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Designing pots: determining Orange Incised design variation and distribution at the Rollins Shell Ring site and the Guana Shell Ring site in Florida

Margaret Kathryn Wrenn

Louisiana State University and Agricultural and Mechanical College

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**DESIGNING POTS: DETERMINING ORANGE INCISED DESIGN VARIATION AND
DISTRIBUTION AT THE ROLLINS SHELL RING SITE AND THE GUANA SHELL
RING SITE IN FLORIDA**

A Thesis
Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Arts

in

The Department of Geography and Anthropology

by
Margaret Wrenn
B.A., Louisiana State University, 2008
May 2012

This thesis is dedicated to my mom and dad, who always had every confidence in me.
I will always love you both.

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ABSTRACT

Orange pottery is a Late Archaic (5000-3000 B.P.) fiber-tempered pottery found throughout northern and central Florida, though the heartland of the ware is considered to be in the northeastern part of Florida. Orange pottery is most commonly plain, but incised Orange pottery is frequently found at shell ring sites on the eastern Florida coast. Prior examinations of Orange Incised pottery have indicated design considerable homogeneity in design at Orange Period sites. The highest percentage of decorated pottery is found at shell ring sites.

For this thesis, I conducted an analysis and comparison of Orange Incised pottery collections from two contemporaneous shell ring sites, Rollins Shell Ring (8DU7510) and Guana Shell Ring (8SJ2554) in order to determine if pots produced by the same potter were present at both sites. Detailed measurements of the sherds were recorded for most incised sherds from both sites and every discrete design was recorded. The distribution of design motifs and incising attributes were compared between sites. Sherds from both sites had similar design motifs and very similar technical and stylistic measurements, suggesting that there was cultural exchange between the Rollins Shell Ring (8DU7510) and the Guana Shell Ring (8SJ2554). However, no evidence was found to support the idea that a single potter or group of potters produced vessels for both sites. Elaborate decorations, finishing techniques, lack of sooting, and other elements also suggest that vessels at shell ring sites were used for serving rather than cooking. This finding supports the hypothesis that shell rings were used for public feasting and ceremonial events during the Late Archaic.

CHAPTER 1: INTRODUCTION

The similarities in the designs on Orange Incised pottery from different sites in Florida have long been noted by archaeologists (Bullen and Bullen 1961; Milanich 1994; Saunders 2004a), but few have conducted detailed analyses and comparisons of this pottery. In 1961, Bullen and Bullen published the first formal record of Orange Incised motifs from the Summer Haven Site (8SJ46). These motifs were then expanded upon by Mitchell (1993). In 2004, Saunders published an article detailing the common designs between four different Orange sites (Figure 1); Summer Haven, the Cotten Site (8VO83), South Indian Field (8BR23), and the Rollins Shell Ring Site (8DU7510). In addition to demonstrating design homogeneity, Saunders hypothesized that the higher percentage of decorated Orange pottery at the shell ring site relative to the other sites is an indication of site function. Shell rings had a distinct and probably ceremonial function. She also suggested that most vessels at the rings were used for serving during feasts at the shell rings rather than for cooking.

Orange Period pottery, both plain and incised, was made during the Late Archaic (5000-3000 B.P.) period and is commonly found along the eastern coast of Florida and along the St. Johns River. It is characterized by fiber tempering and an orange color created by the oxidation of iron in the clay during firing. Typical decorating techniques include incised geometric designs, tick marking, and punctations. Most decorations are linear but some do have curvilinear elements.

In my research I hoped to record all incised pottery designs and motifs from the Rollins Shell Ring site (Figure 2) and the Guana Shell Ring site (Figure 3), two contemporaneous and closely situated shell ring sites to determine how similar the design assemblages at the two sites might be (Figure 1). In addition, given the design similarities elsewhere, I examined the two

assemblages to see if a single potter or group of potters was responsible for at least some of the incised vessels at both sites.

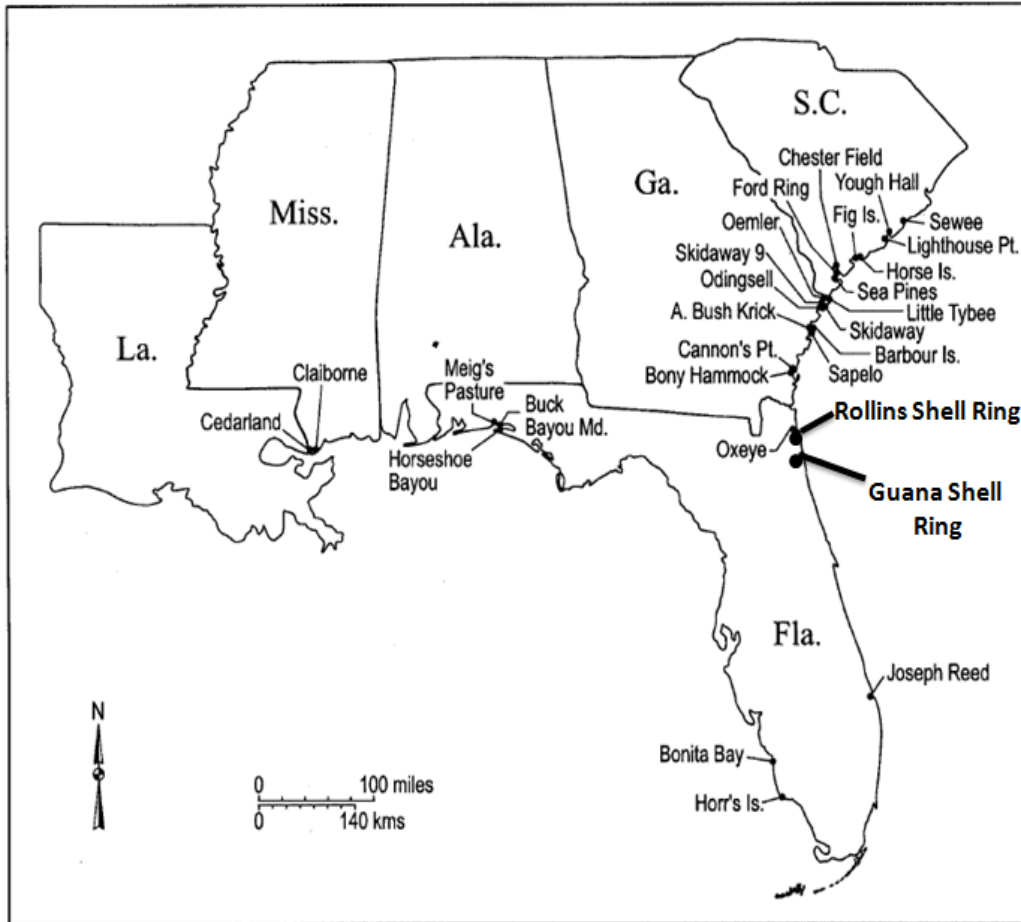


Figure 1. Map showing the location of southeastern shell rings including Rollins Shell Ring and Guana Shell Ring (Saunders 2004a).

In order to place my specific study in cultural context, the first chapters of this thesis are dedicated to a discussion of Late Archaic prehistory (Chapter 2), Orange pottery (Chapter 3), and the history of shell ring research (Chapter 4), specifically at the Rollins Shell Ring (Figure 2) and Guana Shell Ring (Figure 3).

I then examined Orange Incised pottery from Rollins Shell Ring and Guana Shell Ring, to determine what design elements were used in the motifs, how the designs were created, what kind of vessels were made, and what kind of finishing techniques were used (Chapter 5 and Chapter 6). This information will then be used to compare motifs and motif elaborations between the two sites (Chapter 6). The distribution of design motifs at both sites is examined in order to trace the use and popularity of designs across time and space and to search for evidence of individual potters. Vessel finishing and form from both sites will be compared in light of Saunders' 2004 discussion of pottery assemblage and site function to assess site use.

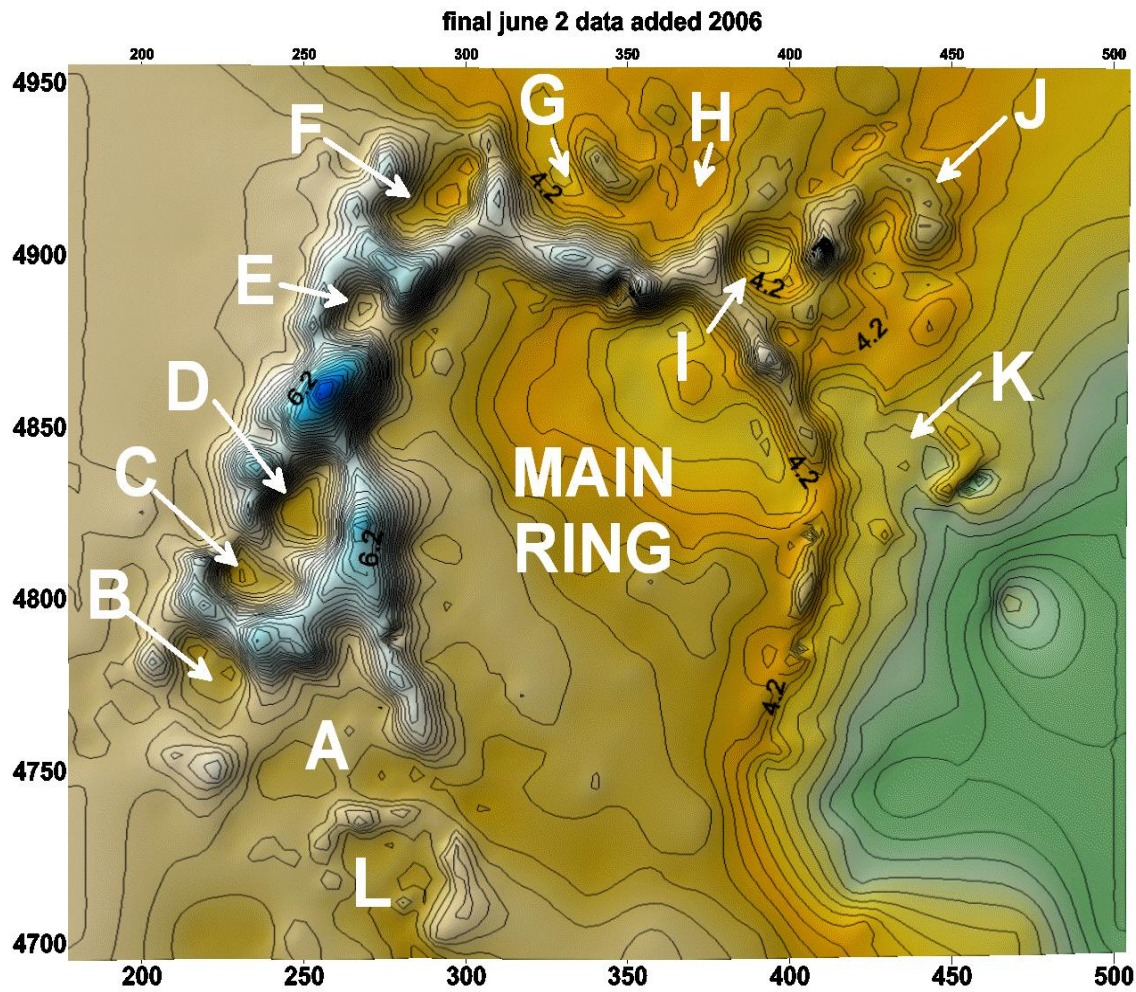
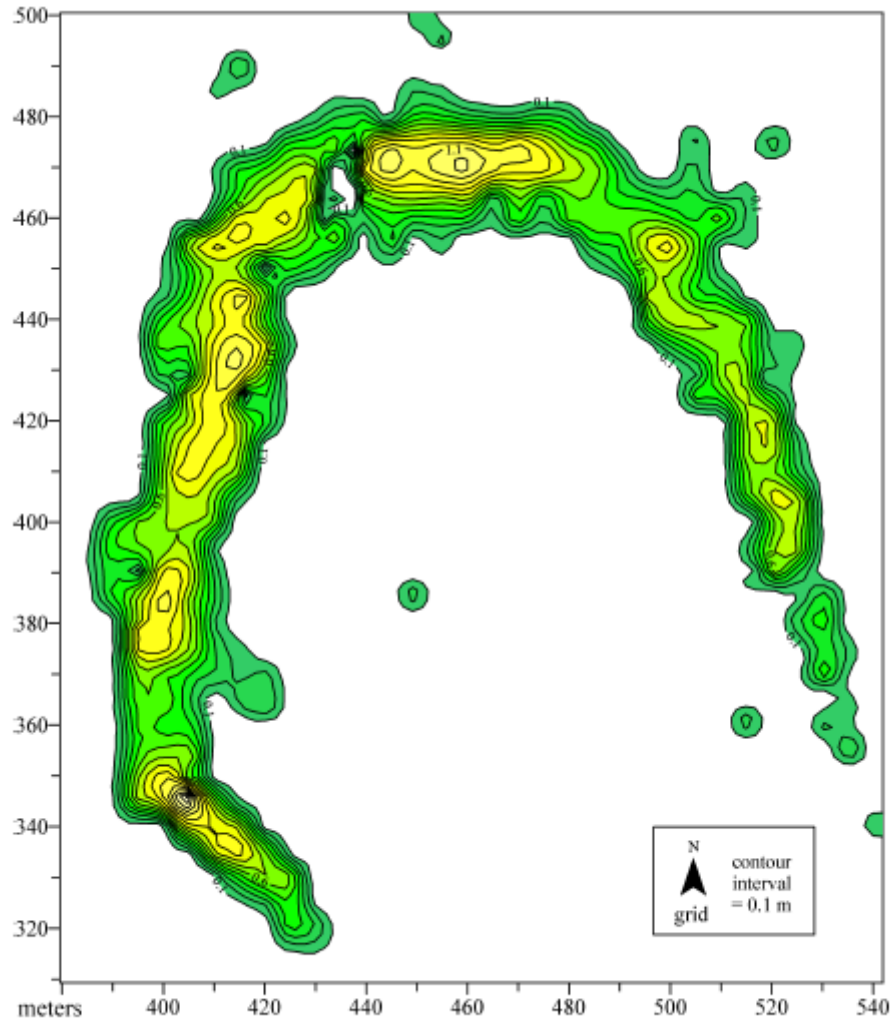


Figure 2. Stratigraphic map of Rollins Shell Ring (Provided by Rebecca Saunders).



Gregory Heide and Michael Russo, Southeast Archeological Center, National Park Service, 2002

Figure 3. Stratigraphic map of Guana Shell Ring (Map taken from Russo, Heide, and Rolland 2002).

CHAPTER 2: ARCHAIC PREHISTORY

Introduction

Orange pottery, some of the oldest in North America, made its first appearance in Florida during the Late Archaic. This chapter will focus on the environmental shifts and technological innovations that define the Late Archaic on the northeastern coast of Florida.

The Archaic stage of Florida prehistory is divided into three periods: the Early Archaic (10,000-8000 B.P.), the Middle Archaic (8000-5000 B.P.), and the Late Archaic (5000-3000 B.P.). During the first two periods, there were dramatic changes in climate and sea level. By the beginning of the Archaic, continental glaciers had almost completely disappeared, and the climate became much warmer (Miller 1998; Schuldenrein 1996; Stanley 2005).

In the literature, this period of global warming is variously referred to as the hypsithermal, the altithermal, the Holocene Climatic Optimum warm event, the Holocene Megathermal, and the Holocene Thermal Maximum (Oliver 2005; Schuldenrein 1996). This unusually warm climatic event peaked around 7000 B.P., with world temperatures at least two degrees Celsius above what they are at present (Stanley 2004). More climatic stability and a dramatic decrease in sea level were present by 5000 B.P. Throughout the Archaic, population levels increased along the eastern coast of Florida, and monumental architecture in the form of shell rings emerged by 5000 cal B.P. Though the earliest rings were pre-ceramic, ceramic vessel usage also emerged in the region at that time.

The Early Archaic (10,000-8000 B.P.)

Environment

In the Early Archaic, the landscape of the Atlantic coast of Florida looked quite different than it does today. At least three abrupt rises in sea level occurred during the late Paleoindian and the Early Archaic Periods, between 15,000 B.P. and 7,000 B.P. (Stanley 2005:519). Evidence of these pulses has been found near Barbados in the Caribbean in studies of the fossil remains of *Acropora palmate*, or moosehorn coral, a reef-building coral that requires light to grow and therefore is only found close to the surface of the ocean. Fossil colonies of moosehorn coral have been discovered much deeper in the ocean than they could naturally grow. Thus, sea level was lower when these colonies were active. Radiometric dating indicates that there were abrupt rises in sea level just after 15,000 B.P., at ca. 12,000 B.P., and, at ca. 8000 B.P. (Stanley 2005:519).

In the Early Archaic, ocean levels measured up to 28 meters below what they are today (Figure 4), even with the rises in sea level since the end of the Pleistocene (Bense 1994:65). The water table was also low, leaving many fresh water sources dry. In addition, rainfall was sporadic, leading to long periods of drought (Bense 1994; Davis 2006; Miller 1998; Stanley 2005; Watts, Grimm, and Hussey 1996; Watts and Stuiver 1980).

Settlement Patterns

It is hard to sketch a complete picture of what coastal life was like during this period since it is suspected that many key sites are submerged by today's much higher ocean levels. However, inland sites from this time period do reveal what life may have been like.

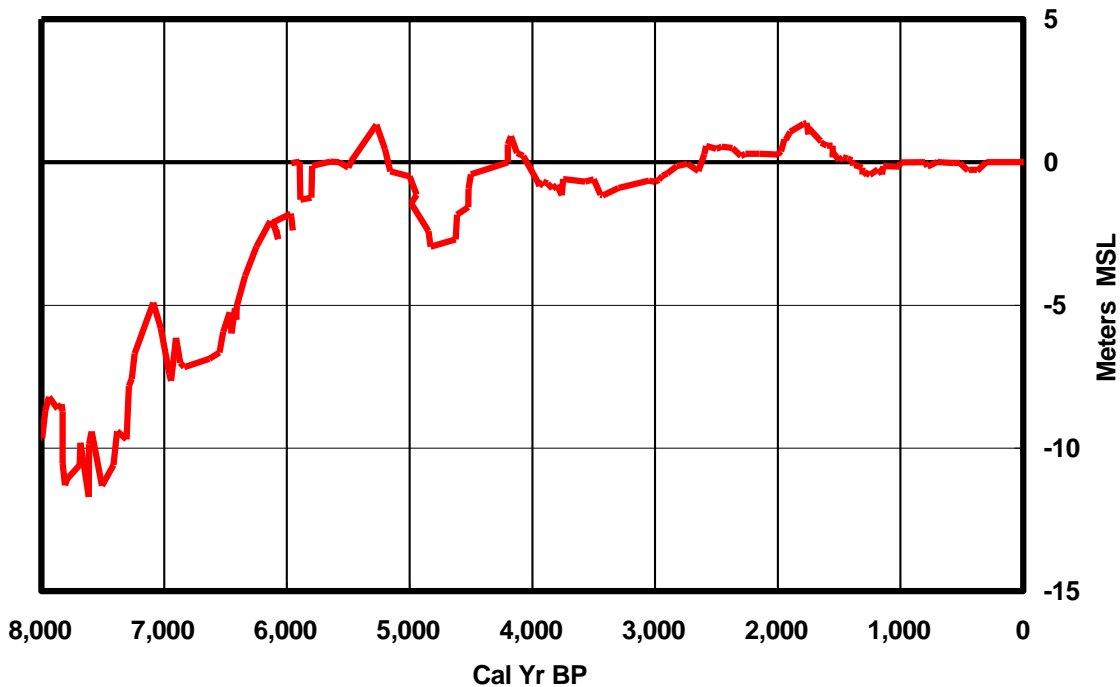


Figure 4. Sea level curve (Basillie and Donoghue 2004).

It is probable that during the Early Archaic northeastern Florida was populated by mobile family-based fisher-hunter-gatherer bands that were dependent on a mixture of woodland, grassland, and ocean resources for survival (Bense 1994). The St. Johns River Valley and other areas of northeastern Florida were probably well populated during this period but not consistently (Bense 1994; Milanich 1994), although this cannot be shown conclusively. Because the water table was low, access to water was limited. This limited their range of movement which may have eventually led to a more sedentary lifestyle (Milanich 1994).

Sociopolitical System

As water was so vital to survival, but limited by the low water levels, it is likely that sociopolitical boundaries were delineated by waterways. The Atlantic coast is home to several good-sized river systems. Each river valley was probably the territory of a large extended family

lineage. Within this group were smaller family bands which utilized the resources of the valley independently. Only at certain times of the year would the whole extended family group come together. Such gatherings may also have included members of neighboring river valley groups and were likely the catalyst for trade in goods and marriage partners (Bense 1994).

Early Archaic Artifacts

Early Archaic sites were briefly occupied campsites where tools were reconditioned and meals were prepared (Daniel 2001; Milanich 1994). Stone tools were the predominant artifact in Early Archaic assemblages, and there is some evidence of an expanded tool kit during this time period (Daniel 2001). The atlatl, or spear thrower, was introduced into Florida during the Early Archaic. With its adaptation, lanceolate spear points, the long, lance-like points typical of Paleoindian tool kits, were replaced by smaller, stemmed points that were better suited for atlatl use. In addition, ground and chipped stone tools are commonly found at Early Archaic sites. However, on the Southeastern coast, shell tools were already replacing the stone tools of the Pleistocene (Bense 1994; Milanich 1994). Although stone artifacts are those most commonly found from the Early Archaic, other materials also were being utilized by the people of the time. For example, impressions of woven mats and baskets have been found at the Icehouse Bottom site in Tennessee (Bense 1994).

The Middle Archaic (8000-5000 B.P.)

Environment

Changes in the landscape of the Middle Archaic were slow but dramatic. By 8000 B.P., pine forests had gained a foothold in South Carolina and were expanding south toward the Florida peninsula (Watts, Grimm, and Hussey 1996). The large oak-hickory forests that once dominated

much of the Southeast were slowly succumbing to deforestation caused by extensive drought and subsequent forest fires sparked by sudden thunderstorms that were a result of the hypsithermal (Bense 1994; Davis 2006; Schuldenrein 1994; Watts, Grimm, and Hussey 1996). However, it was not until ca. 4500 B.P. that pine forests could be found all along the Atlantic Coast from New Jersey to Florida, dominating the coastal areas and the interior (Watts, Grimm, and Hussey 1996). By 6500 B.P., pine species comprised nearly sixty percent of all woodland species (Davis 2006; Watts, Grimm, and Hussey 1996).

As noted above, the hypsithermal reached its peak during the Middle Archaic, resulting in warmer, drier temperatures. However, by 7000 B.P., the mild weather was punctuated by brief but intense periods of rain, which caused massive flooding, sedimentation, and soil erosion (Davis 2006). Backswamps and marshlands began to spread, and meandering rivers became more common along the Florida coast as sea level continued to rise (Davis 2006, Bense 1994). During the Middle Archaic, modern climatic norms were emerging and the forests began to resemble those found in Florida today (Watts, Grimm, and Hussey 1996).

Settlement Patterns

During the Middle Archaic, large “central-base settlements” appeared, which were occupied by larger populations than those of the Early Archaic encampments. These groups of fisher-hunter-gatherers were drawn to the nutrient-rich, expanding swamp and marsh land, where many of the settlements were located. The Middle Archaic also marks the beginning of large shell mounds in Eastern Florida. Moderate-to-large sized shell middens began to accrue along the St. Johns River; there is evidence of estuarine resource use and some habitation near modern coastlines. These fresh and saltwater middens often contain a variety of faunal remains, including apple

snails along the rivers and oyster along the coast, as well as fish, turtle, and deer. Features found in middens include fire pits and other clay-lined earth ovens. Burials have also been observed in shell middens of this period (Bense 1994; Milanich 1994).

Sociopolitical System

It is likely that during the Middle Archaic many people continued to live in territorial family groups along river valleys. However, there is evidence that some people were starting to gather in permanent settlements which relied heavily on marine resources. Increased sedentism may also have led to a more stratified society. Burials of this period do not have an equal distribution of grave goods. Some burials have a much wider array and larger amount of goods than others. Many ornaments such as beads and gorgets found associated with burials have been sourced from as far north as Tennessee (Bense 1994). Such valuable goods were probably buried with individuals considered to be of a high standing in the community.

Middle Archaic Artifacts

One of the most astonishing mortuary sites from the Middle Archaic is that of the Little Salt Springs site in northeast Florida, where a large, submerged burial site was uncovered. Due to the anaerobic nature of the environment, the state of preservation was astounding (Clausen et al. 1979). Some skulls had brain matter still intact. Many of the burials were accompanied by carved wooden tablets with iconography similar to that found on wooden artifacts from Key Marco, which were also remarkably well preserved (Bense 1994; Clausen et al. 1979.; Milanich 1994; Purdy 1974). In addition to wooden artifacts, deer antler artifacts, shell artifacts, ground stone tools, and woven baskets (Bense 1994; Milanich 1994; Moore 1921) were discovered at Little Salt Springs and at other sites from this period.

Another significant discovery is the Windover site near the east coast of Florida, where woven textiles were uncovered in association with 168 well-preserved skeletons (Bense 1994; Milanich 1994; Tomczak and Powell 2003). Analysis of carbon isotope values from the skeletons gave insight into the diet of Middle Archaic people. Tomczak and Powell (2003), concluded that the Windover people did not rely on big game hunting, but instead based their diet on aquatic resources from the immediate area (mainly fresh water shellfish, duck, and fresh water catfish). Analysis of wear patterns in the first and second molars of the skeletons indicated that seeds and nuts were also an important part of the diet (Milanich 1994; Turros et al. 1994; Tomczak and Powell 2003).

The Late Archaic (5000-3000B.P.)

Environment

The Late Archaic period coincided with climatic and ocean-level stabilization and the gradual end of the hypsithermal (Watts, Grimm, and Hussey 1996). By this time, the Florida coastline resembled modern coastal areas and weather patterns were approaching current conditions (Bense 1994; Davis 2006; Watts, Grimm, and Hussey 1996). However, ocean levels were still lower than they are today in many coastal areas (Figure 4). Sheltered river mouths allowed for the formation of marshes and mudflats along bays and coastal estuaries in modern locations. These areas were the perfect environment for the exploitation of terrestrial species, as well as dense populations of marine and estuarine life forms (Bense 1994; Miller 1998).

Settlement Patterns

Three types of sites are commonly found along the eastern Florida coast dating from the Late Archaic Period. These include shell rings, shell middens, and non-shell sites. These three site

types differ from each other in many important ways, most especially usage. Shell rings, considered by many archaeologists to be large-scale monumental architecture, appeared on the Atlantic coast and in some areas along the Gulf Coast during the Late Archaic (Russo, Heide and Rolland 2002; Saunders 2004a; Sassaman 1993; Willey 1949). These structures differ from contemporaneous, amorphous shell middens in that they are circular or semi-circular banks of shell (many of which are immense) as much as six meters in height. The centers of these rings have comparatively few features or artifacts, and are generally referred to as plazas. Unlike middens, shell rings are never associated with formal burials. However, random skeletal elements, such as teeth, have been recovered from shell rings. Also, there is very rarely any evidence of fire pits within the rings themselves (Russo, Heide, and Rolland 2002; Saunders 2004a).

Although the purpose of such rings is still the subject of debate, some form of group affiliation and short-term occupation must have been at play for the construction of such immense structures, which often took place over a relatively short period of time (Russo, Heide, and Rolland 2002). It has been argued that monumental architecture of any kind cannot be undertaken unless an advanced level of social hierarchy exists in the society (Trigger 1990). However, a high level of social stratification cannot be attributed to a society based solely on the existence of monumental architecture.

