AN ARCHEOLOGICAL, ETHNOHISTORIC, AND BIOCHEMICAL INVESTIGATION OF THE GUALE ABORIGINES OF THE GEORGIA COASTAL STRAND

By

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I have known Otto von Mering for four years. In a time in which specialization is too often a euphemism for tunnel vision, he has shown me that interdisciplinary

interests are both feasible and intellectually rewarding. Moreover, I have long benefited from his personal advice, his sensitivity, and his understanding. I consider him a wise counsellor—and a personal friend.

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This study is dedicated to my father.

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AN ARCHEOLOGICAL, ETHNOHISTORIC, AND BIOCHEMICAL
INVESTIGATION OF THE GUALE ABORIGINES
OF THE GEORGIA COASTAL STRAND

by

Ronald Lynn Wallace

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Chairman: Jerald T. Milanich
Major Department: Anthropology

Three separate lines of evidence are brought to bear upon the problem of reconstructing the social organization and technological adaptation of the late protohistoric and historic aboriginal societies of the Georgia costal strand. These lines of evidence include the data from archeological excavations conducted during the spring and summer of 1973 and the summer of 1974, the results of ethnohistorical researching of relevant Jesuit and Franciscan documents, and the results of strontium-88 analysis of human and zooarchelogical skeletal materials uncovered in the course of excavation.

The archeological investigations include the excavation of: 1) a ceremonial mound with associated burials; 2) a pavilion-like structure with burials along its southern walls and a charnel structure, both located within a village

area; and 3) the village middens with associated burials. The findings of these investigations are compared with earlier archeological investigations in the coastal strand region.

Ethnohistorical research sources include the narratives of French Huguenot Rene Laudonnière and Spanish archivist Peter Martyr D'Anghera, as well as the writings of Jesuit and Franciscan priests. Sociocultural information from these documents is compared with relevant excavation data and the results of the biochemical analytical techniques.

The biochemical investigation involves the comparison of human skeletal remains with associated zooarcheological materials to determine absolute and relative amounts of stable strontium present in human bone. The use of zooarcheological materials for comparison is designed to facilitate both the testing of strontium-analysis in a coastal area, as well as to provide information regarding the amount of animal and plant procurement by the protohistoric society of the region. This information is then related to subsistence data elicited from the ethnohistorical sources, zooarcheological analysis, and water-screened soil samples subjected to zinc chloride chemical flotation technique.

These three lines of evidence are then integrated to provide an outline of the technological adaptation, the social organization, and the ideological system of the protohistoric Georgia coastal cultures.

CHAPTER I

INTRODUCTION: SUMMARY OF PREVIOUS RESEARCH AND OUTLINE OF PRESENT RESEARCH HYPOTHESES

The major objective of the present research was the utilization of multiple investigatory techniques, particularly those of archeology, zooarcheology, ethnohistory, and biochemistry, in order to provide a more detailed understanding of the social organization and environmental adaptation of the protohistoric Guale Indians of the Georgia coastal strand. In the chapters that follow, the nature and findings of those investigations as well as the specific locations and the regional ecology where the excavations were conducted will be discussed. In the present chapter, we will first present a brief summary of earlier archeological research conducted on the Georgia coastal strand and then summarize the research hypotheses that guided the present investigation.

Previous Georgia Coastal Research on Late Prehistoric Aborginal Sites

While it would be very incorrect to state that the Georgia coast has been archeologically ignored, it nevertheless seems justified to remark that, excepting the

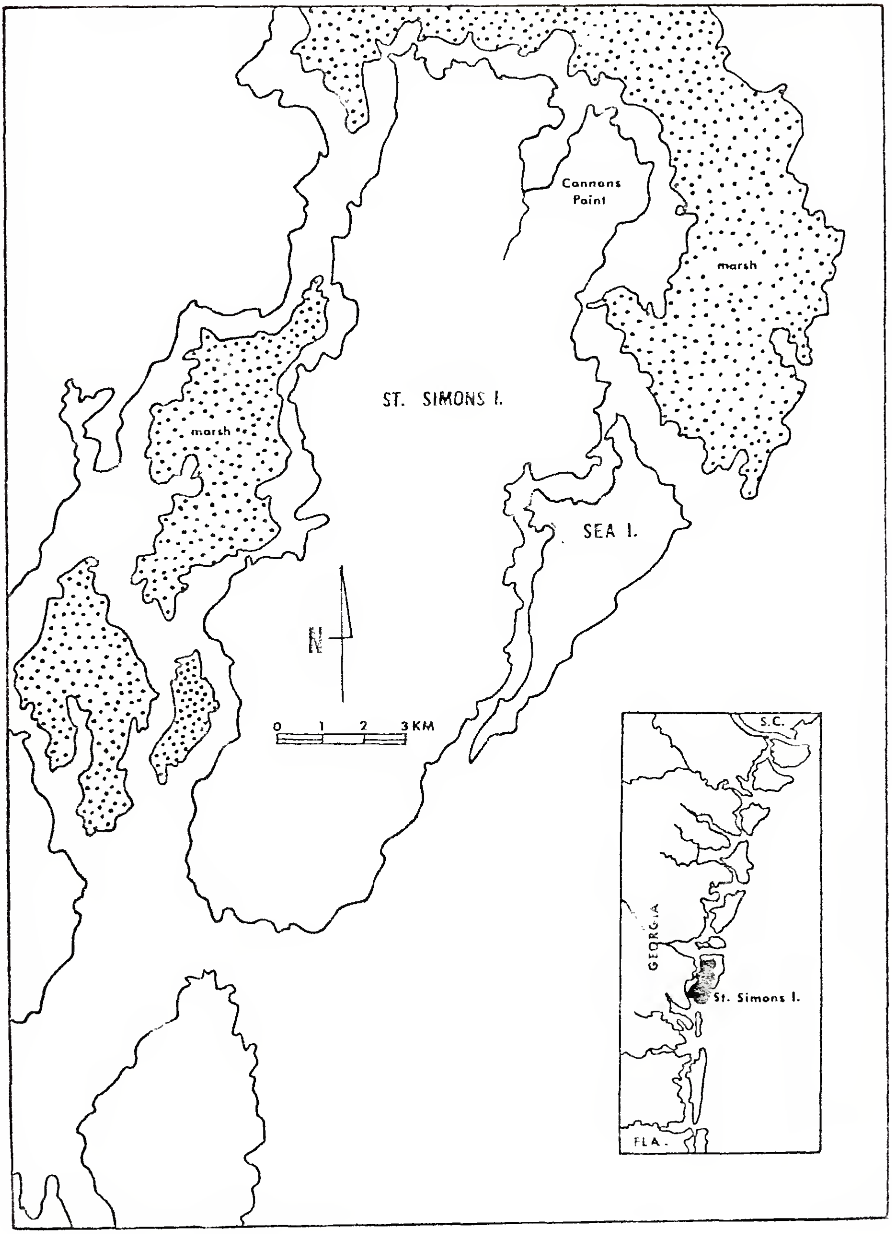


Figure 1. St. Simon's Island

Irene site near Savannah, few extensive investigations of the area have ever been conducted and adequately reported. Research began at a comparatively early date. In the latter part of the nineteenth century, Clarence B. Moore travelled the length of the Georgia coast searching out low sand burial mounds for excavation. By present standards, Moore's work was unsystematic and much information was lost by the "demolishing" (Moore's word) of the mounds. When seen, however, in the context of his times, he becomes less deserving of strong professional criticism. Systematized techniques of archeological investigation were still three decades away, and American cultural anthropology, which might have provided a body of comparative data for the better understanding of C. B. Moore's results, was itself still a miniscule organization strongly beset with racist interpretations and fanciful cultural evolutionary schemes (Harris 1968:251, 292, 297-8). Beyond this, it is noteworthy that Moore provided highly detailed drawings of aboriginal burials and their associated grave goods, published the results of his investigations, and routinely delivered burials, grave goods and occupational debris to the trained specialists of the northern museums (Martinez 1975:9-10). Moore's Georgia findings were eventually published in 1897 by the Philadelphia Academy of Natural Sciences under the title Certain Aboriginal Mounds of the Georgia Coast.

There was no archeological research of any significance conducted on the Georgia coast from C. B. Moore's time until the Works Project Administration's excavations of the 1930's. At that time archeological excavations were characterized by a more systematized methodology (Fay Cooper-Cole had introduced the University of Chicago grid system and the standard-block method of excavations in the late 1920's), with the consequence that the reports of these excavations, when available, are considerably more useful to present-day researchers.

The work of the 1930's presents an unfortunate irony, however, to the present research; i.e., the best reported excavations are those farthest from St. Simon's Island, while the excavations conducted on St. Simon's Island, the region of this report, were scarcely reported at all. These latter excavations were conducted by Preston Holder in 1936 on St. Simon's Island. They had the objective of determining by rapid site surveys and test-pit excavations, a general outline of the cultural (read ceramic) sequence of the island. Holder's results were written down only in his letters to his supervisor, A. R. Kelly (these have recently been made available for study) and in a brief published account several pages in length. The contrastingly remote (but well-reported) excavation was the Irene Mound site of Chatham County, Georgia, reported by Joseph R. Caldwell and Catherine McCann, with physical anthropological analyses conducted by Frederick

Hulse (1941). Both Preston Holder's and Caldwell and McCann's excavations will be discussed in some detail, since their results were instrumental in generating the research hypotheses of the present investigation.

Preston Holder's barrier island excavations included the Airport Site and the Charlie Kind Mound at the southern part of St. Simon's Island, Gascoigne Bluff on the western part of the island, five stratigraphic test pits on Cannon's point, where the present research was conducted, and the Sea Island burial mound on the northern end of Sea Island. Of these, the Airport Site is of particular interest as being possibly close in time to the sites of our own excavation. A summary of Holder's work at that site, prepared for the Professional Projects Supervisor of the Works Project Administration in Savannah, Georgia for presentation at the Proceedings of the Society for Georgia Archeology, provides the following data:

> Work at the Airport Site revealed that the characteristic burial types among the two hundred individuals recovered were the group secondary (that is; the burial of disarticulated fleshless bones) and the prone, full-extended primary (burial immediately after death). The 21,000 sherds recovered established a grit-tempered, complicated-stamp ware as the typical decorated pottery. Noteworthy, also, was the high percentage of bone awls and gravers from this site (50 from a total of 200 artifacts), perhaps indicating an extensive use of skin-clothing by these people. Unfortunately, it was impossible to determine a house-type from the more than 3,000 [sic] post-molds recorded. (Holder, 1938:8)

It is of interest, in the above account, to note that two types of burial are reported. That one of these is secondary suggests possible removal from an ossuary, a possibility that, unfortunately, is best corroborated by the evidence of its architectural features. We will return to the matter of ceremonial mound burial and ossuary burial (with subsequent removal) in chapters that follow, and will take note as well of the possible sociocultural significance of these practices as diagnostic markers of differential group prestige.

As a final note on Holder, we will point out that the similarity of Airport Site ceramics to those of the Irene Site, as well as the probable (ceramic-derived) protohistoric date for both sites, suggest that Caldwell, McCann, and Hulse's excavation should be considered, along with the work of Holder, as having a possible bearing upon the present research.

The Irene site was excavated as a W.P.A. project in the late 1930's, and the final report, The Irene Mound Site: Chatham County Georgia, appeared in 1941. The site was located on the west bluff on the Savannah River, immediately south of its juncture with Pipemaker's Creek, some five miles above the city of Savannah. The excavation determined that the site was probably occupied during two different archeological phases (defined primarily in terms of ceramics), the Savannah (1200-1400 A.D.) and the Irene

(1400 A.D.-1600 A.D.). It functioned as a burial and ceremonial center, and contained a total of 265 burials. The majority of these were distributed as follows:

1) a <u>small mound</u> (2-1/2 feet high, 55 feet in diameter) spanning both Savannah and Irene times. 106 burials.

2) the eighth (and final) stratum of a <u>large mound</u>. 6 burials.

3) a <u>palisaded mortuary</u>, associated exclusively with Irene ceramics.

Additionally present was a rotunda structure composed of six concentric circles of wall trenches and postmolds. No midden accumulation was found in this structure, and many of the ceramics (entirely Irene) were concentrated in a pottery cache outside the rotunda. The similarity of the structure to the Creek councilhouses described by naturalist William Bartram, the lack of midden, and the presence of a pottery cache led Caldwell and McCann to conclude that the rotunda likely functioned as a ceremonial structure, conceivably involving the ritual of cassina drinking and subsequent vessel destruction (Caldwell and McCann 1941:8-31).

Of further interest are the investigations of physical anthropoligist Federick Hulse. Sixty-two of the 265 burials were too fragmentary for analysis, but the remaining 203, including 74 adult males, 75 adult females, 16 adolescents, and 38 children or infants, were subjected to morphological and metrical analyses. Hulse arrived at conclusions regarding sexual differences and similarities as well as aboriginal dietary patterns that are both of interest to the present research. He noted that

> the teeth of the adult inhabitants of the Irene site are badly worn down. . . . There is no case of a really mature skeleton which does not show tooth wear ranging from excessive to extreme, at least for the incisors and canines and usually for all the molars as well. . . . In contrast to this enormous amount of tooth wear, caries is rather unusual, and when it occurs it usually seems to be mild rather than extreme. . . . The premolars and the first molars are the teeth which were more frequently lost. (Hulse in Caldwell and McCann 1941:60)

Hulse attributed the combination of infrequent caries and excessive wear to a diet that was low in carbohydrate and high in grit:

> [It is] likely that these people lived on a diet composed largely of shellfish such as oysters, and other sea food. (Caldwell and McCann 1941:60)

Of shellfish as a significant staple, more later. At the moment, it is of interest to note Hulse's further conclusions regarding similarities and differences of the Irene skeletal material. He observes that

> with respect to head length . . . the females from the burial mound [n=12] are less variable, and therefore more homogeneous, than the females from the mortuary structure [n=17]. The females from the burial mound are also less variable in head length and cranial index than the males from the burial mound [n=20] . . . on the whole, the females at Irene appear to be less variable that the males. (Caldwell and McCann 1941:67)

An interesting sociocultural inference related to these data is drawn by Caldwell and McCann:

> Since as many burials were found in and about the mortuary structure as in the burial mound, which served for a longer time, it is logical to assume a lesser population during each generation of the earlier period. It might, then, have been necessary for the local girls to marry men from some other place. [Calculating descent through females] is a very common custom of American Indian tribes, frequently associated with matrilocal residence. It is not at all unlikely that the Indians at Irene followed the same pattern. (Caldwell and McCann 1941:67)

Finally, it is of interest to note that the Irene site excavators chose to report their zooarcheological findings. Admittedly, this is done in tabular form only, but nonetheless represented a developing interest in eliciting information regarding the prehistoric utilization of the environment. Among the faunal remains were white-tailed deer, black bear, opossum, raccoon, beaver, bobcat, turkey, alligator, sturgeon, gar, drumfish, blue crab, Virginia oyster, and others. The species list provided at least the evidence that the Irene population subsisted by extensive hunting, fishing and shellfishing. While no direct evidence of agriculture was found, it must be borne in mind that ethnobotanical recovery techniques of water-separation and chemical flotation were not in use in American archeology at the time of the Irene site excavation.

It is fortunate that this preliminary concern with prehistoric environmental use was continued to a far more detailed extent in the work of subsequent archeologists, particularly that of Lewis H. Larson. In his doctoral dissertation, Aboriginal Subsistence Technology on the Southeastern Coastal Plain during the Late Prehistoric Period, Larson provided not only a detailed environmental discussion of the resource availability of the pine-barren inland regions, but presented as well the hypothesis that the barrier islands were only seasonally occupied, in that the late prehistoric tribes would migrate inland during the fall and winter for acorn gathering and hunting subsistence activities (Larson 1969). These and other matters of coastal protohistoric subsistence will be examined in some detail in later chapters.

The above research, as well as the considerable body of ethnohistorical material relating to the region, were both insturmental in generating the research hypotheses of the present investigation. These hypotheses, as well as their respective experimental designs, will be discussed in the section that follows.

Research Hypotheses

The present research was organized in relation to a central aspect of the culture-concept paradigm, i.e., the concept of functional integration as a result of sociocultural adaptation. Specifically, it was held, *a priori*, that

> Adaptation, as the concept is used in biology and anthropology, refers to the ability of a population both to tolerate selective forces in its environment and to master environmental problems by developing effective structures, behaviors, and forms of social organization. . . . Natural selection, then, applies as much to man's cultural development as it does to his biological development. Indeed, the two are inseparable, for a new tool, technique, or social innovation cannot persist if it leads to the extinction of any population which accepts it. On the other hand, an innovation which siginficantly improves the adaptation of a group to its environment will give that group an advantage over other groups which lack the innovation. (Bock 1969:208)

It is this selective process which ultimately produces, over a sufficient length of time, the functional integration of any sociocultural system. As summarized by Harris, this integration consists of

> arrangements of patterned behavior, thought, and feeling that contribute to the survival and reproduction of particular social groups. Traits contributing to the maintenance of a system may be said to have a positive function with respect to that system. Viable systems may be regarded as consisting largely of positive-functioned traits, since the contrary assumption would lead us to expect the system's extinction. (Harris 1971:141, emphasis in original)

For heuristic purposes, this integrated system may be understood, following the British anthropologist A. R. Radcliffe-Brown, as possessing three major adaptive aspects: the ecological patterns, the social structure, and the ideological organization. Since it was the ultimate purpose of the present research to reconstruct the sociocultural system of a protohistoric coastal society, the deductive assumptions and their associated research hypotheses involved in this task will be presented below under the particular aspect of the sociocultural system to which they were most directly related. We will begin with the ecological patterns.

Ecological Patterns

The ecological patterns involve

> the culturally given technology of energy procurement, transformation, and distribution. These technological items interact with the conditions of the natural habitat to yield characteristic levels of energy outputs in the form of food, fuels, and other disposable energy rations. (Harris 1971:144)

Research hypotheses regarding ecological patterns were the following:

1) Coastal adaptation involved the utilization of high-hammock, tidal flat, and sea-beach-and-dune habitats. The rationale here was that the scattered-resource environment of the coastal strand would necessitate utilization of all of its respective habitats, in that any single one of them would not be a sufficient resource supply for the coastal societies, and moreover, would soon be depleted if the other habitats were left untouched. Test implications of this hypothesis involved the research techniques of zooarcheology, malacology, and spectrochemical analysis.

The zooarcheological investigation involved the classification of faunal material found in arbitrary 25 cm levels of a 3m x 6m column sample of shellfish midden matrix. If the hypothesis was accurate, then representative fauna from all three habitats should be encountered.

The malacological investigation consisted of classifying the shell content of the above column sample. Representative shells of both beach-and-dune and tidal-flat habitats were anticipated.

Spectrochemical analysis involved the determination of amounts of stable strontium present in the matrix of human skeletal material as evidence of the proportion of animal and plant food in the aboriginal diet. Given the hypothesis, it was anticipated that significant differences in amounts of stable strontium would exist between the individuals in the archeological sample. The rationale here is that the society subsisted by hunting, fishing, and shellfishing, with possible gathering activities as well, and that differential access to the different resource areas would produce significant Sr differences between the individuals of the sample. This situation would be comparable to the same type of differentiation observed by Antoinette B. Brown for a formative population in the Oaxaca Valley of northern Mexico (Brown n.d.: 1-4), in which high-status hunters manifested significantly lower amounts of strontium in the matrix of the skeletal material.

2) At the time of European contact, the coastal tribes were undergoing a technological shift from a hunting,

fishing, horticultural, and shellfishing economy to an economy more pronouncedly horticultural. This hypothesis was suggested both by the architectural massiveness of the Irene site (implying an energy surplus, possibly agricultural) as well as by the early ethnohistorical source materials, to be discussed in a subsequent chapter. There is good reason for exercising considerable care in the formulation of this particular hypothesis. Above all, the near synchronousness of culture contact and the condition of a developed horticultural system in the sixteenth century should not imply an automatic causal relation between the two. While it is true that Spanish missionaries were interested in instituting a full-time agricultural economy on the coast, it should not be overlooked that the earliest European encounters with the coastal strand tribes (ca. 1526; 1562) report the existence of an already-developed, indigenous agriculture. The Spanish priests may simply have sought to transfer more of the inland horticultural activities to the coast by making coastal cultivation more efficient. Use of hoes or other technological improvements could have been useful to this end. The procedures involved in investigating this hypothesis are described below.

Zooarcheological analysis was conducted as discussed for hypothesis (1), but in this instance, it was anticipated that the overall vertebrate animal biomass would decrease through time. The rationale was that an intensification of horticultural activities would parallel a decline in hunting and fishing, which would be reflected in a reduced osseous weight of faunal materials in the more recent levels.

Malacological analysis was conducted as discussed in hypothesis (1), but in this instance, it was of interest to determine whether or not the shell species directly associated with a beach-and-dune environment underwent a decrease throughout time. It was reasoned, in this case, that an increase in horticultural activities would be accompanied by a decrease in the sea fishing activities, during which time the beach-and-dune shells would have been incidentally procured.

Spectrochemical analysis was applied to the skeletal remains of a protohistoric and early historic site to determine biochemically if a noticeable transition in dietary patterns took place at the time of culture contact. In this instance, it was anticipated that the more recent skeletal material would have concentrations of stable strontium closer to that of a known herbivore, while earlier material would be greater than the terrestrial primary consumer level because of the greater concentration of Sr present in malacological and marine faunal materials.

Ethnobotanical analysis was the most crucial technique of all, however, in establishing the existence of aboriginal horticulture. In this investigation, two separate techniques were utilized. One of these was the method of water separation and zinc chloride chemical flotation. This was applied to two arbitrary levels of the column sample of midden matrix discussed above. It was anticipated that evidence of cultigens (i.e., charred seeds, corn kernels) should appear in the arbitrary levels. A supplementary analysis involved food pits present beneath the plow-zone in a sterile sand matrix and within a protohistoric context. Here, all seeds were simply hand-separated from the soil contents of the pits and transported to the University of Florida Department of Forestry herbarium for classification. Specifically anticipated in this instance was direct evidence (supplementing the ethnohistorical data) of the cultivation of *Zea mays* or "Indian corn."

Social Structure

The *social structure* promotes

> the maintenance of orderly relationships among the individuals and groups responsible for technoenvironmental processes and for the breeding and care of children. Social structure is also concerned with the orderly transfer and distribution of energy and labor power among the various production units. (Harris 1971:145)

Research hypotheses involving the coastal aboriginal social structure were the following:

1) <u>The coastal population was characterized by ranked groups</u>. For reasons that are presented in a subsequent chapter, it seemed wisest not to attempt any specification as to the descent rule (if any) that determined membership within the groups. It was reasoned, however, that the scattered-resource ecology of the coastal strand would be most viably utilized by a system of competitive, or rivalrous redistribution, a system which, in turn, could serve as a basis for determining differential group prestige within the protohistoric society. There was, additionally, ethnohistoric documentation suggesting that such a system was in effect. Archeological examination of this question involved mortuary data exclusively, and consisted of the following investigations:

a. The <u>statistical determination</u> that all burial samples were taken from the same population. While it was acknowledged that there is certainly a chronological ordering for the three sites investigated, it was also determined by ceramic and mortuary analyses that there exists no significant temporal gap between any of the three. In view of this, it was seen as legitimate to investigate statistically the possibility of combining the three sites for further analysis. This was accomplished by expressing grave goods content and appearance of the burial as a set of presence-absence traits. Two of the three sites were then compared in this way, the number of similarities between burials being noted. Mean similarity and standard deviation were calculated. This procedure, plus ceramic similarity, served as the rationale for combining two sites. The third site, heavily disturbed, was added to the sample on the basis of ceramic similarity and ethnohistorical documentation relating to aboriginal living structures.

b. The architectural analysis of the sites. With the combined samples, it was hypothesized that rank differences between aboriginal groups would be manifested in mortuary differences between them. In this investigation, three different locations for aboriginal burials were encountered, and an explanation was presented demonstrating the manner in which at least two ranked groups were involved. To avoid circularity, the explanation was supplemented by relevant ethnohistorical data.

2) The ranked groups were characterized by a matrilocal postmarital residence pattern. This hypothesis was suggested by the analysis of the Irene site (discussed above), but could not, due to the limited size of the burial sample, be investigated by the techniques of morphological and metrical analysis. As a consequence, the hypothesis was investigated through the statistical technique of Pielou-Peebles "nearest-neighbor" analysis. In this investigation, it was anticipated that burial dyads

would principally include female-female and female-male pairs with only a limited number of male-male dyads. The rationale was that young, unmarried females would be buried together, married females would be placed with their affines, and few males would be found together, since local males would soon depart to find a wife, and "imported" males would be buried with their wives. (Given partilocality, a mirror image mortuary pattern would be anticipated.) As a supplement to this investigation, a subsample of female-female dyads was examined by the same methodology to determine whether or not there was a significant clustering according to age. In this instance, it was anticipated that the predominant age grouping would be the young-young dyad, since mature/aged individuals would be interred with affines, and would not be a significant part of the female-female subsample. In both the above investigations, the relevant variables were cast in a 2x2 contingency table and tested through the use of Fisher's Exact Probability Test.

Ideological Organization

The ideological organization was the final concern of our attempts at sociocultural reconstruction. It may be defined as

> the entire realm of socially patterned thought. It includes the explicit and implicit knowledge, opinion, values, plans,

> and goals that people have about their ecological circumstances: their understanding of nature, technology, production and reproduction; their reasons for living, working, and reproducing. (Harris 1971:146)

In this instance we have been required to rely, almost exclusively, upon ethnohistorical materials to reconstruct this dimension of the coastal tribes' sociocultural adaptation. We have been aided, however, by the investigations into the possibility of ranked groups (discussed above) which facilitated the use of cross-cultural correlations between the number of hierarchical groups in a technologically primitive society and the existence of a belief in a supreme deity. It was thus possible to substantiate at least one aspect of the ethnohistorical ideological data through the combined use of archeological findings and cross-cultural statistical correlations.

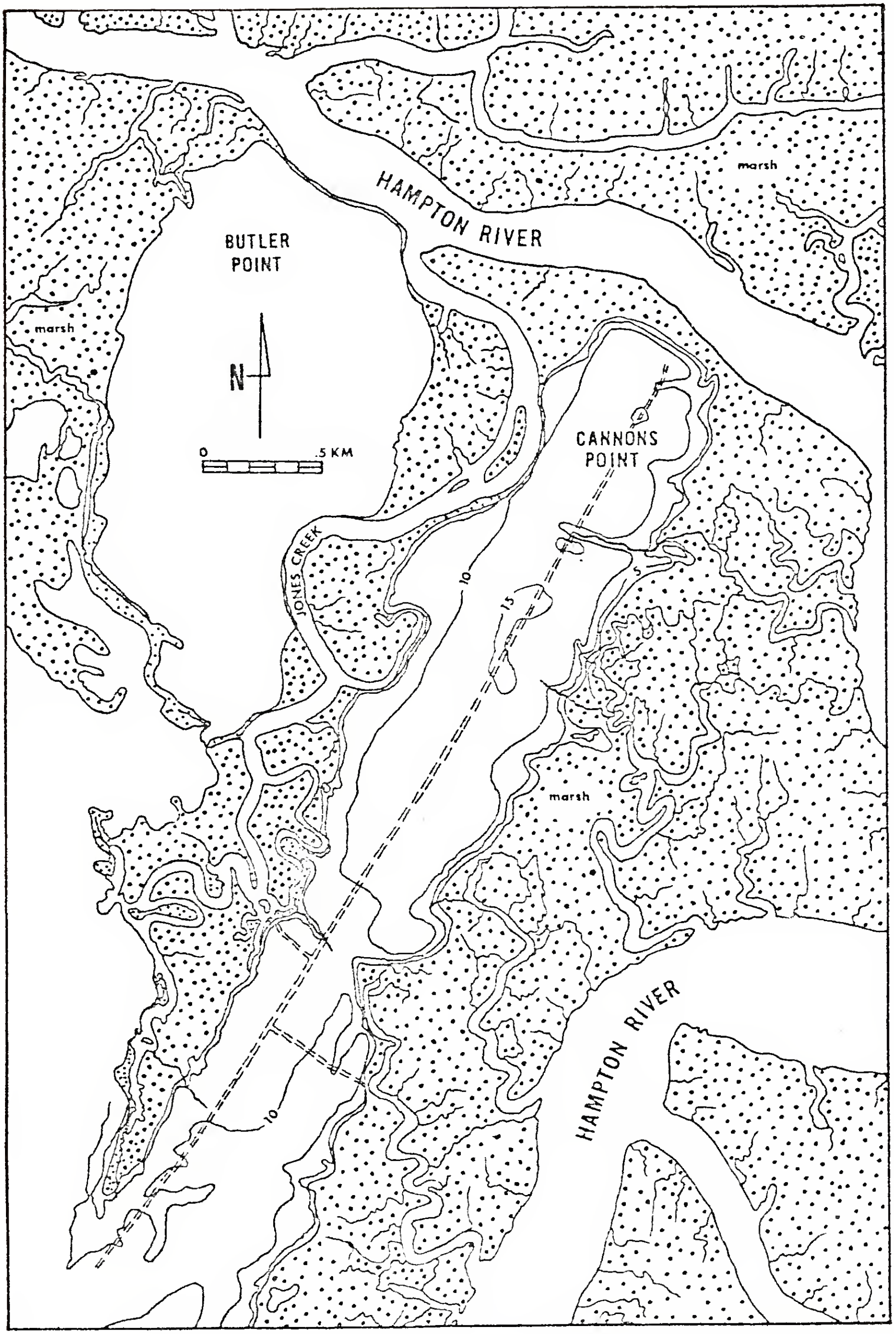
The above research hypotheses provided direction for field and laboratory investigation conducted from the spring of 1973 through the fall of 1974. More extensive details on experimental procedures will be provided in the appropriate chapters. At the moment, however, we will be concerned with describing the region in which the research was conducted, the plant and animal resources located within that region, and the relationships existing between them. These ecological matters (which ultimately have a bearing on virtually everything that follows) will be presented at some length in the following chapter.

CHAPTER II

BARRIER-ISLAND REGIONAL ECOLOGY

St. Simon's Island, where the 1973 and 1974 excavations were conducted, is a part of a chain of ecologically similar barrier islands extending from just south of the Florida-Georgia border along the complete coastlines of both Georgia and South Carolina. These islands are the product of sea level changes, tidal action, and stream-carried sedimentation, all interacting with one another during the Pleistocene. One view of barrier-island formation posits that the estuarine situation of fresh-water streams on the mainland flowing to meet the sea results in much sedimentation occurring in the quiet water at the estuary mouth. The sediment eventually develops into a delta which, if it becomes sufficiently high to be exposed at low tide, will become a lagoon or tidal flat region. Simultaneously, however, the erosion of the coast through tidal action is occurring, and materials are being deposited on the exposed delta; if continued for a sufficiently long period of time, barrier islands will develop which protect both the mainland and the brackish flats on their landward side from the turbulence of the ocean tides (Smith 1966: 210, Larson and Waring 1965:263).

Figure 2. United States Geological Survey Map of St. Simon's Island


HAMPTON RIVER
BUTLER POINT
marsh
N
0 .5 KM
CANNONS POINT
JONES CREEK
10
15
5
marsh
marsh
HAMPTON RIVER
10

Another view of the matter is held by marine geologist John Hoyt, which seems to be a more economical explanation. Essentially, Hoyt maintains that the tidal currents intersect the sloping landscape of the mainland, causing dunes or beach ridges to form adjacent to the shoreline. Eventually, the landward side of these ridges becomes submerged, and a barrier island is created (Hoyt 1967: 1125-1136).

In any case, the resulting ecological situation is one of a multiplicity of habitats in close contiguity. This is sometimes referred to as an "ecotone" environment, the ecotone being the borderline between two or more of the habitats (Fairbanks 1968:37). There are at least three major habitats within the barrier-island system, and many further subdivisions could be made of these three. They are the beach-and-dune, live-oak hammock, and the estuary and tidal flat habitats. A brief discussion of the biotic communities within these habitats, as well as the interaction between the various communities, is presented in detail below.

Beach-and-Dune Community

The sandy beach on the seaward side of the barrier islands is the product of the weathering action of the waves upon the island. It is a habitat that supports a less complex biotic community than the others, and is of

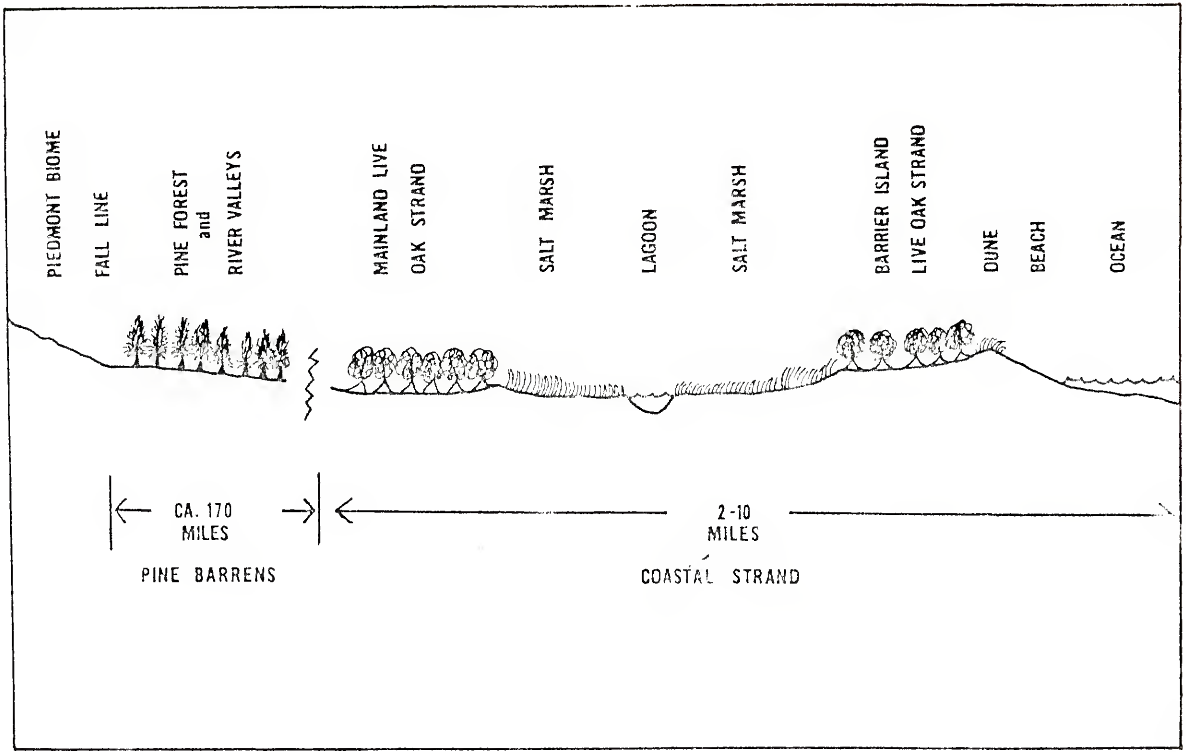


Figure 3. Southeastern Coastal Plain Schematic Cross-Section

considerably less value to human utilization. Nevertheless, it does provide some resources, and is of particular interest ecologically in that it offers a striking example of a delicate relationship between organic matter and saprophytic bacteria (decomposers), an interaction which provides not only a food source for littoral fauna, but functions as well as a site of biogeochemical recycling of essential nutrients (such as phosphates and nitrogen) to the sea (Smith 1966:237).

The life that exists on the beach below the high-water mark must necessarily exist below the sand, as the surface provides neither protection nor features for attachment. A few inches below the surface, however, there exist conditions of relatively constant temperature and salinity. It is here that organic matter brought in by the tide, as well as anaerobic bacteria, which abound in the subsurface low oxygen conditions, are brought into juxtaposition. The result is a constant decay of some of the organic matter into phosphorus and nitrogen (which are returned to the sea), and the provision of a food source for the littoral primary consumers (Smith 1966:235).

These primary consumers are generally burrowing fauna. They include worm species such as lugworms and trumpet worms, which tunnel through the sand to the site of the organic detritus, amphipods (small, often parasitic, crustacea) such as sand fleas and ghost shrimp, and "surf fishers," which are beach fauna that follow the ebb and flow of the tide. This last group includes the razor-like clams, Ensis directus and Taselus plebius (the latter species utilized in the aboriginal diet), herbivorous animals which employ a powerful anterior foot to bring them to the organic "belt" below the sand, and the periwinkle (Littorina sp.), a European immigrant to Atlantic shores, which is a littoral snail generally found near the average high-tide limit, and is also a possible food resource for humans (Morris 1947:147, Milanich 1972a:3-6, Smith 1966:238).

Ths succeeding trophic level, that of the carnivores, includes not only such predatory gastropods as the moon snail (found from Massachusetts to the Gulf of Mexico), but also crustacea such as the blue crab Collinectes sapidu (another human food resource) which, in both cases, prey upon the mollusca (Richards 1938:173, Smith 1966:238). Additionally, the gulls and the shore birds which probe through the wet sand in search of food, would belong to the carnivore level (Smith 1966:239).

The dune and back-dune areas (or subhabitats) are the product of the interaction of tidal litter, wind-blown seeds, and the organic nutrient supply of the tides and tidal creeks. Unlike the flat, sandy beach, the higher beach (or embryonic dune area) is characterized by debris brought in by both the tides and tidal creeks, which makes possible a surface attachment of wind-blown seeds. In the embryonic stages of the dune, these colonizing seeds will take root in the organic belt below the surface of the sand and will extend horizontal roots very close to the sand's surface, an activity made possible by the temperature reduction due to the shelter of the tidal debris (a significant difference of some 87°F in open sand versus 44.6°F beneath the region of the litter). These horizontal feeders aid the debris in halting both wind-blown sand and seeds (they are sometimes referred to as "tillers," in this connection) thus initiating a positive feedback relationship between the wind-blown materials, and the horizontally extended "tiller" plants culminating in the development of a dune (Ranwell 1972:135-40).

The passage of time accomplishes the improvement in the dunes of the various conditions of plant growth. <u>Stability</u> increases with the colonizing vegetation discussed above, subsurface <u>nutrient supply</u> is supplemented by the regular decay of the vegetation, <u>moisture</u> is maintained by tidal creeks and barrier-island rainfall (which is adequate all year round, with almost daily convectional thunderstorms in summer), and <u>temperature</u> is held relatively stable (mean annual temperature is around 60°F.), partly as a result of the shade provided by the developing vegetation community (Gibson 1948:50-51, Ranwell 1972:138).

This community is our first real instance of a primary production level sufficiently developed to provide a food source for nonlittoral herbivorous animals. One finds, in this subhabitat, such plants as cabbage palm (Sabel palmetto), saw palmetto (Serenoa repens), china briar (Smilax bonanox), Spanish bayonet (Yucca gloriosa), cassina (Ilex vomitoria), sea oats (Uniola paniculata), wild grape (Vitis rotundifolia), and wax myrtle (Myrica cerifera) (Milanich 1972:5). Vegetation such as this provides food for herbivores such as the marsh rabbit (Sylvilagus palustris), for browsers such as white-tailed deer (Odocoileus virginianus), and for omnivores such as the raccoon (Procyon lotor) and the opossum (Didelphis marsupialis) which can feed not only on the plants, but on crustacea, worms, and insects as well. All of these animals can additionally serve as human food resources, and the last three species were in fact encountered in food pits (to be subsequently discussed) during the 1973-74 excavations.

The beach-and-dune system, in short, is a habitat which (with the notable exception of surf-fishing activities) is of comparatively little nutritional value for a human society. The high solubility of the soil in combination with wave action, high salinity level and low nitrogen content act in concert to prohibit any lush vegetation which could provide a primary production base for a significant amount of animal biomass. As a consequence, the beach-and-dune system was of comparatively less importance in the adaptive strategies of prehistoric communities than the other habitats and subhabitats found within the coastal strand region (Ranwell 1972:40-59).

Live-Oak Hammock Community

A "hammock" habitat is "a dense growth of mesophytic (i.e., having moderate moisture requirements) broad-leaved trees on a slightly raised substratum and not wet enough to be a swamp" (Shelford 1963:67-68). It is characteristic of the barrier island interiors and the mainland as well—both of which are necessarily removed from the biotically restricting conditions of salinity and nutrient deficiency which are diagnostic of the beach-and-dune habitat.

The major chemical evolutionary process that takes place in the embryonic forest environment is the development of the lime and clay components. Ground water combines with CO_2 in the soil to form carbonic acid (H_2CO_3), an unstable compound which can either return to water and carbon dioxide, or can dissociate into a proton and negatively charged bicarbonate ion ($HC\bar{O}_3$). In the latter case, combination with calcium present in rock will produce lime ($CaCO_3$), which, over time, accumulates deeper in the soil material. In the case of clay, we are dealing with minerals such as aluminum and silicon which react with oxygen to form a large, "sheet"-type lattice structure with a large surface area. Both the clay and lime (as well as other minerals) are carried downward in the soil, where they ultimately consolidate to form a "B" horizon (Smith 1966:244, Colinvaux 1973:45, 201-202).

The aspect of this horizon of particular ecological significance is its clay component. The surface of the "sheet" lattice is negatively charged, which allows it to retain nutritionally crucial cations (atoms bearing a positive charge) such as calcium and potassium, as well as some important trace elements.[1] This lattice "trap" of crucial nutrients thus enhances the possibility of soil colonization by a plant community (Colinvaux 1973: 202).

The plants which colonize the weathered rock accelerate its breakdown into smaller granules by sending down roots. The root systems additionally function as a retrieval system for nutrients which have diffused deeply into the soil. The end result is the generation of a cycle of nutrient retrieval, plant growth, death, decomposition, diffusion of nutrients downward, growth of new plants, and nutrient retrieval. In the temperate climate of the southeast, the decomposition rate is slow in comparision with, for example, a tropical rain forest, resulting in an overall

[1]The relation of soil chemistry and morphology to Sr-38 analysis is dealt with in Chapter VII.

pumping upward of nutrients into an "organic reservoir" or humus zone which is close to the surface of the soil (Smith 1966:244, Colinvaux 1973:201-203).

The nutritional richness of this zone is further enhanced by worms and insects which consume the fresh litter deposited on the forest floor and excrete it in a partially decomposed form. This organic detritus is then further broken down by saprophytic bacteria into carbon dioxide, water, minerals, and salts—a role directly comparable to that of the saprophytes in the "organic belt" below the surface of the shore (Smith 1966:244).

