of example "e" was noted as 50 cm.

Lakes. Maybe due to the Ugly Duckling Effect, no one has given these quartz-tempered types ware designations, so Calabash Unslipped Ware may be the best ware designation due to its similarity to Postclassic types in the Belize Valley, an issue to which we return later in this paper.

### Petrography

Elizabeth Haussner undertook petrographic investigation of 15 samples of Coconut Walk Unslipped and related types under the supervision of myself and Dr. Dori Farthing of Geneseo's Department of Geological Sciences. Thin section petrography is one of the oldest and most useful of the materials science techniques that we use to examine pottery. Thin sections are made by breaking an edge off a sherd, embedding it in epoxy, grinding it to a thickness of 0.03 mm, and mounting it on a glass slide. The sample is then examined with a microscope using different kinds of light. Polarized light effects how the minerals in the clay and the inclusions that have been added to it appear to the human eye, often creating dramatic color differences in a mineral as the slide is rotated. The color of the minerals under cross

polarized light are sometimes distinctive and along with other characteristics can be used to identify minerals. We can also use the microscope to examine voids in the sample. Using these basic techniques, petrography can help us identify the materials in the pottery and how the pot was made.

Although the methods of preparing thin sections are quite standardized, methods of analysis and characterization vary greatly. One of the questions we would often like to answer with petrography is "Where was this pot made". The goal is to tie the mineralogy of the sherd to the geology of some place. Unfortunately, the Maya area is not all that geologically diverse compared to other parts of the world and establishing the origin of a Maya pot can be challenging. The petrographic slides discussed here were prepared by Dr. Linda Howie of HD Analytical Solutions. Howie has been a proponent of a system that can be used to interpret thin sections pioneered by a scholar named Whitbread working with Greek transport amphorae (Whitbread 1989, 1995). Whitbread's method is detailed and time-consuming but it is to our knowledge the most precise and thorough method for the petrographic description of Maya

pottery. Unfortunately, despite its use in studies of European pottery, it has not been widely adopted in the Maya area. Howie's study of the pottery of Lamanai (Howie 2012) using Whitbread's method and other techniques is a landmark study that others should consult when considering petrography in Belize.

We have published more detailed petrographic results of our study elsewhere (Aimers, et al. 2015). The important and surprising finding was that pottery made on a caye covered in sand was not made with sand from that caye. Coconut Walk Unslipped is tempered with quartz sand which is not found on Ambergris but is found in mainland deposits resulting from the geology of the mainland, especially the Maya mountains. When we submitted the abstract for the 2014 Belize Archaeology and Anthropology Symposium, we thought our results would tell us about the production of pottery made close to where it was found, and we expected this to fit in with the conference theme of ancient Maya domestic economy. In fact, the results raise more questions about trade and industry. The results surprised us because many archaeologists take it as practically a given that the cruder the pottery, the more local it is.

We found out from Elizabeth Graham after our analysis that Chellie Teal, a student of Sal Mazullo, wrote an unpublished paper noting the presence of quartz temper in many Marco Gonzalez pottery types, including Coconut Walk Unslipped (Teal 1994). But, at least we now know that Coconut Walk Unslipped from Ek Luum, San Juan, and Chac Balam is also tempered with non-local quartz.

### Pottery Ethnoarchaeology

The non-local quartz in this pottery was a surprise because ethnoarchaeological research suggests that utilitarian pottery was made from local materials in local workshops. Teal mentioned in her unpublished 1994 paper that there are some suitable clay deposits on Ambergris Caye but the quartz temper is certainly non-local. This means that people on Ambergris were either importing the whole pots or just the quartz sand temper. Why? A possible explanation is that heavily-tempered, thin-walled vessels facilitate heating compared

to vessels without temper (Skibo and Schiffer 1995:83). The rough textured surfaces also encourage evaporation, and thus when heated they reduce spalling and cracking. Even the globular shapes are relevant since these shapes are better for cooking than vessels with more angular shapes. In any case, the non-local quartz sand temper appears to be very important to the function of these vessels. In her Stann Creek District samples, the thinness and fragility of the vessels, lime incrustations on the interiors, and lack of burning led Graham (1994:153-156) to suggest that this type could also have been used for soaking, for example to make lime from shells or to soak corn in a lime solution. But what about on the cayes?