The shell rings of eastern Florida were not necessarily built by a highly stratified society, but it is possible that Late Archaic groups in northeastern Florida were sedentary with a society that was just beginning to show signs of stratification (Milanich 1994). Evidence of population nucleation and the relatively quick construction of shell rings may support this theory (Russo, Heide, and Rolland 2002).

Canoes

In the Late Archaic, we find evidence of the first use of waterways as a means of transportation in Florida (Milanich 1994; Wheeler et al. 2003). According to Bense, as of 1994, “Four dugouts from this period have been found, dated between 3190 and 1090 BC [5190 and 3090 B.P.] and all were made from pine logs by a combination of burning and chopping with adzes” (Bense 1994:97) “With a dugout,” Bense adds, “people could exploit larger areas and new sources of food and stay in better communication than on foot” (Bense 1994:97).

In the summer of 2000, the remnants of more than 100 log canoes were found in a dried up lake bed near Gainesville, Florida. Half of the canoes were radiocarbon dated, and 41 of those were shown to belong to the Late Archaic period, between 2300 and 5000 B.P. (Wheeler et al. 2003). Few artifacts were found associated with the canoes, but among these were several fragments of Orange Incised pottery (Wheeler et al. 2003).

Orange Incised Pottery

Pottery was first developed in the Southeast during the Late Archaic at around 5000 B.P. (Bense 1994; Milanich 1994; Saunders 2004b). Orange pottery was characteristically tempered with some kind of fiber. Spanish moss appears to have been the most widely used temper in Orange pottery (Milanich 1994; Saunders 2004b; Simpkins and Allard 1986). Historically, archaeologists argued that the egalitarian hunter-fisher-gatherers of Archaic Florida could not have invented pottery without agriculture as a catalyst, and thus, pottery must have been imported from some more advanced cultures, for instance those of the Ayangue in Ecuador (Ford 1966). Evidence exists, however, that complex hunter-fisher-gatherer societies are capable of independently inventing pottery and decorating it with their own symbolic designs (Sassaman

1998). Even in areas of the world where agriculture was in place, pottery often spread independently of food production (Armit and Finlayson 1995). Thus, there is no necessary connection between pottery and agriculture (Armit and Finlayson 1995). Currently, Orange pottery is considered to have been independently invented on the Florida or Georgia coastal plain (Bullen 1972; Milanich 1994; Sassaman 1993, 2004).

Orange pottery is commonly found in shell rings, shell middens, and non-shell sites of the Late Archaic. Many different vessel shapes and sizes of Orange pottery have been recorded. The majority of Orange sherds are plain, but the decorated sherds reveal incised and often complex geometric designs.

Bullen (1972) described a sequence of five phases of Orange pottery to explain how the design and shape of these vessels changed over time. According to Bullen (1972), during the Orange 1 phase (4000-3650 B.P.) simple, flat-bottomed, undecorated rectilinear vessel shapes were made. Orange 2 (3650-3450 B.P.) marked the introduction of simple triangular and linear designs. This phase also included the Tick Island curvilinear incised designs. From 3450 B.P. to 3250 B.P. (the Orange 3 phase), designs and vessel shapes become more complex. Vessels had small lug-handles and were decorated with lines and punctations. Bullen (1972) called this the “apogee” of Orange pottery. Orange 4 (3250-3000 B.P.) marked a change in the construction with the introduction of some coil-made pots. Designs were simple. The Orange 5 phase (3000-500 B.P.) included the transition from Orange pottery to St. Johns sponge spicule-tempered ware with a continuation of simple linear designs.

However, Bullen’s design sequence has recently been called into question. Bullen and Bullen (1961) proposed a design sequence that was fundamentally a unilinear evolution of plain pottery

to simplistic designs to complex designs. However, there is now evidence (Mitchell 1993, Saunders 2004a, Sassaman 2003) that this is not the case. Research by Mitchell (1993) on over 1000 Orange pottery sherds at the Summer Haven Site revealed a greater number of designs and variations of design than were first suspected by Bullen (1972). Excavations by Saunders (2004a) at the Rollins Shell Ring Site indicate that the relative frequency of plain and incised Orange pottery had more to do with site function than period of site occupation.

Sociopolitical System and Feasting

It is unclear whether the societies responsible for building and maintaining shell rings were egalitarian or transegalitarian. In egalitarian societies, “everyone has about equal rank, access to, and power over basic resources” (Haviland et al. 2011:535). Decisions are arrived at by consensus of autonomous individuals (Leacock 1992). A dispersal of authority, not the lack of authority, is the key to a healthy egalitarian society (Leacock 1992). According to Woodburn (1982), members of egalitarian societies “are well aware of the possibility that individuals or groups within their own egalitarian societies may try to acquire more wealth, to assert more power, or to claim more status than other people, and are vigilantly seeking to prevent or limit this” (Woodburn 1982:432). It is the group’s conscious effort to maintain equality that allows an egalitarian society to thrive (Leacock 1992).

Transegalitarian is a term proposed to “encompass the typological murkiness between egalitarian and stratified societies” and implies the presence of “emerging” inequalities (Ames 2010:26). Unlike in egalitarian societies, transegalitarian societies demonstrate unequal distribution of power and wealth. However, as Ames (2010) points out, transegalitarian societies are not stratified in such a way that only a small group of elite gain access to power and wealth. The

group considered “elite” is often 50 percent or more of the population. Less than ten percent of the population would be considered “resource poor.” As inequality deepens, “With the individualization of food procurement and consumption...sharing is greatly curtailed but not completely eliminated” (Hayden 2001a:257). Nevertheless, food becomes a source of power and status, and complex rituals, such as feasts, and the structures related to them begin to emerge in transegalitarian societies (Hayden and Adams 2004).

Gibson (2004:259) stresses the importance of “beneficent obligation” in egalitarian and transegalitarian societies, for both keeping society functioning and for accomplishing great works that take group cooperation. With a gift from one person to another or even one tribe to another come a sense of debt which Gibson claims carries over into every aspect of life. There is an obligation to repay the giver, but “what is returned will be subjected to valuation relative to the original gift” (Gibson 2004:259). It is likely that this kind of debt and obligation was harnessed by communities to build large mounds. Even without formal leadership, a group could easily elect to undertake a large building project, especially if it was seen to have distinct benefits for the group. Thus, it is not out of the realm of possibility that an egalitarian or low level transegalitarian society could build and maintain monumental architecture.

Often it is through rituals, such as feasting, that beneficent obligation is formed and repaid. Social interaction, which would occur at ritual feasts, is the key to stable egalitarian and transegalitarian societies, and it is vital for maintaining links with other groups in the area for both trade and a source of marriage partners. It is likely that during the Late Archaic communities became more sedentary and populations began to increase. As Jefferies (2004:72) asserts, “One possible response to decreased mobility may have been the establishment of more formal social ties with other local groups, perhaps through a network of trading partners living in

nearby as well as distant settlements.” Feasting at shell ring sites may also have been a way of maintaining and creating such a social network and marking one’s place within it.

Russo (2004:41), who argues for a transegalitarian social system for ring builders, speculates that in northeastern Florida, “Small- and large-scale public consumption of food was a medium through which social interaction took place at ring sites.” If other bands participate, hosting a feast brings prestige to the organizers. The public disposal of large amounts of refuse from the feast (building the shell ring in the process) served to “memorialize” the actions of the hosting group and “feasters received a permanent reminder of the host’s prestige and their own indebtedness” (Russo 2004:41).

In contrast to Russo’s argument, Saunders (2004a) states that feasts at shell rings could have been used as markers of solidarity for essentially egalitarian groups. Such solidarity feasts are often used to solidify friendships within the group and to help form a communal identity. The expenditure of resources as a status symbol is not paramount. In fact, Hayden (2001b:50) states that in solidarity feasts “there is little ostentatious display, and all participants often make equal contributions.” Solidarity feasts are comprised of everyday food. The feasts differ from ordinary meals only in terms of size. The goal of such feasts is to form ties with other family groups.

Therefore, feasting was vital for the safety of both the family and the community (Hayden 2001b; Russo 2004; Saunders 2004a) and the feasts themselves would be catalysts for labor mobilization through beneficent reciprocity (Dietler 2001; Gibson 2004). Large feasting occasions served as forums where many groups could gather, exchange ideas, solidify partnerships, and, especially, seek marriage partners (Hayden 2001b; Russo 2004; Saunders

2004a; Saunders 2004b); the feasting, in turn, would help to create the shell rings and solidify the ties that bind the society together (Hayden 2001a; Saunders 2004a).

Summary

The Archaic was a time of invention and ingenuity when populations grew and people invested time and labor into building monumental sites such as shell rings (Saunders 2004a). Climates shifted from the cooler temperatures of the last Ice Age to the warm, dry conditions of the hypsithermal and finally leveled out to the more temperate climate that exists today (Watts, Grimm, and Hussey 1996). Pine forests became established in the Florida peninsula, and swamps and marshland became more plentiful (Bense 1994; Milanich 1994; Watts, Grimm, and Hussey 1996). More expansive waterways provided faster and easier methods of transportation. Dugout canoes were in use. Better transportation facilitated trade and hastened the spread of ideas and inventions throughout the region (Milanich 1994; Wheeler et al. 2003). Waterways and marshes also provided sources of shellfish, fish, turtle, and, inland along the St. Johns River, freshwater snails (Claassen 1991).

In the Late Archaic, the invention of pottery tempered with fiber allowed for easier transport, storage, and cooking of food items (Sassaman 1993). Pottery also served as a means of ritual display through use at community feasts (Hayden 2001b).

Early Archaic lineage-based bands gave way to larger social systems, sedentary, or semi-sedentary bands and possibly transegalitarian social systems in the Late Archaic. Large shell rings and middens were constructed along the Atlantic and Gulf coasts. Feasting at such sites was used as a means of both bringing people together and as a means to enhance of solidarity (Saunders 2004a).

CHAPTER 3: ORANGE POTTERY

Introduction

Orange pottery, the earliest pottery on the Florida Atlantic coast, appeared by ca. 4800 cal B.P., placing it firmly within the Late Archaic period (Saunders 2004b). The range of Orange pottery extends from southern coastal Georgia south into the Glades area of Florida and west to the vicinity of Tampa Bay (Saunders 2004b). The pottery analyzed in this thesis is from two sites on the northeast Florida coast. In this chapter I will describe Orange pottery characteristics including the uses and advantages of fiber-tempering. I will also examine various decoration methods and delve into what incision tool may have been used by Orange potters.

Orange Pottery Characteristics

Early Orange pottery is typically thick walled, slab molded, and fiber-tempered. As noted, Orange pottery gets its name from the orange or red coloration of many of the sherds due to iron oxide naturally present in the clay (Saunders 2004b). However, color is more variable than the name suggests, with sherds ranging in shades from a bright terracotta orange to a deep maroon, with gray and charcoal also common.

Saunders (2004b) points out that the interiors of many Orange sherds are a deep black color. Taken together with the brighter interior and exterior walls, this suggests a short but high temperature firing technique (Saunders 2004b).

Orange wares were crafted by either slab molding or the coil method (Bense 1994); coiling became more common through time. With slab molding there is a propensity for vertical breakage through the middle vessel wall (Fullen 2005; Saunders 2004b). Fullen (2005:100-101;

Saunders 2004b) slab molded a fiber-tempered vessel for a lab experiment. When he built his slab-molded vessel wall up high to support itself, it folded over on itself creating a lamination seam. The laminator seam was not well compacted and, as Fullen (2005:100-101) discussed, after firing, the vessel wall split apart along the lamination. Lamination is frequent Rollins and Guana pottery assemblages, and was, probably, caused by refolding of the clay during vessel formation.

Fiber-Tempering

“Temper” is defined as the intentionally added inclusions in the clay paste. According to Brown (1994:80), “Tempers mixed into clay form a supportive framework, lessen shrinkage and water loss as the clay dries, and minimize expansion and contraction during firing.” Although sand and grog (crushed pieces of old pots) are more common tempering agents, fiber or other organic matter was used as temper in many parts of the world. Fiber tempering has been found in the Amazon basin, on the Caribbean coast of Colombia, in coastal Japan, on the west coast of Scotland, and in coastal Florida (Bullen 1972). According to Simkins and Allard (1986), the two fibers most probably used as inclusions in Orange pottery are Spanish Moss (*Tillandsia usneoides*) and Palmetto fiber (*Sabal palmetto*). A later study by Cordell (2004) confirms the use of Spanish moss as a temper and examines the theory that sponge spicules were employed as another possible organic temper; however, according to Cordell, it is likely that sponge spicules are a natural inclusion rather than a temper in Orange pottery.

It is difficult to miss the telltale signs left by fiber-tempering. Upon close inspection of the broken edge of a fiber-tempered sherd, a plethora of tiny holes is visible. These air holes, called “vesicles,” are the remnants of fiber inclusions. Fiber-tempered wares are honey-combed with

vesicles where the fiber inclusions have burned away during firing (Saunders and Hays 2004a). In Orange pottery it is also common to find burned fibers still intact within the clay matrix.

Uses and Advantages of Fiber Tempering

Temper were chosen to “improve a vessel’s performance during use” (Skibo, Schiffer, and Reid 1989:123). Although fiber-tempered pottery does have good thermal shock resistance, the thick vessel walls and porous nature of fiber-tempered pottery do not conduct heat well (Skibo, Schiffer, and Reid 1989). This means that fiber-tempered pottery is not well suited to direct fire cooking methods.

Sassaman (1993) suggests that Stallings fiber-tempered pottery might have been used for indirect cooking methods like stone boiling, in which stones are heated in a fire and placed directly into the liquid in a pot to produce boiling. Dropping heated stones into a vessel of cold or tepid liquid, however, might result in thermal shock and cause the vessel to shatter due to an abrupt change in temperature. According to Sassaman (1993:142), fiber-tempered pottery is resistant to such temperature changes because “the pores left behind by burned fibers arrest cracks caused by thermal shock.”

Clay and stone “cooking balls” are not commonly found at shell ring sites—none were found at Rollins or Guana— and very few Orange pottery sherds at these sites show signs of sooting on the bottom and sides from contact with fire. Since Orange pottery does not conduct heat well, its best use is not for cooking. However, fiber-tempered pottery does retain heat well. This is an asset for serving vessels. Fiber-tempered pottery is often lighter and more resistant to breakage on impact than sand or grog tempered pottery (Skibo, Schiffer, and Reid 1989). These characteristics are also advantageous for serving vessels. It is likely that, as Saunders (2004b)

postulates, Orange pottery found at shell ring sites was used not primarily for cooking, but for serving and storage.

Decoration Methods

The designs and motifs used to decorate Orange Incised pottery were varied and often complex. Wheeler (1994:49) gives examples of motifs as “rectilinear themes, simple lines, diamonds, frets, chevrons, zigzags, spirals, ticking, positive and negative shading, and fine parallel or crosshatch shading.” These designs are executed in hundreds of different ways to create distinct patterns and stylistic expressions that create unique motifs. A list and analysis of designs and motifs at Rollins and Guana will be presented later in this thesis (Chapter 6).

Incising was applied prior to firing. Many rims were also highly elaborated with either an extension of the vessel decoration or a complementary decoration. Prior to incising, the majority of Orange Incised vessels were given a finishing treatment. Some vessels were smoothed with a soft buffer (leather or hide possibly), and others were burnished with a smooth rock, which was rubbed vigorously over the face of the vessel to create a finished and water-tight surface (Saunders 2004b).

Incision Tools

Decorations were created with a sharp object and “applied while the paste was still damp in such a way that the lines plowed into the surface” (Ford 1966:792). The marks can be narrow and acute or fairly broad. Broad incisions often show tool marks in the form of small embedded gouges (Figure 5). Although wooden or bone tools may have been employed to create the incisions, these tools would not necessarily account for the unusual marks within some of the incisions.

It is possible that these marks were caused by the serrated edges a shark tooth tool. In coastal Florida, shark teeth have been used as tools for thousands of years. They are naturally sharp with a tapered end, and evidence exists of their use as drills, scrapers, and wood carving tools (Brown 1994; Milanich 1994). Shark tooth tools were often hafted to provide a handle for easier use. It is probable that shark teeth also found use in the decoration of pottery during the Late Archaic.

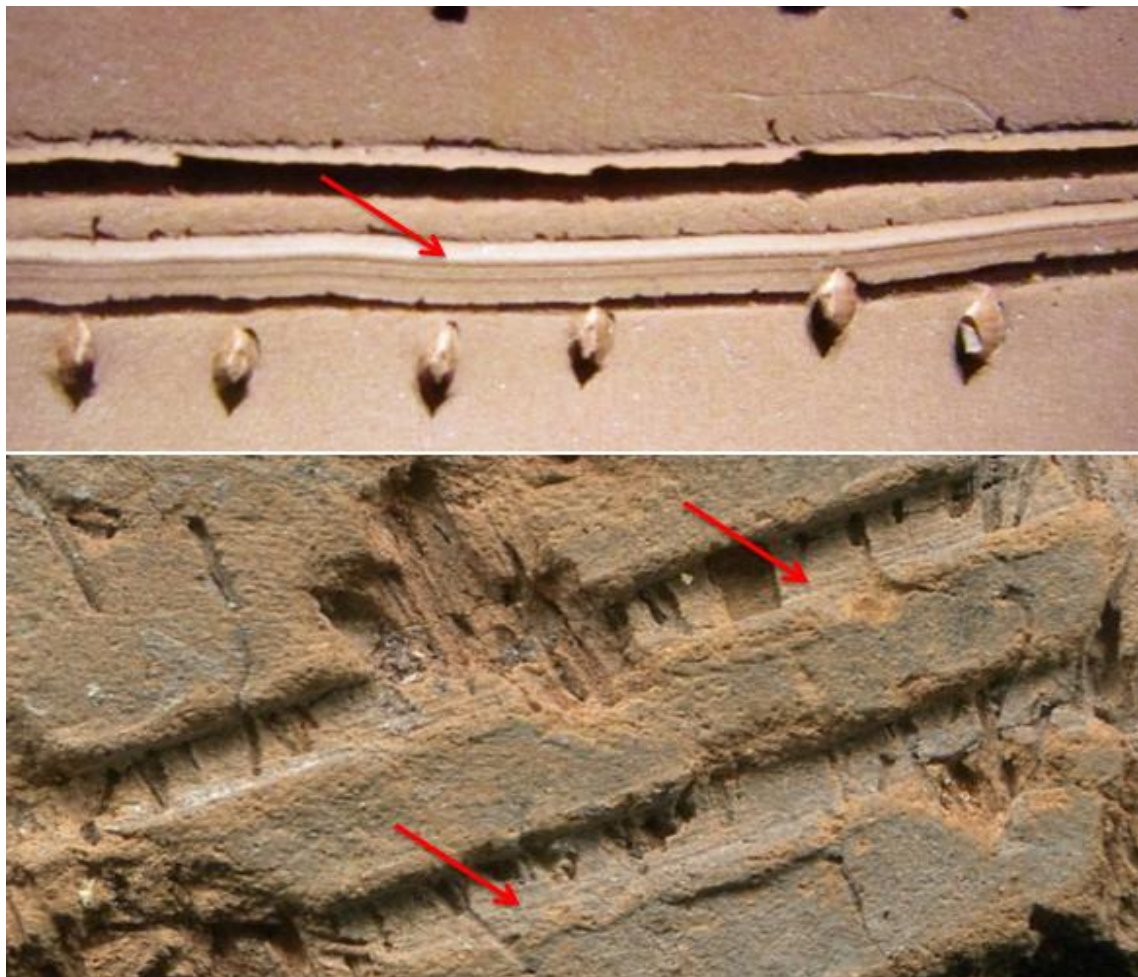


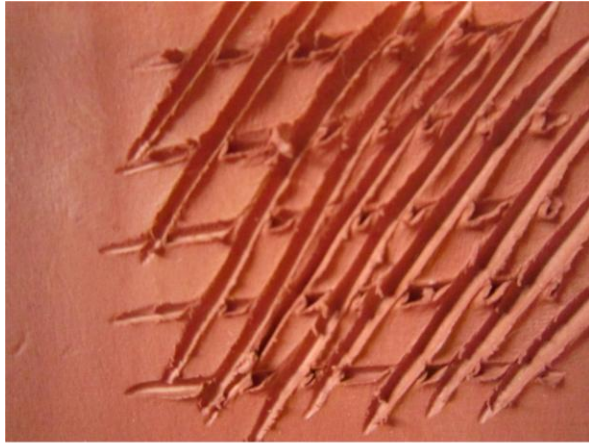
Figure 5. Comparison of gouges left by shark tooth in my experiment (top) and gouges left by incision tools on Orange pottery (bottom).

To examine this theory, I conducted a small, informal experiment using a variety of shark teeth (both fossil and modern) to create incisions in clay slabs. Incisions were made with the broad side of the tooth and with the edge of the tooth (Figure 6). The clay was then dried and the incisions compared to incisions of Orange pottery from the Rollins and Guana sites.

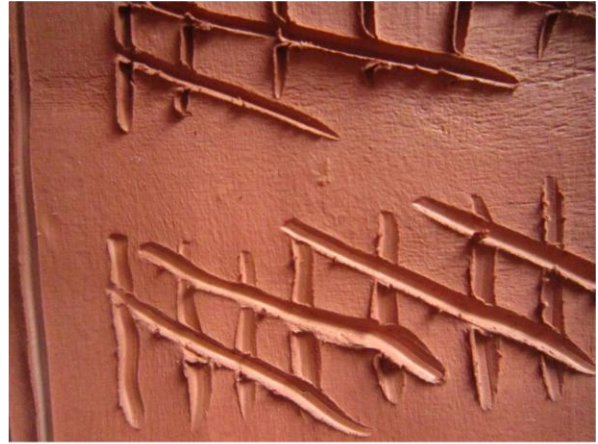
The incisions I made with the broad side of the tooth displayed the same unusual tool marks that I had noted in my analysis. In this experiment, I also noted that the wet-paste incision created a distinct furrow, with clay thrown up on the sides of the grooves (Figure 6). Although these furrows can be seen at both Rollins and Guana, it is especially common at Guana. It is not conclusive that shark teeth were the only tools capable of creating these incisions, but I think they make good candidates for the production of many of the incisions.

A whole toolkit was probably employed to create the desired decorations on Orange pottery. However, it is clear that a shark tooth tool is quite versatile and could be used to make broad, thin, deep, or shallow incisions, as well as a wide range of punctations. Different kinds and sizes of teeth would provide even more options for the decorator. In my experiment, I found that the fossil shark teeth were more forgiving and easily created a straight, steady line, whereas the modern shark teeth were hard to control. In one case, the slightest pressure on a modern tooth cut through the clay (Figure 6).

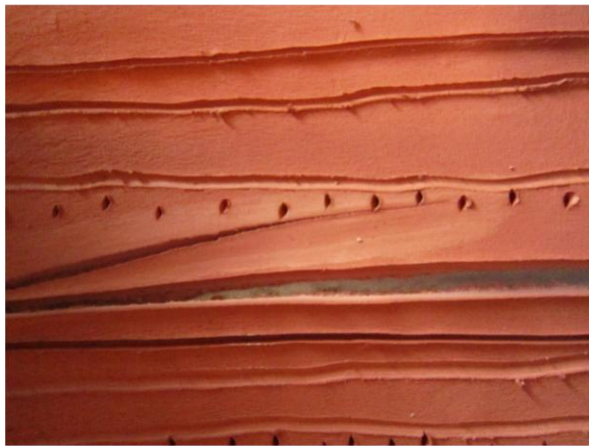
Archaic people may have had particular uses for different kinds of shark teeth. Shark teeth are often found at Orange culture sites, but they are not found in abundance. It is possible that a reliable incising tool would have been invaluable to a potter and may have been kept and passed down to apprentices, and, therefore, would not appear as a common find at Orange sites.



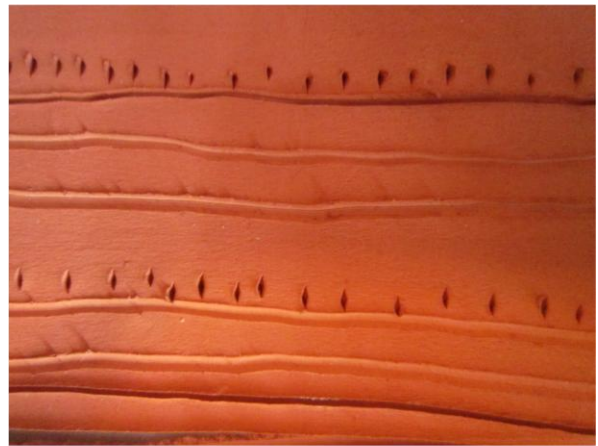
1



2



3



4

Figure 6. Comparisons of incisions made with shark teeth with the blade forward (1) and the blade turned to create a broader surface (2). Comparisons were made between modern shark teeth, which were so sharp they cut fissures through the clay (3), and fossil shark teeth, which were more reliable in terms of not incising too deeply into the clay (4).

Summary

In the Bullen chronology (1975), Orange fiber-tempered pottery of the Late Archaic began as rectangular, straight-sided vessels and large shallow dishes with no decoration. Bullen postulated that vessels then became more elaborate over time. However, as Saunders (2004a) and Sassaman (2003) have now shown, Orange pottery did not follow such a linear evolution.

Incised Orange pottery was carefully decorated. Incisions may have been made with shark tooth tools and other items before firing. Before incising many of the vessels were finished by burnishing (Saunders 2004b). The degree to which a vessel was decorated and burnished depended on the use to which it would be put, and the pottery sherds from the Guana and Rollins sites were probably used in ceremonial and feasting contexts.

CHAPTER 4: SHELL RINGS

Introduction

Shell rings are among the first examples of monumental architecture on the southeastern Atlantic shore. The oldest known shell ring site, Oxeye Island, has been dated to ca. 4800 cal B.P., (1 cal. 4900-4670) (Saunders and Russo 2011). More than 40 different shell rings and shell ring groups have been discovered on the Atlantic coast. Almost all of the sites are located on natural high ground either on barrier islands or the adjacent mainland. However, some of these sites, like Oxeye, have been partially inundated by rising ocean levels, and it is likely that many shell ring sites are already fully submerged and remain undiscovered (Saunders and Russo 2011). Shell rings range in size and shape from the small doughnut-shaped rings of Georgia and South Carolina, which rarely exceed 70 m in diameter, to the enormous horseshoe shaped rings of the Florida coast which can reach 250 m in diameter (Saunders 2004a; Saunders and Russo 2011). The walls of shell rings were made up mostly of oyster shells, small fish bones, crab claws, and other small marine and estuarine animal remains. Artifacts found in the shell ring walls were mostly pottery, but shell tools, bone pins, bone tools, and parts of stone tools have been recovered (Saunders 2004a, Saunders and Russo 2011).

In 2004, Saunders noted that the majority of shell ring sites on the Atlantic coast are spatially separated from habitation, hunting camps, and other sites. She believes that this purposeful separation allowed shell rings to be used as “neutral” territory and provided a forum for cultural information exchange (Saunders and Russo 2011). Thus, a ring built up of feasting deposits would stand as testimony to the group cooperative.

Description

Although called shell rings, very few of these structures are actually complete rings (Figure 7). The vast majority of shell rings are C-shaped or even horseshoe shaped. A small portion of these sites are comprised of overlapping rings that form a figure eight. A hexagonal shape has also been reported (Saunders and Russo 2011). The size of shell rings is also variable, with the tallest ring being Fig Island 1 at 6 m and the widest being Rollins at 250 m in diameter. Generally, the rings of Florida are the largest and most elongated, whereas the rings of Georgia and South Carolina are smaller and more compact (Saunders and Russo 2011). Another difference between ring sites to the north and the Florida ring sites is that the shell ring sites of South Carolina and Georgia often have several small-to-moderate rings at a single site, whereas the Florida sites usually consist of one large ring (Saunders and Russo 2011).