The continual replenishing of the organic content of the humus through forest litter and decomposers in combination with the comparatively small loss of nutrients through leaching eventually culminates in a developed forest community of higher plant and animal species. These mixed deciduous and coniferous forests are vertically stratified (i.e., they consist of multiple vegetation "canopies"). Close to the forest floor are low shrubs such as scrub palmetto, Sabal minor; gallberry, Ilex glabra; as well as a host of shrubs common also the back-dunes area (yucca, cabbage palm, cassina, and saw palmetto). Above this shrub stratum one encounters the vegetation of the dominant trees, the live-oak, Quercus virginiana and the magnolia, Magnolia grandiflora. The primary ecological significance of this vertical stratification of vegetation is the accompanying stratification of conditions of light, temperature, and moisture which it creates, resulting in a multiplicity of stratified subhabitats for a variety of different faunal species (Milanich 1972:6, Smith 1966:305).

The oak trees provide mast for white-tailed deer (Odocoileus virginianus), a herbivorous animal, while the small insects, worms, and ground-layer vegetation support the omnivore populations of raccoon (Procyon lotor), and oppossum (Didelphis marsupialis). The forest floor additionally provides acorns and other seeds for herbivorous fowl such as the turkey (Meleagris gallopavo). There are thus both herbivorous and omnivorous vertebrate tropic levels present in the hammocks, all of which represent potential food resources for an aboriginal society (Milanich 1972:6).

The live-oak hammock habitat, then, is nutritionally richer than that of beach-and-dune. Shielded from the effects of tidal action and wind, containing less soluble soils, and characterized by a relatively stable organic reservoir in its upper humic level, it is a habitat that could have been utilized either for prehistoric horticulture, for hunting-and-gathering activities (or, conceivably for both), and could thereby have been a significant habitat in Georgia coastal subsistence activities.

Estuary and Tidal Flat Community

The estuary and tidal flat subhabitats evolved by the geological processes described at the beginning of this chapter. Their significance in the maintenance of the coastal strand environmental system can probably best be understood, not by discussing them as discrete units (the procedure thus far), but rather by describing their interactions with the other habitats discussed above. By concluding the discussion in this way, we can more easily appreciate the way in which the various coastal habitats are knit together into a mutually interacting biological system.

An estuary/tidal flat habitat is an area of mixed salinity, temperature, and turbulence. In an estuary, the meeting of the river and the incoming tides creates a mixed salinity as well as sufficient turbulence to shift nutrients (primarily brought in by the tide) throughout the depth of the water—a "vertical mixing" process. Temperature in the estuary fluctuates on a seasonal and a daily basis, and is strongly affected by the temperature of the incoming tides. In the tidal flat subhabitat, the salinity and turbulence are not as strikingly variable as the temperature. High tide on the flats either heats or cools them, depending upon the season, while there is also a great diurnal fluctuation as the "tidal flats are submerged in salty water and then exposed to the full insolation of the sun" (Smith 1966:215, 211-212).

The biotic community of an estuary is largely a function of the fluctuation of salinity, and the turbulence of the river currents meeting the incoming ocean tides. The majority of the estuarine live forms are found in its lower depths (i.e., they are "benthic"), and most are securely attached to the bottom. The motile forms are primarily crustaceans and fish, particularly the young of the various species. Almost no fresh-water forms are found (Smith 1966:213).

The organic matter brought in by the tide and the marine plants of the estuary itself form the primary production base for its trophic levels. Herbivorous fish such as mullet (Mugil cephalus) and the herbivorous Virginia oyster (Crassostrea virginica) are both found in abundance. A carnivorous marine trophic level is also present. The sheepshead (Archosargus probatocephalus) feeds upon barnacles and mussels, the black drum (Pogonias cromis) feeds upon oysters and small fish, and the red drum (Sciaenops ocellatus) feeds upon small shrimp and mullet. Other marine carnivores include the salt-water catfish (Arius felis) and the jackfish (Caranx hippos), both of which will eat smaller fish (Milanich 1972:7, La Monte 1945: 36, 72, 79, 86). All of these marine fauna are potential food resources for an aboriginal society, and, in the case of the Virginia oyster and the schools of mullet, could easily have been procured in abundance.

The tidal flats, as explained earlier, are the result of an estuarine delta eventually becoming separated from the sea by the development of barrier islands. They are interlaced with tidal creeks that flow to the estuary and the sea, and are supplied as well with some drainage (or "leaks") from both the island and mainland biogeochemical systems. Organic debris from the leaks and the tides provide a nutrient base for a durable form of vegetation, salt water cord grass (Spartina alterniflora), which extends throughout the tidal flats (Smith 1966:216).

Within the mud of the flats are found the Virginia oyster (Crassostrea virginica), which feeds upon the organic nutrient supply, and many herbivorous insects which feed upon the salt-water cord grass. Both the insects and the plants furnish a food supply for omnivorous reptiles such as the snapping turtle (Chelydra serpentina), the box turtle (Terrapene carolina), and the diamond-back terrapin (Maclemys terrapin) (Smith 1966:216-217, Milanich 1972a:6). All of these last, of course, are easily procured by humans and can be gathered in abundance.

The systems of the habitats and subhabitats described above are in constant interaction with one another and are, like all ecological systems, open—or nondiscrete. This is particularly true of the reservoir of organic nutrients described in relation to tidal flats, estuary, and beach-and-dune areas. In the tidal flats, we have discussed the organic nutrient base furnished primarily by the tides, and making possible the lush growth of Spartina. But only 5 percent of this primary production level is utilized by tidal flat herbivores. The remainder is either decomposed by saprophytic bacteria into methane and hydrogen sulfide (some of which is drained to the sea) or is transported by tidal creeks into the estuary, where it supplements the amounts of organic materials brought in with the tides (Smith 1966:217).

There are additional interactions involving the biotic communities of the vertebrates. Live-oak hammock herbivores such as rabbits and white-tailed deer utilize back-dune vegetation, while forest omnivores such as raccoon and opossum can consume not only small plants in the back-dune and tidal-flat areas, but can feed upon small fish and crustacea as well.

In sum, the live-oak hammock barrier islands provide the shelter and protection that makes the tidal flats a possibility. The tidal flats provide food resources for high-hammock herbivores and omnivores, and additionally transport an extensive nutrient supply to the waters of the estuary. The estuarine fauna, particularly the small fish and crustacea, are protected from extensive predation by the limited salinity of the estuary, to which larger carnivorous fish are less adapted. The estuary thus functions as a "nursery," for organisms which eventually will move to the sea. The sea, in its turn, both "receives" fish and crustacea from the estuary, and provides in turn an organic nutrient supply to both the estuary and the beach. The changes along barrier-island coastlines, however, result in flat beach becoming dune, with the nutrient reservoir forming a food base for xerophytic back-dune vegetation. This back-dune vegetation, in turn, furnishes a primary production level for high-hammock herbivorous and omnivorous mammals, while the back-dune permanence and higher contour provides a "barrier" of its own between the high-hammock forest and the high salinity of the beach.

Interaction between the habitats, then, is pronounced —and occurs on a multiplicity of levels. We have not yet considered, however, the way in which the various habitats were utilized by the coastal strand peoples of protohistoric and early historic times. It is that question, and, specifically, the methodological procedures involved in its archeological investigation, to which we will next direct our attention.

CHAPTER III

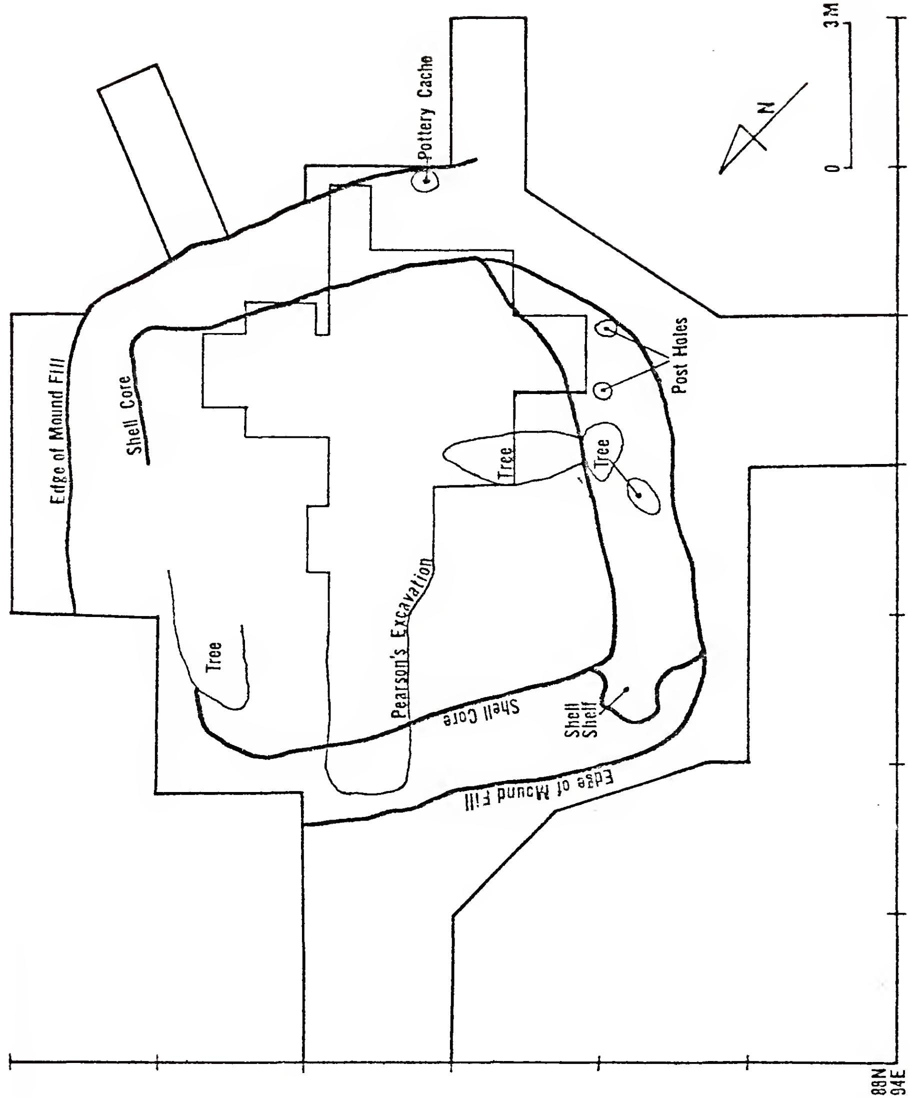
TAYLOR MOUND

Location and Methodological Problems

"Taylor Mound" is the name assigned by the investigator and Dr. Jerald T. Milanich to a historic period (ca. A.D. 1600-1650) ceremonial mound with associated burials located to the southwest of Taylor Fish Camp on the northern end of St. Simon's Island, Georgia, at 31° 15' north latitude and 81° 21' west longtitude. The structure was located in a grove of trees in an area that was undisturbed by plowing. This advantage was offset, however, by an earlier unsystematic excavation by local residents which had removed 13 burials from a trench dug east-to-west across the apex of the mound. This earlier excavation had devoted only slight attention to an artistic and photographic recording of the burials in question (and apparently none at all to trained osteological identification) before the skeletal material was redeposited, in no apparent order, into the trench from which it had been taken.

This earlier disturbance creates a number of serious analytical problems, all of which should be made clear at

Figure 4. Composite Map of Taylor Mound


Edge of Mound Fill
Shell Core
Pottery Cache
N
0
3M
Post Holes
Tree
Tree
Tree
Pearson's Excavation
Shell Core
Shell Shelf
Edge of Mound Fill
89N
94E

the beginning of this discussion. The major difficulties would seem to be (1) the identification of the stratigraphic and, when applicable, the mortuary context of artifacts recovered in the earlier excavation (i.e., were materials found above a burial, within a construction feature of the mound, in the burial pit matrix, or in juxtaposition with the skeleton itself?), (2) the identification of sex and age of the burials, and (3) the related problem of sample size. We will discuss each of these problems in its turn.

The report of the earlier excavation did not include vertical control in terms of distance below datum plane (a concept to be presented in the methodological discussion below), but rather in terms of distance below surface, and even this approach was limited primarily to the discussion of the burials and their associated artifacts. The result of this omission is the impossibility of cross-checking any earlier statements with regard to the stratigraphic contect of artifactual materials. We may take, as an example, the fundamental matter of the stratigraphic context of the burials (and, by implication) of their artifacts. The report on the earlier excavation described "Burial 10" as being located on the eastern edge of the mound's shell core, its surface corresponding to the base of that core (Pearson and Cook n.d.:20). As this is a burial that allegedly was associated with chronologically significant historical materials, it is essential to know if the burial was intrusive into (and thus postdated) the core and the fill (as the excavator contends) or whether it was located within the sterile matrix beneath the mound. The latter would seem to me unlikely, but not impossible, and the absence of sufficient vertical control precluded the possibility of either cross-checking the stratigraphic accuracy of the earlier report or investigating the interesting possibility that the original rationale of the shell core of the mound was to serve as a marker for a cluster of burials beneath it. This burial characteristic has been previously noted for the coastal tribes (Larson 1953:15) and would serve as an additional line of evidence for the contemporaneity of the Taylor Mound site with Couper Field (to be discussed in detail below). In view of this problem, then, it seems wisest to use mortuary and artifactural data recovered at the time of our own investigation, when discussing cultural traits of the builders of Taylor Mound, and when relating Taylor Mound to other sites. The second problem is more readily disposed of. Information regarding any significant association of grave goods of a certain type (e.g., "exotic" versus "local"), or, for that matter, presence of absence of grave goods, according to the status of sex or age is only as reliable as the osteological examination of the skeletal material involved. In this regard, then, only the Taylor Mound skeletal material recovered by the writer (examined *in situ* by a physical anthropologist) will be utilized in discussing cultural practices reflected in mortuary behavior.

Implicit in the above limitations is the special problem of sample size. Eleven burials were recovered in our own investigation, one of which was too fragmented (and too young) to be identified as to sex, the other in a matrix which made it difficult to determine if artifactual materials were deliberately associated. As a consequence, there are at least two statistical strategies that are available. One of these is the utilization of tests (such as Fisher's Exact Probability Test) which are specifically designed for statistical problems in which anticipated frequencies are small (Freeman 1965:227). The other approach is to invetigate the possibility of significant similarity between mortuary practice at Taylor Mound and Couper Field (in which many undisturbed burials were found) so that these two samples (each small in itself) might be legitimately combined when assessing the archeological evidence for cultural practices along the Georgia coast. We will deal at some length with these alternative possibilities in the presentation which follows.

Methodology of Excavation

The excavation was conducted by means of the standard-block system. Horizontal control was maintained through a grid system consisting of three-meter squares, the primary excavation unit. Vertical control was maintained by means of measuring distances below a datum plane swept by the horizontal movement of the scope of a Dietzgen Top-Site transit. Fixity of the plane was maintained by a permanent transit station.

An east-west grid was established across the mound, oriented at 60° east of magnetic north. A stake placed on the western edge of the mound was arbitrarily designated 100N 100E, and all other stakes were numbered accordingly. All units (i.e., all three-meter squares) throughout the excavation were designated by the coordinates of the stake in the southwest corner of the unit, a convention of the University of Chicago grid system.

Excavation of all three-meter squares proceeded by removal of the "natural," i.e., the geophysical, strata (including cultural strata) within each unit. Vertical control over these strata was maintained by means of datum shots from each corner of the unit, in addition to a center datum shot, for the top and the bottom of each stratum. Bone and cultural materials from each zone were maintained, and were placed in bags labelled according to unit coordinate and physical/cultural stratum. The materials were removed from their matrix by shovelling out the soil in each unit, usually in thin layers amounting to approximately an inch in depth (or two and one-half centimeters). The soil was placed on a motorized, vibrating screen of one-quarter inch mesh, powered by a five horsepower engine. Bones and cultural materials remaining on the screen were maintained. The soil was not maintained, but was sampled as described below.

A feature was operationally defined as any aspect of archeological significance in the site which could not be moved intact to a laboratory for analysis. Features of Taylor Mound included a fire pit in a matrix of projecting shell (a construction feature to be described below) and sterile submound sand, a line of worked conch shells in the mound fill on the northeastern edge of the shell core, and a boat-shaped depression cut into the old humus on the eastern edge of the mound, which contained a cache of broken pottery conventionally designated as representing San Marcos Stamped, Irene Incised, and Irene Plain types, and which was covered by soil removed from the mound fill. These features were mapped horizontally when they were first encountered, and vertical control was maintained by datum shots on both the surface and the bottom of each feature. Morphology and contents were recorded on feature forms, and cultural contents were bagged and labelled with provenience. A soil sample was taken from the fire pit mentioned above, and was water-screened through graduated cylinders in an unsuccessful attempt to locate charred fragments of corn as evidence of aboriginal horticulture.

Other than determining the sequence of mound construction and use, the only remaining methodological aspect of major importance in the Taylor Mound excavation was the removal of the associated burials. The procedure that was followed varied in accordance with the nature of interment as well as with special problems which were encountered in a number of cases. If the burial was within a pit, the contents of the pit were removed by a trowel. A bag of this soil was maintained in such cases for the graduated cylinder water-screening referred to above. Once all soil had been removed from the pit by trowelling, the small amount in direct contact with the skeleton was removed by a brush. At this point, the nature of the associated cultural materials (if any), as well as tentative osteological analyses were recorded on burial forms. If the burial was not in a pit (e.g., intrusive into either the shell core or the "shell shelf," or placed on top of submound sterile soil), a modification of the above procedures was required. In the first instance, the burials in question were highly fragmented, and could not be given, in one case, osteological analysis sufficient to determine the sex of the individual. Nevertheless, burial forms were prepared in as much detail as possible and a photographic record was maintained. In the second instance (that of the burials placed on top of submound sterile soil and covered with fill), all soil except that in direct association with the skeleton itself was removed by trowel, such that the skeleton was left supported on a "pedestal" of soil. This provided a kind of "working table" situation in which both the brushing and subsequent osteological analyses of the skeletons were facilitated. Photographs were taken, burial forms were prepared, and the skeletons were sealed in plastic until the systematic physical anthropological analysis was done.

This analysis was conducted by Dr. William R. Maples of the Department of Anthropology and the Florida State Museum at the University of Florida. It consisted of basic demographic data of sex and approximate age of the individual. All visible pathologies were noted and described (e.g., enlargement of left tibia, cranial osteoporosis), but diagnostic labels were not assigned. Upon completion of the analysis of each burial, the skeleton was removed from its context. This removal involved the individual bagging of each skeletal element, and the placing of the bags in a labelled box. The burials were then sent to the Social Science Department of the Florida State Museum for further analysis.[1] Upon completion of the

[1]The osteological analyses of Taylor Mound, Couper Field, and Indian Field skeletal materials are still continuing at the time of this writing. These are being conducted by James Zahler under the direction of William R. Maples. It is possible that these investigations may necessitate a later reconsideration of some of the sociocultural findings of this report.

excavation, the area was backfilled by Sea Island Company, Sea Island, Georgia, who served as cosponsors of the excavation.

The Architectural Characteristics of Taylor Mound

Taylor Mound is probably best described as a small ceremonial mound with associated burials. The term "ceremonial" rather than burial seems advisable in view of the architectural elaboration of the southern portion of the structure and the presence of the "east-side pottery cache," both of which have possible ceremonial significance, as evidenced by ethnohistorical documentation to be discussed in more detail below.

Essentially, the mound consisted of a shell "core" which was placed in an area in which much of the topsoil had been previously scraped away, and which was surrounded by soil removed from a (nearly) surrounding "borrow pit." The eliciting of the probable steps of construction was made possible by considering the most economic explanation of the stratigraphy of the mound which was evident in profile, particularly the strata of a trench 19.77 meters in length (15.40 meters of which was oriented grid east-west across the apex of the mound, and is partially illustrated below, while the remaining 4.37 meters was the profile of a trench extending grid northeast from the shell core).

Figure 5. Stratigraphy of Taylor Mound

A. Modern Shell and Humus

B. Mound Fill

C. Mound Wash and Borrow Pit Fill

D. Humus

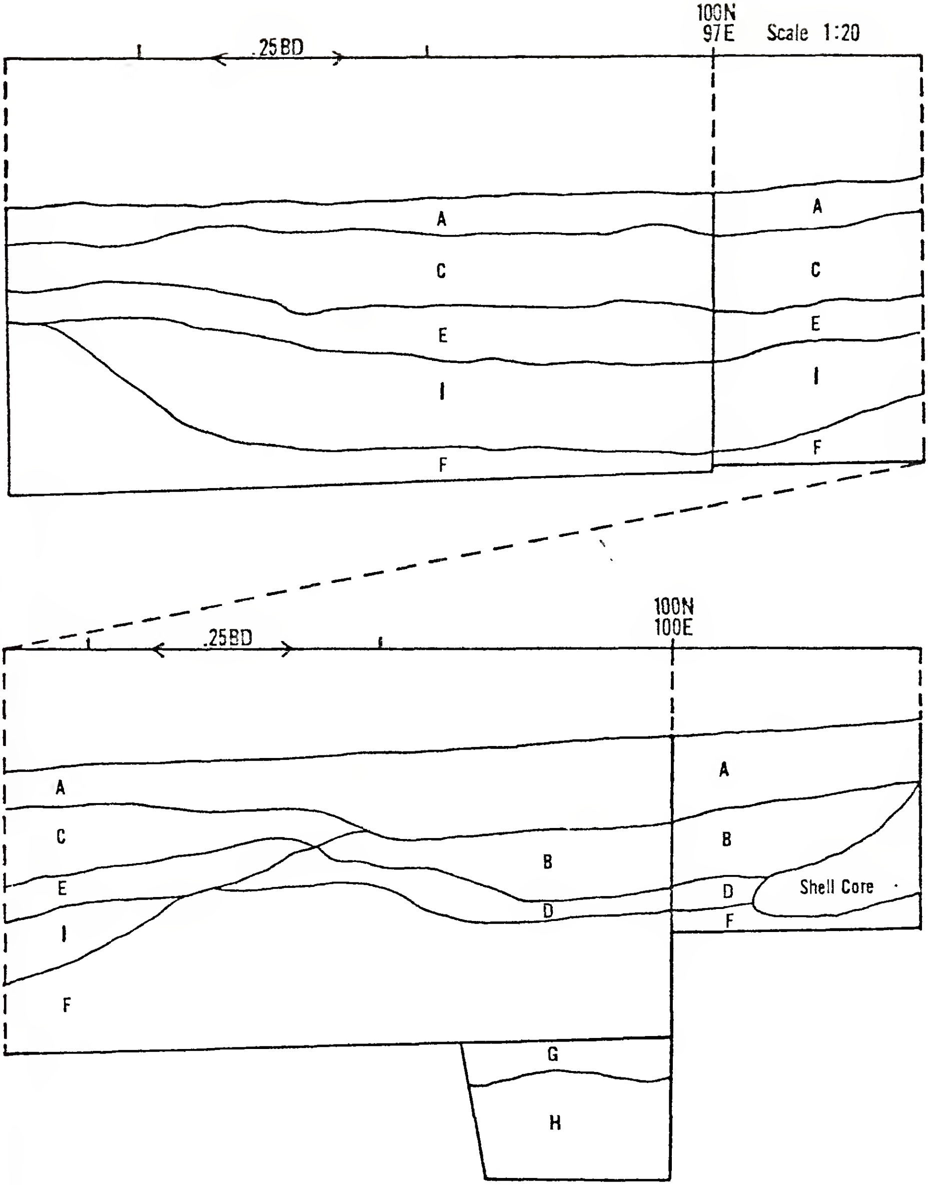
E. Borrow Pit Humus

F. Sterile Sand

G. Gray Sand

H. White Sand

I. Leached Borrow Pit Humus


100N
97E
Scale 1:20
.25BD
A
C
E
I
F
A
C
E
I
F
100N
100E
.25BD
A
C
E
I
F
B
D
A
B
D
F
Shell Core
G
H

The strata evident in profile were as follows: (1) modern humus, (2) mottled brown soil immediately beneath the humus, which "lensed out" at approximately 1.5 meters from the edge of the shell core, (3) darker soil (similar to modern humus) immediately beneath the mottled-brown zone, (4) a moderately lighter zone beneath this darker soil, (5) tan sterile sand, (6) mottled tan soil in contact with the core, which "lensed out" at the onset of (2), and, finally, (6) the shellfish "core" itself.

The simplest explanation of the mound construction sequence would seem to be the following: The greater part of the humus of the site of the shell core was scraped away prior to the placement of the core. A nearby midden, consisting primarily of shellfish, was scraped up, brought to the prepared area, and deposited on the subsoil. This core was square measuring 7m on a side (measured at the top) and 1m thick. The sides sloped outward at an angle of about 30° above horizontal. A large moat-like "borrow" pit extending some 4 meters from the edge of the fill was dug down into the sterile subsoil on the north, west, and south sides of the core. The soil from the pit was placed against all sides of the core, extending out 2.10 meters. This sand was termed the "mound fill." Upon completion of the structure, the sherds from as many as ten broken vessels were deposited in a shallow depression dug into the topsoil at the eastern edge of the fill. In the course of time, burials were added to the structure, and (with one exception which involves a unique construction feature to be discussed below) they were either placed in pits dug into the core, within the fill itself along the eastern side, or within the sterile soil on the eastern side, with mound fill subsequently added.

The southern side of the mound was the only side exhibiting any type of structural elaboration. In this instance, the shell core itself was modified by the creation of a projecting "shelf" of compacted shell. The shelf extended outward approximately two meters (being eroded at the edge), and followed the southern edge of the core for at least two meters, until traces of it were obscured by a combination of a hole dug into the southeastern edge of the core during the previous excavation and a tree which was rooted in the core. Beneath the projecting shelf was sterile sand, while above it was mound fill. Extending southward from the shelf approximately one meter were two molded "steps" of sterile soil leading downward until they became the bottom of the borrow pit. The only other unusual construction feature was a hypothetical sand "topping" mounted on the surface of the core. This was evidenced by sand that was present throughout the core's matrix as well as by sand washed into the borrow pit. Whether this sand topping was present or not would not be a question of any significance beyond that of descriptive architectural history, if

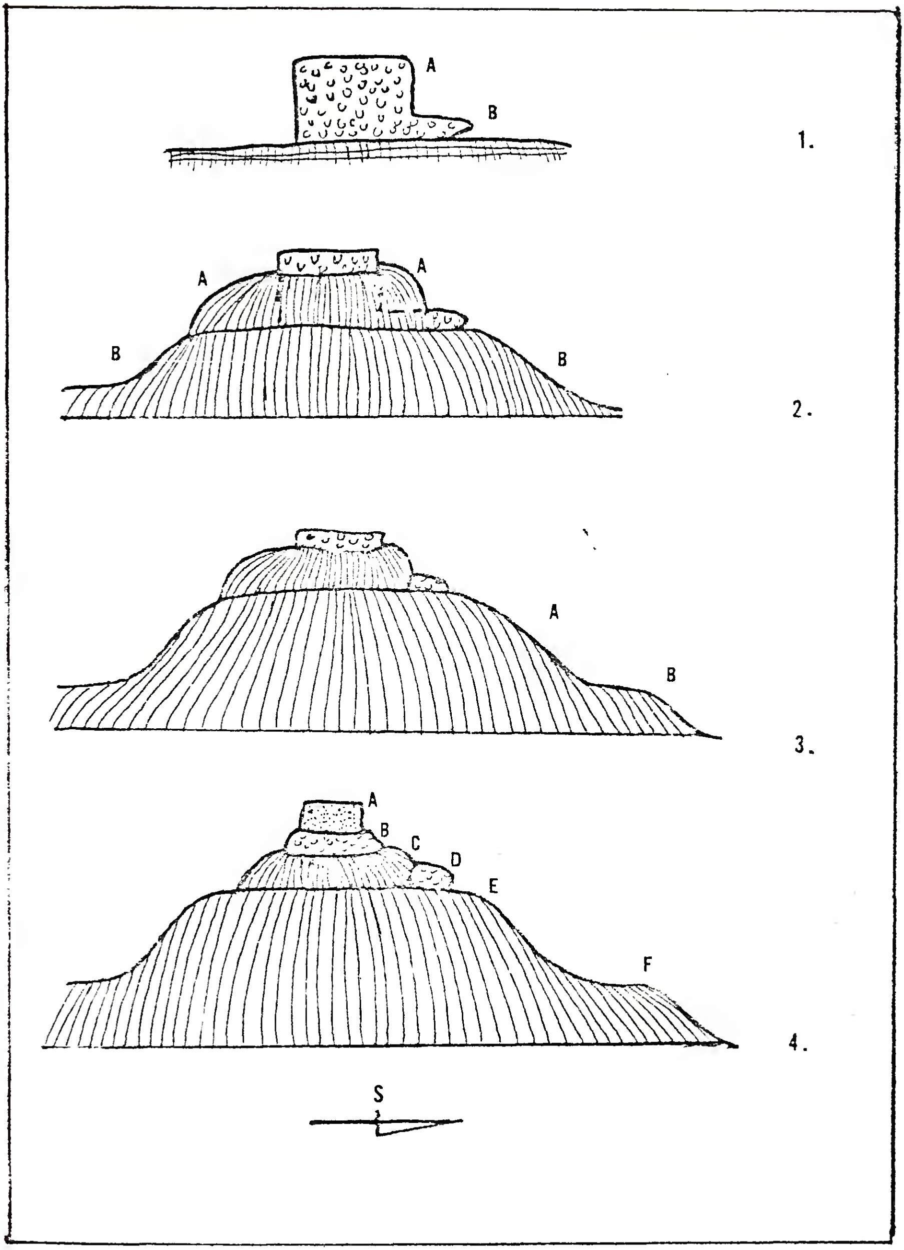
Figure 6. Steps of Mound Construction

1) Shell core with projecting shell shelf (B) is mounted on partially cleared humus

2) Soil from surrounding borrow pit (B) is placed around the core (A)

3) Sterile sand is molded to create an extra step (B)

4) A sand topping (A) is added, to create six steps on the southern side (A through F)


A
B
1.
A
A
B
B
2.
A
B
3.
A
B
C
D
E
F
4.
S

it were not for a possible ethnohistorical significance involving a structural reflection of aboriginal magico-religious systems. Properly, this will be presented in more detail in the appropriate chapter, but here we may take note that, if the "topping" were actually present, it would have resulted in a series of six distinct steps being evident on the southern portion of the mound. These would have been: (1) the sand "topping" (2) the exposed portion of the core between the edge of the "topping" and the beginning of the fill (that the topping was not coterminous with the core was suggested by the centralized concentration of the sand), (3) the mound fill, (4) the projecting "shelf," and (5) and (6) the two molded "steps" of sterile sand. The account of the Guale Festivals in the writings of Father Juan Rogel describes them as having occurred six times during the year (Rogel 1861 [1570]: 328). Further, the account provided by Peter Martyr d'Anghera states that the south was the location of the afterworld, in the belief systems of the coastal strand tribes (Martyr in Swanton 1922:44-54). Combining these two reports, we are left with the possibility that the elaboration of the southern portion of the structure through the construction of six discrete levels did indeed occur, and would constitute an architectural reflection of an aboriginal magico-religious system.

The above sequence of construction would seem to be, then, the simplest explanation of the mound's stratigraphy. It remains only to be said that the additional strata can be explained with equal facility as the result of the combined processes of erosion and deposition through time. Apparently the mound fill was washed by rains (which occur all year around, with convectional thunderstorms occurring almost daily in the summer) into the surrounding borrow pit. This process, however, would have been slower than that of deciduous forest humus accumulating in the bottom of the pit. As a consequence, mound fill was being washed down on top of accumulated borrow pit humus (stratum (3) above) which was itself leached out (creating stratum (4)). Finally, on top of this "mound wash and borrow-pit fill" (2), there exists an accumulation of modern humus (stratum (1)).

The final feature of interest in the ceremonial structure was the east-side pottery deposit. This is a common feature of aboriginal mounds in Southeastern United States. Basically, it is a deposit of potsherds from ceramonial vessels that were possibly broken as part of a ritual commemorating the completion of the structure; normally, the deposit is on the eastern side of the mound. The pottery cache at Taylor Mound was located to the east of the shell core. It was a boat-shaped hole dug into the old humus, filled with pottery fragments, and covered with mound fill. Ceramic types present included San Marcos (rectilinear complicated stamped), Irene incised, Irene Filfot, and Irene Plain. At the Florida State Museum, University of Florida, five vessels have been largely restored from the sherds. They are the following: (1) Irene incised vessel, circumferences: 39cm, top; 47cm, middle; 2) Irene incised, circumferences: 36.8cm, top; 58.0cm, middle, 3) San Marcos Complicated Stamped, circumferences: 64.0cm, top; 59.5cm, middle; height 19.3 cm, 4) Irene Plain, circumferences: 53cm, top; 45.7cm, middle; height 14.0cm; 5) Irene Incised, circumferences: 46.0cm, top; 49.5cm, middle; height 14.0cm. While the presence of the deposit is important in establishing affinities between the Guale end inland Southeastern tribes, it cannot be used in establishing the chronological relationship between Taylor Mound and other St. Simon's Island sites, due to the misleading effect of comparing ceremonial with utilitarian ceramics as well as the inevitable skewing effect arising from sample variation.

It should also be noted that a number of European artifacts were encountered at Taylor Mound. These included (1) a brass spike encountered in the mound fill to the immediate south of the burials, 10.5cm long with a square, tapered shaft, 1.10cm on a side near the top, and .80cm on a side near the bottom; (2) a round ship's spike located in the modern humus on the immediate north of the shell core, 30.00cm long and 6.6cm in circumference; (3) two nails (one 18.4cm long, the other 15.00cm long) and one spike 15cm long, all encountered near the top of the mound fill to the immediate east of the shell core. The presence of these last artifacts within the fill adds greater terminus post quem certainty to the protohistoric dating of the mound.

Such were the architectural characteristics of Taylor Mound. In concluding, we might stress that, while its gross dimensions would not have made it imposing (indeed, it would be miniscule by comparison with many ceremonial mounds), its southern elaboration and east-side pottery deposit would nevertheless characterize it as a ceremonial structure. It did, however, serve a dual role (the other being that of burial) and it is to the matter of the Taylor Mound burials and their cultural significance that we will next direct our attention.

The Burials at Taylor Mound

Eleven burials were recovered from Taylor Mound. In this section, we will deal first with a description of each of these burials, and secondly, with cultural information that may be elicited from them. In the second instance, we will examine (1) the degree of similarity among the Taylor Mound burials, (2) the similarity among the Couper Field burials, and (3) the homogeneity between burials when the Taylor Mound and Couper Field populations are combined. This determination is a necessary prior step toward determining the appropriate test to be used (e.g., chi-square versus Fisher's Exact) when investigating (for example) the association of types of grave goods with sex and age, as an index of differential prestige. At the moment, however, a brief description of the Taylor Mound burials is in order.

The description of all burials to be considered in both Taylor Mound and Couper Field will utilize the following arbitrary categories: (1) sex, (2) age (infant, child or adolescent, adult, aged), (3) burial type (primary/secondary), (4) position of bones (extended/flexed/other), (5) position of head (left side/right side/face down/face up/other), (6) [+, -] marine fauna, (7) [+, -] terrestrial fauna, (8) [+, -] unmodified stone, (9) [+, -] modified stone, (10) [+, -] modified shell, (11) [+, -] modified bone. In the case of the more general categories (such as "worked stone"), the artifact will be specifically identified (e.g., "projectile point," "stone axe"). The description, then, of the Taylor Mound burials is provided below.

Burial One was located on the southeastern side of the mound, intrusive into the projecting "shell shelf" and the molded "step" of sterile sand immediately beneath

Figure 7. Taylor Mound Burial 1

it. Osteological analysis determined that the burial was an infant aged approximately 36 to 38 weeks. The nearly 2000 beads in association with the burial were arranged in the form of a bracelet, an anklet, and an apron. The bracelet and anklet were further characterized by alternating strands (2 white, 2 red, and 2 white) for a total of six different strands. This number is the same as the total levels on the southern portion of the mound (discussed above), implying (along with the fact that the burial was the only one with a southern location) that the placement of this individual possessed a possible magico-relisious significance—and may have been an infant sacrifice. Distinctive features of the burial include the following:

1) indeterminate (IND)
2) infant (INF)
3) primary (PR)
4) flexed (FL)
5) left (L)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) modified shell (1954 shell beads and a painted clam shell) (+)
11) no modified bone (-)

Burial Two was located in the northeastern portion of the mound fill. Apparently, it has been placed on the submound surface (primarily sterile sand) and covered with fill. The following distinctive features were noted:

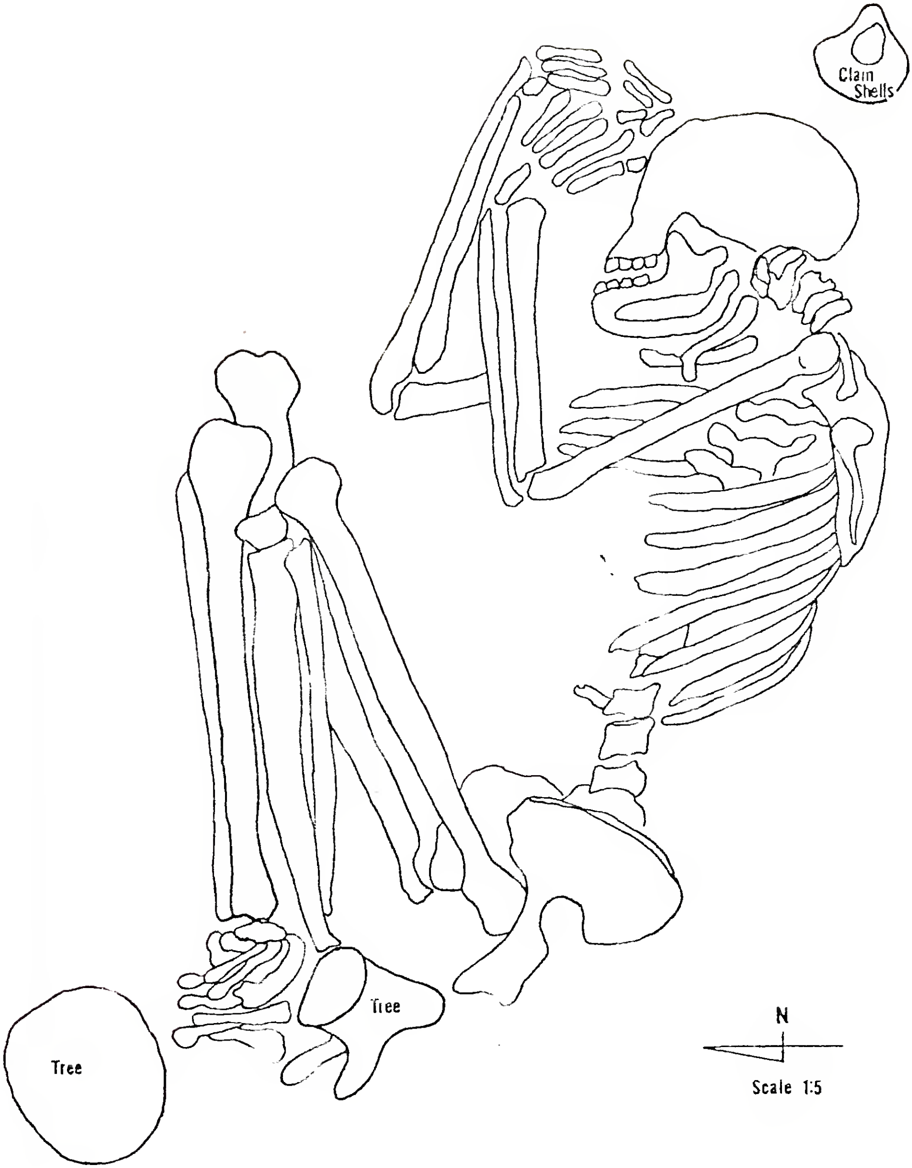


Figure 8. Taylor Mound Burial 2

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (two clam shells, one contained inside the other) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Three was located in a pit intrusive into sterile soil beneath the northeastern part of the mound fill. Distinctive features were the following:

1) male (M)
2) aged (AG)
3) primary (PR)
4) other (supine with legs flexed) (SUP-FL)
5) other (vertical) (VERT)
6) marine fauna[1] (13 clam shells and one busycon shell) (+)
7) no terrestrial fanua (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)

Burial Four was located in a pit intrusive into the sterile soil beneath the mound fill on the southeastern

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[1]Determination of the "worked" or "unworked" status of busycon shells is especially difficult. In this case, we are assuming that it was unmodified.

