CONTINUITY AND CHANGE IN GUALE INDIAN POTTERY, A.D. 1350-1702

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

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ACKNOWLEDGEMENTS

This study was accomplished because of an extraordinary level of cooperation from a number of remarkable individuals and institutions. The research never could have begun were it not for Dr. George and Dottie Dorion and Gus and Marion Heatwole, who own the adjacent lots on Amelia Island where the Santa Catalina and Santa Maria missions have been unearthed. These individuals gave their permission to excavate on their property without any legal requirement to do so. The Dorions went so far as to postpone house construction for five years while we completed our work. Mitch and Beanie Wenigman, who owned the next lot over, provided housing and lab space for several seasons. All of these people bolstered our spirits with their interest in and enthusiasm for our research.

The mission on the Dorion lot was initially investigated by Piper Archaeological Research, Inc. (now Janus Research). Ken Hardin, president of that company, designed the first field seasons at the site, secured funds from the Dorions, and arranged for Dr. Clark Spencer Larsen to analyze the human remains. In so doing, Ken initiated a program of institutional cooperation that remains a hallmark of this project. After two fields seasons, Ken recognized that the work would require more long term effort than a contracting company could afford, and he relinquished the project to the Florida Museum of Natural History. However, Ken never lost his own appreciation for the potential of the site, and has been helpful throughout the long years it has taken to complete the work.

Public interest in the sites on Amelia Island was immense. Though the site was within the Amelia Island Plantation, a restricted residential development, the number of people who visited the site each day began to impinge on our ability to get any work done and still be polite. Deon Jaccard of the Amelia Island Museum of History came to our rescue. We instituted a

series of weekly site tours using Amelia Island Museum volunteer interpreters. The Amelia Island Plantation management, especially James Restor, graciously allowed visitors from all over to take advantage of these tours. In the ensuing years, special tours were instituted for regional school children. In one season, over 2000 children visited the site.

Deon and her closet-architect husband Phil soon began construction of a "Dorion Dig Room" at the Amelia Island Museum, where the history of Florida, the study of archaeology, and Dorions are celebrated in a single (extremely well-designed) space.

All told, there were seven field seasons on Amelia Island. These were financed in part by two Historic Preservation Grants provided by the Bureau of Historic Preservation, Florida Department of State, assisted by the Historic Preservation Advisory Council. The Dorions and the Heatwoles also contributed funds.

Too many crew members have come and gone to list them all here, but there were a number of repeaters who formed the backbone of the excavation. Those folks were (and are) Tina Bassett, Brack Barker, Boots Lewis, James McGill, Kathleen Richert, Vicki Rolland, Donna Ruhl, and Susan Simmons. The Amelia Island Museum of History provided volunteers for the last field season.

There was also a multitude of lab personnel. Again, several individuals deserve special mention--Gianna Browne, Radai Cintron, Tracey Garbade, Joe Hock, Penny Melville, Vicki Rolland, Deb Sommerer, and Joyce Walker.

While work was underway on Amelia Island, we became aware of another long term mission excavation of yet another Santa Catalina (the predecessor of the one on Amelia Island) on St. Catherines Island, Georgia. That research was being conducted by David Hurst Thomas of the American Museum of Natural History. The relevancy of that project to our own work was immediately apparent, and an Amelia Island contingent soon infiltrated American Museum of Natural History crews (and vice versa). Dave has been supportive of all aspects of this research. He helped to secure funds from the Edward John Noble Foundation for the excavation and analysis of the Meeting House Fields site and offered me an American Museum of Natural History Study Grant to

analyze the collections of materials previously excavated at the St. Catherines Island mission. Other individuals from the American Museum have enlightened and enlivened the last few years, including Lorann Pendleton, Deb Peter, and Joe Jimenez. Oh, and David Hurst Thomas III (please pass the baby). Royce Hayes, superintendent of St. Catherines Island, provided every imaginable logistical support for excavations at the mission and at Meeting House Fields and many outstanding island dinners.

The chair of my committee, Jerald T. Milanich, is a fixture of Florida archaeology. When one looks at current research in Mission Period archaeology in Florida, it seems that almost every project owes something to his long involvement in the field. I appreciate the opportunity to have worked with him. By their own achievements in their respective specialties, the other members of my committee provide a model that I hope to emulate in the future.

Finally, I would like to thank those people who provided emotional support. Other graduate students provided an intellectual milieu that more or less goaded me into continuing, especially Mike Russo. Vicki Rolland buttressed me as only a good friend can. My parents have encouraged me throughout this long and sometimes difficult process. Thanks everyone.

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Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Philosophy

STABILITY AND CHANGE IN GUALE INDIAN POTTERY,
A.D. 1350-1702

By

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May 1992

Chairman: Dr. Jerald T. Milanich
Major Department: Anthropology

In this study, the nature and timing of change in Guale Indian pottery from the late Pre-Columbian through the Mission period is explored. Results of the comparison of pottery attributes from a late Irene phase site; the early (1594?-1597) and later (1604-1680) occupations of the Santa Catalina mission on St. Catherines Island, Georgia; and the late Mission period site of Santa Catalina on Amelia Island, Florida, indicated both stability and change in the technological and stylistic attributes of Guale Indian pottery.

Radiocarbon dates and stylistic attributes of the pottery from the late Irene phase Meeting House Fields site suggested that the deposition of some middens at the site occurred quite late, possibly even in the Contact period. Nevertheless, the pottery had no attributes suggestive of a transition to Altamaha phase wares. Analysis of the early component proveniences of the mission on St. Catherines Island indicated that Irene phase pottery was replaced completely by Altamaha phase pottery before the early occupation of the mission compound. The comparison of pottery attributes in the early and late components of the mission evidenced no differences between the two. Despite the infrequent use of a new temper and a few new implements used to punctate

folded rims, there was also little difference between the St. Catherines Island mission pottery assemblage and that from the Santa Catalina mission on Amelia Island.

Though there were changes in design execution from the Irene phase to the Mission period, the principal motif used at both the Georgia and Florida Santa Catalina missions was a variation of the filfot cross. That cross was shown to be a cosmological symbol and its frequency in the different components was used as a (very) indirect measure of change in the worldview of the missionized Guale. Incidence of this "world symbol" was about the same at the St. Catherines Island mission as at the Meeting House Fields site. However, the symbol was visible on only half as many sherds at the Amelia Island mission, suggesting the erosion of traditional beliefs during the late Mission period.

CHAPTER 1

POTTERY AND CULTURE CHANGE

This is a study of change in the pottery made by the late Pre-Columbian and Mission period Guale Indians of the Georgia and northeast Florida coasts. Technological and stylistic attributes of Guale Indian pottery are compared across time and space, beginning in the late Pre-Columbian period and ending in 1702, the date of the demise of the Spanish mission system on the Atlantic coast. As such, the research deals with three previously defined pottery assemblages. The first two, the late Irene phase (ca. A.D. 1425-1550) and Altamaha phase assemblages (ca. A.D.1550-1690; DePratter 1984) from the central and northern Georgia coasts, were associated with the Pre-Columbian and early Mission period Guale Indians, respectively. The last assemblage, San Marcos (ca. A.D. 1650-1763?) assemblages of the St. Augustine phase, appeared in what is now southern Georgia and northeastern Florida at the time of the immigration of the Guale to that region in the mid-17th century.

What follows is a description of technological and stylistic attributes of those pottery types from a series of discrete temporal contexts. A consideration of the changes in attribute values over time and space, in concert with relevant historical and ethnohistoric data, should help explain when Irene assemblages qualitatively changed and became Altamaha assemblages. The characteristics of Altamaha assemblages are then compared to San Marcos assemblages to determine which pottery attributes changed and which remained stable over the years of declining population and the nucleation of peoples in the later Mission period. Taken together, these data will be used to assess the extent to which the disruption of the traditional production and social

systems of the Guale Indians in the Mission period affected pottery production.

A great deal of background material was assembled to provide a basis for understanding the changes observed in the pottery. The dissertation begins with a review of general theories of ceramic change and the results of previous research into Native American pottery in (principally Spanish) colonial contexts.

Chapter 2 presents a social history of the Guale. Using archaeological and ethnohistoric data from La Florida, relevant aspects of Guale Indian settlement and subsistence patterns and social structure are reviewed. The imposition of the mission system among the native inhabitants interfered with those traditions; the resultant changes and their affect on pottery production are the focus of the chapter.

The next chapters provide a review of the type descriptions of the pottery involved (Chapter 3) and the attributes chosen for this study of change (Chapter 4). Attributes were chosen on the basis of the type descriptions developed and refined for late Irene, Altamaha, and San Marcos assemblages and from other studies of pottery from single and multicomponent sites associated with the Guale. Both technological and stylistic attributes are considered, though stylistic aspects are emphasized. In particular, the evolution of the Irene phase filfot cross with its fine land and grooves to the bold carving in San Marcos rectilinear stamped motifs is examined.

Once the relevant attributes have been isolated, the methodology for the analysis of the assemblages studied is explained (Chapter 4). Chapter 4 includes a discussion of the coding system used, how attributes were assessed and measured, and how the data are displayed in subsequent chapters.

The database for this research comes from three Guale Indian sites. The study begins with an analysis of late Irene phase (ca. A.D. 1400-1550) pottery from the Meeting House Fields site on St. Catherines Island, Georgia. This assemblage provides baseline data from which to

monitor the changes known to have occurred in the pottery in the succeeding Mission period. Criteria for the selection of this site for the research and the results of the analysis of the pottery from the site are presented in Chapter 5.

The next set of pottery collections comes from the Spanish buildings at the mission site of Santa Catalina, also on St. Catherines Island, Georgia (Chapter 6). At that site, pottery from early, pre-1597 Guale rebellion contexts in the convento are compared with both the Meeting House Fields materials and later, post-rebellion (1604-1680) context pottery at the mission to determine whether or not there is any evidence for a gradual change of traits from Irene pottery to Altamaha pottery. Once that determination is made, pottery collections from the later contexts--a church, kitchen, and the late convento--are examined to see if pottery attributes are correlated with structure function. The determination of the extent to which these "contexts of use" are associated with distinct assemblages of form or decoration is crucial to an understanding of the change in Guale pottery as a whole.

The Guale Indians associated with the Santa Catalina mission in Georgia (and some other groups) were moved to Amelia Island, Florida, in 1686. Mission Santa Catalina was re-established on that island and remained inhabited until 1702 when it was attacked and burned by British forces from South Carolina. Analysis of the pottery from three contexts--a possible kitchen, the convento, and the church of the Santa Catalina mission on Amelia--are analyzed in the same way as the material from St. Catherines Island (Chapter 7). Finally, the assemblages from the Georgia and Florida incarnations of Santa Catalina are compared. Results of this analysis provide the first detailed study of the differences between Altamaha and San Marcos pottery. The Amelia Island materials can also be used to address the question of what happens to pottery assemblages when different peoples are nucleated and exposed to different pottery traditions.

It is unfortunate that no well-controlled pottery collections from Mission period aboriginal village contexts are available, since these

would be the most appropriate contexts to compare with the village refuse of the Irene phase site. The pueblo associated with the Santa Catalina mission on St. Catherines Island has been tested with a mechanical auger, but the ceramics have not been analyzed. The Wamassee Head site across the Wamassee Creek to the southeast of the mission compound (see Figure 6.1) was tested by Lewis Larson in 1959 and by the American Museum of Natural History in 1980 (Thomas 1987:105, 113). Guale Indian pottery from Larson's excavations was analyzed by Brewer (1985). Her findings are incorporated into this discussion. The village presumably associated with the Santa Catalina mission on Amelia Island (but possibly associated with the earlier Yamassee Indian mission of Santa María) was tested in 1971 and the pottery recovered was reported (Hemmings and Deagan 1973). Though their methodology differed from that used at the mission and their analysis was not as detailed, some of Hemmings and Deagan's results can be compared with those from the mission compound (see Chapter 7).

Taken together, these assemblages provide geographical, temporal, and contextual control over attribute changes in Guale Indian pottery. In contrast to some other cases of aboriginal pottery in colonial contexts (reviewed below), some changes, particularly in decorative style, occurred in Guale Indian pottery after the late Irene phase. The thrust of this work, facilitated by the series of tightly dated components, was to determine the timing and rate of these changes and to correlate them with other changes in Guale culture during the Mission period.

Before examining the specific archaeological contexts used in this analysis, past approaches to the understanding of pottery change are reviewed. The review underscores the fact that pottery production and use is embedded in the productive systems of a society but that no single medium can be expected to directly "reflect" other subsystems in all situations (see Arnold 1985; Hodder 1982).

General Theories of Pottery Change

Some researchers have argued that there is a conservative pragmatism in traditional potters that precludes much dramatic change in their wares (Foster 1960; cf. Rice 1987:460). Nevertheless, over time, pottery does change, and as one of the primary sources of data in the archaeological record, it is incumbent on us to explain under what circumstances changes occur.

Change does not appear to affect pottery uniformly through time or space. Instead, as Binford (1962) suggested some time ago, how pottery changes may be dependent on the way a particular ware functions in a society. Pottery may function in a technic, sociotechnic, or ideotechnic sphere, or in some combination of these contexts. Kubler (1961:15) appears to have had a similar idea when he retrodicted that in Latin America, the utility of any particular native behavior was "closely linked" with its survival. Consequently, religious beliefs and the art symbolizing their expression are particularly vulnerable to rapid extermination. Though Kubler's explanation was uninformed by recent research into the functional uses of style, he nevertheless offered a viable and testable hypothesis for the survival of material culture in conquest situations:

> In respect to colonial action, differing graduated scales can be suggested for the survival of various items in the cultural repertory. The scales vary according to the magnitude of the intrusion. Most likely to weather a great displacement in the hands of a few stragglers would be useful plants and animals (index 5). Useful crafts would be next most likely to attain perpetuation if any one survived (index 4). The, useful symbolic knowledge such as language, explanatory myths or animalistic accounts (index 3). Aesthetic symbols would come next, in the arts of time and space (index 2). Religious beliefs: the accounting of the unknown in nature and in perception would have the lowest value (index 1). (Kubler 1961:34)

Kubler's addendum, that the order is reversed when considering the acquisition of traits by the subjugated population (so that religion is the first to be adopted) has been disproved (e.g., Spicer 1961).

Other factors have also been explored. For instance, in his examination of the causes of stability and change in pottery production, Nicklin (1971; see also Arnold 1985) stressed the cultural context of

pottery production. Pottery is less likely to change if the context was production for use on a seasonal basis than if production is stimulated by market demands, though under certain circumstances the market may also contribute to conservatism. Population pressure (Arnold 1985; Rice 1984) and depopulation (Rice 1984) can force changes in the mode of production and in stylistic aspects of pottery. In one of the most comprehensive treatises on change, Rice (1984) isolated seven major factors--resources, efficiency, diet, ritual behavior, value systems, status of potters and organization of production, and market demand--each with separate variables that might influence stability or change in ware characteristics. The interplay of many of these factors is apparent in the results of previous research of pottery change in Spanish colonial contexts.

Pottery Change in Spanish Colonial Contexts

Conventional wisdom states that the change from Irene pottery to that of the Altamaha and St. Augustine (San Marcos pottery) phases reflected the "deculturation" (sensu M. Smith 1987) of the Guale brought about by the ravages of epidemic disease and other destructive consequences of Spanish colonization. This "deculturation" could have resulted from many of the social changes wrought in the colonial milieu. Theoretically, the transmission of both the technology of pottery manufacture and design style and content could have been interrupted by population loss and/or changes in marriage patterns and residence rules (Deagan 1985:295). Simplification in design execution might also be linked with increased labor demands on the Indians. Hann (1988:246; see Willey 1982:489) noted "a decline in the aesthetic quality of mission-era pottery, but . . . it was expected because this feature was intimately linked with aboriginal tribal lore and religion." The fact that any or all of these factors produced an entirely different pottery type out of the late Pre-Columbian Irene phase pottery makes the case of Guale Indian pottery one of a very few demonstrable cases of ceramic change correlating with historic change.

Several other researchers (Tschopik 1950; Charlton 1968; Cusick 1989) have studied historically known groups of Native Americans whose land had been colonized by the Spanish and found only minor changes in traditional pottery manufacture and decoration (except where the indigenous population died out altogether and the pottery disappeared completely; G. Smith 1986). Studies in other historical contexts, particularly that of Adams (1979), have also failed to correlate ceramic change with known tumultuous events, casting doubt on the ability of archaeology to perceive social change on the basis of changes in material culture.

Two studies of pottery change in the context of Spanish-Amerindian contact are particularly relevant. Despite severe depopulation for both the Aymara (Tshopik 1950) and the Aztec (Charlton 1968), pottery change appeared limited to a decrease in the frequency of burnishing for both groups, the addition of infrequent colono-ware forms for the Aymara, and the loss of a ceramic type for the Aztec. However, as Rice (1984:270) noted when reviewing these works, in both areas pottery factories were established and produced wheel-thrown, kiln-fired glazed wares for Spanish consumption. At least in the Aymara area, Chucuito pottery (the Pre-Columbian type) continued to be used by the Aymara and by Mestizos. Tshopik (1950:206) added that in the case of the Mestizo "aristocracy," the use of native utilitarian wares was restricted to the kitchen and serving wares were imported glazed wares and glassware. A remarkably similar dichotomy existed in the mestizo households of St. Augustine (Deagan 1983, 1988; and see below).

Evidence of more significant change in Native American pottery in Spanish colonial contexts is available from the Caribbean. Cusick (see also Deagan 1988) has summarized what is known about changes in Taino Indian pottery after contact:

> In contrast to what was noted in the cases of the Aymara and Aztec, pottery making among the Taino undergoes rapid changes immediately after conquest, changes which include not only the introduction of new methods of making pottery, but the modification or disappearance of native potting traditions. (Cusick 1989:33-34)

Garcia-Arevalo (1990; following Foster 1960; see also Deagan 1983) distinguished two "phases" of change in post-contact Taino pottery: the contact phase, a period of informal control of the conquest culture over the recipient culture, and the conquest phase, during which control became more formal and change more directed by the conquest culture. In the initial contact phase, the Taino were stimulated to copy Spanish earthenware forms, sometimes producing aberrant forms different from either Taino or Spanish precedents (Garcia-Arevalo 1990:278). During the later conquest phase (ca. 1515-1530), Taino pottery:

> again changed dramatically, marked by artistic impoverishment, and the disappearance of the richly symbolic iconographic traits that characterized Antillean pottery in precontact times. This loss can be explained by Spanish hostility toward elements that were inspired by Taino magico-religious belief and mythology, and that were contrary to the goals of Catholic evangelization. (Garcia-Arevalo 1990:278)

Because the pottery studied by Garcia-Arevalo came from Spanish as opposed to Indian towns, the pottery was hypothesized to have had a utilitarian function only, and to have been adapted to Spanish culinary needs. Vessels were thicker, and, owing to changes in cooking techniques and fuels and the introduction of new foods, vessels were more heavily sooted (Garcia-Arevalo 1978). The pottery also had simpler surface finishes, and, because of the aforementioned loss of ritual and artistic functions, vessel surfaces were most often left plain, lacking the elaborate decorations, adornos, and handles of the Pre-Columbian pottery. Similar results were reported by G. Smith (1986) for Puerto Real in Haiti. At that Spanish town (1503-1580), Pre-Columbian aboriginal wares were replaced first by plain wares and then by a type of colono-ware, designated Christophe Plain, purportedly made by African peoples brought to Hispaniola as slaves. Simplification in response to contact or conquest has also been noted in as widely separated contexts as Venezuela (Deagan 1985) and North Dakota (Deetz 1965).

Cusick (1989:34-35) suggested that the relative rapidity of social change might account for the co-occurrence of societal and ceramic change in the Caribbean as opposed to other areas. As Cusick noted,

however, all the Caribbean assemblages studied and discussed above come from Spanish towns. In contrast, changes in the pottery studied by Cusick from the aboriginal town of En Bas Saline in Haiti were subtle indeed, and change could be demonstrated only through a decline in thoroughness of burnishing and a shift from carinated to unrestricted bowls (Cusick 1989:178). No "colono-wares" replaced the Taino pottery at En Bas Saline; the town ceased to exist by 1520.

Cusick's study may indicate that there will be a difference in response depending upon whether aboriginal pottery was produced for Spanish use, as is likely in the context of Spanish towns in the Caribbean, or whether it was produced for native use. (Obviously correlated with this premise is whether or not pottery factories were established. These talleres were apparently rather common in Latin America and they have been documented in the Caribbean [Cruxent 1990; Ortega y Fondeur 1978; see also Deagan 1985:295, 1983:234]. No Spanish colonial pottery factories have been located in the Southeastern United States.) Evidence from the urban contexts of St. Augustine and the mission foundations of La Florida can be used to address this issue.

Nowhere were the demographic consequences of Spanish colonization as severe as in Hispaniola, where the native population was wiped out by 1520. This is demonstrated in the abandonment of native towns like En Bas Saline, and the appearance of African-influenced "colono-wares" in Spanish towns like Puerto Real. Though vitiated to a certain extent by geographic and historical circumstances (Deagan 1988:198-199), demographic decline was quite severe in northeast Florida (Deagan 1990b; Dobyns 1983; Hann 1986), where the native Timucuan Indian population had to be supplemented with Georgian Guale Indians by 1650. By 1700, the frequency of the Guale Indian San Marcos pottery in St. Augustine was three times that of the Timucuan St. Johns pottery, reflecting the demise of the latter group (Deagan 1990b:306). After 1711, other Indian groups, such as the Apalachee, Jororo, Costa, Western Timucua, and South Florida Indians sought refuge in St. Augustine (Deagan 1990b:306). Though one might expect increasing heterogeneity in the pottery

assemblages of St. Augustine after 1711, in fact, San Marcos continued to increase in frequency in domestic sites in St. Augustine throughout the First Spanish period while the frequency of "other" pottery (non-Timucuan, non-Guale) remained virtually unchanged (Deagan 1990b:307).

Further, according to Deagan, Guale Indian pottery remained virtually unchanged by Spanish colonization. She noted:

> One of the most interesting features of the Indian pottery found in the Spanish sites is that the great majority of it is unmodified from its traditional forms- neither shape nor decoration show European influence in most cases. This is an important observation, because it demonstrates, first, that traditional Amerindian crafts persisted in a largely unaltered form through the entire colonial period, and, second, that there did not appear to be any serous directed effort on the part of the Spaniards to influence change in favor of Spanish tastes. (Deagan 1990b:307)

Deagan's analysis considered only change within the San Marcos type. If one takes the long view and considers San Marcos the derivative of Irene phase wares, changes are more apparent. As will be demonstrated in the following chapters, a bolder, rectilinear stamped design replaced a fine land and groove curvilinear one, and there were changes in rim form and treatment. New, or at least re-emphasized, finishing techniques and new forms were incorporated into pottery assemblages used by both the Spanish and the Indians. Once established, however, the San Marcos type appears to have been extremely stable through many social perturbations, disappearing only with the removal of the Spanish Indians to Cuba at the end of the First Spanish period.

Thus, the situation in the Spanish towns of La Florida contrasts markedly with that in the Caribbean. While Florida urban settings appear to have fostered a stability in aboriginal pottery, in the Caribbean, urban settings resulted in dramatic change in native pottery production.

Nevertheless, it is inaccurate to characterize pottery change in La Florida as monolithic. Different contexts of use appear to have produced very different assemblages. For instance, while no adequate comparison between assemblages of San Marcos pottery from mission

contexts and St. Augustine exists, it is generally believed that San Marcos pottery exhibited more formal change at missions (e.g., Deagan 1990a:239, 1990b:308). In those relatively remote outposts, poverty and isolation made Spanish tablewares difficult to acquire. Indians may have been required to produce most of the pottery suitable for Spanish serving dishes, and perhaps even Catholic services.

In contrast, in St. Augustine the high incidence of Guale Indian woman-Spanish male intermarriage (Deagan 1990b) created a situation (similar to that in the Peruvian highlands) in which traditional utilitarian wares continued to be produced and used by Indian women, while serving dishes and tablewares, more visible status objects, were European (Deagan 1983; 1988). Indeed, zooarchaeological studies have shown that the typical diet in St. Augustine incorporated much of the native subsistence strategy (Deagan 1983; Reitz and Scarry 1985; Scarry and Reitz 1990). In these circumstances, formal change like that observed by Garcia-Arevalo for the Caribbean would not be expected in St. Augustine.

Further evidence that different contexts will produce dramatically different assemblages is available in Hoffman's (1990:127-130) study of the pottery assemblage from the Convento de San Francisco, the Province House of the Franciscan Order in St. Augustine. In a series of discrete contexts dated between 1588 and 1702, Hoffman demonstrated that the frequency of "nonlocal" wares eclipsed that of both St. Johns and San Marcos wares by 1702. Hoffman attributed the increase in nonlocal wares to the collapse of the mission system and the consolidation of peoples in St. Augustine. This collapse, however, was almost invisible in the domestic contexts of urban St. Augustine. In addition, and in contrast to remote mission sites, colono-ware forms were quite rare at the Convento de San Francisco. This was most likely due to the fact that Spanish majolicas were relatively abundant (constituting 12-13% of all ceramics) throughout the time periods analyzed. It appears that the Province House was well-supplied with elite wares and had little need to supplement European serving vessels with colono-wares.

The foregoing summary indicates that the study of pottery change is complex and multi-faceted. The perspective from La Florida is that one of the more crucial controls for an understanding of change will be contexts of use, where "contexts" can be defined at a scale as large as the socioeconomic system and as small as an activity area within a site. A comparison of the assemblages from a mestizo household, a mission convento, and the Province House, for instance, will be very different because individuals in each context had differential access to the "world cultural system" (South 1988). Structure function or activity area within institutional compounds should also determine to a large extent the composition of the assemblage--one would expect a mission church to have a different assemblage than a mission kitchen.

South (e.g., 1977) has long sought pattern recognition in artifact assemblages to determine structure function and ethnic/class identity; here known functions and/or occupants are used to explicate differences in pottery assemblages. In addition, the notion of contexts of use owes much to Binford's (1962) formulation of technomic, sociotechnic, and ideotechnic functions of material culture; majolicas, colono-ware plates, and Guale Indian cooking jars function differently in the system, as do the designs on their surfaces.

With these ideas in mind, it is useful to review the contexts of pottery use and manufacture among the Guale described above. The following archaeological and ethnohistorical summary of the Pre-Columbian and Mission period Guale emphasizes factors that would affect ceramic ecology and technological, formal, and stylistic attributes of pottery produced by a society under continuous stress to adapt to changing social and environmental circumstances.

CHAPTER 2

ARCHAEOLOGICAL AND ETHNOHISTORIC PERSPECTIVES ON THE GUALE INDIANS

Pre-Columbian Settlement and Society

Irene phase sites are confined to a narrow coastal strip of maritime live oak forest on the barrier islands and adjacent mainland in Georgia north of the Altamaha River. Pearson (see also R. Smith 1984) noted:

> No Irene phase sites are reported south of the Altamaha River. It is interesting to note that the southern boundary of Irene phase ceramics corresponds to the linguistic and political boundary described as existing between the historic Guale and Timucua (Swanton 1922). The Irene phase appears to be the archaeological equivalent of the historic Guale (see Larson 1958). (Pearson 1978:55)

The northern boundary of Guale territory is disputed. Some historians believe it extended as far north as Edisto Island (Jones 1978:186-187), while others cite the Savannah River as the northern extent (Hann 1987:2-4). Most archaeologists restrict the historic Guale to northern Georgia (Larson 1978; Braley 1990); however coastal Georgia ceramic sequences have been applied to South Carolina (Anderson 1989:105).

Several fairly extensive treatments of Guale Indian ethnohistory exist (Crook 1978, 1986; Jones 1978; Larson 1978; Milanich et al. 1977; Thomas 1987) and there are a few synthetic treatments of Irene phase site settlement and subsistence patterns (Crook 1986; DePratter and Howard 1980; Larson 1980; Milanich and Larson 1976; Pearson 1978, 1980). These works indicate that Irene phase peoples were organized into chiefdoms (Jones 1978:200). These chiefdoms, however, were neither as hierarchically organized nor as nucleated as their forbearers in the preceding Savannah phase (Pearson 1980:179; cf. Crook:1986); nor were they as involved in the politico-religious Southeastern Ceremonial

Complex as their contemporary inland relatives (Cook and Pearson 1989:149). In fact, except at the type site (Pearson 1978:56), Irene phase sites lack most late Mississippian traits (e.g., B. Smith 1978). This apparent provincialism is often attributed to a lesser reliance on maize horticulture by these coastal peoples, either necessitated by poor soils (Larson 1978, 1980; Pearson 1978:57), or afforded by abundant estuarine resources.

At present, the subsistence pattern of the Guale is under debate (Thomas 1987, 1990). Principally on the basis of correspondence of the early Jesuit priests in La Florida, Larson (1980) and Crook (1978, 1986) proposed that the majority of the Guale engaged in a shifting seasonal subsistence round. In the early winter, matrilineages lived adjacent to the estuary where they exploited molluscs, estuarine fish, and deer. In the spring, when swidden plots had to be prepared, the population was more dispersed, and one or two nuclear families might work the same plot in the oak forest. Crook hypothesized subsistence stress at this time, when stored foods were becoming exhausted. Molluscan resources and estuarine fish were still exploited, however. In June, large schools of anadramous fish arrived, and by July the first harvest could be brought in. Matrilineages converged into strategically located, permanent town sites, where the chief and his retinue had remained throughout the year. Populations dispersed again in the fall to the oak forests where deer and the oak and hickory nuts that attracted them could be taken.

Jones (1978) has argued that this model of residential mobility is based on Jesuit sour grapes. Letters to their superiors in the Old World had to justify the failure to make any inroads on the "heathenism" in La Florida. According to Jones (1978:179), Guale horticulture was productive enough, in combination with other resources, "to account for the presence of permanent towns, a chiefdom level of social organization, temporary federations of chiefdoms under centralized leadership, and long distance trade networks." If the Indians retired to the woods in the winter, it was only to rid themselves of the Jesuits. Documents from sources other than disgruntled friars suggest

bounteous harvests and year-round settlements of *dispersed towns*. Jones takes for his definition a description by Sandford of Orista in 1666--90 years after any effective Spanish control in that area:

> The Towne is scituate on the side or rather in the skirts of a faire forrest, in which at several distances are diverse feilds of maiz with many little houses straglingly amonst them for the habitations of the particular families. (Jones 1978:192)

In other words, horticultural plots and houses were all in the general vicinity of the town. Jones cites similar descriptions for Santa Elena, St. Catherines Island, and Fort George Island.

Crook (1986:73) is correct when he notes that the sources that Jones uses to bolster an argument for sedentary subsistence are later than many used by Crook, and that later documents may reflect dramatic changes in settlement and subsistence patterns as a result of missionization. The argument must be resolved with zooarchaeological studies of site seasonality and subsistence. Two such studies have been done on late Irene phase sites (Braley et al. 1986; Russo 1991). Vertebrate and invertebrate data from the Harris Neck site indicated year-round occupation (Braley et al. 1986:119); invertebrate data from the Meeting House Fields site also indicated year-round occupation. Both of these sites were quite large and might represent the permanent town sites of Crook's model. The full range of possible site types remain to be tested.

There is no argument that the Guale, like all other Southeastern peoples, were matrilineal. They may also have been matrilocal (Hudson 1976:190), but Jones (1978:201) and Larson (1978:126) consider the evidence equivocal. Though the principal economic unit was the lineage, the most important social unit was the clan (Hudson 1976:193). The Southeastern Indians practiced both lineage and clan exogamy. Polygyny appears to have been restricted to important leaders.

According to Hudson (1976:259), two pairs of structural oppositions ruled the organization of labor: men as opposed to women, and a cold season as opposed to a warm season (see also e.g., Adair 1930:448). The

division between the sexes was so complete that men and women were often seen as separate species; day to day activities kept men and women apart from each other (Hudson 1976:260). Europeans were appalled to report that women performed the bulk of the subsistence activities: "The little work that is done among the Indians is done by the poor Women, while the men are quite idle, or at most employed only in the Gentlemanly Diversions of Hunting and Fishing" (Byrd 1929, quoted in Silver 1990:44). Hudson (1976:267) stated: "The principal occupations of the men were hunting, the ball game, politics, war, and the ceremonies connected with the entire round of social life."

Most important to this discussion, pottery making--from clay collection (except where extraction was particularly laborious; Fewkes 1944) to firing--was done by the women (Swanton 1946). Among the modern Catawba, who continue to make pottery very much like that found on archaeological sites associated with their ancestors, pottery is generally produced in the early spring to late fall (Arnold 1985:95, Table 3.2; Fewkes 1944). However, Fewkes (1944:72) noted that the weather did not impose a serious drawback to production throughout the year, as, at least in modern times, vessels could be dried indoors. Vessel construction (not including obtaining the clay and paste preparation) took about 2 hours (Fewkes 1944:95). Firing took another four hours (Fewkes 1944:95), but the fact that several pots could be fired at once must be factored into that figure.

Women executed the incised designs on pottery (Swanton 1946; Speck 1909); however, there is no mention in secondary sources as to which sex might have carved the wooden paddles with which vessels were stamped. Given the broad range of their duties (Hudson 1976:258-269, 285, 295), and their involvement in all other aspects of pottery manufacture, it seems reasonable to assume that women carved the paddles, unless the paddles had some other function unrelated to pottery decoration.

There is some evidence that suggests pottery designs (or other attributes) may have been used to signal clan or tribal affiliation, or some other level of social organization. Hally et al. (1990:133) noted

that each identifiable chiefdom in the interior Southeast (for which adequate data were available) can be distinguished by the associated pottery assemblages at the phase level. For the historic Seminole, Weisman (1989:45; and see Sears 1959) suggested that the limited repertoire of simple rim decorations might correlate with the huti, the matrilocal unit formed by related women.

Of design in general, and pottery design in particular, Speck commented that among the Catawba:

> As regards the artistic expression of this tribe, it seems that, in general, special conventional decorations symbolizing concrete objects are confined to a few articles of clothing such as neckbands, sashes, hair ornaments, leggings, and carry-pouches. The whole field is permeated with a strong religious significance. Decorations of a like sort with a still more emphatic religious meaning are found on pottery, though rarely, as well as on other objects. (Speck 1909:54)

Implications

The degree of sedentism, residence rules, and the organization of labor all potentially affect pottery production (Arnold 1985). If the Guale did shift residences throughout the year, as Crook envisioned, pottery production would have been limited not only by climactic considerations, but would also have to be scheduled for seasons in which the Guale were in areas with all the resources necessary for pottery production (Arnold 1985:123).

Plog (1980) also has discussed the relationship between sedentism and pottery assemblages. If the Guale occupied a series of different settlements throughout the year, emphasizing different resources at each, we might expect to find a different assemblage of vessel forms for seasonal sites having different functions (and food processing needs). In addition, since certain surface treatments and designs are often restricted to particular vessel forms (Arnold 1984; Friedrich 1970; M. Hardin 1984), seasonal settlements may have entirely different formal and/or decorative assemblages from one another.

At present, Pearson's (1977b, 1979, 1980) study is the only one addressing this problem. He identified 61 sites with Irene phase components on Ossabaw Island, just north of St. Catherines Island.

These were clustered into four size classes. Pearson found that site size was correlated with environmental factors and postulated a settlement hierarchy (which has been criticized by Crook 1986:47-48). However, whether or not there were different subsistence foci at each site type is unclear. The evidence did indicate that pottery attributes did not correlate with site types, suggesting that possible biases like those enumerated above will not be a problem for Irene phase sites.

Sedentism is also related to specialization and trade. Full-time pottery production emerges only in the context of fully-sedentary societies, both because scheduling conflicts are reduced and because demand is increased in more populous, sedentary societies (Arnold 1985). Specialization, particularly in the production of elite or ritual wares, might stimulate or maintain trade networks. However, despite the fact that Braley (1990:101) has isolated one possible Irene phase mortuary ware, a small carinated jar, there is no evidence of specialization in pottery production among the Pre-Columbian Guale. Even in mortuary contexts, in general, burial urns and pottery placed with burials are not distinguishable from village pottery (Braley 1990). In fact, the presence of heavy sooting and broken rims on much of the pottery placed with individuals in the Kent Mound (Cook 1986) and Johns Mound (Larsen and Thomas 1982) indicates that it *was* village pottery. However, these data cannot be used as indirect proof of shifting settlements. As Arnold (1985) has shown, specialization is correlated with sedentism, but sedentism does not invariably result in specialization.

There is little archaeological evidence for widespread importation or export of utilitarian pottery per se, though it has been mentioned by Jones (1978:197). The amount of trade *involving* pottery (the contents of pots) has not been tested with any analyses of subtypical variation or technological studies. However, the interrelatedness of the chiefdoms, the probability that there was some system of tribute in Pre-Columbian times, and evidence of informal networks in the documentary record suggest that it was frequent.

Residence rules and the organization of labor have been observed or hypothesized to affect design execution and transmission (e.g., Deetz 1968; M. Hardin 1977). Theoretically, if pottery is made by women, residence is matrilocal, and pottery is constructed, decorated, and fired by women in a single household, lineage, or other social/residential unit, a relatively homogeneous assemblage should result, because there is little opportunity for extra-local designs to appear (Irwin [1974:371] hypothesizes a similar scenario for the interpretation of the distribution of paddle-stamped motifs in the Solomon Islands). Conversely, if residence is patrilocal, women would be "imported," along with construction techniques and design repertoires peculiar to her nuclear family or lineage. In this case, pottery attributes would be expected to be more heterogenous. Similarly, designs are more likely to be borrowed (and assemblages more heterogenous) in the context of ad hoc work groups than if women are engaged in pottery production alone or only with members of their own lineage (M. Hardin 1977; Friedrich 1970).

The extent to which subsistence patterns, residence rules, the organization of labor, and specialization and trade patterns were altered in the Mission period may help to explain the changes observed in Guale Indian pottery from the late Pre-Columbian through the Mission period.

Guale Indians and European Colonization

The Guale Indians of the northern and central Georgia coast were among the first southeastern groups to come into contact with the Spanish and French colonists seeking "Chicora," a land "abounding in timber, vines, native olive tree, Indians, pearls, and at a distance inland, perhaps gold and silver" (Hoffman 1984:419). Though it is now thought unlikely that the slave raids sponsored by Lucas Vásquez de Ayllón and Juan Ortiz de Matienzo in the early 1520s directly affected the Guale (Hoffman 1984:420-421; Jones 1978:180), the Guale may very well have heard from their neighbors that something was up. In 1526,

Ayllón established the colony of San Miguel de Guadalpe in the "land of Guadalpe," probably on Sapelo Sound (Hoffman 1990; cf. Jones 1978:181). Other modern researchers believe the colony was further north among the Souian peoples (Swanton 1922), or even as far south as the Altamaha River (Hann 1990b:9). Axes, a jet rosary, and trade beads were apparently traded from San Miguel to Cofitechique, as these items were shown to members of the de Soto expedition (B. Smith 1968:240; Jones 1978:180).

Ayllón's 1526 expedition was ambitious. His complement consisted of six vessels and 600 men and women, including African-American slaves and Dominican friars. The endeavor was, however, short-lived (Jones 1978:180; Jones reported 500 people on the expedition, Milanich 1990:10 and Biedma 1968:240 cite 600). Ayllón sickened and died, and the colony was deserted.

It is likely that the year 1526 also marked the arrival of the first European epidemic along the Atlantic coast (Jones 1978:194; contra Dobyns 1983. Dobyns [1983:15, Table 1] believed the first pan-American epidemic, smallpox, spread into the Southeast by 1524). The 1526 epidemic spread inland at least as far as Cofitachequi; evidence of population decline was recorded by the de Soto expedition in 1540 (B. Smith 1968:63; Jones 1978:194).

The consequences of the spread of Old World diseases through New World populations has also been recorded by numerous modern researchers. Dobyns (1983), Hann (1986), Milner (1980), Ramenofsky (1987), Silver (1990), and M. Smith (1987) have all examined the evidence with respect to the Southeast. Population estimates and diagnoses of population loss are treacherous undertakings and beyond the scope of this paper. Suffice it to say that there is evidence to suggest that populations along the southeastern Atlantic coast could have been reduced by 90% by the end of the 16th century (Ramenofsky 1987:171); that is, before effective missionization ever began.

Nevertheless, Guale Indian societies appeared to have been flourishing when the French attempted to settle in the 1560s. Jean

Ribault established Charlesfort on an island in what is now Port Royal, South Carolina, in 1562. The settlement, abandoned in 1563, survived as long as it did largely through the beneficence of the Indians of region, the Orista, the Guale, and the Escamacou--an important point when considering the availability of foodstuffs in the winter months. The writings of René Laudonnière remain the best documentary evidence available for the early Guale (Laudonnière 1975).

In spite of increasing resistance from the native inhabitants, the French and the Spanish continued to vie for control of the Guale coast (Hann 1986; Ross 1923, 1924), attesting to the perceived importance of the area (Hoffman 1984, 1990). The Spanish eventually won nominal control of the territory with the establishment of St. Augustine in 1565 and Santa Elena in 1566. However, the French continued to trade with the Indians along the Savannah River into the 17th century and French (and British) pirates harassed Spanish settlements as late as 1686.

Missionization

The missionization of La Florida was begun after the Spanish already had some forty years of experience in converting and "civilizing" the indigenous populations of the Caribbean and twenty to thirty years in parts of Latin America. In La Florida, as elsewhere, pacification was accomplished by "reducing" the scattered populations to mission towns (this may not have been necessary in some areas where aboriginal populations were already nucleated; see Deagan 1985:303; Hann 1988:28), where the neophyte populations could be kept from apostasy by spending most of their time laboring for the Spanish. Such labor included the cultivation of crops which supported both the mission enterprise and the Spanish military and civilian populations, and the construction of mission buildings and secular structures and fortifications both at the missions and in St. Augustine. In the absence of decent roads and an adequate supply of draft animals, the Indians became the principal beasts of burden, transporting goods from ranchos and missions to St. Augustine (see also Larsen 1990:16-17).

Missions, by definition located on the frontier of civilized lands, also served as the front line of defense in the struggle of competing European powers for dominance in the New World.

The history of the missionization of La Florida has been recounted by numerous scholars (Gannon 1965; Geiger 1937; Hann 1988; Matter 1972; Ore 1936; Pearson 1968; Sturtevant 1962). Several watersheds in that history are important for this study of social change and pottery production in the Mission period. The first missionaries to La Florida were the Jesuits, who debarked in St. Augustine in 1567. The Jesuit effort failed to make any conversions and the order retreated from La Florida in 1570. The Franciscans who followed also had little success until after the turn of the century (Jones 1978:183). Indeed, the last quarter of the 16th century saw innumerable skirmishes between the Guale and Spanish colonists, including two organized revolts (in 1576 and 1597). Both revolts were followed by brutal Spanish reprisals; the devastation wrought by the reprisals following the latter was compounded by an epidemic in 1582. The consequences of famine and disease were severe. To appease the Spanish, in 1601 the mico of Asao-Talaxe, a southern Guale chiefdom, led a federation of other Guale chiefs in a successful attack on the leaders of the 1597 rebellion (Jones 1978:184).

The failure of the revolts, the unprecedented (by aboriginal standards) harshness of the Spanish reprisals, and the toll of epidemic disease (perhaps approaching 90% of the population at contact, see above) led to an apparent capitulation on the part of the Guale. The ensuing years saw peace, and the gradual reestablishment of the missions on the Georgia coast.

Despite documentary evidence of continued high mortality among the mission inhabitants and numerous defections to the British, the missions on the Georgia coast endured until the 1680s. With the establishment of Charleston in 1670, however, the international rivalry over the Atlantic coast heated up once again. In 1680, the northernmost Spanish mission, Santa Catalina de Guale on St. Catherines Island, Georgia, was attacked by Indians allied with the British. Though the attackers were repulsed,

the decision was made to withdraw from St. Catherines Island southward to Sapelo Island. The Spanish burned the mission buildings before they left the island. The refugees on Sapelo Island were constantly harassed by pirates and in danger of British attack. In 1686, all Spanish personnel and their Indian allies or converts were moved south of the St. Marys River. New missions were established, but the Spanish hold over their converts was increasingly tenuous (Saunders 1991), and the danger of British attack ominous. The attack came in 1702, when Governor James Moore of South Carolina systematically destroyed every mission on a march to St. Augustine. Though Moore failed in his ultimate purpose of taking Florida from the Spanish, he succeeding in destroying the mission system along the Atlantic coast.

Conversion: Cause and Effect

The ultimate acceptance of the mission system into their territory can be seen as a conscious gambit on the part of the Guale to ensure their own ethnic survival--a revitalization movement of sorts. Axtell, speaking of Indians along the Eastern seaboard under English control, put it this way:

> The more desperate the Indians' social-cultural situation (as in seaboard Massachusetts), the greater the possibility of physical annihilation of the group and thus the greater the efficacy of life-giving conversion and revitalization, which Anthony Wallace [1966:30] defines simply as "any conscious, organized effort by members of a society to construct a more satisfying culture." (Axtell 1988a:51-52)

Axtell (1988a:54) added: "But those tribes who could still put a piece of forest between themselves and the long arm of the invaders, those who escaped the worst of the maladies of European contact, had little need of the full 'civilized' cure offered by the Christian doctors." This prescription undoubtedly applied to many Guale. "The real history of the seventeenth-century Guale is actually not to be found on the island missions but rather in the interior pine forests to which they fled and regrouped. This movement was part of that wider consolidation which led to the Yamasee revolt of 1715, the last major

expression of coastal southeastern rebellion against the European presence" (Jones 1978:208).