### Salt Production

We noted earlier these sherds are very similar to Punta Ycacos Unslipped which is clearly linked to salt production in southern Belize. Elizabeth Graham (1994: 155-6) was the first to point out that given the coastal locations of many analogous vessels they may have been used for evaporating brine to produce salt. Graham (1994:247) noted that "though I have played down the possibility of its use in salt production until more data are collected, the striking similarity of Coconut Walk unslipped bowls to the *cajetes* used in salt making in Sacapulas, Guatemala (Reina and Monaghan 1981) suggests that the ware was used by the Maya at Watson's Island in the same manner-- if not to produce the same product, then perhaps in a way related to the production of lime that took place in Tzakol 3-Tepeu 1 times." Graham is now much more confident in the connection of this style of pottery to salt production (personal communication 2014), and Anthony Andrews, once skeptical, noted that he has "had to eat a fair amount of crow on this matter" (Andrews and Mock 2002:315).

Andrews and Mock (2002:320-321) summarized the evidence for prehispanic *sal cocida* (cooked/boiled salt) production on Ambergris Caye this way: "Coconut Walk Unslipped ceramics have been reported at two sites near the southern end, Marco Gonzalez and Guerrero (Graham 1983, 1989; Graham and Pendergast 1987, 1989) (with cylinders at the latter site) and at four sites on the northern part

of the island: San Juan, Ek Luum, Chac Balam, and Santa Cruz (Guderjan 1988, 1993, 1995). Most of these ceramics were recovered from contexts dating to the Late and Terminal Classic periods. Evidently, salt was produced on Ambergris by cooking brine and harvesting solar salt from the northern lagoons. It is most likely that the inhabitants of northern Ambergris Cay were harvesting solar salt from the northern lagoons throughout the prehispanic period; the Spanish reported salt ponds in the lagoons in the sixteenth century, (Archivo General de Indias 1564-5) and solar salt was harvested in more recent historic times as well (Andrews 1983; Guderjan 1995)."

In Guderjan and Garber's (1995) volume on their Ambergris excavations, Valdez argued that "Coconut Walk is part of an evaporative salt-production complex in coastal northern Belize" (Valdez, et al. 1995:97) although Guderjan and Garber were not completely convinced because the sherds were not associated with the lugs or spacers associated with salt-making. According to the published literature on Ambergris Caye, briquetage-like cylindrical spacers and sockets have only been found on Ambergris at the site of Guerrero (Andrews and Mock 2002:320, citing Graham) and "the Ambergris sites have direct access to large salt-producing lagoons (Andrews 1983) that were productive enough in colonial times for attempts at commercial exploitation to have probably occurred (Guderjan 1988). Some of the contexts of materials from Ek Luum and Chac Balam, . . . also open the likelihood of other functions. However, if this ceramic type functioned in salt production, it may then be conservatism that retains the ceramic form and composition. This conservatism may account for the longevity of a ceramic type in terms of its "description," i.e., form, paste composition, breakage patterns, etc." (Valdez, et al. 1995:97).

In discussing Hector Creek Unslipped (HCU; part of the Coconut Walk Unslipped ceramic system) and contemporaneous unslipped, red-rimmed jars, Murata (2011:232) concluded that "it seems almost certain that both the jars and HCU were deeply related to the *sal cocida* process. Perhaps, as both ethnographic examples (Reina and Monaghan 1981) and logic dictate, multiple vessel types were utilized in the

process—for example, vessels for storing the brine, for pouring the brine into boiling vessels, and for the boiling process itself. Considering the friable nature of HCU, they may have been better suited for storing and pouring, while the jars were used for boiling."

James Garber (personal communication 2014) told me that he recalls some briquetage from the three sites sampled for this project. At Marco Gonzalez, Elizabeth Graham tells us that the Late Classic Coconut Walk Unslipped found so far is associated with burned layers but not typical briquetage (Graham, personal communication 2014). The relatively rarity of briquetage on Ambergris may suggest that there were multiple methods of salt production on the island, or that the pottery had multiple functions.

For us, the most puzzling issue is the imported quartz temper. There are several ways to explain it, each of which raises new questions.