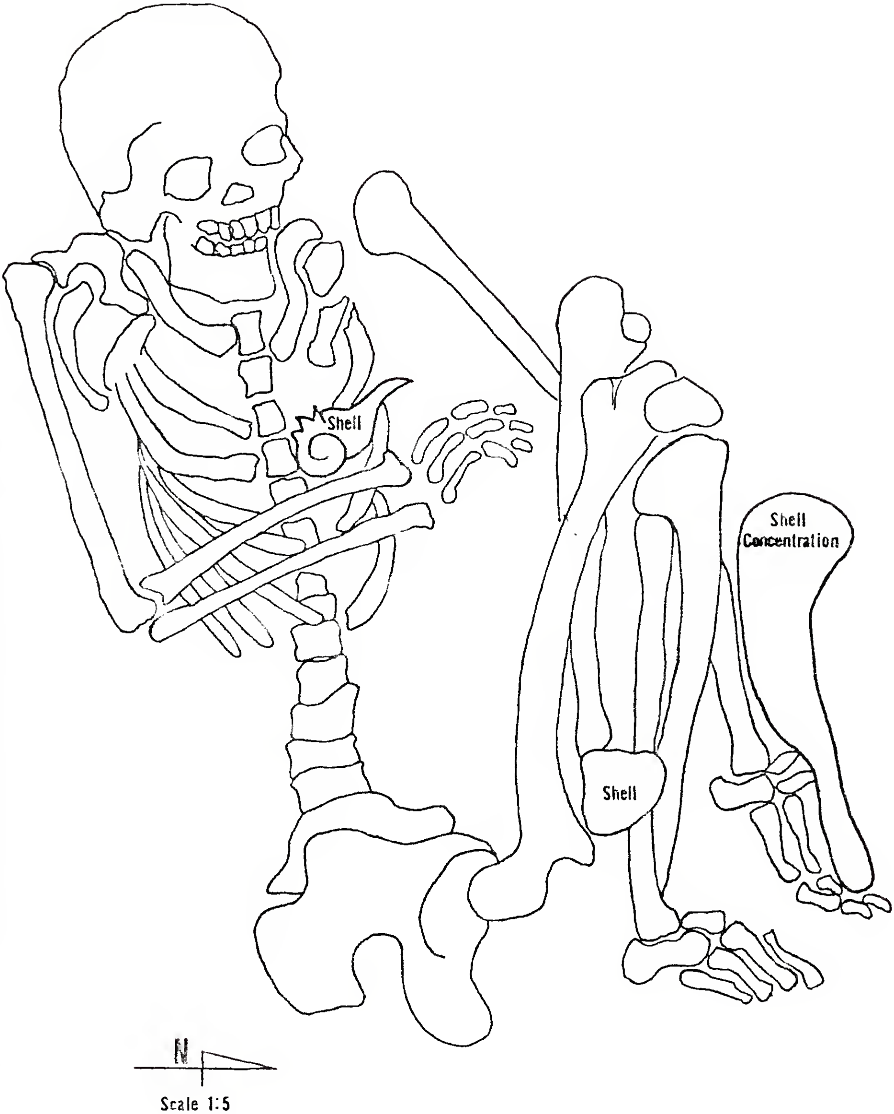


Figure 9. Taylor Mound Burial 3

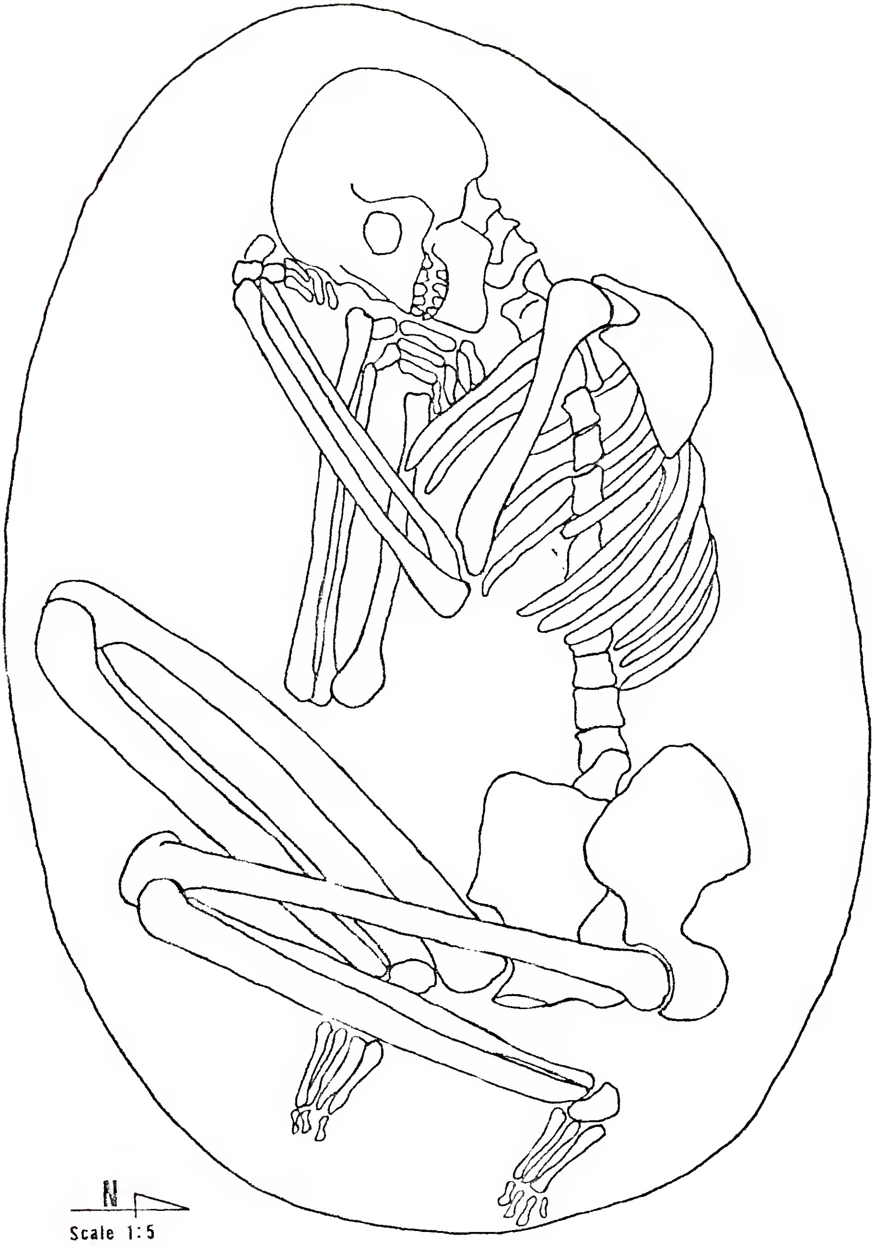


Figure 10. Taylor Mound Burial 4

side. Distinctive features were as follows:

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (38 fragments of shell) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Five was located in a pit dug into sterile soil beneath the east-central portion of the mound fill. Distincive features were:

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (113 fragments of shell) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Six was located within the east-central part of the mound fill, and was above Burial 9, described below. Its distinctive features included the following:

1) male (M)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (36 shell fragments) (+)
7) no terrestrial fauan (-)
8) no unmodified stone (-)
9) no modified sonte (-)
10) modified shell (78 shell beads) (+)

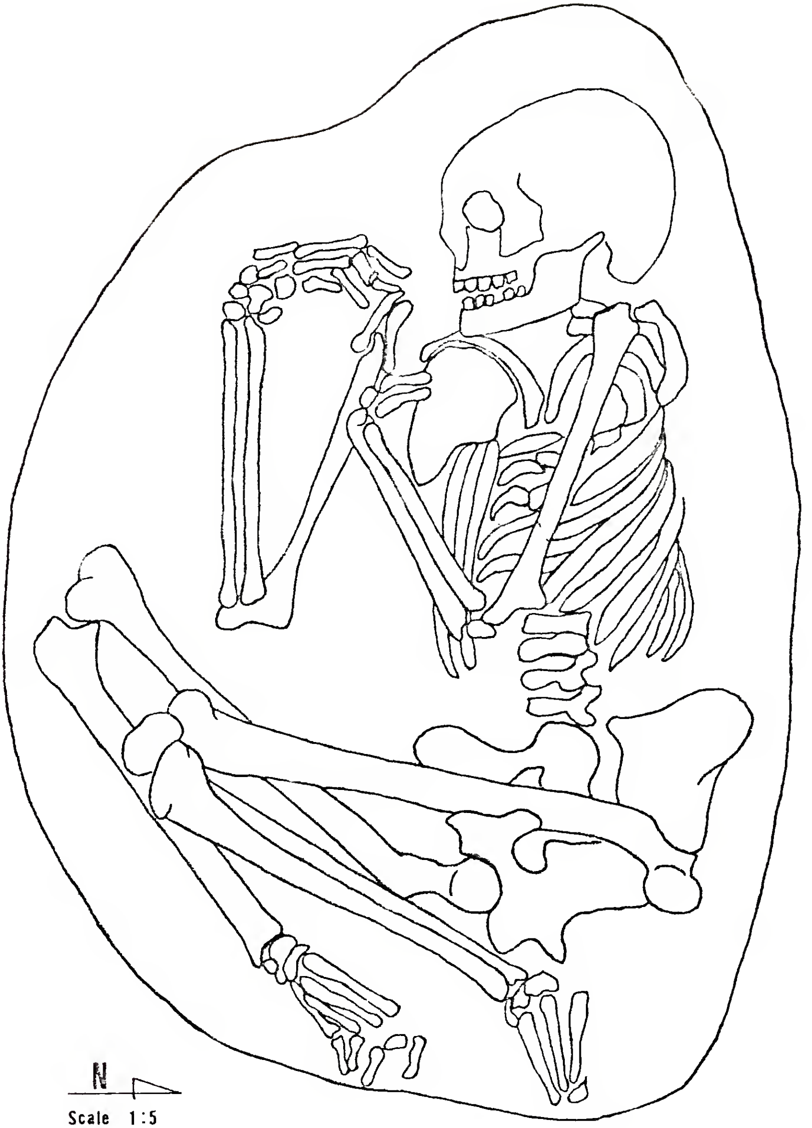


Figure 11. Taylor Mound Burial 5

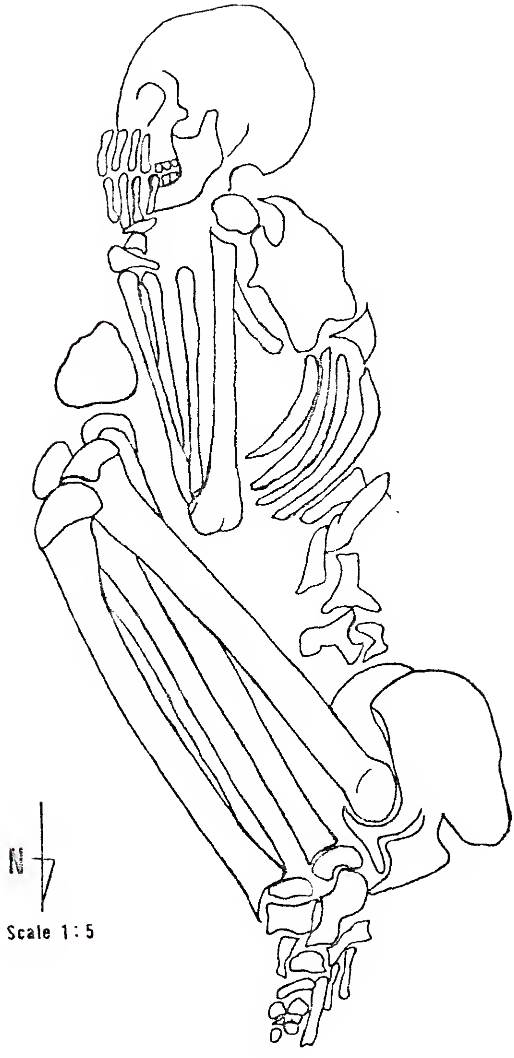


Figure 12. Taylor Mound Burial 6

Burial Seven was located in a pit dug into sub-mound sterile soil on the east-central part of the mound, and was covered with mound fill. Distinctive features were the following:

1) female (F)
2) adolescent (ADO)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (oyster shells) (+)
7) terrestrial fauna (two box turtle shells placed along vertebral column)(+)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Eight was a highly pathologic individual exhibiting premature closure of cranial sutures, osteoporosis of both parietals and the posterior frontal, a vertical forehead, billowed and unfused cranial condyls, ilium unfused to ischium, and cortical thickening of the right tibia. The tentative *in situ* field analysis by William R. Maples resulted in noting the possibility of either an endocrincological pathology or abnormal hemoglobin. Subsequent flouroscopic analyses of the skeletal material of Burial 8 conducted in the J. Hillis Miller Medical Center at the University of Florida (and which are still in progress at the time of this writing) have provided a tentative diagnosis of some type of hemolytic animia, which may be thalassemia. Essentially, this is a pathology in which normal hemoglobin, a conjugated

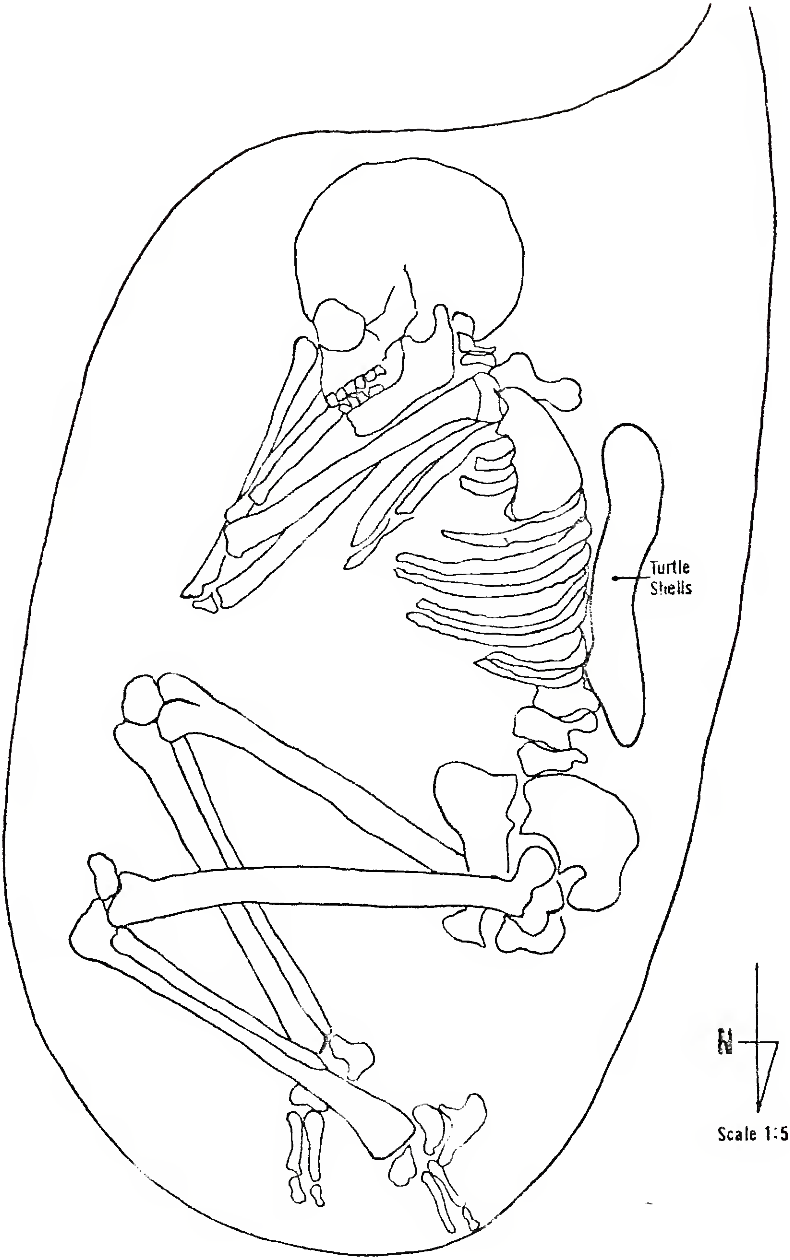


Figure 13. Taylor Mound Burial 7

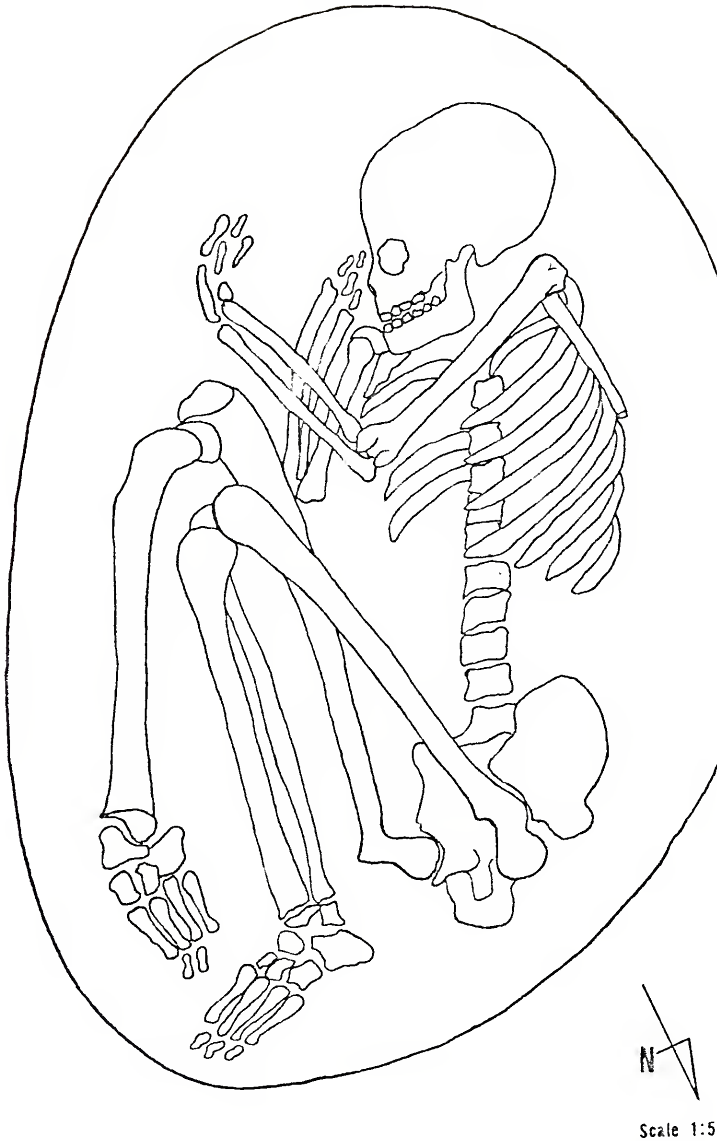


Figure 14. Taylor Mound Burial 8

protein responsible for oxygen transport to the tissues, is not synthesized, but a variant form, in which one of the two amino acid chains is suppressed, is synthesized instead (Buettner-Janusch 1973:453-5). Its Old World distribution included most of Spain, and it is relatively frequent among Arab populations. Moreover, it appears in two forms (major and minor), which vary strongly in likelihood of fatality, severity of anemia, degree of jaundice, enlargement of spleen and liver size, and so forth. The less severe form (minor) is generally not manifested strikingly in the skeletal material; the more severe form is. Finally, the major and minor variations are homozygous and hetereozygous conditions, respectively.

Burial Eight was located in a pit dug into the sub-mound sterile soil on the east-central side of the mound, and was covered with mound fill. Its distinctive features were the following:

1) female (F)
2) adolescent (ADO)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Nine was located in a pit dug into sub-mound sterile sand on the east-central side of the mound, and was covered with mound fill. Distinctive features included the following:

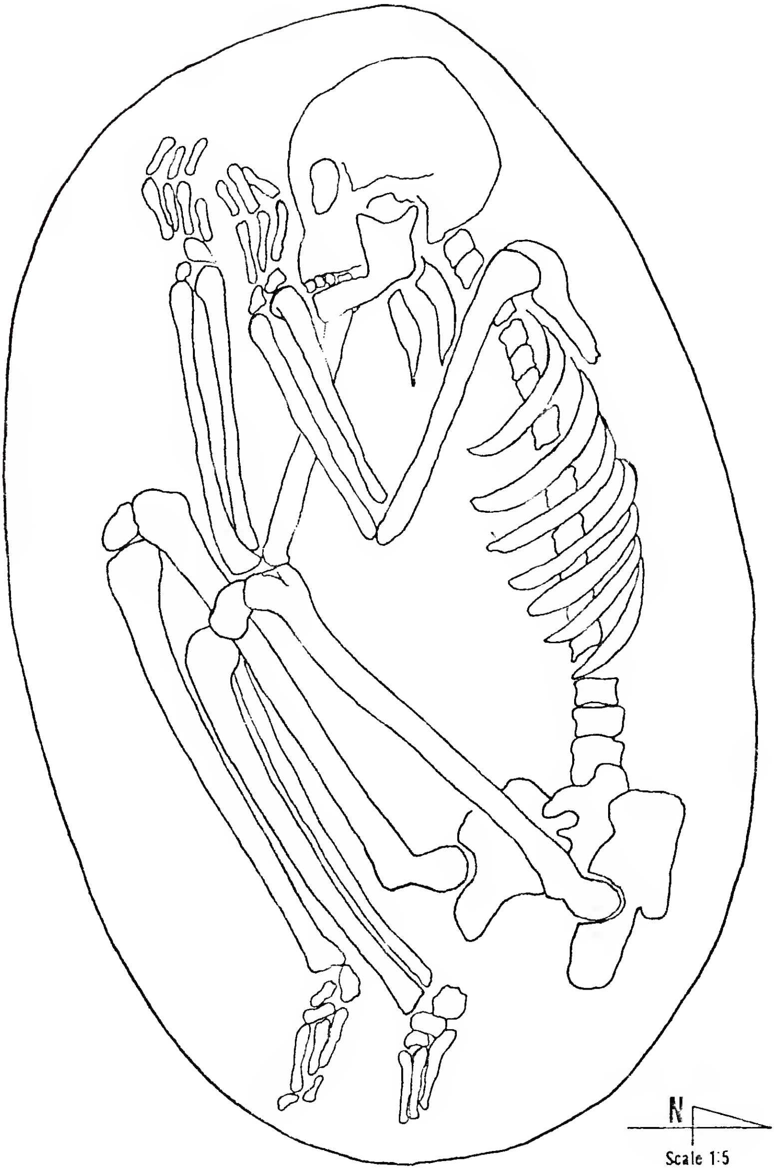


Figure 15. Taylor Mound Burial 9

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

<u>Burial Ten</u> was located in a submound sterile soil pit on the east-central side of the mound, and was covered with mound fill. Its distinctive features were as follows:

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) other (face up) (FU)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

<u>Burial Eleven</u> was located in a pit intrusive into the shell core. It was located beneath a tree, and was totally in fragments, probably as a result of root action. Associated materials presented below were those in direct association with the skeletal fragments.

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (one whelk and one oyster shell)(+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) modified stone (flintchip) (+)
10) modified shell (shell beads) (+)
11) no modified bone (-)

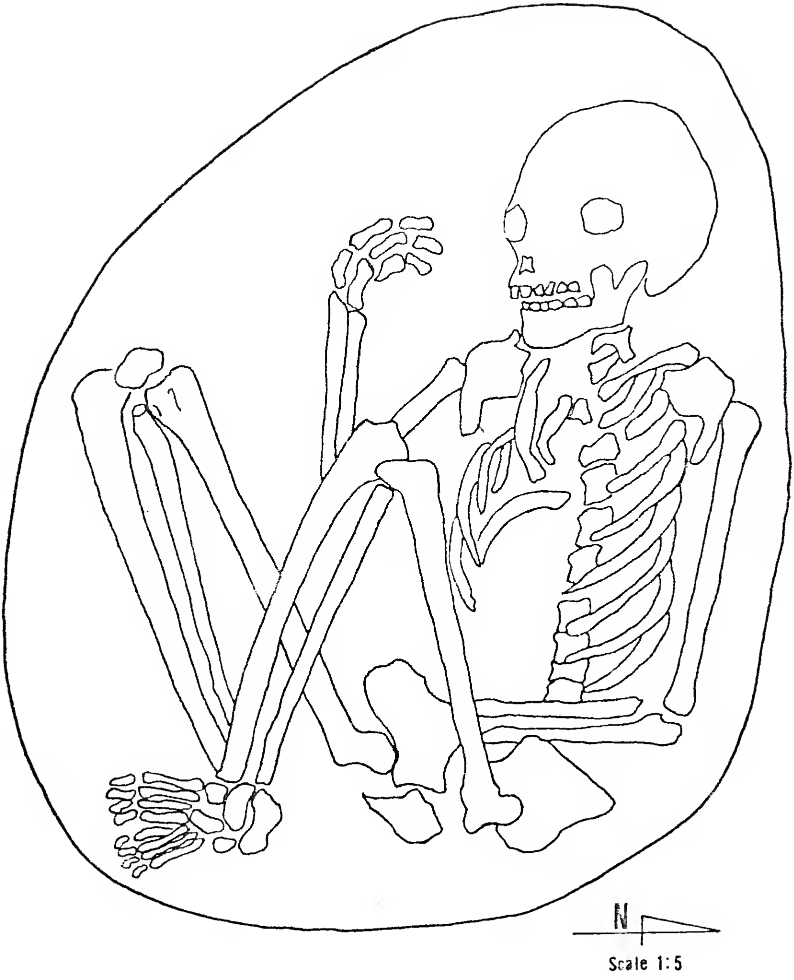


Figure 16. Taylor Mound Burial 10

Taylor Mound burials may be summarized as in the table below:

Table 1

Summary of Mortuary Distinctive Features at Taylor Mound

	Features										
Burial	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	IND	INF	PR	FL	L	-	-	-	-	+	-
2	F	AD	PR	FL	R	+	-	-	-	-	-
3	M	AG	PR	FL	VERT	+	-	-	-	-	-
4	F	AD	PR	FL	R	+	-	-	-	-	-
5	F	AD	PR	FL	R	+	-	-	-	-	-
6	M	AD	PR	FL	R	+	-	-	-	+	-
7	F	ADO	PR	FL	R	+	+	-	-	-	-
8	F	ADO	PR	FL	R	-	-	-	-	-	-
9	F	AD	PR	FL	R	-	-	-	-	-	-
10	F	AD	PR	FL	FU	-	-	-	-	-	-
11	F	AD	PR	FL	R	+	-	-	+	+	-

Probably the most evident aspect of the chart is the apparently pronounced homogeneity between the burials. Our next task will be the utilization of these same categories for a description of the Couper Field burial complex to determine, by examination, if the burials appear to possess the same type of homogeneity as the burial complex at Taylor Mound.

Summary of Investigation of Taylor Mound

Taylor Mound, a protohistoric ceremonial mound with associated primary burials, was the subject of two archeological investigations, the first of which presented serious methodological problems for the second. Essentially, these were problems of the reliability of earlier stratigraphic and osteological data, both of which were responsible for a related problem of sample size. The decision which seemed most advisable was to use only the data retrieved during the second excavation, and to examine statistically the possibility of combining the resultant small sample of mortuary data with the samples from other excavations.

The primary result of the second excavation was the eliciting of detailed architectural and mortuary information. In the former case, it was determined that the mound was constructed by placing a shell midden atop a prepared area of sterile soil, surrounding it with soil removed from a borrow pit, and possibly capping the structure with a topping of fine sand. In the second instance, it was determined that a pronounced mortuary homogeneity with little deviation appears to exist among the burials, suggestive of only limited rank distinctions in the culture. This finding, however, requires a larger burial sample for corroboration, a matter to be explored in the following chapter.

CHAPTER IV

COUPER FIELD

"Couper Field" was the name assigned by the investigator to an abandoned modern field on the northern part of St. Simon's Island, Georgia, immediately south of the remains of the ante-bellum Couper mansion. Unlike Taylor Mound, the area had been heavily plowed, and the sparseness and height of the pine trees on the site suggested that secondary succession had begun only within the last few decades. Nevertheless, the majority of burials which were recovered from this protohistoric burial-complex site were undisturbed by plowing and afforded a larger data base than those which were recovered at Taylor Mound.

Unlike the mound excavation, the Couper Field topography was suggestive with regard to possible concentration of archeological materials, but was not conclusive. There were throughout the area many small circular rises of shell (ca. 50 cm high at the apex) which were probably deposited around dwellings. In order to determine specifically the midden accumulations that were directly associated with living areas or concentrations of features, a sampling design was necessary.

The paramount considerations in the design were uniformity (i.e., that there should be no clustering of sampling units in any particular sector of the site) as well as the limitations of time and personnel. In view of these considerations, the entire open field was not sampled, but instead, was covered by a 60m N-S, 90m E-W grid which created a $5400m^2$ "belt" across its middle. Within this framework, it was possible to establish what was deemed the appropriate sampling design. This was a "chain" or "systematic" sample, an interval sampling technique in which every n^{th} unit is measured (Slonim 1960: 57-59). In content analysis, it might be every tenth page of a document; in sociological surveys, it could be every fifth house along a street. The special advantage of the technique is the avoidance of the sample-variation skewing which can occur in random sample designs (e.g., numbered excavation units being selected through a table of random numbers), but there is the special disadvantage of the sampling pattern coinciding with a "natural" pattern that is present in the data itself (e.g., every fifth house is an expensive corner lot, and the chapters of the document are usually ten pages long). In the present instance, the interval selected was 15 meters: every 15 meters rectilinearly within the grid a three-meter square was excavated, for a total of 28 such units. There was no apparent coinciding of this pattern with degree or depth of plowing, nor with any vegetative or topographic variations. Each unit was excavated to the depth of sterile soil (mean depth of the plow zone was .25m), and horizontal maps were prepared of all features present within each unit. Time and personnel limitations, sample objective, and the disturbed context of materials in the plow zone made motorized screening undesirable. Upon completion of the sample, a composite map was prepared. Examination of this map revealed a clustering of features (particularly shellfish and food bone concentrations) in the western part of $5400m^2$ belt. As a consequence, a sector 45m N-S and 15m E-W, which enclosed this clustering of features, was designated for intensive excavation.

Within the above sector, a smaller grid system of three-meter squares was established. Horizontal and vertical control were maintained in the same manner described for Taylor Mound, and methodology involving features and burials was the same. The latter was the overall archeological characteristic of the site—and it is therefore to the burials and their cultural implications that we will next direct our attention.

The Burials at Couper Field

Sixteen burials were recovered at Couper Field. In the present chapter, we will continue the discussion and analysis initiated with the Taylor Mound burials: (1) the description of the burials according to an arbitrary set of distinctive features, (2) the investigation of site homogeneity by systematic comparison of these features, (3) the examination of the legitimacy of combining the Couper Field and Taylor Mound burials into a single sample, and (4) the investigation of sociocultural questions regarding aboriginal ranked groups and postmarital residential patterns. We begin, then, with a description of the Couper Field burial complex, incorporating the same distinctive features that were previously used.

All burials (with limited exceptions to be noted below) were located in pits dug into the tan sterile sand beneath the plow zone. Burial One was characterized by the following features:

Burial One:

1) female (F)
2) aged (AG)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (oyster shell) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) modified shell (+) (shell beads)

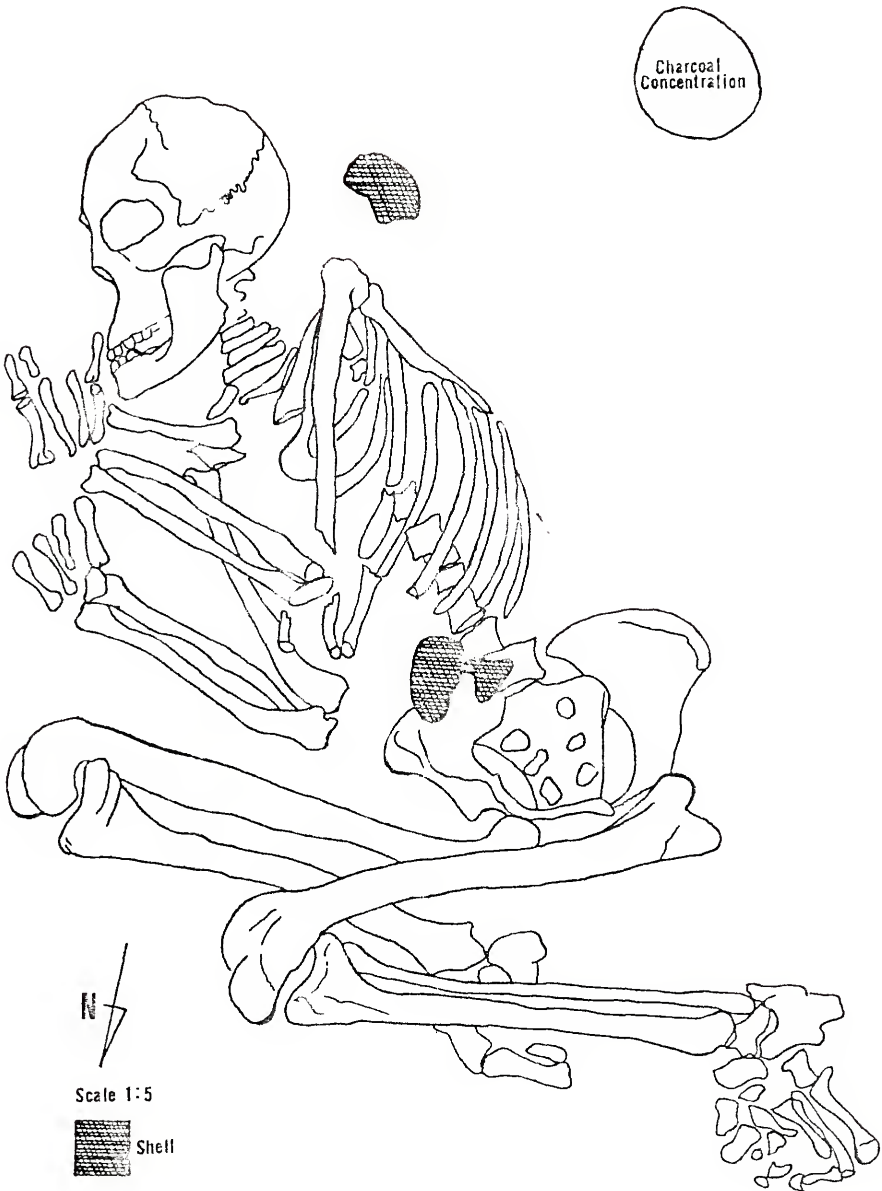


Figure 17. Couper Field Burial 1

Burial Two:

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) left (L)
6) marine fauna (burial pit was lined with oyster shell) (+)
7) terrestrial fauna (+) (animal bone was located along the spine)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Three:

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) face down
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) modified shell (shell beads in association with cervical vertebrae) (+)

Burial Four presents a problem comparable to that of Burial Eleven at Taylor Mound. It was located within the plow zone, was heavily disturbed, and included several individuals. One of these, burial four (c) consisted only of a vertebral fragment in association with a greenstone celt. The celt was spatulate, and was similar to those frequently encountered in Mississippian sites. Its length was 3.16 cm, and its width was 6.3 cm at the base and 4.5 cm at the top. Its circumference was 13.4 cm at the midline.

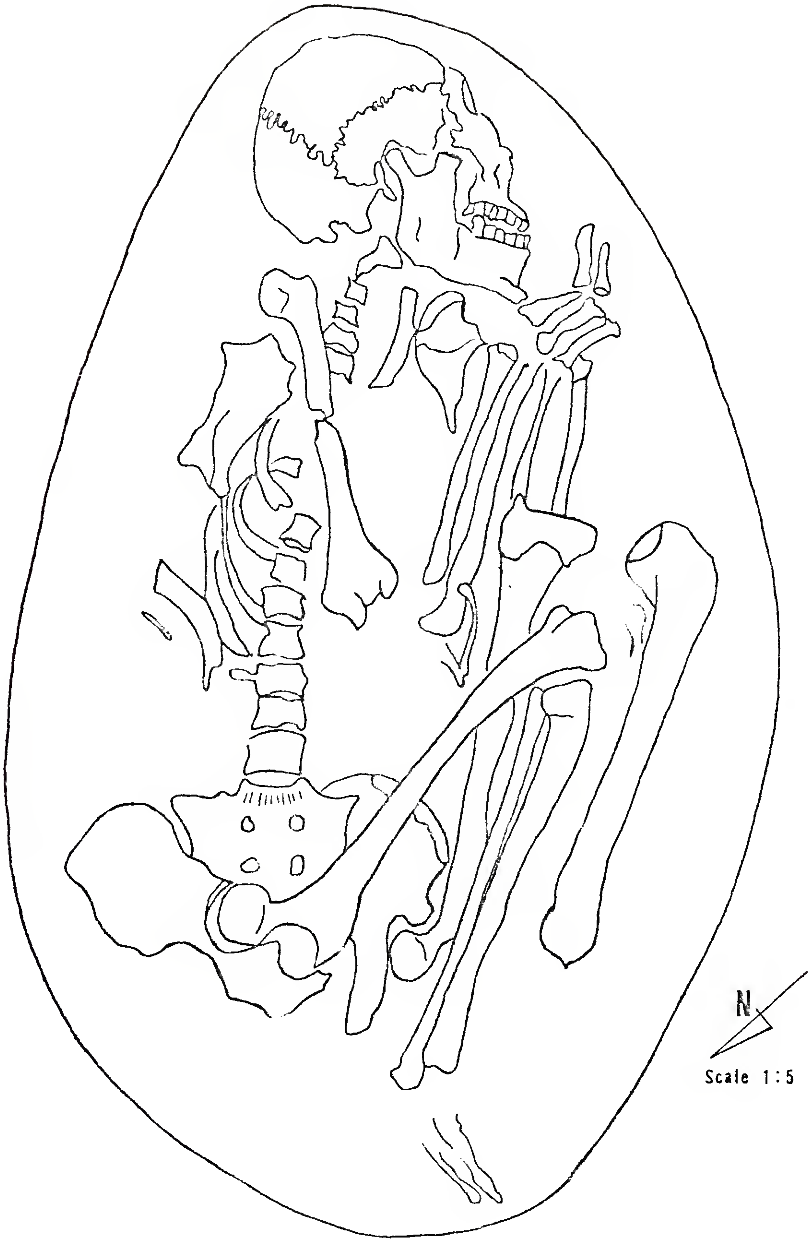


Figure 18. Couper Field Burial 2

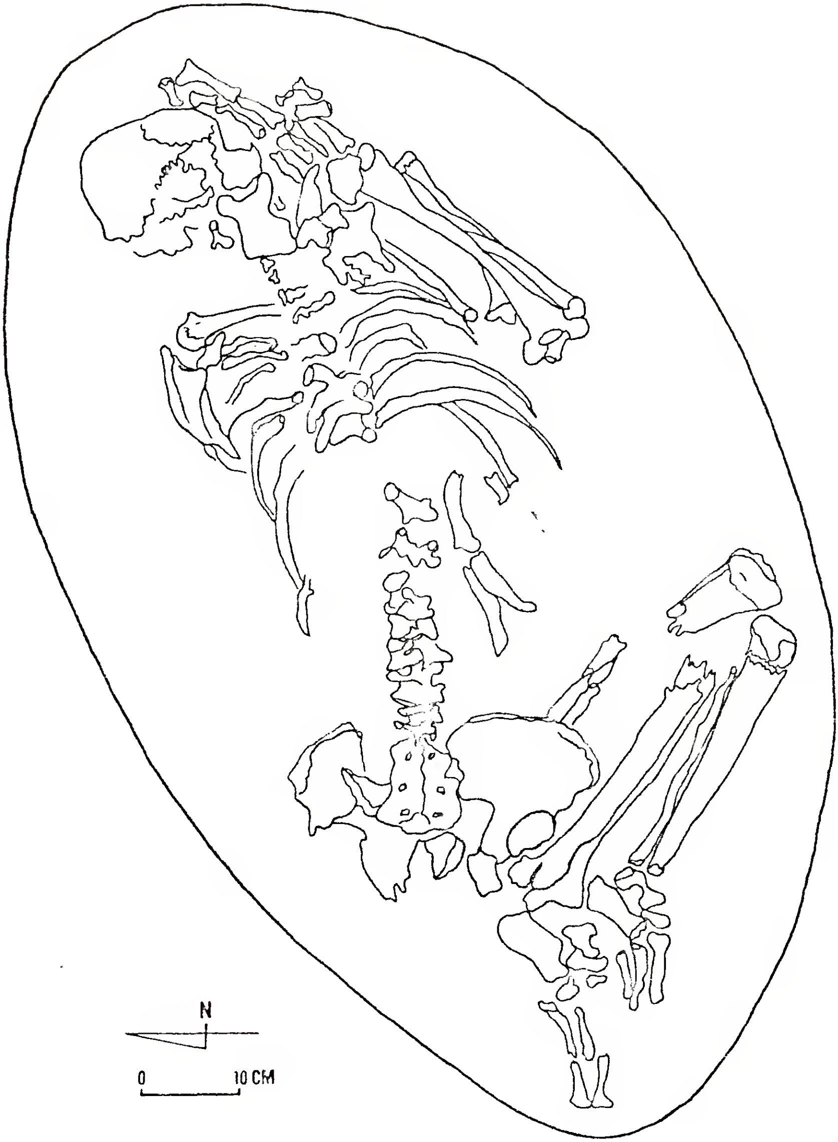


Figure 19. Couper Field Burial 3

Only one burial (4D) was sufficiently undisturbed to be characterized by our present set of features. These were as follows:

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) other (vertical) (VERT)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Characteristics of Burial Five were the following:

1) male (M)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) left (L)
6) marine fauna (seven shark's teeth, two clam shells) (+)
7) terrestrial fauna (bird claw, small animal mandible and skull (+)
8) unmodified stone (igneous rock) (+)
9) modified stone (two flintchips; one slate celt, 35.7 cm long, 5.5 cm wide at the "flared" base, 4.9 cm wide immediately above the flare, 3.5 cm wide at the top, and a midline circumference of 10.5 cm; one stemmed projectile point) (+)