Those Guale that did accept missions in their midst saw major changes in the organization of their culture and society. Marriage patterns were affected to the extent that polygyny was exterminated. Potential partners were wiped out in epidemics and some Guale Indian women became the wives or concubines of Spanish soldiers (Deagan 1990b). Residence patterns also changed, especially as populations were reduced by disease and different mission populations had to be combined to maintain adequate personnel for a single mission (Hann 1986).

Whatever the prehistoric subsistence and settlement system, there can be no doubt that the Spanish friars redirected the system into more intensive horticulture. With the exception of the use of metal tools for clearing, the techniques of cultivation probably remained the same as in the Precontact period (Silver 1990). However, the Spanish demand for cultivars--Indians were required to provide food for whatever garrison might be stationed nearby, to tithe their produce to the Franciscan missionaries, and, (sporadically) to pay tribute to the crown (Bushnell 1981:76-79, 97-99)--caused changes in the organization of labor. Prior to contact, male involvement in cultivation was restricted to the heaviest clearing (Silver 1990). After contact, according to Bishop Calderón (Wenhold 1936:13), "In April they commence to sow, and as the man goes along opening the trench, the woman follows sowing." Females would have many more fields to tend than before contact. The introduction of double-cropping (Deagan 1985:302) would have upset seasonal schedules for the procurement of other foodstuffs.

Other post-contact labor demands on males included sending workers to St. Augustine for construction projects, running ferries between the islands on which the missions were stationed, and transporting goods, particularly produce, from mission outposts such as San Luís and Santa Catalina to St. Augustine. Additional demands on women are not noted. However, Bushnell (1981:99) states that a supply of sixty brewings of cassina a month for the garrison at Santa María was part of the

responsibilities of the Indians at San Juan del Puerto; women probably would have done that brewing. No doubt women manned the mission kitchens. Whatever contribution children had made to the Pre-Columbian foodquest was usurped: "The children, both male and female, go to the church on work days, to a religious school where they are taught by a teacher . . ." (Wenhold 1936:14).

Increased demands on the Guale Indians' labor may have resulted in changes in pottery production. Hypothetically, it might have been necessary to exploit clay resources closer to settlements, to reduce the time invested in clay preparation such as cleaning, or to simplify the finishing process, perhaps, as indicated in other research, by eliminating burnishing. There are no documents discussing how the Spanish acquired Native American wares, either in traditional or colono-ware forms, in La Florida. Presumably, Native American women produced wares for their own use in mission villages or Spanish towns. Some part-time specialization in pottery production might have been necessary to meet the demand for cooking vessels and colono-wares for unmarried colonists, soldiers, and friars, but this has not been demonstrated to date. (Ann Cordell of the Florida Museum of Natural History has begun a study to determine if colono-wares were produced locally or in regional workshops.)

Carbon-isotope evidence from contemporary missions in the Southwest indicate that, though the Pueblo Indians were producing corn for the missions, their own corn consumption fell below that of the preceding period (Spielmann et al. 1990). Evidence from Santa Catalina in Georgia indicates that this was not the case for the Guale. Corn consumption increased over the Savannah phase, and exploitation of marine resources decreased (Schoeninger et al. 1990). These changes in subsistence practices might be reflected in differences in food preparation and serving vessels. Changes in group size and definition might also have changed vessel forms. The Pre-Columbian pattern of a continuously cooking pot of food available all day long might also have been affected.

One consequence of the nucleation of population and the intensification of horticulture was the depletion of wood resources. Even prior to contact, aboriginal clearing practices and exploitation of fallen branches for firewood resulted in a "parklike" environs around Indian villages (Silver 1990:61). With increased clearing and demand for wood for building and firewood, forest resources may have become scarce. When Dunlop (1929:131) visited St. Catherines Island in 1687, he saw "much clear ground for 7 or 8 miles together," probably most of the arable land on the 14,000 acre island. Further evidence for the increased value of wood products might be seen in the fact that to gain admission to a church, each Indian was required to bring a log of wood to the house of the priest (Wenhold 1936:14). By 1655, the forests nearest to St. Augustine were too far away for timber to be carried to the city by Indian laborers (Rebolledo 1655, in Hann 1988:177). One of the main reasons the Indians gave to the visitador in 1702 for not finishing the required stockade at Santa Catalina de Guale on Amelia was the lack of wood in the area. If wood did become scarce, pottery firing might have been affected.

The idea that even simple pottery designs might function in societies to signal ethnic affiliation and sustain group cohesiveness (e.g., Conkey 1978; Hodder 1982; Wiessner 1983; Wobst 1977) has gained acceptance over the years. The population decline and the nucleation of disparate populations described above may have disrupted this process in the Mission period. Further, if Fewkes' statement as to the meaning of pottery designs among the Catawba can be extended to all the southeastern Indian groups, then another consequence of missionization and conversion might be changes in design. At one level, with increased labor demands, the Guale may have lacked the time to produce painstakingly carved paddles and to incise elaborate designs, resulting in design simplification. However, if designs were religious in nature and the Spanish missionaries did effect profound changes in the aboriginal worldview, we might look for an abrupt change in the designs themselves.

Bishop Calderon apparently believed in the true conversion of the 13,152 Christian Indians he counted in 1675: "As to their religion, they are not idolaters, and they embrace with devotion the mysteries of our holy faith" (Wenhold 1936:14). Modern researchers have been more skeptical (see Axtell 1988b). Axtell believed that those who insist that conversion was only "protective coloration" and at best syncretic are wrong:

> This assumption is misleading in three ways: (1) it is unwarrantedly reductionist and belied by countless historical examples, (2) it confuses the *social* functions of conversion for *groups* with its *emotional* and *intellectual* meaning for *individuals*, and (3) it confuses the *explanation* of conversion with the *validity* or *quality* of the result. (emphasis in original; Axtell 1988b:118-119)

Conversion, according to Axtell, was real (cf. Hann 1991, whose documentary research into the attempts to Christianize the Calusa of southwestern Florida reveals that the Spanish missionaries were tolerated only as long as the trade goods lasted).

The extent to which the southeastern Indians accepted Catholicism cannot be answered satisfactorily with reference to contemporary documents because each European chronicler was biased by his own agenda. Primary documents written by Native Americans are rare, but those that do exist suggest that some Indians were possessed of a deep understanding of the faith. Certainly the most visible expressions of Pre-Columbian religious principles, burial mounds, disappeared and unadorned cemetery burial became the norm. Larson (1978:135) noted some documentary evidence of syncretism; Father Pareja's Confessionario (Milanich and Sturtevant 1972) indicated that the friars had to be vigilant against superstition and apostasy. Is something as transcendent as faith susceptible to recovery by archaeology?

Several researchers suggest that it is. Drawing on the contextual methodology of Hodder (1982, 1986) and initial applications by Braithwaite (1982), David et al. (1988) have proposed a "semiotic" approach to the understanding of decoration of pottery. Their analysis goes beyond the information theory, in which designs are understood to symbol group cohesiveness. Rather, their research delved into the

actual meaning of individual motifs. "While pottery may be invested with explicit messages, the decorative techniques, motifs, and designs also embody a potent implicit component that realizes the society's 'ultimate concern, its religious substance'" (David et al. 1988:379). According to David et al. (1988:378), the repetition of a small number of motifs arranged in a limited and rigidly organized set of designs in many artifact classes and physical contexts indicates that the motifs are "condensed symbols" expressive of underlying cosmological principle.

While I am not convinced of their assertion that all societies "assimilate" pots to people because the former is transformed by fire and the latter by enculturation, their case for particular meanings among specific peoples is plausible. Emerson (1989) used a similar method, perhaps less successful because of his wide scope, in extracting the cultural meanings of symbolism at Cahokia:

> The central problem in performing such a study is to define and use units of analysis that will allow us to deal with the realm of mental constructs--cosmology--on the basis of its material manifestations. From this perspective the problems are identical to those that archaeologists have in interpreting the rest of the artifact assemblage. The difference between the two realms of interpretation comes from the fact that traditionally it has been acceptable to make the leap from artifact to chronology, function, or definition of specific cultures. Archaeologists have been trained to accept the ambiguities in such transitions as inevitable and unobjectionable in their research. This is not the case with the transition from artifact to symbolism, except at a very superficial level. (Emerson 1989:45-46)

Emerson's argument recalls that of Kosso (1991) and Patrik (1985), both of whom argued that there is little methodological difference in Binford's middle range theory and Hodder's contextual hermeneutics.

It might well be impossible to understand meanings in cases where ethnography or the direct historic approach is lacking or inapplicable. This is not the case for the Southeast (cf. M. Smith 1987:7-8; however, Smith's indirect historic approach is essentially the same thing and strong continuities have been established). Using the contextual approach, it is possible to demonstrate that the basic cosmology of the southeastern Indians was represented in pottery motifs, and that these continued to exist at least until the end of the Mission period. Evidence for these motifs is discussed in the next chapter.

The degree to which the change in subsistence practices, the rescheduling of Indian labor, the nucleation of disparate populations, environmental depletion, and the reorganization of the Guale Indian worldview affected pottery production are all testable. This entails the consideration of the three pottery assemblages associated with the Guale Indians; these are described in the next chapter.

CHAPTER 3

THE POTTERY OF THE GUALE INDIANS, A.D.1350-1702

Type Descriptions

Irene Phase Pottery

Irene phase pottery, an areal variant of the Lamar ceramic complex, was defined in 1941 by Caldwell and McCann using pottery from the Irene Mound site in Chatham County, Georgia. They recognized three types, Irene Plain, Irene Incised, and Irene Filfot Stamped. As the definition implied, all stamped designs were a variant of the filfot cross (Figure 3.1). Incised designs consisted of a band of repeating or alternating motifs, most commonly the scroll and pendant concentric circles.

Irene Plain, Incised, and Filfot Stamped shared the same method of construction (coiling); temper was "invariably" grit or gravel (Caldwell and McCann 1941:47). Vessel forms consisted of jars, unrestricted or carinated bowls, and, occasionally, bottles (Braley et al. 1986:75; Caldwell and McCann 1941; Pearson 1984).

As noted in Chapter 2, Guale Indian occupation on the coast extended no further south than the Altamaha River prior to contact. Milanich (1986:61) has put St. Simon's Island and the south side of the Altamaha River estuary outside the area of significant Guale habitation (cf. Crook 1986:42). However, there is some evidence that Irene pottery was traded further south to contemporaneous Savannah phase peoples who used Irene pottery principally as a mortuary ware (Milanich 1986).

After the type was defined, there remained some confusion about whether Irene pottery was a Colonial period or Pre-Columbian phenomenon (Braley 1990 and Braley et al. 1986 give a brief synopsis of the argument). Even before the belated appearance of radiocarbon dates for the Irene phase (Pearson 1984; Braley et al. 1986; Braley 1990; Saunders

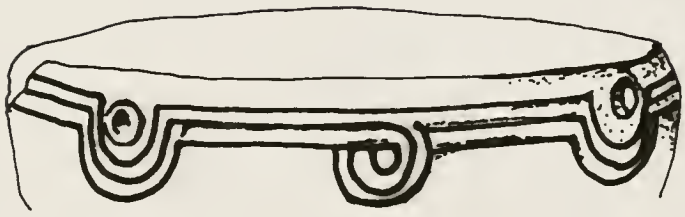


Figure 3.1. Irene Filfot Stamp and Incised with rosettes (after Caldwell and McCann 1941).

and Russo 1988), however, the consensus was that Irene pottery originated before contact, developing out of the Savannah phase by about A.D. 1350 and terminating in the Altamaha phase by A.D. 1550 (e.g., DePratter 1979; cf. Crook 1986:38, 1990:36). The Irene phase is usually divided into an early (A.D. 1350-1450) and late (A.D. 1450-1550) component by the appearance of incising around A.D. 1450.

Braley (1990) has refined the definition of the Irene phase, subsuming the Pine Harbor phase (discriminated by Larson 1955; 1978) into the Irene phase, and subdividing the Irene phase into three phases, Irene I (A.D. 1300-1350), Irene II (Pipemaker's Creek, A.D. 1350-1450), and Pine Harbor (A.D. 1450-1580). The first incising appeared at the beginning of the Irene II phase. The Pine Harbor phase is theoretically contemporaneous with the relocation of the majority of the Guale population south, away from the Savannah River to the Altamaha River and is discriminated on the basis of the appearance of the type McIntosh Incised after A.D. 1450. Thus Braley put the beginning of the Irene phase somewhat earlier than other researchers and the incipience of incising 100 years earlier.

The coastal ceramic sequence is usually seen as derivative from interior Georgia, where incising is said to begin around A.D. 1450 (Hally and Rudolph 1986:63; DePratter 1984). According to Anderson and Joseph (1988:250), however, incising was present in very small amounts somewhat earlier, around A.D. 1350. The fact that an earlier incipience of incising bolstered their hypothesis of the abandonment of the lower Savannah River basin around A.D. 1450 notwithstanding, their data suggested that incising could have begun earlier than A.D. 1450 on the coast. Pipemaker's Creek phase incising, then, should be associated with early rim treatments (described below), and indeed it was at the Irene site.

Several other attributes appear to be temporally sensitive. On the basis of materials from the Kent Mound on St. Simon's Island, Georgia, the Pine Harbor site, and the Irene Mound site, Cook (1980:163) documented an increase in plain and incised wares through time at the

expense of complicated stamping. This trend continued throughout the Irene phase and into the early Colonial period, as it was observed in the comparison of the Pre-Columbian and Colonial period materials on Harris Neck Island (Braley et al. 1986).

Rim treatments also changed through time; the sequence on the coast was quite similar to that in the Lamar interior. Plain rims were the most prevalent type throughout the Irene phases. Besides plain, the earliest treatments, also present on late Savannah wares, were composed of nodes (relatively large, circular to oval applique, Figure 7.1); rosettes, smaller circular applique pellets with cane punctations (Figure 3.1); and plain applique rim strips. Somewhat later, nodes, pellets, and plain rim strips disappeared, segmented rim strips became the most popular treatment after unmodified rims, and there were a variety of experimental treatments like segmented and cane punctated rim strips. During the very late Irene phase, rims strips were most commonly segmented or cane punctated and punctation directly on the vessel wall became common.

This progression has been demonstrated, with minor variations, in several studies. Pearson (1984) compared "incidental rim treatments" from three coastal Irene sites: the Irene Mound site (late Savannah-very early Irene; it should be mentioned here that Caldwell and McCann [1941:42] observed that rim treatments at Irene were quite different than at other coastal "Lamar-like" sites); the Red Bird Creek site in Bryan County, Georgia (early Irene); and the Kent Mound site on St. Simon's Island (mid to late Irene). Pearson (1984:22) found that "plain rims occur in high frequency at all three sites and apparently was a popular treatment throughout the Irene phase. There is an increase in the use of appliqued rim strips, especially of segmented (punctated with a wide, blunt instrument), rim strips. The use of nodes as a rim decoration appears to decline through time."

On the basis of the data from the Kent Mound, Pearson believed the segmented strip was associated with an early to middle Irene phase occupation and that the cane punctated rim strip and cane punctations

directly on the vessel wall "are associated with the very late part of the Irene phase, just before and up to historic contact" (Pearson 1984:22). However, Pearson's (1984:21, Figure 7) data indicated that the segmented rim strip continued to increase through time, becoming most common during the middle to late Irene when it constituted nearly 40% of the rim types and that the cane punctated vessel was the second-most common treatment at the Irene Mound site (early Irene). Pearson's Figure 7 (1984:21) also indicated more standardization in rim treatment through time, with fewer kinds of treatments at the later Kent Mound than elsewhere.

Contrary to Pearson's findings, Cook (1986:17; 1980:165) found the increase in the frequency of cane punctations occurred during the middle Irene, with a concomitant decrease in segmentation of the strip, and an increase in the frequency of plain rims over time. Folded rims were not present in the Kent Mound; Cook (1986:19, 1980:165) correlated their appearance with the Colonial period (cf. DePratter 1984; Caldwell and McCann [1941:42] noted that folded rims were relatively rare at Irene, but were common at contemporaneous coastal sites.) Cook's (1986) comparison of the Kent Mound materials to those of the Seven Mile Bend Site (9Br7) in Bryan County, Georgia, confirmed this progression. Cook also noted (1986:19) that rim pellets or nodes have been recovered from contexts dating up to the last quarter of the sixteenth century, though they are rare. Cook's results may also argue against significant spatial variation in rim treatments during the Irene phase. However, time period of occupation was based on pottery attributes, not radiocarbon dates or some other independent line of evidence, making the argument tautological.

Irene pottery continued to be produced after contact. Terminal dates for the complex have been put at A.D. 1550 (DePratter 1984) and A.D. 1580 (Braley 1990). However, several dates from the Meeting House Fields site (Saunders and Russo 1988; Chapter 5) suggested that Irene pottery continued to be made with little modification into the 17th century (see also Caldwell and McCann 1941:73; Crook 1986:38). As

discussed in Chapter 1, some interior sites containing Irene pottery may represent the habitations of Guale Indians fleeing colonial control, and may also date to the 17th century. More research is needed to establish firm terminal dates for the Irene. These dates ultimately may be shown to depend more on local histories than regional events.

Altamaha Phase Pottery

Altamaha phase pottery was originally described by Larson (1953). The temporal and typological relationship to Irene phase wares was acknowledged at the time the type was defined (Larson 1953, 1978:136). Braley et al. (1986) studied Altamaha phase pottery associated with Spanish artifacts at the Harris Neck Wildlife Refuge on Harris Neck Island. They stated:

> The archaeological complex dating to the protohistoric [sic] period (ca. A.D. 1550-1680) shows the direct outgrowth from the prehistoric Irene/Pine Harbor culture. Altamaha . . . ceramics are very similar to the earlier Irene . . . wares but the design elements of the complicated stamping became more simplified, and fine-line incising became more widespread (Snow 1977; Cook 1980). Curvilinear complicated stamping was replaced by line-block stamping, check stamping returned, and some vessels were painted with red slip. (Braley et al. 1986:14)

In addition, the paddle designs were carved with bolder and deeper lands and grooves (Chapter 6). There was also a shift from the use of cane decorated vessels, segmented strips, and cane punctated strips in the late Pre-Columbian period to an emphasis on cane punctated folded rims in the Colonial period (Braley et al. 1986:137).

Despite the changes in design execution, the principal motif remained the same as in the Irene phase. Brewer (1985:24) determined that all identifiable complicated stamped designs at the Wamassee Head site on St. Catherines Island (the aboriginal component of the Spanish mission site) consisted of "four blocks of parallel lines arranged at right angles to one another around a central node" (Figure 3.2). This design was essentially a filfot cross composed of straight lines rather than scrolls (Fairbanks apparently had the same idea, see McMurray 1973:48). Brewer termed the motif "San Marcos Complicated Stamped."

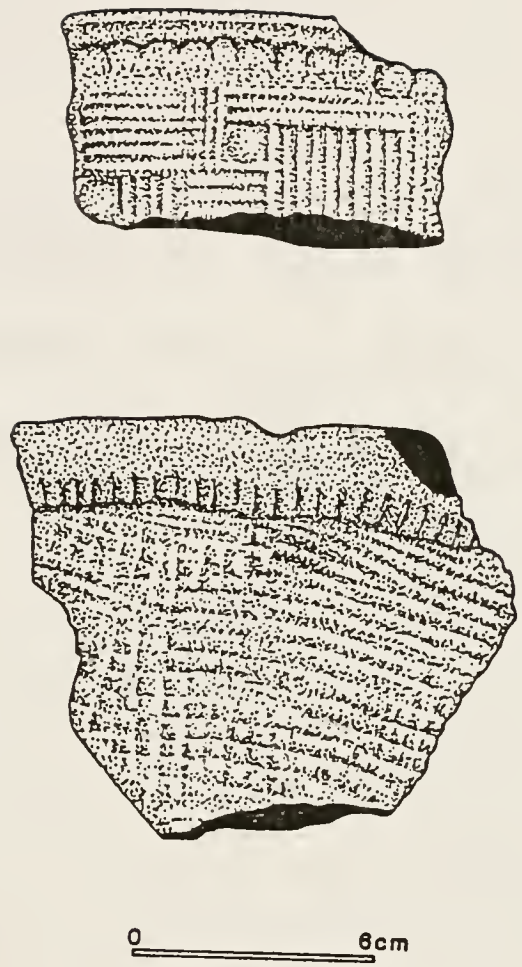


Figure 3.2. "San Marcos Complicated Stamped" (from Brewer 1985).

This same motif is visible on the sherds from colonial contexts at Harris Neck (Braley et al. 1986:82, Figure 30).

Vessel forms from Wamassee Head consisted of small and large globular jars and unrestricted bowls, and several new forms: inverted bell-shaped bowls and plates and bowls with marleys (Brewer 1985:20). Colono-ware forms were apparently quite rare at Harris Neck (Braley et al. 1986:84, Table 11). The difference in the frequency of colono-ware forms at the two sites may be related to the fact that the former, associated with a mission, had Spaniards living at the site, whereas the Harris Neck site probably did not.

San Marcos Pottery

While many researchers see nothing but an areal distinction between Altamaha and San Marcos pottery (Thomas 1987:14; Walker 1985:64; Brewer 1985:19; DePratter 1984:48), Braley (1990:100) believed that Altamaha complicated stamped wares were distinct from the later, more southerly San Marcos wares because the cross simple stamping reportedly characteristic of San Marcos was rare at Harris Neck (see, for instance, Otto and Lewis 1974:99; Goggin 1952:60; Smith 1948:314). Deagan (personal communication, January 1991) also differentiates Altamaha from San Marcos pottery in St. Augustine. According to Deagan, Altamaha is characterized by stamping and incising on the same vessel, and Altamaha rims are not folded and have whole cane as opposed to half cane punctations. She has observed that pottery with these Altamaha-like characteristics come only from earlier contexts in St. Augustine.

At present, any differences between Altamaha and San Marcos pottery remain to be demonstrated in the literature. Though "San Marcos Complicated Stamped" has not been identified in collections from St. Augustine, with the exception of Otto and Lewis (1974), no formal motif analysis has been done on collections from the locality. Otto and Lewis did not discriminate the dot motif, but at least two of the sherds in Plate 1 in Otto and Lewis (1974:100, c, g) are Brewer's San Marcos Complicated Stamped; both are heavily overstamped. The question of the

typological distinction between Altamaha and San Marcos is considered in Chapter 7.

Smith (1948) originally identified San Marcos as a type. Varieties included San Marcos Stamped, San Marcos Plain, and San Marcos Red Filmed (Otto and Lewis 1974:95; these types subsumed previous King George Types, Caldwell 1943; Larson 1958:14). Smith noted some interior red filmed vessels with painted black lines. Paste temper was defined as usually grit, sometimes crushed limestone, and, rarely, grog. Vessel forms included small to large globular vessels and shallow bowls, with rims straight or slightly flaring, and sometimes folded (Smith 1948:315).

Otto and Lewis (1974:106) offered a refinement of the San Marcos type:

> The San Marcos type embraces three Stamped and Plain surface subtypes. The Plain surface examples can be further subdivided into two varieties: Plain and Plain Burnished. Also, there is the Red-Filmed sub-type which is generally plain though at least one stamped red-filmed example was recovered. . . . We hypothesize that the stamped examples probably functioned as cooking vessels while the plain vessels served primarily as tableware.

Colono-ware forms included plates with foot rings, and pitchers, mugs, and cups with handles (Otto and Lewis 1974:96).

On the basis of his excavations in the moat of the Castillo de San Marcos in St. Augustine, Smith identified a number of different curvilinear/rectilinear motifs (Smith 1948:320 plate XXXI; Figure 3.3), most of which reportedly disappeared after 1680, to be replaced by cross simple stamping (Smith 1948:314, 315). There are no other diachronic studies of San Marcos pottery with which to substantiate Smith's. However, more recent analysis of the aboriginal pottery in St. Augustine (Piatek 1985) indicated a wide variety of nonlocal aboriginal wares; it may be that some of the motifs depicted in Smith (1948:320) were not executed by Guale Indians.

With good contextual control and careful observation, it may be demonstrated that Guale Indians continued to produce the "San Marcos Complicated Stamped" design at least until the end of the Mission period. The progression from the "invariant" use of the filfot cross in

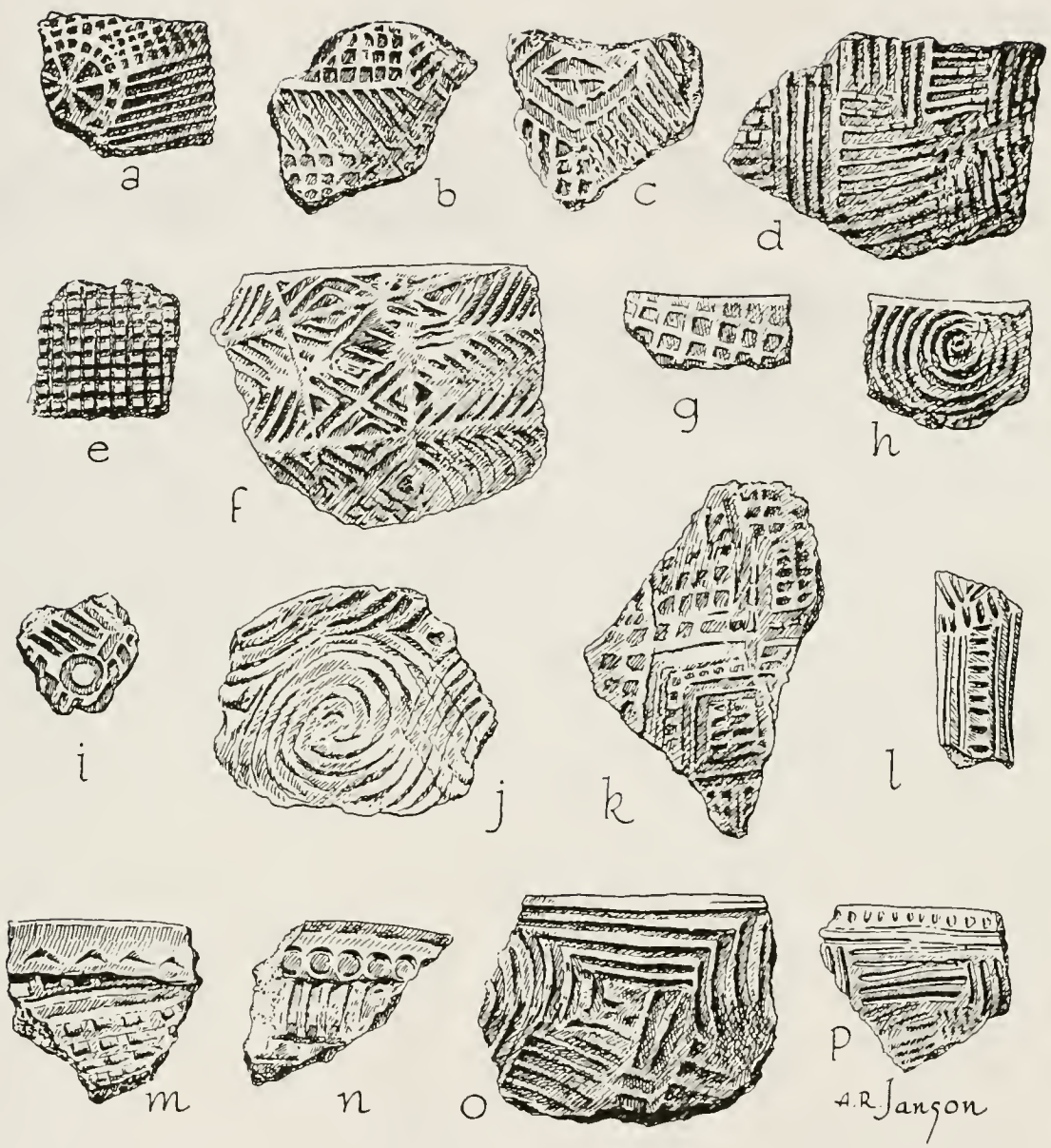


Figure 3.3. San Marcos Stamped (from Smith 1948).

the Irene phase to the production of only San Marcos Complicated Stamped at Wamassee Head would suggest that this is so. If true, it must be recognized that "San Marcos Simple Stamped" or "Cross Simple Stamped" sherds are just incomplete, overstamped portions of the dot motif. Alternatively, if the Guale did produce the profusion of motifs depicted by Smith (1948), then their designs were influenced, however briefly, far more than has been appreciated in the past.

The Filfot Cross as a Cosmological Symbol

Variations on four-field filfot cross motif characterized many Lamar-related types in the late Mississippian period in the Southeast (e.g., Snow 1990). The prevalence and longevity of the filfot cross and related motifs derive from its embeddedness in southeastern Indian cosmology. Hudson (1976:122) described the basis of that cosmology:

> The southeastern Indians conceived of This World as a great, flat island resting on the surface of the waters, suspended from the vault of the sky by four cords attached at each of the cardinal directions. Most of them evidently thought that the island was circular in shape, but that it was crosscut by the four cardinal directions, and it is reasonable to assume that each southeastern society conceived of itself as occupying the center of the circle. It is also reasonable to assume that the circle and cross motif of the Southeastern Ceremonial Complex represents This World, the four directions, and the center.

Fundaburk and Foreman (1957:58; see also Waring and Holder 1968) referred to this motif as the "Cosmic or World Symbol" and interpreted it essentially the same way as Hudson does, though she believed the central circular element represented the sun at its zenith, the period of its greatest power. The Sun itself, the source of all warmth, light, and life, was one of the principal deities; some of the southeastern Indians conceived of the Sun as female and others as male. The earthly representative and ally of the Sun was sacred fire, the principal symbol of purity. Many southeastern Indians built their sacred fire in the shape of a cross, so that the fire burned in the center. According to Howard (1968:19), the concept of the sacred fire, associated with the sun and fed by four logs oriented with the cardinal directions was "the most widespread and basic ceremonial concept in the Southeast". Fires

are still built according to these concepts in modern Green Corn ceremonies in Oklahoma (Howard 1968).

The World Symbol was replicated in a number of media. It occurred, alone or with other mythological symbols, on shell gorgets, pottery, banners (Fundaburk and Foreman 1957:58), gamestones (Fundaburk 1957 and Foreman, plate 96), copper (Fundaburk and Foreman 1957, plates 109, 110), and it was and is represented in the sacred fire and perhaps in the plan of the square ground itself. Though it was embedded in Southeastern Ceremonial Complex iconography, the symbol had great antiquity in the southeast, appearing at least by the beginning of the Woodland period in the interior (Hudson 1984:8).

Design motifs based on the same theme, but with differences in execution, have been observed in other Lamar-related pottery assemblages. Snow (1990:85-87) has isolated an assemblage in the Pine Barrens which he refers to as "Square Ground Lamar":

> The design found on these ceramics is described as a central dot that may stand alone or may have one or more concentric circles about it. Four lines radiate from the central dot element and may be seen as pointing to the cardinal directions. The four quadrants formed by these lines are usually filled with chevrons (Snow 1977). Wauchope (1966, 82, Figure 37, m-q) illustrates similar designs from north Georgia. It is likely that the square ground motif is quite widespread. (Anderson et al. 1986, 41, Figures d-e)

By A.D. 1350, the world symbol was the only motif carved on the wooden paddles used to stamp pottery among the Guale Indians.

The representation of this single motif in many media and physical contexts would seem to justify the consideration of the filfot cross and "San Marcos complicated stamped" as "condensed symbols" (David et al. 1988). As discussed in Chapter 2, the extent to which this design remained a principal motif in Mission period Guale Indian pottery might be used as a measure of the effectiveness of missionization on the reorientation of the Guale Indian worldview.

CHAPTER 4

METHODS

The research questions outlined in the previous sections dictated the attributes recorded for each of the five contexts studied. Though the samples involved two (or three if Altamaha and San Marcos are considered distinct types) pottery types covering over 350 years of production, attributes recorded were held constant for each type so that they could be directly compared. The evolutionary relationship of the types made this program possible. The following discussion deals with the attributes selected and analysis techniques.

Attribute Selection, Measurement, and Recording

The operationalization of an attribute analysis for pottery has been best explicated by Redman (1978; especially Figures 8.4 and 8.5). Redman's hierarchical approach allows for the examination of both subtypical and typological variation within "tentative interpretive frameworks" that explicitly recognize the influence of the technology of production and the function of ceramics within a society. As suggested by Redman, initial attribute selection was based on review of the available ethnographic, historical, and archaeological evidence, much of which was presented in the previous chapters. Attributes traditionally considered both technological and stylistic were recorded. However, during analysis the lines between these two qualities began to blur (see, for instance, Chapter 6). The list of attributes that follows is organized roughly into these two categories, but it is acknowledged that technology and style are inextricably intertwined. Unless noted, attributes were recorded for all sherds used in the study.

Technological Attributes

Temper. Major temper categories included sand, grit, and minor amounts of grit and grog, limestone, and shell. Sand and grit were distinguished following the Wentworth scale (Shepard 1980:118). Quartz inclusions were considered "sand" if the particles were less than .25 mm and "grit" for all particles over this size. When in doubt, grain size was verified using a binocular microscope with a micrometer. All sherds coded as tempered with limestone or shell tested positive for calcium by reacting with a 5% solution of hydrochloric acid. A "grog" designation indicates that there were inclusions of fired clay distinct from the paste. However, no attempt was made to determine whether or not the grog represented ground-up pot sherds.

Burnishing. Interior burnishing was considered a technological trait, because interior burnishing reduces vessel porosity. Burnishing was determined by paste compaction rather than luster, since luster can be destroyed by further drying of the vessel after burnishing (Rice 1987:138). Exterior burnishing was considered a stylistic trait; this is reflected in the recognition of interior and exterior burnished sherds as a different type from plain (exterior unburnished) sherds.

Slipping. Two types of "films" were used on Mission period sites. These were probably pigmented slips (fine clay suspended in water applied in a thin coat before firing), but could have been paints (Ann Cordell, Florida Museum of Natural History Ceramic Laboratory, personal communication, 1991). Some sherds did have the substance painted in bold designs along the marley. However, complete coverage of either the marley or the entire vessel interior was more common. A red slip was by far the most prevalent kind, but there were rare instances of black or red and black filmed sherds. With only a handful of exceptions (which may have been eroded), all slipped sherds were burnished. Burnishing promotes adhesion of the slip to the vessel (Rice 1987:150). A burnished and slipped vessel might be even less porous than a burnished one.

Firing. A subsample of sherds from all three sites were analyzed for firing color. Interior, exterior, and core colors were recorded under fluorescent light with reference to the Munsell color chart. To control for variation in core color due to the location of the sherd on the pot, firing colors were read on rim sherds only. Because of the size of the assemblages, and the expected redundancy of the information, subsamples were used for this attribute. For the Meeting House Fields site, the sample consisted of all rims of adequate size from the 1988 excavations. For the St. Catherines Island sample, a set of proveniences was randomly selected from all structures and color characteristics of the rims in those proveniences were recorded. For the Amelia Island sample, sherds were studied from a systematically unaligned series of pits in each structure.

Form. Where possible, vessel form was recorded. In many cases, however, only lip orientation was recovered. This was because for the bulk of the samples of both Altamaha and San Marcos vessels broke at the base of the rim fold. This phenomenon was so prevalent that a special code was created for the unidentifiable surface decoration of these rimsherds to distinguish them from sherds for which the surface decoration was merely illegible. An analogous situation obtained for colono-ware brimmed vessels, by far the largest category of colono-wares. These vessels commonly broke at the point of inflection between the marley and the body of the plate.

Vessel diameter was taken where possible, but few sherds were large enough to provide reliable diameters. A comprehensive program of crossmending might yield enough data to analyze vessel diameters. However, because of time and space limitations, this was not undertaken for this study.

Stylistic Attributes

Theoretically, pottery decoration is infinitely variable. Nevertheless, the traditional uses of style, with or without symbolic meaning, tend to limit the choices of the potter. That styles evolve with little change cultural change is attributable to drift (Binford

1963). The few studies on the diachronic changes in Irene and Altamaha wares have emphasized such variables. Stylistic attributes for the study of the evolution of Irene to San Marcos wares were chosen on the basis of those studies, as well as on ethnographic and archaeological evidence of the uses of style presented in the previous chapter.

The following stylistic attributes were selected: surface decoration, rim style, and depth of the rim fold. Land and groove width was also recorded for a subsample of sherds. Each of these is discussed below.

Surface decoration. The bulk of all the collections studied consisted of heavily overstamped sherds. It was, therefore, impossible to code at the level of design motif for most sherds. What was coded for each sherd was the highest level of the motif visible. For instance, for the world symbol motif, simple stamping was the basic element (sensu Shepard 1980) involved. When only simple stamping (parallel lines) was visible, one code number (396) was used. If perpendicular lines were visible (in other words, two of the cardinal directions), a different code was used. Sometimes checks were incorporated into the parallel lines; if so, a different number was applied. Sherds with the central dot were given a different code number, as were different executions of the "sun" (it was usually circular but occasionally square or rectangular). Where partial or total motifs were visible, they were recorded with reference to a series of drawings associated with code numbers. Overstamping was recorded only for the various combinations of simple stamping.

There is a great deal of information, then, on motifs in this study. In general, however, code numbers for all designs were collapsed into a set of "master codes" (rectilinear, curvilinear, dot, check, obliterated stamped, plain, burnished plain, incised, and incised and stamped). Dots were combined with either rectilinear or curvilinear stamped when not the focus of the question at hand.

Incised designs were recorded similarly. No attempt was made to assign the incised designs to type. Unlike the situation in the

Apalachee area, east coast incising has not been systematically studied. Terms such as Lamar Bold Incised, Irene Incised, etc., are rather loosely applied and sometimes geographical location and characteristics of execution are conflated. In addition, for the Amelia Island material the use of these type names implies that the material was extra-local, which is probably not true, at least for late Spanish mission sites. To properly type these sherds would require another study of the scope of this one. Data are available without complete reanalysis. Again elements or motifs were recorded with reference to a series of drawings. The presence of stamping below incising was noted, and, for sherds analyzed after the course of this research was understood, land and groove widths were measured.

Rim style. Rim "style" was conceived as the combination of two attributes called rim treatment and rim elaboration. The former defined whether a vessel had a plain rim, a punctation directly on the vessel body, an applique rim strip, an applique node or pellet, or a folded rim. The latter consisted of the more decorative elements, the "elaborations" of the basic rim treatments defined in the first category. Rim elaborations included incising and the variety of punctation styluses used to impress applique strips, vessel bodies (these punctated plain rimmed vessels are referred to as "decorated" vessels throughout this report) or folded rims.

In some instances it was difficult to determine whether or not a rim was folded. This was particularly true for the Meeting House Fields site pottery assemblage. Some rims initially identified as folded were later interpreted to be applique strips applied flush with the lip and the juncture smoothed over. In every case of a folded, punctated rim at Meeting House Fields, closer inspection revealed those smoothing marks, as well as areas that were not well smoothed.

Folded rims were measured from the base of the rim to the center of the lip. Rim strips were measured similarly; strip width was also measured for the Meeting House Fields site but is not discussed in this report.

Land and groove width. Land and groove widths were recorded for a subsample of the sherds from each site. The sample consisted of all sherds with central dots. The main purpose for selecting these sherds was to reduce the sample size of eligible sherds to a manageable level with some criterion that could be easily applied during the main analysis. In addition, it helped to avoid repeated measurements of the characteristics of the same paddle because many of these were recognizable by unique executions of the central dot. Some repetition, though, is doubtless present.

Analysis Techniques

The coding system used for this study was developed by archaeologists with the Florida Bureau of Archaeological Research and Florida State University for use in mission excavations throughout La Florida. However, that system was not designed for a rigorous ceramic analysis and major changes were made to adapt the system to this study. Nevertheless, terminology and definitions that already existed in that code system were used. For instance, vessel form descriptions in this study are as defined therein; all attributes defined in the pre-existing codebook were coded with the same numbers (and definitions) as described in Shapiro (1987).

Data were presented in two formats, by sherd (count and weight for most attributes) and by minimum number of vessels (MNV). Some attributes were considered appropriate for only one of these formats and are so presented. Most attributes were missing or unidentifiable on some sherds. Those sherds or vessels were deleted for specific tests and table results. Because of this, sherd or MNV totals will not match in every table. Count totals are given at the beginning of each analysis section; where tables do not match those values, there were missing data.

The MNV was established similarly for all sites. Using computer printouts with all attributes sorted, rim sherds were combined into single vessels if they shared vessel form and rim style, temper, master code surface treatment or unique motif code, and if measurements such as

rim fold depth were close (these tend to be variable even on single sherds; deviations of less than 1 cm were accepted). Other measurements included the size of punctations, width of brim, land and groove widths, diameter of dot, and vessel diameter. For the Meeting House Fields site sample, it was assumed that there was no crossmending between house middens; pottery from each midden was treated as a separate assemblage. A similar assumption was made for structures at the missions.

The use of the MNV approach is intended to remove the bias present in the differential recovery of vessels. The technique used here, and the MNV approach in general, may depress the frequency of common forms of plain and some stamped vessels because they lack attributes that record individual variation. This can be seen in the data presented in the following chapters, particularly in the differences in percentage totals between sherd and MNV for some attributes like incising and sand tempering.

CHAPTER 5

THE MEETING HOUSE FIELDS SITE

In this chapter, the Meeting House Fields site is described, previous research is detailed, and the 1988 field season designed to ensure the adequacy of the site for this research is discussed. Radiocarbon data and ceramic analyses are applied to the question of intrasite contemporaneity. Finally, the technological and stylistic attributes of this late Pre-Columbian to Colonial period site are presented as baseline data for the study of pottery change in subsequent chapters.

Site Background

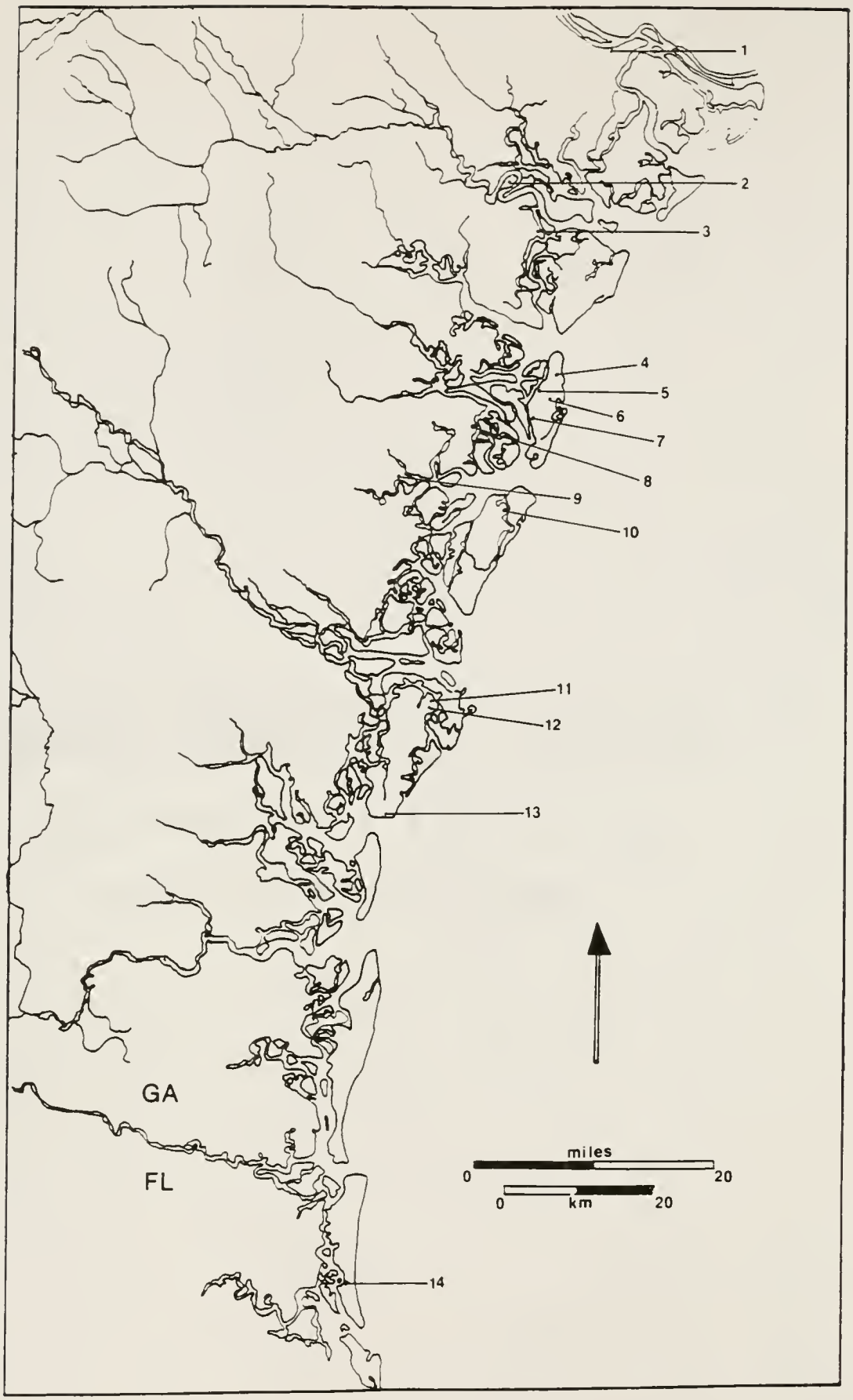
The Meeting House Field site is one of 54 Irene phase (A.D. 1325-1550; DePratter 1984) sites known on St. Catherine's Island, Georgia. The site occupies a peninsula on the estuarine (west) side of the island (Figure 5.1). The westernmost portion of the site is undisturbed and is covered in a climax forest of magnolia with little understory. This undisturbed area is a maximum of 50 m wide and is bordered on the east side by a field ditch. West of the ditch is an old field and this portion of the site has been extensively plowed. Currently, however, this portion of the site is being returned to a more pristine state and is in successional pine.