Shell Ring Construction

Although shell rings were once thought to be built up from the continual dumping of daily refuse (Trinkley 1985), recent studies indicate that this household waste deposit theory is not true of all sites. Trench excavations at various sites show that most shell rings are made up of large deposits of “whole, clean oyster shell” (Saunders and Russo 2011:44). If shell rings were made up of daily deposits of refuse, one would expect to find broken shell in a matrix of dark humus or sand, which would be the result of years of trampling underfoot. Shell orientation within the rings is unpredictable: some shell deposits are vertical and others horizontal (Saunders and Russo 2011). This seems to indicate that the shell matrix was dumped in large piles instead of being left daily after small meals, and that the shell was not subsequently disturbed or compacted as it is in habitation midden sites.

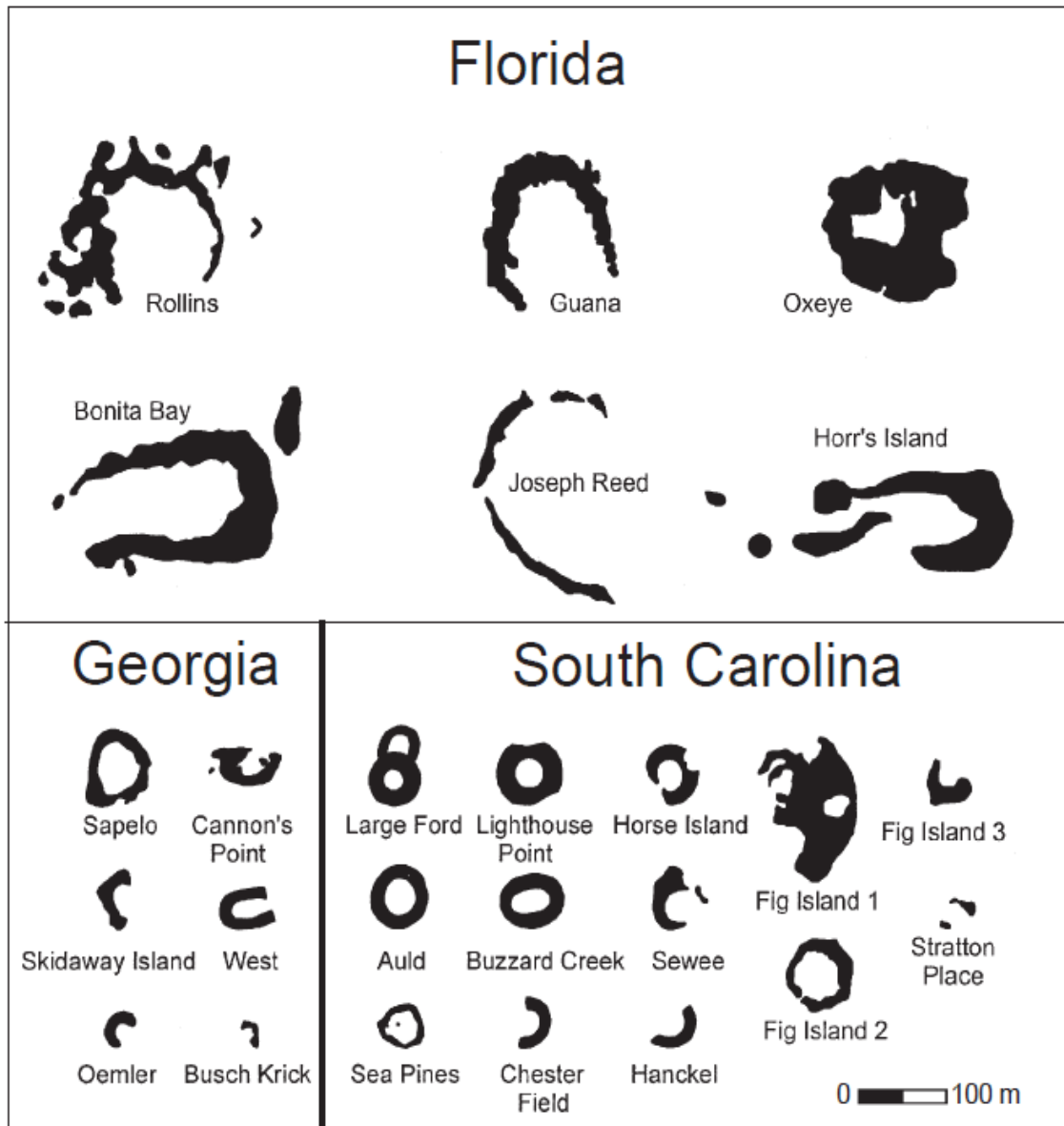


Figure 7. Examples of the relative size and shape of rings from Florida, Georgia, and South Carolina (Taken from Saunders 2004a).

Another argument against the slow deposit of daily trash was that most shell rings seem to have been built in a relatively short period of time. According to Saunders and Russo (2011), the buildup of ring walls was rapid, and radiocarbon dates indicate that top and bottom ring dates are often statistically contemporaneous at 1 sigma.

Usage

Shell rings provide the first true evidence of population nucleation along the south Atlantic coast, but as noted above, the function of these sites is the subject of some debate (Saunders and Russo 2011). According to some the shape and the height of such rings was “designed to facilitate observation of ceremonies in the central plaza, and, conversely, observation of the people on top of the rings by people in the plaza” (Russo, Heide, and Rolland 2002:8). The uses of shell rings have been debated since their discovery, with theories ranging from dance grounds and torture chambers (McKinley 1873) to fish traps (Edwards 1965), although Saunders (2004a) and others (Russo, Heide and Rolland 2002; Saunders 2004b; Saunders and Russo 2011) proposed that shell rings were ceremonial sites built up through ritual feasting. Others believed that some of these shell rings may have been used as habitations sites (Newman and Weisman 1992; Russo, Heide, and Rolland 2002). Newman and Weisman (1992) proposed that the Guana Shell ring was actually the remains of a circular village with habitation sites occupying the top of the shell ring walls and the interior of the ring. According to Russo (Saunders and Russo 2011), shell ring sites may have been used both as long term habitation sites and short term feasting sites. Finally, Thompson (2007) proposed that shell ring sites were originally used as habitation sites and then abandoned and reused as a ceremonial site.

The function of shell ring sites was most likely variable. Not only could one site have been used for many things, but as Saunders and Russo so aptly noted (2011:47) “it would be a mistake to impose too much regularity of function for ring sites that span preceramic to ceramic periods, two distinct traditions (Orange in Florida and Stallings/Thoms Creek in South Carolina), and 13 different archaeological cultures.” Thus, shell ring usage may have varied not only from site to site, but also through time.

The Rollins Shell Ring Site

The shell rings of Florida's Atlantic coast might be considered gargantuan in comparison with their counterparts to the north. Among these Florida shell rings, the Rollins Shell Ring is one of the largest. The Rollins site is located on Ft. George Island in northeast Florida (Figure 1). The ring is close to both the Atlantic Ocean and the St. Johns River. Tributaries of the river and marshlands surround the island, providing vast food resources to the inhabitants.

Like many of the Florida rings, Rollins is horseshoe shaped, not, strictly speaking, a ring. It is asymmetrical; the western arm of the ring is much broader and thicker than the east (Saunders 2004a). Rollins is unique in Florida because it has smaller rings on the outside that are connected to the larger ring. The only other ring with ringlets is the Fig Island 1 ring, in South Carolina.

Different interpretations have been put forth for this unusual configuration and how it reflects the purpose and development of the site. It is possible that Rollins was once more akin to the northern donut-shaped rings of South Carolina and Georgia and was made up of a grouping of small rings which were then joined together by the giant ring that we see today. Radiocarbon dating has shown that one of these ringlets, Ringlet F, preceded the ring construction, Ring D is contemporaneous, and several others appear to be unfinished (Saunders and Russo 2011).

Initial excavations at Rollins were conducted by Russo in 1992 (Russo et al. 1993); Russo and Saunders (1999) subsequently incorporated the Rollins site into a study designed to test three ring sites in the area.

The aims of Russo and Saunders' 1998 excavations were: to produce a topographic map of the shell rings, recover accurate radiocarbon dates for site occupation and abandonment, determine if parts of the ring were borrowed for shell, record how the ring was constructed, determine

seasons of site deposition, and recover a sampling of artifacts (Saunders 2004a). In 2003, Saunders conducted further excavations at the Rollins Shell Ring. Units 10, 11, and 12 were excavated and, as in previous excavations, large amounts of Orange pottery were recovered. Excavations failed to uncover evidence of habitation structures either within the plaza of the ring and runlets or along the ring walls (Saunders 2004a).

Excavations

Initial excavations at the site consisted of excavating ten 1-x-2-m units in several different locations and one 16-x-1-m trench on the western side of the ring (Saunders 2004a). It was concluded that the main portion of the ring in the area of the trench was made up of at least three distinct depositional layers. The whole clean oyster that was found at Rollins and which is present at most other shell ring sites shows that the shell was deposited rapidly and in large amounts (Saunders and Russo 2011). Excavations also indicated that initial activities at the site resulted in the creation of an earth midden on top of a natural sand ridge (Saunders 2004a). Radiocarbon and oxidizable carbon ratio dates indicate there may have been a break in usage between these two deposits (Saunders 2004a).

Although excavations of the interior of the ring and runlets turned up few artifacts (many of which were the result of later occupation or slope wash), the walls of the ring were far more fruitful (Saunders 2004a). Over 8000 pottery sherds were uncovered, although most were less than 3 cm.

Dating

Oysters from the western and eastern walls of the Rollins Shell Ring were radiocarbon dated and returned dates of 3680-3480 1cal B.P. and 3740-3540 1cal B.P. (Table 1), respectively

(Saunders 2004a). This is significant because the closeness of these dates shows that the “ring shape was inherent in the site plan at the beginning of ring deposition” (Saunders 2004a:243). The majority of shell ring dates indicate that they were built quickly and with purpose. The top of the ring was dated to 3580-3420 1cal B.P. while the bottom was dated to 3740-3540 1cal B.P. (Saunders 2004a:253)

The Guana Shell Ring Site

The Guana site (8SJ2554) is located nearly 40 km south of the Rollins site on a strip of land (The Guana Tract) that was once a Spanish land grant (Russo, Heide, and Rolland 2002). The Guana Tract is a long peninsula that runs parallel to the ocean along the northeast coast of Florida with the Guana River on one side and the Tolomato River on the other (Figure 8). Although the Guana River was dammed during the eighteenth century, at one time the river was a tidal creek fed by the fresh water marshes to the north. The section of the river closest to the site would have been brackish during site occupation (Russo, Heide, and Rolland 2002).

Guana was first recorded in 1985, when Tesar and Baker performed a walkover survey for the Florida Department of Natural Resources, Division of Recreation and Parks. They recorded and measured the previously unknown shell ring and reported the presence of several artifacts, including Orange Incised pottery. The Guana Shell Ring, like Rollins, was built in a large horseshoe shape with a segmented ring structure indicating that the ring may have been expanded during construction. A combination of topographical survey and probing indicated that the Guana Shell Ring is 140 m long on the eastern side and 150 m on the western side. The maximum dimensions of the ring have been recorded as 170 m north to south and 150 m east to west. The maximum width of the ring wall itself is 20 m (Russo, Heide, and Rolland 2002).

Table 1. Table of selected corrected and calibrated radiocarbon dates from Rollins Shell Ring Site (Saunders and Russo 2011).

Lab #	Provenience	Corrected B.P.	1 cal
Beta-119816	Trench 1, TU 2, Feature 1, Base of ring, western arm	3670 ± 70	3680-3480 (1.0)
WK-7438	Trench 1, TU 1, Feature 1, Top of ring, western arm	3600 ± 60	3580-3420 (1.0)
Beta-119817	TU 3197, Base of ring, eastern arm of ring	3710 ± 70	3740-3540 (1.0)
GX-30737	TU 10 (ringlet F), Base of shell	3930 ± 80	4050-3820 (1.0)
GX-30739	TU 11 (ringlet J), Base of shell	3630 ± 70	3630-3440 (1.0)
GX-30740	TU 11, Feature 28 (below ringlet base)	3820 ± 70	3870-3680 (1.0)

Excavations

Russo et al. (2002) excavated a series of 13 shovel test units to provide samples of diagnostic artifacts and material for radiocarbon dating. In addition to shovel tests, a large 1-x-2-m unit was excavated in the thickest part of the ring. The fieldwork conducted by Russo et al. revealed that the topmost layer was a thin lens of humus only a few centimeters deep. The next layer was made up of mostly whole oyster shells mixed with broken fragments. Below this layer the shell ring was composed of large deposits of oyster shell with clam and coquina shell deposits in evidence.

The base of the ring rested on sterile sand. As with Rollins, no evidence of domestic structures was obvious either in the plaza or on the ring wall (Russo, Heide, and Rolland 2002). Later excavations by Saunders and Rolland (2005) opened up a block of 2-x-2-m units near the western arm which provided a large sample of pottery from a single area. During excavations at Guana more than 1033 pottery sherds were uncovered.

Dating

Radiocarbon dating indicates that the main Guana Shell Ring was built between ca 3560-3310 1cal B.P. (Table 2), but site occupation began slightly earlier (possibly as early as 3890 B.P.). Although some shovel test dates indicate that the ring may have been completed at a slightly more recent date than Rollins, radiocarbon dating shows that the construction and use of the sites is, for all intents and purposes, contemporaneous (Russo, Heide, and Rolland 2002).

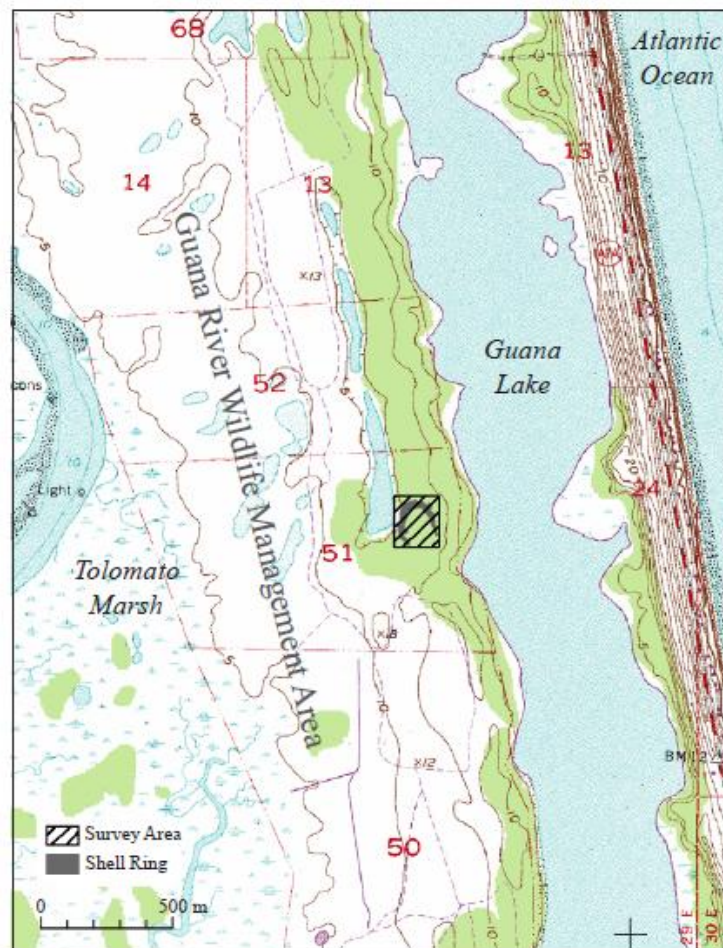


Figure 8. Location of Guana Shell Ring site between the Tolomato River (left) and the Guana River (right) (Map taken from Russo, Heide, and Rolland 2002).

Table 2. Table of selected corrected and calibrated radiocarbon dates returned from Guana Shell Ring site (Saunders and Russo 2011).

Lab #	Provenience	Corrected B.P.	1 cal
Beta-154817	Near base of ring; d. 1.2 m	3600 ± 50	3550-3440 (1.0)
Beta-165598	Base of ring	3490 ± 70	3440-3310 (1.0)
Beta-165599	Base of ring	3590 ± 70	3560-3390 (1.0)

Summary

Although there are shell rings from South Carolina to Florida, the shell rings of Florida are much larger in scope than those found to the north. In general, the Florida rings are more elongated than the rings of South Carolina and Georgia. They are often horseshoe shaped, and the arms of some rings show signs of expansion, perhaps to allow for a growth in population. Shell ring function is a contentious issue; with explanations ranging from village sites to ceremonial feasting sites. Rollins Shell Ring and Guana Shell Ring lie on the Atlantic coast of Florida only 40 km distant from each other. Both sites are surrounded by marshes with slow moving rivers nearby. Radiocarbon dates show that these two sites can be firmly placed within the Orange III period (Russo, Heide and Rolland 2002; Saunders 2004a) and therefore were in use at the same time. Both sites have large amounts of incised and plain Orange pottery.

CHAPTER 5: METHODS AND MATERIALS

Introduction

The purpose of this analysis is to expand upon the work done by Saunders (2004b), first published in an article entitled “Spatial Variation in Orange Culture Pottery: Interaction and Function,” which appeared in the book Early Pottery: Technology, Function, Style, and Interaction in the Lower Southeast (Saunders and Hays 2004b). In the article, Saunders compares her own design data from the Rollins Shell Ring site to another well-documented assemblage collected from the Summer Haven Site (Mitchell 1993). Saunders also included the two assemblages with less detailed data, the South Indian Field Site and the Cotten Site.

Through her analysis of vessel form, size, decoration, and function, Saunders concludes that site function had a direct bearing on the percentage of decorated pottery at a site. She found that 45.0 percent of sherds found at Rollins are decorated and only 27.6 percent of sherds from Summer Haven are decorated. South Indian Field and the Cotten Site had even lower percentages of decorated sherds at 6.8 percent and 4.6 percent, respectively.

Saunders (2004b:61) postulated that “more elaborate, or otherwise formally distinct, vessel assemblages” would be found at ring sites which had a feasting function. The goal of my study is to examine the decorated pottery collections of two closely located shell ring sites, the Rollins Shell Ring and the Guana Shell Ring, and determine whether pots from both sites may have been created by the same potter or group of potters. This section will describe the sample and methods used for the research.

Sample Size

In this study, only incised fiber-tempered Orange pottery from the Rollins Shell Ring site and the Guana Shell Ring site was studied. In total, 639 sherds were analyzed from the Rollins site and 285 were examined from the Guana site. Note that this analysis included decorated sherds less than 3 cm in surface area, which demonstrated a unique design motif or other distinct elaborations having an important bearing on this study (Saunders only included sherds > 3 cm). Throughout this analysis, cross-mended sherds were counted as a single sherd.

A minimum number of vessels (MNV) group was created for each site. To obtain the MNV, the total number of sherds was scrutinized. Only those with unique combinations of rim decorations, vessel decorations, and rim form were counted. These strict guidelines guarantee that the sherds chosen each represent a discreet vessel. The MNV sample was used to make comparisons of vessel measurements. Thus, individual vessels were compared to each other as opposed to different parts of the same vessel, which could occur if MNV is not used.

Methods

The attributes used for this analysis are based on, but not limited to, those used by Saunders (2004b) in her analysis of the Rollins pottery assemblage. Attributes recorded include vessel portion (rim, body, base), type, vessel form, rim type, sherd thickness, rim thickness, base thickness, groove width, groove depth, land width, sherd weight, vessel mouth diameter, the presence of burnishing, and decoration. Pictures or digital scans were taken of each sherd. Additional comments may also have been recorded about color, paste inclusions, tool marks, and other features.

The methodology for stylistic analysis complied with the guidelines laid out by Rice (1987). The smallest unit of a design is referred to as an element. In this study most elements were comprised of single line strokes and different types of punctations. A motif is a combination of elements that may occur once or many times in a design. Nine distinct motif groups were recorded in this analysis. They are Multiple Direction Oblique Lines, Single Direction Oblique Lines, Chevrons, Horizontal and Vertical Lines, Crosses, Nested Shapes, Crosshatching, Alternating lines, and Other. A design is a combination of motifs arranged to create a unique pattern. In this analysis 132 different designs were recorded.

Class and Type

The type recorded for all samples was Orange Incised (OI). The “class” of each sample was recorded as body (BD), base (BS), or rim (RM).

Vessel Form

Vessel forms recorded in my analysis are the flat sided bowl/jar (FU), straight-sided vessel (ST), curved shallow bowl (CS), curved bowl/jar (CU), slightly outslanting vessel (SW), slightly incurved vessel (SI), and incurved vessel (IN).

The straight-sided vessels have one of the most unusual forms. They are often rectangular and flat sided with rounded corners and sometimes lug handles. The curved shallow bowls are defined by Saunders (2004b) as <10 cm in depth. They are wide mouthed and often have thick rims in comparison to the sherd thickness (Saunders 2004b). The outslanting vessels have walls that extend away from the base, whereas the incurved vessels have walls that curve back towards the interior of the vessel.

Rim Type

One of the most impressive vessel features of Orange Incised pottery was the rim. Rims at Rollins and Guana can range from highly elaborate and incised to simple and undecorated. There were nine common rim types identified during this analysis. Rim types include beveled to exterior (BE), flattened (FF), curled/folded (CR), flattened to exterior (EF), slanted to interior (SI), flattened to interior (FI), round (RD), thickened to exterior (TE), and thickened to interior (TI) (Figure 9).

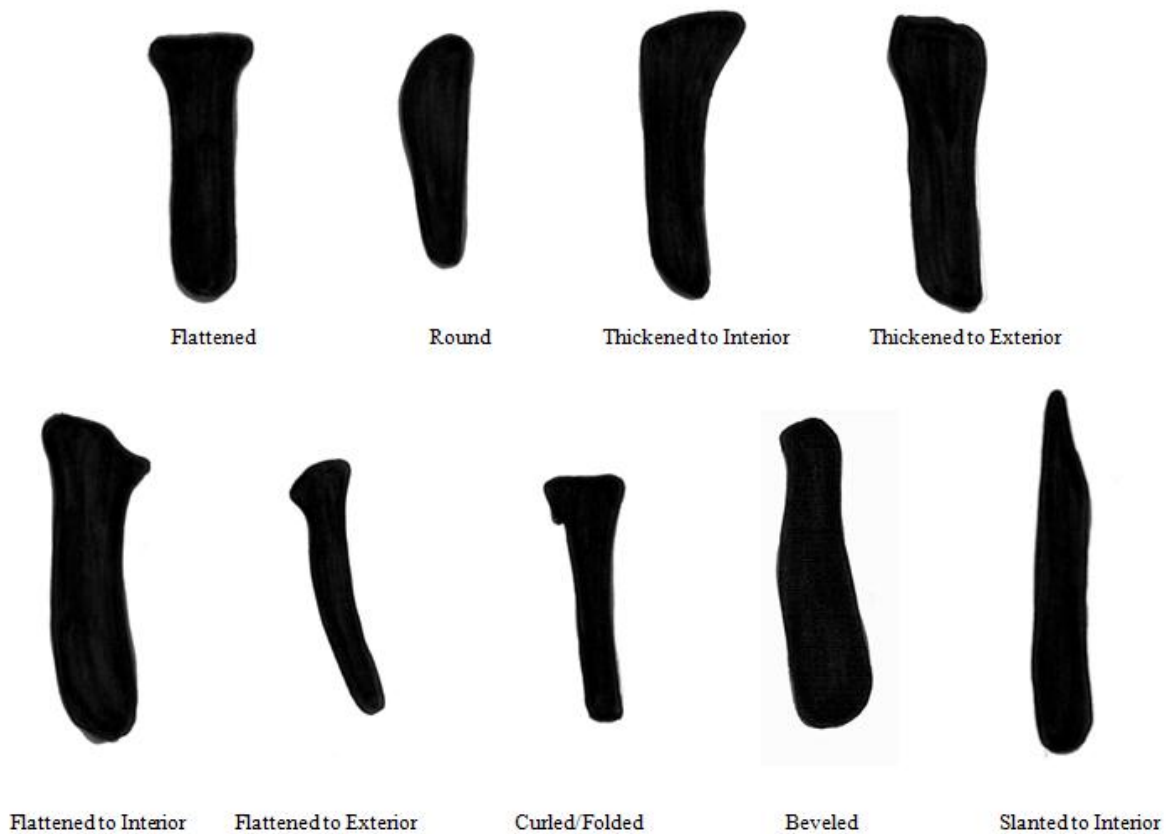


Figure 9. Profiles of Orange vessel rims. In each case the left is the vessel exterior.

Of these rim types, slanted to interior rim decoration is the most uncommon rim type analyzed.

These rims are often highly decorated even though the full extent of the rim would not be

apparent from the exterior of the vessel. Only when looking into the vessel interior would the large and highly decorated rim become apparent (Figure 10). This is an excellent design for a serving vessel because as a diner was presented with the vessel, which is unexceptional on the exterior, the highly decorated rim would suddenly be revealed at close inspection. This would engage and entertain the diner, possibly even sparking conversation as was the purpose of the Kylix of ancient Greece. Like the Orange vessels with rims slanted to the interior, the Kylix has fairly simple exterior designs. However, the interior of the bowl is highly elaborate, often depicting a scene from mythology. The Kylix was presented to the diner full of wine, but only as the guest drained the Kylix would they be able to see the decoration on the interior. (Note, more information on rim types is presented in the comparison section below.)



Figure 10. Photograph of inward slanting vessel rim, FS 150.05, and the corresponding rim profile illustration.

Sherd Thickness, Rim Thickness, and Base Thickness

Sherd, rim, and base thickness measurements were taken at the thickest point below the rim of the vessel with the aid of digital calipers and were recorded in millimeters. Sherd thickness was

not recorded for samples where only the rim or base remained and for samples where one side of the sherd had broken away.

Groove Width, Groove Depth, and Land Width

Groove width and depth were measured with the aid of digital calipers and recorded in millimeters. The groove width was recorded for designs featuring a pronounced pattern of two or more parallel lines. These measurements were highly variable even on the same vessel, and each recorded measurement was accurate plus or minus .5 mm. If the only decoration on the sample was on the rim, or if the rim decoration was the only decoration that can be accurately measured, all measurements were taken from the rim.

Sherd Count per Sample and Total Sample Weight

Each sherd in the sample was counted and recorded. The total sample was then weighed on a digital scientific scale and the weight was recorded in grams. These weights may be different from weights recorded in earlier analyses due to sample fragmentation and deterioration and also due to more recent cross mending.

Vessel Diameter

The mouth diameter was recorded for any sample with a rim large enough that curvature could be measured on a vessel diameter chart. This measurement is recorded in centimeters. Although diameters recorded from rim sherds with less than 5% of the vessel are estimates, they were recorded to show that the sample did have distinct curvature. The measurement data of these sherds was excluded from the analysis.

Decoration

The decoration of each sherd was also recorded for this analysis. The design on each sherd was drawn and given a corresponding number. (For a list of these designs and their numbers refer to Appendix). Each design was also drawn and photographed. These designs were then grouped according to motif and their frequency and distribution were analyzed and compared.

Burnishing

Burnishing usually was easily identified due to the slick feel of the sherd's surface and the slight shine on the surface when it is held to the light. Whether or not the sherd was burnished was recorded. If a sherd was excessively burnished it was also recorded.

Summary

My study is based on a similar analysis of Orange pottery conducted by Saunders (2004b). My goal was to examine pottery form and decoration from two contemporaneous Orange Period sites in the same proximity to estimate whether they share similar pottery and decoration motifs, which may indicate the presence of trade or other social interaction. Several key attributes of the incised Orange pottery from the Guana and Rollins Shell Ring sites were considered during the course of this study. These attributes were: class, type, vessel form, rim type, sherd thickness, rim thickness, base thickness, groove width, groove depth, land width, sherd weight, vessel mouth diameter, the presence of burnishing, and decoration. Accurate measurements were taken in millimeters with digital calipers; weight was recorded in grams with a digital scientific scale. A photographic record of each sample was also preserved for future reference.