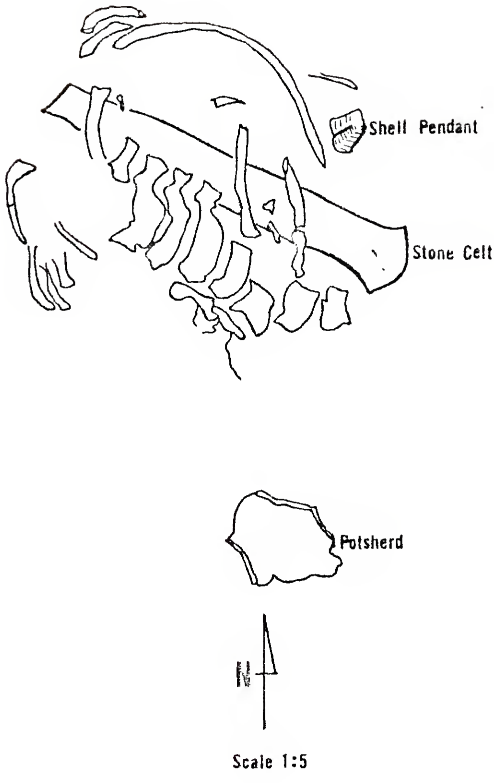


Figure 20. Couper Field Burial 4C

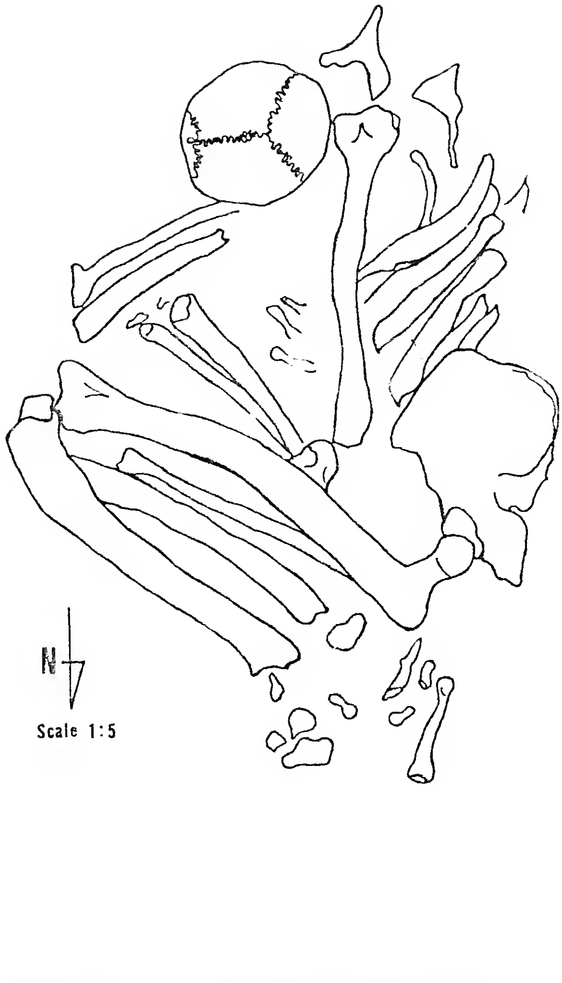


Figure 21. Couper Field Burial 4D

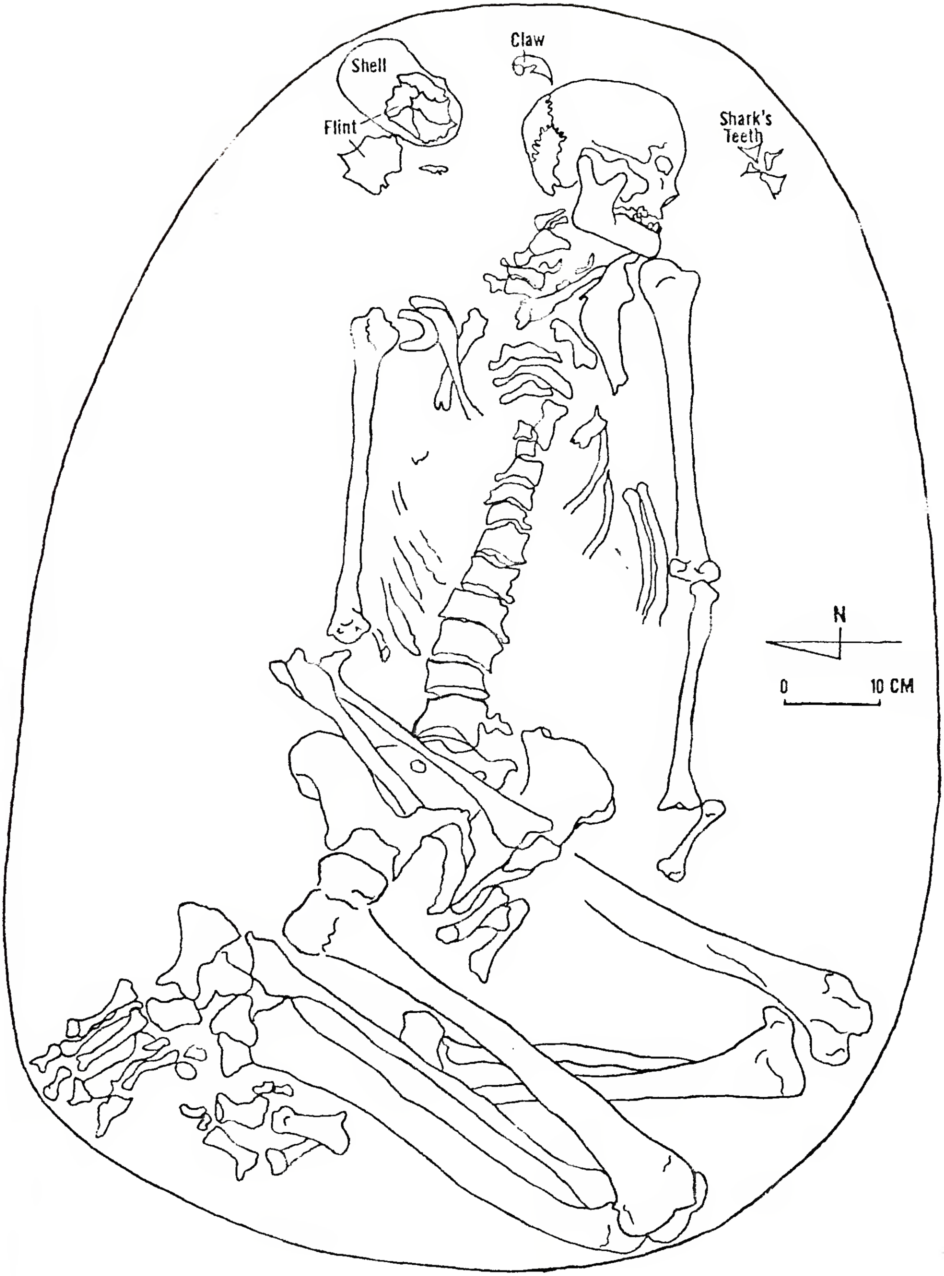


Figure 22. Couper Field Burial 5

Burial Six may be characterized as follows:

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (Busycon sp.) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Seven had the following distinctive features:

1) female (F)
2) aged (AG)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) modified bone (one bone pin) (+)

Burial Eight was characterized as follows:

1) male (M)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

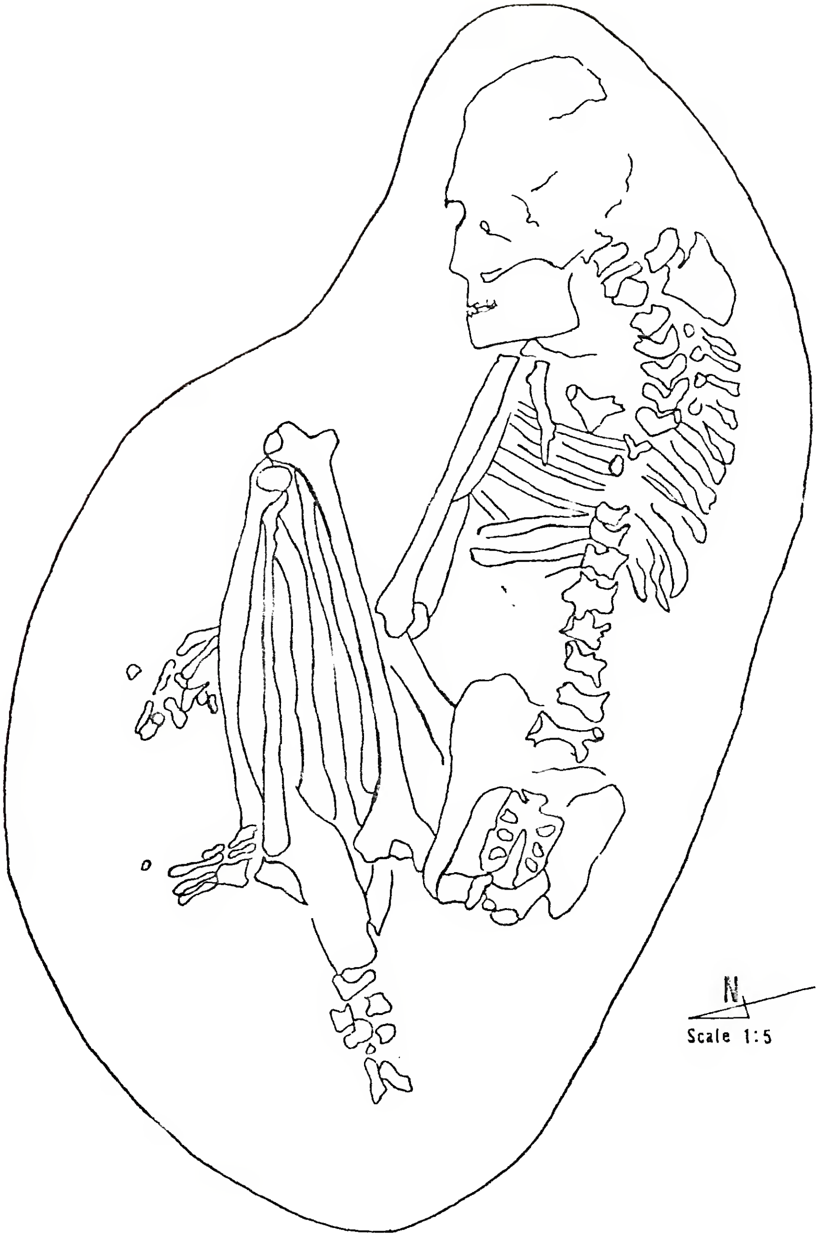


Figure 23. Couper Field Burial 6

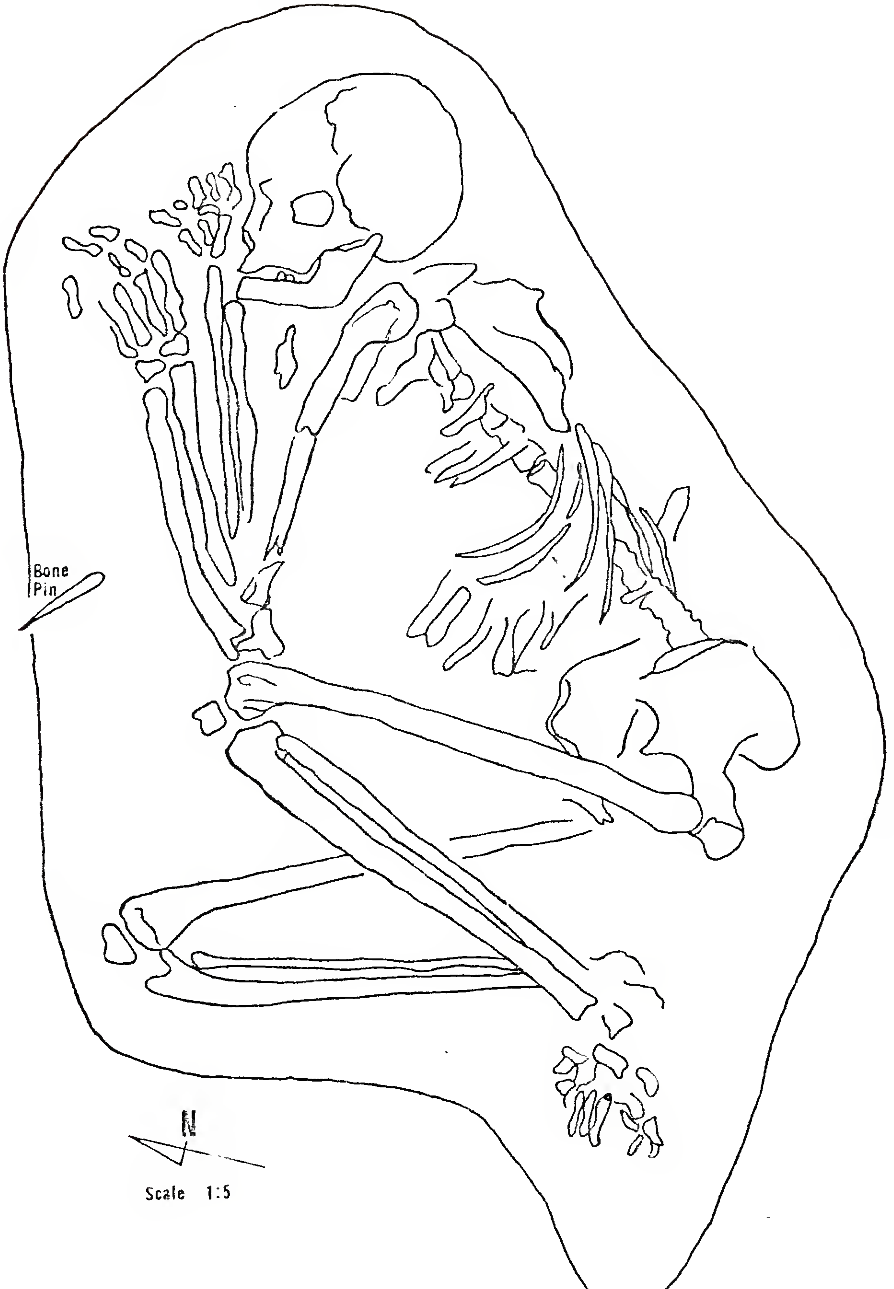


Figure 24. Couper Field Burial 7

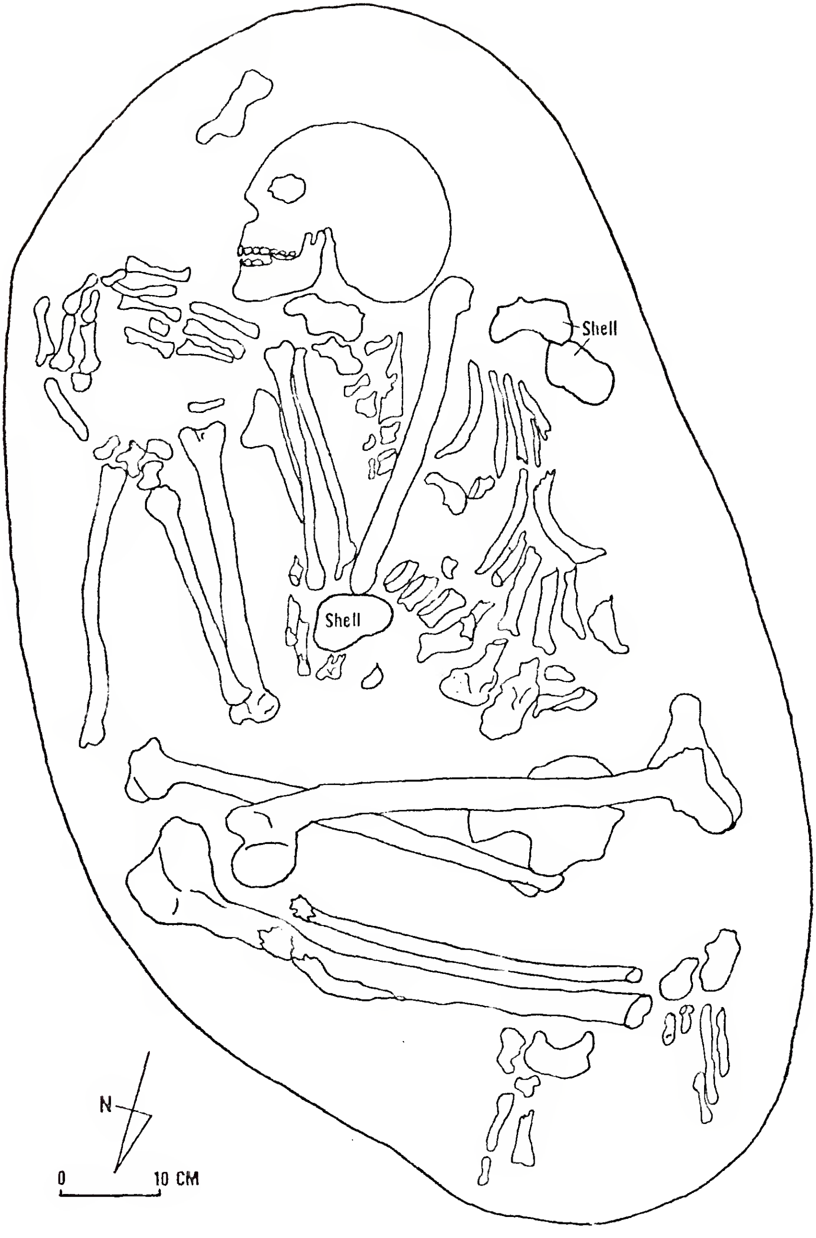


Figure 25. Couper Field Burial 8

Burial Nine consisted of two individuals. The northernmost of the two was complete (A9), but the southernmost (B9) had everything above the pelvis removed by plowing. Sex and age identifications were nevertheless possible, and both individuals are characterized below.

Nine A

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Nine B

1) male (M)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) indeterminate (IND)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Ten also consisted of two individuals, one adult and one child. Each individual is characterized as follows.

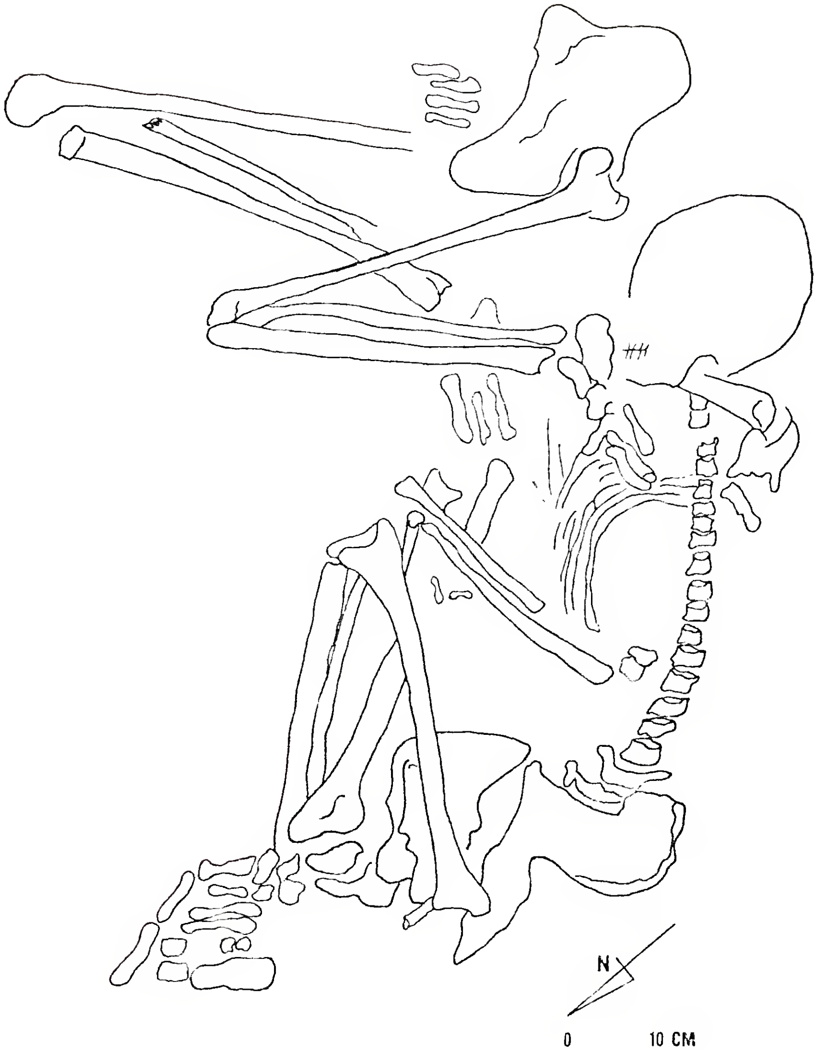


Figure 26. Couper Field Burial 9

Ten/adult (10-ad)

1) female (F)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) modified shell (one small worked fragment near skull) (+)

Ten/child (10-ch)

1) indeterminate (IND)
2) child (CH)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (shell in association with skull and knees) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Eleven was characterized as follows:

1) male (M)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (shell in association with skeleton) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

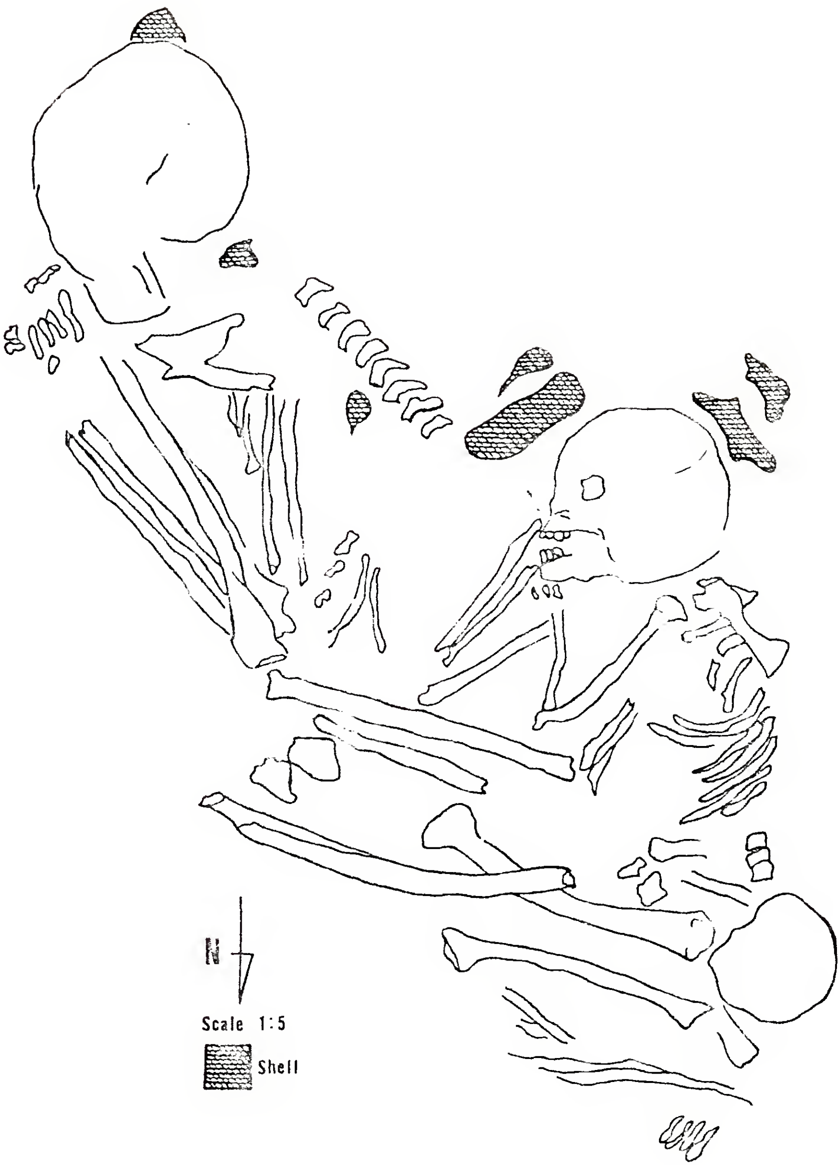


Figure 27. Couper Field Burial 10

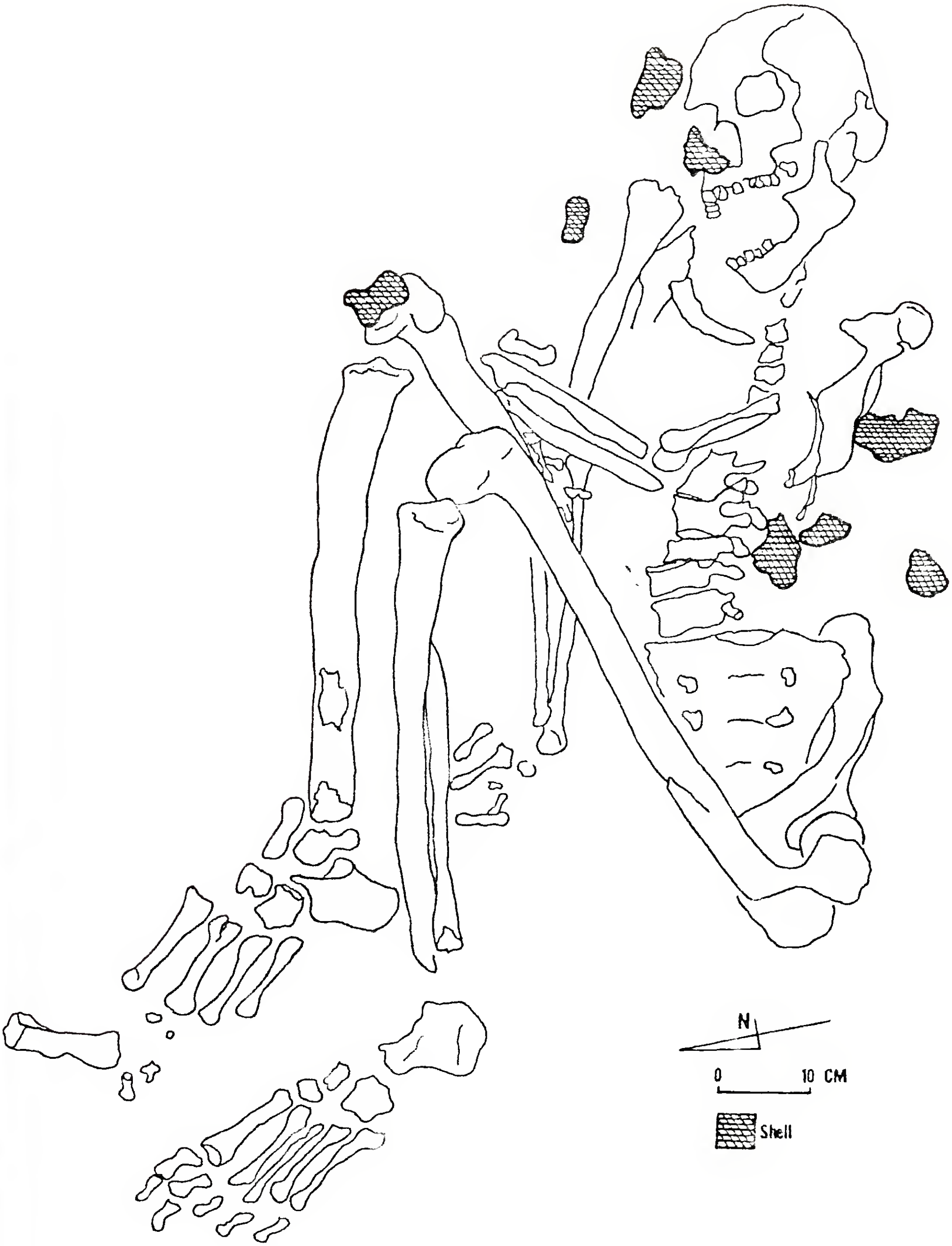


Figure 28. Couper Field Burial 11

Burial Twelve was characterized as follows:

1) male (M)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Thirteen was characterized as follows:

1) female (F)
2) aged (AG)
3) primary (PR)
4) flexed (FL)
5) left (L)
6) marine fauna (oyster-shell concentration in association with burial) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) modified shell (shell earplug beneath skull) (+)
11) no modified bone (-)

Burial Fourteen was characterized by the following features:

1) female (F)
2) child (CH)
3) primary (PR)
4) flexed (FL)
5) vertical (VERT)
6) no marine fauna (-)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

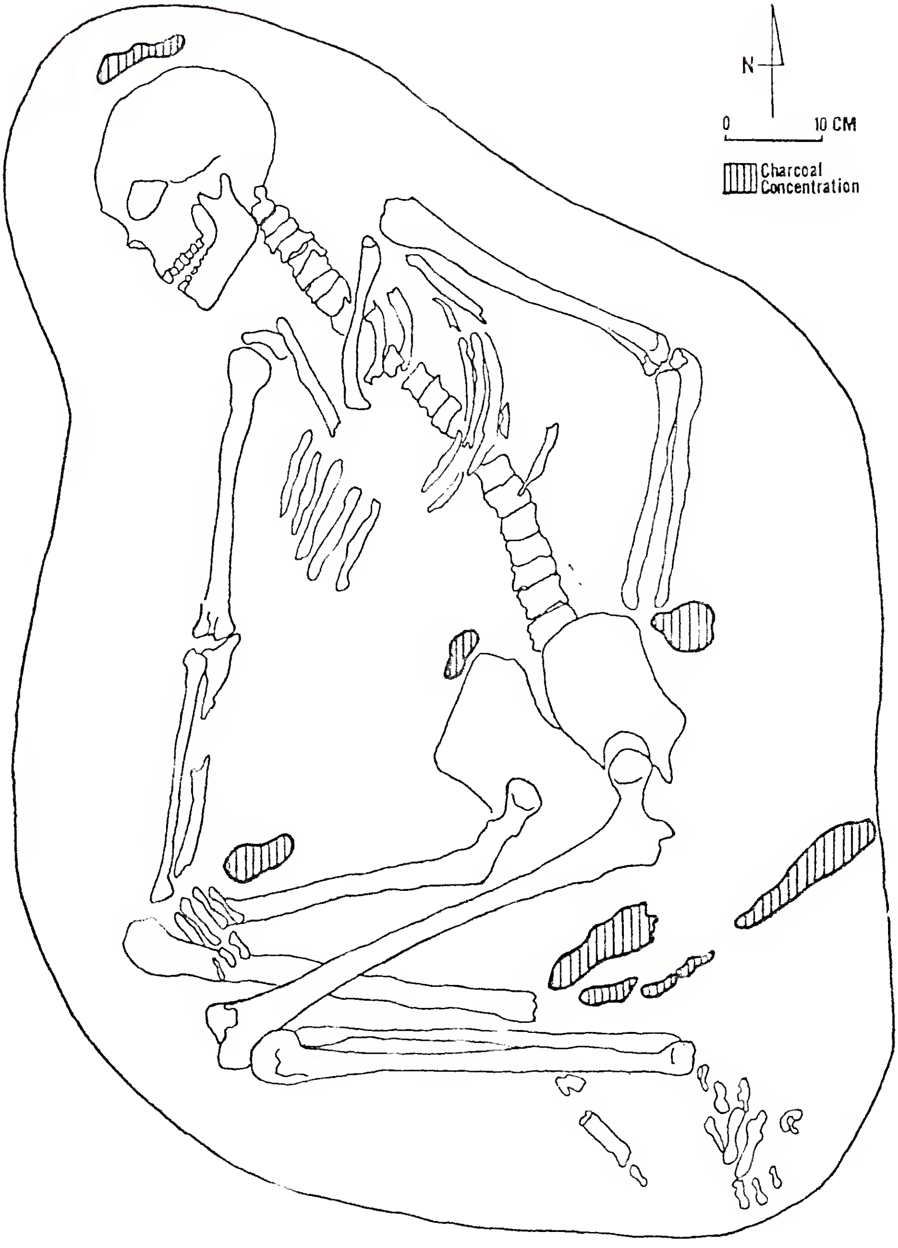


Figure 29. Couper Field Burial 12

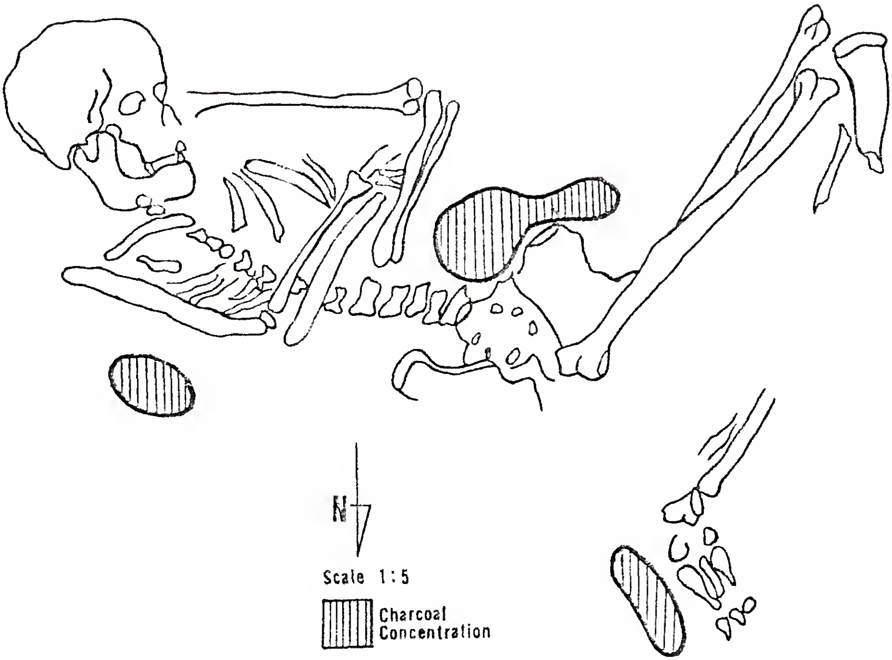


Figure 30. Couper Field Burial 13

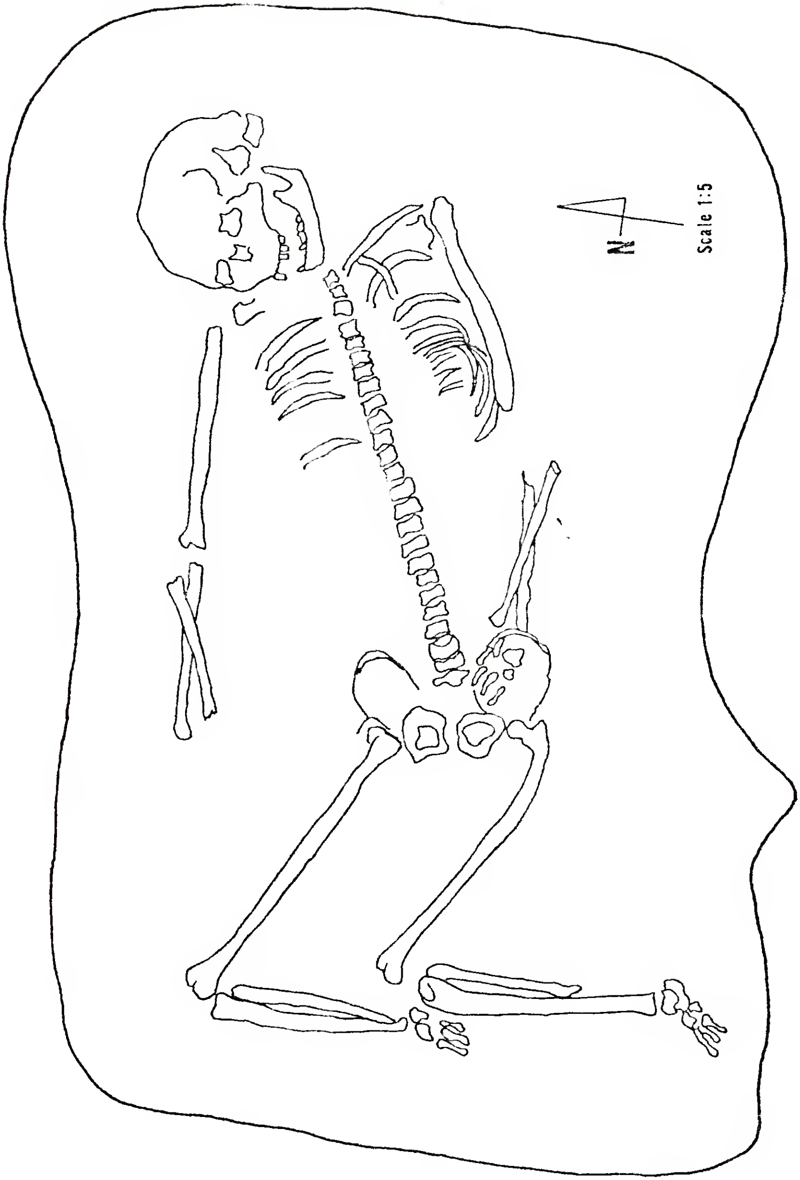


Figure 31. Couper Field Burial 14

Burial Fifteen was characterized as follows:

1) male (M)
2) aged (AG)
3) primary (PR)
4) flexed (FL)
5) indeterminate (IND) (skull was fragmented)
6) marine fauna (oyster concentration above burial) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Burial Sixteen was characterized as follows:

1) male (M)
2) adult (AD)
3) primary (PR)
4) flexed (FL)
5) right (R)
6) marine fauna (oyster concentration above burial) (+)
7) no terrestrial fauna (-)
8) no unmodified stone (-)
9) no modified stone (-)
10) no modified shell (-)
11) no modified bone (-)

Dog Burials

Two dog burials were also encountered at the Couper Field site. One of these was heavily disturbed by plowing and was located a full 12 meters north of the burial complex. The other, however, was in direct association with

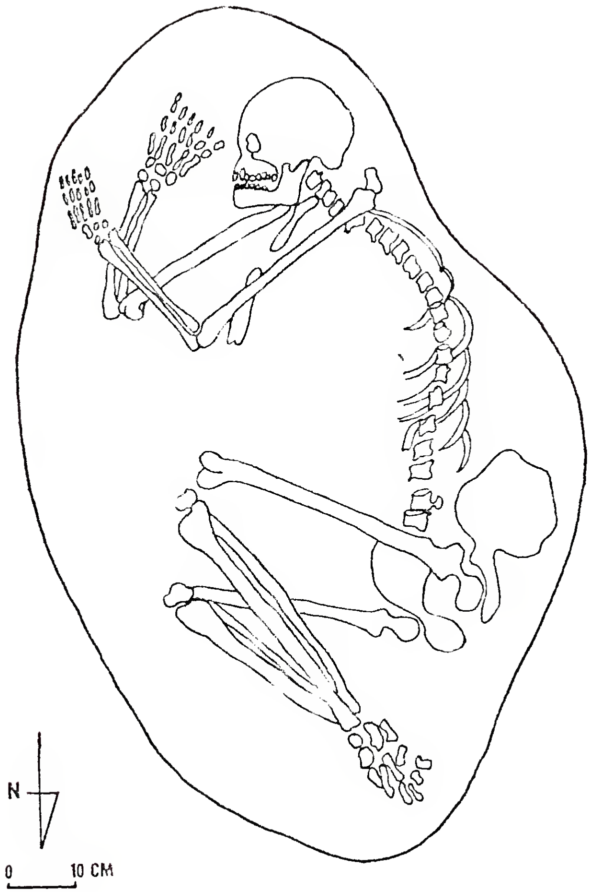


Figure 32. Couper Field Burial 16

the pit in the northwest corner of the Couper Field burial complex. The dog was buried beneath the plow zone in a pit that was intrusive into tan sterile sand. Once the dog was drawn, photographed, and removed, a fine screening of the soil at the bottom of the pit yielded a musket ball. Since the dog was directly outside the lines formed by the human burials, and since it was not disturbed by plowing, was intrusive into sterile soil, and contained a fully historic artifact beneath it, it provides an additional line of evidence for the protohistoric dating of the Couper Field site and its general contemporaneity with Taylor Mound.

Pipes

Additionally encountered in a plow zone matrix at Couper Field were two expanded-mouth clay pipes. These were made of fired clay and are similar to those encountered in both Irene and Pee Dee contexts (i.e., post A.D. 1500). This plow zone finding, in conjunction with the analysis of its ceramic contents (discussed in a later chapter), provides evidence of the protohistoric dating of the Couper Field site.

Mortuary Analysis of Couper Field

Couper Field burials may be summarized as in the table below:

Table 2

Summary of Mortuary Distinctive
Features at Couper Field

Burial	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	F	AG	PR	FL	R	+	-	-	-	+	-
2	F	AD	PR	FL	L	+	+	-	-	-	-
3	F	AD	PR	FL	L	-	-	-	-	+	-
4	F	AD	PR	FL	VERT	-	-	-	-	-	-
5	M	AD	PR	FL	L	+	+	+	+	-	+
6	F	AD	PR	FL	R	+	-	-	-	-	-
7	F	AG	PR	FL	R	-	-	-	-	-	+
8	M	AD	PR	FL	R	-	-	-	-	-	-
9	F	AD	PR	FL	R	-	-	-	-	-	-
9B	M	AD	PR	FL	IND	-	-	-	-	-	-
10Ad	F	AD	PR	FL	R	-	-	-	-	+	-
10Ch	IND	CH	PR	FL	R	+	-	-	-	-	-
11	M	AD	PR	FL	R	+	-	-	-	-	-
12	M	AD	PR	FL	R	-	-	-	-	-	-
13	F	AG	PR	FL	L	+	-	-	-	+	-
14	F	CH	PR	FL	VERT	-	-	-	-	-	-
15	M	AG	PR	FL	IND	+	-	-	-	-	-
16	M	AD	PR	FL	R	+	-	-	-	-	-

On inspection, the burials would appear to have an overall homogeneity similar to that which was noted for Taylor Mound. We may examine this similarity in more detail through a vertical, column-by-column comparison of the mortuary cultural features (i.e., 3 through 11, inclusive) of Taylor Mound and Couper Field. The results of this comparison are presented in the table below. The average difference between the two sites whem comparing distinctive features is only 6.2 percentage points (s.d. = 5.5). Identical sites, of course, would have a mean d of 0; totally different sites a mean d of 100.

Table 3

Distinctive Feature Comparison for Taylor Mound and Couper Field

	A. Taylor Mound		B. Couper Field		d(A-B)
Burial Type	Primary	100%	Primary	100%	0
Position of Bones	Flexed	100%	Flexed	100%	0
Position of Head	Right	73%	Right	62%	11
	Left	9%	Left	25%	16
	Vertical	9%	Vertical	19%	4
	Face UP	9%	Face Up	0%	9
Marine Fauna	Present	63%	Present	56%	7
Terrestrial Fauna	Present	9%	Present	6%	3
Unmodified Stone	Present	0%	Present	6%	6
Modified Stone	Present	9%	Present	6%	3
Modified Shell	Present	27%	Present	25%	2
Modified Bone	Present	0%	Present	13%	13
	$\bar{x}$ d = 6.2		s.d. = 5.5		

The results would seem to indicate a strong resemblance between the burial features of the sites. In view of this similarity, geographic contiguity, and the results of the ceramic analyses to be discussed in the eighth chapter, we will now combine the two sites for subsequent socio-cultural analyses.

The combination of the Taylor Mound and Couper Field samples enables us to continue, with larger data base, the cultural inquiries which were confined to the separate sites. It would seem in order to investigate the following questions: (1) Is there a significant correlation, within the total complex, between exotic grave goods and local-or-none grave goods, and the variable of sex? This can be examined through the use of a 2 x 2 contingency table and Fisher's Exact Probability Test. It would explore the possibility of rank distinctions having been more concentrated among members of one sex—which did not seem to be the case in the investigations above. (2) Were burials grouped with regard to sex? If this were the case, it would provide evidence of mortuary treatment having been dichotomized with regard to sex. This, in turn, has the cultural implication of males as a group being set apart from females as a group, a cultural distinction that is frequently the function of a sharply defined sexual division of labor. (3) Is there any statistically significant grouping of individuals according to the variables of age <u>and</u> sex? This question, as we shall see, has implications for post-marital residence pattern, and can be approached through the use of Fisher's Exact Test in conjunction with "nearest-neighbor" analysis. It is this latter technique which we shall now describe.

"Nearest neighbor" analysis is a statistical technique designed to elicit a segregation of the elements of a population. It was originally developed by ecologist E. C. Pielou, and has been adapted to problems of archeological analysis by Christopher S. Peebles. Essentially, following Peebles' discussion, the scheme of nearest-neighbor analysis is as follows:

In a two-species population, four classes of nearest-neighbor relationships may be distinguished. These are:

1) Individuals of A whose nearest neighbor is an A.

2) Individuals of B whose nearest neighbor is an A.

3) Individuals of A whose nearest neighbor is a B.

4) Individuals of B whose nearest neighbor is a B.

(It is perhaps advisable to point out that (2) and (3) refer indeed to different categories, and do not involve the fallacy of reasoning from the converse. Thus, as illustrated below, A_1's nearest neighbor is B_2, but the converse of the statement is not true.) (Peebles 1971:75-78).

$$B_1 \qquad\qquad\qquad A_1 \quad B_2 A_2$$

The frequencies for the four possible categories can be placed in a 2 x 2 contingency table (F_{AA}, F_{AB}, F_{BA}, F_{BB}) and can be tested for significant correlation through the use of Chi-square. Additionally, it is possible to calculate an index of the <u>nature</u> of the segregation present (if any) following a formula originally developed by Pielou. This "coefficient of segregation" (S_{pielou}, or "SP) is defined as

$$Sp = 1 - \frac{F_{AB} + F_{BA}}{N(a'b + ab')}$$

$$\text{or } Sp = 1 - \frac{\text{observed frequency of AB + BA relationships}}{\text{expected frequency of AB + BA relationships.}}$$

The significance of the Sp values at three crucial points of the range is as follows:

Unsegregated Population/Sp=0	Population all AA, BB/Sp = +1		Population all BA, AB/SP = -1
AB BA	AAAA	BBB	AB AB
BBAAABB	AA	BBB	AB AB
BABAABB	AAAA	BBB	AB

(Peebles 1971:75-78)

This is the method we shall employ below (in conjunction with Fisher's Exact Probability Test) to determine the nature of burial groupings for the variable of sex, as well as to determine whether or not the observed groupings (if any) are statistically significant.