Meeting House Fields is a typical Irene phase site in several respects. Both on barrier islands and on the mainland, the bulk of Irene phase sites are situated adjacent to or within 100 m of the salt marsh edge (Pearson 1979:70). The presence of archaeologically recovered burned corn cobs from Meeting House Fields and other Irene phase sites notwithstanding, this environmental situation reflects the society's reliance on estuarine resources. The typical Irene phase site

Figure 5.1. Sites Analyzed or Mentioned in the Text.

Key:

1. Irene
2. Seven Mile Bend
3. Red Bird Creek
4. Marys Mound
5. Meeting House Fields
6. Johns Mound
7. Santa Catalina, Georgia
8. Harris Neck Wildlife Refuge
9. Pine Harbor
10. Bourbon Field
11. Couper Field/Indian Field
12. Taylor Mound
13. Kent Mound
14. Santa Catalina, Florida


1
2
3
4
5
6
7
8
9
10
11
12
13
14
GA
FL
miles
0
20
0
km
20

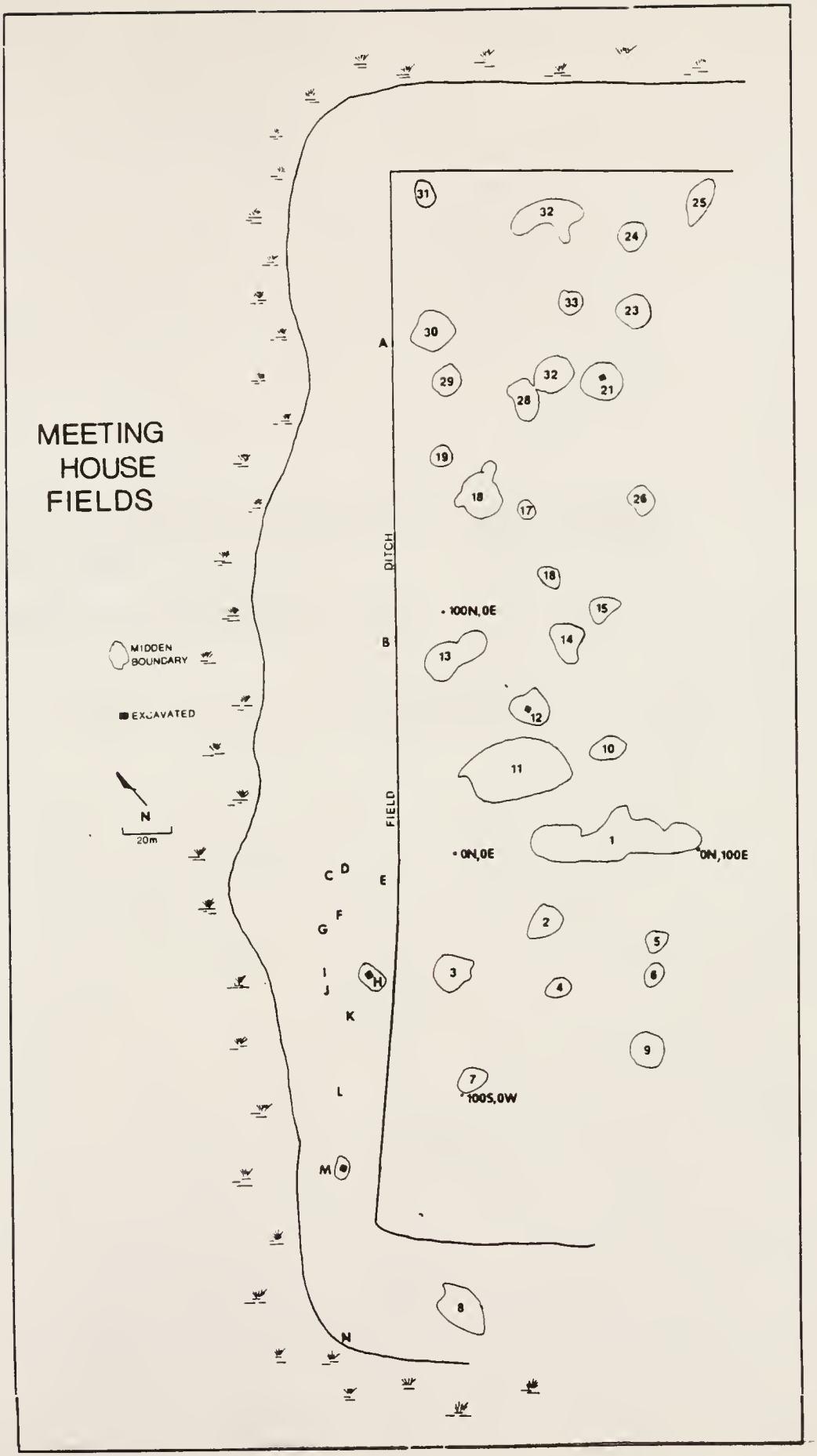
structure, also present at Meeting House Fields, consists of numerous discrete midden deposits, presumably reflecting the refuse of adjacent dwellings scattered (apparently) randomly over the site.

Joseph Caldwell was the first to excavate at the site. In 1969, he dug a unit in the northern portion of what has subsequently been labeled Midden E. Though the materials from his expedition were analyzed by this investigator, they were not included in the analysis. This was because little was recorded of his excavation techniques and because, even without Caldwell's materials, the sample size of pottery from Midden E was already much larger than that from the other middens.

Meeting House Fields was tested in 1975 by the American Museum of Natural History in 1975. During that season, a field map locating the visible middens in the undisturbed western portion of the site was made using a compass. (Center point locations of those middens and plan maps of the middens excavated in 1988 are represented in Figure 5.2.) Excavation units were placed in 5 of the 14 middens located, and C14 samples were run on materials from Midden E. The results of the C14 tests and analysis of the ceramics recovered during the 1975 field season (by the author) indicated that Meeting House Fields might be useful in a research project designed to study pottery change during the Mission period.

As discussed in Chapter 1, the ceramic assemblage from a late Irene phase site would provide the necessary baseline from which to study change during the subsequent Mission period. To avoid confounding the study with transitional attributes, the site needed to be a single component site. In addition, the site should not be a seasonal or special purpose site that might not contain a full range of pottery forms or decorative attributes (e.g., Plog 1980). Finally, the location of the site on the same island as the next context considered, Mission Santa Catalina, helped to control for the variability in stylistic attributes between major river drainages observed along the Georgia coast (Caldwell 1971).

Figure 5.2. Meeting House Fields Site Map.


MEETING
HOUSE
FIELDS
MIDDEN
BOUNDARY
EXCAVATED
N
20m
DITCH
FIELD
100N,0E
0N,0E
0N,100E
100S,0W
A
B
C
D
E
F
G
H
I
J
K
L
M
N
31
32
25
24
33
23
30
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A three-week field season (November-December 1988) was planned to gather additional data about the site, information necessary to answer explicit questions crucial to the aforementioned research program. Specifically, we needed basic information about site size and internal settlement organization to better assess site function. A site survey was proposed, employing extensive subsurface probing for plowed over shell middens in the old field. During the three weeks, a 500 (NS) X 100 m area was mapped (Figure 5.2). Another 250 (EW) X 70 m area was covered less intensively. Shell middens were encountered to the eastern limit of the testing (350E line). Physiographic features suggested that the site could extend twice that far, to the 10 m topographic contour line. Despite the fact that we did not map the whole site, it was apparent that it was quite large and extended several hundred meters east of the marsh. Even if all the middens were not contemporaneous, these data argued against a special purpose function for the site.

Molluscan samples were taken to address the seasonality issue. Samples of clam (Mercenaria mercenaria) and a parasitic oyster drill (Boonea impressa) were analyzed to ascertain the principal seasons of oyster and clam exploitation at the site, and, by extension, some of the seasons of site occupation. Zooarchaeological samples were taken from every midden excavated in either 1975 or 1988. Samples were analyzed from Middens H, M, 12, and 21. Results of this facet of the study (Saunders and Russo 1988; Russo 1991) indicated that, though the fit was not "neat," the site type most consistent with the data was the permanently occupied town. Midden M was an exception. Though evidence from other samples indicated exploitation of molluscs throughout the year, only fall, winter, and spring exploitation was identified at Midden M. Whether or not these data reflect a change in seasonal subsistence patterns that could be correlated with the late radiocarbon dates from that midden (see below) must await the analysis of the vertebrate fauna.

Finally, additional C14 and ceramic samples were needed to establish whether or not the middens at the site were (broadly)

contemporaneous with one another. C14 dates would provide the broad boundaries of the occupation, while ceramic seriation provided a finer relative chronology. The results of this portion of the study make up the remainder of this chapter.

Radiocarbon Data

During the 1975 excavations, a vertical series of radiocarbon dates was taken from the arbitrary 10 cm levels in one of the larger of the middens, Midden E. Though none of the samples from Meeting House Fields were isotopically corrected, a generalized correction for stable isotope C12/C13 fractionation for the southeastern Atlantic coast (420 years, suggested by Michael Russo, Florida Museum of Natural History, 1991) and a local reservoir correction (-5 +/- 20; Stuiver et al. 1986) were added to the dates run on shell. Recalibration of both carbon and shell dates was obtained using the CALIB program (Stuiver and Reimer 1986). Results for Midden E are presented in Figure 5.3. Both Figure 5.3 and Figure 5.4 (1988 radiocarbon samples) present the calibrated date range within one and two sigma (68% and 95% probability that the actual date falls within the range, respectively). The uncorrected/uncalibrated date is shown with an asterisk. Laboratory numbers, source materials, proveniences, and uncorrected and corrected/calibrated date ranges are shown in Table 5.1.

As can be seen in Figures 5.3 and 5.4, correction and calibration created a slightly earlier date range than the uncorrected/uncalibrated date. It should be noted that the correction for the reservoir effect is at best a guess and the CALIB program may not be appropriate for most archaeological materials, including charcoal that was not part of the outer rings of a tree (personal communication, M. Tamers, Beta Analytic, Inc, 1991). The corrected/calibrated dates may be no more accurate than the uncorrected/uncalibrated range.

Figure 5.3 indicates an occupation between A.D. 1200 and A.D. 1440 for the deposition of the lower levels (levels 3-8). Dates from Levels 2 and 3 suggested either that there was an hiatus in site occupation (or

Table 5.1. Radiocarbon Dates from Meeting House Fields.

SAMPLE NO.	SOURCE	PROV	C-14 AGE	CALIBRATED 1 sigma	CALIBRATED 2 sigma
Beta-20806	Oyster	E L2	1190 +/- 60	1190-1289	1110-1320
Beta-21972	Charcoal	E L2	1510 +/- 50	1425-1466	1410-1621
Beta-21973	Charcoal	E L3	1630 +/- 60	1476-1648	1440-1952
UGA-1009	Charcoal	E L3	1370 +/- 60	1299-1416	1280-1440
Beta-20807	Oyster	E L5	1260 +/- 60	1260-1326	1200-1400
Beta-20808	Oyster	E L7	1270 +/- 60	1267-1334	1210-1410
Beta-21974	Charcoal	E L7	1360 +/- 50	1299-1410	1280-1430
UGA-1010	Charcoal	E L8	1265 +/- 60	1265-1386	1220-1405
Beta-30265	Oyster	21 L3	1610 +/- 50	1501-1640	1470-1670
Beta-30263	Clam	21 L3	1420 +/- 60	1378-1455	1310-1490
Beta-30264	Charcoal	21 L3	1410 +/- 60	1325-1430	1280-1440
Beta-30270	Oyster	M L3	1550 +/- 80	1447-1586	1400-1670
Beta-30268	Clam	M L3	1630 +/- 80	1494-1668	1450-1710
Beta-30269	Charcoal	M L3	1660 +/- 60	1494-1656	1450-1955*
Beta-30266	Clam	H L2	1560 +/- 60	1463-1563	1430-1650
Beta-30267	Clam	H L8	1350 +/- 80	1296-1429	1250-1470
Beta-30262	Clam	12 L3	1500 +/- 60	1431-1507	1390-1570
Beta-30271	Clam	N L3	890 +/- 70	871-1018	780-1060

1955* denotes influence of bomb C-14.

Note: Assymetrical dates result from the nonlinearity of the logarithmic relationship between sample C14 activity and age (Long and Rippeteau 1974:207).

Figure 5.3. Radiocarbon Dates, Midden E.

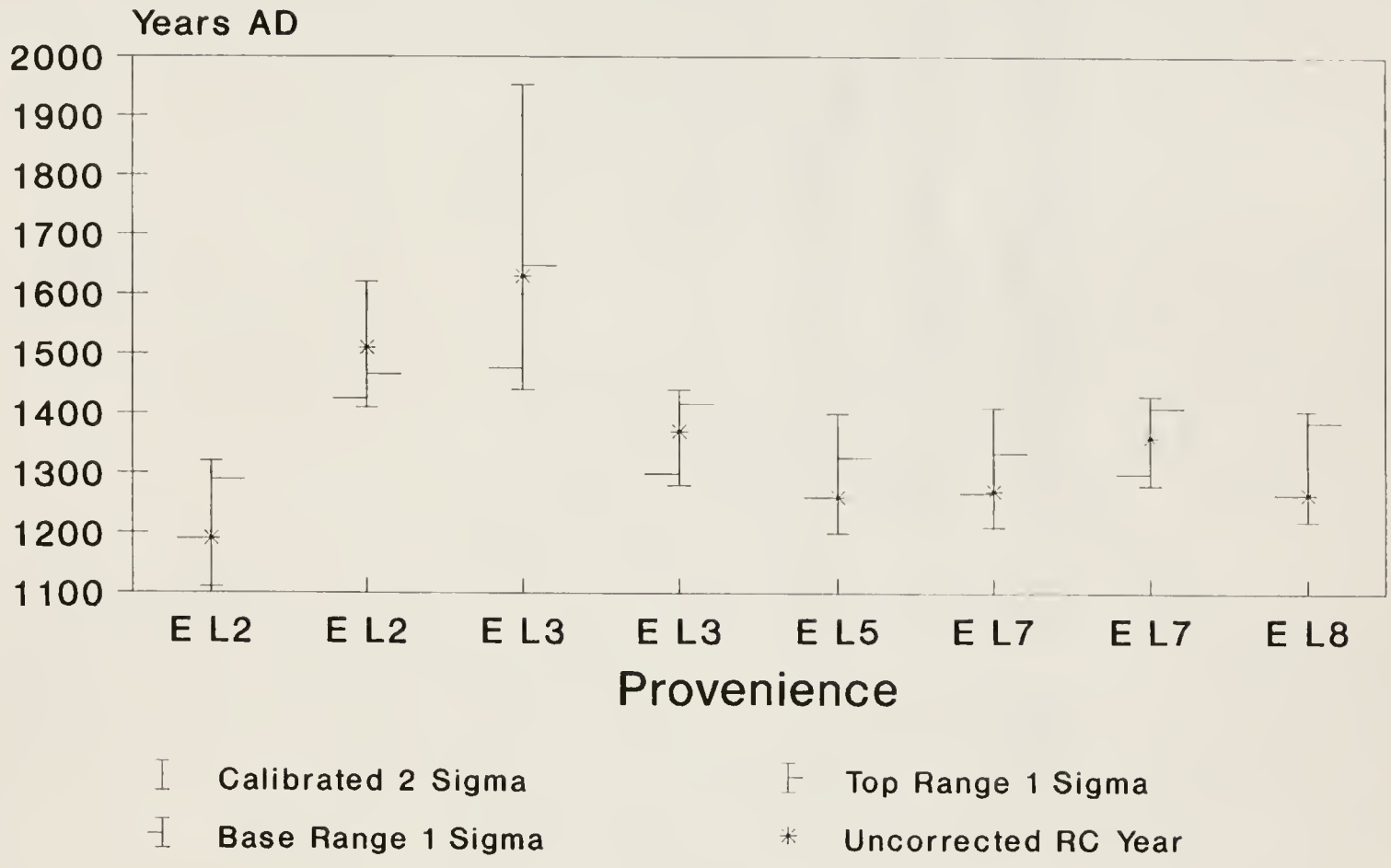
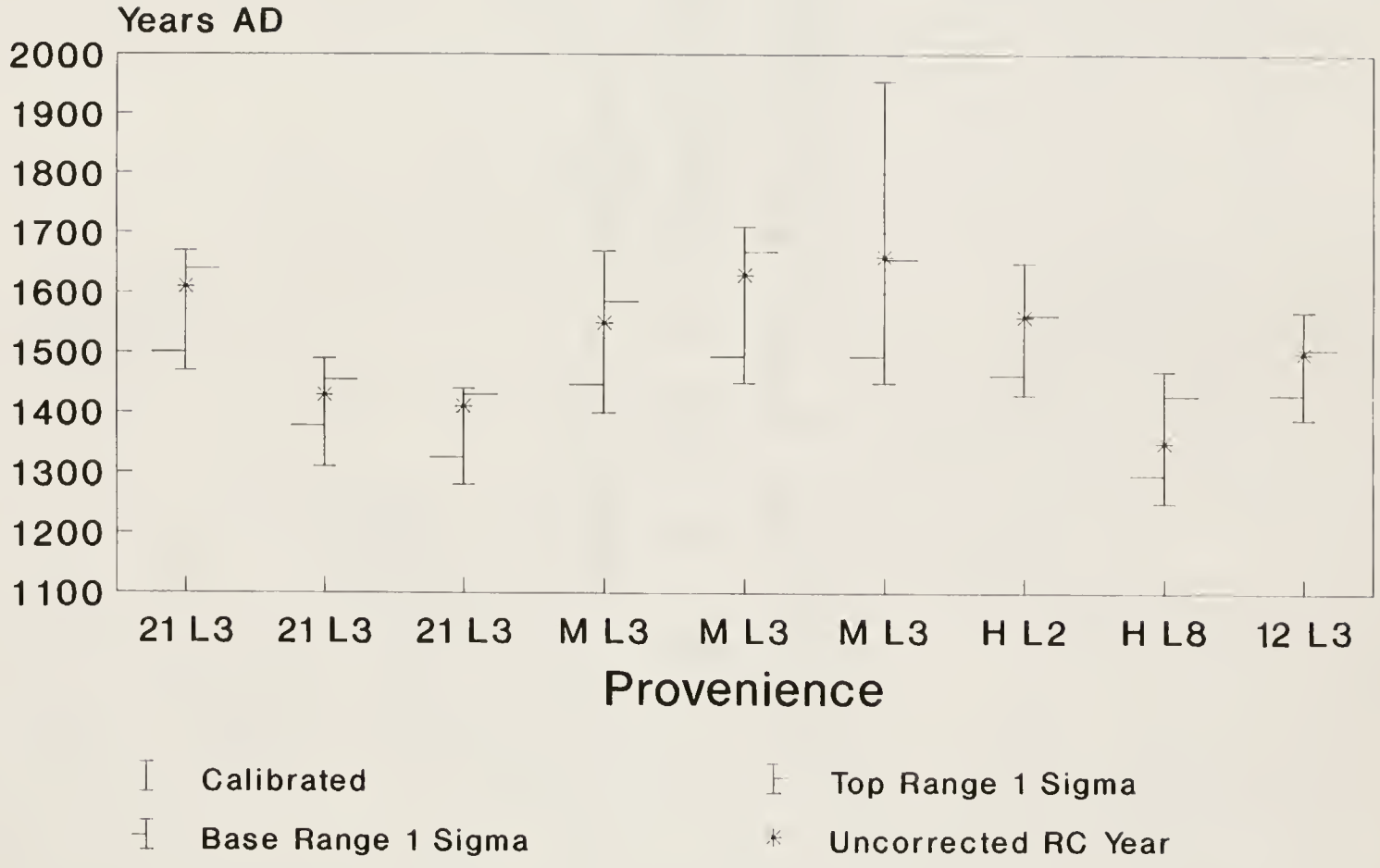

Years AD
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
E L2
E L2
E L3
E L3
E L5
E L7
E L7
E L8
Provenience
Calibrated 2 Sigma
Base Range 1 Sigma
Top Range 1 Sigma
Uncorrected RC Year

Figure 5.4. Radiocarbon Dates, 1988 Samples.


Years AD
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
21 L3
21 L3
21 L3
M L3
M L3
M L3
H L2
H L8
12 L3
Provenience
Calibrated
Base Range 1 Sigma
Top Range 1 Sigma
Uncorrected RC Year

in deposition on this midden) and it was reoccupied, or, because of the A.D. 1190 date from Level 2, that the samples from the upper levels of the midden were contaminated in some way. Aspects of the ceramic assemblage indicated that the radiocarbon dates from the lower levels should be interpreted towards the more recent end of the range. Surface decoration on the pottery of Midden E was predominantly plain (33.7%) and complicated stamped (57.7%, total of rectilinear, curvilinear, dot and surface roughened surface treatments). Incising, though a minority treatment, was consistently present (Table 5.2; complete inventories of midden assemblages by level are presented in Appendix A). Most of the incising was characterized as fine (<= 1mm), but designs were simple and composed of relatively few lines. The fact that rim treatments throughout Midden E consisted primarily of plain, applique strips with segmentations or cane punctations, and cane decorated vessels (Appendix B) may indicate that Midden E was deposited in the Pine Harbor phase.

Comparative ceramic studies with accompanying radiocarbon data were scarce. Irene phase radiocarbon dates existed from only two other sites (the Kings Bay date [DePratter 1984:51, Figure 3] probably does not come from an Irene cultural occupation). Pearson (1984) reported one date from the Red Bird Creek site in Bryan County, Georgia. The single sample, done on charred wood from a burned wattle and daub structure at the site, dated to A.D. 1145 +/- 60. Pearson (1984:8) considered this date "too early". A calibrated date with 2 sigmas yielded a range of A.D. 1039-1280; even with two sigmas the date fell short of the beginning of the early Irene phase as presently defined. The ceramic assemblage from the Red Bird Creek site indicated an early or middle Irene phase site; incising was present at .5% of the sample.

Braley (1990; Braley et al. 1986) published two Irene phase dates from features at the Harris Neck National Wildlife Refuge (9MCI41) site, A.D. 1430+/-60 and A.D.1400+/-70, yielding an uncorrected range of A.D. 1330-1490. On the basis of rim style and surface decoration, Braley et al. (1986:133) favored the latter part of the range. (If these two charcoal dates are calibrated, they yield a range to 2 sigma of A.D.

Table 5.2. Midden E, Surface Treatment by Level.

	STAMPED				PLAIN				BURNISHED PLAIN				INCISED				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																				
1	46	55.4	430.7	70.1	26	31.3	141.4	23.0	.	.	.	.	11	13.3	42.6	6.9	83	100	614.7	100
2	34	33.0	468.8	45.1	49	47.6	430.1	41.4	3	2.9	28.4	2.7	17	16.5	112.0	10.8	103	100	1039.3	100
3	46	73.0	577.1	71.6	10	15.9	85.4	10.6	3	4.8	76.2	9.5	4	6.3	67.0	8.3	63	100	805.7	100
4	50	72.5	678.0	85.1	17	24.6	108.8	13.7	1	1.4	6.2	0.8	1	1.4	3.9	0.5	69	100	796.9	100
5	38	58.5	468.0	64.5	23	35.4	242.1	33.4	2	3.1	11.7	1.6	2	3.1	3.6	0.5	65	100	725.4	100
6	71	64.5	893.8	73.4	28	25.5	240.0	19.7	1	0.9	4.2	0.3	10	9.1	78.9	6.5	110	100	1216.9	100
7	66	49.3	944.2	61.5	58	43.3	508.0	33.1	2	1.5	19.2	1.3	8	6.0	64.4	4.2	134	100	1535.8	100
8	115	61.2	1237.9	67.8	66	35.1	528.1	28.9	1	0.5	12.7	0.7	6	3.2	47.9	2.6	188	100	1826.6	100
9	31	66.0	266.1	74.8	14	29.8	79.6	22.4	.	.	.	.	2	4.3	10.0	2.8	47	100	355.7	100
10	3	60.0	17.2	61.0	1	20.0	7.5	26.6	.	.	.	.	1	20.0	3.5	12.4	5	100	28.2	100
ALL	500	57.7	5981.8	66.9	292	33.7	2371.0	26.5	13	1.5	158.6	1.8	62	7.2	433.8	4.8	867	100	8945.2	100

Note: UID/OTHER not included.

1297-1453 and 1280-1450, respectively. The calibrated terminal dates for the Pre-Columbian component, then, were coeval with the *beginning* of the Pine Harbor phase. Nevertheless, previously established relative chronologies indicate that Braley was probably right in putting the pottery assemblage near the end of the Pre-Columbian period.)

A direct comparison of the surface treatments from the Harris Neck site and Meeting House Fields is presented below, in Table 5.5. A comparison of Table 5.2 with Table 5.5 indicates that Midden E was probably contemporaneous with the Pre-Columbian component at Harris Neck. A late Pre-Columbian date for Midden E was also indicated by the results of subsequent radiocarbon dating on other middens from the site.

Additional radiocarbon samples taken from other middens during the latest field season from both previously excavated contexts and recently excavated middens were intended to address the inconsistencies between the C14 dates and the material assemblage from Midden E. Samples were chosen on the basis of the results of the ceramic analysis. Those results indicated that Middens 12 and 21 might be earlier than the other middens; samples were processed from both these middens. In addition, in order to compare the results from different materials, a set of samples consisting of one each oyster, clam, and charcoal were processed from level 3 of Midden 21 and Midden M. Other samples were processed from the top and bottom of Midden H, to determine dates of initial deposition and abandonment of this deepest midden excavated. A sample was also processed from Midden N, which appeared earlier than all the other middens at the site.

The results of the processing are presented in Figure 5.4 and Table 5.1 (Midden N appears only in Table 5.1). Midden N was indeed earlier than the other middens tested, probably dating to the Wilmington II phase (DePratter 1979:111). All other dates from this series fell within the late Irene phase. Further, if two sigmas are considered, all middens could have been deposited contemporaneously. (Attribute analysis argued for a different conclusion; see below.)

Somewhat surprising was the number of dates that extended into the 17th century; the dates from Midden M could be considered Altamaha phase and sigmas extended the deposition of H and 21 into that period (however, the oyster date on Midden 21 is inconsistent with the other two from the same provenience). However, all pottery recovered from the site displayed the light stamping and thin lands and grooves characteristic of Irene phase designs. No bolder Altamaha-like stamping was observed. There was no red filming and no colono-ware forms or European artifacts were recovered. Though two rims were classified as folded (and one of these is only "possibly folded"), they were plain and smoothed at the base. They bore little resemblance to Altamaha folded, punctated rims.

Pottery Analysis

The Meeting House Fields pottery assemblage included all sherds from midden contexts recovered during the 1975 and 1988 excavations. Materials were screened through 1/4" mesh, but pottery less than 1 cm square was only counted and weighed. Those small sherds were not included in this analysis. Total count for Irene phase sherds used in this study was 2453.

Analysis of the pottery was originally done at three levels (Saunders and Russo 1988). The first two levels tested the hypothesis that the Meeting House Fields site was a single component, late Irene phase site. In the first level, intramidden analysis, the incidence of plain, burnished plain, incised, and stamped pottery were examined by level to determine whether or not there was enough time depth in midden deposition to observe changes in the frequency of the aforementioned attributes through time. Levels of middens which contained pottery attributes determined to be earlier than the late Irene phase would not be included in the subsequent descriptions of pottery style in the late Irene phase.

The second level of analysis involved the determination of contemporaneity between middens, possibly at a finer scale than that

possible with radiocarbon dates. Intermidden assemblages were examined using both surface decoration and rim style. If different areas of the site were occupied at different times, intermidden assemblages should vary regularly along a number of different attributes and the middens could be clustered to produce a chronology of spatial use for the site. Middens earlier than the late Irene phase would be excluded from further analysis.

The initial results from that earlier analysis suggested that the middens were contemporaneous (Saunders and Russo 1988); values of attributes for the site as a whole were discussed. Reanalysis for this paper, however, and an appreciation of Braley's division of the late Irene into Pipemaker's Creek and Pine Harbor phases, has led to the conclusion that portions of the site were not occupied contemporaneously.

Intramidden Analysis

Intramidden analysis yielded mostly negative results (Appendix A, B) in that temporally sensitive attributes did not covary through time within most middens. Several middens (12, B, D, J,) showed no convincing evidence of regular change in attributes of surface treatment. This was attributed to the lack of time depth in midden deposition (the possibility that several levels of shell in Middens 12 and 21 were plowed away must be considered, but the middens seemed quite discrete) or inadequate sample sizes.

The relative frequency of stamping to plain wares did appear to decrease in Midden 21, though because so few sherds were recovered from level 1, it was impossible to determine whether or not this was a trend. In any event, the percentages indicated a deposition within the same phase. In Midden E, the high incidence of incised wares in levels 1 and 2 represented sherds of the same vessel, so a dramatic rise in the frequency of incising near the end of the deposition of the midden was discounted. Indeed, the frequencies of other treatments did not change in any regular manner. Incising did not appear in Midden H until level

4, and some time depth in occupation may be indicated by the radiocarbon dates. As in Midden E, however, other surface decorations did not show regular change; the frequencies of stamped and plain wares between, for instance, level 7 and level 1 were almost identical. These somewhat ambiguous data were interpreted to mean that middens could be treated as wholes for the subsequent analysis.

Intermidden Analysis

Cluster analysis based on both surface treatment and rim treatment of the midden assemblages produced a bipartite division of the middens on the site (Figures 5.5-5.8). The SAS Cluster Procedure, average linkage, was performed on the percentage total (count) of sherds in each surface treatment or rim treatment group. The procedure was run for standardized and unstandardized data.

For surface treatment (Figure 5.5, 5.6), Middens 12, 21, and J formed one major cluster (Cluster 1), and B, E, D, H, and M (Cluster 2) formed the other. The clusters were more monolithic in the unstandardized data, but the results were similar in both. In Cluster 1, plain sherds constituted 20% or lower of the total and stamped sherds comprised 72% of the total (Table 5.3). In Cluster 2, plain sherds ranged between 30 and 40% of the total and stamped sherds were less than 60% In addition, the first group, only Midden J had incising (n=1). Overall, Cluster 1 had more burnished plain wares, though some Cluster 2 individual midden totals were higher.

The rim style clusters (Figure 5.7-5.8) essentially mirrored the results from the surface treatment analysis (Middens B, D, and J were not included because they had only 3, 5, and 6 rims, respectively). In the unstandardized average linkage, Middens 12 and 21 formed one cluster and Middens E, H, and M the other. Middens 12 and 21 were the only middens with pellets or nodes, segmented applique strips with cane punctations, and no incised rims; they had, *in general*, fewer decorated cane vessels and far fewer plain rims than the second cluster (Table 5.4, Appendix B). However, the standardized average linkage result

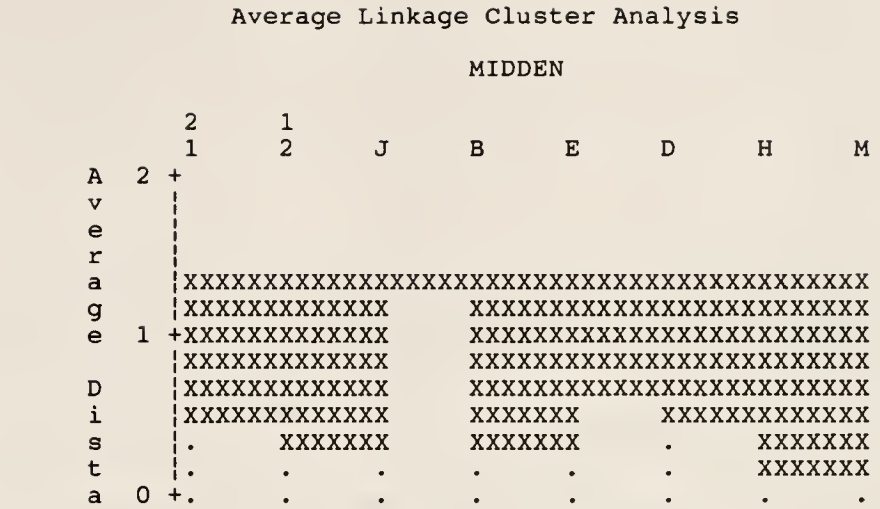


Figure 5.5. Cluster Analysis, Surface Decoration (not standardized).

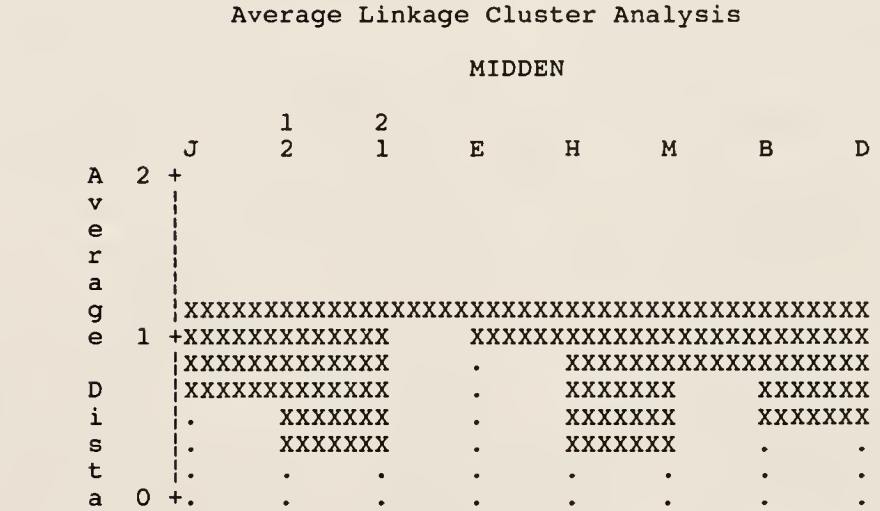


Figure 5.6. Cluster Analysis, Surface Decoration (standardized).

Table 5.3. Surface Decoration by Cluster.

	MASTER CODE																ALL			
	STAMP				PLAIN				BURNISH PLAIN				INCISED							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
CLUSTER																				
1	514	71.7	5096.4	76.6	138	19.2	1041.6	15.7	64	8.9	508.3	7.6	1	0.1	5.3	0.1	717	100	6651.6	100
2	870	52.4	10841	61.4	588	35.4	4908.1	27.8	92	5.5	1095.4	6.2	110	6.6	800.8	4.5	1660	100	17646	100
ALL	1384	58.2	15938	65.6	726	30.5	5949.7	24.5	156	6.6	1603.7	6.6	111	4.7	806.1	3.3	2377	100	24297	100

Master code UID not included.

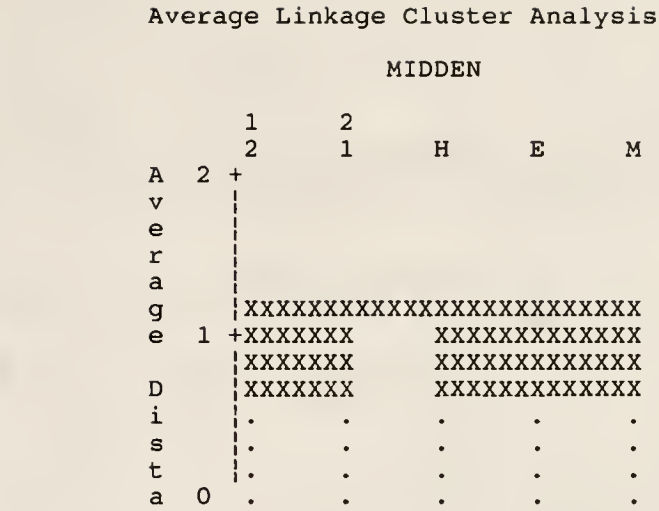


Figure 5.7. Cluster Analysis, Rim Style (not standardized).

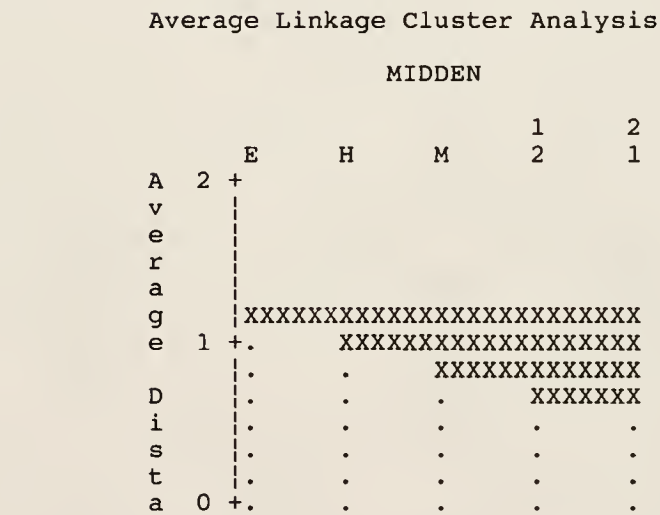


Figure 5.8. Cluster Analysis, Rim Style (standardized).

Table 5.4. Rim Style by Cluster.

	RIM TREATMENT																							
	PLAIN								DECORATED								PELLET/NODE							
	STYLE								STYLE								STYLE							
	PLAIN				INCISED				DEC CANE				DEC FINGER				DEC STAMP				PELLET/NODE			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
CLUSTER																								
1	8	100	47.7	100	.	.	.	.	3	100	24.8	100	.	.	.	.	.	.	.	.	4	100	77.4	100
2	43	78.2	775.9	90.7	12	21.8	79.3	9.3	11	78.6	204.3	86.7	2	14.3	28.3	12.0	1	7.1	3.0	1.3	.	.	.	.
ALL	51	81.0	823.6	91.2	12	19.0	79.3	8.8	14	82.4	229.1	88.0	2	11.8	28.3	10.9	1	5.9	3.0	1.2	4	100	77.4	100

	RIM TREATMENT																							
	APPLIQUE STRIP																FOLDED							
	STYLE																STYLE							
	STRIP SEGMENTED				STRIP CANE				STRIP SEGMENT/CANE				STRIP PINCH				FOLD PLAIN				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
CLUSTER																								
1	4	25.0	45.7	20.3	7	43.7	100.4	44.7	3	18.8	18.1	8.1	2	12.5	60.4	26.9	.	.	.	.	31	100	374.5	100
2	18	47.4	378.0	62.6	17	44.7	188.3	31.2	.	.	.	.	3	7.9	37.4	6.2	1	100	5.4	100	108	100	1699.9	100
ALL	22	40.7	423.7	51.2	24	44.4	288.7	34.9	3	5.6	18.1	2.2	5	9.3	97.8	11.8	1	100	5.4	100	139	100	2074.4	100

chained, indicating no coherent clusters in the data. In addition, while a Ward's method clustering routine produced results similar to the average linkage for the surface treatment data, the Ward's method results for the rims associated Midden M with Cluster 1. This indicated that there was a greater difference *between* clusters developed from surface treatment data than rim treatment data.

These results seemed to represent time differences, with Middens 12, 21, and J (Cluster 1) deposited earlier than the other middens. Surface treatments for Clusters 1 and 2 were compared to similar data from other Irene sites with radiocarbon dates (Table 5.5) to see how the data might seriate.

Table 5.5. Comparative Surface Treatments.

	RBC	MHF1	MHF2	HNPH	HNH
PL	2.8%	19.4%	35.4%	7.0	15.1
BP	18.1%	8.9%	5.6%	.6%	4.8%
ST	78.5%	71.4%	52.4%	53.8%	65.1%
INC	.6%	.1%	6.6%	2.3%	15.0%

RBC= Red Bird Creek (Pearson 1984). Note: Percentages given by Pearson have been refigured without earlier and unidentified sherds.
MHF1= Meeting House Fields, Cluster 1
MHF2= Meeting House Fields, Cluster 2
HNPH= Harris Neck, "Prehistoric" Component (Braley et al. 1986:53, Table 3)
HNH= Harris Neck, "Protohistoric" Component (Braley et al. 1986:74, Table 7, XU1 and non-Irene phase materials excluded)

For Meeting House Fields Cluster 1, percentages of all surface treatments except incising suggested that it was later than the Harris Neck Pre-Columbian period component (ca. A.D. 1415 +/ 65). Similarly, Cluster 2 appeared even later than the Harris Neck Colonial period component (A.D. 1650 +/ 70) except for the values on incising, which were, nevertheless, significantly higher than the values on this attribute in the Pre-Columbian component at Harris Neck. (The Red Bird Creek site had an extremely high proportion of burnished plain wares and a correspondingly low number of plain wares as compared to the other, presumably later, sites. Even if the relatively high percentage of burnished plain materials and other ceramics excavated from the burial

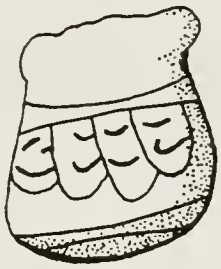
mound at that site were excluded from the analysis, burnished plain was still more prevalent than plain pottery (13.5% to 2.8%). The rim assemblage from Red Bird Creek is consistent with an early Irene site; the reason for the high percentage of burnished plain at that site is unknown.)

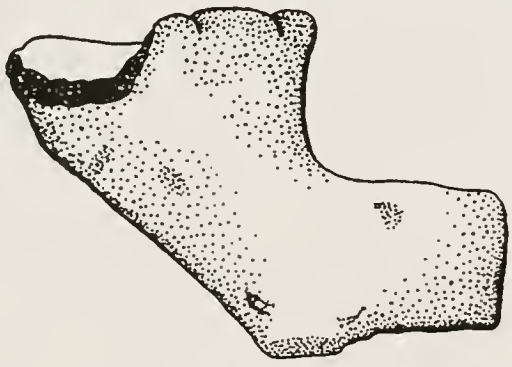
Other data from Middens E and H also suggested a late deposition date. Evidence for the inclusion of basal levels of Midden E in the Pine Harbor phase was given above; radiocarbon dates from level 3 and fine line incising on some of the incised sherds from level 6 in Midden M indicated a Pine Harbor phase or later deposition for that midden. In addition, levels 3 and 4 of Midden M contained pieces of pipes incised with Southeastern Ceremonial Complex designs (Figure 5.9) which are indicative of a very late Irene phase or post-contact period deposit (Cook and Pearson 1989:155, 163; Larson 1958). Midden H had no incised material until the upper levels, but the lower levels had relative frequencies of plain to stamped wares similar to those from Midden M. Together with the radiocarbon dates and rim style information, these data could be interpreted to support a middle Irene (Pipemaker's Creek except for the virtual absence of incising) deposition for Cluster 1 middens. A terminal Pine Harbor phase deposition was indicated for the Cluster 2 middens.

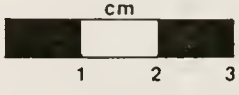
Vessel Form Analysis

Only a few distinct forms were recovered from Meeting House Fields. These included excurvate restricted, excurvate unrestricted, and more often, excurvate unidentified rims presumably belonging to deep jars. There were a few instances of a widely flaring, restricted, long neck jar; simple, slightly incurved, and straight-sided bowls were numerous (the table showing the distribution of all recognized vessel forms in all middens is given in Appendix C). The straight-sided bowls may be functionally equivalent with the carinated bowls more commonly described for Irene phase sites (Pearson 1984:17); an hypothesis possibly supported by the fact that no carinated bowl forms were identified from

Figure 5.9. Pipes from Meeting House Fields (drawing by Radai Cintron).
Top: Obverse and Reverse of pipe, Midden M;
Middle: Possible portion of pipe, Midden M;
Lower: Plain pipe, Midden H.






cm
1
2
3

the rim assemblage at Meeting House Fields. On the other hand, small rim sherds from carinated bowls broken above the point of inflection would have been coded as straight-sided, thus inflating that total. However, the presence of one beaker handle in Midden M indicated that at least some of these straight-sided rims came from beakers or "bean pots" (e.g., Harn 1980:108), a late Mississippian vessel form not usually described for coastal sites.

For comparison between clusters, the seven recognized vessel form categories were collapsed into four categories: simple bowls, straight-rimmed vessels, jars, and long necked jars. The comparison of the relative frequency of these forms by cluster is presented in Table 5.6. There appeared to be no significant difference between the clusters except that long necked jars occurred only in Cluster 2. Preservation factors may be responsible for this difference. Large sherds were required for the determination of this form and larger sherds were recovered from the undisturbed portion of the site.

There was a weak association between vessel form and surface treatment (Table 5.7, 5.8; sample sizes were too small to analyze vessel form by surface treatment by cluster). Stamped and plain surfaces occurred on all forms, though bowls were more likely to be plain than stamped. Similarly, while all forms except bottles were incised, a larger percentage of bowls were incised than any other form.