CHAPTER 6: POTTERY ASSEMBLAGE

Introduction

In this chapter I will first describe the Rollins pottery assemblage followed by the Guana pottery assemblage. I will discuss sample size and the minimum number of vessels (MNV) for each site. Important features such as sherd thickness, groove width, groove depth, land width, vessel diameter, and rim width will be addressed and compared. In this chapter I will also describe the vessel decorations recorded in my analysis, provide descriptions of the motif groups that the individual designs were assigned to, and analyze the distribution of these motif groups both spatially and temporally at the Guana and Rollins Shell Ring sites.

Measurements of the Rollins Shell Ring Pottery Assemblage

Rollins MNV Sherd Thickness

At Rollins, the modal sherd thickness was 6.05 mm, the median was 10.14 mm and the mean sherd thickness was 10.41 mm with a standard deviation of 2.58 mm (n=166) (Table 3). The range of MNV sherd thicknesses at Rollins was large. The thickest sherd was 22.66 mm and the smallest sherd measures 4.34 mm, a difference of 18.34 mm between the largest and smallest sherds.

MNV Land Width

Although groove width, groove depth, and land width all have a direct bearing on the overall design of the finished vessel, to me, land width was the most noticeable aspect of almost any vessel design. Large land width creates a bold stripe pattern, whereas small land width creates a

finer looking and more delicate effect. At Rollins, numerous fine-lined incisions were used to create intricate patterns; broad incisions are usually spaced further apart, creating large lands.

Table 3. Comparison of MNV measurements from Guana and Rollins assemblages.

	Sherd Thickness (mm)	Groove Width (mm)	Groove Depth (mm)	Land Width (mm)	Vessel Diameter (cm)
Rollins Mode	6.05	.89	.28	1.72	51
Guana Mode	6.91	.87	.46	1.8	14
Rollins Median	10.14	.98	.51	2.44	34.00
Guana Median	9.92	1.03	.46	2.16	18.00
Rollins Mean	10.41	1.03	.53	2.69	31.30
Guana Mean	10.46	1.11	.53	2.39	25.44
Rollins Standard Deviation	2.58	.40	.28	1.23	12.78
Guana Standard Deviation	2.89	.40	.35	.83	13.79
Rollins Maximum	22.66	2.81	1.42	8.77	51.00
Guana Maximum	17.42	2.39	1.77	4.87	51.00
Rollins Minimum	4.34	.27	.03	.79	6.00
Guana Minimum	6.12	.36	.09	1.06	11.00

At Rollins, the modal land width was 1.72 mm, the median land width was 2.44 mm, and the mean land width was 2.69 mm with a standard deviation of 1.23 mm (n=166). However, only

when the maximum and minimum land widths are compared can the breadth of variation be seen. The maximum land width at Rollins was 8.77 mm, whereas the smallest was only .79 mm (Table 3). This shows that both broad and thin lands were used at Rollins for decoration. Although the maximum land width at Rollins was 8.77 mm, the mean, median, and mode showed that smaller incised patterns were preferred.

Rollins MNV Groove Depths

The examination of the incisions can lead to a better understanding of how the designs at Rollins were made and what sort of tools might have been used for creating the decorations. The depth of the incision is an indication of technological skill and personal technique rather than of the tool used. The same tool can be induced to create incisions of varying depths depending upon the pressure applied.

At Rollins, there is some standardization of groove depths. The modal groove depth was .28 mm, the median groove depth was .51 mm, and the mean groove depth was .53 mm, with a standard deviation of .28 mm. There was a maximum MNV groove depth of 1.42 mm and a minimum of .03 mm (Table 3). Even the deepest groove recorded at Rollins (not part of the MNV count), 1.42 mm, does not cut more than 25 percent into the vessel wall (7.59 mm). Thus, the incisions at Rollins never extend into the vessel wall more than 25 percent of the total wall measurement. The decorators must have possessed fine motor skills to create such precise incising.

Rollins MNV Groove Width

Groove widths do not carry the same threat of destabilization as groove depth. However, the range of measurements taken was still fairly small. The modal groove width was .89 mm (Table 3). The median groove width was .98 mm. The mean groove width at Rollins was 1.03 mm with

a standard deviation of only .4 mm. The minimum groove width was .27 mm and the maximum was 2.81 mm. These measurements may indicate that most decorators preferred instruments with a fine tip for incision—not just anything that might be at hand. Decorators then, are collecting instruments for incising that meet certain specifications. Not surprisingly, the instrument point sizes preferred by the pottery decorators of Rollins, .5-1.5 mm, are the same as those preferred by artists today for their tools, especially those working in pen and ink.

Rollins Vessel Diameter

Vessel diameter is highly diverse at the Rollins site. The vessel diameter at Rollins ranges from 6 cm to 51 cm (Figure 11). The modal vessel diameter was >51 cm and the median diameter was 34 cm. The mean vessel diameter at Rollins was 31.30 cm with a standard deviation of 12.78 cm (n=33). The difference between the largest and the smallest vessels at this site was enormous. As can be seen by the high standard deviation, the variation in rim diameter at Rollins was significant. The vessel represented by catalog # 487.1/495.1 (Figure 12) was clearly the largest vessel found at Rollins. The sherd weighs 242 g and has a thickness of 22 mm. Although not a rim sherd, the sherd was from a vessel that would have been well over 50 cm in diameter. The vessel could have held an abundant quantity of liquid or food.

On the other hand, catalog # 275.2a was from the smallest vessel found at Rollins. The sherd weighs only .68 g and has a width of 6 mm. The diameter of the vessel would have been less than 6 cm. The vessel would have been lightweight and highly portable. Although it was small, this sherd was highly decorated; even its 3 mm rim size was incised. Clearly, size held no bearing at Rollins on whether a vessel was decorated or not. Such a small decorated vessel may have held valuable items such as oils or pigments.

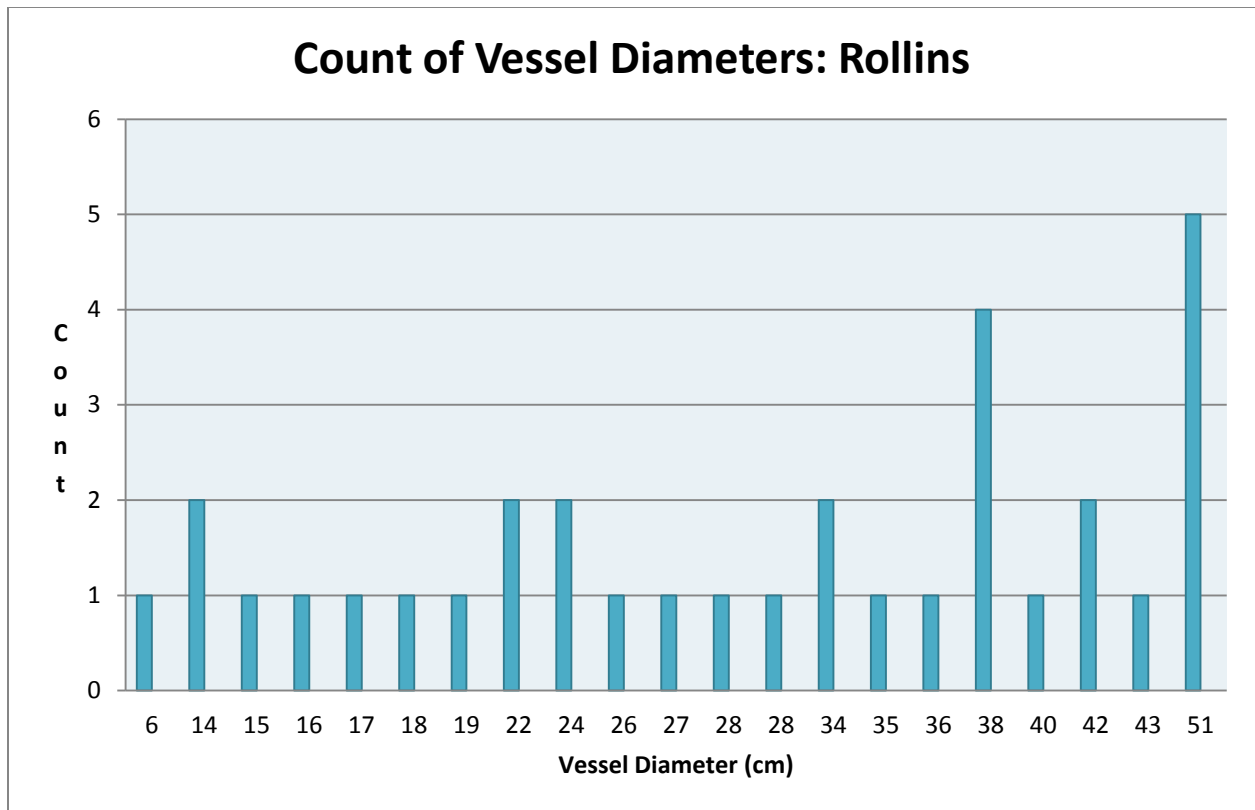


Figure 11. MNV vessel diameters at Rollins (note that the vessel diameters labeled as 51cm represent all vessels recorded at >51cm).

Rollins MNV Rim Types and Widths

The most common rim types found at Rollins are the three flattened rim types including flattened (20.4%), flattened to interior (24.0%), and flattened to exterior (24.6%) (Table 4). The flattened nature of these rims would make them easy to decorate and create a wide canvas for incising. Rims sometimes were thicker than the vessel wall. While the mean rim width of the vessels at Rollins was 13.9 mm, the mean sherd thickness at Guana was 10.41 mm. Indeed, the largest MNV rim width recorded at Rollins was 38.05 mm (catalog #22.25). In this case, the vessel wall was only 22.66 mm. The rim was purposely made 16 mm thicker than the vessel wall. The silhouette of such a vessel is impressive, but even more since the rim was also elaborately incised.

Table 4. Comparison of rim type frequencies from Rollins and Guana.

	Frequency at Rollins MNV	Frequency at Guana MNV
Beveled to Exterior	3 (1.8%)	0 (0%)
Folded	2 (1.2%)	0 (0%)
Flattened to Exterior	41 (24.6%)	9 (14.7%)
Flattened	34 (20.4%)	12 (19.6%)
Flattened to Interior	40 (24.0%)	8 (13.1%)
Rounded	20 (12.0%)	18 (29.5%)
Slanted to Interior	2 (1.2%)	14 (22.9%)
Thickened to Exterior	5 (3.0%)	0 (0%)
Thickened to Interior	8 (4.8%)	0 (0%)
Could Not Be Determined	11 (6.6%)	0 (0%)
Total Number of MNV Rims	166	61



Figure 12. Photograph illustrating size range at Rollins. On the left is the largest sherd recovered from Rollins, FS 487.1/495.1, and on the right is the smallest, FS 275.2a.

Rim designs usually were chosen to complement the vessel surface decoration. For example, if the vessel was decorated with crosshatching, the rim might be decorated with zoned crosshatching. Sometimes the rim decoration was a continuation of the vessel decoration, with incisions continuing from the body of the vessel on to the rim. Rarely are rim decorations completely different than the vessel decorations. Where rim decoration was distinctly different, the decoration was usually simple, perhaps just series of punctations or a sinuous line.

Measurements of the Guana Shell Ring Pottery Assemblage

Guana Sample Size and MNV

Two hundred and eighty-five sherds of Orange Incised pottery from the Guana Shell Ring were examined. As discussed in Chapter 4, the sherds were obtained from two separate excavations

and from numerous areas within and around the ring. From this original sample, I derived an MNV of 61.

Guana Sherd Thickness

The modal sherd thickness at Guana was 6.91 mm (Table 3). The median sherd thickness at Guana was 9.92 mm and the mean sherd thickness at Guana was 10.46 mm with a standard deviation of 2.89 mm (n=61). The maximum recorded sherd thickness at Guana was 17.42 mm, which was 5.24 mm smaller than the thickest sherd at Rollins. The thinnest vessel at Guana was 6.12 mm, which was almost 3 mm larger than the thinnest sherd at Rollins.

Guana MNV Land Width

The modal land width at Guana was 1.8 mm (Table 3). The median land width at Guana was 2.16mm. The mean measurement was 2.39 mm. The land width had a standard deviation of .83 mm. The smallest land width was 1.06 mm, whereas the largest was 4.87 mm.

Guana MNV Groove Depths

The modal groove depth at Guana was .46 mm. The median groove depth at Guana was .46 mm. The mean groove depth at Guana was .53 mm with a standard deviation of .35 mm. Interestingly, the largest groove depth recorded at Guana was 1.77 mm, which was not much deeper than the largest groove depth at Rollins, 1.42 mm (Table 3). The deepest recorded groove at Guana cuts into 35 percent of the vessel wall which is potentially destabilizing.

An interesting peculiarity of decorated pottery at the Guana Shell Ring was a curling of the clay on either side of the groove, sometimes to an extreme degree (Figure 13). Such curling is a sign of wet clay incising. When the grooves were made, the clay was still very wet and pliable. The

displaced clay from the groove was folded over onto the edges of the groove, much like the way earth is turned out of a furrow by the blade of a plow. This method creates a pilled look and rough texture on the surface of the vessel.

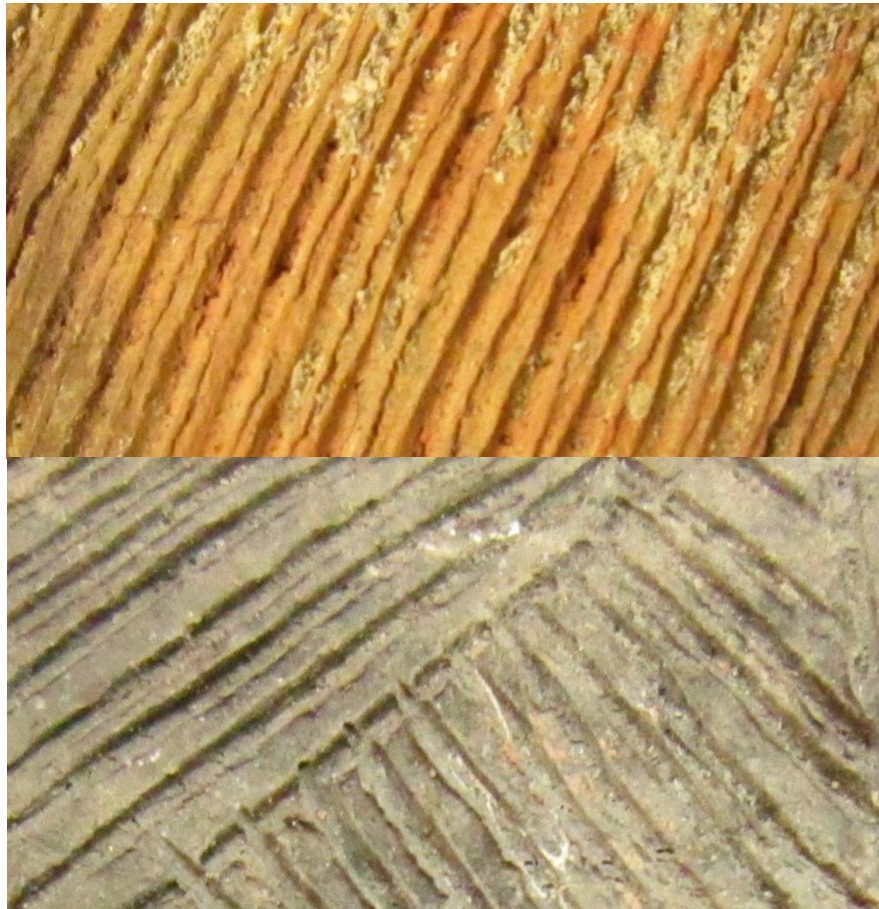


Figure 13. Two examples of wet-paste incising from Guana. Note the curling and pilling along the outside of the grooves (top: Guana FS154.05, bottom: Guana 90.01).

This is rarely seen at Rollins, but it is common-to-rare at Guana. However, the frequency of this technique was not recorded for either site.

MNV Groove Width

The modal groove width at Guana was .87 mm. The median groove width at Guana was 1.03 mm. The mean groove width at Guana was 1.11 mm, only .08 mm larger than that of Rollins.

The largest recorded groove width at Guana was 2.39 mm. The smallest was .36 mm. The maximum and minimum values at Guana are almost identical to those of Rollins. The range of variation of groove width at Guana, 2.03 mm, was also similar to that of Rollins, at 2.54 mm. Interestingly, the standard deviations for groove widths are identical. This indicates a standardization of the tools used to decorate Orange pottery.

Guana Vessel Diameter

Only 27 of 61 rim sherds in the MNV collection were intact enough to measure the diameter. The modal vessel diameter at Guana was 14 cm. The median vessel diameter at Guana was 18 cm. The mean vessel diameter was 25 cm with a standard deviation of 14 cm. The vessel diameters at Guana range from >51 cm to 11 cm (Figure 14).

MNV Rim Types and Width at Guana

The same types of rims are found at both Guana and Rollins. However, the most common rim types at Guana are the Rounded and the Slanted to Interior (Table 4). Flattened rims comprise 19 percent of the MNV assemblage and these rims often are elaborately decorated. Rounded rims often are undecorated but are burnished to create a high sheen. The Slanted to Interior rims often are slanted at a steep 25 to 30 degree angle so that the rim decorations appear to be on the interior of the vessel rather than the rim. The variation of rim thickness at Guana was high, ranging from 3.95 mm to 25.77 mm (Table 5). However, the mode was 7.4 mm. The median rim thickness was 14.55 mm. The mean rim thickness was 14.37 mm, with a standard deviation of 4.89 mm.

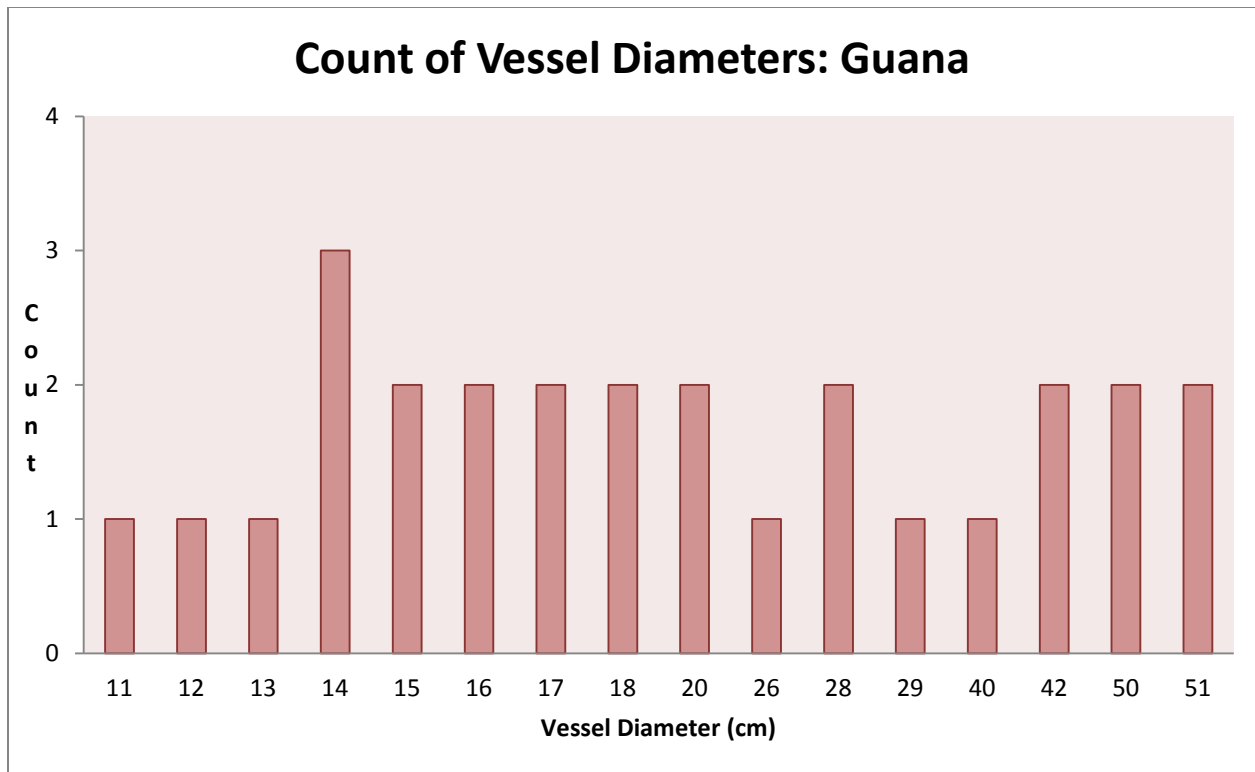


Figure 14. MNV vessel diameters at Guana (note that the vessel diameters labeled as 51 cm represent all vessels recorded at >51cm).

Comparisons between the Rollins and Guana Pottery Assemblages

There were some distinct differences in vessel forms between Rollins and Guana. Of the 61 MNV vessels analyzed from Guana, 55.7% were of the flat sided bowl/jar vessel form (Table 6) while only 35.5% of the total Rollins MNV sherds (n=166) were categorized as flat sided bowl/jars. This is a significant difference showing that the flat sided bowl/jar form was more prevalent at Guana. At Rollins, the curved shallow bowl comprised 8.4% (n=14) of the MNV group and at Guana the curved shallow bowl comprised 4.9% (n=3) of the MNV group. Although this data is interesting, it is important to remember that 48.1% of the Rollins MNV group and 24% of the Guana MNV group were classified as unknown. Thus, a future study may yield different results.

Table 5. Comparison of MNV rim width statistics from Rollins and Guana.

Rim Width Statistics	Rollins	Guana
Mode (mm)	14.25	7.40
Median (mm)	13.71	14.55
Mean (mm)	13.90	14.37
Standard Deviation (mm)	4.51	4.89
Maximum (mm)	38.05	25.77
Minimum (mm)	3.47	3.95
Range (mm)	34.58	21.82

Similarities in decoration properties recorded at the Guana Shell Ring and the Rollins Shell Ring are shown in Table 3 while Table 4 and Table 5 illustrate the differences in rim width and type, respectively. The largest pot diameter recorded at both sites was greater than 50 cm (Table 3). The mean diameter at Rollins was 31 cm. The mean diameter at Guana was 25 cm. The most common vessel diameters between both sites vary greatly. At both sites, there was a high standard deviation in rim diameter of about 13 cm. This statistic means that there is a high variability in vessel diameter at both sites.

Table 6. Frequency table of vessel forms from Rollins and Guana.

Vessel Form	Rollins MNV	Guana MNV
Flat Sided Bowl/Jar (FU)	59 (35.5%)	34 (55.7%)
Straight-Sided Vessel (ST)	2 (1.2%)	3 (4.9%)
Curved Shallow Bowl (CS)	14 (8.4%)	3 (4.9%)
Curved Bowl/Jar (CU)	1 (0.6%)	2 (3.2%)
Slightly Outslanting Vessel (SW)	1 (0.6%)	1 (1.6%)
Slightly Incurved Vessel (SI)	8 (4.8%)	3 (4.9%)
Incurved Vessel (IN)	1 (0.6%)	0 (0%)
Unknown (ND)	80 (48.1%)	15 (24%)
Total	166	61

A wider variety of rim types were found at Rollins than at Guana. Nine distinct rim types were identified in the Rollins MNV group while only five distinct rim types were found in the Guana MNV group. Another interesting difference between the two MNV groups is that Rollins had a much higher percentage of flattened to exterior (24.6% vs. 14.7%), flattened (20.4% vs. 19.6%), and flattened to interior (24.0% vs. 13.1%). However, Guana had a much higher percentage of slanted to interior rim types (22.9% vs. 1.2%).

During my analysis I conducted a series of t-Tests to compare the groove width, groove depth, land width, and thickness of the MNV sherds from both sites (Tables 7, 8, 9, and 10).

Table 7. T-test showing comparison of groove widths.

t-Test: Two-Sample Assuming Equal Variances		
Groove Width		
	<i>Guana</i>	<i>Rollins</i>
Mean	1.111	1.034337
Variance	0.168033	0.164271
Observations	60	166
Pooled Variance	0.165262	
Hypothesized Mean Difference	0	
Df	224	
t Stat	1.25191	
P(T<=t) one-tail	0.105954	
t Critical one-tail	1.651685	
P(T<=t) two-tail	0.211908	
t Critical two-tail	1.970611	

Table 8. T-test showing comparison of groove depths.

t-Test: Two-Sample Assuming Equal Variances		
Groove Depth		
	<i>Guana</i>	<i>Rollins</i>
Mean	0.5325	0.538117
Variance	0.127002	0.082696
Observations	60	154
Pooled Variance	0.095027	
Hypothesized Mean Difference	0	
Df	212	
t Stat	-0.11973	
P(T<=t) one-tail	0.452405	
t Critical one-tail	1.652073	
P(T<=t) two-tail	0.904811	
t Critical two-tail	1.971217	

Table 9. T-test showing comparison of land widths.

t-Test: Two-Sample Assuming Equal Variances
Land Width

	<i>Guana</i>	<i>Rollins</i>
Mean	2.397321	2.696954
Variance	0.693831	1.524905
Observations	56	151
Pooled Variance	1.301934	
Hypothesized Mean Difference	0	
Df	205	
t Stat	-1.67838	
P(T<=t) one-tail	0.047398	
t Critical one-tail	1.652321	
P(T<=t) two-tail	0.094796	
t Critical two-tail	1.971603	

Table 10. T-test showing comparison of sherd thicknesses.

t-Test: Two-Sample Assuming Equal Variances
Sherd Thickness

	<i>Guana</i>	<i>Rollins</i>
Mean	10.46186	10.41085
Variance	8.358333	6.696309
Observations	59	153
Pooled Variance	7.155344	
Hypothesized Mean Difference	0	
Df	210	
t Stat	0.124447	
P(T<=t) one-tail	0.45054	
t Critical one-tail	1.652142	
P(T<=t) two-tail	0.90108	
t Critical two-tail	1.971325	

Design Motif Groups and Distributions

Although the land width and sherd thickness are slightly different between the sites, the mean groove width and depth are almost identical (Table 3). The mean groove width at Rollins was 1.03 mm and the mean groove width at Guana was 1.11 mm. A t-test supports the hypothesis that there was no statistically significant difference between the groove widths at the two sites ($p=.184$). This fact suggests that the tools used to create the incisions at both sites must have had similar dimensions and properties. The mean groove depth at Rollins was .53 mm and the mean groove depth at Guana was also .53 mm. No statistical test was necessary to compare the means as they were the same. However, the way in which these tools were used and at which point in the creation of the pot the design was applied were different.

An analysis of the MNV land widths at the two sites revealed that they were not similar. The mean land width at Rollins was 2.69 mm and the mean land width at Guana was 2.39 mm. A t-test revealed that, though slight, there is a statistically significant difference between the two means ($p=.03$). The similarities between the groove depth and the groove width support the hypothesis that the same tools were being used to decorate Orange pottery at both Rollins and Guana while the land width information seems to indicate that different people were decorating the pots at the two sites.

Orange Incised Designs

In total, 131 designs (Figure 15) were recorded during the analysis of both the Rollins Shell Ring incised pottery and the Guana Shell Ring incised pottery; however some of these designs were merged during later analysis. Although Bullen and Bullen (1961) created their own list of Orange motifs and Mitchell (1993) and Saunders (2004b) later added to this list, I created a new

listing identified from the sherds from the Rollins and Guana sites. Several of the designs labeled as “variations” by Bullen and Bullen (1961) and Mitchell (1993) are now categorized as distinct motifs with their own numerical designation.