At the moment, however, we must investigate the question of mortuary (and possible rank) distinctions in the combined Taylor Mound and Couper Field samples being significantly concentrated among the members of either sex. Unfortunately, the small sample of individuals that can be positively identified as to sex (N=27) results in expected frequencies of less than 5 (even with Yates' correction of .5 of the observed frequencies in the direction of the expected frequencies). Accordingly, this condition prohibits the use of chi-square, and necessitates the utilization of the Fisher's Exact Probability Test. This is also a test for nominal-nominal correlation, but it places no restrictions on the minimum size of expected frequencies and is applicable in all one-degree-of-freedom problems (i.e., those involving a four-cell contingency table) in which the expected frequencies are small (Freeman 1965:219, 227). The contingency table for the combined samples is presented below.

Table 3

Fisher's Exact Probability Test Values for
Burial at Taylor Mound and Couper Field

	Exotic	Local-or-None	
Male	1	8	9
Female	1	17	18
	2	25	27=N

The values within the cells and their marginal totals may be symbolized as below:

A	B	A + B
C	D	C + D
A + C	B + D	N

which forms the basis for the following formula for calculating the exact probability of the observed frequencies:

$$p = \frac{(A+B)!(C+D)!(A+C)!(B+D)!}{(A)!(B+)!(C)!(D)!(N)!}$$

(Siegel 1956:96-104)

Now, setting our significance level (α) at .05, we will reject the null hypothesis if our calculated value of p is equal to or less than α. The calculation for the Taylor Mound and Couper Field combined samples, then, is presented below.

$$p = \frac{9!18!2!25!}{1!8!1!17!27!}$$

$$P = .46 \ (x2 = .92)$$

Our p of .92 (doubled for a two-tailed test) results in a failure to reject the null hypothesis that any association between our two variables is the result of chance or sample variation alone. Put another way, our test has indicated no significant clustering or rank distinctions among either the males of females of the Guale.

At this point, then, we wish to see if differentail mortuary treatment for males and females was manifested in the <u>locations</u> of the burials (i.e. were males and females grouped apart?). The investigation of this question involves the nearest-neighbor technique discussed above, and will be incorporated in the data of the combined samples which are presented in Table

These findings are presented in a 2 x 2 contingency table as shown below:

Table 4

Nearest-Neighbor Contingency Table for Taylor Mound and Couper Field Burials

		F	M	
Nearest	F	13	7($6.20=F_e$)	20
Neighbor	M	4($3.90=F_e$)	2	6
		17	9	26 = N

Table 5

Raw Data for Pielou-Peebles Nearest Neighbor* Analysis of Combined Taylor Mound and Couper Field Samples

Base Burial	
1/COU/F (AG)	2 and 7/COU/F (YA) and (AG)
2/COU/F (YA)	6/COU/F (YA)
3/COU/F (YA)	14/COU/F (CH)
4D/COU/F (M)	4/COU/M (M)
5/COU/F (M)	40/COU/F (M)
6/COU/F (YA)	2/COU/F (YA)
7/COU/F (AG)	1/COU/F (AG)
8/COU/M (M)	12/COU/M (M)
9A/COU/F (M)	9B/COU/F (M)
9B/COU/M (M)	9A/COU/F (M)
10A/COU/F (M)	13/COU/F (AG)
11/COU/M (M)	9A/COU/F (M)
12/COU/M (M)	9B and 8/COU/M (M)
13/COU/F (AG)	10A/COU/F (M)
14/COU/F (CH)	6/COU/F (YA)
15/COU/M (AG)	14/COU/F (CH)
16/COU/M (M)	13/COU/F (AG)
2/TAY/F (YA)	6/TAY/M (YA)
3/TAY/M (AG)	2/TAY/F (YA)
4/TAY/F (M)	10/TAY/F (YA)
5/TAY/F (YA)	7/TAY/F (YA)
6/TAY/M (YA)	9/TAY/F (YA)
7/TAY/F (YA)	10/TAY/F (YA)
8/TAY/F (YA)	9/TAY/F (YA)
9/TAY/F (YA)	6/TAY/M (YA)
10/TAY/F (YA)	7/TAY/F (YA)

*All measurements taken from center to center of burial pits. Parenthetical entries: CH: child, M: mature, YA: young adult, AG: aged

Again, we are required to use the Fisher Exact Porbability Test due to the same limitations just mentioned. Accordingly, our p value is calculated as

$$p = \frac{17!9!20!6!}{13!7!4!2!26!}$$

$$p = .04 \ (x2 = .08)$$

We have hypothesized that sexual groupings are not random, and that clusterings will thus occur within _FF_ and _MM_ cells, $\alpha = .05$. The table indicates, however, that our clustering occurs within the FF and FM/MF pairs. Further, our p value for a two-tailed test is .08, which results in failure to reject H_0. Now we shall compute the segregation coefficient.

Due to the condition of the majority of burials in the combined samples being females paired with females, or male-female pairs, we would expect the Pielou-Peebles coefficient to be close to 0 (i.e., a combination of AA and AB/BA—represented by -1 and +1 values). The coefficient is calculated as

$$Sp = 1 - \frac{11}{3.90 + 6.20}$$

$$Sp = -.08$$

The Pielou-Peebles coefficient is indeed very close to zero, and the contingency table does not have a significantly skewed distribution. Thus, we cannot state that the dichotomous mortuary treatment of males and females discussed above included as well the variable of the location of the burial itself. It is worth noting, however, taht the $p = .08$ is quite close to $\alpha(.05)$, and that the contingency table contains a nearly equal distribution of female-female (13) and male-female plus female-male (11) scores, while the cell for male-male is comparatively low (2). Our mortuary condition, then is one of females being interred either near other females or near males. Put another way, males are almost always interred near females, but comparatively rarely with other males. One cultural implication of these findings is that of a matrilocal post-marital residence pattern. If this were the case, it would provide a simple explanation for the female-female and opposite-sex mortuary patterning: local adult unmarried females are buried with their residence group (primarily other unmarried females), local married females are buried with their affines, local married males are buried elsewhere with their affines of another village, and local unmarried males are interred near one another.

In this regard, we might anticipate that our female-female nearest-neighbor subsample would consist primarily of children or young adults, but not of mature or aged individuals (who would in all likelihood be with their affines). To examine this possibility, we can stratify our female-female subsample according to the nominal categories of <u>Child or Young Adult</u> and <u>Mature or Aged</u> and cast them into a 2 x 2 contingency table shown.

Table 6

Female-Female Nearest Neighbor Subsample
Stratified According to Age*

		C/YA	M/AG	nearest neighbor
Base	C/YA	8	0	8
	M/AG	1	3	4
		9	3	12=N

*N=12 due to first entry in Table being inconclusive with regard to age. C/YA: Child/Yound Adult; M/AG: Mature/Aged.

Calculating as before,

$$p = \frac{(8!)(4!)(9!)(3!)}{(8!)(0!)(1!)(3!)(12!)}$$

$$p = .02 \ (x2 - .04)$$

The null hypothesis has here been rejected at the .05 level of significance (two-tailed test). Referring to our table, we note that the most pronounced skewing within our subsample is in the cell representing nearest neighbors who are both young females (F=8). Young-old pairings are nearly absent from the sample altogether (F=1 + 0=1), and pairings of old-old females fared somewhat better (F=3). The probability is .05 that the skewing is the result of either chance of sample variation, and lends additional support to our inference of matrilocal postmarital residence pattern.

Another inquiry among the same line would involve the subsample of opposite-sex nearest-neighbor pairings represented in Table 7 (n=11). In this regard, if we again stratify our subsample in the same manner with regard to age, we should anticipate that the majority of these pairings might consist of mature and/or aged individuals with other mature/aged individuals, or of young with young, but with comparatively fewer young-old and old-young pairings. The rationale involved is the assumption of homogamy with regard to age, as well as the speculation that opposite-sex pairings represent a husband and wife. The relevant data are presented in the contingency table as shown.

Table 7

Female-Male/Male-Female Nearest-Neighbor Subsample Stratified According to Age

		Nearest Neighbor		
		C/YA	M/AG	
Base	C/YA	3	0	3
	M/AG	2	6	8
		5	6	11 = N

Calculating with our formula,

$$p = \frac{(3!)(8!)(5!(6!)}{(3!)(0!)(2!)(6!)(11!)}$$

$$p = (.06)(x2 = .12)$$

The p value results in a failure to reject H_0, despite the apparent skewing within the table toward the chronological homogamy we have suggested. As a result, we can postulate that our mortuary sample contained a nearly equal number of female-female and opposite-sex pairings and, further, that within the former subsample, there exists a statistically significant clustering of younger individuals; within the latter subsample, however, the contingency table displays an apparent bias toward nearest-neighbor pairing of like ages, but the bias is not statistically significant. The sociocultural implications of these findings willbe more fully discussed in the conclusion of this chapter. The remaining investigations to be conducted relate to the geometric configuration of the Couper Field burials as a whole, the methodological problems involved in its investigation, and its possible socioclutural significance. These matters are presented more fully below.

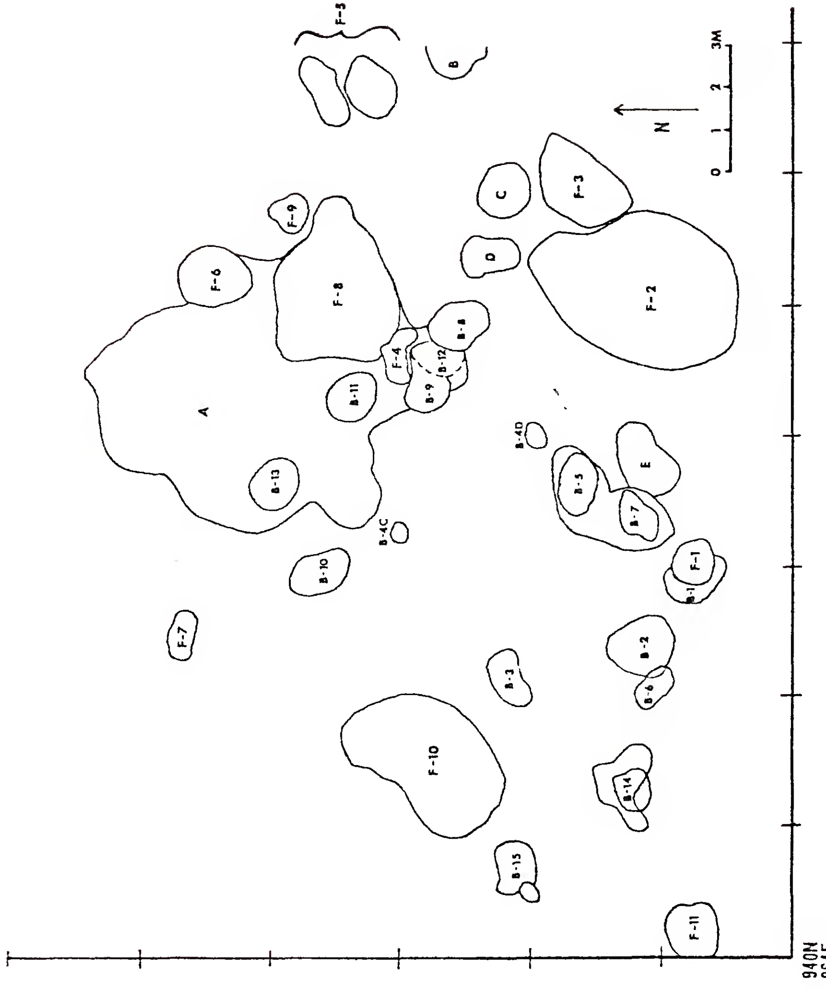
The Architecture of Couper Field

Unlike Taylor Mound, the Couper Field burials were not manifestly associated with a structure of any sort, and thus present far greater porblems with regard to cultural interpretations. In an undisturbed site, if the absence of structural features were noted, then burial alone would have been the obvious primary function and the area could be designated as a "cemetery." In the present case, however, when one is dealing with a plow zone of some 25 cm in mean depth and as much as 200 years of cultivation resulting in severe erosion, both of which could well have obliterated most if not all traces of an associated structure, such functional interpretations as the above are more tenuous, and less justified.

The difficulty involved in dismissing the site as a "cemetery" is particularly evident when we consider the

Figure 33. Couper Field Composite Map Showing Burials and Features

B1-B15.	Burials 1 through 15	F-6.	Concentrated shell
F-1.	Shell concentration over Burial 1	F-7.	Shell concentration over dog burial
F-2.	Charcoal concentration	F-8.	Shell concentration
F-3.	Dark soil	F-9.	Dark soil
F-4.	Shell concentration	F-10.	Exhumed burial
F-5.	Dark soil and shell	F-11.	Dark soil
A.	Large concentration of shell and animal bones	B-E.	Dark soil


F-5
B
3M
2
1
0
N
F-9
C
F-3
F-6
F-8
D
F-2
B-8
F-4
B-12
B-11
B-9
A
B-4D
B-13
E
B-5
B-7
B-4C
B-10
F-1
B-1
F-7
B-2
B-3
B-6
F-10
B-14
B-15
F-11
940N
964E

placement of the burials themselves. As is evident from the composite map of the area (Figure 33) the burials do not appear to have a random distribution, but seem to outline a plane geometric figure surrounding an area in which burials were not found, thus suggesting the perimeter of an aboriginal structure.

It might additionally be hypothesized, however, that the Couper Field burials are associated with a mound, but there are even more problems presented by this interpretation. Basically these are: (1) the concentration of shellfish does not form any sort of focal point for the burials, nor does it exhibit either the regular shape or the structural elaboration that was evident at Taylor Mound, and (2) there is nothing in the stratigraphy indicating the removal of soil and subsequent deposition around and above the shellfish-food bone concentration (e.g., there was no "fill," no "wash," no "second humus"). Thus, there would seem to be a greater number of problems associated with assuming that the Couper Field burials are either a cemetery or a mound, than there is in hypothesizing that we are dealing with burials placed in association with some sort of Guale ceremonial structure.

As to the nature of that structure, both physically and functionally, we are provided with a number of archeological and ethnohistorical suggestions. Most noteworthy among the former is the mortuary of the Irene Mound site discussed in Chapter I. Caldwell *et al.* have described the Irene mortuary as having been "subterranean and of wattle-and-daub construction. The ground plan was square with rounded corners. There was a projecting entrance passage" (Caldwell and McCann 1941:25). A similar ground plan is described by Oviedo y Valdez for the ossuaries of "Gualdape," by which he may possibly have meant "Guale," but his description of the building materials does not fit well with the present site's archeological findings. Oviedo observed that there were "houses or temples" in which the dead were buried, but described them as having "walls of stone about eight or nine feet high set in mortar made of oyster shells, the rest being constructed of pine wood" (Swanton on Oviedo 1946:405-406). Swanton's point here seems well taken: that Oviedo is apparently referring to lime cement (or "tabby") construction materials and that at least some aspects of his housing descriptions may have been colored by his impressions of Timucuan constructions (*Ibid*:406). More relevant for the present side, we believe, is the description provided by Pedro Arias de Avila (also called "Pedrarias Davila"), a Franciscan missionary who was the sole survivor of the 1597 Guale uprising to be discussed in a subsequent chapter. According to his account, his Guale captors compelled him to

> serve in cleaning the house of the demon, for such we call it. They, however, call it a tomb. There they place food and drink for the dead which the dead are supposed to find at the morning meal. The Indians believe that the dead eat this food. However, they are already persuaded that the dead do not eat it, because the wizards eat it themselves, as they know by experience for we have made this known to them. (Davila in Larson 1953:16)

Larson has observed (we think, convincingly) that Avila's

> "house of the demon" with its attendant hungry "wizards" sounds suspiciously like a mortuary temple complete with priests. The wizards were apparently similar to those functionaires that the priest had railed against at the missions and caused father Avila to be preciptiated into his unhappy state of captivity. (Larson 1953:16)

There are a number of archeological reasons for suspecting that Couper Field is a ritually attended ossuary of the type described above. There are: (1) the "marking" of burials with a surface concentration of oyster shell, (2) the presence of empty burial pits below the plow zone (some still containing a few human skeletal fragments), (3) the large concentration of shellfish and food bone to the immediate northeast of the "line" of burials, and (4) the apparent arrangement of the burials, not in a random dispersal, but in a figure that approximates the "square with rounded corners" described by Caldwell and McCann for the mortuary site at Irene Mound. We will consider each of these lines of evidence in turen.

In at least four cases (Burials 1, 13, 15, and 16) there was a concentration of shellfish directly above the burial. (The continguity was, in fact, pronounced enough in the case of Burial 1, so that the skull was encountered while removing the final contents of the "oyster pit"). The directness of the association would seem to suggest that a dual function was being served: the provision of food for the deceased, and the marking of the burial site. That the latter function was a possibility is evidenced by a number of apparent burial pits that contained no burials: thus, in the case of Features 2, 3, 10, and 11, we are dealing with areas of dark soil intrusive into tan sterile sand, which appear to be burial pits, but are empty. The anomaly was particularly striking in the case of Feature 2 and Feature 10. In both these instances, we are dealing with concentrations of dark soil of such dimensions (3.5m E/W, 4.5m N/S, depth of .50m: Feature 2; 3.5 N/S, 3.0m E/W, depth of .37m: Feature 10) that each could well have accommodated two individuals. Feature 2 is the more doubtful case, in that it contained no skeletal material, and had a heavy concentration of charcoal throughout its matrix. In the case of Feature 10, however, the possibility of aboriginal exhumation is considerably more convincing. In this instance, the area of dark soil was encountered immediately beneath the plow zone and was surrounded by tan sterile sand. A fine-screening of the dark soil produced an ulna, a phalynx, and a fragment of a femur, all of which were human. Further, the area around Feature 10 consisted of discrete, undisturbed burials (e.g., Burials 3 and 15) and sterile sand, suggesting (through the absence of skeletal debris) that removal by plowing was not the case. Thus, the combination of shellfish concentrations in association with burials, and the apparent aboriginal exhumation of some individuals both point to the cultural possibility of temporary burial within a ceremonial structure. If this were indeed the case, then the large shellfish-food bone concentration to the northeast of the line of burials (a concentration which is some six meters E/W and 8.5 N/S) could well have represented the accumulated debris resulting from the periodic cleanings of the mortuary, the task to which Father Avila had been assigned.

Finally, we must consider the possibility that the burials themselves are not dispersed at random but outline a geometric figure. According to this reasoning, the plow zone ($\bar{x}$ depth: .25m) would have obliterated most if not all traces of post-holes outlining the structure, thus requiring us to use the deeper, undisturbed burials as evidence of that structure's periphery. Essentially, this would involve the following steps: (1) Conversion of burials to points, using the approximate center of the burial pit, (2) plotting these points on a standard composite map, (3) making a decision as to whether or not the apparent figure is straightline or curvilinear, and (4) selection of the appropriate method of regression and correlation analysis.

The first two steps were performed using the center point of each burial pit. This was the result of taking the intersection of the longest east-west and north-south measurements. Only burial pits actually containing individuals, and the two features discussed above (2 and 10) were included. The outermost burials (with the exception of the two near the 979E line, which are the center points of Feature 2) seemed to outline a rectilinear structure. (This was particularly evident in the line of burials running from 942N 973E to 948N 978E.) To investigate this possibility, we transposed these points onto a standard Cartesian-coordinate graph, fit regression lines to each hypothetical line of burials, calculated the coefficient of correlation in each case, and evaluated the probability that the apparent correlation was due to chance or sample variation alone. To illustrate this procedure, we will begin with the succession of points running from 942N 973E to 948N to 978E.

If we utilize 940N 970E as a convenient point for the intersection of axes, the result is as illustrated in Figure 34. We may now place our observed values of X (distances east of 940N 970N) and Y (distances north of 940N 970E) in the table below.

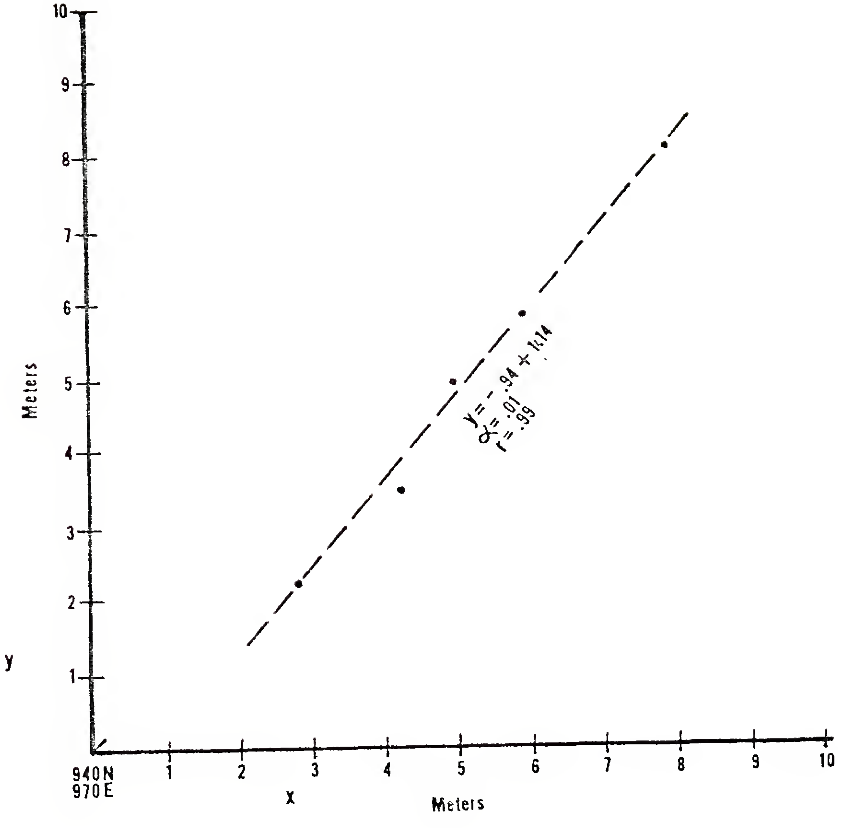


Figure 34. Values for Couper Field Linear Regression Easternmost Wall, Accompanied by Least-Square Line of Best Fit

Table 8

Data for Least-Squares Calculation of Couper Field Burials: Easternmost "Wall"

X	Y	X^2	XY	Y^2
2.80	2.30	7.84	6.44	5.29
4.20	3.45	17.64	14.49	11.90
4.90	4.90	24.01	24.01	24.01
5.90	5.80	34.81	34.22	33.64
7.50	7.65	56.25	57.38	58.52
7.90	8.05	62.41	63.60	63.80
$33.20 = \Sigma X$	$32.15 = \Sigma Y$	$202.96 = \Sigma(X^2)$	$200.14 = \Sigma(XY)$	
	$\overline{X} = 5.53$		$\overline{Y} = 5.36$	

We may now incorporate these values in our formulas for calculating the slope (b) and the origin (a) of the "line of best fit," where

$$b = \frac{\Sigma(XY) - n\,\overline{X}\,\overline{Y}}{\Sigma(X^2) - n(\overline{X})^2}$$

and

$$a = \overline{y} - b\overline{x}.$$

(Ezekiel 1930:57-58)

Substituting the necessary values, our $b = 1.14$, our $a = -.94$, and the equation for the "line of best fit" is:

$$Y = a + bX$$

or

$$Y = -.94 + 1.14X$$

which has been used to plot the line in Figure 34

To what extent does this line "fit" the points of the burials? Or, put another way, if we know a particular distance along the X-axis, and we know the origin and slope of the regression line, what is the probability of predicting the corresponding value of Y? The measure of this is provided by Pearson's r or Coefficient of Product-Moment Correlation, a test for measuring correlation between two interval scales. The formula for r is as follows:

$$r = \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{N}}{\sqrt{\Sigma X^2 - \frac{(\Sigma X)^2}{N} \quad \Sigma Y^2 - \frac{(\Sigma Y)^2}{N}}}$$

Substituting the necessary values,

$$r = \frac{200.14 - \frac{(33.20)(32.15)}{6}}{\sqrt{[202.96 - \frac{(33.20)^2}{6}][198.16 - \frac{(32.15)^2}{6}]}}$$

and

$$r = .99.$$

To test the hypothesis that the above degree of correlation is not due to chance or sample variation alone, we will establish a significance level of .01, and consult a table of values for r for testing H_0. Since our line of regression enables us to predict increases along the Y axis correlated with increases along the X axis, our research hypothesis is directional, and thus involves a one-tailed test, which has four degrees of freedom (where d.f. = n-2). For the above r value then, our table value is .882. Since the table value is less than the r value, we may conclude that our easternmost points are indeed in a line, and the probability that the apparent line is due to chance or sample variation alone is one out of 100.

This same method may be used for the other apparent linear orientations of the outermost burials. Relevant data are indicated in the following tables, and the results are indicated in Figure 35.

Table 9

Least-Squares Data for Northernmost Wall

X	Y	X^2	XY	Y^2
1.45	2.00	2.10	2.90	4.00
.35	4.15	.12	1.45	17.22
2.40	5.00	5.76	12.00	25.00
2.80	3.00	7.84	8.40	9.00
3.80	1.50	14.44	5.70	2.25
4.55	.55	20.70	2.50	.30
4.85	.95	23.52	4.60	.90
$\Sigma X = 20.20$	$\Sigma Y = 17.15$	$\Sigma X^2 = 74.48$	$\Sigma XY = 37.55$	$\Sigma Y^2 = 58.67$

$r = .72$ $Y = 4.52 - .72x$ $\alpha = .05$

Table 10

Least-Squares Data for Western Wall

X	Y	X^2	XY	Y^2
1.10	.50	1.21	.55	.25
3.60	2.00	12.96	7.20	4.00
4.25	3.50	18.06	14.87	12.25
8.50	5.20	72.25	44.20	27.04
$\Sigma X = 17.45$	$\Sigma Y = 11.20$	$\Sigma X^2 = 104.48$	$\Sigma XY = 66.82$	$\Sigma Y^2 = 43.54$

$r = .96$ $Y = .06 + 63x$ $\alpha = .05$

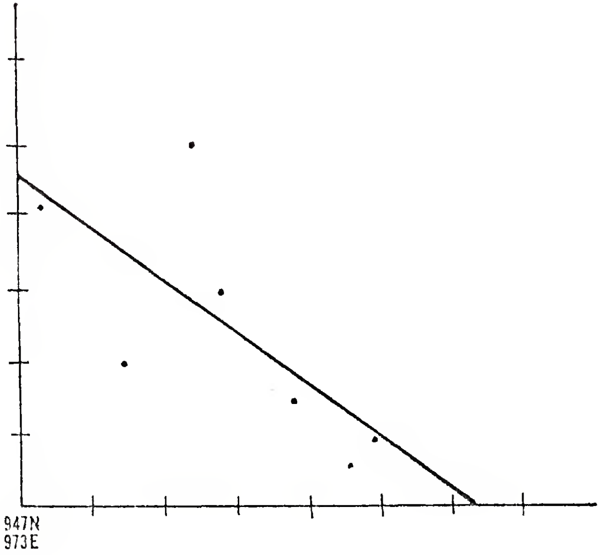


Figure 35. Couper Field Linear Regression, Northern Wall; r = -.72

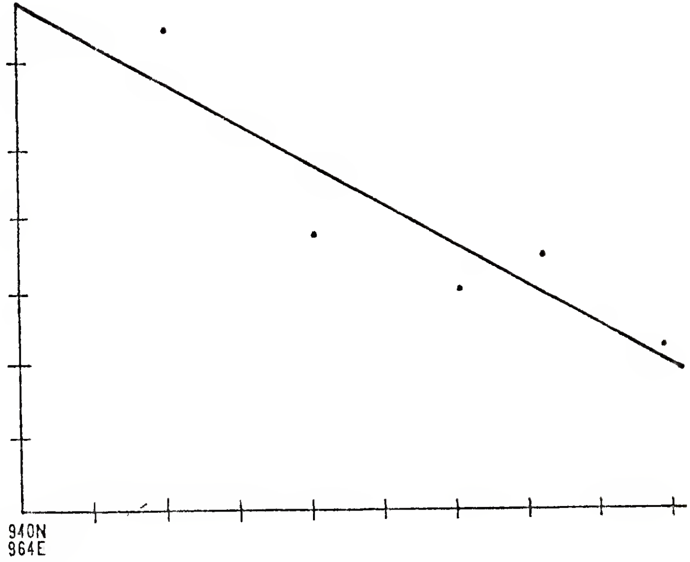


Figure 36. Couper Field Linear Regression, Southern Wall; r = -.89

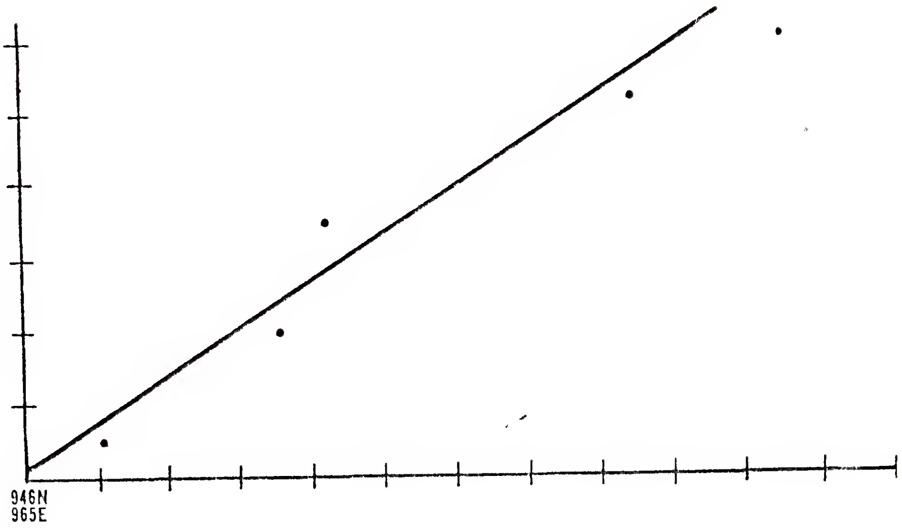


Figure 37. Couper Field Linear Regression, Western Wall; r = .96

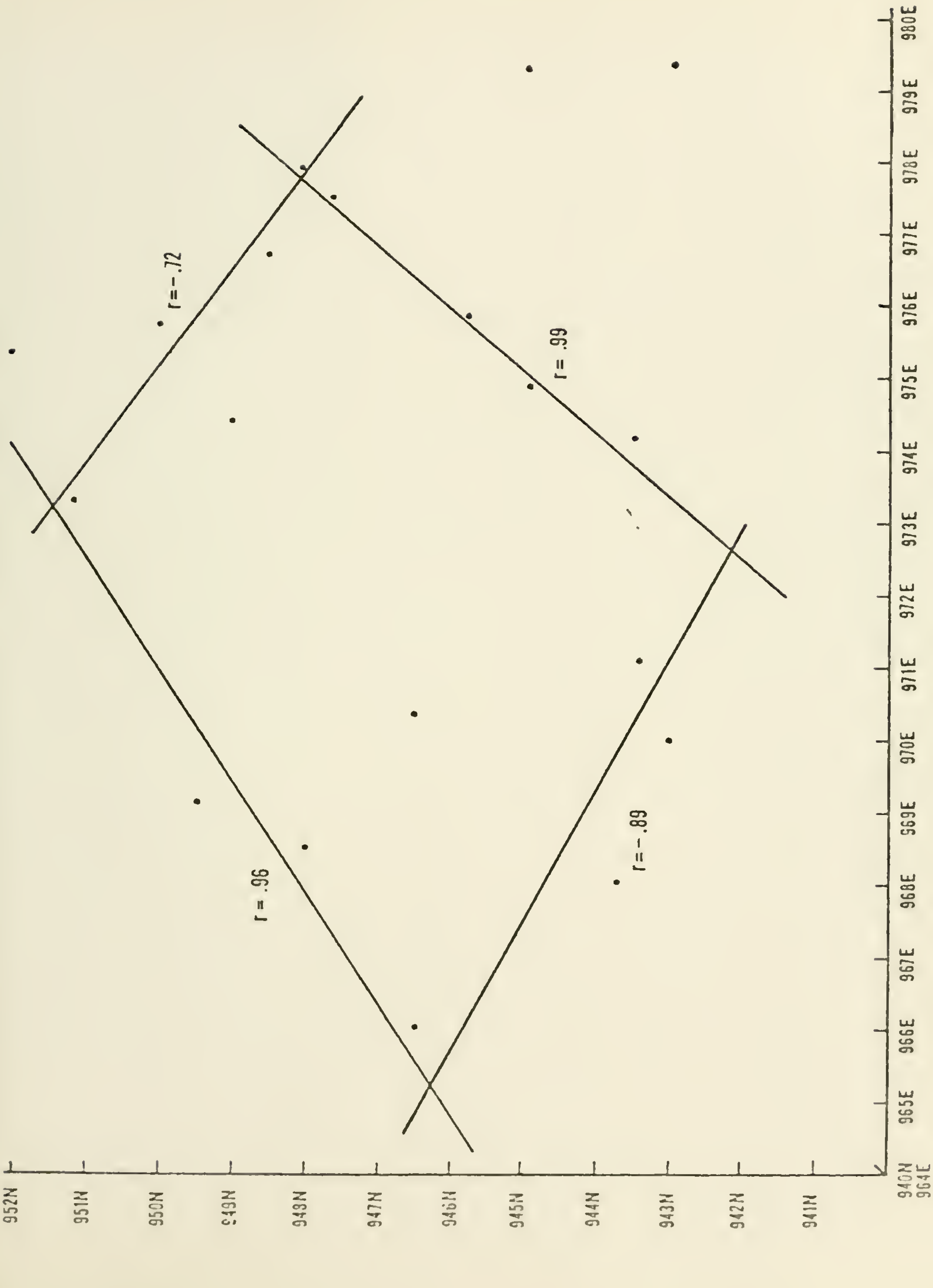
Table 11

Least-Squares Data for Southern Wall

X	Y	X^2	XY	Y^2
2.00	6.70	4.00	13.40	44.89
4.00	3.80	16.00	15.20	14.44
6.00	3.10	36.00	18.60	9.61
7.20	3.55	51.94	25.56	12.60
8.80	2.30	77.44	20.24	5.29
$\Sigma X = 28.00$	$\Sigma Y = 19.45$	$\Sigma X^2 = 185.28$	$\Sigma XY = 93.00$	$\Sigma Y^2 = 86.83$
$b = -.56$	$r = -.89$	$Y = 7.03 - .56x$		$\alpha = .05$

As a final note on the above methodology, and the statistically reconstructed perimeter, we should point out that even in those instances in which the product moment coefficient of correlation is high, there is no aboslute guarantee that one is dealing with a linear relationship. Significant coefficients of correlation can be calculated as above for curvilinear relationships (particularly for the extremes of hyperbolas and parabolas) and, given the disturbed condition of the site, we have no absolute guarantee that we are not dealing with, for example, a segment of a circle or an ellipse. Additionally, we should take note of the two points well to the east of the reconstructed figure. These represent the

Figure 38. Results of Couper Field Linear Regressions


r = -.72
r = .99
r = .96
r = -.89
952N
951N
950N
949N
948N
947N
946N
945N
944N
943N
942N
941N
940N
964E
965E
966E
967E
968E
969E
970E
971E
972E
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974E
975E
976E
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980E

center points of Feature 2, a "possible double burial." In view of the extensive charcoal concentration and total absence of skeletal material in the feature, however, it seems legitimate to view it as having been a hearth or smudge-pit located just beyond the aboriginal structure.

In sum then, our conclusion that the Couper Field burial complex represents a mortuary structure is based upon the following lines of evidence: (1) ethnohistorical discussions (for the same region) of mortuary structures, (2) absence of burial mound stratigraphy, (3) surface concentrations of shellfish above the burials, functioning as possible "markers," (4) archeological evidence of aboriginal burial and later exhumation (a custom more akin to the ossuary that the burial mound), and (5) the possible rectilinear orientation of the peripheral burials, as reconstructed through statistical techniques of least-squares linear regression and Pearson Product-Moment Correlation.

Having said this, we come to the final matter of sociocultural significance. Perhaps the most obvious conclusion to be drawn is that of different mortuary locations for different groups. Thus, certain individuals are interred, for the first time, in a ceremonial mound and never subsequently removed; other individuals are interred in what was probably a mortuary structure and <u>are</u> subsequently removed, while still others (as we shall see below) are interred in immediate association with the southern wall of a dwelling, and in a manner varying pronouncedly from one individual to another. The apparent cultural inference is one of groups of individuals being ranked against one another: we might suggest that a high ranking group would receive ceremonial-mound interment, while, more commonly, individuals would be temporarily placed in a mortuary structure, and subsequently removed for burial in association with a dwelling. Whether this last pattern of behavior represented a symbolic re-integration of the individual with the world of the living, will, of course, always remain conjectural, but it does provide a magico-religious rationale for the apparent mortuary behavior of the region.

Couper Field: General Sociocultural Conclusions

The comparison and contrast of Couper Field and Taylor Mound has resulted in the following set of sociocultural conclusions:

(1) Couper Field and Taylor Mound are samples taken from the same sociocultural population. The use of 11 arbitrary distinctive features for describing the two sites, and comparison of these descriptions has indicated that sites appear to possess the same type of homogeneity.

(2) <u>There were no significant rank distinctions existing among either males or females</u>. This conclusion derives from the examination (through the use of Fisher's Exact Probability Test) of male and female burials with regard to presence or absence of exotic grave goods. No statistically significant clustering of exotic goods with regard to sex was evident.

(3) <u>The coastal population was characterized by a matrilocal postmarital residence pattern</u>. In this instance, our inference derives from one significant statistical test and an apparent skewing present in the other. Pielou-Peebles "nearest-neighbor analysis" indicated an apparent tendency for female-female and opposite sex burials, but the tendency was insignificant by a margin of .03. Subsequent stratification of the female-female nearest neighbors, however, indicated a tendency for the individuals to be young, that young-old combinations were rare, and that these tendencies <u>were</u> statistically significant (α = .05). A possible explanation is a matrilocal postmarital residence pattern resulting in younger (unwed) females being buried with one another, older (married) females being buried with their mates, and very few males being buried with one another since local males would be "exported" early (and buried elsewhere) and incoming males would be buried with their wives. We realize fully that this inference involves one test which is suggestive—and

not significant—and we will thus subsequently reexamine the inference with regard to additional lines of evidence provided by subsistence analyses, an earlier excavation, and relevant ethnohistorical materials.

(4) The aboriginal groups were ranked with regard to one another. Our conclusion here rests upon the assumption (as do all of our earlier conclusions) that differential mortuary treatment is diagnostic of differential group prestige. In this instance, the fact that one group received primary burial in a ceremonial mound, a second group was buried in what was probably a mortuary structure (from which they were occasionally removed), and a third group of burials were distributed along the southern wall of a longhouse is diagnostic, we believe, of a ranking of these aboriginal groups during life. The most economic social explanation of the mortuary pattern, based on the sites excavated, would be to posit two ranked groups: one receving primary burial in the mound, without subsequent removal, the other receiving temporary interment in a mortuary structure followed by reburial at another site (quite possibly the pavilion site to be discussed). This archeological inference will be subsequently reexamined in the light of relevant ethnohistorical information.

Our information so far has indicated a coastal population made up of ranked social groups practicing a matrilocal postmarital residence pattern. Our final site to be considered provides more information with regard to aboriginal daily life and coastal technological adaptation. It is with Indian Field, then, that we will conclude the archeological portion of our investigation.

CHAPTER V

INDIAN FIELD

"Indian Field" is the name assigned locally to an abandoned field immediately south of Couper Field, discussed in the previous chapter, and is a portion of the same village area. Like Couper Field, it presented a suggestive but inconclusive topography, so a systematic or chain-sampling method was elected in order to discover the archeologically significant sectors of the area.

Indian Field was excavated prior to Couper Field, and represents our earlier sampling interval, which was modified for the latter site. At Indian Field, a three-meter square was excavated every 30 meters (twice the interval used at Couper Field) for a distance of 120m north-south and 60m east-west. The plow zone was removed in each of these units and all features intrusive into the tan sterile sand immediately below the plow zone were mapped. Ultimately, a composite map was prepared, and a sector of the field exhibiting postholes and food pits was selected for intensive excavation by the standard-block system utilizing three-meter squares. It was this sector in which the pavilion-burial complex to be described in this chapter was located.

All other aspects of methodology were the same as for Couper Field. The primary difficulty faced at Indian Field, however, which makes it somewhat less valuable for sociocultural investigations of the type presented earlier was the small sample size of the burials and the extremely disturbed condition of almost every burial due to plowing. As a consequence of this, the majority of our archeologically based cultural conclusions must derive from Taylor Mound and Couper Field, and cultural conclusions derived from the present site (with the exception of pavilion structural features and the southern location of the burials) must be seen as highly tentative in nature. We will begin, then, with a general description of the six burials located on the immediate south of what apparently was a Guale pavilion structure.

The Burials at Indian Field

A total of six burials was recovered from Indian Field. While the extremely disturbed condition of the burials prevents a detailed intrasite comparison, we shall see below that enough important differences _have_ been preserved to indicate a striking hetereogeneity of burial practices at Indian Field. The burials are described below.

Burial One and Two. This burial was originally designated as two separate burials until subsequent excavation made clear that the few isolated fragments classified as "Burial One" had, in fact, been removed by plowing from Burial Two. A distinctive plow scar was found intrusive into sterile soil, and directly cutting across Burial Two; the isolated fragments were found directly north of Burial Two, and in the matrix of the plow scar. What follows then is essentially a description of Burial Two.

The burial was a small pit (1.00m N-S, .70m E-W) contianing the heavily disturbed skeletal fragments of at least 13 individuals, with sex indeterminable, but 11 of them classifiable as "mature," one as "young adult," and the thirteenth as a "possible fetus." The bones were jumbled together with no apparent order or deliberate placement evident. It was a first suspected that the burial was a cremation, in that a concentration of burned bone (human) and congealed charcoal was present within the pit along the southern edge of the burial. Removal of all skeletal material from the pit, however, revealed a matrix of tan sterile sand beneath the remainder of the burial, thus increasing the likelihood that the "cremation" was actually an intrusive, postmortem burning resulting, quite possibly, from a clearing of the antebellum fields. Similarly, it seems wisest to view the breakage of the bones as entirely due to post-mortem disturbance by plowing, and not to any aboriginal custom.