Vessel form was also associated with rim type (Table 5.9, 5.10; unusual rims and rare vessel forms were deleted from the chi-square test to ensure adequate cell sizes). The significance level is derived from the large percentage of bowls with plain rims and the corresponding lack of applique rims on bowls.

Other Indices of Change

As discussed in Chapter 3, there were attributes other than those commonly reported that might be sensitive to either temporal change or changes in social groups. The Meeting House Fields site could provide baseline data for the relative frequency of curvilinear to rectilinear

Table 5.6. Vessel Form by Cluster.

CLUSTER VESSEL FORM

Frequency / Percent / Row Pct / Col Pct	bowl	straight	jar	bottle	Total
1	4	12	14	0	30
	3.15	9.45	11.02	0.00	23.62
	13.33	40.00	46.67	0.00	
	17.39	30.00	24.14	0.00	
2	19	28	44	6	97
	14.96	22.05	34.65	4.72	76.38
	19.59	28.87	45.36	6.19	
	82.61	70.00	75.86	100.00	
Total	23	40	58	6	127
	18.11	31.50	45.67	4.72	100.00

Table 5.7. Vessel Form by Surface Decoration.

VESSEL / SURFACE DECORATION Frequency Percent Row Pct Col Pct	STAMPED	PLAIN	B PLAIN	INCISED	Total
bowl	5	9	4	5	23
	4.00	7.20	3.20	4.00	18.40
	21.74	39.13	17.39	21.74	
	8.93	17.65	44.44	55.56	
straight	17	19	0	3	39
	13.60	15.20	0.00	2.40	31.20
	43.59	48.72	0.00	7.69	
	30.36	37.25	0.00	33.33	
jar	32	21	3	1	57
	25.60	16.80	2.40	0.80	45.60
	56.14	36.84	5.26	1.75	
	57.14	41.18	33.33	11.11	
bottle	2	2	2	0	6
	1.60	1.60	1.60	0.00	4.80
	33.33	33.33	33.33	0.00	
	3.57	3.92	22.22	0.00	
Total	56	51	9	9	125
	44.80	40.80	7.20	7.20	100.00

Table 5.8. Chi-Square Test, Vessel Form by Surface Decoration.

VESSEL FORM / SURFACE DECORATION Frequency Expected Deviation Cell Chi-Square	STAMP	PL	Total
bowl	5	13	18
	8.8364	9.1636	
	-3.836	3.8364	
	1.6656	1.6061	
straight	17	19	36
	17.673	18.327	
	-0.673	0.6727	
	0.0256	0.0247	
jar	32	24	56
	27.491	28.509	
	4.5091	-4.509	
	0.7396	0.7132	
Total	54	56	110

STATISTICS FOR TABLE OF VF BY MCODE

Statistic	DF	Value	Prob
Chi-Square	2	4.775	0.092

Table 5.9. Vessel Form by Rim Treatment.

VESSEL RIM TREATMENT

Frequency / Percent / Row Pct / Col Pct	PLAIN	DECOR	PELND	APPLIQUE	FOLD	Total
bowl	17	2	2	1	0	22
	13.82	1.63	1.63	0.81	0.00	17.89
	77.27	9.09	9.09	4.55	0.00	
	29.31	11.76	50.00	2.38	0.00	
straight	17	5	0	17	1	40
	13.82	4.07	0.00	13.82	0.81	32.52
	42.50	12.50	0.00	42.50	2.50	
	29.31	29.41	0.00	40.48	50.00	
jar	21	9	2	24	1	57
	17.07	7.32	1.63	19.51	0.81	46.34
	36.84	15.79	3.51	42.11	1.75	
	36.21	52.94	50.00	57.14	50.00	
bottle	3	1	0	0	0	4
	2.44	0.81	0.00	0.00	0.00	3.25
	75.00	25.00	0.00	0.00	0.00	
	5.17	5.88	0.00	0.00	0.00	
Total	58	17	4	42	2	123
	47.15	13.82	3.25	34.15	1.63	100.00

Frequency Missing = 4

Table 5.10. Chi-Square Test, Vessel Form by Rim Treatment.

VESSEL FORM RIM TREATMENT

Frequency / Expected / Deviation / Cell Chi-Square	PLAIN	DECOR	APPLIQUE	Total
bowl	17	2	1	20
	9.7345	2.8319	7.4336	
	7.2655	-0.832	-6.434	
	5.4227	0.2444	5.5682	
straight	17	5	17	39
	18.982	5.5221	14.496	
	-1.982	-0.522	2.5044	
	0.207	0.0494	0.4327	
jar	21	9	24	54
	26.283	7.646	20.071	
	-5.283	1.354	3.9292	
	1.062	0.2398	0.7692	
Total	55	16	42	113

Frequency Missing = 2

STATISTICS FOR TABLE OF VF BY RTREAT

Statistic	DF	Value	Prob
Chi-Square	4	13.995	0.007

stamping; the frequency of sherds with central dots as opposed to sherds on which the dot was not visible; the popularity of various punctation tools used to decorate applique strips and vessels; the depth of the rim strips; the frequency of burnishing; temper types; and sooting. Data on these variables were analyzed by cluster, except where sample sizes were too small to yield reliable groups. Because all sherds came from a secondary (disposal) context, primary contexts of use cannot be considered for Meeting House Fields.

Temper. Irene phase ceramics are defined as having a grit tempered paste. However, a little over 20% of the sherds at Meeting House Fields were sand tempered; grog tempering was apparent in a very few sherds with Irene filfot stamped motifs (Table 5.11). Sand tempering apparently increased in the Pine Harbor phase. While only 8% of the sherds in Cluster 1 were sand tempered, 28% of the Cluster 2 sherds were sand tempered. An analysis of temper by vessel form (Table 5.12) indicated no concrete association between a vessel form and temper, though the ratio of sand tempered to grit tempered bowls was more even than the ratio of other forms to temper.

Why there was a spate of sand tempering in the late Irene phase is unknown. One possible explanation can be derived from the fact that grit (quartz grains larger than .25 mm) is not available on St. Catherines Island and must be collected from sand (grit) bars in the adjacent salt marsh (Royce Hayes, personal communication, 1988). For environmental or social reasons, these bars may have become unavailable during the late occupation of Meeting House Fields. Another intriguing possibility is that vessel size may have decreased in the late Protohistoric or Contact period. Braley et al. (1986:137) found that small vessels tended to be sand tempered and larger vessels grit tempered. They attributed this correlation to differences in manufacturing techniques for vessels of different sizes. A decrease in vessel size might suggest some demographic changes.

Table 5.11. Temper by Cluster.

	TEMPER															
	GRIT				SAND				GRIT&GROG				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
CLUSTER																
1	694	92.0	6270.5	92.9	60	8.0	477.6	7.1	.	.	.	.	754	100	6748.1	100
2	1225	72.1	13935	77.8	467	27.5	3925.6	21.9	7	0.4	47.5	0.3	1699	100	17908	100
ALL	1919	78.2	20206	81.9	527	21.5	4403.2	17.9	7	0.3	47.5	0.2	2453	100	24656	100

Table 5.12. Temper by Vessel Form.

	TEMPER					
	GRIT		SAND		ALL	
	COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT
VESSEL						
bowl	13	56.5	10	43.5	23	100
straight	24	61.5	15	38.5	39	100
jar	39	67.2	19	32.8	58	100
bottle	4	66.7	2	33.3	6	100
ALL	80	63.5	46	36.5	126	100

Chi-square value (bottles deleted)=0.895
Prob=0.64

Burnishing. The frequency of burnishing is displayed in Table 5.13. Roughly 75% of all sherds had burnished interiors. There appeared to be slightly less interior burnishing in the Cluster 2 assemblage. A few sherds (comprising less than 1% of the total) in Cluster 2 had burnished exteriors and unburnished interiors.

Sooting. Sooting was relatively rare in the Meeting House Fields assemblage and therefore cannot be meaningfully analyzed by cluster. Overall, a little over 7% of the sherds had sooted exteriors. Sooting was most common on stamped sherds, uncommon on plain sherds, and rare on burnished plain and incised sherds. No burnished plain or incised sherds had sooted interiors.

Rectilinear vs. curvilinear stamping. Table 5.14 gives the relative frequencies of rectilinear vs curvilinear stamping by cluster. The analysis based on sherd count indicated that there was virtually no difference between the two clusters. Analysis by sherd weight, however, suggested a slight increase in the incidence of rectilinear stamping in Cluster 2.

Central dots. The ability to discriminate the central dot of the filfot cross in the heavily overstamped sherds was poor (Table 5.15). Of all stamped sherds (surface roughened not included), central dots could be seen on only between 6 and 8% of the sherds (or 8-10% if weight was used).

Rim punctation. Cluster totals for the bivariate analysis of rim treatment were given above. Table 5.16 gives values for rim elaboration only (note, more data was available on this attribute than for other vessel information). A few additional comments could be made. Segmentation of the rim (including all varieties of stick and fingernail impressions) increased in Cluster 2. There was also a slight increase in the incidence of fingernail punctation in Cluster 2 over Cluster 1, and, surprisingly, a decrease in the use of cane punctation.

Table 5.13. Burnishing by Cluster.

	INTERIOR SURFACE											
	UNBURNISHED				BURNISHED				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
CLUSTER												
1	114	15.0	897.6	13.1	646	85.0	5943	86.9	760	100	6841	100
2	368	21.6	3396	18.9	1339	78.4	14542	81.1	1707	100	17937	100
ALL	482	19.5	4293	17.3	1985	80.5	20485	82.7	2467	100	24778	100

Table 5.14. Frequency of Rectilinear vs. Curvilinear Stamping.

	MASTER CODE											
	RECTILINEAR				CURVILINEAR				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
CLUSTER												
1	319	70.9	2657.0	59.1	131	29.1	1835.6	40.9	450	100	4492.6	100
2	487	71.1	5498.5	63.1	198	28.9	3216.0	36.9	685	100	8714.5	100
ALL	806	71.0	8155.5	61.8	329	29.0	5051.6	38.2	1135	100	13207	100

Table 5.15. Frequency of Dots on Stamped Sherds (surface roughened not included).

	MASTER CODE											
	STAMPED				DOT				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
CLUSTER												
1	414	92.0	4045.1	90.0	36	8.0	447.5	10.0	450	100	4492.6	100
2	644	94.0	7997.2	91.8	41	6.0	717.3	8.2	685	100	8714.5	100
ALL	1058	93.2	12042	91.2	77	6.8	1164.8	8.8	1135	100	13207	100

Table 5.16. Rim Elaborations by Cluster.

	RIM ELABORATION																	
	PLAIN		INCISED		FINGRNAIL		CANE		STICK		CANESEG		PELNODE		UID/O		ALL	
	COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
CLUSTER																		
1	8	25.8	.	.	2	6.5	10	32.3	.	.	3	9.7	4	12.9	4	12.9	31	100
2	45	39.8	12	10.6	9	8.0	28	24.8	11	9.7	.	.	.	.	8	7.1	113	100
ALL	53	36.8	12	8.3	11	7.6	38	26.4	11	7.6	3	2.1	4	2.8	12	8.3	144	100

Rim depth. There was no difference between Cluster 1 and 2 in the depth of the rim strip below the lip. Mean depth for both clusters was 10 mm (Table 5.17). An idea that the rim strip might have moved upwards towards the rim through time, eventually suggesting the folded rim, was not supported by these data. Land and groove width. For Cluster 1, mean land and groove width on stamped sherds was 1.4 and 1.8 mm, respectively (Table 5.18). Mean land size in Cluster 2 was virtually identical; mean groove size was slightly smaller, but not significantly so. These results confirmed the lack of Altamaha-like stamping at the site.

Motifs. Every attempt was made to discriminate different motifs (with different code numbers) during the analysis. More often than not, the characteristic overstamping made this difficult. Nevertheless, a number of different variations in the execution of the filfot cross were recorded (Figure 5.10), for instance the center of the scroll could be simply grooved or have a circle or a square, or, as in one instance, a spiral was used instead of a scroll. There was only one sherd in the assemblage that could be identified as most probably coming from elsewhere (Figure 5.10). The design appeared to be yet another variation on the filfot cross, but the crossbar through the circular element suggested a more elaborate treatment than was found at this site. That sherd, from Midden 12 Level 3, also had an uncharacteristic buff to pink exterior and a sandy paste.

Incised designs were classified as either bold or fine; both styles occurred in each midden with incising. While the total design was not usually recoverable, no incising (except that on the pipes) was found that could not be interpreted as part of either a scroll, or concentric semicircles or rounded chevrons. In contrast to what was found in the succeeding sites, punctation was not used either immediately below the rim or as filler in the incised designs.

Table 5.17. Applique Rim Strip Depth by Cluster.

CLUSTER	MIN	MAX	MEAN	STD	N
1	4.0	13.0	9.9	2.0	32
2	3.0	18.8	10.2	3.5	63

Table 5.18. Land and Groove Width by Cluster.

CLUSTER 1

N Obs	Variable	N	Minimum	Maximum	Mean	Std Dev
28	LAND	28	1	2.2	1.421	0.325
	GROOVE	28	0.9	3	1.836	0.536

CLUSTER 2

N Obs	Variable	N	Minimum	Maximum	Mean	Std Dev
16	LAND	16	0.7	2	1.381	0.331
	GROOVE	16	0.1	2.7	1.419	0.648

Figure 5.10. Selected Sherds from Meeting House Fields.
Scale in centimeters.
Top (Left to Right): 1) bold incised; 2) fine incised; 3) folded rim;
Middle: 1) Irene filfot stamped; 2) Irene filfot stamped with "rosettes" along rim; 3) Irene filfot stamped with segmented applique rim strip;
Bottom: 1) UID complicated stamped, possible trade ware; 2) Irene filfot stamped with unusually large elements and without overstamping.

Summary

Radiocarbon samples and the ceramic assemblage from the Meeting House Fields site indicated that the site was occupied principally during the late Irene phase. Discounting the oyster date from Midden 21, radiocarbon dates indicated that the middens in Cluster 1 were deposited between A.D. 1310 and 1570 (corrected/calibrated; Beta 30265 not included). Despite the lack of incising in this cluster, the surface decoration and rim attribute data (principally in the preponderance of cane punctate rim strips) seemed to indicate that deposition occurred in the middle of this range, or in the late Pipemaker's Creek phase. Small sample sizes may be the reason for the absence of incising in these units.

Pottery in Cluster 2 appeared later than that of Cluster 1. Pottery attributes and most radiocarbon dates suggested a late Pine Harbor phase occupation. Despite the relatively early radiocarbon dates from Midden E, it was included in this cluster on the basis of ceramic attributes. The presence of SECC pipes, the results of the zooarchaeological study, and the radiocarbon dates from Midden M might suggest that this midden was deposited later than the rest. Cluster analysis of surface decoration, however, joined M with the other middens of the cluster, particularly Midden H, at high R-squared values.

A two sigma range did extend the possible deposition date of some middens in Cluster 2 to a time coeval with the occupation of the later two Santa Catalina missions. The possibility that portions of the Meeting House Fields were contemporaneous with those missions was considered. The Guale at Meeting House Fields, perhaps, were not won over by the Spanish. The presence of SECC materials in Midden M might suggest that this group participated in a revitalization movement. In this context, it was reasonable to hypothesize that Guale living outside the mission system or other venues of directed change continued to make traditional paddles and pots after the mid-16th century (Saunders and Russo 1988). However, the proximity of the Meeting House Fields site to the mission (they were just under 2 km apart), the absence of any trade

goods (though our sample of the site materials was admittedly small), and the lack of any transitional attributes in the pottery assemblage would appear to make this hypothesis untenable. Cluster 2 materials, then, probably date to the middle to late 16th century. The peoples of the terminal occupation at Meeting House Fields could have been directly antecedent to those at the mission of Santa Catalina or separated from them by a single generation. It should be noted, though, that this discussion highlights our inability to discriminate between late Pre-Columbian, Contact, and Colonial period sites except by our own preconceptions.

There were few surprises in the descriptive data amassed here. Surface decorations and rim treatments were similar to those described elsewhere. There were a few exceptions. Nodes, often considered an attribute restricted to the early Irene phase, were recovered from the relatively late contexts in Cluster 1. However, as discussed previously, this treatment is found as a rare occurrence in later contexts. Though some researchers argue that folded rims were present only in Colonial period contexts, one or two were present in Cluster 2, though they did not resemble the folded, punctated rims that define the succeeding Altamaha phase. Vessel forms were consistent with the late Irene phase, with the exception of the recovery of a possible "bean pot" handle and the lack of carinated bowls. Other attributes, such as the relative percentages of rectilinear vs. curvilinear stamping or the percentage of stamped sherds in which the dot forming the hub of the filfot cross, are not generally reported. Those data were prepared to answer specific questions concerning microchange in design motifs from the Irene phase to the Mission period Guale. Data from the Santa Catalina Mission on St. Catherines Island, Georgia are the focus of the next chapter.

CHAPTER 6

MISSION SANTA CATALINA, ST. CATHERINES ISLAND, GEORGIA

As discussed in Chapter 1, the Guale coast was targeted quite early in the Spanish colonization effort; the Spanish struggle to secure the area against first French and then British encroachment attests to its perceived importance. Despite its pre-eminent position, the early history of the Santa Catalina mission is obscure.

Pedro Menéndez de Avilés, founder of St. Augustine, personally met with the chiefs of Guale and Orista in 1566, and at that time established a garrison in the town of Guale. The location of this garrisoned town is disputed. It may have been on the inland side of Ossabow or Skidaway Island as Jones (1978:181, 1980:217) believed, or on St. Catherines Island (Hann 1990b:13). The first missionaries, the Jesuits, arrived in Guale in 1568. Not surprisingly, the first documented epidemic appeared shortly thereafter, in 1569-1570. In the latter year, the Jesuits abandoned their missionary efforts in La Florida.

The first Franciscan missionaries arrived in Guale in 1573. One of this group baptized the chief of Guale and his wife in 1575 (Jones 1978:182), just before the rebellion of 1576. After the rebellion, the Guale coast was left without a stable mission presence until 1594-1595, when Santa Catalina de Guale was re-established, this time presumably on St. Catherines Island (Hann 1990b:24; Jones 1978:183; cf. Geiger 1937).

The location of this second Santa Catalina is also unclear. According to Hann (1990b:24), the mission was at Asopo (see below), some distance from the principal town of Guale. Asopo disappeared from Spanish records after the Guale rebellion of 1597. When the church was

again rebuilt (by 1604 and apparently without Spanish impetus), it was described as being in the village of the *mico* of Guale.

Archaeological evidence indicates that the second and third Santa Catalina missions were built on the same site. A 20% transect survey of St. Catherines Island, conducted by David Hurst Thomas of the American Museum of Natural History (Thomas 1987, 1988a, 1988b), located only one possible mission site. At that site, there was good archaeological evidence for two Mission period occupational episodes. There was unequivocal evidence that the earlier of the two missions was burned, suggesting that it was the mission at the time of the 1597 rebellion. A second complex of buildings was erected over the first. These too were burned. This later burning correlates with the known Spanish destruction of Santa Catalina prior to the abandonment of the mission after the Yamassee attack of 1680.

Evidence from the mission compound (the only area of the site intensively excavated to date) suggested that the site was not occupied in the Irene phase. There were few, if any subsurface features associated with the Irene phase and little or no Irene phase pottery. This would seem to lend credence to the idea that the late 16th century mission was not founded in the chief's town. Of course, the compound could have been established in a plaza area, or the site may have been cleaned before the Spanish buildings were constructed. Planned research in the pueblo area will help to determine whether or not the mission was originally founded in an extant aboriginal town.

Jerald Milanich (Florida Museum of Natural History, personal communication, 1991) has suggested that Asopo (see above) was Ossabaw Island. If so, then the third mission was first burned in an incident that has not yet come to light. For the present, the analysis of the mission pottery assemblages will be interpreted in the time frame established by Thomas (1988b:40-41).

Descriptions of the site excavation methodology and the resulting definition of the buildings, including architectural characteristics, have been extensively detailed elsewhere (Thomas 1987, 1988a, 1988b;

Saunders 1990). Briefly then, the most visible set of structures were those from the 17th century occupation. Burned wattle and daub rubble delineated the walls of a church, a convento, and a kitchen. All three structures were aligned in a quadrangle pattern on an orientation about 45 degrees west of north (Figure 6.1).

Low level aerial photography initially suggested that two conventos were present. A visible drip line from the earlier structure ran about 10 degrees off the orientation of the burned daub rubble of the later structure. Excavation confirmed the presence of the two structures. The evidence consists of two sets of postholes, one with clean fill representing the early substructural foundation and oriented with the drip line, and one set of rubble-filled postholes (the rubble derived from the remains of the earlier structure) oriented with the burned daub rubble of the later building.

Stratigraphy for the church and kitchen was not as clear. The presence of clean and rubble-filled postholes along the walls of the church indicated that the early and later structures were superimposed. However, the use of different building materials in different parts of the church, the addition of wall trenches, and burial activity within the church have obscured the relationship of many of the features. The kitchen was apparently a 17th century addition to the mission compound (Thomas 1988a:103, 1988b:42).

During excavation, each structure was divided into a series of 2X2 m units. These were originally aligned with a magnetic north grid (the A grid), though once the layout of the buildings was understood, the grid was shifted to align with the buildings (the B grid). The A zone corresponds to the soil above the daub rubble of the buildings; A zone materials were excavated on the A grid. Similarly, the B zone was defined as the soil associated with the building rubble and below to sterile tan sand. B zone materials were excavated on the B grid (see Thomas 1987:145, fn 1). Pottery samples were taken from all structures and analyzed by the author. For the church, a set of 16 systematically unaligned 2X2 m units within the structure were chosen to be analyzed; A

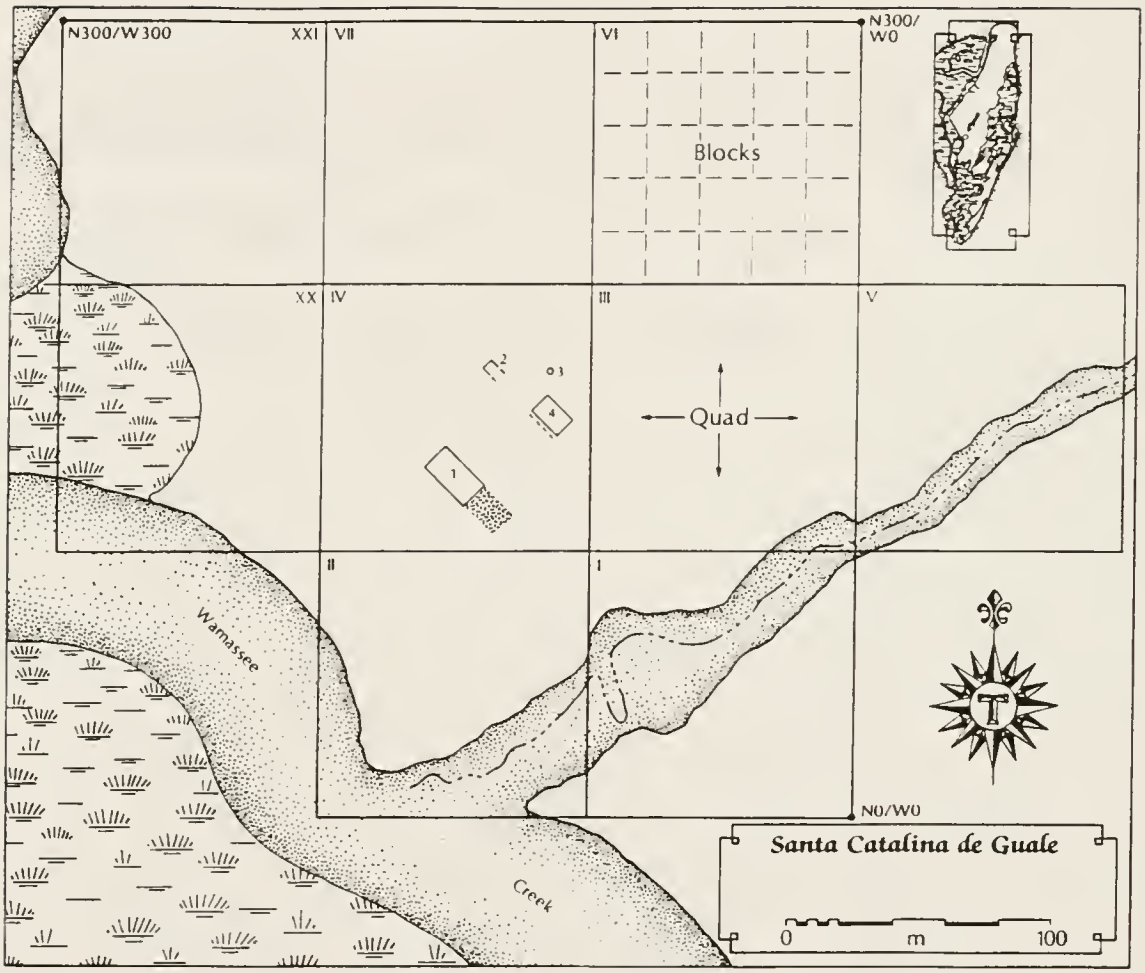


Figure 6.1. Site Map, Santa Catalina, Georgia.
1) Church; 2) Kitchen; 3) Well; 4) Convento (Thomas 1987:106, Figure 18).

and B grid units were matched up as closely as possible. All pottery from those units was analyzed, though it was ultimately decided that only zone material would be used in the analysis.

Sampling strategy for the late convento assemblage was similar to that of the church--A zone materials from 21 units and B zone materials from another 12 units from the convento were analyzed. Fewer B zone proveniences were analyzed due to time constraints and the fact that there was little material in that zone away from daub debris. The few C zone (tan sand) proveniences that contained Altamaha phase materials in the selected units were included in this study. Those few artifacts were added to the B zone materials in the tables that follow. In addition, the pottery from 48 postholes was analyzed for early occupation materials.

The kitchen area was excavated differently from the two other structures. Initially, four test pits (TP) were placed in the area that would prove to be the southwest corner of the building. Materials from two of these, TP 1 and TP 2, were analyzed. These units came down on a 4 X 3 m oval area filled with refuse (Feature 64). The "semi-subterranean" floor of this feature appeared to have been covered several times with clay. Several olive jar vessels were embedded in the clay and the clay surfaces were littered with food bone. The feature extended across four 2 X 2 m units. Pottery was analyzed from one of those (W121) below TP 1 and 2.

The area of the kitchen occupied by Feature 64 may have had a special function over and above domestic food preparation for the friars. Donna Ruhl (Florida Museum of Natural History, personal communication, 1991), the paleoethnobotanist for the project, noted that almost no charred floral remains other than wood (which was abundant) were recovered from Feature 64. The absence of charred seed and vegetable foods, along with the preponderance of deer bone from the area, suggest that this portion of the kitchen may have been used to prepare meat for storage or perhaps even for export. The location of this hypothetical activity within the kitchen, close to the convento,

suggests that it was tightly controlled by the friars. The pottery assemblage from the kitchen, then, may not have served a strictly domestic function, but should be predominantly utilitarian.

Most of these proveniences were screened with 1/8" screen. Some church A zone materials were apparently unscreened. Excavation procedures probably ensured that sherds larger than 1 cm square were recovered, however.

Stratigraphy, features, and structure function at Santa Catalina allowed for the analysis of pottery change along several lines. Pre-rebellion (1594-1597) pottery attributes were best studied from the least ambiguous contexts, that is, from the convento. Both early and late postholes provided closed contexts for the pottery of this earlier mission occupation. Initially the materials from the early occupation were compared with the results from the Meeting House Fields site. The data were then compared to the pottery recovered from the A and B zones. Since the site appeared to have been cleaned before the second convento was erected, pottery from both these strata was considered late. Though there was no known Native American occupation of the site after it was abandoned in 1680, the A zone and B zone materials were analyzed separately to determine if there were any differences in pottery attributes. These were then compared to the feature materials.

The well-defined structure functions also provided the opportunity to determine variability in aboriginal ceramics within different contexts of use. Examining change within these functional contexts was considered imperative for understanding the role of, and by extension the possible reasons for, change in Guale Indian pottery in the overall mission context.

For instance, given the fact that Santa Catalina appeared to have been a relatively well-supplied mission, would there have been no necessity to use aboriginal wares in the church? If aboriginal wares were used, to what extent were their forms modified to conform to Spanish ideals and how did this formal change affect both technological and stylistic attributes?

Similarly, were aboriginal wares incorporated into the domestic life of the friars in the convento? Data from St. Augustine indicated that in Spanish residences there, utilitarian ceramics were almost exclusively aboriginal and apparently unmodified, while serving dishes were European (Deagan 1983). Would the friars have also adopted this pattern, or would their commitment to poverty preclude the use of European ceramics? If serving wares were aboriginal, to what extent did the friars promote change (either formal or decorative) in the Indian pottery made for the friar's own use?

Finally, the kitchen area provided an assemblage of pottery with (presumably) only utilitarian functions. What forms were used there? Would they have been modified to prepare foods to Spanish tastes? How would they compare with contexts of use imbued with more ideotechnic or sociotechnic (sensu Binford:1962) functions?

It was expected that different suite of vessel forms would appear in each structure. Since the Meeting House Fields material displayed some correlation of form and decoration, surface treatment and rim treatment were expected to be correlated with structure as well.

Results: The Pre-Rebellion Component

Unfortunately, the sample size from the pre-rebellion component was small (n=249). Nevertheless, there was enough data to observe that the change from Irene to Altamaha phase pottery was abrupt, at least at this mission site. The most obvious datum was that, even in this early component, curvilinear stamping was not present. Since curvilinear stamping did appear in later contexts in very minor amounts, the total absence of curvilinear stamping from the pre-rebellion context must be partially attributable to small sample size. Nevertheless, the assemblages from Meeting House Fields yielded between 30% (count) and 40% (weight) curvilinear stamping. The replacement of Irene filfot stamping with the rectilinear stamping of Altamaha phase pottery occurred either simultaneously (archaeologically-speaking) with the

beginning of the mission occupation or in the few years between the abandonment of Meeting House Fields and the mission occupation.

There were other surprising differences from the Irene phase. The incidence of stamping increased over that from Cluster 2 at the Meeting House Fields site (Table 6.1). In fact, the percentages were more like those from Cluster 1. (This was true not only for the early context, but for the later mission contexts as well studied.) Early context plain wares decreased in frequency as compared to both Clusters 1 and 2, though burnished plain wares reflected the values for Cluster 2. Incising also decreased in frequency. These results were contrary to those of Braley et al. (1986) at Harris Neck, where plain and incised wares increased in the Colonial period (A.D. 1650) component. Check stamping, absent from Meeting House Fields Irene phase components, appeared in very limited amounts in the early context. The appearance of new "trade wares," the types St. Johns Check Stamped and St. Johns Plain, may have inspired the production of a native check stamping.

The tempo of change reflected in the dramatic decrease in curvilinear stamping was also apparent in rim treatments. While the difficulty of distinguishing some applique rim treatments from true folded rims at Meeting House Fields was noted (Chapter 4), there was no such ambiguity at Santa Catalina. There were no applique rims. Unfortunately, the rim sample (n=18, Table 6.2) from the early context was too small to use for statistical comparisons. Some general observations could be made, however. Even in this early period, the most frequent rim treatment was the folded rim. These were most often cane punctated, but could also be fingernail punctated, stick punctated, or plain. Unfolded, plain rims were the next most common rim treatment. There was only one decorated rim, and one ovoid pellet was recovered.

Vessel Form Analysis

The minimum number of vessels in the early context was just fourteen (Table 6.3; it should be noted that straight rims must be interpreted differently in the later contexts than at Meeting House

Table 6.1. Early Convento Surface Decoration.

MASTER CODE																			
STAMP				PLAIN				BURNISHED PLAIN				INCISED				CHECK			
COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
201	80.7	2389.1	85.5	22	8.84	207.3	7.42	14	5.62	90.8	3.25	7	2.81	53.6	1.92	2	0.80	40.5	1.45

MASTER CODE							
ST JOHNS				ALL			
COUNT		WEIGHT		COUNT		WEIGHT	
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
3	1.20	13.4	0.48	249	100	2794.7	100

Table 6.2. Early Convento Rim Style.

RIM TREATMENTS																							
PLAIN				DECORATED				PELLET/NODE				FOLDED											
STYLE				STYLE				STYLE				STYLE											
PLAIN				INCISED				DECORATED				PELLET/NODE				FOLDED PLAIN				FOLDED CANE			
COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
6	100	79.4	100	2	100	19.3	100	1	100	3.6	100	1	100	17.9	100	1	100	4.4	100	3	100	32.7	100

RIM TREATMENT													
FOLDED													
STYLE													
FOLDED FINGERNAIL				FOLDED STAMP				FOLDED STICK				ALL	
COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT	WEIGHT
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM PCT	SUM PCT
1	100	11.5	100	2	100	11.2	100	1	100	4.2	100	18 100	184.2 100

Table 6.3. Early Convento Vessel Forms by Surface Decoration.

	MASTER CODE											
	UID		STAMP		PLAIN		B PLAIN		INCISED		ALL	
	COUNT		COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
VESSEL FORM												
BOWL	1	25.0	2	50.0	.	.	1	25.0	.	.	4	100
STRAIGHT	1	20.0	2	40.0	1	20.0	1	20.0	.	.	5	100
JAR	1	50.0	1	50.0	.	.	.	.	.	.	2	100
CARINATED BOWL	.	.	1	50.0	.	.	.	.	1	50.0	2	100
BRIMMED VESSEL	.	.	.	.	.	.	1	100	.	.	1	100
ALL	3	21.4	6	42.9	1	7.1	3	21.4	1	7.1	14	100

Fields. At all Santa Catalinas, the straight rim form is an unidentified category.) Simple bowls were the most prevalent identifiable form; with the two carinated bowls and the brimmed vessel, serving bowls were the most common form in the early convento proveniences. One of the simple bowls had a scalloped lip.

The brimmed vessel, a colono-ware form, was burnished and red filmed on the interior and exterior. In fact, three, or 21%, of these early vessels were red filmed, a seemingly high proportion probably related to sample size (see below). Filming occurred on the brimmed vessel noted above, one interior and exterior red filmed, straight-rimmed vessel (probably another brimmed vessel), and an unidentified interior-zoned red filmed and exterior-red filmed unidentified bowl.

The small sample size of the early context MNV may seriously affect the interpretation of the analysis of vessel form by other treatments. Nevertheless, some general observations can be made. Like Meeting House Fields, stamping was the most common surface decoration and it was applied to all forms except the brimmed vessel. The relatively high proportion of burnished plain vessels must be seen as a result of an inadequate sample.

All of the vessels defined were grit tempered save one, the brimmed vessel, which was sand tempered. Temper by sherd count (Table 6.4) indicated that this attribute was not artificially depressed by the MNV approach; only 9 of 249 sherds were sand tempered. None of the sherds recovered from the early context were sooted.

Other Attributes

The sherd count values for burnishing and red filming are given in Table 6.5. Unburnished interiors were present on less than 20% of the sherds, a value more or less consistent with the Meeting House Fields total. Red filming and zoned red filming of interiors and exteriors was present at only 1% of the sample, indicating that the proportion of red filming indicated in the vessel form analysis was inflated.

Table 6.4. Early Convento Temper (Sherd).

TEMPER								ALL			
GRIT				SAND							
COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
237	96.3	2728.7	98.1	9	3.7	52.6	1.9	246	100	2781.3	100

frequency missing=3

Table 6.5. Early Convento Surface Finishes.

INTERIOR FINISH												EXTERIOR FINISH									
UNBRN		IBRN		IEBRN		IZRF		IERF		ALL		UNBRN		EBRN		ERF		ALL			
COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT			
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT		
46	18.6	190	76.9	8	3.2	1	0.4	2	0.8	247	100	224	90.7	15	6.1	8	3.2	247	100		

unbrn=unburnished
ibrn=interior burnished
iebrn=interior/exterior burnished
izrf=interior zoned red filmed
ierf=interior and exterior red filmed
ebrn=exterior burnished
erf=exterior red filmed

Only 4 of the 8 folded rims were measurable; mean rim depth was 17.7 mm. This was considerably deeper than the base of the Irene phase applique strips. Though it is probably unwise to make too much of this considering the small sample size, it is worth noting that the zone of rim decoration had moved down the vessel at this relatively early date.

Central dots (Table 6.6) were visible in about the same percent of sherds as was found in the late Irene phase, or around 7%. This indicated that, as Brewer (1985) originally suggested, the central dot motif was the primary motif used at Santa Catalina.

Land and groove widths for the pottery from the early context were 2.0 and 2.4 mm, respectively. This represents an increase in the size of both attributes from the Cluster 2 Meeting House Fields values. Since pot lands were paddle grooves, the increase in land size might reflect the use of a different paddle carving tool.

Incising was also characterized as bold, with designs comprised of few lands and grooves. Designs were more elaborate than those at Meeting House Fields and they included the use of punctation with incising.

Summary and Implications

The analysis of the early context in the convento at Santa Catalina indicated that the transition from Irene phase to Altamaha phase wares must be seen as relatively abrupt, at least in archaeological time. In the proveniences examined, there were no Irene-like stamped wares. These conclusions will be compared with the findings of other researchers in Chapter 8.

Before 1600, the brimmed plate and/or bowl was incorporated into the suite of traditional vessel forms (other colono-ware forms, such as foot rings and handles, were not found in the early component assemblage). This new form, as well as more traditional forms, was red filmed. Red filming was not unknown in interior Georgia Lamar societies prior to the Mission period. It is reported as a minority

Table 6.6. Early Convento, Frequency of Dots.

MASTER CODE											
STAMPED				DOT				ALL			
COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
165	93.2	1818.0	85.1	12	6.8	318.3	14.9	177	100	2136.3	100

treatment in Mississippian phase components in the Russell Reservoir, for instance (Anderson and Joseph 1988:250). However, red filming was not present in coastal Lamar sequences until the Mission period (contra Larson 1953:24). For this reason, red filming can be considered a development of the Mission period for Guale Indian pottery. Why it should appear (or re-appear) in the Mission period is something of a mystery. It might be worth noting that the Spanish had admired Taino Indian red filmed wares in the Caribbean: "Las Casas also noted and appreciated Taino pottery, writing that the Indians would offer the admiral [Columbus] 'water in earthenware jars, very well done and painted on the outside like red ochre'" (Las Casas 1965:273, quoted in Garcia-Arevalo 1990:276). Red slipped burnished wares also had a long history in Spain (Foster 1960:88-92). The evanescent presence of red filming in Pre-Columbian times, and the above quotes, might indicate that red filming was encouraged by the Spanish.

Rim treatments also changed abruptly. While the technique may have been experimented with in the prehistoric, it appears that folded rims remained a curiosity in the late Irene phase, at least on St. Catherines Island. Applique strips, which had constituted around 30% of the rim treatments in the late Irene, disappeared completely before the early mission occupation. Again, this is curious. Unless there were some compelling reason to change, one would expect that a stylistic element would "drift" rather than be suddenly replaced. Perhaps the answer lies in a reconsideration of the rim strip and the folded rim. They might very well have a function, such as providing better purchase when moving a vessel. The rim fold, one piece with the vessel, would give the rim more strength, and would be far less prone to break off than the applique strip. That said, and again considering the abrupt disappearance of the strip, one wonders if the use of the folded rim could have been promoted by the Spanish.

This line of thought can be extended even further. Why should the design element change so abruptly? There are at least three possibilities, one functional, one social, and one ideological. First,

paddles do have a function: to compress the coils of the pot and force air out of the fabric of the vessel. Paddles with deeper, wider lands would do this better than the fine land and grooved Irene phase paddles. The friars might have asked that the lands and grooves be carved wider and deeper. If the paddle remained the same size and proportions of the design were kept the same, the result would be that the terminal, curvilinear elements would have to drop out.

The sociological reason is the more common explanation for the change in design content and execution. Perhaps by analogy to what is known to happen to traditional pottery in market contexts (e.g., Lathrap 1976:203-207; Rice 1987:454), the reasoning is that the neophytes no longer had time to carve their intricate designs, resulting in design simplification with bolder elements. However, the cases are not truly analogous. The studies on market effects have all been done on painted pottery. The same time constraints do not apply to paddle stamped pottery because a single paddle can be used on a multitude of pots. Further, the presence of literally hundreds of sherd hones on late Irene phase sites (Larson 1978; Saunders and Russo 1988) points to considerable native expertise in wood working. Carving a paddle probably did not take that long. In any case, because pre-existing paddles could have been brought to the site, this explanation fails to explain the abrupt fall-off in frequency of filfot cross motifs.

Finally there is a possible ideological rationale for the change. If the Spanish understood that the Irene filfot cross was a cosmological symbol representing the sun deity, the friars could have directed that the symbol no longer be carved (or if the Guale were truly converted they might have ceased carving the design). This explanation, like the one above, does not serve when it is demonstrated that the central dot motif was still the principal motif throughout the mission occupation. It is possible that the Guale dropped the more noticeable curvilinear element and quietly went on producing the world symbol, confident that the friars (not unlike archaeologists of the distant future) would not

recognize it. Wider and deeper lands and grooves would serve to obliterate the design all the better.

While this kind of subterfuge is consistent with the sort of passive resistance described by Scott (1985), we lack independently derived data to choose between these (not necessarily mutually exclusive) alternatives. However, the absolute and abrupt replacement of Irene phase wares argues for some more direct intervention on the part of the Spanish than has usually been attributed to them. Keeping in mind that the Spanish quickly set up potting industries everywhere else they settled (Deagan 1983:234), directed change in all facets of native pottery production among the Guale is not far-fetched.

The Seventeenth-Century Ceramic Assemblage

Data from the early component confirmed that a fully new pottery complex, Altamaha, was in use at the mission compound before the 17th century. That complex changed little, if at all, during the next 80 years at Santa Catalina.

Sample size for the late component was large (n=2476) and adequate for an analysis of pottery attributes by mission structure. The attribute with the largest sample size, surface decoration, was analyzed by structure and zone to determine whether or not there was any significant difference between the assemblage directly associated with the daub rubble of the church and convento (B zone) and that overlying them (A zone). Data for the kitchen could not be segregated in this manner and the assemblage from that area was analyzed as a single provenience. These data are presented in Table 6.7.

Data from the convento suggested that the relative frequencies of plain sherds increased through time, as indeed would be expected from work at other sites. However, a comparison of the values for these and other surface decorations between the church and the convento indicated that this was not true for the site as a whole. The frequency of plain wares decreased slightly (count) or was stable (weight) at the church and the frequency of stamped and incised wares did not change

Table 6.7. Surface Decoration by Structure/Zone.

CHURCH

	MASTER CODE																				ALL			
	STAMP				PLAIN				BURNISHED PLAIN				INCISED				CHECK							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
ZONE																								
A	208	69.1	2666.7	71.6	40	13.3	431.7	11.6	25	8.31	311.1	8.35	18	5.98	212.0	5.69	10	3.32	103.5	2.78	301	100	3725.0	100
B	244	68.9	3157.8	73.8	55	15.5	491.2	11.5	19	5.37	146.9	3.44	21	5.93	296.8	6.94	15	4.24	183.3	4.29	354	100	4276.0	100
ALL	452	69.0	5824.5	72.8	95	14.5	922.9	11.5	44	6.72	458.0	5.72	39	5.95	508.8	6.36	25	3.82	286.8	3.58	655	100	8001.0	100

KITCHEN

	MASTER CODE																								ALL			
	STAMP				PLAIN				BURNISHED PLAIN				INCISED				CHECK				ST JOHNS							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
ZONE																												
ALL	604	77.8	9007.7	81.6	45	5.80	347.0	3.14	26	3.35	260.8	2.36	42	5.41	599.8	5.43	31	3.99	695.7	6.30	28	3.61	126.6	1.15	776	100	11038	100
ALL	604	77.8	9007.7	81.6	45	5.80	347.0	3.14	26	3.35	260.8	2.36	42	5.41	599.8	5.43	31	3.99	695.7	6.30	28	3.61	126.6	1.15	776	100	11038	100

Table 6.7. (continued).

CONVENTO

	MASTER CODE																											
	STAMP				PLAIN				BURNISHED PLAIN				INCISED				CHECK				ST JOHNS				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
ZONE																												
A	486	67.5	3881.0	70.8	133	18.5	968.2	17.7	24	3.33	142.6	2.60	44	6.11	316.7	5.78	15	2.08	153.8	2.80	18	2.50	21.2	0.39	720	100	5483.5	100
B	124	72.5	1387.1	81.8	21	12.3	137.2	8.09	7	4.09	33.6	1.98	16	9.36	121.7	7.18	1	0.58	11.6	0.68	2	1.17	3.8	0.22	171	100	1695.0	100
ALL	610	68.5	5268.1	73.4	154	17.3	1105.4	15.4	31	3.48	176.2	2.45	60	6.73	438.4	6.11	16	1.80	165.4	2.30	20	2.24	25.0	0.35	891	100	7178.5	100

significantly. These data indicated that the two zones could be combined for further analysis.