Design Motif Groups

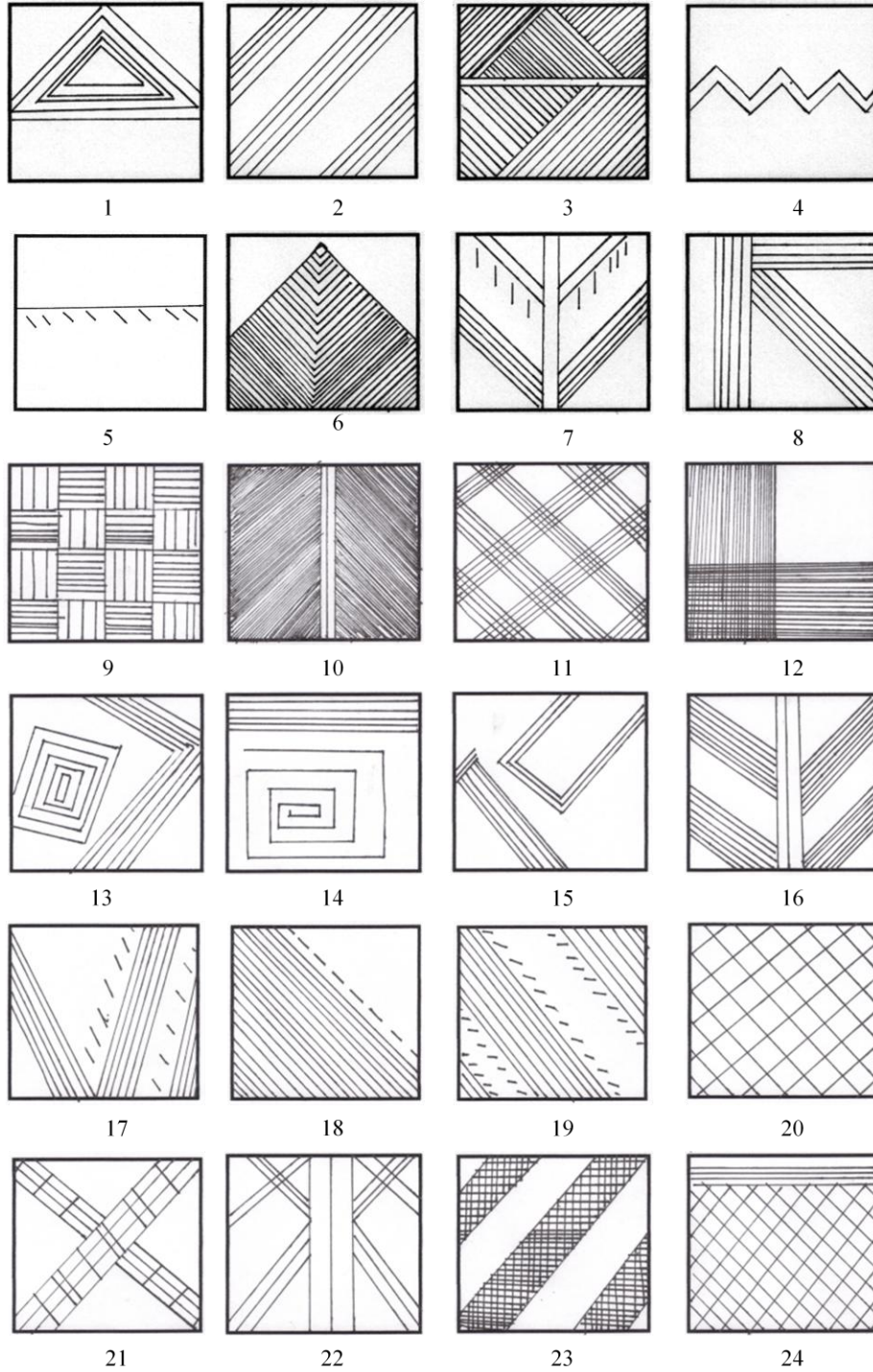
The Orange Incised designs were divided into nine individual motif groups. Each incised sherd was assigned to one of these groups. In addition to assigning a design to a motif group, important attributes and embellishments were noted. Some of these attributes and embellishments include punctations, tick marks, branching lines, deeply cut incisions, fine detailing, and the inclusion of zigzagged lines.

Motif Group 1, Multiple Direction Oblique Lines (Rollins 9.0%, Guana 11.4%). The majority of the design is comprised of lines set at oblique angles (Figure 16).

Motif Group 2, Single Direction Oblique Lines (Rollins 28.3%, Guana 31.1%). The design is comprised of lines set at oblique angles that may be zoned or unzoned, but are consistently slanted in the same direction (Figure 17).

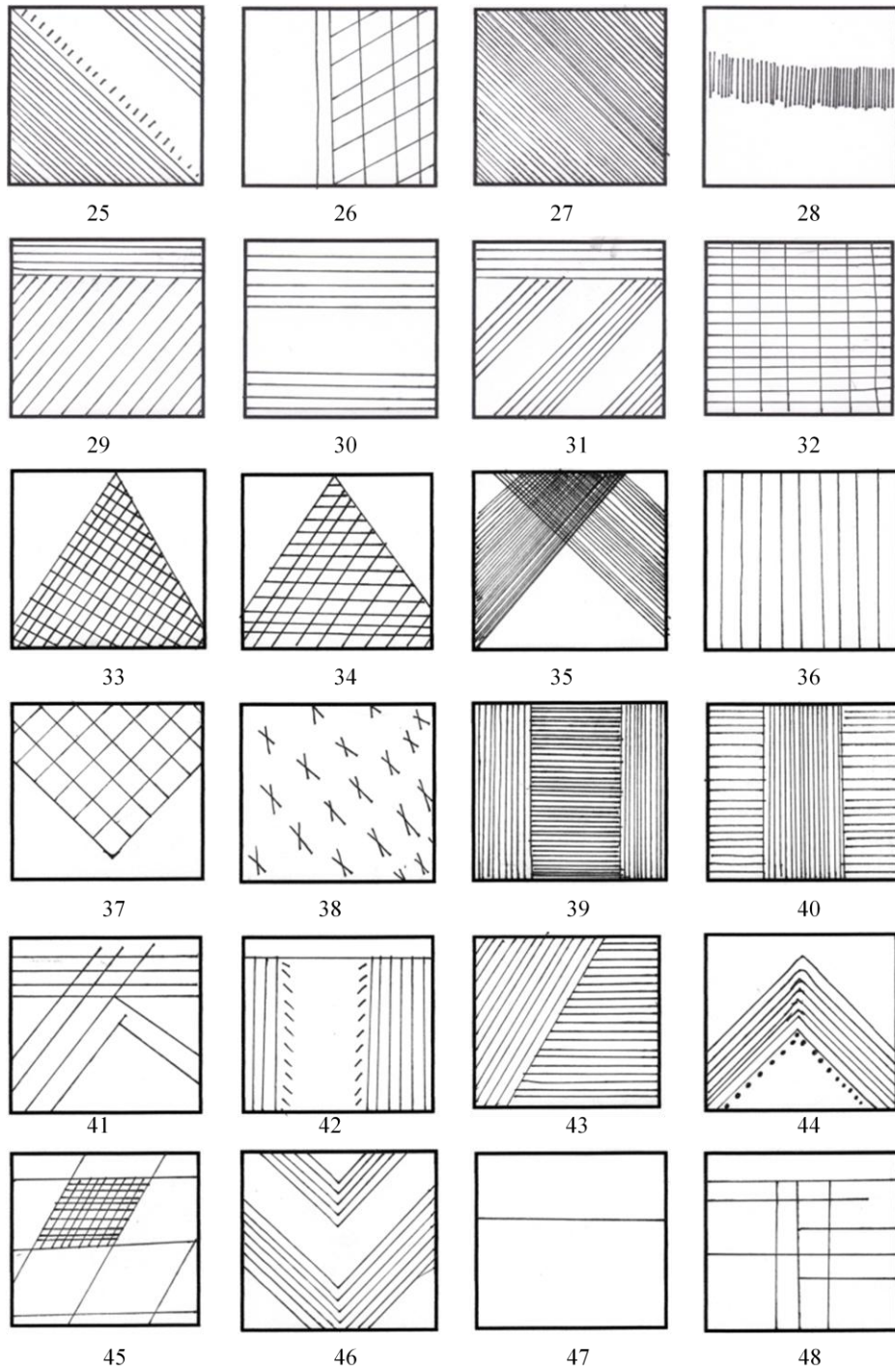
Motif Group 3, Chevrons (Rollins 4.8%, Guana 8.1%). The majority of the design is comprised of chevrons (Figure 18).

Motif Group 4, Horizontal and Vertical Lines (Rollins 11.4%, Guana 18%). The design is comprised of either horizontal lines or vertical lines. These were grouped together because it is often hard to distinguish sherd orientation making it hard to differentiate between horizontally and vertically oriented lines (Figure 19).



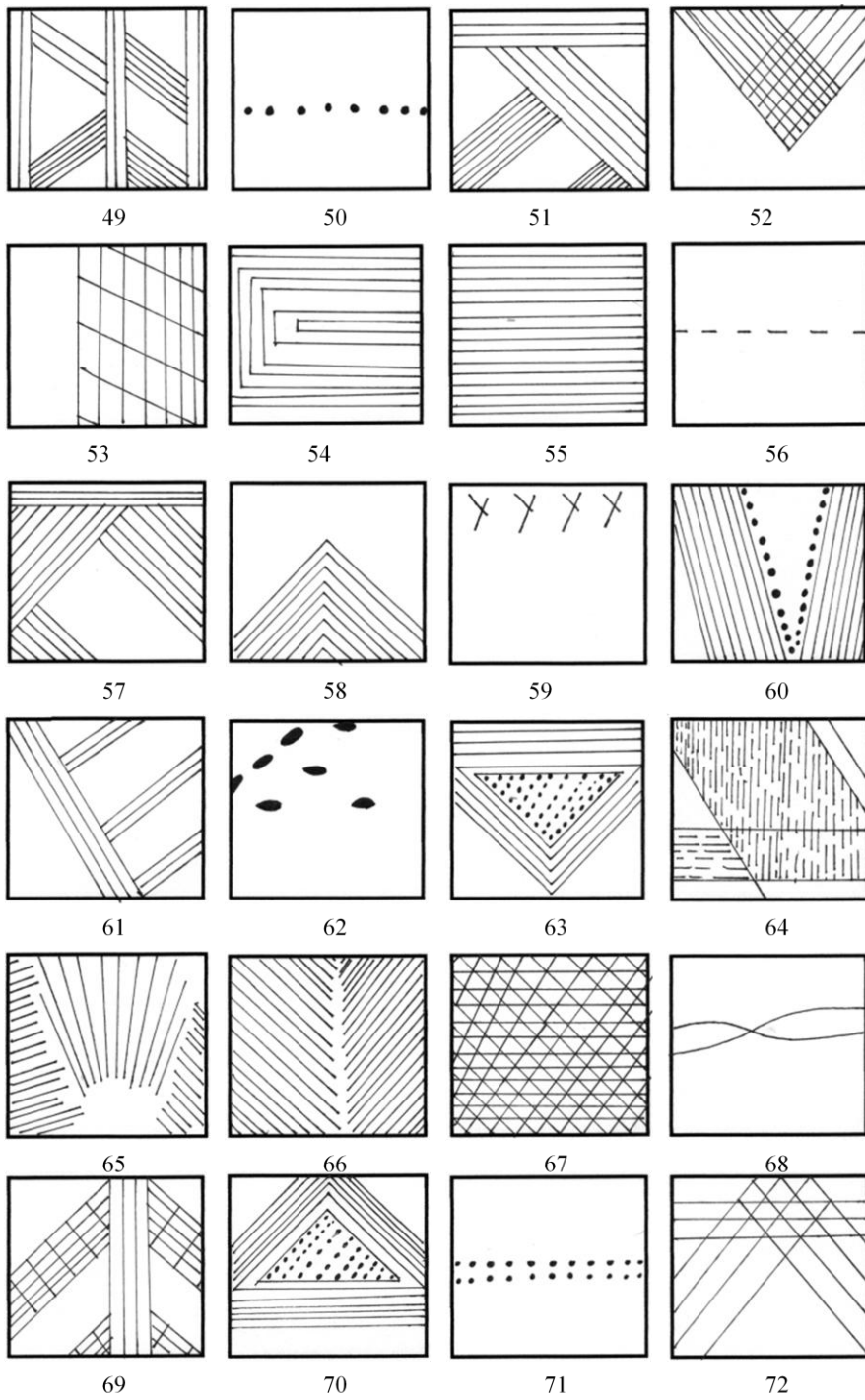
Part A

Figure 15. Illustrations of designs recorded at the Rollins Shell Ring and the Guana Shell Ring.



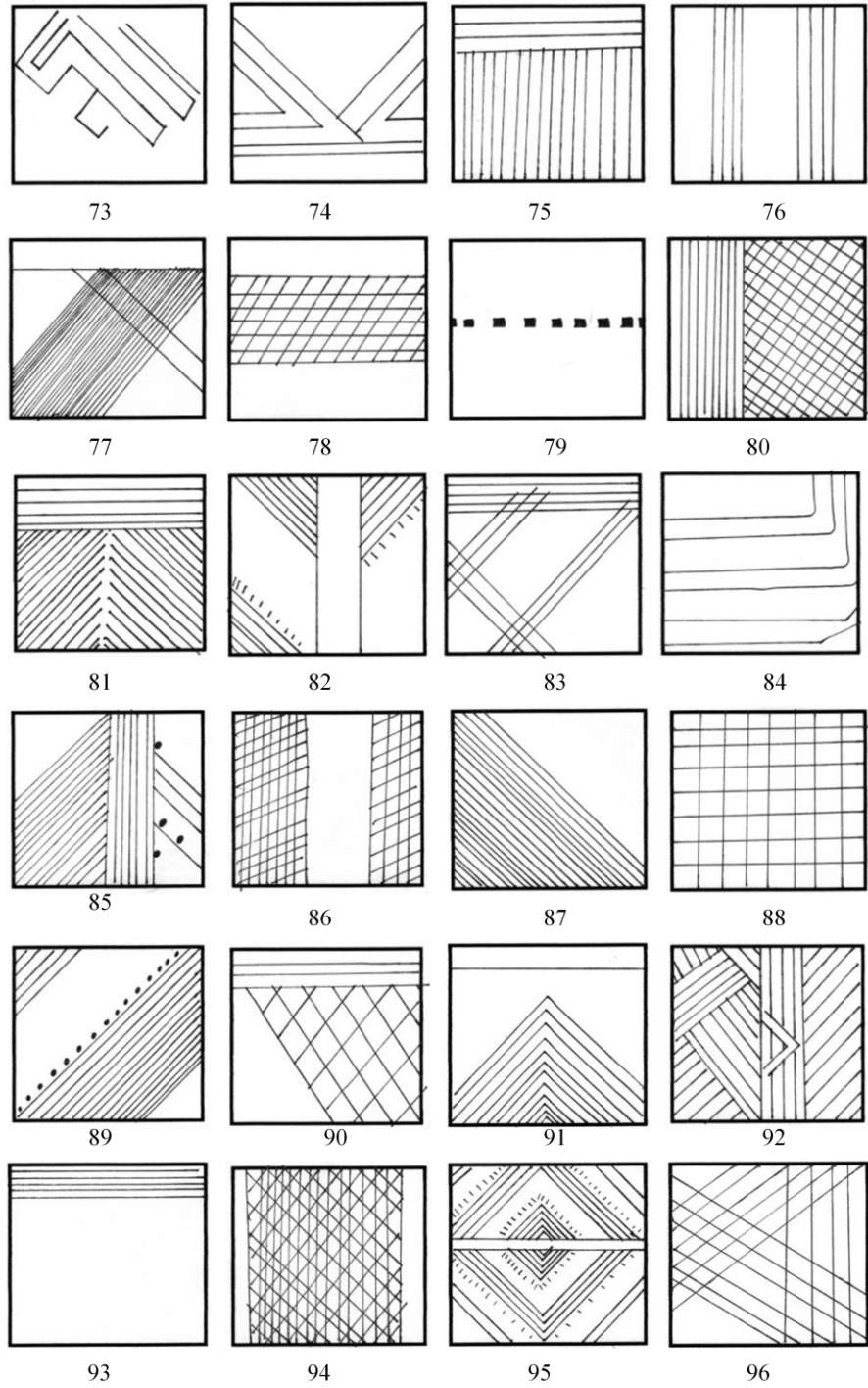
Part B

Figure 15 (cont'd).



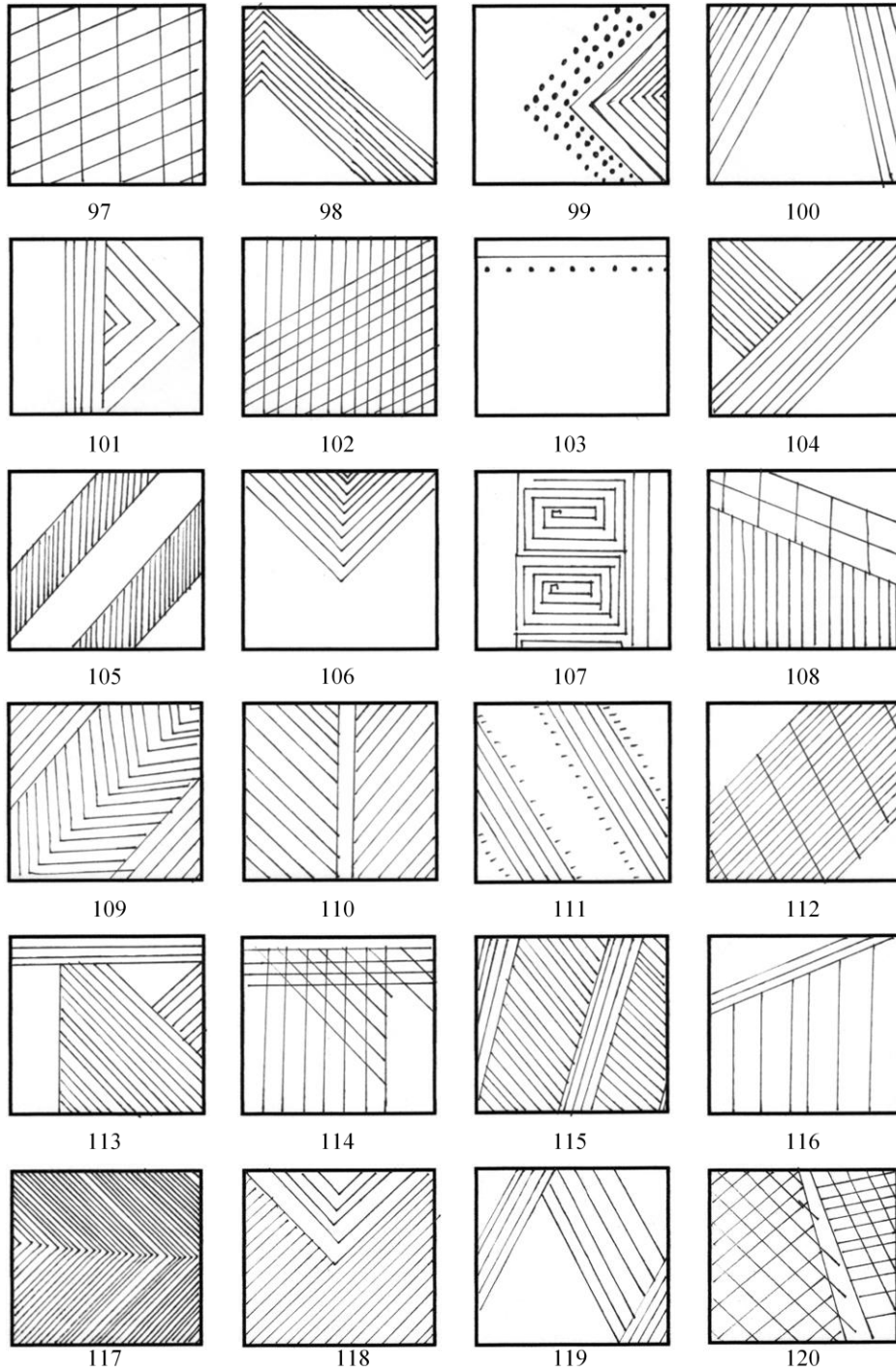
Part C

Figure 15 (cont'd).



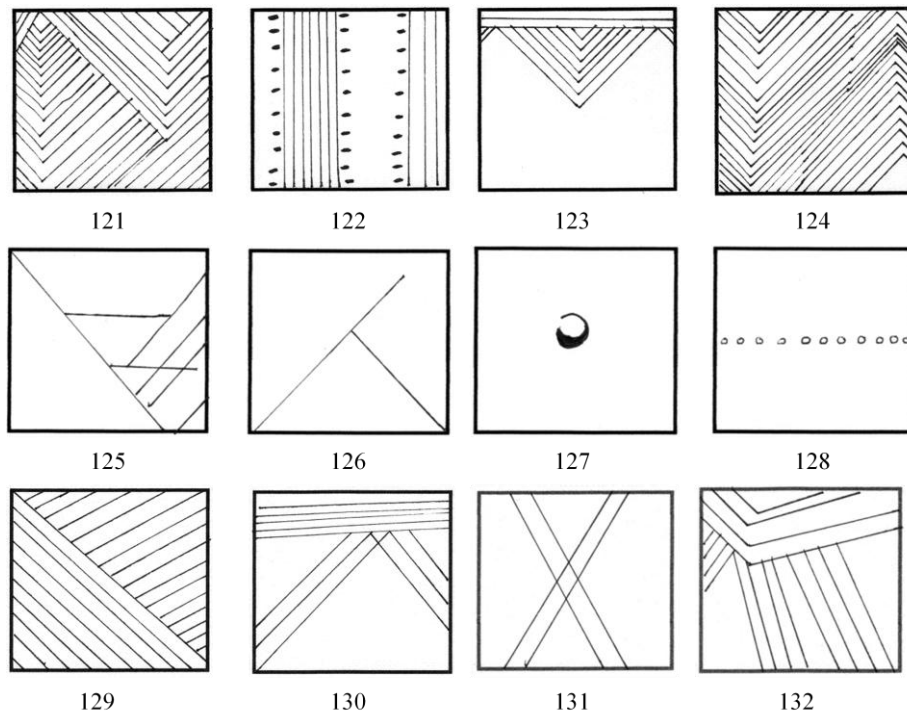
Part D

Figure 15 (cont'd).



Part E

Figure 15 (cont'd).



Part F

Figure 15 (cont'd).

Motif Group 5, Crosses (Rollins 0.6%, Guana 0%). The only design present is a repeated cross or X shape (Figure 20).

Motif Group 6, Nested Shapes (Rollins 6.0%, Guana 3.2%). The design is comprised of a shape such as a square or triangle nested within successively larger shapes (Figure 21).

Motif Group 7, Crosshatched (Rollins 7.8%, Guana 9.8%). The majority of the design is made up of intersecting lines which form a crosshatched pattern. In my thesis I have defined crosshatching as an obviously repeating pattern of intersecting lines. If a design was not clearly repetitive in its pattern of intersections it was classified as Other rather than crosshatched (Figure 22).

Motif Group 8, Alternating Lines (Rollins 4.8%, Guana 8.2%). The design is made up of groups of parallel lines that meet other parallel line sets at either oblique or perpendicular angles. These line groups often alternate from one direction to the other and back (Figure 23).

Motif Group 9, Other (Rollins 7.2%, Guana 9.8%). The design cannot be easily fit into any of the other categories and is unique (Figure 24).

Punctations and tick marks (Figure 25) can be found in both the Guana and Rollins pottery assemblages.

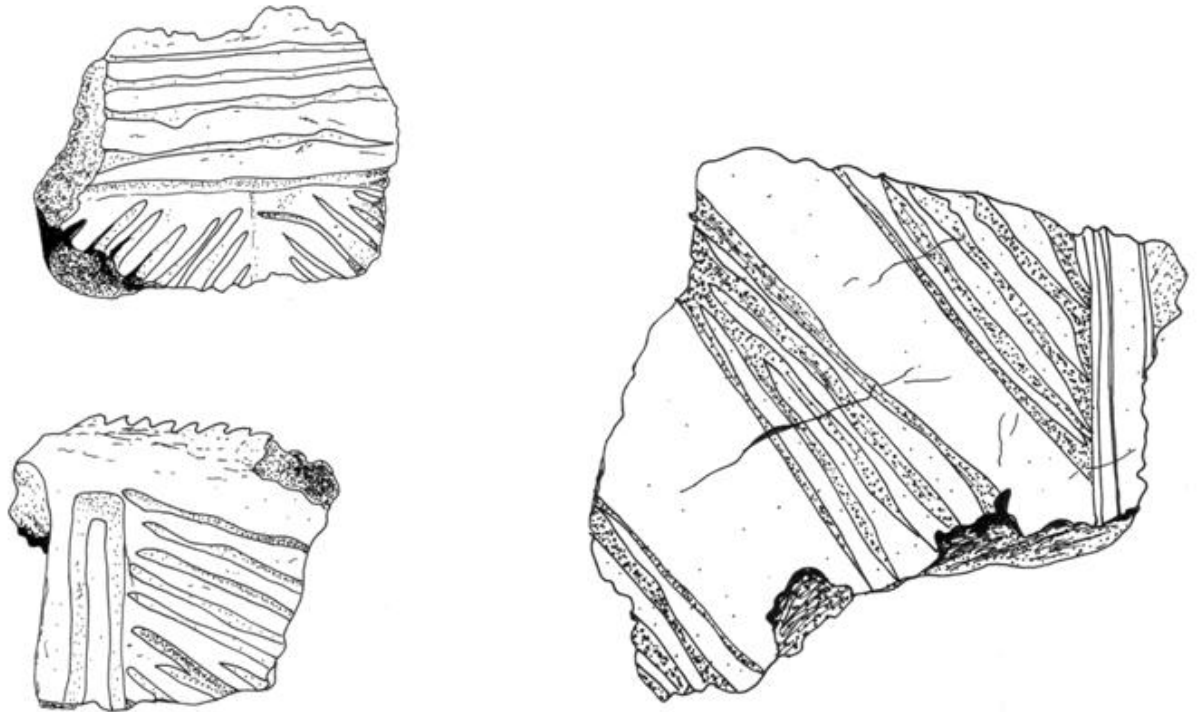


Figure 16. Motif Group 1, multiple direction oblique lines. All illustrations by the author (clockwise from top: Rollins FS 74.15, Guana FS 113.01, Rollins FS 14.1).