1. The most logical hypothesis is that the temper is imported and used with local clays to produce the pots. This raises the question of whether the Ambergris Caye could support large scale pottery production. Ideally, then, we need to know how extensive suitable clay deposits on Ambergris are, and also if the island could produce (or import) the fuel needed for firing. Teal found that several of the pottery types at Marco Gonzalez were quartz sand tempered, which adds to the volume of production. Most of the pottery Aimers has looked at on the Cayes appears imported, so in this scenario Coconut Walk Unslipped could be one of the few types actually produced on the island.
2. Alternatively, are the vessels themselves imported? The problem here is that these vessels are so fragile it is hard to imagine them surviving transport.
3. Probably the least likely scenario is that the vessels were imported with salt in them. Anthony Andrews (1983: 46) has described Ambergris as a salt production location, I think partially based on the assumption that Coconut Walk Unslipped vessels were locally made. This would still be true if only the temper were imported, and could still be true if these

fragile vessels were imported. We are intrigued by Shirley Mock's (1998) idea that Coconut Walk Unslipped was used to evaporate brine and to make salt molds, but we would add one caveat: She assumed that the molds were broken near where they were made, but we should at least consider the possibility that Coconut Walk Unslipped jars were actually left on salt cakes as they were transported from mainland coastal production sites (possibly as close as Belize City) to the Caye. This idea is reinforced by the rarity of the standard salt-making paraphernalia like cylinders, sockets, and spacers on the Caye. This seemingly implausible idea (since we know that historically a great deal of salt was produced on Ambergris) is at least conceivable if one considers Valdez and Mock's (1991) idea that in the Late Classic the island was using extraordinary amounts of salt for export and for salting fish and game to meet Late Classic demand inland. Ambergris Caye clearly did produce salt, but in the Late Classic it is possible to imagine that the scale of production along the coast of Belize made imported salt economically viable and perhaps necessary on Ambergris to meet a high Late Classic demand for salt and salt-preserved foods. Eleanor Harrison-Buck (personal communication, 2014) made the comparison to the importation of oil to the United States. Even though the U.S. produces huge amounts of oil, consumers require more and it is economically viable to import oil. Or, were the Maya using different kinds of salt for different purposes, and some of that salt was imported? In any case, the non-local quartz temper is real, and we need to explain it.

### **Coconut Walk Unslipped, Calabash Unslipped Ware, and Migration**

Aimers et al. (2015) discuss the emergence of the Rio Juan Unslipped type of Calabash Unslipped Ware in the Early Postclassic of the Belize Valley, possibly in relation to population movement after the

Terminal Classic. There, we speculate that the paste recipes of the two Rio Juan Unslipped varieties (one with quartz; one with quartz and calcite) and their corresponding modal attributes (e.g. effigy lugs on the variety with calcite) may represent different populations with distinct traditions. Specifically, we wonder if the exclusively quartz-tempered Rio Juan Variety represents a coastal population that moved inland. In that light, it is interesting that all of the Hector Creek Unslipped sequence sherds from Wits Cah Ah'Kal that Murata (2011) examined via petrography and Instrumental Neutron Activation Analysis have the same exclusively quartz-tempered paste but through time take on the distinctive collared jar form of Rio Juan Unslipped in the Belize Valley.

We suggest that the movement of people spread this techno-stylistic tradition from the coast to the Belize Valley in the Postclassic Period. This challenges the in-situ, devolutionary argument first made by Gifford (1965:384) who believed that "the collapse of a technically specialized society [in the Belize Valley] yields to the basic family unit with an associated lack of technical know-how" (Sharer and Chase 1976:288-289). The problem with Gifford's argument is reinforced by the fact that some of the Postclassic types in the Belize Valley are in fact very well made. Rio Juan Unslipped thus may represent the introduction of a useful if visually unappealing ceramic technology to the Belize Valley after centuries of use along the coast.

### **Conclusion**

So, this ugly duckling pottery turned into something of a Cinderella. Firstly, the temper is not local to Ambergris, it is imported. Robert Fry (2012) has pointed out that ordinary unslipped pottery may have actually moved farther than we think in the Maya world and Coconut Walk Unslipped could be evidence of that. If that were the case, the volume of pottery the Maya moved around may have been much higher than we typically assume and conceivably all of the pottery on Ambergris could be imported. Secondly, the types in Calabash Unslipped Ware that come before and after Coconut Walk Unslipped represent the longest-lived example of a Maya pottery tradition or

sequence of which we are aware. This pottery must have been very useful for something (or some things) to be used for so long.

*Acknowledgements* We are grateful to Thomas Guderjan for providing us with the sherd material upon which this study is based. We would also like to thank Elizabeth Graham for her insights into the significance of this pottery type although we should note that she is skeptical about some of the ideas we present here. Finally we are grateful to the members of the Institute of Archaeology of Belize for their tireless dedication to archaeology in Belize, to the benefit of all.

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