While there was no stratigraphic difference in the frequency of surface decoration, frequency distributions and a chi-square test (Table 6.8, 6.9) indicated that surface decorations (as well as the presence of St. Johns pottery, Table 7) were not distributed equally in space. Burnished plain wares were "over-represented" in the church; St. Johns pottery was absent. This was an intuitively pleasing result, but it should be emphasized that no surface decoration was restricted to a single structure; stamping was overwhelmingly the most frequent surface decoration at the church as it was elsewhere on the site.

Plain wares were more prevalent at the convento than expected. In contrast to the church, St. Johns wares were present in relative abundance in the convento. Approximately half of the St. Johns pottery recovered was from the convento and the other half was from the kitchen area. In the kitchen area, plain wares were "under-represented"; the deviation from the expected frequency yielded the highest cell chi-square value in the test. This, too, conformed to the conventional wisdom, i.e., that cooking wares were predominantly stamped vessels. Again, however, note that decoration not commonly associated with cooking pots--incising and interior/exterior burnishing--were present in proportions consistent with their frequency.

Vessel Form Analysis

One hundred and fifty-nine vessels were defined out of the sherd assemblage. Though the different sampling procedures used for the structures preclude a reliable comparison between structures on the basis of raw frequency, it is not surprising that the largest number of vessels came from the kitchen area.

Forms included all those from the late Irene phase as well as carinated bowls, brimmed vessels, and a restricted jar with a wide mouth (Table 6.10). Vessel form was correlated with the same surface decorations as in the late Irene phase (Table 6.12; all jars were

Table 6.8. Structure by Surface Decoration.

STRUCTURE MASTER CODE

Frequency / Percent / Row Pct / Col Pct	STAMP	PLAIN	B PLAIN	INCISED	Total
CHURCH	477	95	44	39	655
	20.98	4.18	1.93	1.72	28.80
	72.82	14.50	6.72	5.95	
	27.45	32.31	43.56	27.66	
KITCHEN	635	45	26	42	748
	27.92	1.98	1.14	1.85	32.89
	84.89	6.02	3.48	5.61	
	36.54	15.31	25.74	29.79	
CONVENTO	626	154	31	60	871
	27.53	6.77	1.36	2.64	38.30
	71.87	17.68	3.56	6.89	
	36.02	52.38	30.69	42.55	
Total	1738	294	101	141	2274
	76.43	12.93	4.44	6.20	100.00

Table 6.9. Chi-Square Test, Structure by Surface Decoration.

STRUCTURE MASTER CODE

Frequency / Expected / Deviation / Cell Chi-Square	STAMP	PLAIN	B PLAIN	INCISED	Total
CHURCH	477	95	44	39	655
	500.61	84.683	29.092	40.613	
	-23.61	10.317	14.908	-1.613	
	1.1136	1.2568	7.6396	0.0641	
KITCHEN	635	45	26	42	748
	571.69	96.707	33.223	46.38	
	63.31	-51.71	-7.223	-4.38	
	7.011	27.647	1.5702	0.4136	
CONVENTO	626	154	31	60	871
	665.7	112.61	38.686	54.007	
	-39.7	41.391	-7.686	5.9934	
	2.3674	15.213	1.5269	0.6651	
Total	1738	294	101	141	2274

STATISTICS FOR TABLE OF STR BY MCODE

Statistic	DF	Value	Prob
Chi-Square	6	66.488	< 0.001

Table 6.10. Structure by Vessel Form.

STRUCTURE VESSEL FORM

Frequency / Percent / Row Pct / Col Pct	BOWL	STRAIGHT	X UNRES	X REST	X UID	RSMJAR	CARBOWL	BRIM	Total
CHURCH	16	7	2	1	6	2	6	6	46
	10.06	4.40	1.26	0.63	3.77	1.26	3.77	3.77	28.93
	34.78	15.22	4.35	2.17	13.04	4.35	13.04	13.04	
	41.03	20.00	40.00	33.33	19.35	40.00	42.86	22.22	
KITCHEN	14	17	2	1	15	2	6	9	66
	8.81	10.69	1.26	0.63	9.43	1.26	3.77	5.66	41.51
	21.21	25.76	3.03	1.52	22.73	3.03	9.09	13.64	
	35.90	48.57	40.00	33.33	48.39	40.00	42.86	33.33	
CONVENTO	9	11	1	1	10	1	2	12	47
	5.66	6.92	0.63	0.63	6.29	0.63	1.26	7.55	29.56
	19.15	23.40	2.13	2.13	21.28	2.13	4.26	25.53	
	23.08	31.43	20.00	33.33	32.26	20.00	14.29	44.44	
Total	39	35	5	3	31	5	14	27	159
	24.53	22.01	3.14	1.89	19.50	3.14	8.81	16.98	100.00

x unrest=excurvate unrestricted
x rest=excurvate restricted
x uid=excurvate unidentified
rsmjar=restricted mouth jar
car bowl=carinated bowl
brim=brimmed vessel

combined). Incising was correlated with bowls, both simple and carinated, while jars were most commonly stamped. Again, none of these associations were 100%. Brimmed vessels bore all three categories of surface decoration, though, like bowls and carinated bowls, they were most frequently incised. This indicates that brimmed vessels, in general, were assimilated into the design categories of more traditional bowls. One unusual brimmed vessel had a strongly notched rim (Figure 6.2). A single handle was found in the convento, 1 came from the kitchen, and 4 handles were recorded in the pottery sample from the church. No sherds in the sample selected had a foot ring, though one was recovered from the kitchen area in a provenience that was not included in this study.

In light of the fact that surface decoration (by sherd) was associated with structures, and vessel forms were associated with surface decoration, it was surprising that a chi-square test indicated no association between vessel form and structure (Table 6.11). The chi-square test of structure by surface decoration was redone using only the MNV sample and the result indicated no difference in distribution (Table 6.14). In fact, the relative percentages of surface decorations changed quite a bit when analyzed by MNV. Incising rose from just 6% by sherd count (Table 6.8) to nearly 30% by MNV (Table 12). This is largely because incised vessels show a great deal more individual variation in execution than stamped vessels and it is easier to tell them apart. Because the assemblage from the church was not a 100% sample and because the MNV method no doubt depressed the total number of stamped and plain vessels present, it seems best to take the sherd data at face value and conclude that there was a difference in the distribution of surface decoration at the site.

If a difference in the distribution of surface decoration is accepted, it might be concluded from this series of tests that a limited range of forms was adapted to function by applying an appropriate decoration, and/or that structures had overlapping functions. For instance, all three structures might be expected to have numerous

Table 6.11. Chi-Square Test, Structure by Vessel Form.

STRUCTURE / VESSEL FORM Frequency Expected Deviation Cell Chi-Square	BOWL	STRAIGHT	JAR	CARBOWL	BRIM	Total
CHURCH	16	7	11	6	6	46
	11.283	10.126	12.73	4.0503	7.8113	
	4.717	-3.126	-1.73	1.9497	-1.811	
	1.972	0.9649	0.235	0.9385	0.42	
KITCHEN	14	17	20	6	9	66
	16.189	14.528	18.264	5.8113	11.208	
	-2.189	2.4717	1.7358	0.1887	-2.208	
	0.2959	0.4205	0.165	0.0061	0.4348	
CONVENTO	9	11	13	2	12	47
	11.528	10.346	13.006	4.1384	7.9811	
	-2.528	0.6541	-0.006	-2.138	4.0189	
	0.5545	0.0414	304E-8	1.1049	2.0237	
Total	39	35	44	14	27	159

STATISTICS FOR TABLE OF STR BY VF

Statistic	DF	Value	Prob
Chi-Square	8	9.577	0.296

Table 6.12. Vessel Form by Surface Decoration.

VESSEL SURFACE DECORATION

Frequency / Percent / Row Pct / Col Pct	UID	STAMP	PLAIN	B PLAIN	INCISED	CHECK	Total
BOWL	1	11	4	3	20	0	39
	0.63	6.92	2.52	1.89	12.58	0.00	24.53
	2.56	28.21	10.26	7.69	51.28	0.00	
	5.26	16.92	25.00	30.00	43.48	0.00	
STRAIGHT	11	16	2	3	3	0	35
	6.92	10.06	1.26	1.89	1.89	0.00	22.01
	31.43	45.71	5.71	8.57	8.57	0.00	
	57.89	24.62	12.50	30.00	6.52	0.00	
JAR	6	22	6	3	4	3	44
	3.77	13.84	3.77	1.89	2.52	1.89	27.67
	13.64	50.00	13.64	6.82	9.09	6.82	
	31.58	33.85	37.50	30.00	8.70	100.00	
CAR BOWL	0	6	0	0	8	0	14
	0.00	3.77	0.00	0.00	5.03	0.00	8.81
	0.00	42.86	0.00	0.00	57.14	0.00	
	0.00	9.23	0.00	0.00	17.39	0.00	
BRIM	1	10	4	1	11	0	27
	0.63	6.29	2.52	0.63	6.92	0.00	16.98
	3.70	37.04	14.81	3.70	40.74	0.00	
	5.26	15.38	25.00	10.00	23.91	0.00	
Total	19	65	16	10	46	3	159
	11.95	40.88	10.06	6.29	28.93	1.89	100.00

Table 6.13. Chi-Square Test, Vessel Form by Surface Decoration.

VESSEL FORM MASTER CODE

Frequency / Expected / Deviation / Cell Chi-Square	STAMP	PLAIN	INCISED	Total
BOWL	25	12	39	76
	36.348	14.319	25.333	
	-11.35	-2.319	13.667	
	3.5428	0.3755	7.3728	
STRAIGHT	16	5	3	24
	11.478	4.5217	8	
	4.5217	0.4783	-5	
	1.7813	0.0506	3.125	
JAR	25	9	4	38
	18.174	7.1594	12.667	
	6.8261	1.8406	-8.667	
	2.5639	0.4732	5.9298	
Total	66	26	46	138

STATISTICS FOR TABLE OF VF BY MCODE

Statistic	DF	Value	Prob
Chi-Square	4	25.215	< 0.001

Table 6.14. Chi-Square Test, Structure by Surface Decoration (Vessel Form).

STRUCTURE MASTER CODE

Frequency / Expected / Deviation / Cell Chi-Square	STAMP	PLAIN	INCISED	Total
CHURCH	23	9	14	46
	22	8.6667	15.333	
	1	0.3333	-1.333	
	0.0455	0.0128	0.1159	
KITCHEN	28	7	17	52
	24.87	9.7971	17.333	
	3.1304	-2.797	-0.333	
	0.394	0.7986	0.0064	
CONVENTO	15	10	15	40
	19.13	7.5362	13.333	
	-4.13	2.4638	1.6667	
	0.8918	0.8055	0.2083	
Total	66	26	46	138

STATISTICS FOR TABLE OF STR BY MCODE

Statistic	DF	Value	Prob
Chi-Square	4	3.279	0.512

Note: both tables--master code=unidentified deleted; burnished plain combined with plain.

storage jars, etc. These two hypotheses are not necessarily mutually exclusive. The former hypothesis, that form was modified by decoration to serve a specific function, is given some weight by the fairly high probability that rim treatment was associated with structure (Table 6.15, 6.16). There were few folded rims in the church as compared with the convento or the kitchen.

Rim style showed the same association with vessels as was described for both Meeting House Fields and the early convento component (see Appendix D for all rim styles for the late component). There was an association between form and rim treatment (Table 6.17, 6.18). Bowl (including brimmed bowls and plates) rims were predominantly plain, while jar rims were folded. The incidence of decorated vessels was very low. This late Pre-Columbian development appeared to have been truncated in the Mission period. One rim treatment fell under the pellet/node category. However, the applique really fit no existing definition. It was a large circular addition, more in the size range of a lug, and was heavily punctated.

Rim elaborations associated with the various forms are given in Table 6.19. Cane punctation remained the dominant elaboration, followed by fingernail punctation. Note that if a bowl had a folded rim, it was never punctated, though a few brimmed vessel rims were, and one carinated bowl rim was pinched.

One new rim elaboration appeared in the late component. This was "triangle punctate" (one unidentified punctate sherd at the Meeting House Fields site carried the comment "triangle"?). Six vessels bore this decoration. Unlike the other styluses used for punctation, the triangular stylus was used only on folded rims. Folded rims were also stamped with the same paddle as was used for the pot. There was a preponderance of cane punctation in the kitchen and stick impressions in the convento (Table 6.20).

Table 6.15. Structure by Rim Treatment.

STRUCTURE RIM TREATMENT

Frequency / Percent / Row Pct / Col Pct	PLAIN	DECORATE	PELNODE	FOLDED	Total
CHURCH	33	3	0	9	45
	22.00	2.00	0.00	6.00	30.00
	73.33	6.67	0.00	20.00	
	39.76	50.00	0.00	15.00	
KITCHEN	29	2	1	30	62
	19.33	1.33	0.67	20.00	41.33
	46.77	3.23	1.61	48.39	
	34.94	33.33	100.00	50.00	
CONVENTO	21	1	0	21	43
	14.00	0.67	0.00	14.00	28.67
	48.84	2.33	0.00	48.84	
	25.30	16.67	0.00	35.00	
Total	83	6	1	60	150
	55.33	4.00	0.67	40.00	100.00

Frequency Missing = 10

Table 6.16. Chi-Square Test, Structure by Rim Treatment.

STRUCTURE RIM TREATMENT

Frequency / Expected / Deviation / Cell Chi-Square	PLAIN	FOLDED	Total
CHURCH	34	9	43
	24.958	18.042	
	9.042	-9.042	
	3.2758	4.5315	
KITCHEN	28	30	58
	33.664	24.336	
	-5.664	5.6643	
	0.9531	1.3184	
CONVENTO	21	21	42
	24.378	17.622	
	-3.378	3.3776	
	0.468	0.6474	
Total	83	60	143

STATISTICS FOR TABLE OF STR BY RTREAT

Statistic	DF	Value	Prob
Chi-Square	2	11.194	0.004

Table 6.17. Vessel form by Rim Treatment.

VESSEL RIM TREATMENT

Frequency / Percent / Row Pct / Col Pct	PLAIN	DECORAT	PELNODE	FOLDED	Total
BOWL	34	0	1	3	38
	22.82	0.00	0.67	2.01	25.50
	89.47	0.00	2.63	7.89	
	40.96	0.00	100.00	5.08	
STRAIGHT	12	1	0	22	35
	8.05	0.67	0.00	14.77	23.49
	34.29	2.86	0.00	62.86	
	14.46	16.67	0.00	37.29	
JAR	7	2	0	32	41
	4.70	1.34	0.00	21.48	27.52
	17.07	4.88	0.00	78.05	
	8.43	33.33	0.00	54.24	
CAR BOWL	10	1	0	1	12
	6.71	0.67	0.00	0.67	8.05
	83.33	8.33	0.00	8.33	
	12.05	16.67	0.00	1.69	
BRIM	20	2	0	1	23
	13.42	1.34	0.00	0.67	15.44
	86.96	8.70	0.00	4.35	
	24.10	33.33	0.00	1.69	
Total	83	6	1	59	149
	55.70	4.03	0.67	39.60	100.00

Frequency Missing = 10

Table 6.18. Chi-Square Test, Vessel Form by Rim Treatment.

RIM TREATMENT VESSEL FORM

Frequency / Expected / Deviation / Cell Chi-Square	BOWL	STRAIGHT	JAR	CAR BOWL	BRIM	Total
PLAIN	34	12	7	10	20	83
	21.627	19.873	22.796	6.4296	12.275	
	12.373	-7.873	-15.8	3.5704	7.7254	
	7.0791	3.1192	10.945	1.9827	4.8621	
FOLDED	3	22	32	1	1	59
	15.373	14.127	16.204	4.5704	8.7254	
	-12.37	7.8732	15.796	-3.57	-7.725	
	9.9587	4.388	15.398	2.7892	6.84	
Total	37	34	39	11	21	142

STATISTICS FOR TABLE OF RTREAT BY VF

Statistic	DF	Value	Prob
Chi-Square	4	67.362	<0.001

Table 6.19. Vessel Form by Rim Elaboration.

VESSEL RIM ELABORATION

Frequency / Percent / Row Pct / Col Pct	PLAIN	INCISED	FINGER	CANE	STICK	TRIANGLE	FLD/ST	PINCH	Total
BOWL	17	21	0	0	0	0	0	0	38
	10.97	13.55	0.00	0.00	0.00	0.00	0.00	0.00	24.52
	44.74	55.26	0.00	0.00	0.00	0.00	0.00	0.00	
	33.33	43.75	0.00	0.00	0.00	0.00	0.00	0.00	
STRAIGHT	12	4	4	9	3	2	1	0	35
	7.74	2.58	2.58	5.81	1.94	1.29	0.65	0.00	22.58
	34.29	11.43	11.43	25.71	8.57	5.71	2.86	0.00	
	23.53	8.33	26.67	42.86	33.33	33.33	25.00	0.00	
JAR	7	4	10	11	4	4	3	0	43
	4.52	2.58	6.45	7.10	2.58	2.58	1.94	0.00	27.74
	16.28	9.30	23.26	25.58	9.30	9.30	6.98	0.00	
	13.73	8.33	66.67	52.38	44.44	66.67	75.00	0.00	
CAR BOWL	2	10	1	0	0	0	0	1	14
	1.29	6.45	0.65	0.00	0.00	0.00	0.00	0.65	9.03
	14.29	71.43	7.14	0.00	0.00	0.00	0.00	7.14	
	3.92	20.83	6.67	0.00	0.00	0.00	0.00	100.00	
BRIM	13	9	0	1	2	0	0	0	25
	8.39	5.81	0.00	0.65	1.29	0.00	0.00	0.00	16.13
	52.00	36.00	0.00	4.00	8.00	0.00	0.00	0.00	
	25.49	18.75	0.00	4.76	22.22	0.00	0.00	0.00	
Total	51	48	15	21	9	6	4	1	155
	32.90	30.97	9.68	13.55	5.81	3.87	2.58	0.65	100.00

Frequency Missing = 4

Table 6.20. Rim Elaboration by Structure.

STRUCTURE RIM ELABORATION

Frequency Percent Row Pct Col Pct	PLAIN	INCISED	FINGER	CANE	STICK	TRIANGLE	FOLD/ST	PINCH	Total
CHURCH	22	14	2	3	1	1	3	0	46
	14.19	9.03	1.29	1.94	0.65	0.65	1.94	0.00	29.68
	47.83	30.43	4.35	6.52	2.17	2.17	6.52	0.00	
	43.14	29.17	13.33	14.29	11.11	16.67	75.00	0.00	
KITCHEN	15	21	9	14	0	3	0	1	63
	9.68	13.55	5.81	9.03	0.00	1.94	0.00	0.65	40.65
	23.81	33.33	14.29	22.22	0.00	4.76	0.00	1.59	
	29.41	43.75	60.00	66.67	0.00	50.00	0.00	100.00	
CONVENTO	14	13	4	4	8	2	1	0	46
	9.03	8.39	2.58	2.58	5.16	1.29	0.65	0.00	29.68
	30.43	28.26	8.70	8.70	17.39	4.35	2.17	0.00	
	27.45	27.08	26.67	19.05	88.89	33.33	25.00	0.00	
Total	51	48	15	21	9	6	4	1	155
	32.90	30.97	9.68	13.55	5.81	3.87	2.58	0.65	100.00

Frequency Missing = 4

Other attributes

Though conspicuous, the amount of red and/or black filming was actually quite low (Table 6.21). Just 2.3% of the sherds were interior filmed; 25 sherds, or 1.0% had filming on the exterior. Only three of the MNV vessels were identified as filmed: 1 bowl, 1 excurvate rim jar, and 1 brimmed vessel. Though the numbers were small, it appeared that both interior and exterior filming was more common in the convento than in the other structures. Surprisingly, filming was no more common at the church than in the kitchen.

Another surprising find was that virtually none of the sherds analyzed were sooted on the interior or exterior. While this might have been expected in the church or even the convento, a high incidence of sooting was anticipated in the kitchen samples. As Table 6.22 shows, this was not the case.

Data from the late component indicated that the low incidence of sand tempering in the early convento component was not influenced by small sample size. Sand tempering was present in only 2-3% of the sample (Table 6.23). These figures represented quite a drop from the values for the Meeting House Fields site, where 20% (sherd count/weight) to 36% (vessel count) of the assemblage was sand tempered. Plain sherds were most likely to be sand tempered, but sand tempering occurred in stamped and incised sherds as well. Sand tempering occurred in bowl, brimmed vessel, straight rim, and jar forms (Table 6.24). Grit and grog tempering appeared in minor amounts. The percentage of sherds with grit and grog tempering was identical to that at Meeting House Fields. This tempering can be positively identified with the Mission period because one brimmed vessel was made with this paste.

Other stylistic attributes

Land and groove widths averaged 1.8 mm for lands and 2.3 mm for grooves. These figures were virtually identical to those found for the early component (land 2.0, groove 2.4). There appeared to be no meaningful variation in land and groove width between structures; the

Table 6.21. Surface Treatments.

	INTERIOR FINISH																	
	UNBURN		IBRN		IRF		IZRF		IEZRF		IERF		IZB		IZRB		ALL	
	COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
STR																		
CHURCH	162	23.3	524	75.5	4	0.58	.	.	.	.	.	.	1	0.14	3	0.43	694	100
KITCHEN	164	20.5	628	78.4	6	0.75	2	0.25	.	.	.	.	.	.	1	0.12	801	100
CONVENTO	271	27.8	664	68.1	34	3.49	3	0.31	2	0.21	1	0.10	.	.	.	.	975	100
ALL	597	24.2	1816	73.5	44	1.78	5	0.20	2	0.08	1	0.04	1	0.04	4	0.16	2470	100

	EXTERIOR FINISH													
	UNBRN		EBRN		ERF		EZB		BP		EZRF		ALL	
	COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
	637	91.8	51	7.35	3	0.43	1	0.14	1	0.14	1	0.14	694	100
	770	96.1	24	3.00	4	0.50	.	.	.	.	3	0.37	801	100
	941	96.5	22	2.26	11	1.13	.	.	1	0.10	.	.	975	100
	2348	100	97	100	18	100	1	100	2	100	4	100	2470	100

unburn=unburnished
ibrn=interior burnished
irf=interior red filmed
izrf=interior zoned red filmed
ierf=interior exterior red filmed
ibf=interior black filmed
iezrf=interior exterior zoned red filmed
izb=interior zoned black
izrb=interior zoned red and black
exbrn=exterior burnished

erf=exterior red filmed
ebf=exterior black filmed
ezrf=exterior zoned red filmed
ezb=exterior zoned black
bp=black pigment

Table 6.22. Frequency of Sooted Sherds.

	NO SOOT				SOOTED				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
STRUCTURE												
CHURCH	697	99.3	8208.2	99.5	5	0.7	44.7	0.5	702	100	8252.9	100
KITCHEN	780	96.8	10441	93.1	26	3.2	771.9	6.9	806	100	11213	100
CONVENTO	978	99.2	7678.8	99.2	8	0.8	61.5	0.8	986	100	7740.3	100
ALL	2455	98.4	26328	96.8	39	1.6	878.1	3.2	2494	100	27206	100

Table 6.23. Temper (Sherds).

	TEMPER															
	GRIT				SAND				GRIT AND GROG				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
STR																
CHURCH	660	95.7	7950.2	97.4	30	4.3	208.8	2.6	.	.	.	.	690	100	8159.0	100
KITCHEN	764	98.5	10865	98.2	8	1.0	151.2	1.4	4	0.5	48.9	0.4	776	100	11066	100
CONVENTO	919	95.6	7465.7	97.2	38	4.0	192.6	2.5	4	0.4	20.3	0.3	961	100	7678.6	100
ALL	2343	96.5	26281	97.7	76	3.1	552.6	2.1	8	0.3	69.2	0.3	2427	100	26903	100

Table 6.24. Temper by Vessel Form.

VESSEL TEMPER

Frequency / Percent / Row Pct / Col Pct	GRIT	SAND	GRIT/GRG	Total
BOWL	36	2	1	39
	22.64	1.26	0.63	24.53
	92.31	5.13	2.56	
	24.00	33.33	33.33	
STRAIGHT	32	2	1	35
	20.13	1.26	0.63	22.01
	91.43	5.71	2.86	
	21.33	33.33	33.33	
X UNRES	5	0	0	5
	3.14	0.00	0.00	3.14
	100.00	0.00	0.00	
	3.33	0.00	0.00	
X RES	2	1	0	3
	1.26	0.63	0.00	1.89
	66.67	33.33	0.00	
	1.33	16.67	0.00	
X UID	31	0	0	31
	19.50	0.00	0.00	19.50
	100.00	0.00	0.00	
	20.67	0.00	0.00	
RSMJAR	5	0	0	5
	3.14	0.00	0.00	3.14
	100.00	0.00	0.00	
	3.33	0.00	0.00	
CAR BOWL	14	0	0	14
	8.81	0.00	0.00	8.81
	100.00	0.00	0.00	
	9.33	0.00	0.00	
BRIM	25	1	1	27
	15.72	0.63	0.63	16.98
	92.59	3.70	3.70	
	16.67	16.67	33.33	
Total	150	6	3	159
	94.34	3.77	1.89	100.00

See Table 10 for key to forms.

average (land and groove widths, respectively) were: church, 2.0 and 2.1 mm; convento 1.8 and 2.8 mm; and kitchen 1.7 and 1.9 mm.

Rim depth did vary between structures. The average depth for folded rims in the church was 13.2 mm, in the convento average depth was 20.5 mm, and in the kitchen it was 18.3 mm. It is uncertain whether or not a difference of 0.5 cm in rim depth can be considered culturally significant. More data is needed on the association of rim depth and structure function before that determination can be made. The overall average rim fold depth at the site was 17.3 mm.

Dots were visible on between 5% (count) and a relatively large 14% (weight) of the stamped sherds (Table 6.25). A comparison with the Meeting House Fields data on this attribute indicates that the world symbol remained the dominant motif. Curvilinear stamping, absent from the small early component sample, was present on only .5% of the sherds from the late component (Table 6.26).

Motifs

As mentioned, the central dot motif appeared to have been the primary motif used. Some sherds displayed a variation of the motif in which the central dot was carved without a border (Figure 6.2). Single or double lines of checks were sometimes incorporated into the radiating lines. Whether or not this indicates the presence of another group of peoples with a slightly different traditional execution of the same design is unknown. The checks may have been inspired by St. Johns Check Stamped pottery.

Incising was almost all bold incising. Designs appeared to be principally scrolls, concentric semi-circles, and filler. The most distinctive thing about the assemblage was the addition of punctation, which was not present in the Meeting House Fields assemblage or, indeed, in the interior Georgia Lamar incising tradition. Of the 49 different patterns of incising recorded (and many of these were probably not discrete, but different portions of the same design), 21, or 43%, had

Table 6.25. Frequency of Central Dots.

MASTER CODE											
STAMP				DOT				ALL			
COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
1424	94.9	15728	85.2	77	5.1	2741.2	14.8	1501	100	18469	100

Table 6.26. Frequency of Curvilinear Stamping.

MASTER CODE											
RECTILINEAR				CURVILINEAR				ALL			
COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
1494	99.5	18376	99.5	7	0.5	93.2	0.5	1501	100	18469	100

Figure 6.2. Selected Sherds, Santa Catalina, Georgia.
Scale in centimeters.
Above scale: Altamaha Incised;
Below scale (left to right): 1) "San Marcos Complicated Stamped" with folded, cane punctate rim; 2) "dot" with no border; 3) "San Marcos Complicated Stamped".

either rim punctation immediately above the top of the incising, or (rarely) punctation incorporated into the incised design.

Summary and Implications

Data from the mission on St. Catherines Island suggested that, contrary to expectations, there was little difference in the frequencies of most pottery attributes between structures. Though the relative frequency of different surface decorations did vary between structures, this did not translate into differences in vessel form distribution. Rather, it appeared that the same suite of forms was present in all structures, but that different decorations and rim treatments were applied to vessels according to their context of use. This hypothesis needs confirmation from other studies to be accepted. The data presented here could be a statistical anomaly. However, the results from the Amelia Island Santa Catalina mission at least partially substantiate these results (see Chapter 7).

If true, the use of certain classes of surface treatment and rim styles for specific functions of vessels might represent a new strategy for the Guale. In comparing Irene phase burial mound and midden contexts, previous researchers have concluded that there was no difference in surface treatment between domestic and mortuary wares--the only different contexts of use examined thus far (Braley et al. 1986:88; Cook 1980; Pearson 1977b). Domestic and mortuary wares, in fact, could be one and the same, since many of the vessels accompanying burials at the Kent Mound on St. Simons Island and Johns Mound on St. Catherines Island were heavily sooted or showed other evidence of use before interment (Cook 1980:168; Larsen and Thomas 1982). Nevertheless, the most elaborately incised vessels, often bearing SECC motifs, appear to occur predominantly in pottery caches in burial mounds (e.g., Cook and Pearson 1989).

More concrete data were available from the two occupations of the mission to indicate substantial breaks with the Pre-Columbian past, changes that occurred simultaneously with or just prior to the initial

mission occupation. Technological changes included the introduction of a new form, the brimmed vessel, made to copy the forms of majolica plates and bowls that the Spanish were accustomed to. The form was assimilated into the "bowl" decorative category by the Guale.

Another technological change was the dramatic decrease in the use of sand as a tempering agent. At Meeting House Fields as at Mission Santa Catalina, sand tempering was not restricted to one vessel form or one surface decoration. The reason why one vessel would be tempered with sand and another of the same form with grit is unknown. Both reasons discussed for the increase in sand tempering in the Meeting House Fields Cluster 2 assemblage might apply (in reverse) for the decrease at the mission. In addition, the selection of one temper over the other would alter functional attributes (porosity, hardness, and strength) of the vessel considerably (Rice 1987:347-369). The design of this study did not include the measurement of those characteristics.

Fired color was recorded. Fired color indicates the extent to which organic materials and iron compounds were oxidized during firing of the pot, and, by extension, firing temperature (Rice 1987:343). Fired color is also influenced by particle size of the temper used, with coarser clays firing more thoroughly than fine clays (Rice 1987:89, Figure 4.3). Finally, firing affects hardness--high fired vessels are harder than low fired vessels.

Core color and interior and exterior color of a sample of rim sherds from Meeting House Fields and both Santa Catalina missions are shown in Table 6.27-6.29. Comparison of the samples indicated that the Georgia Santa Catalina sample had generally lighter (better oxidized) cores, lighter interiors, and, in particular, lighter exteriors than the Meeting House Fields sample. This might suggest that the Spanish influenced firing practices. H. Smith (1951:129) also observed that Mission period pottery was harder than Pre-Columbian pottery and might indicate "improved techniques of firing learned from the Spanish." The Florida Santa Catalina, in turn, had somewhat darker cores, but much higher frequencies of light interiors and exteriors than the Georgia

Table 6.27. Firing Characteristics, Meeting House Fields.

CORE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
HD	55	34.4	55	34.4
HM	47	29.4	102	63.7
LC	21	13.1	123	76.9
MC	18	11.3	141	88.1
NC	19	11.9	160	100.0

Frequency Missing = 2

INTERIOR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
.	4	2.5	4	2.5
1	57	36.3	61	38.9
2	44	28.0	105	66.9
3	44	28.0	149	94.9
4	8	5.1	157	100.0

Frequency Missing = 5

EXTERIOR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	54	34.0	54	34.0
2	50	31.4	104	65.4
3	47	29.6	151	95.0
4	8	5.0	159	100.0

Frequency Missing = 3

Table 6.28. Firing Characteristics, Mission Santa Catalina, Georgia.

CORE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
HD	11	12.5	11	12.5
HM	52	59.1	63	71.6
LC	6	6.8	69	78.4
MC	9	10.2	78	88.6
NC	10	11.4	88	100.0

INTERIOR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	40	45.5	40	45.5
2	12	13.6	52	59.1
3	30	34.1	82	93.2
4	6	6.8	88	100.0

EXT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	27	30.7	27	30.7
2	11	12.5	38	43.2
3	42	47.7	80	90.9
4	8	9.1	88	100.0

Table 6.29. Firing Characteristics, Mission Santa Catalina, Florida.

CORE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
HD	29	22.3	29	22.3
HM	73	56.2	102	78.5
LC	5	3.8	107	82.3
MC	20	15.4	127	97.7
NC	3	2.3	130	100.0

INTERIOR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	81	62.3	81	62.3
2	15	11.5	96	73.8
3	33	25.4	129	99.2
4	1	0.8	130	100.0

EXT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	65	50.0	65	50.0
2	21	16.2	86	66.2
3	42	32.3	128	98.5
4	2	1.5	130	100.0

Key:
NC: no coring, well oxidized throughout
LC: light coring, up to 30% of cross section is dark and core color is same as either HM or HD.
MC: moderate coring, 30-60% of cross section is dark and core color same as either HM or HD.
HM: heavy medium coring, at least 60% of cross section is dark and core is 10YR to 5Y values >=3 and <=5.
HD: heavy dark coring, at least 60% of cross section is dark and core is 2.5Y or 5Y with values <3 and chromas <2.
1: hues 5YR to 10YR, values >4, chromas 3-6. Well oxidized.
2: hues 10YR to 5Y, values 4-6, chromas 1-2. Moderately oxidized.
3: hues 10YR to 5Y, values 3-4, chromas 1-2. Poorly oxidized.
4: hues 10YR to 5Y, values <3, chromas <2. Extremely poor oxidation.

mission. This indicated that more pots were fired at high temperatures than at the earlier mission; firing duration, however, may have decreased. This may be some indirect evidence of wood shortages.

Again, this study was not designed to be a rigorous exploration into the technological changes of the two pottery types. The above data, however, suggest that such a study would be worthwhile. Taken together, the change in the ratios of temper types and the apparent change in firing practices may indicate another instance of Spanish influences in native pottery production.

Profound changes also occurred in decorative attributes (some of which may have had functional aspects). The use of applique rims strips was abandoned completely in favor of folded rims. The same elaborations that graced the strips were applied to folded rims. Both at Meeting House Fields and the mission, cane punctation was the dominant rim elaboration. Red and/or black filming was added as decoration, (but would also decrease permeability of the vessel and perhaps inhibit loss of vessel strength due to cracks; Rice 1987:368). Perhaps most important, the stamped design changed abruptly, with no apparent intermediate steps. The design execution became much bolder and, while the design continued to emphasize a central node with offset radiating lines, the curvilinear elements of the preceding phase almost completely disappeared. Incised designs also changed as punctation was incorporated into the motif.

Elsewhere in this chapter, the idea was advanced that many of the changes described above were stimulated by the Spanish. Once established, there appeared to be no significant changes in these pottery attributes after the Guale rebellion of 1597 or throughout the 17th century occupation of the site. It is not surprising that these principally utilitarian wares did not change over the years. Utilitarian wares in general are quite resistant to change (Rice 1987:460, 465) and Spanish utilitarian wares in particular have been described as "monotonous" (Foster 1960:88). There may, in fact, have been little need for the introduction of new forms for cooking. Because

both the Spanish peasant and the southeastern Indian relied principally on soups or stews for staple foods (though with different ingredients, see Otto and Lewis 1974:106-110; Reitz 1990), independent but similar evolution of forms would not be unusual. The cookpots depicted in a 17th-century Velasquez painting (Braudel 1979:231), though probably iron, were not that different in basic form from the Guale everted lip jar.

The Guale Indians of the Santa Catalina mission on St. Catherines Island, probably under the direction of Spanish friars, created a pottery assemblage that drew on previous forms and decorative traits that were altered to suit new demands. The Guale created this assemblage in relative isolation. In the next chapter, the affects of the move to Amelia Island and the nucleation of peoples on this pottery assemblage will be explored.

CHAPTER 7

MISSION SANTA CATALINA, AMELIA ISLAND, FLORIDA

Santa Catalina de Guale on Amelia Island, Florida, was established as the doctrina of the province of Guale after the withdrawal of the Spanish and their Indian allies from the Georgia coast. The mission was located on the marsh side of Amelia Island (called Santa Maria by the Spanish), Florida. The site was adjacent to Harrison Creek, a tidal creek leading to the South Amelia River.

The mission was inhabited by those Guale from the St. Catherines Island mission who had remained loyal to the Spanish after the Yamassee attack of 1680 and the relocation to Sapelo Island (Hann 1990b:25). Additional refugees from Satuache (Bushnell 1986:6) were also settled on Amelia Island. Thus, the primary population of the Amelia Island mission consisted of the same families, perhaps even some of the same individuals, responsible for the ceramic assemblage from St. Catherines Island described in Chapter 6. This provided a degree of control over subtypical variation that might be expected in pottery from the Georgia coast, where, at least in Pre-Columbian times, pottery attributes appeared to change markedly along each river drainage (Caldwell 1971). Indeed, other things being equal, the continuity of family groups between sites, and therefore, the continuity of learning pools, would be expected to produce an assemblage of pottery attributes very similar to that on St. Catherines Island. However, as noted above, individuals from other Guale groups, and at least one Yamassee Indian (Hann 1990a:82), also lived at the Amelia Island mission. In addition, the move to Florida brought the Georgia Guale into more direct contact with other groups--such as the Timucua and the Apalachee--than they had previously had. This population amalgamation should produce a more heterogenous stylistic assemblage than that of Saint Catherines Island,

unless environmental or social factors (e.g., the use of pottery decoration to signal ethnic affiliation) were operating to decrease the number of stylistic elements used. The Amelia Island Santa Catalina mission, then, offered a unique opportunity for the study of change in Guale Indian pottery. Though containing a strong element of continuity with the Georgia tradition, the site was a good laboratory to study the affects of an increasingly heterogenous population on traditional pottery of the late Mission period.

Besides the relatively high degree of continuity, the site had other advantages. It was absolutely distinct, both spatially and temporally, from the earlier sites associated with Irene and Altamaha phase pottery. In addition, the site was occupied for a very short time. The sixteen years it existed (1686-1702) comprised less than the life of a single generation. Such a short occupation was ideal for descriptive and comparative purposes. Comparison of the Amelia Island pottery assemblage to the pottery assemblage from the mission on St. Catherines Island also furnished an opportunity to directly compare San Marcos and Altamaha pottery and to determine the discreteness of the two types.

The site structure and mission architecture have been described in detail elsewhere (Saunders 1990, 1991). Only a brief description of the contexts used for this report and how they compare with those from the mission on St. Catherines Island are presented here. At the outset it should be noted that the two Santa Catalina mission sites differed in archaeological integrity. While the site on St. Catherines Island was relatively undisturbed (Thomas 1987:142), the Amelia Island site was re-occupied around 1790 and more or less continuously occupied until the present. All Mission period proveniences examined from Amelia Island were impacted to some degree by Plantation period and more modern activities. However, because the short time of Mission period occupation precluded questions of temporal change in the Mission period materials, the mixing of artifacts resulting from these multiple occupations was not perceived as a problem. The site also contained a

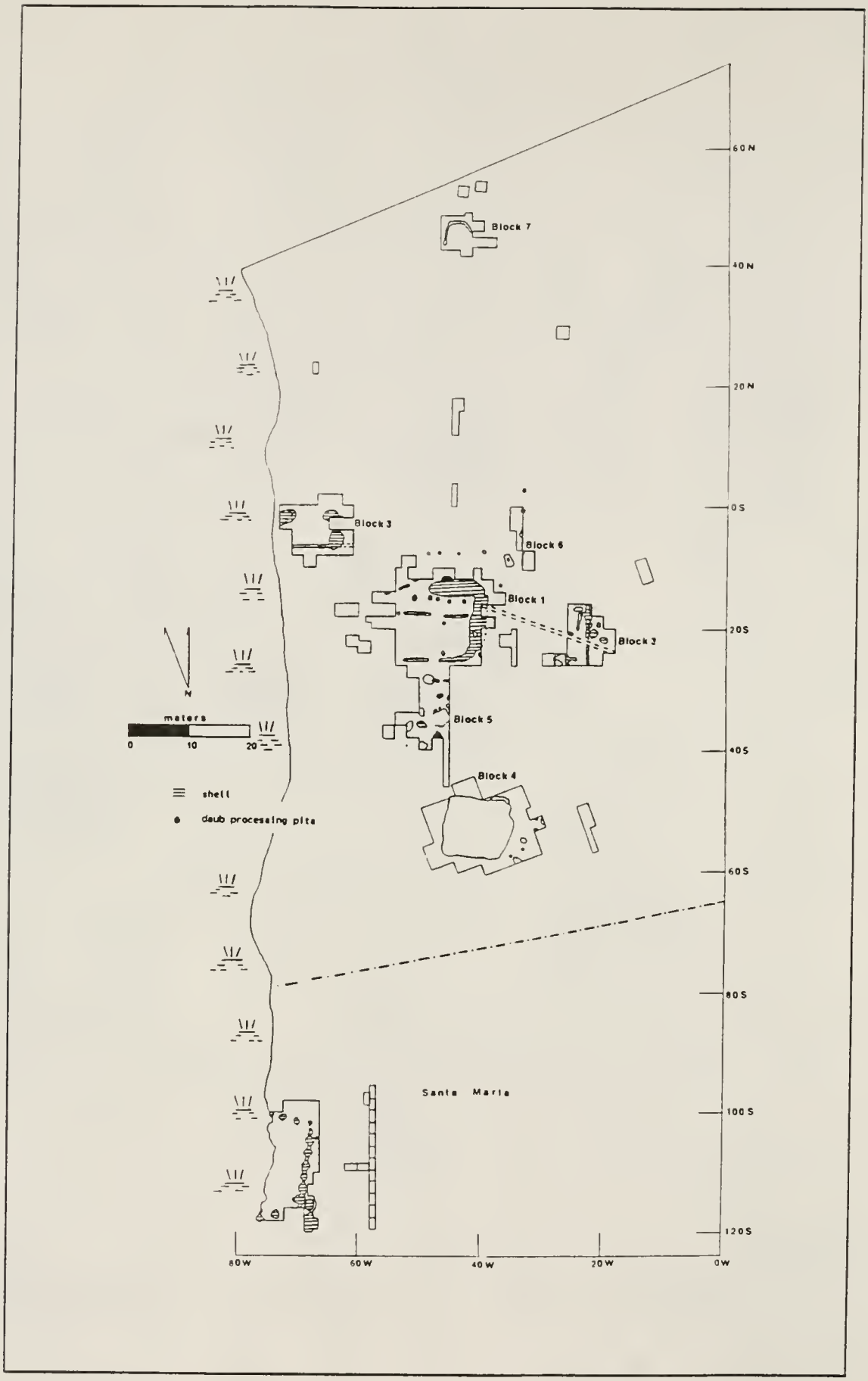
significant late Pre-Columbian Savannah phase component. (This Savannah phase complex probably extended into the early Contact period in northeast Florida, but should not be contemporaneous with the late Mission period materials.) In general, it was not difficult to segregate the Savannah phase wares from the Mission period wares on the basis of surface treatment and vessel thickness. Some sand tempered plain wares were more difficult to distinguish. The treatment of those sherds is discussed in the temper section.

Seven different Mission period "contexts of use" were intensively excavated (Figure 7.1) and four were selected for intrasite and/or intersite comparisons. These included the convento (Block 1); the church (with subfloor burials, Block 4); one activity area (possibly the kitchen, Block 3); and an aboriginal structure (Block 7), probably located outside the mission compound proper. Thus, in addition to the site specific questions enumerated above, the same questions outlined for the St. Catherines Island mission can be addressed at the Amelia Island site.

The Amelia Island convento was quite different architecturally from the one on St. Catherines Island. Nevertheless, there was little doubt as to the function of this wattle and daub structure. It was aligned with the church some 20 m to the south. Squared post construction and the use of wrought iron nails and spikes confirmed that the building had been constructed under Spanish supervision. The recovery of the seal of Santa Catalina (see Hardin 1986), used to impress the wax closure in official correspondences from the friar, clinched the functional identification.

The church was also constructed differently than the later church on St. Catherines Island. Though the area was heavily disturbed by Plantation period and modern construction, as best as could be determined, it was a far less substantial structure, despite the fact that the site was the doctrina of the Province of Guale in the late Mission period. Nevertheless, the presence of burials, a disturbed clay

Figure 7.1. Site Map, Santa Catalina, Amelia Island, Florida.


Block 7
Block 3
Block 6
Block 1
Block 2
Block 5
Block 4
Santa Maria
N
meters
0
10
20
shell
daub processing pits
60 N
40 N
20 N
0 S
20 S
40 S
60 S
80 S
100 S
120 S
80 W
60 W
40 W
20 W
0 W

floor, and some large postholes indicated that a church had been present.

Archaeologists also contributed to the disturbance in the church. Prior to the initial archaeological excavation at the cemetery, a series of backhoe trenches were dug to define the limits of the interments and the overlying Plantation period midden was removed with a bulldozer (Hardin 1985a, 1985b). Obviously these tactics resulted in the loss of artifacts; the assemblage from the church is not directly comparable to the other contexts excavated on Amelia Island or to the St. Catherines Island assemblage. Nevertheless, sufficient in situ artifacts remained to provide a reasonable sample.

No area excavated at the Amelia Island site contained features similar to the complex of features identified as the kitchen on St. Catherines Island. Block 3 had a Mission period midden and a possible posthole pattern that was extrapolated to represent a ramada-type structure. If this were the kitchen, the pottery from it might not be directly comparable with the pottery from the portion of the kitchen on St. Catherines Island, which, as noted previously, might not have been used for the preparation of meals for the friars (see Chapter 6). Thus, the two structures were compared as utilitarian food processing areas rather than as kitchens per se.