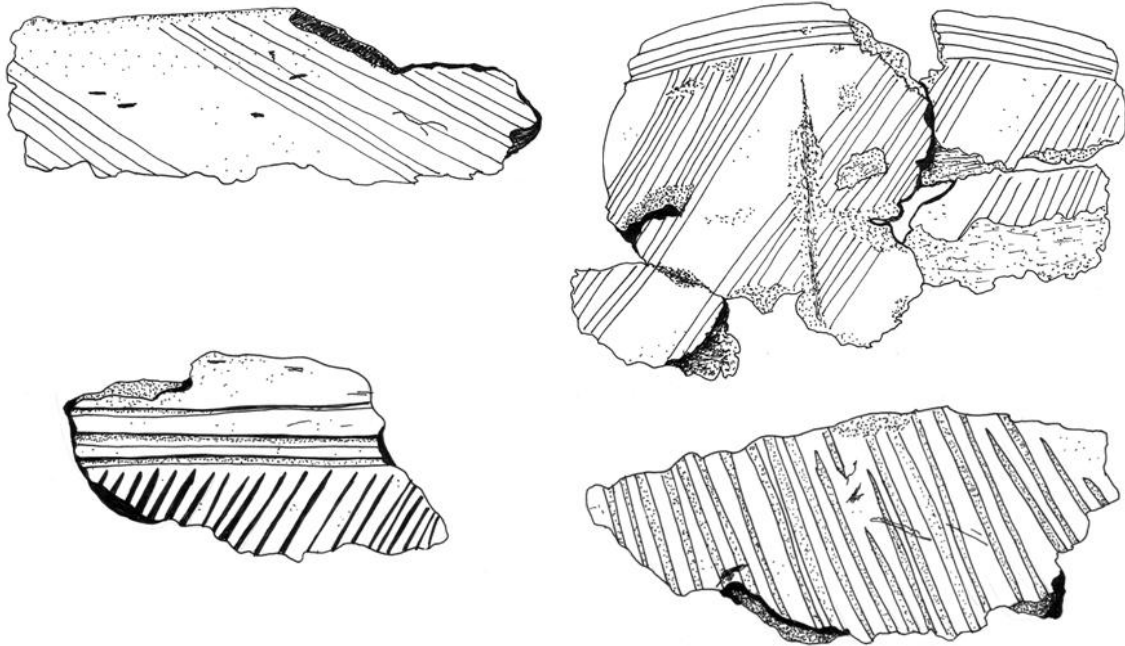


Figure 17. Motif Group 2, Single Direction Oblique Lines (clockwise from top left: Rollins FS 40.8, Rollins FS 102.19, Rollins FS 130.16, Rollins FS 131.20).



Figure 18. Motif Group 3, Chevrons (Rollins FS 123 and 504).

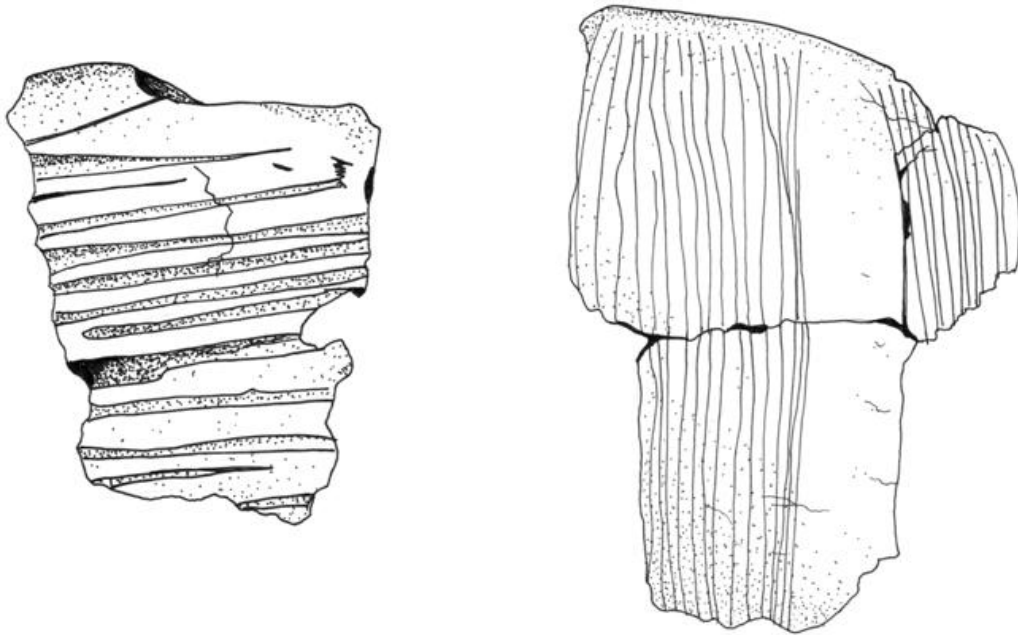


Figure 19. Motif Group 4, Horizontal and Vertical Lines (left to right: Rollins FS 390.9, Guana FS 69.01).

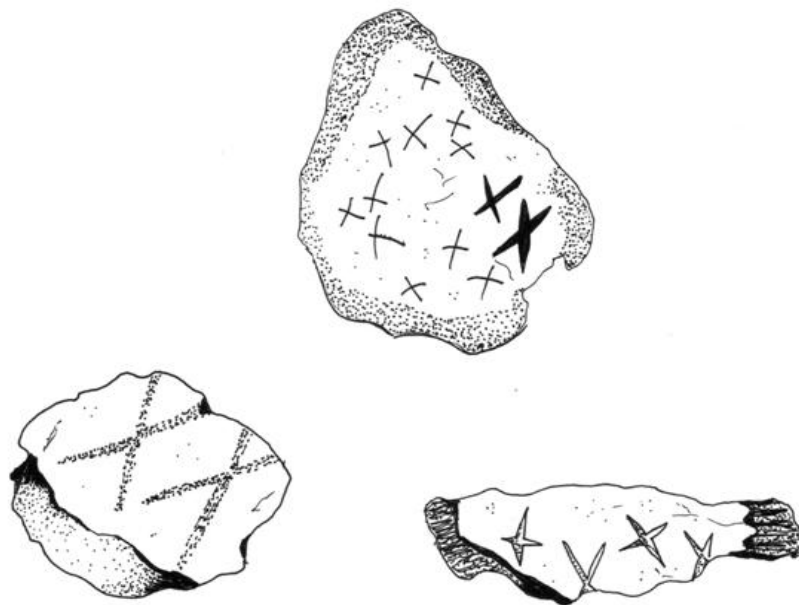


Figure 20. Motif Group 5, Crosses (clockwise from top: Rollins FS 129.17, Rollins FS 84.23, Guana FS 154.11).

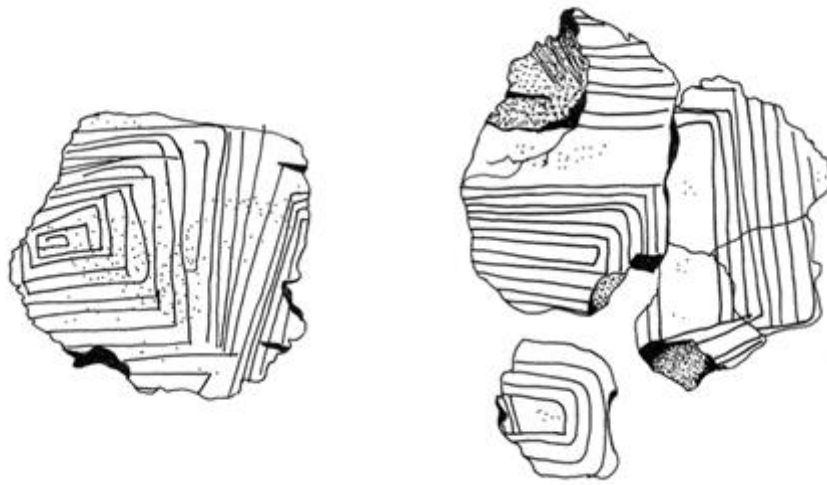


Figure 21. Motif Group 6, Nested Shapes (left to right: Rollins FS 91.9, Guana FS 293.01).

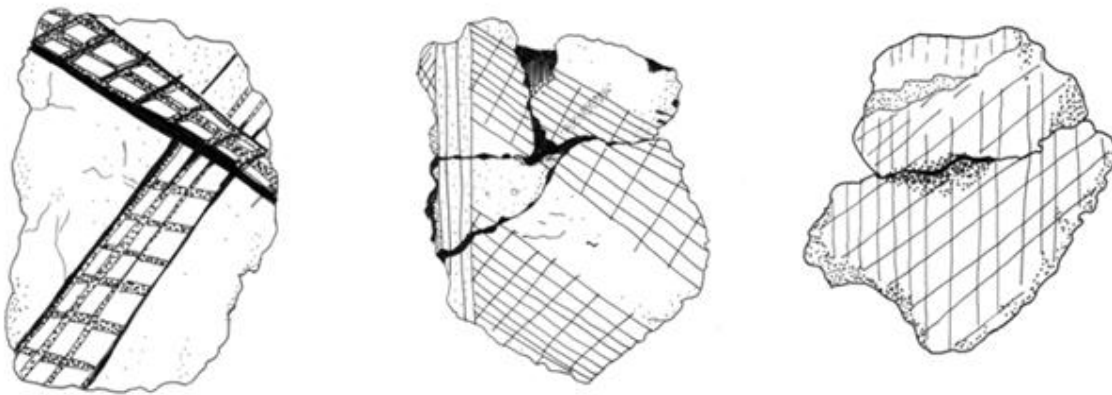


Figure 22. Motif Group 7, Crosshatching (left to right: Rollins FS 123.14, Rollins FS 676, Rollins FS 108.14).

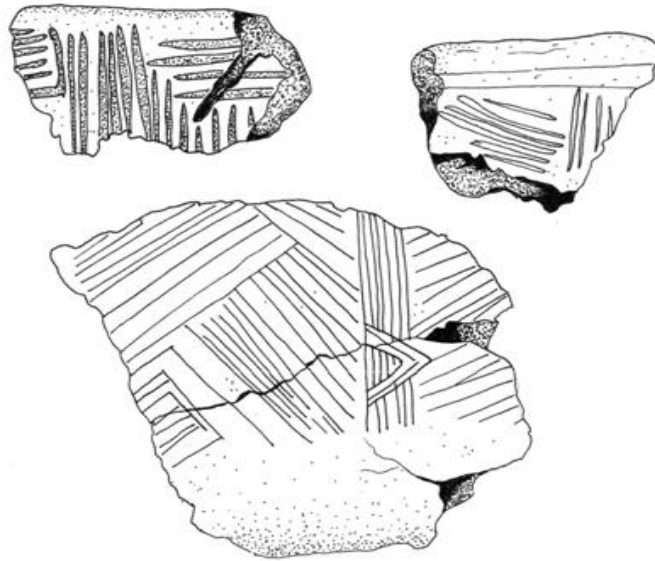


Figure 23. Motif Group 8, Alternating Lines (clockwise from top left: Rollins FS 84.27 , Rollins FS 368.1, Guana FS 90.01).

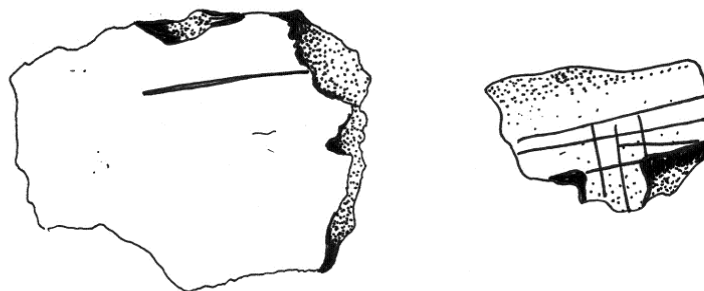


Figure 24. Motif Group 9, Other (left to right: Rollins FS 147.9, Rollins FS 147.23).

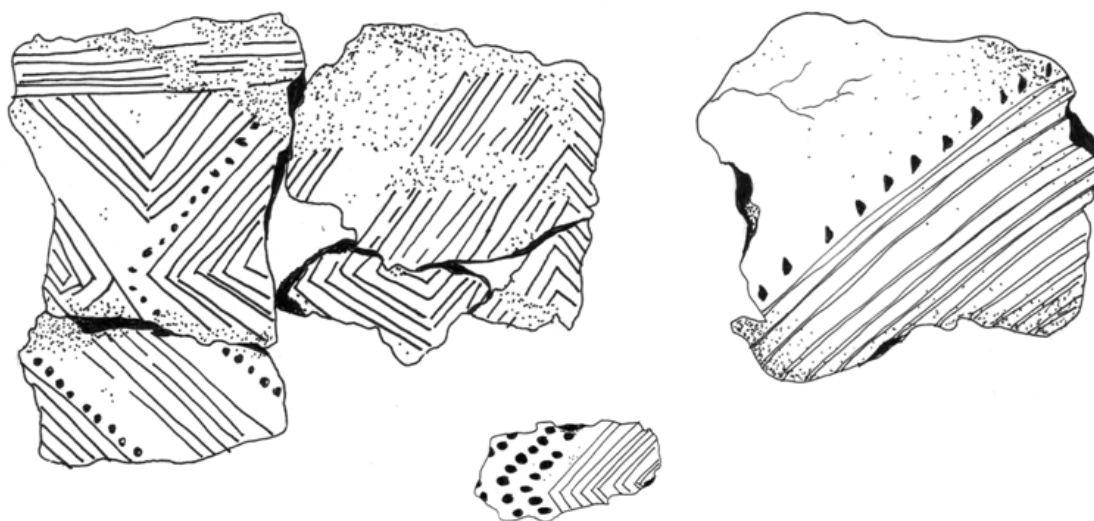


Figure 25. Elaborated sherds with tick marks and punctations (clockwise from left: Rollins FS 144.16, Rollins FS 369.05, Guana FS 369.05).

Frequency of Motif Groups

All of the motif groups were found at both sites. The crosses motif was the most rarely found with only seven sherds found overall at Rollins (1%) and one sherd found at Guana (.3%). While the frequency of motif occurrence differed between the units at both sites, the overall frequencies between the two sites were the same. At both Rollins and Guana the single direction oblique lines motif was the most common (Rollins 28.3%, Guana 31.1%). The second most common motif at both sites was the horizontal and vertical lines motif (Rollins 11.4%, Guana 18%). A X^2 analysis was done to compare the distribution of the motif frequencies at both sites (Tables 11 and 12). Although there was a clear difference in distributions ($p < .001$) when looking at all of the sherds analyzed from both sites (Table 11), there was no significant difference between the sherds in the MNV sherds analyzed ($p = .879$) (Table 12).

Table 11. X^2 test of all sherds. Expected counts are printed below observed counts. X^2 contributions are printed below expected counts.

Motif	Rollins	Guana	Total
Multiple Direction Oblique Lines	76	18	94
	65.8	28.2	
	1.6	3.7	
Single Direction Oblique Lines	226	108	334
	233.7	100.3	
	.26	.59	
Chevrons	58	13	71
	49.7	21.3	
	1.4	3.2	
Horizontal/Vertical Lines	64	54	118
	82.6	35.4	
	4.2	9.7	
Nested shapes	28	6	34
	23.8	10.2	
	.7	1.7	
Crosshatched	69	28	97
	67.9	29	
	.02	.04	
Alternating Lines	29	9	38
	26.6	11.4	
	.22	.51	
Total	550	236	786
$X^2=28.0$, DF=6, P-Value=0.00			

Table 12. X^2 test of MNV sherds. Expected counts are printed below observed counts. X^2 contributions are printed below expected counts.

Motif	Rollins	Guana	Total
Multiple Direction Oblique Lines	15	7	22
	15.1	6.9	
	0.00	0.001	
Single Direction Oblique Lines	47	19	66
	45.3	20.7	
	.07	.15	
Chevrons	8	5	13
	8.9	4.1	
	.09	.21	
Horizontal/Vertical Lines	19	11	30
	20.6	9.4	
	.12	.26	
Nested shapes	10	2	12
	8.2	3.8	
	.38	.83	
Crosshatched	13	6	19
	13.0	5.6	
	0.00	0.00	
Alternating Lines	8	5	13
	8.9	4.1	
	.09	.21	
Total	120	55	175
$X^2=2.4$, DF=6, P-Value=0.879			

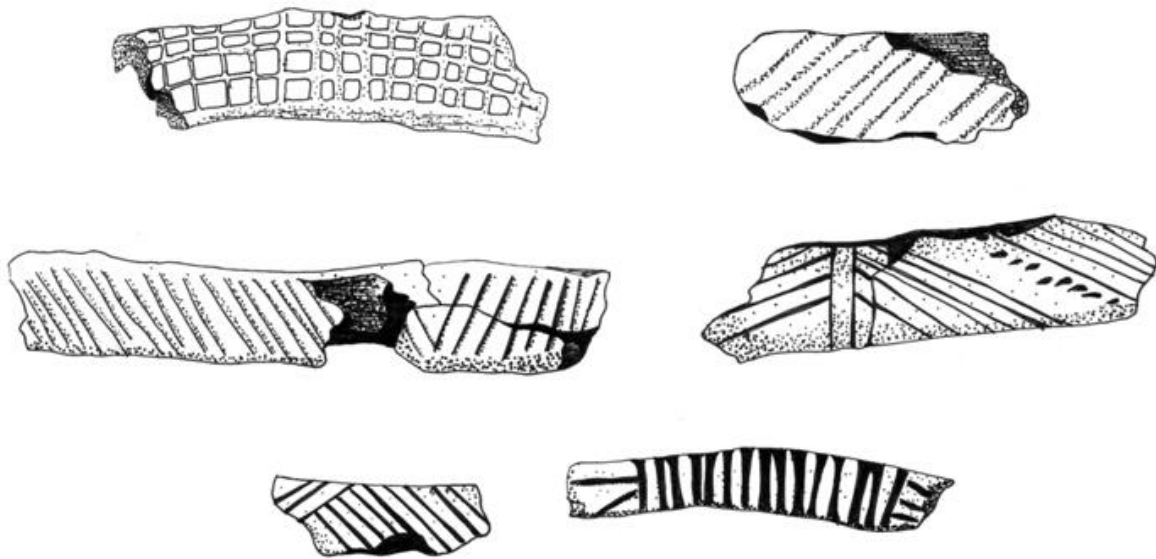


Figure 26. Examples of Rollins rim decorations.

Rim Motifs

The rim motifs found at both Guana and Rollins were the same as those commonly found on the vessel exteriors at both sites (Figures 26 and 27). However, the rim motifs found at Rollins were often elaborated with punctations and tick marks, accenting the design. In addition, the rim motifs at Rollins were usually different from the designs on their respective vessels, which may indicate an attempt to add as much decoration to a vessel as possible. On the other hand, the rim decorations at Guana were simple. They were often just a continuation of the vessel decoration and sometimes even connected to the decoration on the vessel's exterior. This may reflect a desire to draw attention to the overall effect of the vessel rather than the little details and nuances of the design.

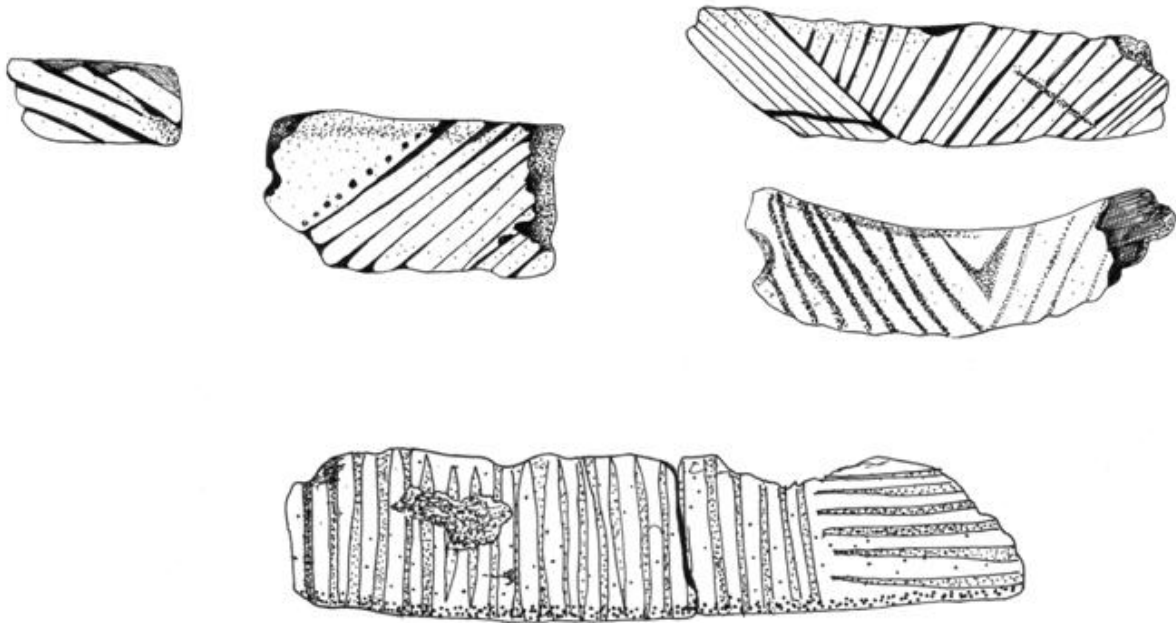


Figure 27. Examples of Guana rim decorations (clockwise from top: Guana FS 111.22,b, Guana FS 358.01, Guana FS 112.18,Guana FS 367.08).

Distribution of Design Motif Groups across the Rollins Shell Ring

To determine the degree of correspondence in the design assemblages at Rollins and Guana, I conducted a distribution analysis to determine what the differences were in motif variability across the rings and across time. At Rollins, the analysis involved sherds from nine excavation areas: Trench 1, a 1-x-16 m trench, and eight 1-x-2 m units: Unit 10, Unit 11, Unit 12, Unit 1097, Unit 1225, Unit 2011, Unit 2082, and Unit 3197 (Figure 28). Radiocarbon dates of 3680-3480 1cal B.P., 3630-3440 1cal B.P., and 3740-3540 1cal B.P were returned on shell samples from ring and ringlet bases in Trench 1, Unit 11, and Unit 3197 (see Table 1), respectively. The earliest shell date from the site, 4050-3820 1cal B.P., was returned from the base of Unit 10 on the north side of the ring (Saunders 2004a). Only two areas had the full array of design motifs. These two areas were Unit 2011, an essentially non-shell unit located at the entrance to ringlet E and Trench 1, the 1-x-16 m trench, excavated through the west wall of the shell ring.

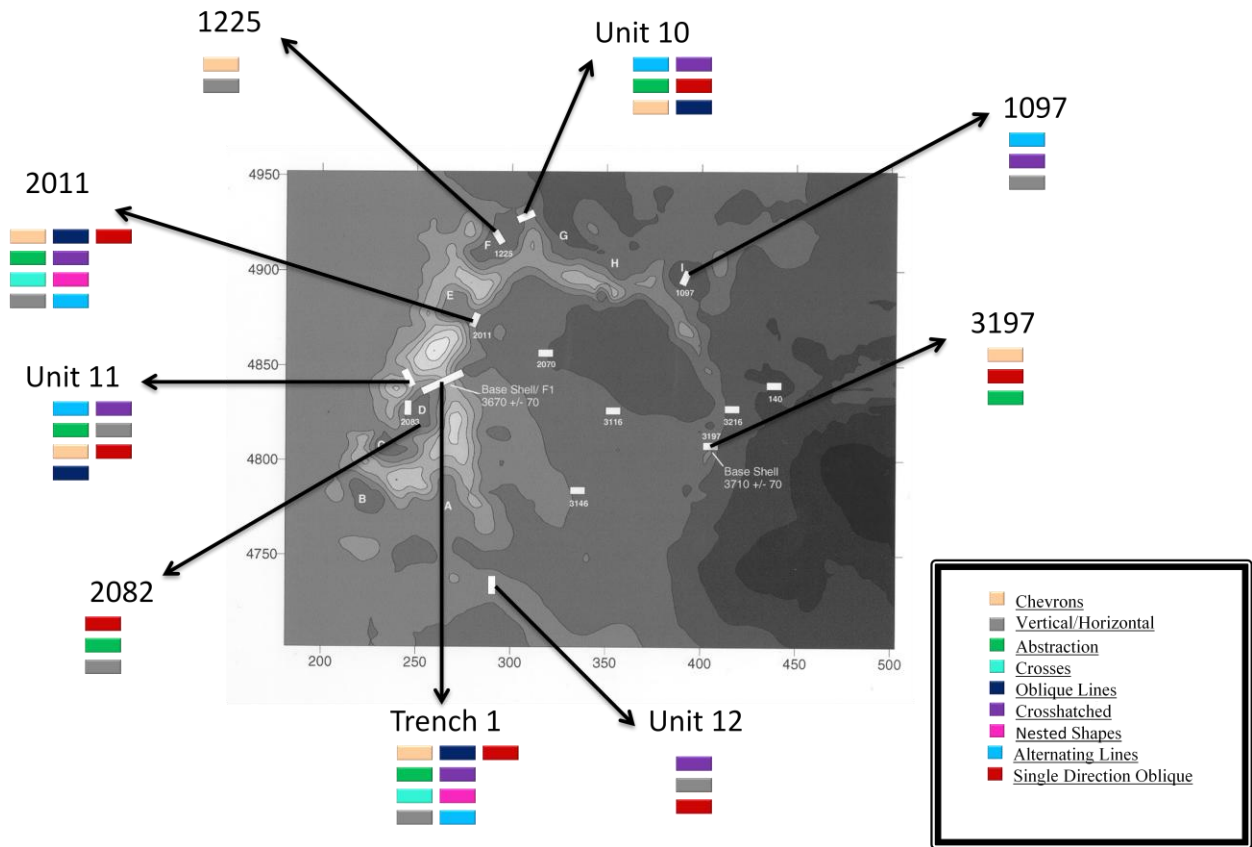


Figure 28. Distribution of the motif groups across Rollins Shell Ring. Base map is from Saunders (2004a).

Given the size of Trench 1—it spans from the eastern wall of Ringlet D to the western wall of the main ring—it was not surprising that there would be a large range of design motifs. In addition, unlike the other units, Trench 1 also had sherds with a wide variety of tick marks and punctations. Another unit with the whole range of motif groups was Unit 2011. However, unit 2011 had a much smaller sample size and the sherds that were found were probably deposited there by erosion.

The most common motifs found at these units were chevrons motif group, oblique lines motif group, vertical and horizontal lines motif group, and other motif group. However, none of these motifs were found in all of the units. The crosshatching motif group was also a well distributed

motif. Crosshatching was particularly well represented at Trench 1 and Unit 1097. At Trench 1, 62 of the 553 sherds analyzed were classified as being part of the crosshatching motif and 3 of the 7 sherds recovered from Unit 1097 were crosshatched. A single example of crosshatching was also found at Unit 10.

Two of the rarest motifs were the crosses motif (.6%) and the nested-shape motif (6%). Both of these motifs were relatively restricted in distribution around the shell ring. Nested shapes and crosses were found only in at Trench 1 and Unit 2011 (Figure 28). The majority (70%) of samples with tick marks or punctations were found in the excavations near Ringlet D, although three tick-marked sherds were found in Unit 2011 at the entrance to Ringlet E. Punctuation was also found at Unit 3197. Some of these punctated sherds were highly decorative, with chevrons accented with rows of punctations or triangular shapes filled in completely with punctations. No sherds with punctations or tick marks were recovered from Unit 12, Unit 10, Unit 1225, or Unit 1097. The relatively earlier dates for Unit 10 and Unit 12 may suggest that punctations and tick marks were techniques only employed during the later stages of ring occupation as Bullen (1972) suggests in his description of Orange 3 pottery (see Chapter 3).

Another interesting design elaboration at the site was the branching design elaboration, where oblique lines extend outward in a branch-like fashion from a central line grouping (Designs 7, 16, and 82). This motif was present at Trench 1, Unit 11, and Unit 2011. Unlike tick marks and punctations, branching was found at the earlier-dated Unit 10. The alternating line motif has also been found at Unit 10 as well as four other units at Rollins (Table 13). This would suggest that the alternating line motif and the branching elaboration were employed at the shell ring since its initial usage.

Table 13. Table showing frequency of motif groups.