The only grave good remaining was a lightning whelk shell close to the top of the burial. This is the type of shell that normally functioned as a drinking cup in the cassina rituals of the Muskoghean tribes. It is entirely possible, as with the other burials to be discussed in this section, that additional grave goods were present, but were removed by the plowing.

Burial Three. This burial involved one young adult, of indeterminate sex. Almost all bones were absent except for a tibia and a fragment of the occipital. The former had deeply notched cuts, and constitute possible evidence of defleshing. There were not associated grave goods, but the fragments were encountered in close association with an area of compacted oyster shell, similar in nature to those earlier discussed for burials at Couper Field. It should be noted, however, that the skeletal material was not underneath the concentration.

Burial Four. This burial consisted of two individuals. Apparently, the burial consisted of one individual burial fully extended and one bundle burial. Evidence for the former is the presence of a pelvic girdle articulated with a femur in extended position, while the bundle burial consists of longbones grouped in association with skull fragments to the north and south of the articulated pelvis. The only associated grave good was a shark's tooth found near the articulated pelvis.

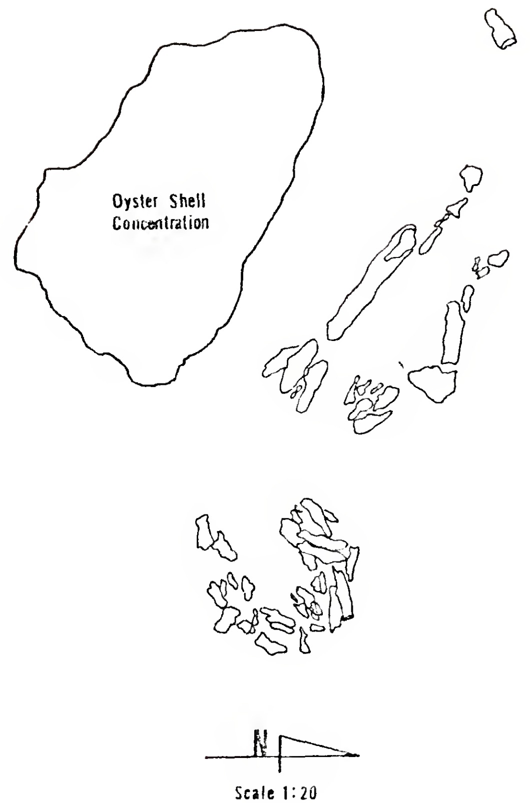


Figure 39. Indian Field Burial 3

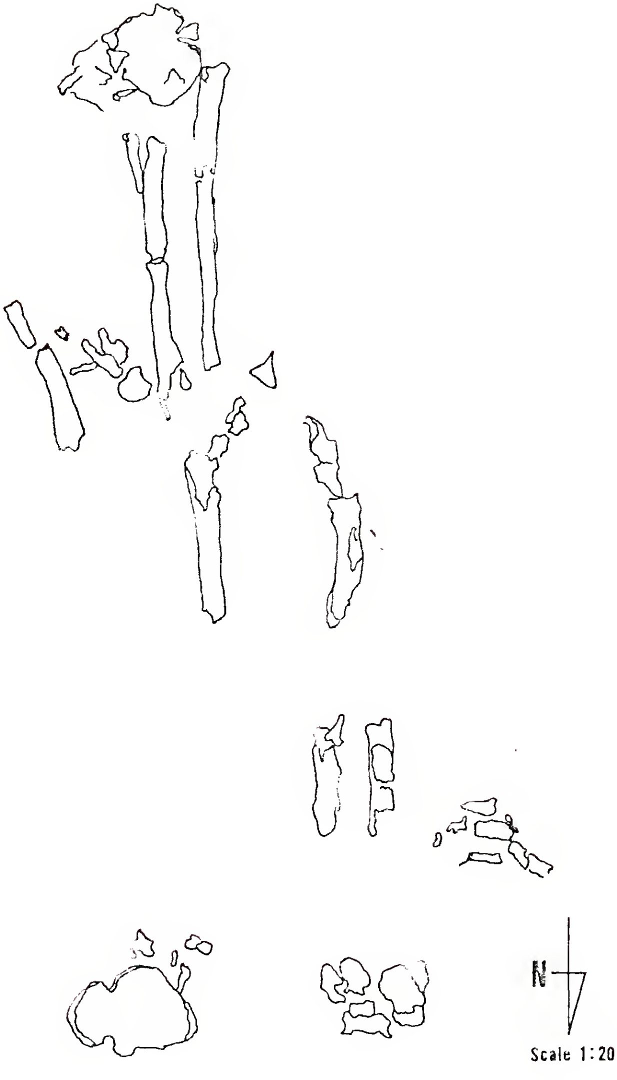


Figure 40. Indian Field Burial 4

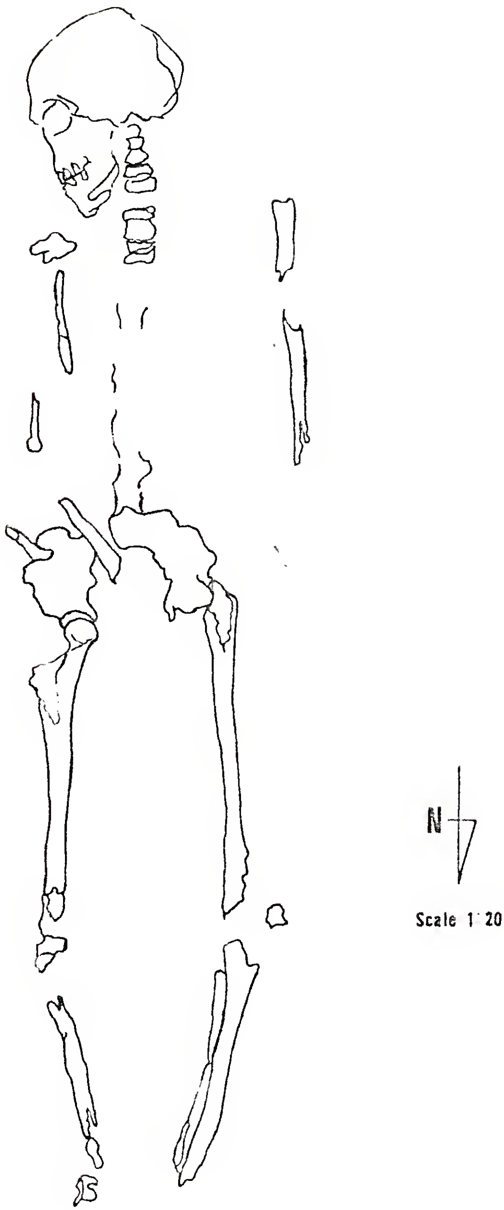


Figure 41. Indian Field Burial 5

Burial Five. The burial was fully extended and consisted of one individual, a mature female. All bones were in poor condition, and the feet, hands, left fore-are, a portion of the pelvis, and the vertebral column were all absent. No grave goods were recovered from the burial.

Burial Six. This was an apparent bundle burial composed of the longbones of at least four individuals (exhibiting deeply notched cuts) which were grouped in association with a central skull. In direct association with the latter was a red ochre concentration and a green-stone celt with a pecked, roughened surface.

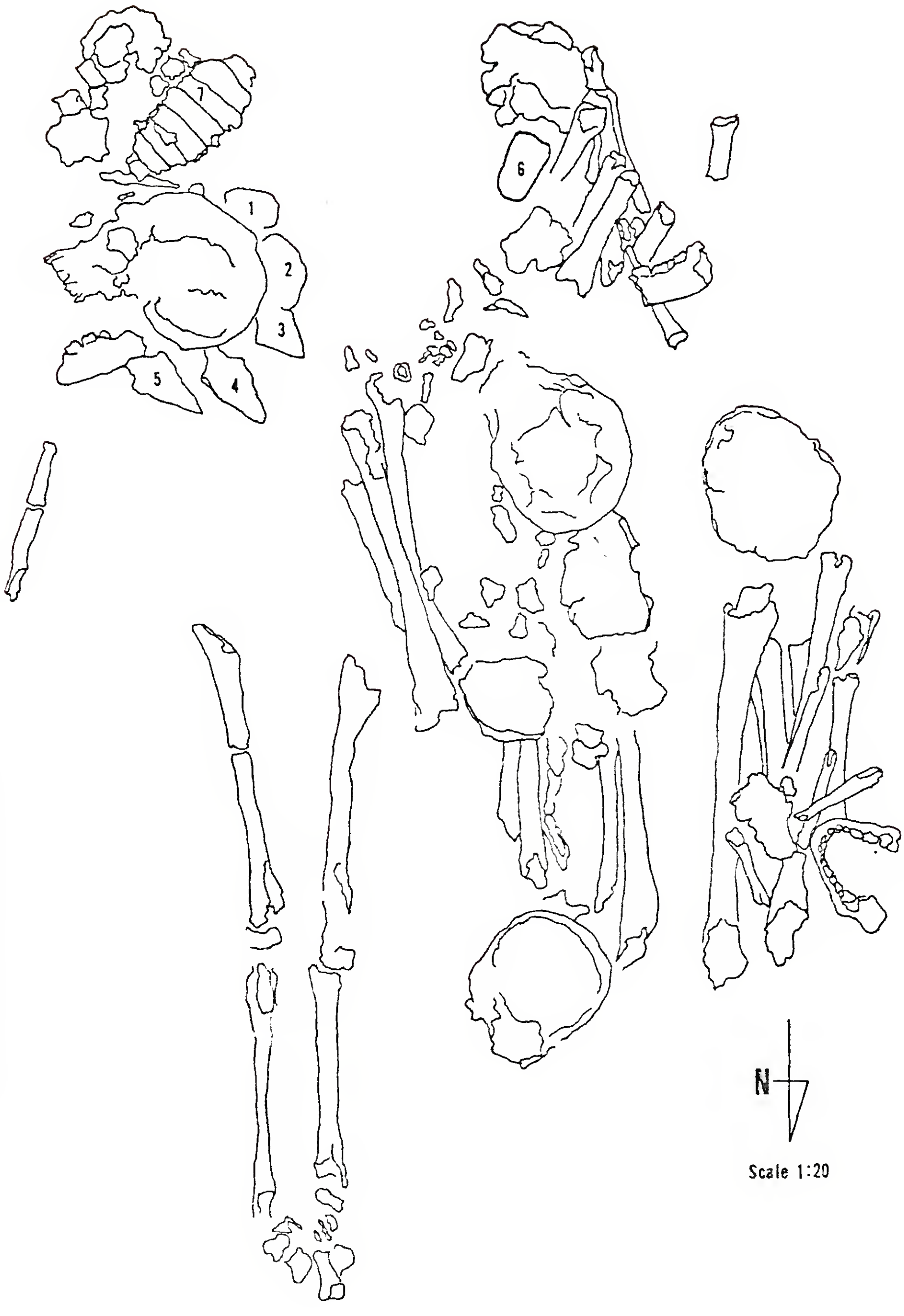
Burial Seven. This burial consisted solely of an isolated skull of a mature male. A turtle shell and an apparently unworked fragment of flint were in direct association, as were three projectile points and two polished stones arranged around the skull in a "headdress" fashion.

While our sample is too small to make possible the types of analyses done earlier, we may nevertheless make a number of observations that seem to be supported by the data.

(1) Indian Field burials were of both sexes and almost all major age divisions (there was no "aged" individual. We are not apparently, dealing with a burial site for any age or sexual grouping.

Figure 42. Indian Field Burials 6 and 7

1,2	Stones associated with Burial 7 skull
3,4,5	Projectile points
6	Pecked greenstone celt
7	Turtle plastron


1
2
3
4
5
6
7
N
Scale 1:20

(2) A wider diversity of burial practices was evident at Indian Field than at either of the two sites earier discussed. Allowing for the disturbed condition of the burials, it is nonetheless evident that burial practices noted earlier (e.g., flexing, placement of possible food offerings of oyster shell) were not evident at Indian Field and, conversely, a number of Indian Field practices (e.g., separation of skull, fully extended burial, bundle burial) were not found at either Couper Field or Taylor Mound.

(3) The skeletal material exhibited cutting marks. Both Burial Three and Six possessed deeply notched cuts at right angles to the shafts of the longbones. This is generally diagnostic of a "defleshing" process associated with placement in a mortuary structure, and since only the longbones exhibited the marks, it seems more reasonable to conclude that they more likely are derived from the defleshing process than they are from the effects of the plow.

These general conclusion support the idea that the burials at Indian Field were the result of different aboriginal groups utilizing the pavilion when subsistence activities brought them to that particular area. It seems unlikely (particularly in view of the sites discussed above) that such mortuary diversity as was evident in Indian Field could have been practiced by a single group. This invites the inference of different groups utilizing the pavillion at different times.

Beyond this, the defleshing marks evident in two burials suggest that some (if not all) of the individuals were secondarily placed along the wall of the pavilion following their removal from a mortuary. Our overall conclusion stemming from this would be the existence of ranked groups among the Guale: one group receiving primary burial in a ceremonial mound, the others being placed in a mortuary structure on a temporary basis until they were subsequently removed for reburial in a living area, symbolic of reintegration into the fabric of aboriginal social organization. Of the possible nature of the "group" burial in the ceremonial mound and the "groups" interred within the mortuary (and subsequently at the pavilion), we will have more to say when the ethnohistorical material is reviewed below. Our final concern in this chapter, however, is a brief discussion of the architectural characteristics of the pavilion at Indian Field.

The Architecture of Indian Field

In one respect, Indian Field is the exact converse of Couper Field. At the latter site, the majority of the burials were deep and undisturbed, while consturction features were obliterated; at Indian Field, the comparatively shallow burials were all but obliterated, but the deeper construction features were preserved.

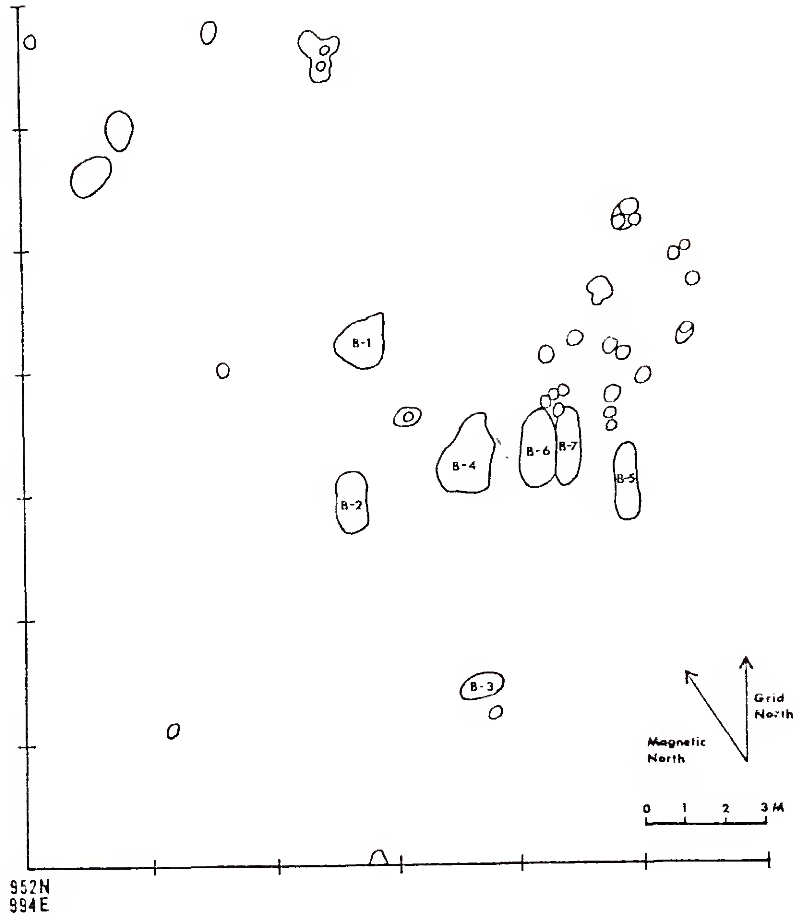


Figure 43. Indian Field Composite Map Showing
Pavilion Postholes and Burials 1-7

These "features" were postholes outlining a structure. The dimensions were 9m north-south and 15m east-west. Pits containing animal bone were encountered within the structure itself, blackened sherds (possibly diagnostic of cooking) were found within the pits, charcoal within the pits was heavily congealed (an effect that can result from dripping animal fat), and one flint scraper was encountered. The functional conclusion deriving from these findings is that the longhouse at Indian Field was a multipurpose structure: habitation, cooking, eating, butchering, and burial were all accomplished there by whatever group was inhabiting the structure. It does not, in fact, seem unrealistic to suggest that such pavilions are distributed throughout the coastal strand region— and that further extensive investigations will disclose them.

As to the possible appearance of the structure, our only recourse is to the ethnohistorical materials. In this instance, we are provided with a description of a Guale dwelling located on St. Simon's Island. The account is that of Andreas de San Miguel, a Franciscan priest involved in the mission effort in 1595:

> All of the walls of the houses are of rough timbers and covered with palmetto . . . all of the houses are small, because, as they have little to keep in them, they make them only for shelter, and for this reason the houses of the chiefs are also small . . . [We were lodged in] a big cabin, circular in shape, made of entire pines from which the

> limbs and bark had been removed, set up with their lower ends in the earth and the tops all brought together above like a pavilion or like the ribs of a parasol: three hundred men might be able to live in one: it had within around the entire circumference a continuous bed or bedstead, each well fitted for the repose and sleep of many men, and because there was no bed-clothing other than some straw, the door of the cabin was so small that it was necessary for us to bend in order to enter; an arrangement due to the cold although it was spring when we arrived: and so that one might not feel the cold at night and may sweat without clothing it is sufficient to cover the doorway at night with a door made of palmetto, and to light two sticks of firewood within: with this alone we perspired at night and when we were indoors did not feel the cold during the daytime. (San Miguel in Swanton 1946:405)

San Miguel's description is both informative and contradictory. Underlying the obvious problem of "all of the houses" being small, while the structure in which he lodged was sufficiently large so that "three hundred men might be able to live in one," is a possible misunderstanding of function. It is entirely possible that San Miguel and his friends were lodged in a rotunda or council-house structure similar to those described for the Creek:

> Sometimes situated on an elevation, it was circular in plan, with eight central posts and two concentric circles of posts supporting a roof daubed with clay and covered with pine bark. The walls likewise were plastered, and the only entrance lay variously to the east or south. The rotunda was used particularly for large meetings, and participants sat by rank and affiliation on seats covered with reeds or mats in the space between the two circles of posts. (Spencer, Jennings *et al.* 1965:422)

This function seems further cooroborated by Johnathan Dickinson's 1696 account of the building in which he was lodged at St. Mary's on the Georgia coast:

> We were conducted to the war-house, as the custom is, for every town hath a war-house. Or, as we understood, these houses were for their times of mirth and dancing, and to lodge and entertain strangers. This house is about 81 foot diameter built round with 32 squares, in each square a cabin about eight feet long and of a good height being painted and well-matted. The center of this building is the quadrangle of 20 foot being open at the top of the house, against which the house is built thus. In this quadrangle is the place they dance having a great fire in the middle. One of the squares of this building is the gateway or passage in. (Dickinson in Larson 1953:21-22)

These accounts would explain San Miguel's discussion of a parasol-like structure accommodating so many persons, as well as his account of the "beds" on the periphery of the structure. But the important point here is not the possible existence of council-houses or "rotundas" among the Guale, but rather the details that are provided by San Miguel regarding construction materials, techniques, and shapes of dwellings among the St. Simon's Island tribes.

San Miguel's description of construction techniques would fully explain the archeological features of the Indian Field structure. Postholes are in a circular arrangement, natural materials of pine and palmetto are abundant, and the sub-plow zone sand at any point within the structure contained fine amounts of charcoal for a depth of at least 25 cm., explicable as a possible result of the regular nightly heatings of the structure.

But beyond this, there are additional architecturally based inferences which may be formulated in the light of cross-cultural comparisons. In this regard, John Whiting and Barbara Ayres, utilizing a subsample of 136 of the 700 societies listed in the Ethnographic Atlas (Ethnology, Vols. 1-4), have explored a variety of statistical relationships existing among architectural variables themselves, as well as between these variables and general characteristics of environment and social organization (Whiting and Ayres in Chang 1968:117-133).

With regard to interrelationships among the architectural variables themselves, the possibility of "grass" roof is somewhat supported by the cross-cultural data (26 out of 40 curvilinear dwellings), as is the possibility that the structure contained only one room (23 out of 24 curvilinear dwellings). The existence of single-room dwellings, however, does not support an inference of small, "independent" families, or, for that matter, an absence of ranking distinctions: societies with one-room dwellings "may or may not be based upon extended families, and they may or may not recognize status distinctions" (Whiting and Ayres in Chang 1968:120-123). Concerning environmental associations, curvilinear dwellings appear more pronouncedly among either seminomadic or fully sedentary societies (22 out of 29 cases), and more often among polygynous than monogamous cultures (19 out of 25 cases) (Ibid:124, 131).

In all of the above instances we are utilizing both the archeological and the ethnohistorical data pertaining to St. Simon's Island, and are thus assuming that the oval dwelling we encountered was one of the small, palmetto-covered shelters which San Miguel claims to have been the characteristic house-type among the Guale. All the above inferences, then, rest upon the assumption of curvilinearity as a "primary" house type along the Georgia coastal strand, and could conceivably be altered by the discovery of rectilinear-dwelling settlement patterns, or subsequent ethnohistorical information. At this point, however, the inferences of seminomadism or full sedentism, as well as that of possible polygyny are in agreement with both the ethnohistorical information and the subsistence analyses to be discussed in subsequent chapters.

Indian Field: General Sociocultural Conclusions

Taken together, the archeological and architectural findings at Indian Field provide evidence of a curvilinear dwelling-place serving the additional function of a burial site. The burials themselves are indicative of a practice of temporary interment in a mortuary followed by subsequent reburial at a site of the living.

In contrast to Taylor Mound, this provides evidence of different groups receiving different mortuary treatment. Finally, the associations between dwelling-shape and aspects of social organization noted by Whiting and Ayres suggest the additional possibility of polygynous marriage. These inferences of ranked groups and polygynous marriage structure, however, all require substantiating information from the ethnohistorical materials, a problem to which we will next direct our attention.

CHAPTER VI

ETHNOHISTORY OF THE GUALE

Ethnohistorical Accounts and Their Associated Problems

From the time of the 1526 visit to the Savannah River area of Lucas Vasquez de Ayllon, a Spanish auditor from Santo Domingo, until the final collapse of Guale culture during the late 17th century conflicts between the Spanish and English, the coastal peoples were exposed to almost continual contact with European cultures. Much of the documentary material that resulted from this situation is, from the standpoint of the ethnographer, highly fragmentary and unsystematic. Ayllon was concerned with the problems of establishing a colony; the French Huguenots of René Laudonnière's 1562 expedition were preoccupied with finding enough to eat; the Jesuit Father Juan Rogel faced problems of converting a semi-sedentary population; while the later Franciscans (as well as their political allies, such as Governor Canzo and Governor Ibarra) were primarily involved with problems of rebellion and the consequent necessity of understanding at least something of aboriginal political organiztion. As a consequence of these limited foci, we must attempt to integrate the diverse bits of information that are gleaned from multiple sources through the use of contemporary cross-cultural data and the information derived from regional archeological investigations. Consequently, it is necessary to note the different ethnohistorical sources upon which we are relying—as well as the special problems associated with each. By doing this, it will at least become clearer that extensive acculturation is by no means a guarantee of extensive sociocultural information, just as comparatively short-term contact does not necessarily result in documentary information that is more superficial, or of less ethnohistorical significance.

Probably the best example of problematic documentary data is the account of Ayllon's 1526 visit to what was possibly a Guale-inhabited region. Location itself is a major difficulty with the Ayllon material, since his colony could well have been located on a borderline area between different aboriginal societies. Ayllon is only fairly precise on the location; he landed some 40 to 45 leagues south of the "River Jordan" (The Pee Dee River?) which, in turn, was located at 33° 40' north latitude. If a league was approximately 2.5 miles, then Ayllon's expedition would have landed somewhere near the Savannah River. This location, if correct, presents the same problems of interpretation as does the Irene Mound site. Basically it is a problem of labels: the Spanish documents apply "Guale" to the coastal region between St. Andrew's Sound and the Savannah River. The southern boundary, however, is not simply a political one separating one Spanish province from another, but is a cultural and linguistic separation as well, which divides the Georgia coastal tribes from the Eastern Timucua of present-day northeastern Florida. That the southern boundary was more than arbitrary is attested to by the difference in environmental conditions as well as by a difference in language. The major Eastern Timucua adaptation was to an inland, riverine environment (although Cumberland Island, Georgia, was inhabited by Timucuan speakers). Differences in language are suggested by the fact that Governor Ibarra, journeying from Timucua country to "Guale," had to change interpreters at the provincial border, but not when travelling from "Guale" to "Cusabo" territory in the Orista province immediately north of the Savannah River. (Swanton 1922:14-17, 59-60). This invites the question, then, as to whether or not the northern boundary of "Guale" (beyond which is "Orista") is a cultural as well as Spanish-provincial demarcation. If it is, then we face the possibility of Aylon's description's being applicable to an ethnographically distinct "Orista" (a possibility that is even more acute in view of Aylon's own uncertainty as to how far south of "River Jordan" he actually was). The matter will only be solved by subsequent archeological excavations of protohistoric South Carolina coastal sites, but in view of the linguistic and environmental similarities, we will tentatively consider Aylion to have been describing the people we have referred to as "Guale." Whether or not it will eventually become justifiable to combine Guale and Cusabo into a "Coastal Strand Tribe" must depend, of course, upon the results of future ethnohistoric and archeological investigations.

Another difficulty of equal significance is the "degrees of removal" of the documentary material itself. Lucas Vasquez de Ayllon and his followers were far more concerned with survival than with documentation. The Santo Domingo auditor had set sail with 600 men and women, and, upon disembarking, had begun erecting houses and a chapel. The combination of low food supplies, winter cold and widespread sickness, however, led to an abondonment of the colony less than a year after its beginning. One hundred and fifty survivors returned to Santo Domingo—survivors who later relayed their account of the matter to Peter Martyr D'Anghera, who, himself had never visited the region. D'Anghera's recording of the colonists' description was in turn subjected to an abridgement, and, _tradutti traditore_, to a subsequent distortion into the French of Gomara (Swanton 1922:41). If we consider the Spanish cognitive orientation of the original colonists to be a "removal" all its own, then Gomara's mistranslations constitute our third remove from the "on-the-ground" social organization of the Guale. An example of the problem is provided when we consider the possibility of captive animal species among the Georgia coastal tribes. The members of the Ayllon expedition apparently informed Peter Martyr that they had encountered among the Guale "herds of deer similar to our herds of cattle," that the deer were allowed to range freely during the day, that they returned to captivity at night, and, finally, that the deer furnished the Indians with milk, from which cheese was eventually made (Martyr in Swanton 1922:42). Furnishing the basis for such reports, as Swanton has indicated, could have been isolated cases of animal domestication (for totemic purposes?) which were subsequently interpreted through the cultural grid associated with the sheep-and-cattle technology of Spain. At any rate, the quadrapeds were somehow lost between Peter Martyr and Gomara, and the resulting description in the latter mistranslation gives what may well be the only account of a bipedal herding technology: "Ils Font du Fromage du laict de leur Femmes" —"They make cheese from the milk of their women" (Swanton 1922:41).

In considering Martyr's account then, we will deal with the English translations of the original which are provided by John Swanton. Further, we will also bear in mind the special problem that Peter Martyr never visited the site of the expedition—a site which, in itself, is still geographically uncertain. Nevertheless, when all of these difficulties are borne in mind, we are left with documentary material regarding social organization that fits well with additional ethnohistorical accounts, as well as with our archeological, zooarcheological, and biochemical information.

The second important instance of Western European culture contact in the coastal strand region was the 1562 exploration of Jean Ribault, an account of which was prepared by Rene Laudonnière, who accompanied Ribault on the expedition. This account is particularly interesting (and ambiguous) with regard to its discussion of Guale subsistence, particularly the possibility of agriculture. The interest of Laudonnière in the coastal strand region was essentially a military one: his followers were soldiers, sailors, and artisans, all of whom could be instrumental in establishing a French stronghold to the north of the Spanish, a stronghold which could prevent the latter's New World territorial expansion, as well as provide a base for preying upon the yearly treasure fleets that sailed northward along the coast out of Havana. The French thus established a fort (Charlesfort) 25 leagues north of St. Catherine's Island, and, like Vasquez de Ayllon, began to run low on supplies. The result was a visit to St. Catherine's Island and a meeting with the Guale "king"

"Ouadé." The "king," Laudonnière writes, "commanded his subjects to load the boat with millet (mil) and beans (fèves)." This being done, the party returned to Charlesfort, lost their new supplies when their storehouse burned, and promptly paid a second visit to the Guale, who again supplied them with grain (Gannon 1967:20, Laudonnière [1562] 1927:132-134; 1853:47-52).

The account is of interest for both linguistic and technological reasons. We have mentined above the problem of whether or not "Guale" was a cultural, as well as provincial, disignation. In this connnection, it is of interest to note that Laudonnière refers to the "king" as "Ouadé." This could possibly reflect, as John Swanton has discussed, the sixteenth-century European custom of referring to a ruler by the name of the people, or the state, over which he rules. (In the Shakesperian dramas of the same period, "France" is both a country and a king.) (Swanton 1922:49). If this is the case, then the French label "Ouadé" could have been the explorers' understanding of an aboriginal term applied by the people to themselves (one of the better candidates for which is wahali, a Muskoghean term meaning "the south")(Swanton 1946:135). The ultimate implication, then, is that the Spanish provincial designation "Guale," which was applied to the Georgia coast with the 1566 establishment of the Jesuit mission system, represents a cultural area (as do "Timucua," "Calusa," "Tequesta," and "Ais"), as well as a political and religious unit. The "ruler-ruled" linkage, first seen in Laudonnière, in addition to the phonological similarities betwen Guale, Ouadé, and Wahali, all provide evidence that the Western European labels, and subsequent geographic boundaries, are not arbitrary designations, but reflective of sociocultural realities.

The technological problem is of equal interest. Laudonnière's report of having been supplied with millet and beans invites immediate consideration of the actual crops that were grown in the Guale agricultural system. Beans are a common New World aborininal cultigen, and were grown, for example, by the neighboring Creek (Spencer _et al_. 1965:421), but millet has not yet been reported as an aboriginal cultigen in New World sites. The possibility exists, then, that Laudonnière's _mil_ is generic, not specific (analogous in that regard to the British use of "corn"), and could well have been a reference to large quantities of maize that were being cultivated on the Georgia coastal strand (A. B. Smith, Associate Professor of Romance Languages, University of Florida, personal communication).

A subsequent document that affords some insight into the possible seasonality of the above cultivation is the 1570 letter of Father Juan Rogel to Spain, in which he attempts to explain the failure of the Jesuit mission system. Rogel's account is brief, but it does specifically mention a spring cultivation of maize alternating with fall and winter hunting-and-gathering activities. The difficulty with the document, however, is similar to that of the Ayllon-Martyr account: Father Juan Rogel was living 11 months in "Orista," the Spanish provincial label for the South Carolina coast, and we are faced again with the question of whether or not his description derives from a differing cultural, as well as politico-religious, area. Our decision in this regard will be the same as that made for the "borderline" Martyr material: that, although the Spanish labels, as noted above, possess both Spanish politico-religious and aboriginal-cultural significance, the linguistic and environmental similiarities, as well as the fit between Rogel's account, other documentary materials, and the results of biochemical and subsistence analyses (to be discussed in subsequent chapters), all imply that the cultural differences between the Guale and the Cusabo of "Orista" are negligible—and that Rogel's discussion is admissible as evidence when formulating cultural conclusions regarding Guale (Rogel 1861 [1570]:328; Gannon 1965:29-34).

Our richest documentary material, however, is probably that of the Franciscan missionaires, and the Governors of La Florida during the Franciscan period, a time extending from 1595 until the collapse of the system during the 1680's. Of greatest value among the Franciscan-period writings are those of Father Avila (sole survivor of the 1597 Juanillo rebellion), Governor Gonzalo Méndez de Canzo and his successor Pedro de Ybarra, both of whom conducted "inspections" of Guale province in 1603-4, Father Luîs Jerónimo de Oré, who toured the Guale missions in 1616, Father San Miguel, who visited St. Simon's Island in 1595, and, finally, that of Bishop Gabriel Diaz Vara Calderon who, in 1674, reported to the Crown the observations made during a 10-month visit to "what has been discovered, up to today, concerning the entire district of [La] Florida, both along the seacoast and inland" (Calderon in Gannon 1965:61). In all of the above instances, we are dealing with documents pertaining directly to the Georgia coastal strand, and are thus able to use the materials as a cross-check against the difficulties mentioned above for the Peter Martyr and Juan Rogel materials. It should be pointed out, however, that this comparative geographical-cultural exactitude of the materials is somewhat offset by the fact that they treat of an aboriginal population considerably more exposed to Western European acculturation than the focal population in the days of Rogel's fledgling Jesuit system—or the scarcely touched coastal tribes in the time of the explorations of Ayllon. The only resolution of the problem is to attempt to identify, within each document, behavioral patterns that provide an echo of earlier accounts—and would thus more likely be indigenous cultural continuities—and not the results of Spanish-mission acculturation.

The above, then, are the major ethnohistorical materials upon which we have relied in developing an ethnographic reconstruction. We will now direct our attention to the reconstruction itself, and attempt to present an outline not only of Guale Indian technological, economic, kinship, residential, political, and magico-religious organization—but some idea as well of the way in which these various sub-systems were interrelated to ultimately produce a highly cohesive sociocultural organization.

The Ethnohistorical Reconstruction

Technology

There seems to be ample documentary evidence that the subsistence pattern of the protohistoric Guale was essentially one of an incipient-agricultural system supplemented by hunting, gathering, fishing, and shell-fishing activities. Our earliest reference to agricultural activities on the coast is provided by Peter Martyr D'Anghera:

> They eat maize bread, similar to that of the islanders, but they do not know the yucca root, from which cassabi, the food of the nobles, is made. The maize grains are very like our Genoese millet, and in size are as

> large as peas. The natives cultivate another cereal called xathi. This is believed to be millet but it is not certain, for very few Castilians know millet, as it is nowhere grown in Castile. This country produces various kinds of potatoes, but of small varieties. (Martyr in Swanton 1922:42)

The account is of particular interest in that the maize crop of the Guale is specifically identified as being similar to Western European millet. This adds greater weight to the possibility that the mil of Laudonnière discussed above was actually corn, and was being cultivated (before the arrival of the Spanish) in quantities sufficiently large to twice replenish the Huguenot supplies at Charlesfort (Laudonnière [1562] 1927:132-134; 1853:47-52).

This cultivation, according to the later account of Father Rogel, was accomplished by both men and women during the spring and summer months. The associated sedentism, however, was only part-time in nature, for in the fall of the year, the Guale left the fields and dispersed into the forest:

> At the season they were congregated together, but when the acorns ripened, they left me quite alone, all going to the forests, each one to his own quarter, and only met together for certain festivals, which occurred every two months, and then not always in the same spot, but now in one place, now in another. (Rogel 1861 [1570]:327-328)

Rogel's unsuccessful attempt to impose full-time sedentism upon a semisedentary population has been described in some detail by Andrés G. Barcia Carballido y Zuñiga;

and follows well the account provided by the Jesuit Father himself:

> Father Rogel tried to see if he could prevail upon the Indians to remain quietly in one location, where continued preaching might have some effect. He offered them a quantity of maize for their plantings and exhorted them to take care of the fields and not to go wandering. They accepted the maize and promised to establish a village, and they asked him for hoes to cultivate the gound. Father Rogel had only three so he sent to Esteban de las Alas for more. The latter sent him five, which the Father gave to the Indians. They began to carry out Father Rogel's wish, building more than twenty dwellings as the site selected for the village, while two of the Indians sowed their fields with the maize given them by Father Rogel. In a short time, however, all the villagers (except those who had planted seeds) fled from the place from no other motive other than their natural weakness and inconstancy. Although Father Rogel followed them for twenty leagues, and tried to hold them with adornments, presents, and gifts (which are the things which most influence the disposition of these Indians), he could not get them to come with him.
>
> The Indians were so reluctant to recieve the Catholic religion that no admonitions would curb their barbarity—a barbarity based on liberty unrestrained by the yoke of reason, and made worse because they had not been taught to live in the villages. They were scattered about the country for nine of the twelve months of the year, so that to influence them at all, one missionary was needed for each Indian. (Barcia in Larson 1953:6)

The nine-month nomadism, which Barcia credits to "natural inconstancy" was also reflected upon (far more perceptively) by Father Rogel himself—who realistically comments upon the condition of coastal soils not permitting long-term cultivation, and a fully sedentary existence:

> And there are two reasons for this [nomadic pattern]: first because they have been accustomed to live in this manner for many thousands of years, and to try to get them away from it looks to them equal to death; the second, that even if they wished to live thus the land itself does not allow it—for being so very poor and miserable and its strength very soon sapped out—and therefore they themselves state that this is the reason why they are living so disseminated and changing their abode so often. (Rogel in Swanton 1922:57)

Substantiating documentary evidence for the existence of Guale agriculture is also found in the writings of Father Avila and Father San Miguel. As a part of the former's punishment following the 1597 Juanillo Rebellion (of which, more later), he was compelled, as Larson has described it,

> to act as a human scarecrow and keep birds from maize fields during his period of captivity in 1598 following the Guale revolt of 1597. It was during this same period of captivity that he was beaten by Indians when he happened to pass by them digging with rods. It is not clear that they were working in a corn field, but their implements sound very much like digging sticks. (Larson 1953:4)

As for Father San Miguel, upon his 1595 visit to St. Simon's Island, he encountered Guale who were grinding their corn

> in deep and narrow wooden mortars: the mano is a kind of rammer more than two yards in length and the rammer widens above and is slender in the mortar. (San Miguel in Larson 1953:5)

The grinding of corn into flour observed by San Miguel provides additional corroboration for our earliest records of Guale technology in the writings of Peter Martyr D'Anghera. The latter has described, in connection with Guale redistributive festivals (to be discussed below), offerings made to religious idols to insure rich crops, peace, and bodily health. Martyr notes that "thick cakes"

> similar to those the ancients made from flour, are offered to them. The natives are convinced that their prayers for harvests will be heard, especially if the cakes are mixed with tears. (Martyr in Swanton 1922:44)

Martyr's earlier identification of a maize crop grown among the Guale, and the clear possibility that the "cakes" in his description were prepared by the same mano-metate process described by San Miguel, all point to a continuity of maize cultivation and processing that was underway before intensive acculturation began, and was maintained intact despite the inroads of the Jesuits and Franciscans.

Maize, of course, although important, was not the sole subsistence base in Guale. In a later section we will present in some detail the zooarcheological evidence from our own excavation of the supplemental hunting, gathering, fishing, and shellfishing activities—but at present it seems in order to mention briefly that earlier archeological research on the coastal strand is fully in accord with ethnohistorical materials regarding this complementary aspect of Guale subsistence. Thus Lewis H. Larson, in discussing the pre-Spanish Pine Harbor complex (including the type site in McIntosh County) has observed that

> The proximity of the village sites to salt water and the tremendous accumlulation of shell in the middens offer ample evidence of the pre-Spanish Guale dependence upon a marine economy. The contents of Pine Harbor middens reveal a utilization of not only the local oysters which form the bulk of the midden material, but also several species of whelk, crabs, and a wide variety of fish. Fishing was supplemented by hunting as witness the numerous deer, small game, and bird bones which regularly occur in the middens. Agriculture was practiced, but its importance seems to have been slight. (Larson 1953:4)

Similar archeological evidence of this aspect of Guale economy is found in the faunal remains of the Irene Mound site—in which such typical high-hammock fauna as deer, bear, opposum, squirrel, raccoon, and rabbit were found associated with marine fauna such as salt-water fish, crabs, clams, and oysters (Caldwell et al. 1941:60, 78079).

During the period of planting and caring for the crops the Guale subsisted by utilization of other adjacent resources, such as fish. Barcia's account of the visit of Pedro Menendez de Avilés to St. Catherine's Island in the spring of 1566 notes that "Many Indians came" to meet him, and were

> laden with corn, cooked and roasted fish, and many acorns. (Barcia [1723] 1951:113-118; Swanton 1922:54)

The resulting picture, then, is one of an incipient-agriculture economy supplemented by hunting, gathering, fishing, and shellfishing activities.

In virtually all of the above documents we have noted considerable agreement with regard to the nature of Guale technology—an agreement that extends as well to the results of earlier excavations and to the zooarcheological and biochemical analyses to be discussed in a subsequent section. But Guale technology is not important only in relation to the products it provided, but is of significance as well because of its intimate relation with other aspects of social organization. Paramount among these is its relation to the aboriginal economic system—a stysem which may have involved a rivalrous (and highly ritualized) redistribution of commodities, a system not uncommon in the scattered resource regions of the world. It is to this system, then, and its implications for environmental adaptation and social stratification that we will now direct our attention.

Economic and Political Organization

The seminomadic adaptation of incipient agriculture and hunting-and-gathering discussed above for the Guale appears to have been linked with a ritualized redistributive system that helped insure the survival of the spatially scattered but culturally unified groups throughout the coastal strand. A brief hint of the existence of ritualized redistribution is contained in the letter of Father Rogel, in which he describes the scattering of the Guale

> each one to his own quarter [after which they] only met together for certain festivals which occurred every two months, and then not always in the same spot, but now in one place, now in another. (Rogel 1861 [1570:328)

Not only is the reference to territoriality of interest, but the "festivals" are important as well, in that they seem to echo an earlier (and more lengthy) discussion of the subject by Peter Martyr D'Anghera. The chronicler points out that the coastal strand was economically unified by a flow of commodities from the "provinces" to the "King," a tribute that was "paid in kind; for they are free from the pest of money, and trade is carried on by exchanging goods" (Martyr in Swanton 1922:45).