The pueblo to the northwest of the St. Catherines Island mission has not been excavated. Consequently, materials comparable to those recovered from the aboriginal structure on Amelia were not available. The pottery from the Amelia Island aboriginal structure was analyzed for comparison with the more "Spanish" contexts within the site. Strictly-speaking, however, this aboriginal structure was not a village habitation site. The pueblo associated with the Amelia Island Santa Catalina was probably to the south of the mission, where Hemmings and Deagan (1973) conducted tests in 1971. The aboriginal structure uncovered during this project, located a little over 50 m north of the convento, was between the mission compound and another Spanish structure and box well excavated by Robert Johnson (personal communication, 1989).

These structures, including the aboriginal structure, might have been associated with the Spanish garrison attached to the mission. Nevertheless, the construction techniques used were clearly aboriginal. Though there was a great deal of mixing of late Pre-Columbian pottery in the excavation, as well as severe impact from post-Mission period occupations, the presence of San Marcos pottery in the wall trench describing the building indicated that it dated to the Mission period. While not from the village proper, the pottery assemblage associated with the structure probably represented that used by Guale Indians.

All pottery from the block excavations in the four mission contexts was used in this analysis. In other words, the pottery assemblages were not sampled. Most of the collections were analyzed by the author. However, some proveniences from the church and the convento that were excavated early in the project were analyzed by others under the supervision of the author. Zone A (modern humus and overlying Plantation period materials mixed with Mission period materials in gray fine sand) was either 1/2" or 1/4" screened. Zone B (slightly humic brown fine sand with predominantly Mission period materials) was 1/4" screened. As for the Georgia sites reported in Chapters 5 and 6, only pottery larger than 1 cm square was studied.

Comparisons

A total of 16,232 sherds were recovered from the four contexts of use examined for this study. The distribution of surface decoration by structure for Santa Catalina on Amelia is displayed in Table 7.1 and a chi-square test for the significance of the distribution is presented in Table 7.2. The most significant deviation from expectations in the chi-square test was the relatively high incidence of incising at the aboriginal structure. Other high cell chi-square values derived from the relative lack of plain wares in the area hypothesized to have been the kitchen. Stamped wares were "over-represented." The reverse was true for the convento, where the bulk of the incised sherds occurred. In the church, burnished plain wares were more frequent than expected.

Table 7.1. Surface Decoration by Structure.

	MASTER CODE																				ALL			
	STAMP				PLAIN				BURNISHED PLAIN				INCISED				CHECK							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
STRUCTURE	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
CONVENTO	8038	74.4	50325	76.2	1866	17.3	9978.3	15.1	426	3.9	2486.6	3.8	135	1.3	770.5	1.2	333	3.1	2472.8	3.7	10798	100	66033	100
KITCHEN	2549	82.6	16728	81.8	306	9.9	1947.6	9.5	100	3.2	757.6	3.7	50	1.6	312.1	1.5	80	2.6	713.0	3.5	3085	100	20459	100
CHURCH	1468	74.5	10263	75.9	317	16.1	2037.3	15.1	95	4.8	620.0	4.6	36	1.8	228.9	1.7	55	2.8	371.9	2.8	1971	100	13521	100
ABO STR	293	77.5	1642.1	78.6	60	15.9	276.8	13.2	9	2.4	89.3	4.3	13	3.4	73.6	3.5	3	0.8	7.3	0.3	378	100	2089.1	100
ALL	12348	76.1	78958	77.3	2549	15.7	14240	13.9	630	3.9	3953.5	3.9	234	1.4	1385.1	1.4	471	2.9	3565.0	3.5	16232	100	102102	100

Table 7.2. Chi-Square Test, Structure by Surface Decoration.

STRUCTURE / Frequency / Expected / Deviation / Cell Chi-Square	STAMP	PLAIN	B PLAIN	INCISED	Total
CONVENTO	8371 8527.6 -156.6 2.8748	1866 1695.7 170.33 17.11	426 419.09 6.9056 0.1138	135 155.66 -20.66 2.743	10798
KITCHEN	2629 2436.3 192.66 15.236	306 484.45 -178.5 65.736	100 119.74 -19.74 3.253	50 44.473 5.5267 0.6868	3085
CHURCH	1523 1556.6 -33.57 0.724	317 309.52 7.4831 0.1809	95 76.499 18.501 4.4745	36 28.414 7.5861 2.0254	1971
ABO STRUCTURE	296 298.52 -2.52 0.0213	60 59.359 0.6406 0.0069	9 14.671 -5.671 2.1921	13 5.4492 7.5508 10.463	378
Total	12819	2549	630	234	16232

STATISTICS FOR TABLE OF AREA BY MCODE

Statistic	DF	Value	Prob
Chi-Square	9	127.840	<0.001

These divergent distributions were remarkably similar to what was found at the mission site on St. Catherines Island.

Not only were the distributions similar, but percentage totals for the different surface decorations at each site were almost identical as well (see Table 8.1). The major difference was the decrease in incised wares, from around 6% on St. Catherines Island (at both Meeting House Fields and mission Santa Catalina) to just 1.4% on Amelia. This decrease was not unexpected. Though H. Smith (1948) reported incised wares as a minority occurrence in post-1686 proveniences in St. Augustine, incising was apparently absent from all First Spanish period contexts at 8SA16-23 (Otto and Lewis 1974; they may not have considered incised wares to be locally produced, see Piatek 1985). The decrease in incising may well be related to the kind of time constraints cited in Chapter 6 as an explanation for the simplification of designs. Incised pots must be paddled, then resmoothed, incised, and they were often heavily burnished--all of which requires more time and/or skill than stamping.

Vessel Form Analysis

Four hundred and seventy-seven vessels were defined from the assemblage of 16,232 San Marcos sherds (Table 7.3). Unidentified straight rims (probably of jars, though some bowl and brimmed vessel sherds might also be included) constituted the most frequent vessel form, followed by excurvate rim jars. Brimmed plates or bowls were the next most frequent form, followed by simple bowls. These four forms were far and away the most common vessels, though there were a few other jar forms. Carinated bowls and unidentified forms that were nevertheless recognized as non-traditional (colono-ware) forms rounded out the list of vessels present.

A comparison of the relative frequencies of forms at the Georgia and Florida missions indicates that was a slight decrease in the percentage of bowls (carinated and simple) and an increase in the number

Table 7.3. Structure by Vessel Form.

STRUCTURE VESSEL FORM

Frequency / Percent / Row Pct / Col Pct	BOWL	STRAIGHT	X UNR	X RES	X UID	LNJ	RSMJAR	CAR BOWL	UCLNO	BRIM	Total
CONVENTO	45	62	25	11	67	1	6	14	13	55	299
	9.43	13.00	5.24	2.31	14.05	0.21	1.26	2.94	2.73	11.53	62.68
	15.05	20.74	8.36	3.68	22.41	0.33	2.01	4.68	4.35	18.39	
	55.56	56.88	96.15	64.71	65.05	100.00	54.55	70.00	76.47	59.78	
KITCHEN	14	24	0	2	16	0	2	4	1	15	78
	2.94	5.03	0.00	0.42	3.35	0.00	0.42	0.84	0.21	3.14	16.35
	17.95	30.77	0.00	2.56	20.51	0.00	2.56	5.13	1.28	19.23	
	17.28	22.02	0.00	11.76	15.53	0.00	18.18	20.00	5.88	16.30	
CHURCH	18	18	1	4	16	0	3	2	2	18	82
	3.77	3.77	0.21	0.84	3.35	0.00	0.63	0.42	0.42	3.77	17.19
	21.95	21.95	1.22	4.88	19.51	0.00	3.66	2.44	2.44	21.95	
	22.22	16.51	3.85	23.53	15.53	0.00	27.27	10.00	11.76	19.57	
ABO STR	4	5	0	0	4	0	0	0	1	4	18
	0.84	1.05	0.00	0.00	0.84	0.00	0.00	0.00	0.21	0.84	3.77
	22.22	27.78	0.00	0.00	22.22	0.00	0.00	0.00	5.56	22.22	
	4.94	4.59	0.00	0.00	3.88	0.00	0.00	0.00	5.88	4.35	
Total	81	109	26	17	103	1	11	20	17	92	477
	16.98	22.85	5.45	3.56	21.59	0.21	2.31	4.19	3.56	19.29	100.00

x unr=excurvate unrestricted
x res=excurvate restricted
x uid=excurvate unidentified
lnj=long necked jar
rsmjar=restricted mouthed jar
car bowl=carinated bowl
brim=brimmed vessel
uclno=unidentified colono ware

of jars at the Florida site. Brimmed vessels were slightly more common at the Amelia Island site.

A chi-square test for the significance of the distribution of forms was done with all jars collapsed into a single category. The result of that test is displayed in Table 7.4 (the aboriginal structure and UID colono-wares were deleted to ensure adequate cell sizes). The structure with the most diversity in forms was the convento. Nevertheless, just as at the St. Catherines Island mission, the dominant forms were more or less evenly distributed between structures. This included the aboriginal structure, which had as many brimmed vessels as it had simple bowls. In fact, there was a remarkable correspondence between the number of bowls and the number of brimmed vessels at each context at the Amelia Island site.

Vessels showed the same correlation with surface decoration as was exhibited at the Santa Catalina mission in Georgia and at Meeting House Fields: simple bowls were most commonly incised and jars were more likely to be stamped (Table 7.5, Table 7.6). Simple bowls were also more frequently burnished than other forms. This could not be tested against the other site assemblages because there were too few burnished plain vessels in those samples. Other forms displayed all surface decorations in more or less equal proportions. Note that in the vessel form analysis, the percentage of incising increased compared to the values for sherds. This was also observed for the St. Catherines Island vessel form analysis. Again, this was due to ease of recognition of individual variation in incising, and the total of 9% is considered inflated (or rather, the other values considered depressed) relative to the other totals. If the percentages of incised vessels at each site are taken at face value, however, the drop in incising in the later site is even more dramatic: from nearly 30% of the vessels on St. Catherines Island to only 9.0% on Amelia Island.

When surface decoration was reanalyzed using only the MNV vessels, and with related surface decorations collapsed (Table 7.7), there was still a correlation between structure and surface decoration. As in the

Table 7.4. Chi-Square Test, Structure by Vessel Form.

STRUCTURE / Frequency / Expected / Deviation / Cell Chi-Square	BOWL	STRAIGHT	JAR	CAR BOWL	BRIM	Total
CONVENTO	45	62	110	14	55	286
	49.711	67.142	99.422	12.912	56.813	
	-4.711	-5.142	10.578	1.088	-1.813	
	0.4465	0.3938	1.1254	0.0917	0.0578	
KITCHEN	14	24	20	4	15	77
	13.384	18.077	26.767	3.4763	15.296	
	0.6163	5.9233	-6.767	0.5237	-0.296	
	0.0284	1.9409	1.711	0.0789	0.0057	
CHURCH	18	18	24	2	18	80
	13.905	18.781	27.81	3.6117	15.892	
	4.0948	-0.781	-3.81	-1.612	2.1084	
	1.2058	0.0325	0.5221	0.7192	0.2797	
Total	77	104	154	20	88	443

STATISTICS FOR TABLE OF STR BY VF

Statistic	DF	Value	Prob
Chi-Square	8	8.639	0.374

Table 7.5. Vessel Form by Surface Decoration.

VESSEL MASTER CODE

Frequency / Percent / Row Pct / Col Pct	UID	STAMP	PLAIN	B PLAIN	INCISED	Total
BOWL	4	34	13	10	20	81
	0.84	7.13	2.73	2.10	4.19	16.98
	4.94	41.98	16.05	12.35	24.69	
	4.60	13.99	17.57	33.33	46.51	
STRAIGHT	28	53	18	5	5	109
	5.87	11.11	3.77	1.05	1.05	22.85
	25.69	48.62	16.51	4.59	4.59	
	32.18	21.81	24.32	16.67	11.63	
JAR	45	86	14	7	6	158
	9.43	18.03	2.94	1.47	1.26	33.12
	28.48	54.43	8.86	4.43	3.80	
	51.72	35.39	18.92	23.33	13.95	
CAR BOWL	0	16	1	1	2	20
	0.00	3.35	0.21	0.21	0.42	4.19
	0.00	80.00	5.00	5.00	10.00	
	0.00	6.58	1.35	3.33	4.65	
UID COLONO	2	0	12	2	1	17
	0.42	0.00	2.52	0.42	0.21	3.56
	11.76	0.00	70.59	11.76	5.88	
	- 2.30	0.00	16.22	6.67	2.33	
BRIM	8	54	16	5	9	92
	1.68	11.32	3.35	1.05	1.89	19.29
	8.70	58.70	17.39	5.43	9.78	
	9.20	22.22	21.62	16.67	20.93	
Total	87	243	74	30	43	477
	18.24	50.94	15.51	6.29	9.01	100.00

Table 7.6. Chi-Square Test, Vessel Form by Surface Decoration.

VESSEL FORM / Frequency / Expected / Deviation / Cell Chi-Square	MASTER CODE: STAMP	PLAIN	B PLAIN	INCISED	Total
BOWL	34	13	10	20	77
	49.896	12.731	5.7493	8.624	
	-15.9	0.2693	4.2507	11.376	
	5.0642	0.0057	3.1427	15.006	
STRAIGHT	53	18	5	5	81
	52.488	13.392	6.048	9.072	
	0.512	4.608	-1.048	-4.072	
	0.005	1.5855	0.1816	1.8277	
JAR	86	14	7	6	113
	73.224	18.683	8.4373	12.656	
	12.776	-4.683	-1.437	-6.656	
	2.2291	1.1737	0.2449	3.5005	
CAR BOWL	16	1	1	2	20
	12.96	3.3067	1.4933	2.24	
	3.04	-2.307	-0.493	-0.24	
	0.7131	1.6091	0.163	0.0257	
BRM	54	16	5	9	84
	54.432	13.888	6.272	9.408	
	-0.432	2.112	-1.272	-0.408	
	0.0034	0.3212	0.258	0.0177	
Total	243	62	28	42	375

STATISTICS FOR TABLE OF VF BY MCODE

Statistic	DF	Value	Prob
Chi-Square	12	37.078	<0.001

Table 7.7. Chi-Square Test, Structure by MNV Surface Decoration.

STRUCTURE / MASTER CODE Frequency Expected Deviation Cell Chi-Square	STAMP	PLAIN	B PLAIN	INCISED	Total
CONVENTO	151	52	12	29	244
	152.91	45.547	18.869	26.677	
	-1.907	6.4533	-6.869	2.3227	
	0.0238	0.9143	2.5008	0.2022	
KITCHEN	45	4	5	4	58
	36.347	10.827	4.4853	6.3413	
	8.6533	-6.827	0.5147	-2.341	
	2.0602	4.3045	0.0591	0.8645	
CHURCH	39	14	12	8	73
	45.747	13.627	5.6453	7.9813	
	-6.747	0.3733	6.3547	0.0187	
	0.995	0.0102	7.1531	437E-7	
Total	235	70	29	41	375

Note: aboriginal structure deleted for adequate cell size

STATISTICS FOR TABLE OF AREA BY MCODE

Statistic	DF	Value	Prob
Chi-Square	6	19.088	0.004

sherd analysis, this derived from the relatively high incidence of burnished plain wares in the church and the high frequency of stamped vessels and the lack of plain vessels in the possible kitchen.

A complete listing of all rim styles by vessel form is given in Table 7.8 (note: one fluted and one pinched rim were not included because vessel form was indeterminant). Rim styles are broken down into rim treatments and rim elaborations in Tables 7.9-7.12. When compared with the assemblage from the mission on St. Catherines Island, the differences appeared negligible. Folded rims were present on 46% of the vessels from Amelia and 40% of the vessels on St. Catherines; there was a consequent 7% decrease in the percentage of plain rims at the later site. The frequencies of decorated and noded rims remained about the same.

If applique rims were regarded as the stylistic equivalent of the folded rim, in the long run, there was a trend towards the use of more folded rims: from 34.2% applique rims at Meeting House Fields (29.5% for Cluster 2 only), to 39.6% folded rims at Mission Santa Catalina in Georgia, to 46.5% folded rims at the eponymous mission on Amelia Island.

The association of specific rim treatments with certain vessel forms was similar to the St. Catherines Island mission and represents a continuum from the Pre-Columbian period Meeting House Fields site. Bowls were much more likely to have plain than folded or decorated rims; the reverse was true for jars. This was a statistically significant association (Table 7.10). Carinated bowls generally had plain rims. Though the number of brimmed vessels with folded rims increased, the percentage of brimmed vessels with folded rims remained about the same.

While the association was not statistically significant, rim treatment did correlate with structure. As at the St. Catherines Island mission, there were fewer folded and more plain rims in the church than expected (Table 7.11). On the other hand, there were more folded and fewer plain rims at the proposed kitchen than expected.

The overall increase in folded rims was accompanied by a diversification in the implements used to punctate those rims. In

Table 7.8. Vessel Form by Rim Style.

	RIM TREATMENT																					
	UID		PLAIN						DECORATED						PELNODE		APPLIQUE		FOLDED			
	STYLE		STYLE						STYLE						STYLE		STYLE		STYLE			
	UID		PLAIN		INCISED		SHARK		CANE		FINGER		STICK		PELNODE		CANE		PLAIN		CANE	
	COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
VESSEL																						
BOWL	2	2.5	44	55.7	15	19.0	1	1.3	2	2.5	1	1.3	.	.	1	1.3	.	.	5	6.3	2	2.5
STRAIGHT	.	.	37	34.6	4	3.7	.	.	4	3.7	1	0.9	.	.	.	.	1	0.9	8	7.5	25	23.4
X UNR	.	.	5	20.8	1	4.2	.	.	1	4.2	.	.	.	.	1	4.2	.	.	3	12.5	6	25.0
X RES	.	.	4	25.0	2	12.5	.	.	1	6.2	1	6.2	.	.	.	.	.	.	3	18.8	3	18.8
X UID	1	1.0	9	8.8	2	2.0	.	.	7	6.9	1	1.0	1	1.0	.	.	.	.	5	4.9	28	27.5
LNJ	.	.	1	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
RSMJ	.	.	1	9.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	9.1	4	36.4
CAR BOWL	2	10.0	14	70.0	1	5.0	.	.	.	.	.	.	.	.	.	.	.	.	1	5.0	.	.
UCLNO	13	81.2	2	12.5	1	6.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BRIM	6	6.5	61	66.3	9	9.8	.	.	1	1.1	.	.	.	.	.	.	.	.	1	1.1	8	8.7
ALL	24	5.1	178	38.0	35	7.5	1	0.2	16	3.4	4	0.9	1	0.2	2	0.4	1	0.2	27	5.8	76	16.2

Table 7.8--Continued.

	RIM TREATMENT																					
	FOLDED																					
	STYLE																					
	FINGER		TRIANGLE		STAMP		STICK		INCISED		UID		SHARK		OVAL		MOLAR		SQUARES		PINCH	
	COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
VESSEL																						
BWL	1	1.3	.	.	.	.	1	1.3	3	3.8	.	.	.	.	.	.	.	.	.	.	.	.
STR	8	7.5	5	4.7	2	1.9	7	6.5	.	.	1	0.9	1	0.9	2	1.9	1	0.9	.	.	.	.
XUNR	5	20.8	.	.	.	.	1	4.2	.	.	.	.	1	4.2	.	.	.	.	.	.	.	.
XR	1	6.2	1	6.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
UIDX	20	19.6	9	8.8	5	4.9	6	5.9	.	.	1	1.0	2	2.0	1	1.0	1	1.0	1	1.0	1	1.0
LNJ	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
RSNJ	2	18.2	.	.	.	.	.	.	.	.	.	.	1	9.1	.	.	.	.	2	18.2	.	.
CBWL	.	.	.	.	.	.	.	.	1	5.0	.	.	.	.	.	.	.	.	.	.	.	.
UCLNO	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BRM	2	2.2	.	.	.	.	3	3.3	.	.	.	.	.	.	.	.	1	1.1	.	.	.	.
ALL	39	8.3	15	3.2	7	1.5	18	3.8	4	0.9	2	0.4	5	1.1	3	0.6	3	0.6	3	0.6	1	0.2

Table 7.8--Continued.

	RIM TREATMENT					
	FOLDED					
	STYLE					
	PUSHED		THUMB		ALL	
	COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT
VESSEL						
BWL	.	.	1	1.3	79	100
STR	.	.	.	.	107	100
XUNR	.	.	.	.	24	100
XR	.	.	.	.	16	100
UIDX	1	1.0	.	.	102	100
LNJ	.	.	.	.	1	100
RSNJ	.	.	.	.	11	100
CBWL	.	.	1	5.0	20	100
UCLNO	.	.	.	.	16	100
BRM	.	.	.	.	92	100
ALL	1	0.2	2	0.4	468	100

Note: for abbreviations, see Table 7.3.

Table 7.9. Vessel Form by Rim Treatment.

VESSEL RIM TREATMENT

Frequency / Percent / Row Pct / Col Pct	UID	PLAIN	DECORATE	PELNODE	APPLIQUE	FOLDED	Total
BOWL	3	60	3	1	0	14	78
	.	13.48	0.67	0.22	0.00	3.15	17.53
	.	76.92	3.85	1.28	0.00	17.95	
	.	28.04	14.29	50.00	0.00	6.76	
STRAIGHT	2	41	5	0	1	60	107
	.	9.21	1.12	0.00	0.22	13.48	24.04
	.	38.32	4.67	0.00	0.93	56.07	
	.	19.16	23.81	0.00	100.00	28.99	
JAR	5	25	12	1	0	115	153
	.	5.62	2.70	0.22	0.00	25.84	34.38
	.	16.34	7.84	0.65	0.00	75.16	
	.	11.68	57.14	50.00	0.00	55.56	
CAR BOWL	2	15	0	0	0	3	18
	.	3.37	0.00	0.00	0.00	0.67	4.04
	.	83.33	0.00	0.00	0.00	16.67	
	.	7.01	0.00	0.00	0.00	1.45	
UID	14	3	0	0	0	0	3
COLONO	.	0.67	0.00	0.00	0.00	0.00	0.67
	.	100.00	0.00	0.00	0.00	0.00	
	.	1.40	0.00	0.00	0.00	0.00	
BRIM	6	70	1	0	0	15	86
	.	15.73	0.22	0.00	0.00	3.37	19.33
	.	81.40	1.16	0.00	0.00	17.44	
	.	32.71	4.76	0.00	0.00	7.25	
Total	.	214	21	2	1	207	445
	.	48.09	4.72	0.45	0.22	46.52	100.00

Table 7.10. Chi-Square Test, Vessel Form by Rim Treatment.

VESSEL FORM / Frequency / Expected / Deviation / Cell Chi-Square	RIM TREATMENT: PLAIN	FOLDED	Total
BOWL	60 37.354 22.646 13.729	14 36.646 -22.65 13.994	74
STRAIGHT	41 50.983 -9.983 1.9549	60 50.017 9.9833 1.9926	101
JAR	25 70.67 -45.67 29.514	115 69.33 45.67 30.084	140
CARINATED BOWL	15 9.0861 5.9139 3.8492	3 8.9139 -5.914 3.9235	18
BRIMMED VESSEL	70 42.907 27.093 17.108	15 42.093 -27.09 17.439	85
Total	211	207	418

STATISTICS FOR TABLE OF VF BY RTREAT

Statistic	DF	Value	Prob
Chi-Square	4	133.588	<0.001

Table 7.11. Chi-Square Test, Structure by Rim Treatment.

STRUCTURE / Frequency / Expected / Deviation / Cell Chi-Square	RIM TREATMENT: PLAIN	FOLDED	Total
CONVENTO	132	128	260
	131.61	128.39	
	0.3871	-0.387	
	0.0011	0.0012	
KITCHEN	29	41	70
	35.434	34.566	
	-6.434	6.4342	
	1.1683	1.1977	
CHURCH	43	30	73
	36.953	36.047	
	6.0471	-6.047	
	0.9896	1.0144	
Total	204	199	403

STATISTICS FOR TABLE OF AREA BY RTREAT

Statistic	DF	Value	Prob
Chi-Square	2	4.372	0.112

Table 7.12. Structure by Rim Elaboration.

Frequency Percent Row Pct Col Pct	UID	PLAIN	INCISED	FINGER	CANE	STICK	TRIANGLE	STAMP	Total
CONVENTO	26	128	28	28	54	13	9	6	292
	5.59	27.53	6.02	6.02	11.61	2.80	1.94	1.29	62.80
	8.90	43.84	9.59	9.59	18.49	4.45	3.08	2.05	
	70.27	61.84	71.79	65.12	57.45	56.52	60.00	85.71	
KITCHEN	6	29	2	7	20	5	4	1	74
	1.29	6.24	0.43	1.51	4.30	1.08	0.86	0.22	15.91
	8.11	39.19	2.70	9.46	27.03	6.76	5.41	1.35	
	16.22	14.01	5.13	16.28	21.28	21.74	26.67	14.29	
CHURCH	4	41	7	5	17	5	2	0	81
	0.86	8.82	1.51	1.08	3.66	1.08	0.43	0.00	17.42
	4.94	50.62	8.64	6.17	20.99	6.17	2.47	0.00	
	10.81	19.81	17.95	11.63	18.09	21.74	13.33	0.00	
ABO STRUCTURE	1	9	2	3	3	0	0	0	18
	0.22	1.94	0.43	0.65	0.65	0.00	0.00	0.00	3.87
	5.56	50.00	11.11	16.67	16.67	0.00	0.00	0.00	
	2.70	4.35	5.13	6.98	3.19	0.00	0.00	0.00	
Total	37	207	39	43	94	23	15	7	465
	7.96	44.52	8.39	9.25	20.22	4.95	3.23	1.51	100.00

addition to the common cane and fingernail punctation and the less common triangular punctation and stamped folds found on St. Catherines Island, there were a variety of new styluses, including shark's teeth, shells, an unidentified square tool and an oval implement, thumbs, and something that looked like a tooth impression (Table 7.8). A few folded rims were incised. Nevertheless, despite the increase in the diversity of rim elaborations, there was a net increase in the use of cane punctation (Table 7.12). The incidence of the other, more common elaborations (except incising) remained surprisingly stable. A hypothesis that the more unusual rim styles were not locally made received some support from the paucity of such rims in the aboriginal structure. However, their absence could be due to the small size of the sample from that context.

Perhaps the most interesting treatments were the rarest ones. One straight rim had an applique rim strip, another vessel had applique nodes (Figure 7.2), and one other had a lug (Table 7.8). The strip and lug were found at the convento and the noded vessel was from the church. As noted in Chapter 6, there were no rim strips and only one noded vessel at the mission on St. Catherines Island. Since neither of these treatments existed in Florida in Pre-Columbian times, their appearance in the Amelia Island assemblage indicates that these traditional styles remained part of the "style pool" and further, that the cultural continuum responsible for the transmission of these attributes through at least three generations had not broken down. The lug treatment, on the other hand, though in the Lamar tradition, was not found in the Pre-Columbian Irene style. It may suggest inspiration from the Leon-Jefferson phase to the west.

It is tempting to see in the reappearance of the applique rim and the node some nativistic overtones. Certainly the conditions in the late 17th century coastal missions were deplorable (e.g., Hann 1987:22-23, 1990a; Saunders 1991). Spanish labor demands were seen by the Indians as excessive and whatever villages had the bad luck to have a garrison assigned to them were subjected to outright thievery and

physical abuse. Official correspondences alluded to widespread defections of the mission Indians, who fled from Spanish control to the sanctuary of the woods (Hann 1990a, 1991:80). Indians who remained in Spanish territory were aware that they were in constant danger of attack by Indians loyal to the British. The Spanish friars and their religion could not succor the Indians as promised.

Other pottery attributes that might be used to substantiate a renewed emphasis on Pre-Columbian religious principles did not support this premise, however. Curvilinear stamped sherds were only slightly more common at the mission on Amelia than on St. Catherines Island (1.1% vs .45%, Table 7.13). More important, central dots (Table 7.14) were visible in only 2.3% (count) and 4.4% (weight) of the sherd assemblage, amounts that did appear to be a significant decrease from the St. Catherines Island totals. Stylistic attributes, then, do not suggest a revitalization movement among the Indians who chose to stay at the mission.

While the size of the collection was relatively small, and the significance, therefore, dubious, it is interesting that no sherds with dots were recovered from the aboriginal structure.

Other Attributes

While the overwhelming majority of San Marcos sherds were grit tempered (Table 7.15, 7.16), there was a higher incidence of sand tempering at the Amelia Island site than was recorded for the St. Catherines Island mission (2.3% vs 4.8% by count, for St. Catherines and Amelia, respectively). This apparent increase in sand tempering at the later mission might suggest that some Pre-Columbian sand tempered plain sherds were included in this total. However, in the analysis, sand tempered sherds were considered San Marcos only if they had the characteristic stamping, were filmed, or displayed a form not characteristic of the Savannah phase pottery found on Amelia Island. Hence, if anything, the number of San Marcos sand tempered sherds, and

Table 7.13. Frequency of Curvilinear Stamped Sherds.

MASTER CODE								ALL			
RECTILINEAR				CURVILINEAR							
COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
11557	98.9	74016	98.7	126	1.1	980.6	1.3	11683	100	74996	100

Table 7.14. Frequency of Sherds with Central Dots.

MASTER CODE								ALL			
STAMPED				DOT							
COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
11409	97.7	71693	95.6	274	2.3	3303.8	4.4	11683	100	74996	100

Table 7.15. Structure by Temper.

	TEMPER																							
	GRIT				SAND				GRIT AND GROG				SHELL AND SAND				GROG				SAND AND SHELL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
STRUCTURE																								
CONVENTO	10044	93.8	62124	94.7	526	4.9	2590.3	3.9	66	0.6	382.5	0.6	5	0.0	14.7	0.0	30	0.3	229.0	0.3	1	0.0	5.9	0.0
KITCHEN	2966	96.3	19483	95.3	87	2.8	689.6	3.4	4	0.1	25.0	0.1	13	0.4	146.9	0.7	1	0.0	5.0	0.0	.	.	.	.
CHURCH	1687	90.7	11858	91.4	109	5.9	672.8	5.2	32	1.7	254.1	2.0	23	1.2	141.7	1.1	3	0.2	15.6	0.1	.	.	.	.
ABQ STR	328	87.2	1853.1	88.9	44	11.7	179.2	8.6	1	0.3	7.7	0.4	.	.	.	.	.	.	.	.	.	.	.	.
ALL	15025	93.8	95319	94.3	766	4.8	4131.9	4.1	103	0.6	669.3	0.7	41	0.3	303.3	0.3	34	0.2	249.6	0.2	1	0.0	5.9	0.0

	TEMPER															
	GRIT AND SHELL				GRIT AND LIMESTONE				SAND AND LIMESTONE				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
STRUCTURE																
CONVENTO	20	0.2	128.7	0.2	12	0.1	99.8	0.2	3	0.0	13.1	0.0	10707	100	65588	100
KITCHEN	2	0.1	11.7	0.1	5	0.2	57.4	0.3	3	0.1	28.5	0.1	3081	100	20447	100
CHURCH	5	0.3	23.3	0.2	.	.	.	.	1	0.1	2.6	0.0	1860	100	12968	100
ABQ STR	.	.	.	.	1	0.3	3.8	0.2	2	0.5	41.0	2.0	376	100	2084.8	100
ALL	27	0.2	163.7	0.2	18	0.1	161.0	0.2	9	0.1	85.2	0.1	16024	100	101089	100

frequency missing=208

Table 7.16. Vessel Form by Temper.

VESSEL TEMPER

Frequency / Percent / Row Pct / Col Pct	GRIT	SAND	GRITGROG	SHELL	SHELGRIT	GRTLMSTN	LIMSTONE	Total
BOWL	55	24	1	1	0	0	0	81
	11.53	5.03	0.21	0.21	0.00	0.00	0.00	16.98
	67.90	29.63	1.23	1.23	0.00	0.00	0.00	
	13.78	34.78	33.33	33.33	0.00	0.00	0.00	
STRAIGHT	94	12	1	2	0	0	0	109
	19.71	2.52	0.21	0.42	0.00	0.00	0.00	22.85
	86.24	11.01	0.92	1.83	0.00	0.00	0.00	
	23.56	17.39	33.33	66.67	0.00	0.00	0.00	
JAR	144	13	1	0	0	0	0	158
	30.19	2.73	0.21	0.00	0.00	0.00	0.00	33.12
	91.14	8.23	0.63	0.00	0.00	0.00	0.00	
	36.09	18.84	33.33	0.00	0.00	0.00	0.00	
CARINATED BOWL	14	6	0	0	0	0	0	20
	2.94	1.26	0.00	0.00	0.00	0.00	0.00	4.19
	70.00	30.00	0.00	0.00	0.00	0.00	0.00	
	3.51	8.70	0.00	0.00	0.00	0.00	0.00	
UID COLONO	12	5	0	0	0	0	0	17
	2.52	1.05	0.00	0.00	0.00	0.00	0.00	3.56
	70.59	29.41	0.00	0.00	0.00	0.00	0.00	
	3.01	7.25	0.00	0.00	0.00	0.00	0.00	
BRIMMED	80	9	0	0	1	1	1	92
	16.77	1.89	0.00	0.00	0.21	0.21	0.21	19.29
	86.96	9.78	0.00	0.00	1.09	1.09	1.09	
	20.05	13.04	0.00	0.00	100.00	100.00	100.00	
Total	399	69	3	3	1	1	1	477
	83.65	14.47	0.63	0.63	0.21	0.21	0.21	100.00

particularly plain sherds, was more likely to be depressed than inflated.

Grog tempered sherds were similarly treated. Grog tempering was used in minor amounts in the Wilmington/Savannah phase in coastal southern Georgia and northeast Florida. Grog tempering increased in the Contact period (Borremans 1985:210, 286; DesJean 1985:149). This (or a related) grog tempered ware has been associated with the inhabitants of the mission of San Pedro de Mocama on Cumberland Island (Milanich 1971). This ware was present at the Santa Catalina mission on Amelia Island, as well as at the earlier mission of Santa Maria de Yamassee, also on Amelia Island. Sherds belonging to this as-yet undefined phase were removed from the sample. The grog tempering in Tables 7.15 and 7.16 is believed to be in San Marcos wares on the basis of surface decoration. As such, less than 1% of the San Marcos assemblage was determined to have been tempered with grog or grog and grit.

Another group of peoples represented in the Pre-Columbian and Mission period components at the site were Timucuans making St. Johns type pottery. This pottery was probably acquired by trade during the Mission period. Because of the inability to reliably segregate St. Johns pottery associated with the late Pre-Columbian component on the site from that associated with the mission, St. Johns phase materials are not discussed.

Limestone tempering, absent from the St. Catherines Island assemblage, appeared in minute amounts, as did shell tempering. Otto and Lewis (1974:101) remarked that shell and limestone were present in San Marcos wares only as incidental inclusions in the sand used for tempering or in the clay sources. Indeed, a few of the sherds coded as containing shell on Amelia carried the note "incidental?," though other sherds did have larger quantities of shell and/or limestone. Apparently, true shell tempering did appear in wares with San Marcos-like surface decorations in St. Augustine (Jim Cusick, personal communication, 1991). However, at the present time little is known about either the temporal or ethnic associations of that ware. Because

limestone outcrops are not found on Amelia Island (Hemmings and Deagan 1973:16), and no limestone or shell tempered wares were found in the village area excavated by Hemmings and Deagan, the limestone tempered vessels in the mission compound probably were imported from St. Augustine.

Sand and shell tempering occurred in one bowl and two straight rim forms. Shell and grit and limestone tempered pastes occurred only in brimmed vessels (Table 7.16). One of the latter was stamped, one burnished plain, and the remainder were plain. All shell or limestone tempered wares came from either the church or the convento.

A chi-square test of the association of temper with vessel form was done for the sand and grit tempered vessels and with jar forms collapsed (Table 7.17). While there was no absolute association of temper and form, the test indicated significance at a probability greater than .005. This probability resulted from the very high percentage of simple bowls that were sand tempered. The low percentage of sand tempered jars and high number of sand tempered carinated bowls and colono-ware vessels also contributed.

The complete inventory of interior and exterior surface treatments (excluding burnished plain) is shown in Table 7.18. On a sherd basis, around 20% of the total assemblage had unburnished interiors. Again, this figure was quite similar to the totals from the Meeting House Fields site and the mission on St. Catherines Island. Unlike the earlier mission, where the lowest frequency of interior burnishing was from the kitchen, at the Amelia Island mission the kitchen area had the highest proportion of interior burnishing. The discrepancy was considered too small on St. Catherines Island to be significant. However, values from the Amelia Island site did suggest a meaningful difference.

Because they were so visible, it was again surprising to find that the actual frequency of red filmed sherds was quite low. Less than 5% (count) of the assemblage had red filming, zoned red filming, and very rarely, red and black filming on vessel interiors. Less than 2% of the

Table 7.17. Chi-Square Test, Temper by Vessel Form.

TEMPER	VESSEL FORM						
Frequency Expected Deviation Cell Chi-Square	BOWL	STRAIGHT	JAR	CAR BOWL	UCLNO	BRIM	Total
GRIT	55 67.252 -12.25 2.2321	93 89.386 3.6142 0.1461	142 131.95 10.05 0.7654	14 17.026 -3.026 0.5378	12 14.472 -2.472 0.4222	79 74.914 4.0862 0.2229	395
SAND	24 11.748 12.252 12.778	12 15.614 -3.614 0.8366	13 23.05 -10.05 4.3816	6 2.9741 3.0259 3.0785	5 2.528 2.472 2.4172	9 13.086 -4.086 1.2759	69
Total	79	105	155	20	17	88	464

car bowl=carinated bowl
uclno=unidentified colono
brim=brimmed vessel

STATISTICS FOR TABLE OF TEMPER BY VESSEL FORM

Statistic	DF	Value	Prob
Chi-Square	5	29.094	<0.001

Table 7.18. Structure by Interior Finish.

	INTERIOR SURFACE																					
	UNBURN		IBRN		IRF		IZRF		IERF		IBF		IEZRF		IZB		IZRB		ALL			
	COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT			
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT		
STRUCTURE																						
CONVENTO	2597	24.1	7624	70.6	323	3.0	128	1.2	58	0.5	16	0.1	49	0.5	1	0.0	2	0.0	10798	100		
KITCHEN	253	8.2	2798	90.7	26	0.8	6	0.2	1	0.0	.	.	.	.	1	0.0	.	.	3085	100		
CHURCH	354	18.0	1534	77.8	63	3.2	6	0.3	9	0.5	4	0.2	.	.	.	.	1	0.1	1971	100		
ABO STR	62	16.4	307	81.2	9	2.4	.	.	.	.	.	.	.	.	.	.	.	.	378	100		
ALL	3266	20.1	12263	75.5	421	2.6	140	0.9	68	0.4	20	0.1	49	0.3	2	0.0	3	0.0	16232	100		

	EXTERIOR SURFACE											
	UNBRN		EBRN		ERF		EBF		EZRF		ALL	
	COUNT		COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
STRUCTURE												
CONVENTO	10699	99.1	44	0.4	34	0.3	8	0.1	13	0.1	10798	100
KITCHEN	3062	99.3	9	0.3	7	0.2	7	0.2	.	.	3085	100
CHURCH	1934	98.1	23	1.2	13	0.7	.	.	1	0.1	1971	100
ABO STR	373	98.7	5	1.3	.	.	.	.	.	.	378	100
ALL	16068	100	81	100	54	100	15	100	14	100	16232	100

unburn=unburnished
ibrn=interior burnished
irf=interior red filmed
izrf=interior zoned red filmed
ierf=interior exterior red filmed
ibf=interior black filmed
iezrf=interior exterior zoned red filmed
izb=interior zoned black
izrb=interior zoned red and black
exbrn=exterior burnished
erf=exterior red filmed
ebf=exterior black filmed
ezrf=exterior zoned red filmed

sample had these treatments on vessel exteriors, either alone or in combination with filmed interiors. These figures were higher, however, than the number of filmed sherds from the Georgia mission.

Like the Georgia mission, filmed sherds were slightly more likely to be found in the convento than elsewhere. Red filming was present at the aboriginal structure. A little over 2% of the sherds from that area were filmed, a lower total than from the church or convento, but higher than the kitchen area. Red filming was also present in the pueblo portion of the mission to the south (Hemmings and Deagan 1973:16).

There was so little filming in the St. Catherines Island sample that an association between form and filming could not be tested. However, the test for the larger Amelia Island assemblage (Table 7.19) indicated a strong association between filming and brimmed vessels. Few jars were filmed and no carinated bowls were filmed.

Another similarity with the northern Georgia mission was the extremely low incidence of sooting (Table 7.20). A comparison of counts and weights for the incidence of sooting indicated that there was no significant difference in the distribution of sooted sherds, except for the surprising absence of sooting at the aboriginal structure.

The final attributes measured on sherds were folded rim width and land and groove measurements. The average folded rim width for the site as a whole was 18.8 mm, only 1.5 mm deeper than the St. Catherines Island mission average of 17.3 mm. Averages were 18.9, 20.1, and 17.8 mm at the convento, church, and kitchen, respectively. Since the standard deviation was larger than the difference between these averages, they were considered insignificant. Land and groove widths were also similar to those from St. Catherines; they were 2.0 and 2.1 mm, respectively, compared to 2.0 and 2.4 mm from the earlier mission.

Motifs

As might be expected, there was a wider variety of motifs at the Amelia Island Santa Catalina mission than at the Georgia mission. Most appeared to be a reinterpretation of the world symbol. Even the

Table 7.19. Chi-Square Test, Interior Filming by Vessel Form.

Frequency / Expected / Deviation / Cell Chi-Square	BOWL	STRAIGHT	JAR	CAR BOWL	UCLNO	BRIM	Total
NO FILM	69	94	151	20	16	58	408
	69.283	93.233	135.14	17.107	14.541	78.692	
	-0.283	0.7673	15.855	2.8931	1.4591	-20.69	
	0.0012	0.0063	1.8602	0.4893	0.1464	5.4409	
FILMED	12	15	7	0	1	34	69
	11.717	15.767	22.855	2.8931	2.4591	13.308	
	0.283	-0.767	-15.86	-2.893	-1.459	20.692	
	0.0068	0.0373	10.999	2.8931	0.8658	32.172	
Total	81	109	158	20	17	92	477

Note: for abbreviations, see Table 7-17.

STATISTICS FOR TABLE OF FILMING BY VF

Statistic	DF	Value	Prob
Chi-Square	5	54.919	<0.001

Table 7.20. Sooted Sherds.

	NO SOOTING				SOOTED				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
STRUCTURE												
CONVENTO	10753	99.6	65591	99.3	45	0.4	441.4	0.7	10798	100	66033	100
KITCHEN	3079	99.8	20266	99.1	6	0.2	192.6	0.9	3085	100	20459	100
CHURCH	1960	99.4	13414	99.2	11	0.6	107.4	0.8	1971	100	13521	100
ABO STR	378	100	2089.1	100	.	.	.	.	378	100	2089.1	100
ALL	16170	99.6	101361	99.3	62	0.4	741.4	0.7	16232	100	102102	100

curvilinear complicated stamped designs (Figure 7.2) were probably central to a four-field background similar to that depicted by H. Smith (1948; see Figure 4.3). One sherd may have a cross-in-circle motif (too poorly defined to be photographed). The world symbol was as implicit in this design as it was in the filfot cross, but the cross-in-circle motif was quite ancient, appearing on pottery in the much earlier, but related Swift Creek period.

The actual number of sherds with unusual designs was quite low. Though it was tough to come up with a consistent definition of "unusual," most counts brought the total percentage of sherds with uncommon designs to around .1% (a count of 20 sherds) of the total number of sherds.

Despite the decrease in incising, there did not appear to be much difference in the designs incised. Some fine line incising was present (Figure 7.2), but the bulk of the incising was bold. Punctation continued to be used frequently with incising.

Summary and Implications

Beyond the goal of the presentation of the descriptive characteristics of the assemblage at Santa Catalina de Guale on Amelia Island, two questions were proposed: 1) what would be the affect on the pottery assemblage of the increasingly heterogeneous populations of the late Mission period and 2) is there enough variation between the St. Catherines Island mission assemblage and the Amelia Island assemblage to justify the use of two separate types?

Heterogeneity

As expected, the San Marcos assemblage on Amelia Island did become more diverse as compared with the St. Catherines Island assemblage. There was an increase in temper types, new or reworked designs appeared, as did a wide variety of new rim elaborations. Nevertheless, these experiments remained infrequent in the overall assemblage. Shell or limestone inclusions, for instance, were found in only 1.2% of the sherds and no shell or limestone tempered pottery was found in the

Figure 7.2. Selected Sherds, Santa Catalina, Amelia Island, Florida.
Scale in centimeters.
Above scale: San Marcos Incised, upper left is a red filmed plate marley;
Left of scale: San Marcos Burnished Plain with anachronistic ovoid node;
Below scale: San Marcos Complicated Stamped, upper bottom left is unusual.

village area (Hemmings and Deagan 1973:16). The amount of shell or limestone tempering at the mission is much lower than what is found in St. Augustine, where San Marcos sherds with these tempers constitute from 7.5% to 65.7% of assemblages (Jim Cusick, personal communication, 1991). Vessels with these temper types were probably brought to Amelia Island from St. Augustine.