Motif Group	Rollins MNV	Rollins Sherd	Guana MNV	Guana Sherd
Multiple Direction Oblique Lines	15 (9.0%)	76 (11.8%)	7 (11.4%)	18 (6.3%)
Single Direction Oblique Lines	47 (28.3%)	226 (35.2%)	19 (31.1%)	108 (37.8%)
Chevrons	8 (4.8%)	58 (9%)	5 (8.1%)	13 (4.5%)
Horizontal/Vertical Lines	19 (11.4%)	64 (9.9%)	11(18%)	54 (18.9%)
Crosses	1(0.6%)	7 (1%)	0 (0%)	1 (0.3%)
Nested Shapes	10 (6.0%)	28 (4.3%)	2 (3.2%)	6 (2.1%)
Crosshatched	13 (7.8%)	69 (10.7%)	6 (9.8%)	28 (9.8%)
Alternating Lines	8 (4.8%)	29 (4.5%)	5 (8.2%)	9 (3.1%)
Other	12 (7.2%)	32 (4.9%)	6 (9.8%)	10 (3.5%)
Unknown	33 (19.8%)	52 (8.1%)	0 (0%)	38 (13.3%)
Total	166	641	61	285

One of the most interesting elaborations found at Rollins was that of “expanded crosshatching,” in which lands and grooves were purposefully exaggerated (Designs 11 and 22 at Rollins) to create a different effect from regular crosshatching. Only five examples of this elaboration were recorded at Rollins. Execution of this design ranges from an almost haphazard mesh of thick lines to well-executed, meticulous lines; the best examples were intricate and finely crafted. Rims of the vessels with this design elaboration were also highly decorated, and the vessel and rim were usually burnished. Interestingly, this design elaboration was found only at Trench 1. It is possible that the expanded crosshatching design had a significance tied to the location of

Trench 1 or to Ringlet D. However, sample size from other areas at the site was too small to draw any significant conclusions.

Distribution of motif and design elaborations at the Rollins Shell Ring site suggests that, in general, there was a continuity of design across the site and across time. Some designs (the crosses motif and nested shape motif) as well as ticking and incising may be later additions, but the large sample size at Trench 1 and the relatively small sample sizes at the other units mean that this assumption cannot be quantified.

Distribution of Design Motif Groups across the Guana Shell Ring

Mapping the distribution of motif groupings at the Guana Shell Ring Site was itself as a challenge. The original fieldwork carried out by Russo, Heide, and Rolland (2002) consisted of 50-x-50 cm shovel tests located throughout the ring (Figure 29). A single larger unit (1-x-2 m) was opened at the apex of the ring. This means that although the collection from Guana was more spatially diverse than Rollins, not many sherds were recovered from any unit and some units had no sherds at all. In later excavations, Saunders and Rolland (2005) opened four 2-x-2 m units in a block on the interior of the ring near the western arm, providing a larger sherd assemblage from a single area of the ring. Radiocarbon dates were secured from four locations at the ring: Test Units 340N540E, 469N453E, 380N400E, and 410N520E. The dates returned for these areas were 3890-3720 1cal B.P., 3550-2440 1cal B.P., 3440-3310 1cal B.P., and 3560-3390 1 cal B.P. (Table 2) (Russo, Heide and Rolland 2002).

The Guana Shell Ring pottery assemblage contains the same design motifs as Rollins. However, only one example of the crosses motif was found at Guana. The distribution of the design motifs were mapped in the same way as those at Rollins (Figures 28 and 29). Unlike at Rollins, there

were no units at Guana which provide examples of every design motif present at the site. However, Test Unit 1 does have all of the design motifs except the crosses motif.

The most common design motif at Guana was the oblique line motif (Motif 1). As at Rollins, this motif was found at units all over the ring. The horizontal and vertical line motif and the crosshatching motif were also common and were found distributed in many units around the ring. There does not seem to be a focused area of distribution for any of these motifs. For example, the crosshatching motif was found at both the extremes of the ring and along the interior wall.

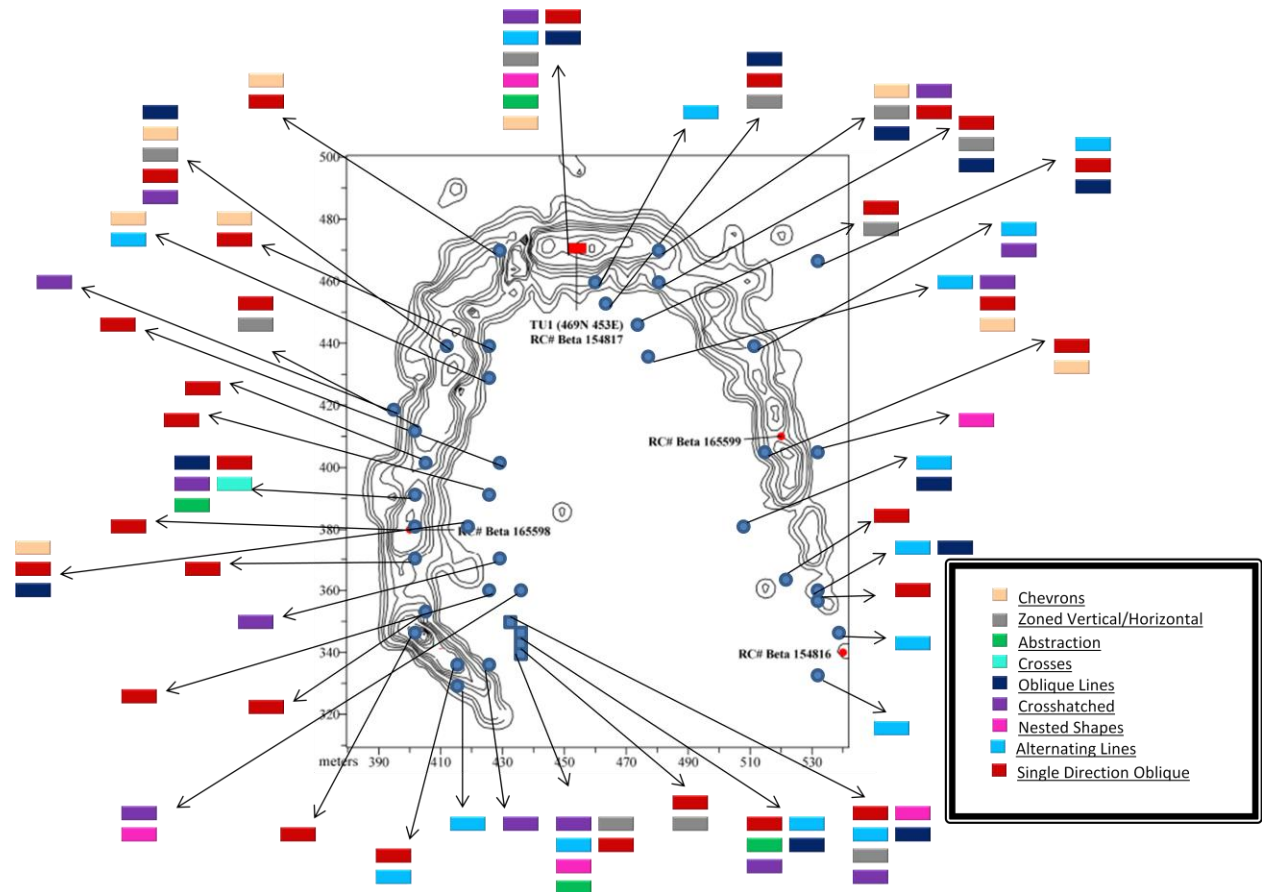


Figure 29. Distribution of motif groups across Guana Shell Ring. Adapted from Russo, Heide, and Rolland (2002) and Saunders and Rolland (2006).

The same can be said for the nested-shape motif. The oblique lines motif was also widespread. However, not all of the design motifs at Guana were so widely distributed. The chevron, so common and widely distributed at Rollins, was found almost exclusively at the northern end of the ring at Guana and only on the walls or on the interior of the ring, never along the exterior. This is understandable as sample sizes were larger on the interior of the ring and along the walls. Another common design motif with an interesting distribution was the alternating lines motif (Rollins 4.8%, Guana 8.2%). In general, this motif at Guana was far more elaborate than that found at Rollins. It was also more common and widely distributed at Guana than at Rollins as well. Surprisingly, this motif was not found all over the ring at Guana. It was very rare on the western arm of the ring but there was a high concentration of it along the southeastern arm of the ring and at the southern opening of the ring. This was the area that provided the oldest radiocarbon date recorded at the site, 3890-3720 1cal B.P.

Two design elaborations found at Guana showed a similar distribution to the alternating lines motif, but were never found as part of the same vessel. These elaborations are punctations and tick marks. Although they were found at five different units at Guana, these elaborations were limited to the northern end and the eastern arm of the ring in distribution.

Identifying Individuality and Commonality

There is a certain homogeneity among the Orange pottery of the Late Archaic. It was remarked upon by Bullen (1975) when comparing attributes between Summer Haven, the Cotten site, and South Indian Field. Saunders (2004b) also noted similarities between these sites and also Rollins. It was my hope that such homogeneity might represent more than just a sharing of cultural identity and technique. Through the analysis of pottery assemblages from Guana and Rollins, I

hoped to discover traces of the individual craftsmen responsible for making and decorating the Orange pottery.

As Crown (2007) suggested, it should be possible to identify a “school” of potters from a close analysis of pottery sherds. An individual can often be detected by observing idiosyncrasies inherent in the overall design of a vessel. Such irregularities are automatic and are repeated by the potter subconsciously every time they apply a certain design or make a specific stroke. By observing and tracking the irregularities present in the Orange Incised Pottery from the Rollins Shell Ring and from the Guana Shell Ring, it may be possible to distinguish an a certain craftsman or group of craftsmen active at one or both of these sites.

Although differences of symbolism and craftsmanship can be tentatively identified from pottery shape and decoration, it is more difficult to isolate an individual craftsman or even a “school” of potters (Crown 2007). According to Chilton (1999:50), “Individuals within a particular society simply come to rely on a particular technique, even though other viable options are potentially available.”

According to DeBoer (1990), complex designs and fine decoration methods require much longer learning periods than more simplistic and rough decoration methods. This was first illustrated by DeBoer in his 1990 study of the Shipibo-Conibo potters. He recorded an eleven-year specialization period for potters in training. He also noted that children begin with a limited range of shapes and poor motor control skills. However, with practice, their skills and decorative shape range gradually improve. As Crown noted (2007: 683) “even as such motor coordination is improving, there are aspects of the growing brain that limit replication of culturally appropriate designs” and it is only through experience and practice that children can improve their

vocabulary of cultural symbolism and meaning. To truly master the technique of decoration of pottery with a consistently high skill level takes practice of four to five hours a day for at least ten years (Ericsson and Lehmann 1996).

Searching for the Individual Craftsmen

In searching for individual craftspeople I sequestered certain sherds which stood out from the rest. They may have been unusually well made or perhaps they had a flaw in their construction that individualized them. However, I finally focused on those sherds that were exceedingly well made and meticulously decorated. At the Rollins Shell Ring and the Guana Shell Ring, there were several sherds which illustrate the skill of the potters. I identified fifteen sherds from Guana and twenty-one sherds from Rollins which were particularly well made and finely decorated. As can be seen in the representative sherds in Figures 30 and 31, there was a high level of motor control used by the decorators as well as a precise placement of design elements, which are the marks of expert craftsmanship.

In my analysis I made statistical comparisons between the best examples of finely made sherds from Rollins (n=18) and the best examples of finely made sherds from Guana (n=13). In making this comparison I hoped to discover vital differences between the finely made sherds from each site.

I compared the sherd thickness, land width, groove depth, and groove width (Table 14). However, the data revealed that the fine sherds at both sites were remarkably similar. I continued my analysis by examining each of the finely made sherds for evidence of specific techniques, flaws in design, and other idiosyncrasies which might be the “signature” of a specific artisan.



Figure 30. Examples of incised sherds from Rollins decorated by individuals with a high skill level and well developed fine motor control. Note the even line spacing and unwavering application of incisions (clockwise from top left Rollins FS 154.32, Rollins FS 144.16, Rollins FS 36.21, Rollins FS 323.4).



Figure 31. Examples of incised sherds from Guana decorated by individuals with a high skill level and well developed fine motor control (Guana FS 215.02, Guana FS 106.21, Guana FS 91.02, Guana FS 99.01).

Then, through comparison, I hoped to find other examples of the same artisan's work. I looked, specifically, at punctuation and tick mark shape, line formation, crosshatching formation, angle formation, and line junctures.

Punctuations and Tick Marks

The fine sherd group from Rollins only had two sherds with punctuations (FS 144.16 and FS 374.16) and no sherds with tick marks. The punctuations on these two sherds were formed

completely differently. The punctations on FS 144.16 were deep and very circular in shape while the punctations on FS 374.16 were deep and elongated with a teardrop shape. The punctations on both of these sherds were evenly spaced along the outside edges of a parallel line series.

The fine sherd group from Guana had one sherd with punctations and one sherd with tick marks. The one sherd with tick marks, FS 106.21, revealed shallow, but evenly spaced tick marks radiating outward from a series of nested triangles. The sherd with punctations, FS 369.05, had very deep, circular punctations. These punctations were arranged in at least three parallel rows which were aligned with a series of chevrons.

Groove Formation

Three different groove styles were recorded during the fine sherd analysis (Figure 32). The first was simply a straight line groove. This groove is very straight and does not waver in any significant way. The second was an inconsistent groove. In this case the craftsman intended to make a linear groove, but deviated from the intended trajectory creating a wobbly line. The third groove style was bowed. As with the inconsistent groove, it appeared that the craftsman intended to make a linear groove, but deviated from this path. In this case, the craftsman gradually bowed all of his or her grooves outward in the same direction. Thus, although the groove is not completely linear it is still consistent.

The fine sherd analysis revealed that the straight line groove was the most common in the fine sherd groups from both sites (Rollins 50%, Guana 84%). At Rollins, the inconsistent groove style made up 33% of the fine sherds analyzed, but none were observed in the analysis of the fine sherd group from Guana. The bowed groove style made up 11% of the Rollins fine sherd group and 25% of the Guana fine sherd group.

Table 14. Comparison of fine sherd group measurements from Guana and Rollins.

	Fine Sherds Rollins (mm)	Fine Sherds Guana (mm)
Mean Sherd Thickness	10.3	10.3
Standard Deviation Mean Sherd Thickness	2.4	.61
Mean Incision Width	.95	.97
Standard Deviation Mean Incision Width	.08	.07
Mean Incision Depth	.56	.59
Standard Deviation Mean Incision Depth	.07	.07
Mean Land Width	1.97	1.96
Standard Deviation Mean Land Width	.15	.19
Total	18	13

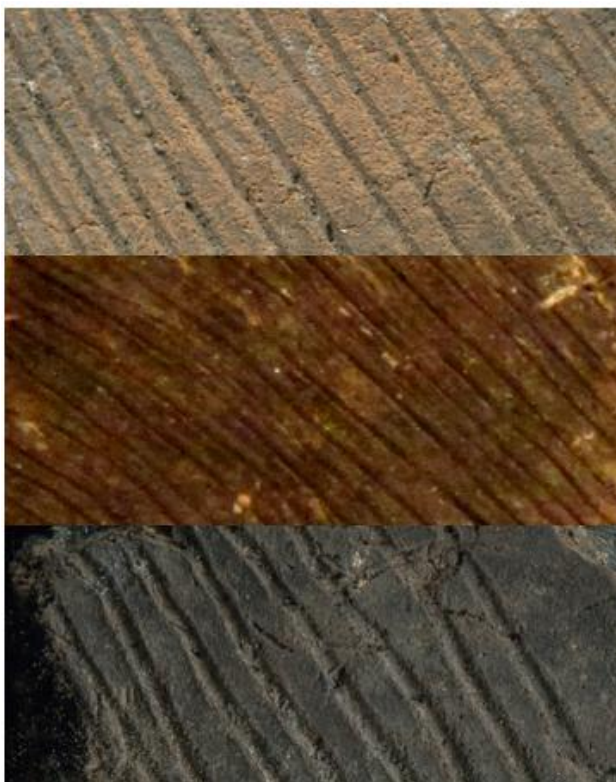


Figure 32. Comparison of grooves. From top to bottom: straight line groove (Rollins FS 575.3), bowed groove (Rollins FS 154.32), and inconsistent groove (Rollins FS 290.17).

Crosshatching Formation

All crosshatched sherds analyzed from both Rollins and Guana were decorated with the same basic process. A series of parallel incisions was first made in one direction and then another series of parallel incisions was made on top of the first series in the opposite direction. The angle of intersection varies from sherd to sherd. However, in my analysis of the finely decorated sherd groups, I discovered that the Rollins crosshatched sherds were different than the Guana sherds in one particular way. The Rollins crosshatching was formed by first incising a series of lines with a top left to bottom right direction and then overlaying the series with a separate group of lines incised with a top right to bottom left direction (Figure 33). However, at Guana, the order of incision was the opposite (Figure 33). First a series of lines was incised from the top right to the

bottom left and then they were superimposed with a group of lines from the top left to the bottom right. This demonstrates a fundamental difference in the crosshatching process at the two sites.



Figure 33. Comparison of crosshatching between Rollins (FS 84.24) and Guana (FS 99.01).

Linearity of the Vertices of the Angles

Angles used in the oblique line motif and nested shape motif, among others, are one of the most telling features which I analyzed. I noted how well the angles lined up -that is whether the vertices of the angles were in a straight line or if they were offset from each other. I also noted whether the angle was created in a single stroke or through the intersection of two strokes (Figure 34). At Rollins, 75% of sherds in the fine sherd group had a linear alignment of vertices compared to 50% at Guana. The frequency of the number of strokes used to create the vertices was different at both sites. At Rollins, 50% of the finely made sherds with the nested shape motif or the chevron motif had vertices made with a single stroke and 50% made with a double stroke.

However, at Guana sherds from the fine sherd group with one stroke vertices were less common (13%) while sherds with vertices made by more than one stroke were more common (87%).

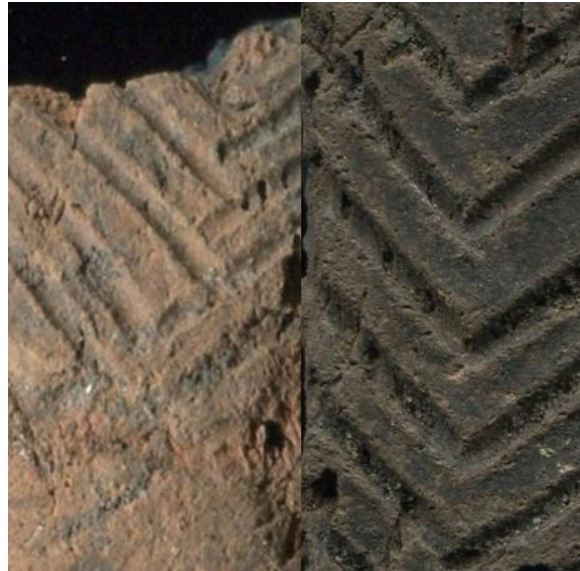


Figure 34. Comparison of linearity of vertices: poorly aligned (left Rollins FS 53.22), well aligned (right Rollins FS 290.17).

Line Junctures

A line juncture is the place in which one line terminates at another line. For the finely made sherd groups, I recorded whether the line junctures were intrusive or non-intrusive (Figure 35). Of the sherds with line junctures in the Rollins finely decorated sherd group, 75% had non-intrusive line junctures. For example, FS 131.20 has a large group of oblique lines intersecting a horizontal line. The oblique lines terminate at the horizontal line and do not intrude upon the horizontal line. At Guana, 77% of the finely made sherds with line junctures had non-intrusive line junctures. This finding is not unexpected. Since only the most finely made sherds were examined, it is logical that the decorators were meticulous in their design and carefully made the junctures between one line and another.

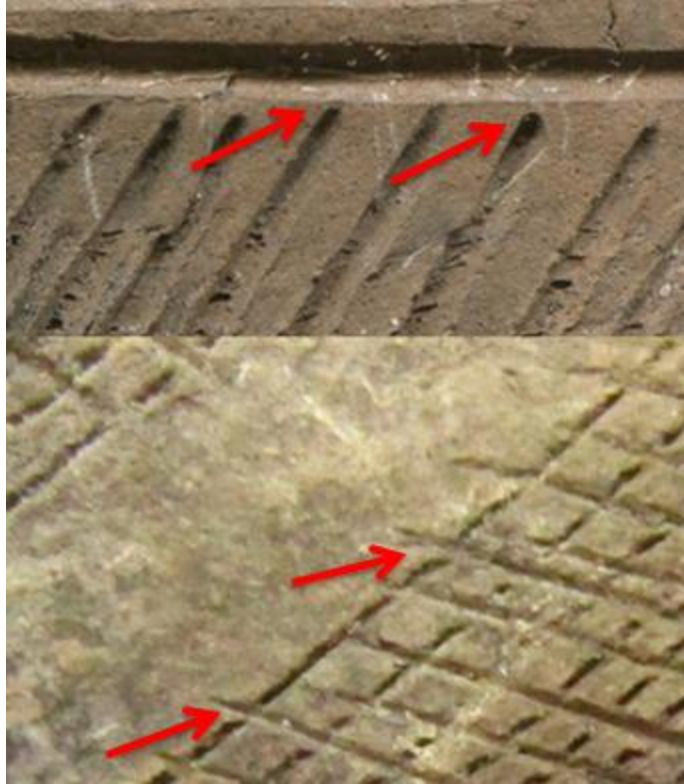


Figure 35. Comparison of line junctures: non-intrusive line junctures (top Rollins FS 131.20), intrusive line junctures (bottom Guana FS 91.02).

Comparison of Fine Pottery at Rollins and Guana

When examining the finely made Orange pottery from each site, I found that Guana and Rollins had some similarities between their fine sherd groups, but also many differences. The most obvious difference is the crosshatching method at each site. At Rollins, all crosshatching from the fine sherd group was formed by incising in a top left to bottom right orientation and then overlaying incisions with a top right to bottom left orientation. At Guana, on the other hand, the crosshatching was formed by first laying down incisions in top right to bottom left orientation and then incising in a top left to bottom right direction on top of the first incision set.

Another noteworthy difference was the number of strokes used to create a vertex. At Rollins, the vertices were made with a single stroke in half of the instances and with a double stroke in the

other half. However, at Guana vertices were made with a double stroke more than 80% of the time. Also, Guana had a much higher frequency of straight line groove types than Rollins, but a more limited range of groove types. Although there were interesting qualities in design creation at both sites, I could not isolate a repeating amalgamation of traits which could be easily ascribed to an individual craftsman or group of craftsmen. Therefore, it does not appear that a single craftsman or “school” producing pottery for both sites.

Summary

My analysis of the sherds from the Rollins Shell Ring and the Guana Shell Ring showed that there was close cultural similarity between the two sites. There were many similarities between the measurements taken of the MNV sherds from both sites. Groove width and groove depth were found to be statistically equivalent, and the mean sherd thicknesses was the same. The mean land width was also the same at both sites. Also, the two sites shared many techniques and methods for tempering, shaping, and manipulating the clay. Many of the designs recorded were the same at both sites, and the frequencies at which the motif groups appeared at each site were remarkably similar. Furthermore, an analysis of the fine sherd groups from each site revealed that the two groups had no discernible differences.

However, there were also many differences. The land widths at both sites were found to be statistically distinct from each other. Also, the modal rim width at Rollins was almost double that of Guana. An artistically oriented analysis revealed that there were indeed differences between the fine sherds at each site. These differences include crosshatching formation, groove formation, and the formation of vertices. None of these differences or similarities pointed toward a single craftsman or group of craftsmen working at one or both of the sites.

CHAPTER 7: CONCLUSIONS

Introduction

In my research I examined the Orange Incised pottery from two contemporaneous sites situated within 40 km of each other, the Rollins Shell Ring and the Guana Shell Ring, both located on the eastern coast of Florida. The goals of my research were to record all incised pottery designs and motifs from each site, to determine what the use of Orange Incised pottery might be at these two shell rings, and to determine if a craftsman or group of craftsmen may have made pottery for both sites.

In Chapter 1, I gave a brief introduction to my research and my research goals. In Chapter 2, I offered an outline of the Archaic Period in the southeastern United States, particularly in Florida. Then, in Chapter 3, I gave a description of Orange pottery and fiber-tempered pottery. In the next chapter, Chapter 4, I looked at the history and construction of shell rings, with an emphasis on the Rollins Shell Ring and the Guana Shell Ring. I used Chapter 5 to outline my methods of analysis. In Chapter 6, I looked closely at the pottery assemblages of both the Rollins Shell Ring and the Guana Shell Ring. I examined the different designs and motifs found at these sites and their distributions. I also attempted to draw some correlations between the two pottery assemblages. In this, the final chapter, I will provide a brief summary of the contents of this thesis and give my thoughts on opportunities for further research.

Orange Pottery

Orange pottery is from the Late Archaic Period which dates from 5000 B.P. to 3000 B.P. Orange pottery is found throughout northern and central Florida, but its culture hearth is considered to be the northeast coast of Florida. It is a fiber-tempered pottery mixed with an organic material. In

this study the Orange pottery was tempered with Spanish moss. It is called Orange pottery because the iron naturally present in the clay oxidizes when the pot is fired, creating an orange color. Most Orange pottery vessels were undecorated or “plain.” Orange pottery that is decorated is done so with incising and many archaeologists have noticed that Orange Incised designs were similar between sites. In 2004a, Saunders noted that Orange Incised pottery is more common at shell rings than at other Orange sites.

Orange pottery is often found at shell ring sites. Shell rings are large circular embankments of shell. Although they are found along the south east Atlantic coast, the shell rings in Florida are bigger and more elongated in shape. These were manmade structures which probably served a ceremonial function. The two shell rings I focused on, Rollins and Guana, are two of the biggest shell rings. Radiocarbon dating at Rollins Shell ring returned dates of between 4050 1cal B.P. and 4050 1cal B.P. Guana shell ring returned dates of between 3980 1cal B.P. and 3310 1cal B.P.

Designs and Motifs Recorded

Each incised pottery sherd from these two sites was weighed, and design elements were measured. Each design was categorized and then drawn and photographed. In total, 131 separate designs were recorded. After the analysis was done, each of the designs was categorized into one of nine motif groups. These motif groups were Multiple Direction Oblique Lines, Single Direction Oblique Lines, Chevrons, Horizontal and Vertical Lines, Crosses, Nested Shapes, Crosshatching, Alternating lines, and Other. Important decorative features such as rim design as well as punctations and tick marks were also noted. The distribution of these motifs was then mapped at both sites.

Rollins Shell Ring and Guana Shell Ring Designs

At Rollins, incised pottery was found all around the ring, but the highly decorative sherds were found primarily at Trench 1 and its surrounding areas. This unit had the largest variety of pottery of unit at Rollins, probably because it had the largest sample size.

The distribution of incised pottery was different at Guana than at Rollins, with the highest diversity and most complexity located at the top and bottom of the ring. For example, the chevron motif was found mostly at the top of the ring, while the alternating lines motif was relegated to the eastern side of the shell ring. Each of these motifs may represent a different spatial use for the ring. Perhaps the top of the ring was used only by one group while the eastern side of the ring was used by another.

Comparison

When I compared the measurements that I took of the incised sherds from each site, I found that while the sherd thickness, land width, and groove width modes were quite similar between sites, the incision depth and vessel diameter modes were different. The incision depths at Rollins were much shallower than those at Guana. Also, the vessels at Rollins tend to have a much larger diameter than those at Guana. It is also apparent that different complex designs and design combinations were favored at each site. For instance, an examination of fine sherd groups revealed similarities between both sites, but also differences. While some measurements of the fine sherd design execution from both sites were statistically the same, closer observation of the design elements from these sherds revealed that there were significant differences. This indicates that Rollins and Guana probably shared cultural similarities when it came to pottery creation, including what tools they favored, but that the same potters probably were not creating pottery at

both sites. Both sites had groups of highly skilled potters capable of creating beautiful and very precise incised designs. It is clear that many of the potters who decorated Orange pottery had a very high level of fine motor control, an artistic eye, and the confidence and experience needed to apply incised designs without flaw.