In contrast to Rogel, Martyr provides considerable detail regarding the nature of these festive commercial exchanges. He writes:

> In the courtyard of [the ruler's] palace, the Spaniards found two idols as large as a three-year-old child, one male and one female. These idols are both called Inamahara, and had their residence in the palace. Twice each year they are exhibited, the first time at the sowing season, where they are invoked to obtain successful result for their labors. We will speak later of the harvest. Thanksgivings are offered to them if the crops are good; in the contrary case they are implored to show themselves more favorable the following year.
>
> The idols are carried in procession amidst pomp, accompanied by the entire people. It will

not be useless to describe this ceremony. On the eve of the festival the King has his bed made in the room where the idols stand, and sleeps in their presence. At daybreak the people assemble, and the King himself carries these idols, hugging them to his breast, to the top of his palace, where he exhibits them to the people. He and they are saluted with respect and fear by the people, who fall upon their knees or throw themselves on the ground with loud shouts. The King then descends and hangs the idols, draped in artistically worked cotton stuffs, upon the breasts of two renerable men of authority. They are, moreover, adorned with feather mantles of various colors, and are thus carried escorted with hymns and songs into the country, while the girls and young men dance and leap. Anyone who stopped in his house or absented himself during the procession would be suspected of heresy; and not only the absent, but likewise any who took part in the ceremony carelessly and without observing the ritual. The men escort the idols during the day, while during the night the women watch over them, lavishing upon them demonstrations of joy and respect. The next day they were carried back to the palace with the same ceremonies with which they were taken out. If the sacrifice is accomplished with devotion and in conformity with the ritual, the Indians believe they will obtain rich crops, bodily health, peace, or if they are about to fight, victory, from these idols. Thick cakes, similar to those the ancients made from flour, are offered to them. The natives are convinced that their prayers for harvests will be heard, especially if the cakes are mixed with tears.

Another feast is celebrated every year when a roughly carved wooden status is carried into the country and fixed upon a high pole planted in the ground. The first pole is surrounded by similar ones, upon which people hang gifts for the gods, each one according to his means. At nightfall the principal citizens divide these offerings among themselves, just as the priests do with the cakes and other offerings given them by the women. Whoever offers the divinity the most valuable presents is the most honored. Witnesses are present when the gifts are offered, who announce

> after the ceremony what everyone has given, just as notaries might do in Europe. Each one is thus stimulated by a spirit of rivalry to outdo his neighbor. From sunrise till evening the people dance round this statue, clapping their hands, and when nightfall has barely set in, the image and the pole on which it was fixed are carried away and thrown into the sea, if the country is on the coast, or into the river, if it is along a river's bank. Nothing more is seen of it, and each year a new statue is made. (Martyr in Swanton 1922:43-44)

Martyr identifies, in the above passage, festivals that serve a distinctly redistributive function, in that the goods accumulated are divided by the "principal citizens" of nightfall, but he maintains that the festival was an annual one. This is in contrast to Rogel's account, in which the festivals are said to occur "every two months" (if we assume that the same cultural phenomenon is being identified by both men). There are two reasonable grounds, however, for accepting Rogel's account of the periodicity, and rejecting that of Martyr-Ayllon. The first of these is the coastal environment itself, described in an earlier chapter. It seems unlikely, given the scattered-resource nature of the coastal strand, that even if the food supply was augmented by incipient cultivation, it would be possible to prevent inadequate food supplies by gathering together only one time during the year. Beyond this, Rogel's account is more credible in this regard, because he spent a longer time (11 months) in Guale. The Ayllon expedition departed Santo Domingo in June, 1526, and abandoned Guale during the winter of the same year (Swanton 1922:34). Given also their preoccupation with sheer survival (which Rogel did not face), it is doubtful that Martyr's recording on the festivals' periodicity is correct. It is more likely, rather, that they occurred, as Rogel has suggested, six different times during the year.

Assuming, then, that regular redistributive festivals were a reality, we face the question of the nature of the commodities that were exchanged. Peter Martyr is vague, mentioning "cakes and other offerings," and our own information on the subject is indirect and only somewhat more complete. We can begin by pointing out that the shellfish, though gathered in abundance, were likely <u>not</u> important in the redistributive ceremonies, since, even if they could be preserved, their dietary or qualitative importance (to be discussed in more detail below) was negligible (Parmalee and Klippel 1974:433), and could not figure seriously in survival. Terrestrial fauna, wild plant foods, and cultigens, however, are all capable of being preserved—and could all have been utilized as redistributive commodities. Harold E. Driver has pointed out that:

> every Indian tribe prepared <u>and preserved</u> its food in some way and stored <u>some of it for</u> future use . . . We have already noted that about 1500 species of plants were eaten, and if we add to this the lists of mammals, birds, fishes, and invertebrates consumed by Indians, the total might exceed 2500 species. (Driver 1969:89, emphasis ours)

Moreover, Swanton has indicated that, among the Southeastern tribes,

> vegetable and animal food was treated in such a manner that it could be preserved for long periods of time, usually, if sufficient fore-thought were exercised, until spring. (Swanton 1946:372)

With regard to the Timucua, who bordered the Guale on the south, Swanton informs us (following LeChalleux) that

> lizards were eaten—a snake, and some quadraped about the size of a dog, all placed there [i.e., on a scaffold] without any previous dressing. (Swanton 1946:376)

Then citing Le Moyne, he further describes the existence of a "storehouse" for preservation:

> At a set time every year they gather in all sorts of wild animals, fish, and even crocodiles; these are then put in baskets, and loaded upon a sufficient number of the curly-haired hermaphrodites above mentioned, who carry them on their shoulders to the storehouse. (Le Moyne in Swanton 1946:377)

That food storehouses existed in Guale is suggested not only by the immediacy with which the Huguenot supplies were twice replenished (Laudonnière [1562] 1927:132-134; 1853:47-52), but also by the account of Father Oré, who states that granaries, or garitas

> are found all over Florida [i.e., La Florida], and in them the Indians place the maize they keep for their sustenance; it is a type of barn supported by four posts, high and bulky, raised from the earth. (Oré in Larson 1953:22)

Taking Le Moyne and Oré together, as well as the cross-cultural observations of Swanton and Driver (and the additional fact of the low nutritional value of corn)—it seems likely that the "storehouses" of Guale functioned not only as granaries, but for the maintenance of fish, terrestrial mammals, and reptiles as well (deer, opossum, alligator, box turtle, etc.)—and thus provided the supplies to be utilized in the regular redistributive ceremoneis.

But if the ecological viability of redistribution is not in question, what of its political significance? Martyr is specific on the point that the redistribution is rivalrous, since witnesses announce to the gathering exactly who has contributed how much, and it is thus tempting to infer that political office in Guale could have been a function of the conspicuous accumulation and distribution of resources. Unfortunately, the documentary evidence, while affording some information as to Guale political structure, does not offer any insight into its connection with economic redistribution. We can only suggest that in a scattered-resource environment such as the coastal strand, the conferring of political office (or "jural status") upon those individuals most successful in procurement and provision for the needs of others would represent a system of obvious ecological viability, and would be comparable, in that regard, to the systems of the Tlingit, Haida, and Tsimshian tribes inhabiting the scattered resource regions of the American Northwest Coast (Harris 1971: 245).

What the documents do suggest, however, concerning Guale political structure is a type of confederacy in which political power was vested in territorial and local chieftains, as well as in ranking functionaries within each of the coastal villages. As mentioned earlier, most of the Spanish curiosity on the subject was inspired by the 1597 Juanillo rebellion, a coastal uprisng that was sparked by Spanish attempts to manipulate the succession to the territorial chieftainship (Lanning 1936:17). Thus, most information on the subject postdates the rebellion, as, for example, Governor Canzo's 1600 letter to the Crown explaining the head chieftainship position:

> The mico mayor [head chief] is a sort of King of a territory. To whatever pueblo or cacique's hut to which he arrives when they hold him as mico, he is given the place of honor. Said caciques have their huts and houses in common [the rotunda?]. And as he takes his place all go to him to drink his health and every year they contribute to him certain tributes of pearls and other moneys that they make with shells and chamois [sic]. (SCUF AGI 54-5-9/32: Canzo to Crown Feb. 28, 1600)

Whether or not the position of mico mayor was hereditary or elective remains conjectural. Swanton is inclined toward the latter opinion, stating that "mention is made" in the Spanish documents of Don Juanillo of Tolomato, "whose turn it was to be head mico of that province" (Swanton 1922:84, emphasis mine). The "turn," it seems to us, could imply hereditary succession as easily as election (in fact, it seems to us more strongly to imply succession), and it is interesting to note that John Tate Lanning adopts this view. "The chief of Orista," he states, "leader of a movement of insubordination against his uncle, the chief, and head mico of Aluste, was 'heir to the head micoship'" (Lanning 1936:242).

It is unfortunate that neither Lanning nor Swanton cites the exact original source materials. In Lanning's case, in particular, it would be of interest to know what is being referred to as "uncle." If the chief of Orista was the sister's son of the mico mayor of Aluste, then transmission of that office would have been along matrilineal kinship lines. Such evidence of matrilineality for political purposes would have good fit with our own statistical inferences presented earlier of a matrilocal post-marital residence patterns as well as the morphological and metrical analyses of Frederick Hulse at Irene Mound—but the documentary materials are too inexactly cited to justify this type of reconstruction.

As to other aspects of the political system, there seem to have been a number of political positions subordinate to the mico mayor. Principal among these are the positions of aliaguita and manador. During Governor Ibarra's 1604 visit to the town of Guale (which possibly was located on Ossabaw Island), he met with "the aliaguitas of Guale, the head manadors of Guale, and other principal

Indians" (Swanton 1922:82; Serrano y Sans 1912 in Larson 1953:8). As Larson had indicated, these persons were obviously "Indian officials of some sort," but the only possibility that might be suggested regarding their function is that they were analogous to the Creek offices of <u>heniha</u> and <u>tastanagi</u>, the former being concerned with peace, the latter with war and internal policing. In any case, it is evident in the documents that the Guale political system included multiple positions and a hierarchy of political control—a condition that is conventionally associated with aboriginal societies that have proceeded beyond a hunting-and-gathering level of subsistence.

In this regard, we may take note again of our earlier archeological findings, in which we have observed differential mortuary treatment for different groups. Combining this fact with the above documentary evidence of multiple political positions, and bearing in mind Martyr's discussion of honorific designations being a function of conspicuous production and redistribution, it seems most likely that a compromise between Lanning and Swanton regarding the political system could be made. We could see the territorial chieftainship as indeed proceeding along kinship lines (as Lanning has formulated), while subordinate positions such as local <u>mico</u>, <u>aliaguita</u>, and <u>manador</u> could be a function of conspicuous redistribution. The viability of the system would consist both in the practice of the deliberate diffusing of coastal resources to individuals less fortunate in procurement, as well as in the providing of a fixed, predictable succession to the highest political position—all rivalry being thus confined to the subordinate and less important political statuses. Whether this was actually the case must, unfortunately, remain uncertain—but it does provide an explanation of the mixed accounts of John Tate Lanning and John Swanton, the discussion by Peter Martyr and Juan Rogel, and the archeological investigations discussed above.

Kinship, Residence, and Marriage

We have noted earlier the possibility that the transmission of the territorial cheiftainship could have proceeded along martilineal kinship lines. If matrilineality for transfer of this title were indeed the system among the Guale, it would provide a good fit with the archeological inference of a matrilocal postmarital residence pattern discussed above, as well as with the subsistence base of hunting-and-gathering and incipient agriculture.

The adaptive interaction between matrilineality, matrilocality and incipient agriculture has been succinctly stated by Harris (1971):

> There is agreement that matrilineal descent groups will not form independently, that is,

> in the absence of matrilineal neighbors, unless matrilocality is the postmarital residence practice, Matrilocality . . . may occur if there is a general subsistence advantage to be derived from structuring extended family domestic units around sisters and their daughters. These conditions are met when women perform the basic planting, weeding, and harvesting operations in relatively small gardens, while men spend a considerable amount of time hunting and, especially, fishing (the spread of horticulture diminishes hunting opportunities). Corporate, exagamous domestic units under such circumstances may find it highly disruptive to detach women from the fields they have been working in and from crops perhaps still in the ground, in order to export them as wives to neighboring domestic units. We may speculate that the women themselves, never too happy about having to live with strangers, would strongly resent the loss of their fields and crops. On the other hand, a man who moved in with his wife's sisters might be getting the best of two worlds without causing any general loss in productive or reproductive efficiency. He need not surrender control over his sister and his sister's daughters, since he can always return "home" to check up on them and to claim his share of the lands or harvests. At the same time his wife is working for him on her lands and he is fed from her table. The next step, as in the case of patrilineal descent groups, is an increase in population density, the fission of the matrilineally extended family, and the maintenance of descent ties on an interlocal basis. (Harris 1971:329)

It would not be proper, however, to present this cultural reconstruction without taking note of certain "structural flaws" in the matrilineal-matrilocal arrangement (which are also discussed by the above writer), as well as devoting some attention to the more serious criticism of the possibility of reconstructing residential and kinship variables at all from the evidence of the archeological record. We will consider each of these problems in turn.

The major structural difficulty, as Harris has indicated, is the difficulty of a male maintaining control over the matrilineal "estate" when "he spends most of his time away from 'home' with his wife and children and when there is a 'strange man around the house'" (Harris 1971: 330). This loss of control, however, as Harris acknowledges, is a serious problem primarily in those areas where there is a great distance separating the husband's natal "home" from his wife's matrilineal garden lands. In the areas where this is not a problem, there are a number of postmarital residential systems that are structurally and ecologically viable, including both the patrilocal and avunculocal varieties. We have noted earlier that, at almost any point along the Georgia coastal strand, the distance separating the mainland from the tidal beach of the barrier island is rarely greater than 10 miles. This implies that "control" over separate garden lands would scarecely be a serious problem in the region—a consideration that ultimately begs the question of why matrilocality would be selected in favor of alternative residential variations.

The most realistic answer seems to be the one suggested by Helms. Essentially, she has proposed that different mobility and space requirement for the sexes is a crucial feature in determining the postmarital residential pattern. An example of this relationship would be the contemporary Navaho, in which

> men raise horses and work for wages, both tasks requiring them to leave their homesteads for long periods, [but] Navaho women are less mobile, and sheep herding is carried out close to their matrilocal homestead without disrupting other essential domestic tasks. (Harris 1971:332)

It is also possible to cite examples of less "Westernized" cultures, in which the residential effects of differential mobility requirements may be noted. Among these would be the nonagricultural Northwest Coast tribes such as the Tlingit and Haida (referred to in an earlier discussion), in which women are responsible for exploiting beds of shellfish, while the men are engaged in the far-ranging hunting of sea mammals (Harris 1971:333). In the case of the Guale aborigines, this latter reference is suggestive. While Father Rogel was careful to note that men and women labored together in the fields, he also pointed out that this was only during the spring and summer months—after which the population was dispersed in the forest, each group in its appropriate "quarter." Combining his observation with the account of Menendez' visit to Guale, in which a feast of fish, shellfish, and maize was consumed—as well as with the archeological recovery of high-hammock and marine faunal materials (to be discussed below)—we find ourselves dealing with a society of differential space and mobility requirements. It does not, then, seem unrealistic to suggest that males would engage in high-hammock hunting and marine fishing activities, both sexes would engage in cultivation, and women would engage in shellfishing and gathering activities. The end result would be a relative male absenteeism from the home and the village in conjunction with female sedentism. The comparatively limited territory required for the shellfishing and gathering (in contrast with the male activities) suggests that the exogamous exporting of males (and subsequent acquisition of more hunting and fishing space) would possess greater ecological viability on the coast than the alternative marrying-out of local females. Not only would this provide a unifying account of the ethnohistorical and ecological information, but would also accord well with the morphological and metrical analyses discussed earlier which were conducted by Frederick Hulse at Irene Mound.

A difficulty presented by the above type of analysis which is more serious than the one of "structural flaws" is whether or not such inferences are possible at all—that is, whether or not the eliciting of data regarding kinship and descent from the archeological record is a methodological possibility. William L. Allen and James B. Richardson III have concluded in a recent article that, for the most part, such variables are not recoverable.

Calling archeologically based analyses of kinship "illusory or at best misleading" they have reviewed an abundance of contemporary literature concerning the ambiguities and complexities of kinship and residence systems to support their view. While conceding that archeologists can make meaningful contributions to the diachronic study of political organization, economic cooperation spheres, settlement patterns, etc., their survey has led them to conclude that

> given the multiplicity of obstacles that confront the archeologists in their attempts to make meaningful statements about prehistoric kinship systems, it seems justified to conclude that unless extremely detailed historic data exists, the analysis of kinship is best left to the ethnographer . . . . All that we wish to illuminate is the fact that studies of kinship structures have a low information content (even in many ethnographic situations) and because the resulting reconstructions are so tenuous, the archeologist would profit by concentrating his efforts elsewhere. (All and Richardson 1971:51)

One of the major obstacles dealt with by the authors is "the great disparity between residence <u>rules</u> and the <u>actual choice</u> of residence within a specific social group" (emphasis ours). Thus, the Northeastern Algonkian are characterized by patrilocal, matrilocal, matri-patrilocal, matri-patri-neolocal, and "individual preference" post-marital residence systems. Similar ethnographic problems are cited for the Lozi of Northern Rhodesia and the Montagnais-Naskapi, leading ultimately to the conclusion that

> while each of the groups . . . probably has a concept of where they ought to reside, the disparity between such rules and the actual residence configurations is at least suggestive that factors other than or in addition to sociological prescriptions are operative in determining the residence of individuals in a given social unit. (Allen and Richardson 1971: 46)

A closely related problem exists with regard to descent. Essentially, the problem here is that the traditional fourfold descent classification is "too general to be explanatory" in that "where rules or principles or concepts of descent do exist, there seeem to be many alternate courses of action that are available to the participants." Ultimately, one is counselled to abide by Meyer Fortes' prescription that "any statement to the effect that a society is "partilineal or matrilineal, etc., is very nearly meaningless without a detailed specification of 'descent for what'" (Allen and Richardson 1971:48).

Dealing with each of the proposed obstacles in turn (i.e., problems of descent and the problems of residence analyses), it would seem that Allen and Richardson have, in one instance, correctly identified a need for statements of greater functional exactitude but, in the other, have postulated an epistemological difficulty which, though very real in cultural anthropology, is nevertheless completely foreign to the very nature of archeological investigation. In the first case, the point is well taken that different descent systems will function for different purposes within the same society, and, given the presence of historical documentation, it is occasionally possible to state (for example) not only "matrilineal" but "matrilineal for what." In the present case (as we have stated above) the documents do _not_ justify this type of reconstruction for the Guale.

The objections regarding postmarital residence patterns, however, seem far less legitimate, and involve primarily the problem of a "disparity" that is not, in our opinion, a part of archeological research. The point is a fundamental one, and has been succinctly expressed by Patty Jo Watson, Seven A. LeBlanc and Charles L. Redman:

> Though the archeologist cannot dig up a language or the details of a kinship system, he has the advantage of direct access to immense quantities of _behavioral data_. The archeological record reveals in the static patterning of directly observable material _what the people actually did in the past, not what they thought they did or what they said they thought they did_. (Watson, LeBlanc, and Redman 1971:25, emphases ours)

It is, then, not the objective of archeology to deal with "concepts of where they ought to reside," "residence rules," or "sociological prescriptions." As a consequence, it matters little that there is often a "great disparity between residence rules and the actual choice of residence within a specific social group" (Allen and Richardson 1971:46). We shall never know, for example, whether or not in Guale a newly married man thought he "ought to reside" in the vicinity of the parents of his bride. What we have recovered, however, is mortuary data that implies this pattern of behavior, and it is behavior that is referred to when the label "matrilocal" is applied. Similarly, the overall homogeneity among female skeletons at Irene Mound, and the relative hetereogeneity among the males implies matrilocal behavior with males marrying-in, but tells us nothing (as indeed it never can) of the mentalistic "rules" among the Guale. The "disparity," then, between the conceptual and the actual is only an explanatory problem when the conceptual is recoverable to begin with. In the vast majority of archeological instances, it is not—and we are presented, in effect, with an overly severe solution to a methodological problem we do not possess. Archeologists do not recover rules.

In summary then, the nature of the environmental adaptations of the Guale with its differential mobility requirements, taken together with the earlier physical anthropological data for the coastal strand tribes at Irene Mound and our own statistical investigations reflecting a paired-female and opposite-sex nearest-neighbor mortuary pattern—all point toward a matrilocal post-marital residence pattern of behavior. Such a residential pattern would certainly facilitate the existence of female corporate groups for the transmission of political positions—

but this aspect must for the present remain uncertain. We turn finaly, then, to the form of Guale marriage—for which our sole sources of information are the Spanish documentary materials.

Our earliest reference to the system of marriage in the coastal strand region comes, not surprisingly, from the Ayllon materials. Peter Martyr has recorded that

> Widows are forbidden to marry again if the husband has died a natural death; but if he has been executed they may remarry. The natives like their women to be chaste. They detest immodesty and are careful to put aside suspicious women. The lords have the right to have two women, but the common people have only one. The men engage in mechanical occupations, especially carpenter work and tanning skins of wild beasts, while the women busy themselves with distaff, spindle, and needle. (Peter Martyr in Swanton 1922:45)

This is our earliest reference to the existence of polygyny among the Guale. The observation that it was a privilege of the "lords" suggests that it was not a widespread practice—and was confined to the more significant political positions, or perhaps to the <u>micro mayor</u>.

When these restrictions noted by Martyr are borne in mind, it is not surprising that Father Rogel failed to record it all among the group of families with whom he lived for 11 months:

> When I found each Indian married to only one wife, assisting in the tillage of the fields, maintaining and ruling their children and households with much care, not addicted to the crime against nature, neither incestuous, nor cruel, nor thieves, dealing among

> themselves with great justice, truth, and gentleness, I gave God thanks. (Rogel 1861 [1570]:327-328)

But subsequent documents seem to cooroborate Martyr in this instance, and not Rogel. During the 1597 uprising, Don Juanillo, the leader of the rebellion, complained specifically about the attempt of the Franciscan missionaries to enforce monogamy among the Guale:

> Since the punishment on account of one is not going to be greater than for all, let us restore the liberty of which these friars have robbed us, with promises of benefits which we have not seen, in hope of which they wish that those of us who call ourselves Christians experience at once the losses and discomforts: they take from us women, leaving us only one, and that in perpetuity, prohibiting us from changing her. (Don Juanillo speech recorded in Barcia. Cited in Swanton 1922:86)

The most detailed discussion of the polygnous system, however, is provided by the 1616 account of Father Luís Jerónimo de Oré, who tells of the problems encountered by the Franciscans priests attempting to eleiminate the practice:

> We have an example of this (polygamy) in reference to the principal cacique of the province of Guale. During the time of his apostacy he took to his house as a concubine and mistress one of his sisters-in-law, the sister of his own wife, with whom he lived all the time. By her he had three children, and by his own wife four children. Knowing that he would be commanded to leave his sister-in-law he spoke first and said to the father: "I see the evil I have done in committing this incest with the sister of my wife. I have three children by her, but if I

> eject them from my house, they will have to suffer and perish. Although she is in my house I do not have to have relations with her; if the Indians murmur at this, recall what I said." The fathers said nothing in order not to break immediately with the cacique for it seemed proper to them to act in this manner until a more opportune season presented itself, lest everything be lost. Afterwards, they treated with this cacique in resolving his difficulty. They told him to eject his sister-in-law from his house and to send her to her father's house because her presence in his house was scandalizing the Indians and was setting them a bad example. The fathers said the reformation of morals should start with him. All they accomplished with him was that they put her in a separate house, which was an ancient custom of the chiefs who placed in a separate house each one of the women or lovers they had. Even then the Indians complained, "Until now the cacique had in one house two women and children; now he has two houses and in each house he has a woman as if he were a pagan! The Indians urged him [the cacique] to marry her. Neither did he nor she wish [to marry], nor did anyone dare to marry her, for it was a custom that no one should marry or speak to the wives or the lovers of the caciques. God was pleased to call to Himself the wife of the cacique, while the sister-in-law gathered the children of her sister together with hers in her house. (Oré in Larson 1953:11)

The Oré account coincides well with the complaint of Don Juanillo (heir to the mico mayor position) that the right to have more than one wife was being lost, as well as the early account of Peter Martyr D'Anghera which identifies polygyny as a privilege of the "lords." The widespread oppostion of the cacique's behavior in the Oré account, then, would seem to testify more to the power of

Spanish acculturation than it would to the irregularity of sororal polygyny among the mico mayors of Guale province.

As the final observation, it should be noted that the documentary evidence for polygyny supplements well the comparative architectural data of John Whiting and Barbra Ayres, discussed above, which was reflected in the living area that was excavated at Indian Field. Summarizing our findings, then, with regard to kinship, residence, and marriage, we may conclude that the Guale were a matrilocal and possibly matrilineal society with both monogamous and polygynous forms of marriage—the latter apparently being a privilege reserved for the politically authoritative members of the Guale culture.

We will conclude our examination of Guale ethnohistory by a consideration of coastal magico-religious systems. This is, of course, the one aspect of our reconstruction that requires more than any other the aid of the documentary materials. We are fortunate, however, in the fact that a considerable amount of information regarding religious practices has been recorded—and it is that information which will be our final topic of consideration.

Magico-Religious Beliefs and Behavior

Virtually our sole source of information for the magico-religious practices of the protohistoric Guale is the Peter Martyr D'Anghera material, much of which has been cited and discussed above. In the present discussion, we will be particularly concerned with those aspects of Guale religious behavior involving the explanation of their origin and destiny—and the religious offices providing solutions to the problems of everyday existence. We will deal, in short, with Guale cosmological beliefs, and the degree and nature of magico-religious specialization.

Peter Martyr makes direct reference to "priests" among the Guale, and describes them as being repositories of knowledge concerning the origin and destiny of the soul. This knowledge is transmitted as an integral part of a eulogy for the deceased:

> The natives celebrate a third festival, during which, after exhuming a long-buried skeleton, they erect a black tent out in the country, leaving one end open so that the sky is visible; upon a blanket placed in the center of the tent they then spread out the bones. Only women surround the tent, all of them weeping, and each of them offers such gifts as she can afford. The following day the bones are carried to the tomb and are henceforth considered sacred. As soon as they are buried, or everything is ready for their burial, the chief priest addresses the surrounding people from the summit of a mound, upon which he fulfills the functions of orator. Ordinarily, he pronounces a eulogy on the deceased, or on the imortality of the soul, or the future life. He says that souls originally came from the icy regions of the north, where perpetual snow prevails. They, therefore, expiate their sins under the master of that region who is called Mateczungua, but they return

> to the southern regions, where another great sovereign, Quexuga, governs. Quexuga is lame and is of a sweet and generous disposition. He surrounds the newly arrived souls with numberless attentions, and with him they enjoy a thousand delights; young girls sing and dance, parents are reunited to children, and everything one formerly loved is enjoyed. The old grow young and everybody is of the same age, occupied only in giving himself up to joy and pleasure.
>
> Such are the verbal traditions handed down to them from their ancestors. They are regarded as sacred and considered authentic. Whoever dared to believe differently would be ostracized. These natives also believe that we live under the vault of heaven; they do not suspect the existence of the anticpodes. They think the sea has its gods, and believe quite as many foolish things about them as Greece, the friend of lies, talked about Nereids and other marine gods—Glaucus, Phorcus, and the rest of them. (Martyr in Swanton 1922:44-45)

The above passage is of particular interest in view of the earlier discussion of archeological findings in the St. Simon's excavations—and a possible relationship between the magico-religious system, placement of burials, and the style of aboriginal architecture.

We may note at the outset the interesting correspondence between the Guale belief in an afterworld located in the south, and the archeological findings of the elaboration of the southern portion of the Taylor Mound structure, as well as the apparent practice (noted at Indian Field) of secondary burial along the southern wall of the dwelling. Beyond this, there is a similarity between Peter Martyr's description of the exhumation of a long-buried skeleton and our own Couper Field finding of burials "capped" by a shellfish concentration, possibly serving as a marker, as well as burial pits beneath the plow zone from which the individual had been removed. We can never be certain of the ideological justification for this secondary burial practice, but it is interesting to view it in terms of the belief noted above that immediately following death the soul of the deceased temporarily resided in the regions of the north until all his sins were expiated. During this intermediate, purgatorial phase, it does not seem unreasonable to suggest that the body would be placed in a mortuary structure until the period of expiation was accomplished, following which he was returned, reburied, and reincorporated into the world of the living Guale. While these seeming affinities between archeological findings and the documentary record of magico-religious systems are seldom as extensive as we should desire, they nevertheless provide some basis for assuming that the details of the ideological system described in the literature apply to the same people whose occupational debris is being recovered from the ground.

In this regard, it is of interest to examine another of Martyr's discussions concerning the Guale account of an earlier "tailed" people. He learned from Aylion that the inhabitants of the coast

> declare that, according to the tradition of their ancestors, there once arrived amongst

> them men with tails a meter long and as thick as a man's arm. This tail was not moveable like those of the quadrapeds, but formed one mass as we see in the case with fish and crocodiles, and was as hard as a bone. When these men wished to sit down, they had consequently to have a seat with an open bottom; and if there was none they had to dig a hole more than a cubic deep to hold their tails and allow them to rest. Their fingers were as long as they were broad, and their skin was rough, almost scaly. They ate nothing but raw fish, and when the fish gave out they all perished, leaving no descendants. (Martyr in Swanton 1922:43)

The moral, of course, is sufficiently clear: overexploitation of a coastal resource (in this case, raw fish) has its penalty in depletion and starvation. This type of sacred myth would be eminently logical in a society that rewarded resource distribution and prevention of starvation in the form of regular festivals that were surrounded with the quality of a pious duty.

The Guale, we may also note, seem to have had both priests and shamans for the performance and direction of their magico-religious ceremonies. It has been observed above that the priests in Guale were responsible for the delivery of eulogies, but they additionally were responsible for the absolution of the community's sins:

> when the priest has finished his speech he inhales the smoke of certain herbs, puffing it in and out, pretending to thus purge and absolve the people from their sins. After this ceremony the natives return home, convinced that the inventions of this impostor not only soothe the spirits, but contribute to the health of their bodies. (Martyr in Swanton 1922:45)

The remainder of Martyr's discussion, however, seems more to describe the slight-of-hand that is characteristic of the shaman:

> Another fraud of the priests is as follows: When the chief is at death's door and about to give up his soul they send away all witnesses, and then surrounding his bed they perform some secret jugglery which makes him appear to vomit sparks and ashes. It looks like sparks jumping from a bright fire, or those sulphured papers, which people throw into the air to amuse themselves. These sparks, rushing through the air and quickly disappearing, look like those shooting stars which people call leaping wild goats. The moment the dying man expires a cloud of those sparks shoots up three orbits high with a noise and quickly vanishes. They hail this flame as the dead man's soul, bidding it a last farewell and accompanying its flight with their wailings, tears, and funereal cries, absolutely convinced that it has taken its flight to heaven. Lamenting and weeping they escort the body to the tomb. (Ibid:45)

As a final note, we will make a brief reference to the evidence that the above material provides of the possible existence of a class-structured society possessing only a comparatively limited number of hierarchical groups. In this connection, Guy E. Swanson has utilized a statistical sample of 50 societies to establish a correlation between the concept of a supreme monotheistic deity and the development of heirarchical groupings. In classless, egalitarian cultures, the concept of a supreme deity tends to be absent. Harris remarks that

> The social structure of egalitarian peoples is not served by the idea of a central or

> supreme authority. Just as there is an absence of differential control over strategic resources in life, so in religious belief, the denizens of the spirit world lack decisive control over each other; they form an egalitarian pantheon. (Harris 1971:558)

More specifically, Swanson has observed that of the nineteen societies surveyed which possessed only one or two heirarchical groups, 17 of these were not characterized by belief in a supreme deity (Swanson has further observed that the probability of such a correlation occurring as a result of chance or sample variation is .0005) (Swanson 1960:65). This cross-cultural information coincides well with the documentary data relating the existence of at least two important gods (Matecqungua and Quezuga—and gods of the ocean as well), and with our earlier archeological inference concerning the existence of different mortuary customs that were accorded to continually changing hierarchical groups.

In sum, then, the utilization of archeological, documentary and cross-cultural data has indicated that the Guale were characterized by a magico-religious set of beliefs that told of the origin and destiny of the soul, provided a cultural channel for the communal expiation of sin, and (through the precept of myth and religiously oriented recurrent festivals) placed stress upon the judicious use of environmental resources and the redistribution of those resources to the less fortunate groups of the society. Ultimately, the Guale magico-religious system, like many of the other aspects of their culture, seems to have been very closely adapted to the scattered resource ecological conditions that characterize the Georgia coastal strand.

CHAPTER VII

SUBSISTENCE ANALYSES

As a supplement to the documentary evidence of protohistoric aboriginal adaptation discussed above, four independent investigations into Guale subsistence were conducted. These were: 1) zooarcheological analysis, involving the identification of food bone and conversion of minimum numbers of individuals and osseous weight into percentage of usable meat, thus creating a dietary ratio; 2) malacological analysis, involving the classification of midden shellfish into genera and species, and noting their changes through time; 3) strontium analysis, a spectrochemical technique which provides evidence of the plant and animal dietary proportions of a prehistoric society; and 4) ethnobotanical analyses, which involved the direct examination of field soil samples and food pits to uncover direct evidence of aboriginal horticulture. In the present chapter, we will discuss the methodology and findings of each of these techniques in turn.

Zooarcheological Analyses

At the north end of Couper Field, a 3m x 6m column sample of a shellfish midden was excavated by arbitrary

25 cm levels for zooarcheological and malacological analyses. Ceramics present within the shellfish matrix were of the same type of those of the sites previously discussed. The animal bone was classified into genera and species, and further quantified, by species, into minimum number of individuals (m.n.i.), osseous weight, total live weight, and percentage of usable meat. Analyses were conducted by K. F. Johnson of the Florida State Museum under the direction of Elizabeth S. Wing. Of all the investigations done, the percentage of usable meat is probably the most important, in that it provides the most accurate zooarcheological measurement of the relative dietary importance of the different animal species that were present in the prehistoric diet (Ziegler 1973:30-31). The findings of the analyses are presented graphically in Table 12.

As the table indicates, the Guale in all instances were procuring maritime and terrestrial species with a relatively high percentage of usable meat per individual. Beyond this, it is evident in both levels that the most significant species in the diet were the Atlantic sturgeon and the white-tailed deer. These two species comprise 94.9% of the diet in level IIA and 73.2% in level IIB. The two species would both have been characterized by relative ease of procurement: deer are abundant in the high-hammock areas of the islands and mainland and could be shot

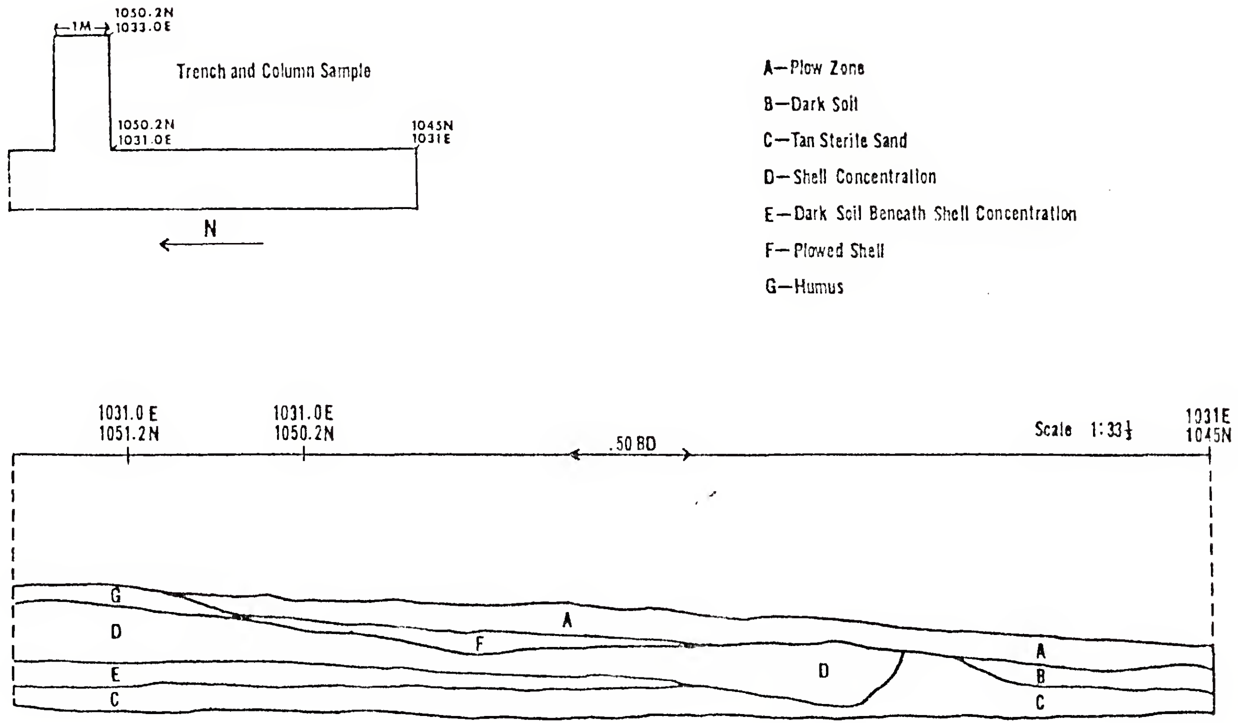


Figure 44. Couper Field: East Profile of Trench to North of 1045N, 1030E

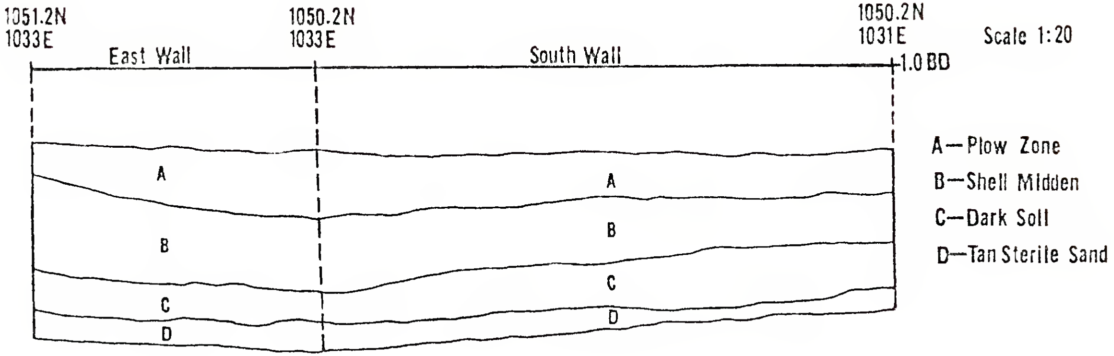


Figure 45. Profile of Column Sample Taken from Couper Field Trench

Table 12

Results of Zooarcheological Analysis of
Couper Field Column Sample

IIA - Couper Field

Species	No. Bones	MNI	% Usable Meat Per Individual	% Deitary Contribution
Odocoileus virginianus/white-tailed deer	9	1	50%	35.7%
Bagre/sea catfish	4	2	75%	3.0%
Scianidae/red drum	2	1	75%	1.3%
Archosargus/sheepshead	2	1	75%	.8%
Acipenser/sturgeon	1	1	50%	59.2%
	18	6		

IIB - Couper Field

Species	No. Bones	MNI	% Usable Meat Per Individual	% Deitary Contribution
Odocioleus virginianus/white-tailed deer	4	1	50%	27.5%
Saiurus/ten-pounder	2	1	70%	.5%
Bagre/sea catfish	44	15	75%	17.1%
Scianidae/red drum	12	1	75%	2.4%
Pogonias/black drum	18	2	75%	5.9%
Acipenser/sturgeon	2	1	50%	45.7%
Kyphosidae	1	1	75%	.3%
	83	22		

Source: Johnson 1975

with bow-and-arrow, trapped, or snared; the Atlantic sturgeon is an omnivorous bottom feeder which inhabits the shallower parts of the sea during all but the winter and which spawns in inland streams during the spring, thus making procurement by nets a possibility.

Additionally, it is apparent from the table that no striking changes in the species that were procured were occurring during the accumulation of the levels. The time period involved is possibly on the order of years, since contemporaneous ceramics (to be discussed in the next chapter) were found in both levels, so the slight fluctuations that are apparent (i.e., among red drum and sea catfish) may be due to minor changes in seasonal availability. Certainly, it seems justifiable to conclude that the most significant aspects of Guale adaptation (evident in both IIA and IIB) are the concentration on the Atlantic sturgeon and the white-tailed deer, both of which, in all likelihood, were taken on a year-round basis.

A noteworthy change that did take place, however, was in the amount of animal bone present in the two levels. In the deeper level (IIB), there was a total of 351.2 grams of bone; in the higher (IIA), there was only 50.7 grams. This is a decrease of 86%, which suggests the possibility of a pronounced decline in the intensiveness of the hunting-and-fishing adaptation discussed above. To further investigate this implication, we may take note as to whether or not the shellfish, also collected, in toto, from the same two levels, exhibit a decrease in their overall mass throughout time, and, particularly, whether the most pronounced decrease was characteristic of the beach-and-dune habitat—the area where most of the fishing activities discussed above (e.g. for sea catfish, drum, and especially, the sturgeon) would have been conducted. It is this matter that we will discuss in the following section.

Malacological Analysis

The shellfish content of the above sample was also subjected to analysis. This was accomplished by maintaining, in bags labelled by provenience, all shellfish (including fragments) that appeared on the 1/4 inch mesh motorized screen. The first 25 cm level was not analyzed, as it exhibited some disturbance by plowing, but the complete contents of the following two levels (designated IIA and IIB) were returned to the Florida State Museum for analysis.

The analysis involved the classification into genera and species of every fragment larger than 1/4" out of a 372-kg. mass (or 708.4 pounds) of shellfish, and the weighing of each species to the nearest tenth of a gram. This level of precision was decided upon in view of the limited representation (and comparative light weight) of the individual members of certain species (e.g. Tagelus plebius) which implied that any changes in mass might not be as readily evident if rounded off to the nearest gram. While this precaution proved unnecessary, it did nonetheless provide a highly precise measure of mass changes in all species from level IIA to IIB. The result, however, was only made possible by the use of a Dial-o-Gram scale, with vernier, that measured approximately 1.5 kg. of sample at a time. In order to preserve the same degree of accuracy for both the extensively represented species (such as Crassostrea virginica) and the sparsely represented ones (e.g. Tagelus plebius; Dinocardium robustum) it was necessary to perform over 250 separate weighings. The result of this classification and weighing was an independent method for eliciting the portions of the environment most extensively utilized by the protohistoric Guale. It should be emphasized, however, that this shellfish analysis does not provide substantial evidence of these environmental emphases in and of itself, but must be seen in the light of the supplementary subsistence investigations described in the other sections of this chapter.

On the following page, we will present the quantative results of our analyses, along with a discussion of their environmental significance. Additionally, we will present a cautionary discussion of the nutritional significance of the shellfish middens (commonly encountered at archeological sites).

The following table illustrates the relative proportion of shellfish species, by level.