New rim elaborations constituted a larger percentage of the assemblage than new tempers; about 5% of the rim elaborations were not found on St. Catherines Island. These rim elaborations were not copied from other styles, but represent new creations. One would not expect a great deal of creativity if the pottery was produced under time constraints. In addition, there were a number of colono-ware forms not found at the earlier site. Two colono-ware olive jar-like rims were found, both from the church; there were another 16 unidentified colono-ware vessels. In addition, 9 handles and 8 footed or ringed bases were recovered from the convento, another 4 handles and 2 footed or ringed bases came from the church, 1 ringed base was found in the kitchen area, and the aboriginal structure excavation block yielded 1 ringed base and 1 handle. While there are no comparable analyses from St. Augustine reporting the proportion of colono-wares (either sherd data or MNV) compared to traditional forms, it would appear that Deagan (1990b) was correct in positing greater formal diversity in the colono-wares at mission sites than in urban St. Augustine.

While the San Marcos assemblage did become more heterogenous, the diversity was not accompanied by any loss of creativity or technical excellence. The latter is reflected in the remarkable stability in the proportion of interior burnished sherds from the late Irene phase through the Mission period.

It is possible that many or all of the unusual designs, rim elaborations, and forms, along with the unusual tempers, were produced off-site, perhaps at a workshop. For that matter, all of the pottery produced for Spanish use on the site could have been produced elsewhere or by a single individual at the site. Using one datum measuring

individual variation (Hill and Gunn 1977; Saunders 1985, 1986a)--rim fold depth--it appears that more than one individual produced the folded rim pots. Standard deviation around the mean was higher on Amelia Island (4.6 mm) than at the Meeting House Fields site (2.0 mm for Cluster 1 and 3.5 mm for Cluster 2), where production for use was expected. This suggests that much of the pottery was made by a number of different individuals, probably on site. This question needs to be pursued further. As noted previously, Ann Cordell of the Florida Museum of Natural History is examining the question of workshop production of colono-wares in La Florida.

Other data indicate increasing standardization. The tendency for bowls to be sand tempered was present in the late Irene phase. At Meeting House Fields, between 30 and 38% of the vessels of other forms were sand tempered and 44% of the bowl forms were sand tempered. Sand tempering declined dramatically in the succeeding Mission period; only 5% of the simple bowls at the St. Catherines Island mission were sand tempered. By the late Mission period on Amelia Island, though the incidence of sand tempering by sherd was about the same (3.1% on St. Catherines Island, 4.8% of Amelia Island), 30% of bowls were sand tempered. Red filming, slightly more prevalent at the later mission than the earlier one, became associated with brimmed vessels. However, the small sample size of red filmed vessels from St. Catherines Island (n=3) precluded direct comparison.

Though it is tempting to see the red filmed brimmed vessels as elite (Spanish) wares, it is important to remember that approximately the same proportion of red filmed wares was present in the village area (about 4.7%--plain wares were not included in the San Marcos type by Hemmings and Deagan) as within the mission compound. Brimmed vessels were also present in the village. These data may argue against workshop production for red filmed wares and brimmed vessels.

Types

Braley (1990) drew a distinction between the Altamaha phase wares recovered at the Harris Neck Wildlife Refuge and San Marcos pottery:

> By the seventeenth century, complicated stamped designs became more sloppily applied, and the curvilinear filfot cross was abandoned in favor of rectilinear designs. However, the complicated stamped wares resemble their prehistoric counterparts more than they do the San Marcos wares found in St. Augustine. The San Marcos cross-simple stamped motif, so common in post-1660 contexts in St. Augustine, . . . is rarely represented at site 9MC41.
>
> (Braley 1990:100)

If true, the situation in the colonial component at 9MC41 contrasted with that on neighboring St. Catherines Island, where the difference between Irene and Altamaha phase wares (though they were clearly related) was quite striking.

It was possible to test Braley's assertion that there was more overstamping in the later wares. The five principal stamped codes--accounting for 80.6% of all stamped sherds (excluding obliterated stamped) on St. Catherines Island and 80.9% on Amelia Island--were simple stamped, simple stamped paddle zoned (commonly called line blocked--perpendicular lines are present on the paddle), simple stamped and cross-simple stamped, cross-simple stamped, and simple stamped paddle zoned with cross simple stamping. The first two codes were not overstamped and the latter three were. In fact, there was more overstamping on St. Catherines Island (79% of the sherds were overstamped) than Amelia Island (70% overstamped).

The comparison of pottery attributes on the Altamaha wares from the St. Catherines Island mission and the San Marcos wares from Amelia Island suggests that the two should not be separate types. As the above analysis has demonstrated, there was little difference between the two in either stylistic or formal attributes. The most these designations accomplish is the recognition of the geographical location of the site (northern Georgia vs. southern Georgia and northeast Florida). Such "extrinsic" data (Rice 1987:276) is not necessarily improper in

typologies. However, as the sole basis for the typological distinction, it answers few questions.

Clearly the criteria used in St. Augustine to distinguish Altamaha from San Marcos (Chapter 3) need revision. Punctation directly on the vessel body was not confined to the north Georgia wares and the incidence of this attribute remained stable throughout the Mission period (Table 8.1). Other attributes cited to distinguish Altamaha, stamping and incising on the same vessel and whole rather than half cane punctate, also occur on San Marcos vessels. Whole cane punctation occurred on 50 of 123 (40.6%) cane punctated sherds on Amelia Island and 23 of 67 (34.3%) cane punctated sherds on St. Catherines Island. Whole cane punctation was significantly more frequent at the Meeting House Fields site, where 75% of cane punctations were whole cane. As with the other stylistic attributes, dramatic change occurred at the juncture of the Irene and Altamaha phases, not between the Altamaha and the San Marcos types. Stamping on vessels with incised rims was less frequent on Amelia Island (9 sherds vs. 16 sherds on St. Catherines), but this is probably related to the overall decrease in incised wares at the later site. This last attribute, the decrease in incising, is a significant difference between the two phases. However, it could not be used to distinguish individual sherds of one "type" from the other. While the assemblages from the two Santa Catalinas might be expected to be more similar than assemblages from less related sites, the data compiled here argue against a typological distinction between Guale Indian pottery produced in north Georgia and that produced in Florida. Unfortunately, these terms are embedded in the literature and it will be difficult to correct the terminology without creating confusion. Perhaps when other studies corroborate this one, a consensus can be reached over the use of a single term to refer to Guale Indian pottery of the Mission period.

CHAPTER 8

CONCLUSIONS

As discussed in Chapter 1, the objective of this study was to determinate the nature and timing of change in Guale Indian pottery from the late Pre-Columbian Irene phase through the Mission period of Spanish colonial Florida (A.D. 1350-1702). The data base consisted of pottery assemblages from four temporally sequential contexts--a late Irene phase site on St. Catherines Island; early and late proveniences from the Santa Catalina mission compound, also on St. Catherines Island, Georgia; and selected proveniences from the late Mission period site Santa Catalina on Amelia Island, Florida. In addition to temporal changes, different "contexts of use," defined as the different structures in the two Spanish missions, were studied to determine if pottery assemblages would vary according to structure function. Once the descriptive characteristics of the respective assemblages were defined, it was thought it would be possible to correlate differences between the assemblages with changes in demography, subsistence patterns, residence rules, or the organization of labor brought about by Spanish colonization.

Guale Indian pottery was contrasted with that of other peoples in colonial environments. While changes in the pottery of other peoples has been demonstrated to be subtle, change in Guale Indian pottery was quite obvious, at least in terms of design motif. The only motif on paddle stamped pottery of the late Irene phase was the filfot cross, a representation of the world symbol reflecting the cosmology of the southeastern peoples. Sometime after contact, the curvilinear elements of the cross disappeared, the design became bolder, and, it was thought, devolved into a series of perpendicular lines. Previous work indicated

that through time there would also be a change in rim treatment, from applique strips to folded rims, and some changes in the relative frequencies of surface decorations.

The comparison of the pottery from the late Irene phase Meeting House Fields site (Cluster 2, ca. A.D. 1550) and the early component of the St. Catherines Island mission (A.D. 1594-1597) indicated that the transition from the Irene phase to the Colonial period Altamaha phase was abrupt, at least in archaeological terms. No curvilinear elements were present in the designs on the sherds from the early mission context, designs were bolder, and there were no applique strips in that context or in later ones from the site (Table 8.1). However, the motif on the pottery continued to emphasize a central dot (the sun) surrounded by four sets of lines radiating in the four cardinal directions.

A number of possible explanations--functional, social, and ideological--were forwarded to explain the change in the execution of the world symbol (Chapter 6). While it was not possible to eliminate any of the possibilities with the available data, the ostensibly abrupt change in this trait, along with the simultaneous adoption of the folded, punctated rim, and better firing techniques, implicated the Spanish in these changes to a larger degree than had been anticipated.

This conclusion was surprising. It was expected that changes in Irene phase pottery would begin before the first Franciscan missions appeared among the Guale. Certainly there must have been profound changes in Guale Indian society before the establishment of the second Santa Catalina mission (the first being the short-lived mission founded by the Jesuits in the village of Guale [1568-1570; Hann 1990b:13; contra Jones 1978:13). Prior to the Franciscan mission, the French had lived among the Guale, perhaps in the same village (Hann 1990b:13), and Menéndez had stationed soldiers there and later established a blockhouse. The Guale had been providing food for the Spanish colony at Santa Elena, sometimes under duress, since its inception in 1566. And prior to the early Franciscan mission, at least four epidemics had struck the Guale coast. The first epidemic emanated from the Ayllón

Table 8.1. Summary of Proveniences and Selected Attributes.

PROVENIENCE	DATE	HISTORICAL EVENT	SURFACE DECORATION STAMP	PLAIN	B PLAIN INC		RIM TREATMENT PLAIN	DECORATE	PELNODE	APPLIQUE	FOLD
MHF CLUSTER 1	ca. A.D. 1420	Precolumbian	71.7%	19.2%	8.9%	0.1%	25.0%	10.7%	14.3%	50.0%	0.0%
MHF CLUSTER 2	ca. A.D. 1550	Deposited after the Ayllón colony of 1526	52.4%	35.4%	5.5%	6.6%	53.7%	14.7%	0.0%	29.5%	2.1%
STA. CATALINA, GEORGIA, EARLY COMPONENT	A.D. 1594?-1597	Deposited prior to the Guale rebellion of 1597	80.7%	8.8%	5.6%	2.8%	44.4%	5.6%	5.6%	0.0%	44.4%
STA. CATALINA, GEORGIA, LATE COMPONENT	A.D. 1604-1680	Deposited after the Guale rebellion of 1597	76.4%	12.9%	4.4%	6.2%	55.3%	4.0%	0.7%	0.0%	40.0%
STA. CATALINA, FLORIDA	A.D. 1686-1702	Deposited after the abandonment of Georgia mission	79.1%	15.7%	3.9%	1.4%	48.1%	4.7%	0.5%	0.2%	46.5%

Note: Radiocarbon dates based on uncorrected/uncalibrated radiocarbon year for comparative purposes. Date presented was selected as most appropriate on the basis of stylistic attributes.

colony of 1526, the second was reported by Father Sedeño in 1570, the third appeared after the Spanish reprisals for the 1576 Guale rebellion, and a fourth occurred in 1582. As noted in Chapter 2, by the time the first Franciscan mission was established (1594), mortality among the Guale could have been approaching 90%.

Despite these turbulent conditions, the pottery from the later contexts at the Meeting House Fields site showed no characteristics that could be considered transitional to Altamaha pottery. The changes that did occur appeared to represent a continuation of the changes in the Lamar tradition in general, and to be a result of drift. For instance, Cluster 2 at Meeting House Fields differed from the slightly earlier Cluster 1 in having more plain and incised wares, more decorated vessels, and fewer applique strips.

In addition, there was significantly more sand tempering in Cluster 2. The incidence of sand tempering returned to the same low frequency as was found in Cluster 1 in the early (and late) mission components. There was also a slight decrease in the number of burnished sherds in Cluster 2, but the percentage of burnished plain vessels in Clusters 1 and 2 was virtually the same.

The attribute most connected with the change from Irene to Altamaha phase pottery, curvilinear vs. rectilinear stamping, showed no change over time at Meeting House Fields. Only the appearance of two possible folded plain rims in Cluster 2 presaged the developments to come.

The trend towards more plain and incised wares over time in the late Irene phase was not continued into the Mission period. Instead, the percentages of stamped and plain wares from both St. Catherines Island Mission period assemblages resembled the Cluster 1 totals more than those from Cluster 2. In addition, the incidence of sand tempering declined, burnishing remained about the same, and decorated vessels declined. Attributes that might have been expected to decline gradually, for instance, curvilinear designs with the eventual loss or breakage of all paddles with the filfot cross, were absent from the

1594-1597 context at mission Santa Catalina. The use of the applique strip was also abandoned before 1594.

It is difficult to associate any of the changes between Irene and Altamaha pottery with the further disruption of the Guale lifeway once missions were established. Population loss was probably severe before A.D. 1600. Indeed, the population interred within the church at the mission Santa Catalina on St. Catherines Island apparently had greater survivorship than their Mississippian period forbearers. (However, the same data can be read to signify decreased fertility [Russell et al. 1990]). In any event, if population loss were going to affect pottery production, some of those effects should have appeared in the Contact period contexts of the Meeting House Fields site.

The results from studies of pottery changes in other areas of the Spanish colonial empire that suffered severe population losses would seem to indicate that craft traditions were extremely tenacious despite high morbidity and mortality. This may be precisely because pottery production was not specialized in most of the areas studied. In the case of the Guale, the repertoire of designs was quite small and, as a comparison of rim elaborations between middens at Meeting House Fields indicates, rim styles did not correspond to household units. Both technique and style could be passed down by any female member of the group. Thus, there were no major differences in the frequency of different rim elaborations between the Irene and the Altamaha phases and it would appear that these wares are not sensitive to changes in residence patterns.

While a redirection of traditional labor patterns is well-chronicled, the idea that the world symbol became simplified because of time constraints did not explain the sheer drop-off of this attribute (see Chapter 6). Nor would changes in labor patterns explain the complete rejection of the applique strip in favor of the folded rim. Functional reasons may explain the evolution of both of these attributes.

More data from other sites is needed before the hypothesis presented here, that the Spanish had directed change in Guale Indian pottery, can be accepted. In fact, data from two previously excavated sites seem to indicate that, at least in some areas, the change to a San Marcos-like stamping occurred earlier than was visible in the St. Catherines Island data.

The first data set is from Sapelo Island. At the Bourbon Field site (see Figure 5.1), Crook (1981:18) defined an "Irene-San Marcos pottery nexus." Crook felt that a distinction between Irene and San Marcos pottery was "unfounded" at Bourbon Field: "significant correlations among members of the nexus provides an excellent indication that all are components of a single pottery complex." The problem with this interpretation is that, as the name implies, the site had been heavily plowed. Crook's analysis was based on horizontal distributions of pottery. However, without better site integrity, it is impossible to determine whether or not these two pottery types were related in time. Sapelo Island was the location of the mission of San José de Sápala. It was there that the St. Catherines Island peoples fled after Santa Catalina was abandoned. The recovery of olive jar sherds in the "nexus" may well indicate that mission contexts were mixed with earlier occupations.

The other data set comes from St. Simons Island, which is nominally south of the area of Irene phase occupation. Wallace (1975) excavated three sites at the northern end of the island, Couper Field and Indian Field (probably the same site) and the Taylor Mound. An attribute analysis of the pottery indicated that San Marcos and "Pine Harbor" Complicated Stamped were used contemporaneously at those sites. (R. Smith (1981) has questioned many of Wallace's methods and interpretations, particularly as regards the question of contemporaneity between these sites. It may be that much of this data needs to be reconsidered.) In the case of Couper and Indian Fields, however, once again the sites had been plowed. In addition, pottery was assigned to type on the basis of rectilinear vs. curvilinear stamping. As the

analysis of Meeting House Fields has shown, rectilinear stamping is the most frequent design recovered on sherds even in Irene phase pottery assemblages.

The Taylor Mound provides the best contextual evidence for the contemporaneity of Irene and San Marcos wares. Pearson (1977a) described the Taylor Mound as a Savannah phase mound intruded on by three historic burials containing iron implements and glass beads, including several Nueva Cadiz beads. Wallace (1975) revisited the site and expanded on the previous excavations. He found no other burials associated with European artifacts (though several nails and spikes were recovered near the top of the mound fill), but did find an east side pottery cache containing at least five vessels and several wrought iron spikes (Milanich and Larson 1976). According to Wallace (1975:57-58), the cache was not intrusive from the surface of the mound, but originated at the level of the old humus and was covered with mound fill. Types were described as "San Marcos (rectilinear complicated stamped), Irene Incised, Irene Filfot, and Irene Plain" (Wallace 1975:58).

Four of these vessels were reconstructed at the Florida Museum of Natural History. Two are incised and obliterated stamped and the others are stamped. Both stamped vessels are jars with slightly excurvated lips. They have plain rims with whole cane punctation. One of these has San Marcos-like stamping and a high fired exterior. The other jar is obliterated stamped, probably San Marcos, and also relatively highly fired.

Both incised vessels have more complex forms. One is a small (diameter=14 cm) collared jar with an excurvate rim. This shape may be associated with the "carinated jar" Braley et al. (1986) identified as a mortuary ware. The collar is plain and the rim stick punctated. Elaborately incised scrolls (7 lands per scroll) decorate the vessel shoulder. The dark body of the vessel is stamped with obliterated Irene filfot crosses. The other incised vessel is a long necked jar. The neck is plain and the simple rim is cane punctated. The vessel shoulder

is incised with pendant semi-ovals and filler. Incising on this vessel is not as well executed as that on the collared jar. The vessel body is obliterated stamped and could not be typed. None of the vessels examined were sooted.

Both Irene and San Marcos wares, then, were manifestly present in the Taylor Mound. The assemblage of European artifacts from the burials suggests that the cache dates to an early period of interaction with Europeans, perhaps as early as the Ayllón colony (1526). In contrast to the St. Catherines Island data, then, San Marcos-like stamping may have appeared in some areas prior to sustained Spanish settlement.

This interpretation hinges on the stratigraphic position of the cache. Elsewhere in his study, Wallace (1975:245) stated that the cache was deposited at the time of mound completion, which implies that the feature originated at the mound surface. If the cache were introduced from the mound surface, without more diagnostic artifacts it would be impossible to determine whether the cache was deposited 15 minutes or 50 years after the mound was completed. The cache, then, could have been a Colonial period feature intrusive into the contact period mound. Though the presence of the two types of stamping in the same deposit at Taylor Mound suggested that they were used contemporaneously, it may be that in areas south of traditional Guale territory, traded Irene phase wares were curated (Milanich and Larson 1976). Thus, while these vessels were deposited contemporaneously, they may not have been produced at the same time.

There is other evidence suggesting that Mission period Guale used Pre-Columbian mounds. At Johns Mound on St. Catherines Island (Larsen and Thomas 1982), two bundle burials associated with Altamaha pottery were found in a St. Catherines/Irene phase burial mound. One of these burials was also accompanied by elements of a domestic pig, suggesting that there was a European occupation on the island before this interment.

The answer to the question of when Irene phase pottery became Altamaha phase pottery remains elusive. Indeed, the interpretations of

the data used in this study depend on the acceptance of the dating of the proveniences examined. The Meeting House Fields Cluster 2 material could be earlier than suggested and/or the early component at the St. Catherines Island mission might be later than supposed. As is discussed for another context below, both the absolute and relative dating methods available are at present too imprecise to yield unequivocal answers to the complex question of the timing of culture change. As noted in Chapter 3, pottery change along the Guale coast probably kept pace with local events. Different sites with different histories (especially as regards the amount of direct and indirect European contact) will yield different answers.

Unfortunately, the database at hand offers too few sites that are too widely scattered over the coast to construct a reliable chronology. Many previously identified sites are known only through surface survey (e.g., Larsen 1953) or have been impacted by agriculture or other modern developments. The last decade has seen a resurgence of interest in Contact period sites. Nevertheless, the rate of site destruction along the coast will render it impossible to understand the process of culture change unless we intensify our efforts.

In order to fully understand the transition between the phases, we need to study (in addition to more sites with characteristics similar to those under discussion here) two other contexts. The first, obviously, is the mission pueblo, particularly those of early missions. Initially, the Spanish may have been more concerned with directing change in pottery produced for their own use. Associated village pottery may have retained some Pre-Columbian attributes longer. Pottery produced by Guale living in villages not directly associated with missions might also have changed less dramatically, as the work of Braley et al. (1986) suggests.

Secondly, we need to know more about the pottery of the Guale who did not submit to Spanish domination, those who "put a piece of forest between themselves and the long arm of the invaders" (Axtell 1988a:54; Chapter 1). One might predict that the pottery of those peoples would

remain Irene and therein lies a problem. Possibly many previously identified sites with Irene pottery have been considered Pre-Columbian but actually represent the occupations of those refugees. Those hypothetical sites will be almost impossible to date. Radiocarbon dating is not accurate enough and it is likely that in eschewing the Spanish, those Guale also either shunned European material culture or had little access to it prior to the arrival of English traders after 1670. Unless some diagnostic European artifacts were present, site locations away from the centers of Spanish occupation and in environs not typically occupied by the Pre-Columbian Guale may be the only criteria for identifying such occupations. Snow (1990) may have located such sites in the Pine Barrens of south-central Georgia. Some of the sites discovered by Larsen (1953) in McIntosh and Liberty County might also qualify.

The problem of the identification of those sites aside, if refugee sites have "Altamaha" pottery, a (somewhat arbitrary) date of A.D. 1600 was a true watershed, a time when a number of complex and interrelated variables culminated in the replacement of Irene phase pottery with a different type.

As demonstrated in Chapters 6 and 7, the changes wrought in the Guale Indian pottery of the early 17th century quickly stabilized. Except for a large decrease in the frequency of incising, values for relative frequencies of surface decoration, rim treatments and elaborations, and even the distributional patterns of surface decorations and vessel forms were quite similar between the St. Catherines Island and Amelia Island missions (Table 8.1). These data suggested that Altamaha and San Marcos should not be separate types.

In the two mission sites, contexts of use proved to have subtle but intriguing effects on assemblages. Contrary to expectations, vessel forms showed little correlation with structure. Instead, pottery assemblages from the structures varied along "stylistic" as opposed to "functional" attributes (though, as noted, those categories tended to blur). Assemblages from utilitarian contexts had higher percentages of

stamped wares and churches had more plain and burnished plain pottery. While in most cases these differences were statistically significant, they were not absolute. However, these data did suggest that certain "stylistic" properties were desirable for vessels used in each structure. Other differences between structures included a slightly higher percentage of red filmed wares in the convento and relatively low percentages of folded rims in the churches.

Two not necessarily mutually exclusive hypotheses were offered for the similarity between pottery assemblages from the different structures. First, structures probably did have overlapping functions; for instance, kitchens, conventos, and church sacristies could all be used for storage. However, the overall lack of difference between structures probably emerged from the relatively undifferentiated set of forms in both the Pre-Columbian Guale and Spanish peasant traditions. One attribute not measured in this study, vessel diameter, might evoke stronger differences in contexts of use. Folk taxonomies of pottery in Spain and Mexico use vessel size, measured in cuartillos as a major distinguishing criterion (Foster 1960:90-91; the referent, however, is not capacity but the number of pots that could be purchased for a fourth of a real.) Vessel size also appeared related to context in the comparison of Guale Indian pottery from mounds and middens (Braley et al. 1986:90), though only for certain forms.

The world symbol continued to be used on pottery after the Guale were removed from the Georgia coast to Amelia Island. However, the frequency of the design did appear to decrease. While paddles continued to exhibit the four sets of radiating lines, many motifs no longer had central "suns." At the same time, a few long disused attributes, like the rim strip and the applique node, reappeared (though in minute quantities), so it was unlikely that the loss of the central dot was due to a breakdown in the transmission of design concepts from one generation to another.

Was the decline in the use of the world symbol evidence of the adoption of a different worldview by some of the Guale at the mission on

Amelia Island? Very likely. Fray Pareja noted as early as 1616 that (as in most cultures undergoing rapid change) "the younger generation makes fun of and laughs at some old men and women who carelessly have recourse to these abuses (the aboriginal customs)" (Milanich and Sturtevant 1972:4; Oré 1936:106). However, unless one is willing to believe that many carvers continued to produce paddles with customary designs then bereft of meaning, some Guale Indian women continued to believe in Pre-Columbian cosmological concepts. Documentary evidence (see especially Milanich and Sturtevant 1973 and Hann 1991) does not indicate that friars put less emphasis on indoctrinating women into the Christian fold than men. The continued use of the world symbol should not be construed as a difference in acculturation between men and women in mission contexts (an idea for which there is very little evidence, see Saunders 1986b). In any event, when one reflects on the continuity between Irene and San Marcos pottery, the overall impression is that the Guale retained their formal and decorative categories for pottery throughout a period of rapid demographic and cultural change. Since these categories often signal group affiliation (see the discussion in Saunders 1986a, 1986c), the results of this study suggest that the Guale may have maintained a strong sense of their ethnic and social identity as well.

APPENDIX A.
MEETING HOUSE FIELDS SURFACE DECORATION BY MIDDEN/LEVEL.

MIDDEN 12

	MASTER CODE															
	STAMPED				PLAIN				BURNISHED PLAIN				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																
1	47	58.0	291.4	64.9	27	33.3	139.8	31.2	7	8.6	17.5	3.9	81	100	448.7	100
2	47	65.3	408.5	71.8	15	20.8	89.0	15.6	10	13.9	71.2	12.5	72	100	568.7	100
3	57	90.5	651.4	94.1	4	6.3	34.0	4.9	2	3.2	6.7	1.0	63	100	692.1	100
4	11	78.6	121.1	77.5	3	21.4	35.1	22.5	.	.	.	.	14	100	156.2	100
ALL	162	70.4	1472.4	78.9	49	21.3	297.9	16.0	19	8.3	95.4	5.1	230	100	1865.7	100

MIDDEN 21

	MASTER CODE															
	STAMPED				PLAIN				BURNISHED PLAIN				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																
1	9	56.2	42.7	55.7	6	37.5	30.5	39.8	1	6.2	3.5	4.6	16	100	76.7	100
2	109	68.1	509.6	67.2	32	20.0	169.4	22.3	19	11.9	79.7	10.5	160	100	758.7	100
3	89	93.7	808.4	95.6	6	6.3	36.8	4.4	.	.	.	.	95	100	845.2	100
4	29	82.9	320.5	79.4	4	11.4	66.3	16.4	2	5.7	17.0	4.2	35	100	403.8	100
5	2	100	23.1	100	.	.	.	.	.	.	.	.	2	100	23.1	100
6	.	.	.	.	1	100	0.4	100	.	.	.	.	1	100	0.4	100
ALL	238	77.0	1704.3	80.9	49	15.9	303.4	14.4	22	7.1	100.2	4.8	309	100	2107.9	100

MIDDEN B

	MASTER CODE												ALL			
	STAMPED				PLAIN				BURNISHED PLAIN							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																
3	2	66.7	18.2	87.9	1	33.3	2.5	12.1	.	.	.	.	3	100	20.7	100
4	7	46.7	71.2	63.5	7	46.7	37.9	33.8	1	6.7	3.0	2.7	15	100	112.1	100
5	4	66.7	29.3	80.1	1	16.7	3.7	10.1	1	16.7	3.6	9.8	6	100	36.6	100
6	7	58.3	101.1	69.0	5	41.7	45.4	31.0	.	.	.	.	12	100	146.5	100
7	4	44.4	93.6	61.9	4	44.4	48.8	32.3	1	11.1	8.7	5.8	9	100	151.1	100
9	4	80.0	35.6	69.9	1	20.0	15.3	30.1	.	.	.	.	5	100	50.9	100
10	2	100	48.5	100	.	.	.	.	.	.	.	.	2	100	48.5	100
ALL	30	57.7	397.5	70.2	19	36.5	153.6	27.1	3	5.8	15.3	2.7	52	100	566.4	100

MIDDEN 0

	MASTER CODE																ALL			
	STAMPED				PLAIN				BURNISHED PLAIN				INCISED							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
LEVEL	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
1	.	.	.	.	5	100	27.8	100	.	.	.	.	.	.	.	.	5	100	27.8	100
2	.	.	.	.	1	100	3.7	100	.	.	.	.	.	.	.	.	1	100	3.7	100
4	4	50.0	38.5	67.1	3	37.5	13.8	24.0	1	12.5	5.1	8.9	.	.	.	.	8	100	57.4	100
5	5	35.7	103.1	56.6	8	57.1	74.0	40.7	1	7.1	4.9	2.7	.	.	.	.	14	100	182.0	100
6	8	57.1	105.5	66.9	3	21.4	26.7	16.9	2	14.3	19.0	12.0	1	7.1	6.6	4.2	14	100	157.8	100
7	10	55.6	89.7	65.7	7	38.9	40.2	29.5	1	5.6	6.6	4.8	.	.	.	.	18	100	136.5	100
8	1	100	6.8	100	.	.	.	.	.	.	.	.	.	.	.	.	1	100	6.8	100
ALL	28	45.9	343.6	60.1	27	44.3	186.2	32.6	5	8.2	35.6	6.2	1	1.6	6.6	1.2	61	100	572.0	100

MIDDEN E

	MASTER CODE																ALL			
	STAMPED				PLAIN				BURNISHED PLAIN				INCISED							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																				
1	46	55.4	430.7	70.1	26	31.3	141.4	23.0	.	.	.	.	11	13.3	42.6	6.9	83	100	614.7	100
2	34	33.0	468.8	45.1	49	47.6	430.1	41.4	3	2.9	28.4	2.7	17	16.5	112.0	10.8	103	100	1039.3	100
3	46	73.0	577.1	71.6	10	15.9	85.4	10.6	3	4.8	76.2	9.5	4	6.3	67.0	8.3	63	100	805.7	100
4	50	72.5	678.0	85.1	17	24.6	108.8	13.7	1	1.4	6.2	0.8	1	1.4	3.9	0.5	69	100	796.9	100
5	38	58.5	468.0	64.5	23	35.4	242.1	33.4	2	3.1	11.7	1.6	2	3.1	3.6	0.5	65	100	725.4	100
6	71	64.5	893.8	73.4	28	25.5	240.0	19.7	1	0.9	4.2	0.3	10	9.1	78.9	6.5	110	100	1216.9	100
7	66	49.3	944.2	61.5	58	43.3	508.0	33.1	2	1.5	19.2	1.3	8	6.0	64.4	4.2	134	100	1535.8	100
8	115	61.2	1237.9	67.8	66	35.1	528.1	28.9	1	0.5	12.7	0.7	6	3.2	47.9	2.6	188	100	1826.6	100
9	31	66.0	266.1	74.8	14	29.8	79.6	22.4	.	.	.	.	2	4.3	10.0	2.8	47	100	355.7	100
10	3	60.0	17.2	61.0	1	20.0	7.5	26.6	.	.	.	.	1	20.0	3.5	12.4	5	100	28.2	100
ALL	500	57.7	5981.8	66.9	292	33.7	2371.0	26.5	13	1.5	158.6	1.8	62	7.2	433.8	4.8	867	100	8945.2	100

MIDDEN H

	MASTER CODE																ALL			
	STAMPED				PLAIN				BURNISHED PLAIN				INCISED							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																				
1	69	51.5	694.8	64.7	51	38.1	276.4	25.7	8	6.0	39.0	3.6	6	4.5	63.3	5.9	134	100	1073.5	100
2	22	22.2	260.7	32.5	35	35.4	237.9	29.7	24	24.2	154.6	19.3	18	18.2	148.5	18.5	99	100	801.7	100
3	12	38.7	205.8	41.7	19	61.3	287.3	58.3	.	.	.	.	.	.	.	.	31	100	493.1	100
4	4	40.0	72.0	41.5	5	50.0	84.0	48.5	.	.	.	.	1	10.0	17.3	10.0	10	100	173.3	100
5	14	70.0	310.9	83.8	5	25.0	55.3	14.9	1	5.0	4.8	1.3	.	.	.	.	20	100	371.0	100
6	10	62.5	261.8	73.3	6	37.5	95.2	26.7	.	.	.	.	.	.	.	.	16	100	357.0	100
7	24	58.5	350.8	69.1	17	41.5	156.7	30.9	.	.	.	.	.	.	.	.	41	100	507.5	100
8	8	66.7	129.2	85.2	3	25.0	17.7	11.7	1	8.3	4.8	3.2	.	.	.	.	12	100	151.7	100
9	1	100	3.9	100	.	.	.	.	.	.	.	.	.	.	.	.	1	100	3.9	100
ALL	164	45.1	2289.9	58.2	141	38.7	1210.5	30.8	34	9.3	203.2	5.2	25	6.9	229.1	5.8	364	100	3932.7	100

MIDDEN J

	MASTER CODE																ALL			
	STAMPED				PLAIN				BURNISHED PLAIN				INCISED							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																				
1	46	60.5	567.4	64.5	21	27.6	172.2	19.6	9	11.8	139.9	15.9	.	.	.	.	76	100	879.5	100
2	.	.	.	.	14	100	197.7	100	.	.	.	.	.	.	.	.	14	100	197.7	100
3	1	16.7	7.0	7.0	.	.	.	.	5	83.3	93.2	93.0	.	.	.	.	6	100	100.2	100
4	1	10.0	14.2	15.1	.	.	.	.	9	90.0	79.6	84.9	.	.	.	.	10	100	93.8	100
5	13	86.7	270.5	89.9	2	13.3	30.4	10.1	.	.	.	.	.	.	.	.	15	100	300.9	100
6	15	100	344.1	100	.	.	.	.	.	.	.	.	.	.	.	.	15	100	344.1	100
7	22	91.7	427.6	93.0	1	4.2	26.8	5.8	.	.	.	.	1	4.2	5.3	1.2	24	100	459.7	100
8	16	88.9	288.9	95.6	2	11.1	13.2	4.4	.	.	.	.	.	.	.	.	18	100	302.1	100
ALL	114	64.0	1919.7	71.7	40	22.5	440.3	16.4	23	12.9	312.7	11.7	1	0.6	5.3	0.2	178	100	2678.0	100

MIDDEN M

	MASTER CODE																ALL			
	STAMPED				PLAIN				BURNISHED PLAIN				INCISED							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																				
1	3	16.7	32.6	22.3	6	33.3	48.0	32.9	8	44.4	62.1	42.5	1	5.6	3.4	2.3	18	100	146.1	100
2	23	33.3	278.8	35.2	26	37.7	228.2	28.8	14	20.3	237.6	30.0	6	8.7	46.9	5.9	69	100	791.5	100
3	70	60.9	824.1	65.4	35	30.4	308.8	24.5	5	4.3	102.5	8.1	5	4.3	24.3	1.9	115	100	1259.7	100
4	20	40.8	302.2	49.2	22	44.9	199.4	32.4	4	8.2	85.8	14.0	3	6.1	27.3	4.4	49	100	614.7	100
5	19	61.3	241.0	49.8	6	19.4	48.5	10.0	6	19.4	194.7	40.2	.	.	.	.	31	100	484.2	100
6	12	37.5	142.1	46.7	13	40.6	132.6	43.6	.	.	.	.	7	21.9	29.4	9.7	32	100	304.1	100
7	1	50.0	7.7	26.6	1	50.0	21.3	73.4	.	.	.	.	.	.	.	.	2	100	29.0	100
ALL	148	46.8	1828.5	50.4	109	34.5	986.8	27.2	37	11.7	682.7	18.8	22	7.0	131.3	3.6	316	100	3629.3	100

ALL

	MASTER CODE																ALL			
	STAMPED				PLAIN				BURNISHED PLAIN				INCISED							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																				
1	220	53.3	2059.6	63.0	142	34.4	836.1	25.6	33	8.0	262.0	8.0	18	4.4	109.3	3.3	413	100	3267.0	100
2	235	45.4	1926.4	46.3	172	33.2	1356.0	32.6	70	13.5	571.5	13.7	41	7.9	307.4	7.4	518	100	4161.3	100
3	277	73.7	3092.0	73.3	75	19.9	754.8	17.9	15	4.0	278.6	6.6	9	2.4	91.3	2.2	376	100	4216.7	100
4	126	60.0	1617.7	67.2	61	29.0	545.3	22.6	18	8.6	196.7	8.2	5	2.4	48.5	2.0	210	100	2408.2	100
5	95	62.1	1445.9	68.1	45	29.4	454.0	21.4	11	7.2	219.7	10.3	2	1.3	3.6	0.2	153	100	2123.2	100
6	123	61.5	1848.4	73.2	56	28.0	540.3	21.4	3	1.5	23.2	0.9	18	9.0	114.9	4.5	200	100	2526.8	100
7	127	55.7	1913.6	67.9	88	38.6	801.8	28.4	4	1.8	34.5	1.2	9	3.9	69.7	2.5	228	100	2819.6	100
8	140	63.9	1662.8	72.7	71	32.4	559.0	24.4	2	0.9	17.5	0.8	6	2.7	47.9	2.1	219	100	2287.2	100
9	36	67.9	305.6	74.4	15	28.3	94.9	23.1	.	.	.	.	2	3.8	10.0	2.4	53	100	410.5	100
10	5	71.4	65.7	85.7	1	14.3	7.5	9.8	.	.	.	.	1	14.3	3.5	4.6	7	100	76.7	100
ALL	1384	58.2	15938	65.6	726	30.5	5949.7	24.5	156	6.6	1603.7	6.6	111	4.7	806.1	3.3	2377	100	24297	100

APPENDIX B
MEETING HOUSE FIELDS RIM STYLE BY UNIT/LEVEL.

MIDDEN 12

	STYLE																							
	PLAIN				PELLET/NODE				DECORATED CANE				STRIP SEGMENTED				STRIP CANE				STRIP CANE/SEGMENTED			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																								
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	20.0	3.4	14.4	4	80.0	20.2	85.6
2	1	25.0	4.2	9.2	.	.	.	.	1	25.0	6.1	13.3	1	25.0	7.3	15.9	1	25.0	28.3	61.7	.	.	.	.
3	.	.	.	.	1	33.3	9.6	24.4	.	.	.	.	.	.	.	.	2	66.7	29.7	75.6	.	.	.	.
4	1	33.3	2.5	4.8	1	33.3	25.2	48.4	.	.	.	.	1	33.3	24.4	46.8	.	.	.	.	.	.	.	.
ALL	2	13.3	6.7	4.2	2	13.3	34.8	21.6	1	6.7	6.1	3.8	2	13.3	31.7	19.7	4	26.7	61.4	38.2	4	26.7	20.2	12.6

	ALL			
	COUNT		WEIGHT	
	SUM	PCT	SUM	PCT
LEVEL				
1	5	100	23.6	100
2	4	100	45.9	100
3	3	100	39.3	100
4	3	100	52.1	100
ALL	15	100	160.9	100

MIDDEN 21

	STYLE																							
	PLAIN				PELLET/NODE				DECORATED CANE				STRIP SEGMENTED				STRIP CANE				STRIP CANE/SEGMENTED			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																								
2	3	21.4	7.3	15.8	3	21.4	12.8	27.7	1	7.1	2.0	4.3	3	21.4	8.9	19.3	4	28.6	15.2	32.9	.	.	.	.
3	2	50.0	6.5	36.9	.	.	.	.	.	.	.	.	1	25.0	4.1	23.3	.	.	.	.	1	25.0	7.0	39.8
4	1	25.0	3.1	2.7	1	25.0	38.2	33.2	.	.	.	.	.	.	.	.	1	25.0	18.6	16.2	.	.	.	.
ALL	6	27.3	16.9	9.5	4	18.2	51.0	28.5	1	4.5	2.0	1.1	4	18.2	13.0	7.3	5	22.7	33.8	18.9	1	4.5	7.0	3.9

	STYLE							
	STRIP PINCH				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL								
2	.	.	.	.	14	100	46.2	100
3	.	.	.	.	4	100	17.6	100
4	1	25.0	55.0	47.9	4	100	114.9	100
ALL	1	4.5	55.0	30.8	22	100	178.7	100

MIDDEN B

	STYLE								ALL			
	DECORATED CANE				STRIP CANE							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL												
4	.	.	.	.	1	100	3.8	100	1	100	3.8	100
6	1	50.0	8.1	61.4	1	50.0	5.1	38.6	2	100	13.2	100
ALL	1	33.3	8.1	47.6	2	66.7	8.9	52.4	3	100	17.0	100

MIDDEN D

	STYLE												ALL			
	PLAIN				DECORATED CANE				STRIP CANE							
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																
2	1	100	3.7	100	.	.	.	.	.	.	.	.	1	100	3.7	100
5	1	100	5.8	100	.	.	.	.	.	.	.	.	1	100	5.8	100
7	1	50.0	3.1	40.3	.	.	.	.	1	50.0	4.6	59.7	2	100	7.7	100
8	.	.	.	.	1	100	6.8	100	.	.	.	.	1	100	6.8	100
ALL	3	60.0	12.6	52.5	1	20.0	6.8	28.3	1	20.0	4.6	19.2	5	100	24.0	100

MIDDEN E

	STYLE																							
	PLAIN				DECORATED CANE				DECORATED FINGERNAIL				DECORATED STAMPED				STRIP SEGMENTED				STRIP CANE			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																								
1	2	22.2	8.4	24.3	1	11.1	3.1	9.0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	5	38.5	84.4	48.7	2	15.4	34.5	19.9	.	.	.	.	.	.	.	.	1	7.7	12.9	7.4	.	.	.	.
3	.	.	.	.	.	.	.	.	1	20.0	18.1	29.6	.	.	.	.	.	.	.	.	1	20.0	20.0	32.7
4	2	28.6	6.8	13.5	.	.	.	.	.	.	.	.	1	14.3	3.0	6.0	3	42.9	29.2	58.2	1	14.3	11.2	22.3
5	3	50.0	45.1	55.6	.	.	.	.	1	16.7	10.2	12.6	.	.	.	.	.	.	.	.	.	.	.	.
6	5	41.7	86.8	52.5	3	25.0	34.5	20.9	.	.	.	.	1	8.3	3.0	1.8	.	.	.	.	.	.	.	.
7	9	52.9	61.2	44.3	3	17.6	12.2	8.8	.	.	.	.	.	.	.	.	1	5.9	18.1	13.1	3	17.6	44.6	32.2
8	6	33.3	25.0	9.2	2	11.1	65.3	24.1	.	.	.	.	.	.	.	.	5	27.8	117.8	43.4	3	16.7	52.2	19.2
9	2	66.7	23.5	83.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	33.3	4.7	16.7
ALL	34	37.8	341.2	34.0	11	12.2	149.6	14.9	2	2.2	28.3	2.8	2	2.2	6.0	0.6	10	11.1	178.0	17.7	9	10.0	132.7	13.2

MIDDEN E--CONTINUED.