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APPENDIX: LISTING OF DESIGN DESCRIPTIONS

The following listing of Orange Incised designs represents the total number of designs recorded in the analysis of both the Rollins and the Guana Shell Ring collections. The site or site where the design was found is listed as well. Many of the motifs recorded in the Bullen and Bullen (1961) study and the Mitchell (1993) study were classified as “rim sherd designs” only. However, in the Rollins and Guana assemblages, the same motifs are found on both rim and body sherds. To avoid confusion and to facilitate future research, a note next to the description has been made to indicate alternate numbering used in the Bullen and Bullen (1961) and Mitchell (1993) studies.

Design 1 (Rollins) consists of a basic triangle which is sometimes nested within larger triangles but often is just a single zoned triangle. A more complex variation of this design was recorded by Ford (1966:790). This design was added to the nested shape motif group.

Design 2 (Rollins) consists of a series of zoned, oblique lines. The number of lines in the design varies but is often five or seven. Line groupings with a top left to bottom right orientation are designated with an “a” and line groupings with a top right to bottom left orientation are labeled with a b. This design was first recorded by Bullen and Bullen (1961), who list it as Orange Incised Motif 5. This design was added to the single direction oblique lines motif group.

Design 3 (Rollins and Guana) consists of a complex design made up of zoned sections of parallel lines poised at perpendicular angles to each other and framed at the top and bottom by a set of double lines running parallel to the vessel rim. This design was first published by Ford (1966) and is very similar to Orange Incised Motif 20 recorded by Mitchell (1993) at Summer Haven. This design was added to the alternating lines motif group.

Design 4 (Rollins) consists of a simple zoned parallel zigzag pattern around the outside of the vessel near the rim with no additional ornamentation. This design was added to the oblique lines motif group.

Design 5 (Rollins) consists of a single zoned line or double line running parallel to the vessel rim accented by a row of punctations beneath it. This design was later merged with design 78.

Design 6 (Rollins) consists of zoned chevrons filled with a series of chevrons running in the opposite direction. This design was added to the chevrons motif group.

Design 7 (Rollins) consists of a small set of vertical lines (usually two or three) extending down at a perpendicular angle from the rim. Sets of zoned lines branch up and out at oblique angles from the vertical lines. The highest of these line sets is accented by vertical punctations beneath it. This design was first published by Saunders (2004b). This design was added to the oblique lines motif group.

Design 8 (Rollins) consists of a set of zoned vertical lines (usually 5) extending down at a perpendicular to the rim of the vessel. A grouping of horizontal lines extends perpendicularly to the right of the vertical line set near the rim. Zoned oblique line sets branch out from the bottom of the horizontal line sets. This design was added to the “other” motif group.

Design 9 (Rollins) consists of alternating square groupings of zoned vertical and horizontal lines to form a basket weave style pattern. This design was published by Ford (1966). This design was added to the alternating lines motif group.

Design 10 (Rollins and Guana) consists of small sets (2 or 3) of vertical lines arranged around the vessel in such a way as to form panels. These panels are then filled with zoned parallel lines

set at an oblique angle to the vertical lines. The direction of the lines alternates between panels. This design was first recorded by Mitchell (1993) as Motif 25. Variations include the addition of parallel lines around the rim of the vessel, the absence of vertical lines, or the presence of only two sets of panels that cover only one face of the vessel rather than continuously around the whole vessel. This design was added to the oblique lines motif group.

Design 11 (Rollins) consists of an unzoned crosshatch pattern that covers the whole vessel and is not enclosed by any boundary lines. The crosshatch pattern is made up of groupings of lines (5 usually) rather than single incisions. This creates an even smaller crosshatched design element at the point of intersection. Mitchell (1993) recognized this motif and recorded it as Motif 17. It was also recorded by Saunders (2004b) as Motif 81. This design was added to the crosshatched motif group.

Design 12 has been merged with design 35.

Design 13 (Rollins and Guana) consists of a zoned rectangle inset with consecutively smaller rectangles. This is framed at a skewed angle by a grouping of parallel lines set out in a larger rectangular shape. This design was added to the nested shape motif group.

Design 14 (Rollins and Guana) consists of a series of zoned parallel lines running around the outside rim of the vessel with square-shaped spirals located beneath and slightly removed from the parallel lines. This design was added to the nested shapes motif group.

Design 15 (Rollins) consists of a series of zoned parallel lines in a rectangular shape. It is framed by a series of parallel lines that intersect another set of lines at a perpendicular angle. The full scope of this design is not clear due to the fragmentary nature of the sherds, but it may be similar

to a design illustrated by Ford (1996:793). This design was added to the oblique lines motif group.

Design 16 (Rollins and Guana) consists of a small set of vertical lines (2 or 3) extending down from the rim at a right angle. Zoned oblique lines extend out in both directions from the vertical lines. It is very similar to design 7 but there are no punctations. This design was added to the oblique lines motif group.

Design 17 (Rollins) consists of a series of zoned oblique lines in one direction on half of the rim and a series of zoned oblique lines in the other direction on the second half of the rim. There is a chevron where the two series of oblique lines meet. Perpendicular punctations accent a single side of the oblique line segments similar to Motif 18 recorded by Mitchell (1993). This design was added to the chevrons motif group.

Design 18 (Rollins) consists of a thick series of zoned oblique lines accented by punctations horizontal to the series. This design was added to the oblique lines motif group.

Design 19 (Rollins) consists of a series of zoned oblique lines. The lines are accented by punctuation arranged at an oblique angle. The direction of the punctuation alternates on either side of the line grouping. A similar design element is recorded by Bullen and Bullen (1961) in what they label as Motif 14. This design was added to the oblique lines motif group.

Design 20 (Rollins and Guana) consists of an unzoned, crosshatched pattern made with individual lines intersecting at right angles. This design was originally identified by Bullen and Bullen (1961) as Motif 7. This design was added to the crosshatched motif group.

Design 21 (Rollins) consists of a grouping of four zoned parallel lines extending down from the rim at an oblique angle. It is intersected by a similar grouping of oblique parallel lines extending from the rim in the opposite direction so that together they form an X. Rather than forming a crosshatched section where the groupings intersect, one line group disappears behind the other only to reemerge on the other side. This bottom band of lines is incised at equal intervals by perpendicular line segments. The top band of lines is incised at equal intervals by either single or double perpendicular line segments. Mitchell (1993:27-28) described this as “forming a pattern which resembles the frets on the neck of a guitar” when he recorded a rim motif (motif 27R) similar to this design. This design was added to the crosshatched motif group.

Design 22 (Rollins and Guana) consists of a set of three zoned vertical lines. Extending outward from these lines at oblique angles are sets of two and three lines. These line sets alternate in their direction so that they eventually intersect, forming a spread out crosshatch pattern. This design was added to the crosshatched motif group.

Design 23 (Rollins and Guana) consists of bands made of two oblique lines extending downward from the rim of the vessel. These lines are filled with zoned vertical and horizontal lines that intersect to form a crosshatched pattern. This design was recorded by Mitchell (1993) as Motif 7B, a variation of Motif 7. This design was added to the crosshatched motif group.

Design 24 (Rollins) consists of a band of horizontal stripes around the vessel rim. A simple unzoned crosshatched pattern like that of Design 20 extends down from the horizontal banding. This design was added to the crosshatched motif group.

Design 25 (Guana) consists of a series of zoned oblique parallel lines accented on one side with punctations perpendicular to the line set. This design was added to the oblique lines motif group.

Design 26 (Rollins) consists of a pair of parallel lines perpendicular to the rim. An area of simple zoned crosshatching extends from the line pair in one direction. This design was added to the crosshatched motif group.

Design 27 (Rollins and Guana) consists of continuous parallel unzoned oblique lines that range across the entirety of the vessel. This design was first recognized by Bullen and Bullen (1961) and was labeled as Motif 4. This design was added to the single direction oblique lines motif group.

Design 28 (Rollins) consists of a zoned series of short, parallel lines which are perpendicular to the rim of the vessel. There is undecorated space both above and below the line series. This design was added to the vertical and horizontal motif group.

Design 29 (Rollins) consists of unzoned parallel oblique lines which are bordered at the rim of the vessel with a band of horizontal lines. A similar rim decoration was first published by Mitchell (1993) as Motif 19. This design was added to the single direction oblique lines motif group.

Design 30 (Rollins) consists of zoned horizontal lines that appear to cover the entire vessel. This design was added to the vertical and horizontal motif group.

Design 31 (Rollins and Guana) consists of zoned oblique lines capped by a band of horizontal lines around the exterior rim. A similar rim decoration was first recorded by Bullen and Bullen (1961) and was called Motif 6. This design was added to the single direction oblique lines motif group.

Design 32 (Rollins) consists of regularly spaced unzoned vertical lines and unzoned horizontal lines covering the surface of the vessel that intersect to create a crosshatched pattern of rectangles. This design was added to the crosshatched motif group.

Design 33 (Rollins and Guana) consists of a triangular form filled with a crosshatch pattern made up of oblique angles, creating a diamond shape rather than a square or rectangular shape. This form is often repeated in a linear series around the vessel surface. This design was added to the crosshatched motif group.

Design 34 (Rollins) consists of a triangular form filled with a crosshatch pattern made up of a series of oblique lines and a series of horizontal lines. Like Design 33 this form is often repeated in a linear sequence around the exterior of the vessel. This design was added to the crosshatched motif group.

Design 35 (Rollins) consists of two bands of closely set zoned parallel lines extending at opposing oblique angles from the rim to the base. The bands converge and form a crosshatched pattern where they overlap. This design was added to the “other” motif group.

Design 36 (Rollins and Guana) consists of unzoned and vertical parallel lines. This design was first recognized by Bullen and Bullen (1961) as Motif 3. This design was added to the vertical and horizontal motif group.

Design 37 (Rollins and Guana) consists of a series of downward pointing chevrons filled in with a right angle crosshatched pattern. This design was added to the crosshatched motif group.

Design 38 (Rollins and Guana) consists of randomly spaced X-shaped incisions. They are often hard to make out because the incisions are always very shallow. This design was added to the motif crosses group.

Design 39 (Rollins and Guana) consists of a long, zoned segment of parallel horizontal lines. The segment is bordered on the left and right by swaths of vertical parallel lines. The design may or may not be repeated around the exterior of the vessel. This design was added to the alternating lines motif group.

Design 40 (Rollins and Guana) consists of a long, zoned segment of vertical parallel lines. The segment is bordered on the left and right by swaths of parallel horizontal lines. This design may or may not be repeated around the exterior of the vessel. This design was added to the horizontal and vertical motif group.

Design 41 (Rollins) consists of a series of horizontal parallel lines that runs around the outside rim of the pot. The series is then intersected by a group of oblique lines and chevrons. These oblique lines and chevrons are, in turn, intersected by a lower band of horizontal parallel lines. This design was added to the “other” motif group.

Design 42 (Rollins) consists of a horizontal line that runs around the outside rim of the vessel. Zoned parallel lines descend vertically from the horizontal band. These vertical line zones are accented on either side by obliquely angled, downward-facing punctations. This design was added to the oblique lines motif group.

Design 43 (Rollins) consists of unzoned parallel lines with a horizontal orientation that are bordered on one side by unzoned parallel lines with an oblique orientation. This design was added to the alternating lines motif group.

Design 44 (Rollins) consists of a grouping of parallel, upward-pointing chevrons accented by single point punctations on the underside of the chevron group. This design is similar to one recorded by Mitchell (1993), which he called Motif 21. This design was added to the chevrons motif group.

Design 45 (Rollins) consists of widely spaced parallel, horizontal lines and widely spaced oblique lines that intersect to create a large crosshatched pattern. One of the parallelograms created by this crosshatching is filled with a smaller series of crosshatching. This design was added to the crosshatched motif group.

Design 46 (Rollins and Guana) consists of a series of zoned chevrons either pointed upward or downward. A rim decoration consistent with this design was identified by Mitchell (1993) as Motif 23. This design was added to the chevrons motif group.

Design 47 (Rollins) consists of a single horizontal line or line segment. This design was added to the horizontal and vertical motif group.

Design 48 (Rollins) consists of three vertical parallel lines capped by a horizontal line. The three lines are intersected by a series of horizontal lines. Between the horizontal lines segments branch out from the vertical lines in the same direction. This design was added to the “other” motif group.

Design 49 (Rollins) consists of several groupings of three vertical lines each. These groupings are spaced apart to create panels that are filled with zoned oblique line groupings facing in varied directions. This design was added to the oblique lines motif group.

Design 50 (Rollins and Guana) consists of a linear grouping of single point punctations. This design is most often found on vessel rims. This design was added to the “other” motif group.

Design 51 (Rollins and Guana) consists of several horizontal parallel lines that run around the exterior rim of the vessel. A set of zoned oblique lines extends down from the horizontal line set from the top right to the bottom left. Further sets of oblique parallel lines extend down from this set of oblique lines but at an opposing orientation. This design was added to the oblique lines motif group.

Design 52 (Rollins and Guana) consists of a set of oblique parallel lines extending from top right to bottom left. This set intersects with a second set of oblique lines that extend in an opposing orientation. Where they intersect they form a right angled crosshatched pattern. The line sets do not extend past the point of intersection. This design was added to the “other” motif group.

Design 53 (Rollins and Guana) consists of an area or areas of zoned crosshatching. The crosshatching is formed by vertical lines intersected by oblique lines. This design was added to the crosshatched motif group.

Design 54 (Rollins and Guana) consists of a series of inset rectangles. This design was added to the nested shape motif group.

Design 55 (Rollins and Guana) consists of unzoned horizontally oriented parallel lines. This design was first recorded by Bullen and Bullen (1961) as Motif 1. This design was added to the vertical and horizontal motif group.

Design 56 (Rollins and Guana) consists of slender line segments laid out in a linear formation to create a dotted line. This is most commonly found as a rim design. This design was added to the “other” motif group.

Design 57 (Rollins and Guana) consists of a band of parallel lines around the exterior rim of the vessel. From this band a group of zoned parallel lines extends downward at an oblique angle. Further bands of zoned parallel lines extend downward from this group at an opposite oblique angle. This design was added to the oblique lines motif group.

Design 58 (Rollins and Guana) consists of sets of upward-pointing zoned chevrons. This design was added to the chevrons motif group.

Design 59 (Rollins) consists of a series of Y shapes made from short intersecting line segments that wrap around the exterior rim of the vessel. This design was added to the crosses motif group.

Design 60 (Rollins) consists of two groups of parallel oblique lines set at opposing angles. Although the groups come near to each other they do not cross. The groups are accented by circular punctations along the sides closest to each other. This design was added to the chevrons motif group.

Design 61 (Rollins and Guana) consists of a set of parallel oblique lines descending from the top left to the bottom right. Further sets of parallel lines extend upwards from this set at an opposing oblique angle. This design was added to the oblique lines motif group.

Design 62 (Rollins) consists of large oval shaped punctations placed at apparently random intervals and orientations. This design was added to the “other” motif group.

Design 63 (Rollins) consists of a group of inset triangles pointing downward. The inner most triangle is filled with circular punctations. This design was added to the chevrons motif group.

Design 64 (Rollins) consists of a pair of horizontal lines spaced some way apart. These lines are intersected by a set of oblique parallel lines also set far apart. The space created by two of the oblique lines is filled with staggered, parallel, line segments that extend down to the bottom most horizontal line. The horizontal lines outside of the oblique zone are filled with staggered horizontal line segments. This design was added to the “other” motif group.

Design 65 (Rollins) consists of a set of zoned oblique lines arranged in a fanned out shape. On either side of this fan shape are sets of zoned oblique lines extending downward in an opposing direction. This design was added to the oblique lines motif group.

Design 66 (Rollins and Guana) consists of zoned sets of oblique lines which alternate in their direction of orientation. This design was added to the oblique lines motif group.

Design 67 (Rollins) consists of an unzoned crosshatched pattern created by parallel horizontal lines crossed by parallel oblique lines in two opposing directions. This creates a pattern of tiny interlinked right triangles. This design was added to the crosshatched motif group.

Design 68 (Rollins) consists of two sinuous lines that intertwine once. This design was added to the “other” motif group.

Design 69 (Rollins) consists of a set of vertical parallel lines. Groups of zoned oblique lines extend downward from both sides of this set. The extending oblique lines are crossed by evenly spaced oblique line segments which divide them into small rectangles. This design was added to the crosshatched motif group.

Design 70 has been merged with Design 63.

Design 71 (Rollins) consists of a double row of round punctations in linear alignments. This is only found as a rim decoration. This design is similar to one identified by Mitchell (1993) as Motif 31. It was also identified as a rim motif, but it had three rows of round punctations. This design was added to the “other” motif group.

Design 72 (Rollins and Guana) consists of a series of parallel horizontal lines that run around the exterior rim of the vessel. Oblique parallel lines extend from top left to bottom right. This set intersects with a second set of oblique lines which extends in an opposing orientation. Where they intersect they form a right angled crosshatched pattern. The lines extend down from this intersection, which sits on top of the horizontal line grouping around the vessel rim. This design was added to the “other” motif group.

Design 73 (Rollins) consists of several geometric shapes. These shapes seem to be made from a single line that formed a labyrinthine shape. This design was added to the “other” motif group.

Design 74 (Rollins) consists of groups of inset triangles which intersect with each other at the base. The triangles sit on a pair of horizontal parallel lines. This design was added to the nested shape motif group.

Design 75 (Rollins) consists of a group of horizontal lines which run around the exterior of the vessel. Extending downward from these lines are vertical, parallel lines. This design was added to the vertical and horizontal motif group.

Design 76 (Rollins and Guana) consists of sets of zoned vertical lines. This design was originally recognized by Bullen and Bullen (1961) as Motif 3. This design was added to the vertical and horizontal motif group.

Design 77 (Rollins) consists of a single horizontal line that runs around the exterior of the pot. From this line two parallel lines extend down at an oblique angle. A large swath of parallel lines descends down from this line at an opposite oblique angle. This design was added to the “other” motif group.

Design 78 (Rollins and Guana) consists of zoned parallel lines with a horizontal orientation. These lines are crossed by parallel line segments at an oblique angle. This design was added to the crosshatched motif group.

Design 79 (Rollins) consists of square-shaped punctations in a linear formation. This is usually a rim decoration. This design was added to the other motif group.

Design 80 (Rollins) consists of vertical parallel lines that are bounded on one side by a crosshatching pattern made of contrasting oblique lines. This design was added to the crosshatched motif group.

Design 81 (Rollins) consists of a series of horizontal lines which extend around the exterior rim of the vessel. Zoned sections of oblique lines extend down from this series. The oblique line orientation alternates from one section to the next. This design was added to the oblique lines motif group.

Design 82 (Rollins) consists of a pair of parallel vertical lines from which zoned oblique line groupings extend upward. These oblique lines are accented by short line punctations. These

appear sometimes on the top of the lines and sometimes beneath. This design was added to the oblique lines motif group.

Design 83 (Rollins) consists of a series of horizontal lines which extend around the rim of the vessel. A set of three oblique lines descends from this series. This set is crossed by similar line sets extending downward in the opposite direction. This design was added to the crosshatched motif group.

Design 84 (Rollins) consists of what appears to be inset rectangular shapes. However, the shapes become less precise as they extend outward until the rectangular shape is cursory at best.

Saunders (2004b:58) made note of this design phenomenon. This design was added to the nested shapes motif group.

Design 85 (Rollins) consists of a series of vertical lines from which a thick swath of zoned oblique lines descends downward in one direction and only four oblique lines descend downward in the other direction. The four oblique lines are accented by four circular punctations. This design was added to the oblique lines motif group.

Design 86 (Rollins and Guana) consists of zoned vertical sections of crosshatching. The crosshatching is formed by vertical lines which have been crossed by oblique lines to create vertically skewed parallelograms. This design was added to the crosshatched motif group.

Design 87 (Rollins) consists of a large but solitary section of zoned oblique lines. This design was added to the single direction oblique lines motif group.

Design 88 (Rollins) consists of unzoned crosshatching which is created by evenly spaced vertical lines that have been crossed by evenly spaced horizontal lines. This design was added to the crosshatched motif group.

Design 89 (Rollins and Guana) consists of zoned oblique lines which have been accented on the top by circular shaped punctations. This is the same as a design named by Mitchell (1993) as Motif 21. This design was added to the single direction oblique lines motif group.

Design 90 (Rollins and Guana) consists of a series of horizontal lines that run around the exterior rim of the vessel. Oblique, zoned sections of cross hatching descend from these lines. This design was added to the crosshatched motif group.

Design 91 (Rollins) consists of a single horizontal line that runs around the exterior of the vessel. A series of inset chevrons decorate the lower part of the vessel. This design was added to the chevrons motif group.

Design 92 (Rollins and Guana) consists of a series of vertical lines inset with a pair of horizontally pointing chevrons. On one side of the vertical line set are unzoned oblique lines. On the other side are zoned sections of oblique lines which seem to weave under and over one another. This design was added to the alternating lines motif group.

Design 93 (Rollins) consists of a series of horizontal lines which run around the exterior of the vessel. This design was added to the vertical and horizontal motif group.

Design 94 (Rollins and Guana) consists of zoned vertical areas of crosshatching. The crosshatching is made up of closely set vertical lines which have been intersected by oblique lines from two opposite directions. This design was added to the crosshatched motif group.

Design 95 (Guana) consists of a pair of horizontal lines from which groups of inset chevrons extend upward and downward, creating a mirror image. The outside chevron of each set is accented by short line punctations in a radiant shape. This design was added to the nested shapes motif group.

Design 96 (Guana) consists of a series of vertical lines. These lines are intersected by two sets of oblique lines which also intersect each other. This design was added to the nested shapes motif group.

Design 97 (Rollins and Guana) consists of unzoned crosshatching. This crosshatching is made up of evenly spaced vertical lines crossed by evenly spaced oblique lines. This design was added to the crosshatched motif group.

Design 98 (Guana) consists of groups inset zoned chevrons. These chevron groups point in alternating directions to create a zigzag shape. This design was added to the chevrons motif group.

Design 99 (Guana) consists of inset chevrons accented on the outside by three rows of circular shaped punctations. This design was added to the chevrons motif group.

Design 100 (Rollins and Guana) consists of two sets of obliquely angled lines that ascend towards each other but never intersect. This design was added to the chevrons motif group.

Design 101 (Guana) consists of a vertical line set with inset chevrons extending from one side of it. This design was added to the chevrons motif group.

Design 102 (Rollins and Guana) consists of a large zoned area of vertical lines intersected by a large zoned area of oblique lines. This creates an area of crosshatching where they intersect. This design was added to the crosshatched motif group.

Design 103 (Guana) consists of a single horizontal line accented by a single line of circular punctations beneath it. This design was added to the “other” motif group.

Design 104 (Rollins and Guana) consists of a group of oblique, parallel lines from which another group of oblique, parallel lines extends upward in an opposing direction. This design was added to the oblique lines motif group.

Design 105 (Guana) consists of pairs of oblique parallel lines. These line pairs are filled with vertical line segments. This design was added to the oblique lines motif group.

Design 106 (Guana) consists of zoned inset chevrons pointing in a downward direction. This is only seen as a rim decoration. This design was added to the chevrons motif group.

Design 107 (Guana) consists of square shaped spirals stacked one on top of the other. A vertical line extends downward on one side. This design was added to the nested shapes motif group.

Design 108 (Guana) consists of a set of three oblique lines crossed by line segments. Unzoned vertical lines descend down from the set. This design was added to the crosshatched motif group.

Design 109 (Guana) consists of two sets of oblique lines. The space between these two sets is filled with obliquely lined chevrons. This design was added to the oblique lines motif group.

Design 110 (Rollins and Guana) consists of a pair of vertical lines. Unzoned oblique lines extend upward in either direction from the vertical line pair. This design was added to the oblique lines motif group.

Design 111 (Guana) consists of zoned oblique lines accented on either side by linear punctations. This design was added to the single direction oblique lines motif group.

Design 112 (Guana) consists of a series of closely set oblique parallel lines. These are crossed by evenly spaced oblique lines to form a linear crosshatching pattern. This design was added to the crosshatched motif group.

Design 113 (Guana) consists of a band of parallel lines around the exterior rim of the vessel. A vertical line descends down from this band. Extending downward from this line and the horizontal band is a thick swath of oblique lines. Another band of oblique lines extends upward from this swath. This design was added to the oblique lines motif group.

Design 114 (Guana) consists of a series of zoned horizontal lines that wrap around the exterior rim of the vessel. Several evenly spaced vertical lines descend from this series. Various line segments cross these line sets at oblique angles. This design was added to the “other” motif group.

Design 115 (Guana) consists of evenly spaced sets of oblique lines. The spaces between these line segments are filled with oblique lines oriented in the opposite direction. This design was added to the oblique lines motif group.

Design 116 (Guana) consists of a small set of oblique lines. Widely spaced vertical lines descend from this set. This design was added to the oblique lines motif group.

Design 117 (Rollins) consists of an unzoned series of horizontally pointing chevrons. This design was added to the chevrons motif group.

Design 118 (Guana) consists of a set of downward-pointing chevrons. Unzoned oblique lines surround this set of chevrons. This design was added to the oblique lines motif group.

Design 119 (Guana) consists of a series of widely spaced sets of oblique lines. These line sets are connected by a single set of oblique lines laid out in an opposing orientation. This design was added to the oblique lines motif group.

Design 120 (Guana) consists of two spans of crosshatching divided by a pair of oblique lines. These segments of crosshatching are not evenly spaced and are laid out at oblique angles. This design was added to the crosshatched motif group.

Design 121 (Rollins and Guana) consists of opposing triangular shapes. These triangular shapes are filled in with downward facing chevrons which continue down the face of the vessel. This design was added to the alternating lines motif group.

Design 122 (Guana) consists of evenly spaced sets of zoned vertical lines. These vertical line sets are accented by oval shaped punctations on either side of the sets. These punctations have a horizontal orientation. This design was added to the vertical and horizontal lines motif group.

Design 123 (Rollins and Guana) consists of a small band of horizontal lines around the exterior rim. Sets of downward pointing chevrons extend downward from this band all the way around the vessel. This design was added to the chevrons motif group.

Design 124 (Guana) consists of a large swath of parallel oblique lines which alternate the angle of their orientation. This results in large swaths of zigzag lines. This design was added to the oblique lines motif group.

Design 125 (Guana) consists of a single oblique line from which oblique lines extend upward with horizontal line segments extending outward in the same direction. This design was added to the “other” motif group.

Design 126 (Guana) consists of an oblique line segment. Another oblique line segment descends down from the middle of this line segment. This design was added to the “other” motif group.

Design 127 (Guana) consists of a single large circular-shaped incision. This design was added to the “other” motif group.

Design 128 (Guana) consists of a line of punctations which are circular outlines rather than complete circles perhaps made by a hollow cane tool. This design was added to the “other” motif group.

Design 129 (Rollins and Guana) consists of a large section of oblique lines from which another large swath of oblique lines runs in the opposite direction. This design was added to the oblique lines motif group.

Design 130 (Rollins) consists of a band of horizontal lines around the exterior rim of the vessels. Three oblique lines descend from this band in one direction and three oblique lines descend from this band in the opposite direction. This design was added to the “other” motif group.

Design 131 (Rollins) consists of two pairs of parallel oblique lines set at opposing angles so that one pair of lines crosses the other. This design was added to the “other” motif group.

VITA

The author was born in Tulsa, Oklahoma, but grew up in Baton Rouge, Louisiana. She took an interest in archaeology at an early age and was eagerly encouraged to pursue this path by her father, Dr. John Wrenn. Family vacations were not complete without trips to famous museums and archaeological sites. In school, the sixth grade social studies fair marked the author's first foray into anthropological research when she and her partner wrote and presented a paper on human evolution, winning first place regionally and third place at state competition. In High School the author chose Latin for her foreign language study and took every opportunity to research and write about the ancient world. As an undergraduate at Louisiana State University the author began her formal training in anthropology and graduated in 2008 with a bachelor of arts from the College of Arts and Sciences with a minor in classical civilizations.