	STYLE											
	STRIP PINCH				INCISED				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL												
1	2	22.2	12.9	37.4	4	44.4	10.1	29.3	9	100	34.5	100
2	.	.	.	.	5	38.5	41.4	23.9	13	100	173.2	100
3	.	.	.	.	3	60.0	23.1	37.7	5	100	61.2	100
4	.	.	.	.	.	.	.	.	7	100	50.2	100
5	1	16.7	24.5	30.2	1	16.7	1.3	1.6	6	100	81.1	100
6	.	.	.	.	3	25.0	40.9	24.8	12	100	165.2	100
7	.	.	.	.	1	5.9	2.2	1.6	17	100	138.3	100
8	.	.	.	.	2	11.1	11.0	4.1	18	100	271.3	100
9	.	.	.	.	.	.	.	.	3	100	28.2	100
ALL	3	3.3	37.4	3.7	19	21.1	130.0	13.0	90	100	1003.2	100

MIDDEN H

	STYLE																							
	PLAIN				DECORATED CANE				STRIP SEGMENTED				STRIP CANE				FOLD PLAIN				INCISED			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																								
1	4	28.6	76.4	39.6	.	.	.	.	9	64.3	113.6	58.9	1	7.1	2.8	1.5	.	.	.	.	.	.	.	.
2	3	60.0	21.1	69.4	1	20.0	3.6	11.8	.	.	.	.	1	20.0	5.7	18.8	.	.	.	.	.	.	.	.
3	5	100	48.1	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	2	66.7	35.6	67.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	33.3	17.3	32.7
5	2	50.0	40.8	40.6	.	.	.	.	2	50.0	59.6	59.4	.	.	.	.	.	.	.	.	.	.	.	.
6	3	75.0	172.2	80.9	.	.	.	.	1	25.0	40.6	19.1	.	.	.	.	.	.	.	.	.	.	.	.
7	2	28.6	8.2	7.8	4	57.1	83.6	79.4	.	.	.	.	.	.	.	.	1	14.3	13.5	12.8	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	100	5.4	100	.	.	.	.
ALL	21	48.8	402.4	53.8	5	11.6	87.2	11.7	12	27.9	213.8	28.6	2	4.7	8.5	1.1	2	4.7	18.9	2.5	1	2.3	17.3	2.3

MIDDEN H--CONTINUED

	ALL			
	COUNT		WEIGHT	
	SUM	PCT	SUM	PCT
LEVEL				
1	14	100	192.8	100
2	5	100	30.4	100
3	5	100	48.1	100
4	3	100	52.9	100
5	4	100	100.4	100
6	4	100	212.8	100
7	7	100	105.3	100
8	1	100	5.4	100
ALL	43	100	748.1	100

MIDDEN J

	STYLE																							
	PLAIN				DECORATED CANE				STRIP SEGMENTED				STRIP CANE				STRIP PINCH				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																								
0	.	.	.	.	.	.	.	.	2	66.7	14.0	48.6	1	33.3	14.8	51.4	.	.	.	.	3	100	28.8	100
5	.	.	.	.	1	100	16.7	100	.	.	.	.	.	.	.	.	.	.	.	.	1	100	16.7	100
7	1	100	26.8	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	100	26.8	100
8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	100	5.4	100	1	100	5.4	100
ALL	1	16.7	26.8	34.5	1	16.7	16.7	21.5	2	33.3	14.0	18.0	1	16.7	14.8	19.0	1	16.7	5.4	6.9	6	100	77.7	100

MIDDEN M

	STYLE																							
	PLAIN				DECORATED CANE				STRIP SEGMENTED				STRIP CANE				INCISED				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																								
1	.	.	.	.	.	.	.	.	.	.	.	.	1	100	7.7	100	.	.	.	.	1	100	7.7	100
2	4	66.7	157.6	93.9	.	.	.	.	1	16.7	3.3	2.0	.	.	.	.	1	16.7	6.9	4.1	6	100	167.8	100
3	8	66.7	143.3	76.5	.	.	.	.	2	16.7	25.2	13.4	2	16.7	18.9	10.1	.	.	.	.	12	100	187.4	100
4	1	25.0	4.5	10.3	.	.	.	.	.	.	.	.	2	50.0	24.1	54.9	1	25.0	15.3	34.9	4	100	43.9	100
5	1	50.0	6.3	50.4	1	50.0	6.2	49.6	.	.	.	.	.	.	.	.	.	.	.	.	2	100	12.5	100
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	100	2.5	100	1	100	2.5	100
7	.	.	.	.	.	.	.	.	.	.	.	.	1	100	7.7	100	.	.	.	.	1	100	7.7	100
ALL	14	51.9	311.7	72.6	1	3.7	6.2	1.4	3	11.1	28.5	6.6	6	22.2	58.4	13.6	3	11.1	24.7	5.8	27	100	429.5	100

ALL

	STYLE																							
	PLAIN				PELLET/NODE				DECORATED CANE				DECORATED FINGERNAIL				DECORATED STAMPED				STRIP SEGMENTED			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																								
0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	66.7	14.0	48.6
1	6	20.7	84.8	32.8	.	.	.	.	1	3.4	3.1	1.2	.	.	.	.	.	.	.	.	9	31.0	113.6	43.9
2	17	39.5	278.3	59.6	3	7.0	12.8	2.7	5	11.6	46.2	9.9	.	.	.	.	.	.	.	.	6	14.0	32.4	6.9
3	15	51.7	197.9	56.0	1	3.4	9.6	2.7	.	.	.	.	1	3.4	18.1	5.1	.	.	.	.	3	10.3	29.3	8.3
4	7	31.8	52.5	16.5	2	9.1	63.4	19.9	.	.	.	.	.	.	.	.	1	4.5	3.0	0.9	4	18.2	53.6	16.9
5	7	50.0	98.0	45.3	.	.	.	.	2	14.3	22.9	10.6	1	7.1	10.2	4.7	.	.	.	.	2	14.3	59.6	27.5
6	8	42.1	259.0	65.8	.	.	.	.	4	21.1	42.6	10.8	.	.	.	.	1	5.3	3.0	0.8	1	5.3	40.6	10.3
7	13	46.4	99.3	34.7	.	.	.	.	7	25.0	95.8	33.5	.	.	.	.	.	.	.	.	1	3.6	18.1	6.3
8	6	28.6	25.0	8.7	.	.	.	.	3	14.3	72.1	25.0	.	.	.	.	.	.	.	.	5	23.8	117.8	40.8
9	2	66.7	23.5	83.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
ALL	81	38.4	1118.3	42.4	6	2.8	85.8	3.3	22	10.4	282.7	10.7	2	0.9	28.3	1.1	2	0.9	6.0	0.2	33	15.6	479.0	18.2

ALL--CONTINUED

	STYLE																							
	STRIP CANE				STRIP CANE/SEGMENTED				STRIP PINCH				FOLDED PLAIN				INCISED				ALL			
	COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT		COUNT		WEIGHT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
LEVEL																								
0	1	33.3	14.8	51.4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	100	28.8	100
1	3	10.3	13.9	5.4	4	13.8	20.2	7.8	2	6.9	12.9	5.0	.	.	.	.	4	13.8	10.1	3.9	29	100	258.6	100
2	6	14.0	49.2	10.5	.	.	.	.	.	.	.	.	.	.	.	.	6	14.0	48.3	10.3	43	100	467.2	100
3	5	17.2	68.6	19.4	1	3.4	7.0	2.0	.	.	.	.	.	.	.	.	3	10.3	23.1	6.5	29	100	353.6	100
4	5	22.7	57.7	18.2	.	.	.	.	1	4.5	55.0	17.3	.	.	.	.	2	9.1	32.6	10.3	22	100	317.8	100
5	.	.	.	.	.	.	.	.	1	7.1	24.5	11.3	.	.	.	.	1	7.1	1.3	0.6	14	100	216.5	100
6	1	5.3	5.1	1.3	.	.	.	.	.	.	.	.	.	.	.	.	4	21.1	43.4	11.0	19	100	393.7	100
7	5	17.9	56.9	19.9	.	.	.	.	.	.	.	.	1	3.6	13.5	4.7	1	3.6	2.2	0.8	28	100	285.8	100
8	3	14.3	52.2	18.1	.	.	.	.	1	4.8	5.4	1.9	1	4.8	5.4	1.9	2	9.5	11.0	3.8	21	100	288.9	100
9	1	33.3	4.7	16.7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	100	28.2	100
ALL	30	14.2	323.1	12.2	5	2.4	27.2	1.0	5	2.4	97.8	3.7	2	0.9	18.9	0.7	23	10.9	172.0	6.5	211	100	2639.1	100

APPENDIX C
MEETING HOUSE FIELDS, VESSEL FORM BY MIDDEN

	VESSEL FORM									
	BOWL		STRAIGHT		JAR		BOTTLE		ALL	
	COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
MIDDEN										
12	2	16.7	4	33.3	6	50.0	.	.	12	100
21	2	15.4	4	30.8	7	53.8	.	.	13	100
B	.	.	1	33.3	2	66.7	.	.	3	100
D	1	25.0	1	25.0	2	50.0	.	.	4	100
E	8	16.0	14	28.0	26	52.0	2	4.0	50	100
H	6	27.3	8	36.4	6	27.3	2	9.1	22	100
J	.	.	4	80.0	1	20.0	.	.	5	100
M	4	22.2	4	22.2	8	44.4	2	11.1	18	100
ALL	23	18.1	40	31.5	58	45.7	6	4.7	127	100

APPENDIX D
SANTA CATALINA, GEORGIA, RIM STYLES

RIM STYLES

	RIM TREATMENT																					
	PLAIN								DECORATED						PEL/NODE		FOLDED					
	STYLE								STYLE						STYLE		STYLE					
	UID/OTHER		PLAIN		INCISED		PINCH		DEC CANE		DEC FINGER		DEC STICK		INCISED		FLD PLAIN		FLD CANE		FLD FINGER	
	COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
VESSEL																						
BOWL	1	2.9	16	47.1	17	50.0	.	.	.	.	.	.	.	.	1	100	1	33.3	.	.	.	.
STRAIGHT	.	.	9	75.0	3	25.0	.	.	1	100	.	.	.	.	.	.	3	13.6	8	36.4	4	18.2
X UNR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	25.0	1	25.0
X RESTR	.	.	2	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
X UID	.	.	2	66.7	1	33.3	.	.	1	50.0	1	50.0	.	.	.	.	.	.	9	37.5	7	29.2
RSNJ	.	.	1	50.0	1	50.0	.	.	.	.	.	.	.	.	.	.	1	33.3	.	.	1	33.3
CBWL	1	10.0	2	20.0	6	60.0	1	10.0	.	.	1	100	.	.	.	.	.	.	.	.	.	.
BRIM	1	5.0	13	65.0	6	30.0	.	.	.	.	.	.	2	100	.	.	.	.	1	100	.	.
ALL	3	3.6	45	54.2	34	41.0	1	1.2	2	33.3	2	33.3	2	33.3	1	100	5	8.5	19	32.2	13	22.0

RIM STYLES--CONTINUED

	RIM TREATMENT									
	FOLDED									
	STYLE									
	FLDTRIANGL		FLDSTAMP		FLDSTICK		FLDINCISE		ALL	
	COUNT		COUNT		COUNT		COUNT		COUNT	
	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT	SUM	PCT
VESSEL										
BOWL	.	.	.	.	.	.	2	66.7	38	100
STRAIGHT	2	9.1	1	4.5	3	13.6	1	4.5	35	100
X UNR	1	25.0	1	25.0	.	.	.	.	4	100
X REST	.	.	.	.	.	.	1	100	3	100
X UID	3	12.5	2	8.3	3	12.5	.	.	29	100
RSNJ	.	.	.	.	1	33.3	.	.	5	100
CBWL	.	.	.	.	.	.	1	100	12	100
BRIM	.	.	.	.	.	.	.	.	23	100
ALL	6	10.2	4	6.8	7	11.9	5	8.5	149	100

BIBLIOGRAPHY

Adair, J.
1930 (1775) *The History of the American Indians*. Promontory Press, New York.

Adams, W.Y.
1979 On the Argument from Ceramics to History: a Challenge based on Evidence from Medieval Nubia. *Current Anthropology* 20(4):727-44.

Anderson, D.G.
1989 The Mississippian in South Carolina. In *Studies in South Carolina Archaeology: Essays in Honor of Robert L. Stephenson*, edited by A.C. Goodyear, III and G.T. Hanson, pp.101-132. Occasional Papers of the South Carolina Institute of Archaeology and Anthropology, Anthropological Studies 9, The University of South Carolina.

Anderson, D.G., D.J. Hally, and J.L. Rudolph
1986 The Mississippian Occupation of the Savannah River Valley. *Southeastern Archaeology* 5:32-51.

Anderson, D.G. and J.W. Judge
1988 Prehistory and History along the Upper Savannah River: Technical Synthesis of Cultural Resource Investigations, Richard B. Russell Multiple Resource Area, Vol.1. Interagency Archaeological Services, National Park Service, Atlanta, Georgia.

Arnold, D.E.
1984 Social Interaction and Ceramic Design: Community-wide Correlates in Quinua, Peru. In *Pots and Potters: Current Approaches in Ceramic Archaeology*, edited by P.M. Rice, pp. 133-161. UCLA Institute of Archaeology Monograph 24. University of California Press, Los Angeles.

1985 *Ceramic Theory and Cultural Process*. Cambridge University Press, Cambridge.

Axtell, J.
1988a Some Thoughts on the Ethnohistory of Missions. In *After Columbus: Essays in the Ethnohistory of Colonial North America*, by J. Axtell, pp. 47-57. Oxford University Press, New York.

1988b Were Indian Conversions *Bona Fide*? In *After Columbus: Essays in the Ethnohistory of Colonial North America*, by J. Axtell, pp. 100-124. Oxford University Press, New York.

Binford, L.R.
1962 Archaeology as Anthropology. *American Antiquity* 28(2):217-225.

1963 "Red Ochre" Caches from the Michigan Area: a Possible Case of Cultural Drift. *Southwestern Journal of Anthropology* 19:89-108.

Borremans, N.T.
1985 Archaeology of the Devil's Walkingstick Site: A Diachronic Perspective of Aboriginal Life on a Tidal River in Southeast

Georgia. Unpublished Master's Thesis, University of Florida, Gainesville, Florida.

Braithwaite, M.
1982 Decoration as Ritual Symbol: a Theoretical Proposal and an Ethnographic Study in Southern Sudan. In *Symbolic and Structural Archaeology*, edited by I. Hodder, pp. 80-88. Cambridge University Press, Cambridge.

Braley, C.O.
1990 The Lamar Ceramics of the Georgia Coast. In *Lamar Archaeology: Mississippian Chiefdoms in the Deep South*, edited by M. Williams and G. Shapiro, pp. 94-103. The University of Alabama Press, Tuscaloosa.

Braley, C.O., L.D. O'Steen, and I.R. Quitmeyer
1986 Archaeological Investigations at 9McI41, Harris Neck National Wildlife Refuge, McIntosh County, Georgia. Southeastern Archaeological Services, Inc., Athens, Georgia.

Braudel, Fernand
1981 *The Structures of Everyday Life: the Limits of the Possible*, translated by Siân Reynolds. Harper & Row, New York.

Brewer, M.A.
1985 Pottery from Wamassee Head. *Early Georgia* 13:15-28.

Bushnell, A.
1981 *The King's Coffer: Proprietors of the Spanish Florida Treasury 1656-1702*. University of Florida Press, Gainesville.

1986 *Santa María in the Written Record*. Florida State Museum Department of Anthropology Miscellaneous Project Report Series No. 21. Gainesville.

Caldwell, J.R.
1943 Cultural Relations of Four Indian Sites of the Georgia Coast. Unpublished Ph.D. Dissertation, University of Chicago.

1971 Chronology of the Georgia Coast. *Southeastern Archaeological Conference Bulletin* 13:88-92.

Caldwell, J.R. and C. McCann
1941 *Irene Mound Site, Chatham County, Georgia*. University of Georgia Press, Athens.

Charlton, T.
1968 Post-Conquest Aztec Ceramics: Implications for Archaeological Interpretation. *Florida Anthropologist* 21:96-101.

Conkey, M.W.
1978 Style and Information in Cultural Evolution: Toward a Predictive Model for the Paleolithic. In *Social Archaeology: Beyond Subsistence and Dating*, edited by C.L. Redman, M.J. Berman, E.V. Curtin, W.T. Langhorne Jr., N.M. Versaggi, and J.C. Wanser, pp. 61-85. Academic Press, New York.

Cook, Fred C.
1980 Chronological and Functional Reexamination of the Irene Ceramic Complex. In *Excursions in Southeastern Geology: The Archaeology-Geology of the Georgia Coast*, edited by J.D. Howard, C.B. DePratter, and R.W. Frey, pp. 160-169. The Geological Society of America, Guidebook 20. Georgia Department of Natural Resources, Atlanta.

1986 Origin and Change of Irene Rim Decoration in Coastal Georgia. *The Chesopiean* 4(24):2-22).

Cook, Fred C. and Charles E. Pearson
1989 The Southeastern Ceremonial Complex on the Georgia Coast. In *The Southeastern Ceremonial Complex: Artifacts and Analysis*, edited by P. Galloway, pp. 147-165. University of Nebraska Press, Lincoln.

Crook, M.R.
1978 Mississippian Period Community Organization on the Georgia Coast. Ph.D. Dissertation, University of Florida, Gainesville.

1980 Spatial Association and Distribution of Aggregate Village Sites in a Southeastern Atlantic Coastal Area. *Sapelo Papers: Researches in the History and Prehistory of Sapelo Island, Georgia*, edited by D.P. Juengst, pp. 77-88. West Georgia College, Carrolton.

1981 Space, Time, and Subsistence at Bourbon Field: Final Summary Report of Investigations Submitted to The National Geographic Society and The Georgia Department of Natural Resources. Xerox on file, West Georgia College, Carollton, Georgia.

1986 *Mississippi Period Archaeology of the Georgia Coastal Zone*. Laboratory of Archaeology Series Report No. 23. Georgia Archaeological Research Design Papers, No. 1. University of Georgia, Athens.

1990 Regional Chronologies, Georgia/South Carolina Coast. In *Lamar Archaeology: Mississippian Chiefdoms in the Deep South*, edited by M. Williams and G. Shapiro, pp. 36. The University of Alabama Press, Tuscaloosa.

Cruxent, J.M.
1959 *An Archaeological Chronology of Venezuela*. 2 vols. Pan American Union Social Science Monographs No. 6. Washington, D.C.

1990 The Origin of La Isabella: First Spanish Colony in the New World. In *Columbian Consequences: Archaeological and Historical Perspectives on the Spanish Borderlands East*, Volume 2, edited by D.H. Thomas, pp. 251-260. Smithsonian Institution Press, Washington.

Cusick, J.
1989 A Study of Postcontact Stylistic Change in Taino Ceramics at En Bas Saline, Haiti. Unpublished Master's Thesis, University of Florida, Gainesville.

David, N., J. Sterner, and K. Gavua
1988 Why Pots are Decorated. *Current Anthropology* 29(3):365-379.

Deagan, K.
1983 *Spanish St. Augustine: The Archaeology of a Colonial Creole Community*. Academic Press, New York.

1985 Spanish-Indian Interaction in Sixteenth Century Florida and the Caribbean. In *Cultures in Contact: The European Impact on Native Cultural Institutions in Eastern North America, A.D. 1000-1800*, edited by W. Fitzhugh, pp. 281-318. Smithsonian Institution Press, Washington, D.C.

1988 The Archaeology of the Spanish Contact Period in the Caribbean. *Journal of World Prehistory* 2(2):187-233.

1990a Sixteenth Century Spanish-American Colonization in the Southeastern United States and the Caribbean. In *Columbian Consequences: Archaeological and Historical Perspectives on the Spanish Borderlands East*, Volume 2, edited by D.H. Thomas, pp. 225-250. Smithsonian Institution Press, Washington.

1990b Accommodation and Resistance: The Process and Impact of Spanish Colonization in the Southeast. In *Columbian Consequences: Archaeological and Historical Perspectives on the Spanish Borderlands East*, Volume 2, edited by D.H. Thomas, pp. 297-314. Smithsonian Institution Press, Washington.

Deetz, J.
1965 *The Dynamics of Stylistic Change in Arikara Ceramics*. Illinois Studies in Anthropology No. 4. University of Illinois Press, Urbana.

1968 The Inference of Residence Rules from Archaeological Data. In *New Perspectives in Archeology*, edited by S.R. Binford and L.R. Binford, pp. 41-48. Aldine Publishing Co., Chicago.

DePratter, C.B.
1979 Ceramics. In *The Anthropology of St. Catherines Island 2. The Refuge-Deptford Mortuary Complex*. Anthropological Papers of the American Museum of Natural History, Volume 56: Part 1, by D.H. Thomas and C.S. Larsen, pp. 109-132. American Museum of Natural History, New York.

1984 Irene Manifestations on the Northern Georgia Coast. *Early Georgia* 12(1-2):44-58.

DePratter, C.B. and J.D. Howard
1980 Indian Occupation and Geologic History of the Georgia Coast: a 5000 Year Summary. In *Excursions in Southeastern Geology: The Archaeology-Geology of the Georgia Coast*, edited by J.D. Howard, C.B. DePratter, and R.W. Frey, pp. 1-65. The Geological Society of America, Guidebook 20. Georgia Department of Natural Resources, Atlanta.

DesJean, T.
1985 The South Bunker Area. In *Aboriginal Subsistence and Settlement Archaeology of the Kings Bay Locality*, Vol. 1: The Kings Bay and Devils Walkingstick Sites, edited by W.H. Adams, pp. 125-151. University of Florida Department of Anthropology Report of Investigations, No. 1. Gainesville.

Dobyns, H.
1983 *Their Number Become Thinned: Native American Population Dynamics in Eastern North America*. University of Tennessee Press, Knoxville.

Dunlop, Captain
1929 Journal Capt. Dunlop's Voyage to the Southward, 1687. *South Carolina Historical and Genealogical Magazine* 30(3):127-133.

Emerson, Thomas E.
1989 Water, Serpents, and the Underworld: An Exploration into Cahokian Symbolism. In *The Southeastern Ceremonial Complex: Artifacts and Analysis*, edited by P. Galloway, pp. 45-92. University of Nebraska Press, Lincoln.

Fewkes, V.J.
1944 Catawba Pottery Making with Notes on Pamunkey Pottery Making, Cherokee Pottery Making, and Coiling. *Proceedings of the American Philosophical Society* 88(2):69-124.

Foster, G.
1960 *Culture and Conquest: America's Spanish Heritage.* Viking Fund Publications in Anthropology No. 27, New York.

Friedrich, M.H.
1970 Design Structure and Social Interaction: Archeological Implications of an Ethnographic Analysis. *American Antiquity* 35(3):332-43.

Fundaburk, E.L. and M.D.F. Foreman, editors
1957 *Sun Circles and Human Hands: The Southeastern Indians Art and Industries.* Southern Publications, Fairhope, Alabama.

Gannon, M.V.
1965 *The Cross in the Sand.* University of Florida Press, Gainesville.

Garcia-Arevalo, M.
1978 *Influencia de la Dieta Indo-Hispanica in la Cerámica Taína.* Boletín del Museo del Hombre Dominicano 9, Santo Domingo.

1990 Transculturation in Contact Period and Contemporary Hispaniola. In *Columbian Consequences: Archaeological and Historical Perspectives on the Spanish Borderlands East*, Volume 2, edited by D.H. Thomas, pp. 269-280. Smithsonian Institution Press, Washington.

Geiger, M.
1937 *The Franciscan Conquest of Florida (1573-1618).* Catholic University of America, Washington, D.C.

Goggin, J.M.
1952 *Space and Time Perspective in Northern St. Johns Archaeology, Florida.* Yale University Publications in Anthropology 47. New Haven.

Hally, D.J. and J.L. Rudolph
1986 Mississippi Period Archaeology of the Georgia Piedmont. *Georgia Archaeological Research Design Papers*, no. 2. Laboratory of Archaeology Series Report #24, Athens.

Hally, D.J., M.T. Smith, and J.B. Langford
1990 The Archaeological Reality of de Soto's Coosa. In *Columbian Consequences: Archaeological and Historical Perspectives on the Spanish Borderlands East*, Volume 2, edited by D.H. Thomas, pp. 121-138. Smithsonian Institution Press, Washington.

Hann, J.
1986a Demographic Patterns and Changes in Mid-Seventeenth Century Timucua and Apalachee. *Florida Historical Quarterly* 64:371-392.

1986b Translation of the Ecija Voyages of 1605 and 1609 and the González Derrotero of 1609. *Florida Archaeology* No. 2. Florida Bureau of Archaeological Research, Tallahassee.

1987 Twighlight of the Mocamo and Guale Aborigines as Portrayed in the 1695 Spanish Visitation. *Florida Historical Quarterly* 46(1):1-24.

1988 *Apalachee: the Land between Two Rivers.* University of Florida Press, Gainesville.

1990a 1701 Visitation of Guale and Mocama. Manuscript on file, San Luis Historical and Archaeological Site, Tallahassee, Florida.

1990b Summary Guide to Spanish Florida Missions and Visitas with Churches in the Sixteenth and Seventeenth Centuries. *The Americas* 46(4).

1991 *Missions to the Calusa*. University of Florida Press, Gainesville.

Hardin, K.
1985a A Preliminary Archaeological Assessment of the Dorion Tract and Harrison Homestead Site (8NA41), Amelia Island, Florida. Piper Archaeological Research, Inc., St. Petersburg, Florida.

1985b The Santa Maria Mission Project. *The Florida Anthropologist* 39(1-2):75-83.

Hardin, M.A.
1977 Individual Style in San José Pottery Painting: The Role of Deliberate Choice. In *The Individual in Prehistory*, edited by J.N. Hill and J. Gunn, pp. 109-136. Academic Press, New York.

1984 Models of Decoration. In *The Many Dimensions of Pottery: Ceramics in Archaeology and Anthropology*, edited by S.E. van der Leeuw and A.C. Pritchard, pp. 573-614. CINGULA 7. Institute for Pre-and Proto-History, University of Amsterdam.

Harn, A.D.
1980 *The Prehistory of Dickson Mounds: the Dickson Excavation*. Illinois State Museum, Reports of Investigations, No. 35. Dickson Mounds Museum Anthropological Studies.

Hemmings, D. and K. Deagan
1973 *Excavations on Amelia Island in Northeast Florida*. Contributions of the Florida State Museum, Anthropology and History, No. 18. Florida State Museum, Gainesville.

Hill, J.N. and J. Gunn
1977 *The Individual in Prehistory: Studies in the Variability in Style in Prehistoric Technologies*. Academic Press, New York.

Hodder, I.
1982 *Symbols in Action: Ethnoarchaeological Studies of Material Culture*. Cambridge University Press, Cambridge.

1986 *Reading the Past*. Cambridge University Press, Cambridge.

Hoffman, K.
1990 Archaeological Excavations at the Florida National Guard Headquarters (Site SA-42A), St. Augustine, Florida. Manuscript on file, Florida Museum of Natural History, Gainesville.

Hoffman, P.
1984 The Chicora Legend and Franco-Spanish Rivalry in La Florida. *Florida Historical Quarterly* 62:419-438.

Howard, James H.
1968 The Southeastern Ceremonial Complex and its Interpretation. *Missouri Archaeological Society Memoir* No. 6. Oklahoma State University, Stillwater, Oklahoma.

Hudson, C.
1976 *The Southeastern Indians*. University of Tennessee Press, Knoxville.

Irwin, G.
1974 Carved Paddle Decoration of Pottery and its Capacity for Inference in Archaeology: An Example from the Solomon Islands. *Journal of the Polynesian Society* 83(3):368-71.

Jones, G.D.
1978 The Ethnohistory of the Guale Coast through 1684. In *The Anthropology of St. Catherines Island 1: Natural and Cultural History*, by D. H. Thomas, G.D. Jones, and R.S. Durham, pp. 178-209. Anthropological Papers of the American Museum of Natural History, Volume 55: Part 2, New York.

Kosso, P.
1991 Method in Archaeology: Middle-Range Theory as Hermeneutics. *American Antiquity* 56(4):621-627.

Kubler, George
1961 On the Colonial Extinction of the Motifs of Pre-Columbian Art. In *Essays in Pre-Columbian Art and Archaeology*, edited by S.K. Lothrop, pp. 14-34. Harvard University Press, Cambridge, Massachusetts.

Larsen, C.S.
1990 Biological Interpretation and the Context for Contact. In *The Archaeology of Mission Santa Catalina de Guale: Biocultural Interpretations of a Population in Transition*, edited by C.S. Larsen, pp. 11-25. Anthropological Papers of the American Museum of Natural History No. 68, New York.

Larsen, C.S. and D.H. Thomas
1982 *The Anthropology of St. Catherines Island 4. The St. Catherines Period Mortuary Complex.* Anthropological Papers of the American Museum of Natural History Vol. 57: Part 4, New York.

Larson, L.H., Jr.
1953 Coastal Mission Survey. Unpublished manuscript on file, Georgia Historical Commission, Atlanta.

1955 An Unusual Figurine from the Georgia Coast. *Florida Anthropologist* 8:75-81.

1958 Southern Cult Manifestations of the Georgia Coast. *American Antiquity* 23:426-430.

1978 Historic Guale Indians of the Georgia Coast and the Impact of the Spanish Mission Effort. In *Tachachale*, edited by J.T. Milanich and S. Proctor, pp. 120-140. University Presses of Florida, Gainesville.

1980 *Aboriginal Subsistence Technology on the Southeastern Coastal Plain during the Late Prehistoric Period.* University Presses of Florida, Gainesville.

1984 Irene Manifestations in the McIntosh County Tidewater Area. *Early Georgia* 12(1-2):64-70.

Lathrap, D.W.
1976 Shipibo tourist art. In *Ethnic and Tourist Arts: Cultural Expressions from the Fourth World*, edited by N.H.H. Graburn, pp. 197-207. University of California Press, Berkeley.

Laudonnière, R.
1975 (1586) *Three Voyages*, translated by C. Bennett. University Presses of Florida, Gainesville.

Long, A. and B. Rippeteau
1974 Testing Contemporaneity and Averaging Radiocarbon Dates. *American Antiquity* 39(2):205-215.

Matter, R.A.
1972 The Spanish Missions of Florida: The Friars vs the Governors in the "Golden Age," 1606-1690. Ph.D. Dissertation, University of Washington, Seattle.

McAlister, L.N.
1984 *Spain and Portugal in the New World, 1492-1700*. University of Minnesota Press, Minneapolis.

McMurray, J.A.
1973 The Definition of the Ceramic Complex at San Juan del Puerto. Ph.D. Dissertation, University of Florida, Gainesville.

Milanich, J.T.
1971 Surface Information from the Presumed Site of the San Pedro de Mocamo Mission. *Conference on Historic Sites Archaeology Papers* 5:114-121.

1977 A Chronology for the Aboriginal Cultures of Northern St. Simon's Island, Georgia. *The Florida Anthropologist* 30:134-142.

1978 The Western Timucua: Patterns of Acculturation and Change. In *Tacachale: Essays on the Indians of Florida and Southeastern Georgia during the Historic Period*, edited by J. Milanich and S. Proctor, pp. 59-88. University Presses of Florida, Gainesville.

1986 Comments. In *Mississippi Period Archaeology of the Georgia Coastal Zone*. Laboratory of Archaeology Series Report No. 23, by M.R. Crook, pp. 58-61. Georgia Archaeological Research Design Papers, No. 1. University of Georgia, Athens.

1990 The European Entrada into La Florida. In *Columbian Consequences: Archaeological and Historical Perspectives on the Spanish Borderlands East*, Volume 2, edited by D.H. Thomas, pp. 3-30. Smithsonian Institution Press, Washington.

Milanich, J.T. and L.H. Larson, Jr.
1976 Lower South Atlantic Coastal Plain Archeology, A.D. 700-1690. In *The Southeast*, R.D. Fogelson, Volume Editor, Volume 14 in *The Handbook of North American Indians*, W.C. Sturtevant, General Editor. Smithsonian Institution, Washington, D.C.

Milanich, J.T., L.H. Larson, Jr., and R.L. Wallace
1977 The Cusabo, Guale, Yamasee, and Yamacraw Aborigines. In *The Southeast*, R.D. Fogelson, Volume Editor, Volume 14 in *The Handbook of North American Indians*, W.C. Sturtevant, General Editor. Smithsonian Institution, Washington, D.C.

Milanich, J.T. and W.C. Sturtevant
1972 *Francisco Pareja's 1613 Confessionario: a Documentary Source for Timucuan Ethnography*. Florida Division of Archives, History, and Records, Tallahassee.

Milner, G.R.
1980 Epidemic Disease in the Postcontact Southeast: A Reappraisal. *Mid-Continental Journal of Archaeology* 5:39-56.

Nicklin, K.
1971 Stability and Innovation in Pottery Manufacture. *World Archaeology* 3(1):13-48.

Oré, L.G. de
1936 The Martyrs of Florida (1513-1616), translated and edited by M. Geiger. *Franciscan Studies* 19. Joseph W. Wagner, New York.

Ortega, E. and C. Fondeur
1978 *Estudio de la Cerámica del Periodo Indo-Hispano de la Antigua Concepción de la Vega.* Fundación Ortega Alvarez. Serie Cientifica 1. Santo Domingo.

Otto, J. and R. Lewis
1974 A Formal and Functional Analysis of San Marcos Pottery from Site SA-16-23, St. Augustine. *Florida Department of State, Bureau of Historic Sites and Properties Bulletin* 4. Tallahassee.

Patrik, L.
1985 Is There an Archaeological Record? In *Advances in Archaeological Method and Theory*, Vol. 8, edited by M. B. Schiffer, pp. 1-26. Academic Press, New York.

Pearson, C.E.
1977a Evidence of Early Spanish Contact on the Georgia Coast. *Historical Archaeology* 11:74-83.

1977b Analysis of Late Prehistoric Settlement on Ossabaw Island, Georgia. *Laboratory of Archaeology Series*, Report Number 12, University of Georgia, Athens.

1978 Analysis of Late Mississippian Settlements on Ossabaw Island, Georgia. In *Mississippian Settlement Systems*, edited by B.D. Smith, pp. 53-80. Academic Press, New York.

1979 Patterns of Mississippian Period Adaptation in Coastal Georgia. Ph.D. Dissertation, Department of Anthropology, University of Georgia.

1980 Late Prehistoric Settlement Systems on Ossabaw Island, Georgia. In *Excursions in Southeastern Geology: the Archaeology-Geology of the Georgia Coast*, by J.D. Howard, C.B. DePratter, and R.W. Frey, pp. 179-191. Guidebook 20, Department of Natural Resources, Atlanta, Georgia.

1984 Red Bird Creek: Late Prehistoric Material Culture and Subsistence in Coastal Georgia. *Early Georgia* 12 (1-2):1-40.

Piatek, B.
1985 Non-local Aboriginal Ceramics from Early Historic Contexts in St. Augustine. *Florida Anthropologist* 38(1-2):81-89.

Plog, S.
1980 *Stylistic Variation in Prehistoric Ceramics: Design Analysis in the American Southwest.* Cambridge University Press, New York.

Ramenofsky, A.F.
1987 *Vectors of Death: The Archaeology of European Contact.* University of New Mexico Press, Albuquerque.

Redman, C.L.
1978 Multivariate Artifact Analysis: A Basis for Multidimensional Interpretations. In *Social Archaeology: Beyond Subsistence and Dating*, edited by C.L. Redman, M.J. Berman, E.V. Curtin, W.T. Langhorne Jr., N.M. Versaggi, and J.C. Wanser, pp. 159-192. Academic Press, New York.

Reitz, E.J.
1990 Zooarchaeological Evidence of Subsistence at La Florida Missions. In *Columbian Consequences: Archaeological and Historical Perspectives on the Spanish Borderlands East*, Volume 2, edited by D.H. Thomas, pp. 543-554. Smithsonian Institution Press, Washington.

Reitz, E.J. and M.C. Scarry
1985 *Reconstructing Historic Subsistence with an Example from Sixteenth Century Spanish Florida*. Society for Historical Archaeology Special Publication No. 3.

Rice, P. M.
1984 Change and Conservatism in Pottery-Producing Systems. *The Many Dimensions of Pottery: Ceramics in Archaeology and Anthropology*, edited by S.E. van der Leeuw and A.C. Pritchard. CINGULA 7. Institute for Pre- and Proto-History, University of Amsterdam, Amsterdam.

1987 *Pottery Analysis: A Sourcebook*. University of Chicago Press, Chicago.

Ross, M.
1923 French Intrusions and Indian Uprisings in Georgia and South Carolina (1577-1580). *Georgia Historical Quarterly* 7(3):251-281.

1924 The French on the Savannah 1605. *Georgia Historical Quarterly* 8(3):167-194.

Russell, K.F., I. Choi, and C.S. Larsen
1990 The Paleodemography of Santa Catalina de Guale. In *The Archaeology of Mission Santa Catalina de Guale: Biocultural Interpretations of a Population in Transition*, edited by C.S. Larsen, pp. 36-49. Anthropological Papers of the American Museum of Natural History No. 68, New York.

Russo, M.
1991 A Method for the Measurement of Season and Duration of Oyster Collection: Two Case Studies from the Prehistoric Southeast U.S. Coast. *Journal of Archaeological Science* 18:205-221.

Saunders, R.
1985 The Artesian Well Area. In *Aboriginal Subsistence and Settlement Archaeology of the Kings Bay Locality, Volume 1: The Kings Bay and Devils Walkingstick Sites*, edited by W.H. Adams, pp.257-294. University of Florida Department of Anthropology Report of Investigations, No. 1, Gainesville.

1986a Attribute Variability in Late Swift Creek Phase Ceramics from Kings Bay, Georgia. Unpublished Master's Thesis, University of Florida, Gainesville.

1986b The Archaeological Assessment of Acculturation: A Case Study using Spanish Missions of the American Southwest. Unpublished manuscript.

1986c Pottery Manufacture and Design Symbolism of Late Swift Creek Phase Ceramics at Kings Bay, Georgia. In *Ceramic Notes*, 3, edited by P.M. Rice, pp. 145-198. Occasional Publications of the Ceramic Technology Laboratory, Florida Museum of Natural History, Gainesville.

1990 Ideal and Innovation: Spanish Mission Architecture in the Southeast. In *Columbian Consequences: Archaeological and Historical*

Perspectives on the Spanish Borderlands East, Volume 2, edited by D.H. Thomas, pp. 527-542. Smithsonian Institution Press, Washington.

1991 Architecture of the Missions Santa Maria and Santa Catalina, Amelia Island, Florida. *Florida Anthropologist* 44(3-4).

Saunders, R. and M.R. Russo
1988 Meeting House Fields: Irene Phase Material Culture and Seasonality of St. Catherines Island. Report prepared for the American Museum of Natural History, New York.

Scarry, M.C. and E.J. Reitz
1990 Herbs, Fish, Scum, and Vermin: Subsistence Strategies in Sixteenth Century Spanish Florida. In *Columbian Consequences: Archaeological and Historical Perspectives on the Spanish Borderlands East*, Volume 2, edited by D.H. Thomas, pp. 343-356. Smithsonian Institution Press, Washington.

Schoeninger, M.J., N.J. van der Merwe, K. Moore, J. Lee-Thorpe, and C.S. Larsen
1989 Decrease in Diet Quality Between the Prehistoric and Contact Periods on St. Catherines Island, Georgia. In *The Archaeology of Mission Santa Catalina de Guale: Biocultural Interpretations of a Population in Transition*, edited by C.S. Larsen, pp. 78-93. Anthropological Papers of the American Museum of Natural History No. 68, New York.

Scott, J.C.
1985 *Weapons of the Weak: Everyday Forms of Peasant Resistance*. Yale University Press, New Haven.

Sears, W.H.
1959 A-296--A Seminole Site in Alachua County. *Florida Anthropologist* 7:25-30.

Shapiro, G.N.
1987 Archaeology at San Luis: Broad Scale Testing, 1984-1985. *Florida Archaeology* (3). Florida Bureau of Archaeological Research, Tallahassee.

Shepard, A.O.
1980 *Ceramics for the Archaeologist*. Carnegie Institution of Washington, Washington, D.C.

Silver, T.
1990 *A New Face on the Countryside: Indians, Colonists, and Slaves in the South Atlantic Forests, 1500-1800*. Cambridge University Press, Cambridge.

Smith, B., translator
1968 *Narratives of de Soto in the Conquest of Florida: as told by A Gentleman of Elvas and in a relation by Luys Hernandez de Biedma*. Palmetto Books, Gainesville, Florida.

Smith, B.D.
1978 Variations in Mississippian Settlement Patterns. In *Mississippian Settlement Patterns*, edited by B.D. Smith, pp. 479-503. Academic Press, New York.

Smith, G.
1986 Non-European Pottery at the Sixteenth Century Spanish Site of Puerto Real, Haiti. Unpublished Master's Thesis, University of Florida, Gainesville.

Smith, H.G.
1948 Two Historical Archaeological Periods in Florida. *American Antiquity* 13(4):313-319.

1951 A Spanish Mission Site in Jefferson County, Florida. In *Here They Once Stood*, by M.F. Boyd, H.G. Smith, and J.W. Griffin, pp. 107-136. University Presses of Florida, Gainesville.

Smith, M.
1987 *Archaeology of Aboriginal Culture Change in the Interior Southeast*. University Presses of Florida, Gainesville.

1989 Early Historic Period Vestiges of the Southern Cult. In *The Southeastern Ceremonial Complex: Artifacts and Analysis*, edited by P. Galloway, pp. 142-146. University of Nebraska Press, Lincoln.

Smith, R.L.
1984 Coastal Mississippian Period Sites at Kings Bay, Georgia: a Model-Based Archeological Analysis. Ph.D. Dissertation, University of Florida, Gainesville.

Smith, R.L., C.O. Braley, N.T. Borremans, and E.J. Reitz
1981 Coastal Adaptations in Southeast Georgia: Ten Archaeological Sites at Kings's Bay. Manuscript report submitted to U.S. Navy.

Snow, F.
1977 *An Archaeological Survey of the Ocmulgee Big Bend Region*. Occasional Papers from South Georgia, No. 3. South Georgia College, Douglas.

1990 Pine Barrens Lamar. In *Lamar Archaeology: Mississippian Chiefdoms in the Deep South*, edited by M. Williams and G. Shapiro, pp. 82-93. The University of Alabama Press, Tuscaloosa.

South, S.
1977 *Method and Theory in Historical Archeology*. Academic Press, New York.

1988 Santa Elena: Threshold of Conquest. In *The Recovery of Meaning*, edited by M. Leone and P.B. Potter, Jr., pp. 27-71. Anthropological Society of Washington. Smithsonian Institution Press, Washington, D.C.

1990 From Thermodynamics to a Status Artifact Model: Spanish Santa Elena. In *Columbian Consequences: Archaeological and Historical Perspectives on the Spanish Borderlands East*, Volume 2, edited by D.H. Thomas, pp. 329-341. Smithsonian Institution Press, Washington.

Speck, Frank G.
1909 *Ethnology of the Yuchi Indians*. University of Pennsylvania Anthropological Publications of the University Museum, Volume 1, No. 1. The University Museum, Philadelphia.

Spicer, E.H.
1961 Types of Contact and Processes of Change. In *Perspectives in American Indian Culture Change*, edited by E.H. Spicer, pp. 517-544. The University of Chicago Press, Chicago.

Spielmann, K.A., M.J. Schoeninger, and K. Moore
1990 Plains-Pueblo Interdependence and Human Diet at Pecos Pueblo, New Mexico. *American Antiquity* 55(4):745-765.

Stuiver, M., G.W. Pearson, and T. Braziunas
1986 Radiocarbon Age Calibration of Marine Samples Back to 9000 CAL YR BP. *Radiocarbon* 28:980-1021.

Stuiver, M. and P.J. Reimer
1986 A Computer Program for Radiocarbon Age Calibration. *Radiocarbon* 28:1022-1030.

Swanton, J.R.
1922 *Early History of the Creek Indians and their Neighbors.* Bureau of American Ethnology Bulletin 73. Washington, D.C.

1946 *The Indians of the Southeastern United States.* Bureau of American Ethnology Bulletin 137. Washington, D.C.

Tschopik, H.
1950 An Andean Ceramic Tradition in Historical Perspective. *American Antiquity* 15(3):196-218.

Thomas, D.H.
1987 *The Archaeology of Mission Santa Catalina de Guale: 1. Search and Discovery.* Anthropological Papers of the American Museum of Natural History 63(2):47-161.

1988a Saints and Soldiers at Santa Catalina: Hispanic Designs for Colonial America. In *The Recovery of Meaning in Historical Archaeology*, edited by M.P. Leone and P.B. Potter, Jr., pp. 73-140. Smithsonian Institution Press, Washington, D.C.

1988b *St. Catherines: An Island in Time.* Georgia History and Culture Series. Georgia Endowment for the Humanities, Atlanta.

Thomas, D.H., G.D. Jones, R.S. Durham, and C.S. Larsen
1978 *The Anthropology of St. Catherines Island: 1. Natural and Cultural History.* Anthropological Papers of the American Museum of Natural History 56(2):155-248.

Thomas, D.H., G.D. Jones, R.S. Durham, and C.S. Larsen
1987 *The Anthropology of St. Catherines Island:1. Natural and Cultural History.* Anthropological Papers of the American Museum of Natural History 55:155-248.

Walker, K.J.
1985 The Protohistoric and Historic Indian Occupation at Kings Bay: An Overview. In *Aboriginal Subsistence and Settlement Archaeology of the Kings Bay Locality*, Vol. 1: The Kings Bay and Devils Walkingstick Sites, edited by W.H. Adams, pp. 55-72. University of Florida Department of Anthropology Report of Investigations, No. 1, Gainesville.

Wallace, A.F.C.
1966 *Religion: An Anthropological View.* New York.

Wallace, R.L.
1975 An Archeological, Ethnohistoric, and Biochemical Investigation of the Guale Aborigines of the Georgia Coastal Strand. Ph.D. Dissertation, University of Florida, Gainesville.

Waring, A.J. and P. Holder
1968 A Prehistoric Ceremonial Complex in the Southeastern United States. In *The Waring Papers: The Collected Works of Antonio J. Waring*, edited by S. Williams, pp. 9-29. Papers of the Peabody Museum of Archaeology and Ethnology, Vol. 58. Harvard University, Cambridge, Massachusetts.

Weisman, B.R.
1989 *Like Beads on a String: a Culture History of the Seminole Indians in North Peninsular Florida*. University of Alabama Press, Tuscaloosa.

Weissner, P.
1983 Style and Social Information in Kalahari San Projectile Points. *American Antiquity* 48:253-276.

Wenhold, L.L., (translator and editor)
1936 *A 17th Century Letter of Gabriel Díaz Vara Calderón, Bishop of Cuba, Describing the Indians and Indian Missions of Florida*. Smithsonian Miscellaneous Collections 95(16). Publications 3398.

Willey, G.R.
1982 *Archeology of the Florida Gulf Coast*. Smithsonian Miscellaneous Collections Volume 113. Reprint Edition, Florida Book Store, Inc., Gainesville, Florida.

Wobst, H.M.
1977 Stylistic Behavior and Information Exchange. In *Papers for the Director: Research Essays in Honor of James B. Griffin*, edited by C.E. Cleland, pp. 317-342. University of Michigan Museum of Anthropology Anthropological Papers 61, Ann Arbor.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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May 1992

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