Table 13

Results of Shellfish Analysis—Couper Field

Level	IIB (lower)		IIA (higher)	
Species	Weight (g)	% Total Weight in Level	Weight (g)	% Total Weight in Level
Crassostrea virginica	179,487.2	.994	140,877.0	.995
Tagelus plebius	356.9	.001	11.5	.000
Mercenaria campechense	548.5	.003	301.2	.002
Balanius sp.	161.2	.001	82.6	.001
Geukensia demissus	141.0	.001	164.2	.001
Dinocardium robustum	0	.000	40.1	.001
	180,694.8	1.000	141,387.6	1.000

It is obvious from the table that the total shellfish mass undergoes a decline from level IIB to IIA, and also that the Virginia oyster (*Crassostrea virginica*) was overwhelmingly predominant in both levels. Bearing this in mind, we will designate the other species as "incidental" and tabulate their changes below. The rationale here is that these species were not, of themselves, a motive for visiting a particular part of the coastal environment, but were incidentally collected by Guale who were present in the area for the procurement of other, more important species. These incidental species, however, were brought back to the living area and deposited on the midden. Changes in their concentrations would afford endurance, then, of the extent of the "visitations" to the various parts of the environment, and changes in these visits through time. The table is presented below.

Table 14

Changes in "Incidental" Species

Level	IIB (lower)	IIA (higher)	
Species	Weight (g)	Weight (g)	% Change
Tagelus plebius	356.9	11.5	.97 (-)
Mercenaria campechense	548.5	301.2	.45 (-)
Balanius sp.	161.2	82.6	.49 (-)
Geukensia demissus	141.0	164.2	.16 (+)
Dinocardium robustum	0	40.1	n.a. (+)

The most striking change evident in the table is that of the razor-like Gari shell Tagelus plebius, ("stout Tagelus") which decreases 97% from level IIB to IIA. This species bears a close resemblance to the razor clam, Ensis directus, and is a mud-burrower, some 3 to 4 inches long, with an elongated, abruptly rounded shell (Morris 1973:83). Its habitat is the

> muddy bottoms in shallow water, below the low-water mark, where it digs in with its powerful foot, leaving only its long siphons exposed (Miner 1950:595).

On St. Simon's Island, the likeliest habitat for Tagelus plebius would have been the mud of the tidal creeks found throughout the area. This indicates the possibility of the decreased utilization of this habitat throughout time.

A decline was also evident in the two species more directly related to a marine environment, the quahog clam (Mercenaria campechense) and the Acorn barnacle (Balanius sp.). The latter are normally found attached to driftwood, seaweed, and the bottoms of boats. In view of the fact that they may also be attached to sea turtles, whales, and other marine animals, the Balanius may not have been procured for itself, but could well be present as an "accidental contaminant" of some other marine resource (Miner 1950:420, 424; Dr. Fred Thompson, personal communication). The quahog claim, however, is definitely a food item, and is associated with a tidal creek or beach-and-dune, marine environment. This particular species

> is the chief commercial clam of the East Coast, ranking second only to the oyster in shellfish value. When young or half grown it is the delicious "cherrystone," said to have a flavor surpassing that of any other bivalve. When older it is less tender and is used extensively for bakes and chowders (Morris 1973:59).

This species is found "on sandy or muddy bottoms, between the tides and in shallow water" (Miner 1950:588). Rogers has described the modern method of procurement as follows:

> When the tide goes out the clam-digger may be seen in the mud flats and in shallow covers raking the clams to fill his boat or basket. He has a special tool called a "clam rake." It is not a romantic enterprise . . . but it is profitable (Rogers 1908:347).

It should also be noted that the Great Heart Cockle (<u>Dinocardium robustum</u>) increases from 0 to 40.1 grams. The cockle is a strong-ribbed, serrated-edge species found generally in shallow estuarine waters—but is also a heavy shell. In the present instance, we are dealing with two fragments (and possibly, one individual) which, balanced against the near-50% and near-100% reductions of such tidal flat and sea-beach-and-dune species as <u>Tagelus plebius</u>, <u>Balanius sp</u>., and <u>Mercenaria campechense</u>, does not in our opinion substantially signify an increased utilization of tidal-flat-estuary environment.

Having considered these incidental species, we should finally direct our attention to the species that, in both levels, constituted over 99% of the biomass—the Virginia oyster, <u>Crassostrea virginica</u>. This species, generally from 6 to 10 inches long, lives in moderately shallow water, attached to any sunken object, throughout its life (Morris 1973:37). While this estuarine shellfish continued to constitute the primary species procured, it is interesting to note that it, too, underwent a decrease (21%), from level IIB to IIA, which is again indicative of a general de-emphasis upon fishing and shellfishing subsistence technology throughout time.

As a final cautionary note, it should be emphasized that the larger number of shellfish present in the sample should not prompt the conclusion that they constituted a major subsistence resource. Clement Meighan has warned that

> the shells so apparent in a shell midden do not have to indicate primary dependence on molluscs for food since small quantities of less visible components may indicate food resources of even greater importance to the inhabitants of the site (Meighan 1969:420).

Further, in a suggestive qualitative analysis of two species of freshwater mussels, pink hell-splitters (<u>Proptera alata</u>) and muckets (<u>Actinonaias carinata</u>), Paul W. Parmalee and Walter E. Klippel discovered that

> if the two species analyzed generally reflect the food energy value of mussels during the prehistoric period, and there is no reason to believe otherwise, it is apparent that this subsistence resource contains far fewer calories per given unit than provided by most other meat animals that would have been available in eastern North America. From this evidence, it is submitted that even when valves occur in considerable number, such as at many of the Archaic period

> shell middens in the Southeast, the animal represented a resource exploited as a supplement, rather than a staple (Parmalee and Klippel 1974:432).

In sum, then, our shellfish sample has provided evidence of Virginia oysters being the most pronounced among the mollusc species collected, and has also provided an independent line of evidence supporting an inference derived from the zooarcheological analysis: that there was a de-emphasis, through time, of the Guale utilization of tidal flat and beach-and-dune habitats for the movement of marine resources. With these findings in mind, we now have a greater possibility of a meaningful interpretation of the result of a third independent investigation, strontium analysis, to be discussed in the next section.

Strontium Analysis

As a supplement to the documentary and zooarcheological lines of evidence discussed above, the relatively recent technique of strontium analysis was utilized to provide corroborating information concerning prehistoric subsistence. In the present section, we will be concerned both with the rationale and laboratory methods of the technique, as well as with relating its results to the findings of the supplementary investigations. Also, we will deal briefly with the use of the technique to provide evidence of prehistoric social stratification. Finally, we will devote some attention to possible and definite methodological limitations of strontium analysis, one of which was discovered in the process of our own investigations.

Strontium analysis is essentially the process of "matching-up" human and nonhuman animal trophic (or feeding) levels. As discussed in Chapter II, any environmental system may be conceptualized in terms of an Eltonian Pyramid, or so-called "pyramid of numbers." The pyramid is hierarchically arranged in terms of a consumer-consumed, or predator-prey relationship. The base level is that of green plants, or "primary producers." This is the level which provides, through the capture of solar energy, the fundamental, or initial amount of energy for all subsequent levels of the pyramid. These green plants are, in turn, consumed by herbivorous animals ("primary consumers"), which are, in turn, consumed by carnivores, which (in some ecosystems) are subsequently consumed by members of the "top carnivore" level. All living things (including man) are involved in such a pyramid. The determination of the trophic level to which the members of the prehistoric society belonged is the primary objective of strontium-88 analysis.

The fact that matter and energy undergo quantitative changes in moving from one trophic level to another establishes the rationale of the technique. In this

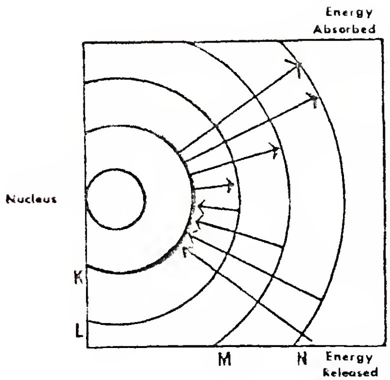


Figure 46. Schematic Drawing of Atomic Energy Levels. Movement of electrons toward nucleus causes energy emission; energy absorption causes movement outward.

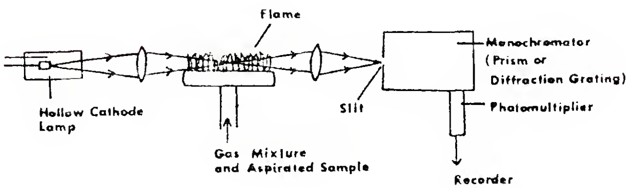


Figure 47. Schematic Drawing of Spectrochemical Equipment. Flame "collapses" electrons as shown above, while light energy from cathode lamp moves them back to former levels.

instance, we are concerned with the movement of the stable isotopic form of the element strontium. This element is present in the soil, in trace amounts, as an alkaline earth. It is taken up by plants (the primary producer level) along with calcium. The plants are consumed by herbivorous animals, and these are in turn consumed by the carnivores. Within the physiological system of any animal in this food chain, the ingested strontium is preferentially excreted in favor of calcium and, conversely, is discriminated against in the movement from the circulating body fluids (the "internal environment") into the matrix of the animal's bones. The consequence is that physiological discrimination against stable strontium is taking place at each trophic level, and that the relative amount of strontium that is present within the matrix of an animal's bones is diagnostic of the position of the animal on the food pyramid. The implication of this process for archeological research lies in the possibility of comparing amounts of stable strontium present within human skeletal material to the amounts present within the skeletal material of identified faunal specimens from the same archeological site. Thus, one would anticipate that in a meat-eating, hunting society, the amount of strontium present would be most similar to that of the animals of the carnivore level, a hunting-and-gathering society would be most comparable to omnivorous animals, while a fully agricultural society would be most comparable to the fauna of the primary consumer level, such as the white-tailed deer.

The laboratory procedures involved are based directly upon the energy-level model of atomic structure and the consequent selective absorption and emission of energy in the form of light. Basically, this model considers an atom of any element to have a set of discrete orbital levels in which its electrons are found. The input of thermal energy to the atom results in the movement of electrons to levels that are closest to the nucleus, until all the levels have been filled. This process is a transformation of potential to kinetic energy and results in the emission of light. The subsequent application of light energy will result in moving these electrons from their collapsed "ground" state to their former metastable energy levels. Important in this process is the fact that only the amount of radiation necessary to move electrons back to their former levels will be absorbed. As a consequence, it has been possible to correlate the quantity of absorbed radiation with the quantity of an element present in a sample such that when one is known the other may immediately be formed. This is the rationale for determining the amount of stable strontium present in both human and nonhuman skeletal material.

In the present investigation, the laboratory procedures were as follows. One gram of bone from each human or nonhuman animal skeleton to be analyzed was dissolved in 9 ml. of hydrochloric acid. This process alone generally requires about six hours time. Filter paper is then placed into a glass funnel above an empty beaker. One such apparatus is set up for each vial of dissolved bone. Then, from a solution of lanthanum and potassium chloride, 10 ml. is poured into each sample of dissolved bone. The samples are then filtered into the beakers; 25 ml. of deionized water is then added to each sample to dilute the solution.

The next step is the preparation of "standing solutions." These are solutions prepared to cancel out, within the spectrochemical equipment itself, the effects of the other chemicals present in addition to the element of interest. Four such solutions are prepared: one of HCl (9 ml.), one of $SrCl_2$ (9 ml.), one of dilute H_2O (9 ml.) and one of lanthanum (10 ml.).

The spectrometer is then adjusted for a wavelength of 4607.3 Å and a slit width of 200 microns. Its voltage is set at 560 volts and the range at 10^{-8} amperes.

At this point, gas (either H_2 or O_2) is released from the tanks, and the flame is lighted. The standing solutions are then placed, in any order, beneath a small tube extending downward from the burner allowing the solutions to be aspirated upward into the flame. Each solution is changed whenever the signal on the recorder is steady. Finally, the hydrochloric solutions containing the dissolved bone are added, and the readings are taken.

Following are presented the results of a strontium analysis of ten burials from Couper Field and Taylor Mound.

Table 15

Results of Strontium Analysis of Taylor Mound and Couper Field

Couper Field		Taylor Mound	
Burial	Mg/kg Sr	Burial	Mg/kg Sr
1	208.000	3	34.50
2	223.30	5	134.00
3	225.80	6	74.30
5	94.80	7	134.00
6	146.00	10	68.80
	$\overline{X}$ = 179.58		$\overline{X}$ = 89.12
	Odocoileus virginianus (white-tailed deer, herbivore)		= 149.00

To examine whether or not the difference between the mean amounts (in mg./kg. or ppm.) of stable strontium present in the two sites is statistically significant, we shall use Fisher's F Test for the analysis of variance, a statistical test frequently used when testing hypotheses of correlation between one nominal and one interval scale. As a first step, it is necessary to calculate eta squared (η^2), a measure of association between the two scales. The formula is as follows:

$$\eta^2 = \frac{\sum_{j=1}^{k} n_j(\overline{Y}_j - \overline{Y})^2}{\sum_{i=1}^{n} (Y_i - Y)^2}$$

where nj = the number of observations in a subgroup (5), $\overline{y}$j = the mean of a subgroup (179.58 and 89.12), $\overline{y}$ = the grand mean (134.35), k = the number of subgroups (2), y_i = a score on the internal scale (the values for the burials), and N = the total number of observations (10). Thus,

$$\eta^2 = \frac{(5)(2045.75) + (5)(2045.75)}{41272.50}$$

and

$$\eta^2 = .50$$

With this value of η^2, we may now calculate F as follows:

$$F = \left(\frac{\eta^2}{1-\eta^2}\right)\left(\frac{N-K}{K-1}\right)$$

$$F = \left(\frac{.50}{.50}\right)\left(\frac{8}{1}\right)$$

and

$$F = 8.0$$

Given the above (N-K) and (K-1) values, a value of F greater than 5.32 is statistically significant (α = .05). The probability of a difference between the means as great as that between the Taylor Mound and Couper Field mean strontium values occurring as a result of chance or sampling variation alone is five out of 100. We may therefore conclude that the difference is statistically significant, and will now turn to the problem of its techno-environmental significance.

The fact most crucial for evidence of a shift in subsistence patterns is this marked decrease in mean strontium absorbtion. It is evident from the greater concentration of historic material in the ceremonial mound (discussed in Chapter III), as well as from the ceramic evidence to be discussed in the following chapter, that Taylor Mound is later than Couper Field and that we are, therefore, dealing with a decline in mean strontium absorption through time. Superficially, this might simply mean that we are progressing from a more horticulturally-based society to one relying primarily upon hunting, but more close examination of the readings reveals that this is not the case.

Among the Couper Field burials, there were three instances of readings noticeably higher than the primary consumer level, represented by the white-tailed deer. This does not occur in the Taylor Mound sample. Further, stable strontium characteristically is drained to the sea in coastal situations as part of the biogeochemical cycle, where it is concentrated in large amounts in bones, shells, and tissues of mollusca and other marine fauna (Howard T. Odum, personal communication). The consequènces of this process were readily noted in the uniformly high concentrations of strontium in all species (whether terrestrial or marine) that were taken from the shellfish matrix of level IIB. The results of this analysis are presented in Table 16.

Table 16

Sr Concentrations of Fauna in Levels IIB and IIA

Faunal specimen/level	Sr (ppm)
Bagre marinus (IIB)	312.00
Aridae (IIB)	300.00
Scianidae (IIA)	280.00
Odocoileus virginianus (IIA)	280.00
Malaclemys terrapin (IIB)	268.00
Pogonias (IIB)	260.00
$\bar{X}$ = 283.00 mg/kg (ppm)	

In view of the findings in Table 16, the most reasonable interpretation of Table 15 would be to see it as evidence of a change from a marine-oriented, fishing-and-shellfishing economy (with consequently high strontium readings) to one that is pronouncedly horticultural.

The low double-digit values in both sites are also of interest, since in all but one case (Burial 10, Taylor Mound) they are associated with male burials. Since these values are lower than that for a known herbivore, they likely represent more pronounced consumption of animal rather than plant foot (i.e. hunting activities). It is thus not unreasonable to suggest that the procurement of deer continued apace, paralleling the technological shift from a hunting-fishing-and-collecting to a horticultural economy.

One final method of investigating aboriginal subsistence patterns was the examination of ethnobotanical materials. We will deal with the results of these investigations in the section which follows.

Ethnobotanical Analyses

Since virtually all of the investigations discussed above (i.e., archeological, zooarcheological, ethnohistorical, biochemical) provided evidence for the existence of aboriginal horticulture, it was of considerable interest to see if any direct evidence could be found. With this in mind, an ethnobotanical sampling procedure was devised and put into operation at the northern part of Couper Field.

The first procedure involved the column sample discussed in the first two sections of this chapter. It was hypothesized that if crops were being cultivated in the area, then remains of the cultigens would be found in soil of the midden. For this reason, plastic was placed underneath a motorized screen to retain the soil for analysis. The soil was bagged in the field and labelled (IIA or IIB) according to provenience. Once at the field laboratory, the soil was flushed with water through a 1/8" mesh screen, and the remaining residue was rebagged and labelled, and returned to the Florida State Museum, University of Florida, for chemical flotation.

The first step of the chemical flotation analysis was the drying out of the residue, in accord with Stuart Streuver's suggestion that chemical separation techniques will be dysfunctional unless the residue is first dried (Streuver 1968:355). To accomplish this, the residue was placed in trays under photographic lamps and periodically stirred with a trowel. Once dried, it was subjected to chemical flotation.

Chemical flotation utilized a solution of Technical Grade zinc chloride ($ZnCl_2$) with a specific gravity of 1.62. The solution was prepared in a large plastic container. The container was filled with 6 liters solution, with 430 g. of $ZnCl_2$ per liter of water. This strength was used for both IIA and IIB, while a stronger solution of 860 g./liter was used for IIB alone. Residue was added to the $ZnCl_2$ solution. Shell fragments sank to the bottom, while plant remains and small animal bones floated to the top. These were removed with a tea strainer, allowed to dry, and examined microscopically for the presence of seeds (Streuver 1968:353-362).

A supplementary ethnobotanical technique was applied to the food pits located in the tan sterile sand beneath the plow zone in the northern part of Couper Field. In this instance, the soil from the pits was placed upon a 1/8" mesh screen and all visible seeds and plant remains were removed by hand-sorting and placed in vials labelled according to provenience. The contents of these vials were subsequently submitted to the herbarium of the Department of Forestry at the University of Florida for genera and species identification.

Results of the chemical separation procedure were negative. There is no evidence that the midden in north Couper Field from which the column sample was taken was anything other than a refuse pile for shellfish and animal bone. The food pits immediately south of the midden, however, provided specific evidence of an edible plant (the black-eyed pea, or cow pea). The relevant features and their ethnobotanical contents are presented in Table 17.

Table 17

Ethbotanical Results/North Couper Field

Field Specimen	Content	Common Name	Food Status
111	*Polygonum sp.*	Knotweed	Possible medicinal use
118	*Celtis sp.*	Hackberry	Possible medicinal use; raw but astringent
120	*Vigna sp.*	Black-eyed pea or cow pea	Edible

Subsistence Analyses: Conclusions

In attempting to determine the nature and extent of the various coastal resources utilized by the protohistoric Guale, four separate investigatory techniques were used: zooarcheological analysis, malacological analysis, spectrochemical analysis, and ethnobotanical analysis. The results of the investigations are summarized below.

Zooarcheological Results

Analysis of a column sample of midden animal bone material provided evidence (in terms of usable meat per individual) that the coastal tribes were concentrating upon Atlantic sturgeon and the white-tailed deer. Supplementary species, although of much less dietary importance, were in every instance marine fauna. Most suggestive of a technological change was an overall decline in animal biomass (measured in total osseous weight) of 86%. A pronounced shift away from hunting-and-fishing technology is one possible explanation for this decline.

Malacological Results

Analysis of a column sample of marine shellfish provided evidence of a general decline in shellfish collecting activities as well as evidence of a decreased utilization of a beach and tidal creek environment. Virginia oysters, constituting 99% of the sample, underwent a 21% decrease (measured in terms of shell weight) from one level to another. Further, all other pronounced changes in species weight were also negative (e.g. declines of 45%, 49%, 97%), and were, in all cases, characteristic of species associated with a beach-and-dune or tidal creek environment. A decreased emphasis upon marine resources, is one possible implication of these results.

Spectrochemical Results

The stable strontium content of Taylor Mound and Couper Field burials was compared with amounts present in a known herbivore and marine fauna present within a shellfish matrix. Taylor Mound burials were similar to the herbivore level, while Couper Field burials were much higher than this level. The difference was statistically significant at the .05 confidence level. The only food pyramid so far analyzed that contains more Sr than terrestrial herbivores is that of marine fauna. The implication is a dietary emphasis of the Couper Field sample upon maritime resources, while the Taylor Mound sample was characterized by an emphasis upon plant food in the diet. Since Taylor Mound is later in time, this would represent a shift from a marine-resource economy to a plant-consuming economy at about the time of European contact.

Ethnobotanical Results

Zinc chloride chemical flotation of residue taken from a column sample of midden material produced negative results. Hand-sorting of seeds taken from food pits beneath the plow zone and intrusive into sterile sand, however, provided direct evidence of aboriginal edible plants.

Altogether, the separate subsistence analyses seem to have good fit with one another, and support as well the ethnohistorical descriptions of an aboriginal society characterized by increasing reliance upon a horticultural subsistence base at the time of European contact. There are, however, a number of cautionary observations that should be made regardint the analytical techniques discussed above.

Concerning the zooarcheological and malacological data, it is important to note that a considerable time expenditure was involved in the analysis of only 3m x 6m x .50m block of midden material, and that if a large number (e.g. 20) of middens had been similarly analyzed, the time involved would have virtually prohibited all other supplementary investigations. This necessary limitation of sample unit and sample size, however, is not without its associated problems. Most significant of these are the difficulties of specialized middens and differential rates of deposition. Thus, there always exists the possibility that one has investigated a dumping area used primarily after fishing and shellfishing expeditions or one used on return from a high-hammock hunting expedition, etc. Further, there is the problem of midden heaps not accumulating uniformly, but periodically on one side, later in another. Decreases in biomass must always be understood as having been possibly affected, if not entirely caused by differential rates of midden deposition (Ziegler 1973:10-14).

With regard to ethnobotanical analyses, it should be emphasized again that only the seeds that were visible to the naked eye were retained from the food pits (although the residual material from the chemical flotation was microscopically examined). Given sufficient time and personnel for microscopic analysis of soil samples, it seems likely that additional edible species would be found. Taxonomic identification of plants from their seeds is, however, a specialty all its own (and is not always a simple matter for a trained botanist), thus presenting an important obstacle for any archeologist involved with the problem of prehistoric dietary reconstructions. (Dan Ward, Herbarium, University of Florida Department of Forestry and Resources Conservation, personal communication).

Also, we should observe that the spectrochemical technique discussed above has not yet been widely used in archeological investigations, and is subject to a number of difficulties, some of which are only now becoming apparent. A major theoretical problem is the possibility of strontium analysis producing results which indicate exactly the opposite of what was actually happening "on the ground." It has been suggested that the slash-and-burn techniques commonly associated with technologically primitive agriculture would accelerate the leaching of humic acids and decrease the amount of stable strontium present in the soil. More specifically, the acids are seen as combining with the Sr to form a hetereocyclic, ring-structured compound known as a chelate, which should subsequently be removed in the normal functioning of the biogeochemical cycle. The ultimate result would be, then, an inverse relation between amount of ingested Sr and extend of horticultural subsistence activities, directly contrary to expectation. A wider application of the analytical technique to archeological sites characterized by a fully agricultural subsistence base would have to be conducted before the possiblity of this problem could be dismissed from any serious methodological consideration (Seymour Block, Univeristy of Florida Department of Chemical Engineering, personal communication).

Finally, the possibility of postmortem sample contamination deserves to be noted. In the present investigation, a comparison of a terrestrial species from a sand matrix context with the same species taken from a shellfish midden (i.e. Odocoileus virginianus, white-tailed deer, 149 vs. 280 mg./kg.) in addition to the uniformly high, clustered values for all species contained within the midden, both imply that the latter matrix is responsible for postmortem combination of the sample. This, of course, had its own possibilities for cultural interpretations when examining the human skeletal material: high values for Couper Field burials could be diagnostic of more extensive fishing and shellfishing activities, resulting ultimately in higher Sr concentrations within the human bones. But the problem of the matrix remains. More investigations will have to be conducted in which species-by-species comparisons are made for shellfish matrix versus soil matrix to determine empirically if the former contest inevitably results in a negative skewing of Sr values for all the animal species it contains. The result might possibly be the inapplicability of the method of archeological situations characterized solely by a shellfish matrix (e.g. the "shellfish Archaic"). But more work must be done before we know.

Nevertheless, the findings of the various subsistence analyses seem to accord well with one another and with the earlier discussed ethnohistorical materials. Ultimately, they serve to reinforce our picture of a coastal hunting, fishing, and shellfishing society extending its agricultural activities most pronouncedly at the time of early European contact.

CHAPTER VIII

CERAMIC ANALYSIS AND SITE CHRONOLOGICAL SEQUENCE

Introduction

Ceramic analysis has been extensively criticized for having been a penchant if not an obsession, of most archeologists—often to the exclusion of the responsibility of sociocultural explanation (Harris 1968:683-684, Steward and Seltzer 1938:5-7). Fortunately, one does not have to explore the details of the "old" versus "new" archeology controversy to appreciate the continuing importance of ceramic analysis. The general reasons for its relevance relate to the necessity of explanation as fully as to the necessity of description—and were probably most succinctly stated in the lecture notes and writings of Ferdinand de Saussure nearly a century ago. De Saussure, a structural linguist, frequently impressed upon his students the necessity of recognizing the difference between synchronic and diachronic phenomena as a prerequisite to scientific explanation. "Certainly," he stated,

> all sciences would profit by indicating more precisely the coordinates along which their subject matter is aligned. Everywhere distinctions should be made between (1) <u>the axis</u>

> <u>of simultaneities</u> which stands for the relations of coexisting things and from which the intervention of time is excluded; and (2) <u>the axis of successions</u>, on which only one thing can be considered at a time but upon which are located all the things on the first axis together with their changes. For a science concerned with values the distinction is a practical necessity and sometimes an absolute one. In these fields scholars cannot organize their research rigorously without considering both coordinates and making a distinction between the system of values per se and the same values as they relate to time (De Saussure 1959:79-80; translation of lecture notes 1906-1911, emphasis in original).

This distinction is crucial for archeological analysis. If different types of burial practice are diachronic (i.e. sequential) then we may entertain hypotheses concerning a given society altering its burial patterns throughout time (e.g. changing environmental influences, acculturation, etc.). If, however, the differences are synchronic (i.e. contemporaneous), then hypotheses of a different order (i.e. ranking differences, class differences) may be pursued. It should be noted, in passing, that this distinction is rarely, if ever, a sharp one. Burial practices to return to our example, rarely succeed one another as perfectly as beads on a string, nor do they, conversely, all begin with perfect simulaneity. There is generally synchronic and diachronic "overlap," and practicality requires that one demonstrate a <u>general tendency</u> rather than discrete categorization, when seeking chronological justification for the nature of one's cultural explanations. This is the problem we will pursue in this chapter, through the use of a statistical methodology.

The major steps involved in approaching the problem were the following: 1) the viewing of random samples of pottery taken from the three sites discussed earlier, 2) the creation of arbitrary distinctive features of design and temper, 3) the classification of all pottery fragments from all the sites according to their observed distinctive features, 4) the construction of contingency tables for each site, for the variables of design and temper, 5) the statistical determination of the types at each site, and 6) the arrangement of all identified types into a histogram (i.e. seriation) to determine the chronological sequence as well as the general synchronicity or diachronicity of the sites investigated.

In all, the ceramics of three different sites were subjected to this type of analysis. They included North Couper Field, the area from which the faunal and malacological column sample was taken, South Couper Field, where the mortuary burial complex was located, and Indian Field, in which the pavilion structure with associated burials was found. In the case of Taylor Mound, since only the "pottery cache" (probably deposited at the time of the mound's completion) was subjected to analysis, only the first four steps described above were applied, since sample variation prohibited the use of the last two analytical procedures.

The dimensions chosen for analysis were design and temper. The first variable was subdivided into six nominal categories which appeared to be exhaustive: plain, check-stamped, card-marked, cob-marked, rectilinear complicated-stamped, and curvilinear complicated-stamped. Temper was divided only into sherd or grit. The result was 6 x 2 = 12 possible attribute (distinctive feature) combinations per site, each of which constituted a possible "type" (Spaulding in Deetz 1971:49-50).

Tables 19 to 22 present the resulting contingency tables for the four different sites.

Three of the listed sites have a sample size sufficiently large to permit the statistical determination of ceramic types: Indian Field and the north and south sectors of Couper Field. These three sites will be analyzed through the use of two different statistical techniques. First, we shall compute chi-square to determine whether or not the observed frequencies in the table are significantly different from their expected frequencies. Put another way, we are utilizing a statistic "that is sensitive to any systematic departure from independence or total nonpredictability" (Freeman 1965:215). Our second step will be the identification of the specific cells of the contingency table in which the significant departure is occurring. This will involve the use of Binomial Proportion Analysis, and will serve to identify the ceramic types of the archeological site in question. We will illustrate the two methods below with the ceramic frequencies of Indian Field (see Table 19).

Chi-Square

The problem of departure from nonpredictability of Indian Field ceramic frequencies will involve Pearson's chi-square (X^2), for which the formula is

$$\frac{\Sigma(f_o - f_e)^2}{f_e}$$

where f_o is observed frequency and f_e is expected frequency, for any particular cell. These latter frequencies may be calcuated in the following manner. Given a contingency table such as the following,

	X_1	X_2	X_3	
Y_1	(a)	(b)	(c)	a + b + c
Y_2	(d)	(e)	(f)	d + e + f
	a + d	b + e	c + f	N

then $f_{e(a)} = (a+b+c)(a+d)/N$. Expected frequencies of all other cells may be calculated in this way, through the use of the two marginal totals that "intersect" the particular cell in question. The following are the relevant values for a X^2 calculation at Indian Field (Table 18).

Table 18

Chi-Square Calculations for Indian Field

Cell	f_o	f_e	f_o-f_e	$(f_o-f_e)^2$	$(f_o-f_e)^2/f_e$
a	97	141.51	-44.51	1981.14	14.00
b	16	15.45	.55	.30	.02
c	160	146.73	13.27	176.09	1.20
d	4	5.35	-1.35	1.82	.34
e	25	14.85	10.15	103.02	6.94
f	39	23.76	15.24	232.26	9.78
g	130	92.14	37.86	1433.38	15.56
h	10	10.55	-.55	.30	.05
i	87	100.26	-13.26	175.83	1.75
j	5	3.65	1.35	1.82	.50
k	0	10.15	-10.15	103.02	10.15
l	1	16.24	-15.24	232.26	14.30
					$\Sigma = 74.59(X^2)$

Entering a X^2 table for five degrees of freedom (no. of rows - 1)(no. columns - 1), we find that our value of 74.59 is significant at the .01 level. We will now investigate cells in which nonrandom frequencies are believed to exist, using the method of binomial proportions.

Binomial Proportion Analysis

Binomial proportion analysis is one method of determining statistically the specific cells in which the differences between observed and expected frequencies is too great to be the result of chance or sample variation.[1] Basically it involves the paired comparison of every cell with every other cell in a 2 x n contingency table. It should be emphasized that the method is only applicable to tables of this nature. Given a situation in which both variables consist of more than two nominal categories, other contigency-table techniques should be applied.

To illustrate the method, we may begin with a table such as the one that follows:

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[1] I am grateful to Richard L. Schaeffer, Associate Professor of Statistics, and Zoran R. Pop-Stojanovic, Professor of Mathematics (both of the University of Florida) for their assistance with the following presentation.

		Variable Two				
		C	D	E	F	
Variable One	A	f_{AC}	f_{AD}	f_{AE}	f_{AF}	n_5
	B	f_{BC}	f_{BD}	f_{BE}	f_{BF}	n_6
		n_1	n_2	n_3	n_4	N

The first step in the method would be to investigate the possibility that the frequency of AC (F_{AC}) is significantly large. (This is a matter of convenience; one can, of course, begin with any cell.) To do this, we will find the proportion value (p) of AC. This is f_{AC}/n_1, and is simply a percentage. We may symbolize it as P_{AC}. The proportion value of BC, then, is simply $1-P_{AC}$. In the same manner, the P and 1-P values for AD and BD, respectively, are computed. We are now prepared to compare AC with AD. The formula for this would be as follows:

$$Z = \frac{\frac{f_{AC}}{n_1} - \frac{f_{AD}}{n_2}}{\sqrt{\frac{\frac{f_{AC}}{n_1}\left(1 - \frac{f_{AC}}{n_1}\right)}{n_1} + \frac{\frac{f_{AD}}{n_2}\left(1 - \frac{f_{AD}}{n_2}\right)}{n_2}}}$$

Simplifying this to a general formula, our statistic is:

$$Z = \frac{P_1 - P_2}{\sqrt{\frac{P_1(1 - P_1)}{n_1} + \frac{P_2(1 - P_2)}{n_2}}}$$

This procedure would be followed in comparing every cell with every other cell within the table. The Z value that results from each comparison may be checked against a table of normal curve areas. For an α of .05 $Z > 1.96$ is used, while for $\alpha = .01$ one uses $Z > 2.58$. Any cell that is thus statistically significant in a majority of such paired comparisons (i.e., 6, in the present investigation) may be arbitrarily defined as a ceramic type. As a final note on the method, only positive values are important. Negative values (including significant ones) result from the proportion of the cell in question (p_1) being smaller than the proportion of the cell with which it is compared (p_2). This would occur as a pattern if the frequency in the p_1 cell were relatively low, meaning ultimately that negative values are diagnostic of low-frequency attribute combinations.

As an actual illustration of the method, the "plain grit" with "check grit" paired comparison for Indian Field is done as follows:

P_1 = proportion plain grit

P_2 = proportion check grit

Thus, $P_1 = \frac{97}{227} = .427$, and $1-P_{\cdot} = .573$;

$P_2 = \frac{16}{26} = .615$, and $1-P_2 = .385$.

Then, $$Z = \frac{.427 - .615}{\sqrt{\frac{.427(.573)}{227} + \frac{.615(.385)}{26}}}$$

and $Z = -1.90$.

Thus, "plain grit" is not significantly large in comparison with "check grit." In all, eleven such paired comparisons must be done to establish the status of "plain design, grit temper" as a statistically defined ceramic type. Total comparisons, for a table with K cells, are equal to K(K-1) /2, which, for Indian Field, is 12(11)/2 or 66 calculations.

In all, three different sites were examined by this method: Indian Field, North Couper Field, and South Couper Field. Taylor Mound was characterized by a sample size too small for the binomial proportion method of analysis. Generally speaking, the method should only be used in samples sufficiently large for chi-square. Results of the analyses are summarized in the tables following. Z-values for each attribute are to be read horizontally; significance levels are cited below the tables.

Having thus determined, by binomial proportion analysis, the ceramic attribute combinations that are statistically significant, we will determine the site chronological sequence through the seriation of these ceramic

Table 19

Attribute Combinations for Indian Feild*

Temper	Design						
	Plain	Check	Cord	Cob	Recti Comp	Curvi Comp	
Grit	97/.17	16/.03	160/.28	4/.01	25/.04	39/.07	341/.59
Sherd	130/.23	10/.02	87/.15	5/.01	0/0.00	1/.01	233/.41
	227	26	247	9	25	40	574

*Decimal expressions are percentage total sherds.

Table 20

Attribute Combinations for South Couper Field*

Temper	Design						
	Plain	Check	Cord	Cob	Recti Comp	Curvi Comp	
Grit	133/.10	133/.10	376/.28	41/.03	50/.03	127/.09	860/.64
Sherd	152/.11	68/.05	207/.15	45/.03	2/.01	11/.01	485/.36
	285	201	583	86	52	138	1345

*Decimal expressions are percentage total sherds.

Table 21

Attribute Combinations for North Couper Field*

Temper	Design						
	Plain	Check	Cord	Cob	Recti Comp	Curvi Comp	
Grit	136/.25	26/.25	63/.12	7/.01	120/.22	108/.20	460/.84
Sherd	32/.06	21/.04	3/.01	5/.01	14/.03	10/.02	85/.16
	168	47	66	12	134	118	545

*Decimal expressions are percentage total sherds.

Table 22

Attribute Combinations for Taylor Mound*

Temper	Design						
	Plain	Check	Cord	Cob	Recti Comp	Curvi Comp	
Grit	145/.33	0/0.00	0/0.00	0/0.00	149/.35	137/.32	431/1.00
Sherd	0/0.00	0/0.00	0/0.00	0/0.00	0/0.00	0/0.00	0/0.00
	145	0	0	0	149	137	431

*Decimal expressions are percentage total sherds.

Table 23

Binomial Proportion Analysis for Indian Field (Z Values)

	Pl gr	Pl sh	Ck sr	Ck sh	Cor gr	Cor sh	Cob sr	Cob sh	Rec gr	Rec sh	Cur gr	Cur sh
Pl gr	——	-35000	-1.90	.500	- 5.00	.186	- .061	- .778	-2.82	2.12	- 1.41	-1.062
Pl sh	35000	——	- .500	1.90	- .186	5.00	.778	.061	-2.12	2.82	1.062	1.41
Ck gr	1.90	.500	——	1.85	- .0003	-2.73	.950	.320	-1.73	2.82	- 3.71	6.19
Ck sh	-.500	-1.90	-1.86	——	2.73	.0003	- .320	- .950	-2.82	1.73	- 6.19	3.71
Cor gr	5.00	.186	.0003	-2.73	——	7.14	1.26	.540	-1.73	3.22	- 8.92	17.03
Cor sh	-.186	-5.00	2.73	- .0003	- 7.14	——	- .540	-1.26	-3.22	+1.73	-17.03	8.92
Cob sr	.061	- .778	- .950	.320	- 1.26	.540	——	- .517	-2.16	1.69	- 3.25	2.53
Cob sh	.778	- .061	- .320	.950	- .540	1.26	.517	——	-1.69	2.16	- 2.53	+3.25
Rec sr	2.82	2.12	1.73	2.82	1.73	3.22	2.16	1.69	——	3.53	.010	4.88
Rec sh	-2.12	-2.82	-2.82	-1.73	- 3.22	-1.73	-1.69	-2.16	-3.53	——	- 4.88	- .010
Cur sr	1.41	-1.062	3.71	6.19	8.92	17.03	3.25	2.53	- .010	4.88	——	30.97
Cur sh	1.062	-1.41	-6.19	-3.71	-17.03	-8.92	-2.53	-3.25	-4.88	.010	-30.97	——

χ^2 value, Indian Field: 74.59. $\alpha_{.05} = 11.07$, $\alpha_{.01} = 15.09$, 5 d.F.

Z Significance Levels: $\alpha_{.05}$, $Z = 1.96$; $\alpha_{.01}$, $Z = 2.58$

Table 24

Binomial Proportion Analysis for North Couper Field (Z Values)

	Pl gr	Pl sh	Ck gr	Ck sh	Cor gr	Cor sh	Cob gr	Cob sh	Rec gr	Rec sh	Cur gr	Cur sh
Pl gr	——	14.76	3.38	4.55	- 3.5	19.00	1.58	2.67	2.31	18.21	2.82	18.72
Pl sh	-14.76	——	-4.55	-3.38	-19.00	3.5	-2.67	- 1.58	-18.21	2.31	-18.72	2.82
Ck gr	- 3.38	4.45	——	1.00	- 5.33	6.67	- .19	.82	- 4.67	6.00	- 4.93	6.27
Ck sh	- 4.55	3.38	-1.00	——	- 6.67	5.33	- .82	.19	- 6.00	4.67	- 6.27	-4.93
Cor gr	3.5	19.00	5.33	6.67	——	24.32	2.55	3.66	1.39	23.61	.83	24.17
Cor sh	-19.00	- 3.5	-6.67	-5.33	-24.32	——	-3.66	- 2.55	-23.61	- 1.39	-24.17	- .83
Cob gr	- 1.58	2.67	.19	.82	- 2.55	3.66	——	.20	- 2.21	3.31	- 2.34	3.45
Cob sh	- 2.67	1.58	- .82	- .19	- 3.66	2.55	- .20	——	- 3.31	2.21	- 3.45	2.34
Rec gr	2.31	+18.21	4.67	6.00	- 1.39	23.61	2.21	3.31	——	22.86	- .57	23.43
Rcc sh	-18.21	- 2.31	-6.00	-4.67	-23.61	1.39	-3.31	- 2.21	-22.86	——	-23.43	.57
Cur sr	2.82	18.72	4.93	6.27	- .83	24.17	2.34	3.45	.57	23.43	——	24.00
Cur sh	-18.72	- 2.82	-6.27	-4.93	-24.17	.83	-3.45	- 2.34	-23.43	- .57	-24.00	——

X^2 value, N. Couper Field: 51.28, $\alpha_{.05} = 11.07$, $\alpha_{.01} = 15.09$, 5 d.F.

Z Sigificance Levels: $\alpha_{.05}$; $Z = 1.96$; $\alpha_{.01}$, $Z = 2.58$

Table 25

Binomial Proportion Analysis for South Couper Field (Z Values)

	Pl gr	Pl sh	Ck gr	Ck sh	Cor gr	Cor sh	Cob gr	Cob sh	Rec gr	Rec sh	Cur gr	Cur sh
Pl gr	——	1.43	3.96	.625	- 4.59	.270	- .163	- .82	-12.25	10.75	-12.16	10.54
Pl sh	- 1.43	——	- .625	3.96	- .270	4.59	.82	.163	-10.75	12.25	-10.54	12.16
Ck gr	3.96	.625	——	4.07	.45	4.55	2.73	2.12	- .64	1.33	- 5.91	13.18
Ck sh	- .625	-3.96	- 4.07	——	- 4.55	-.45	-2.12	-2.73	- 1.33	.64	-13.18	5.91
Cor sr	4.59	.270	- .45	4.55	——	5.63	2.76	2.07	- 9.14	17.14	- 8.75	17.5
Cor sh	- .270	-4.59	- 4.55	.45	- 5.63	——	-2.07	-2.76	-17.14	9.14	-17.5	8.75
Cob gr	.163	- .82	- 2.73	2.12	- 2.76	2.07	——	- .53	- 8.00	7.33	- 7.46	6.78
Cob sh	.82	- .163	- 2.12	2.73	- 2.07	2.76	.53	——	- 7.33	8.00	- 6.78	7.46
Rec gr	12.25	10.75	.64	1.33	9.14	17.14	8.00	7.73	——	24.21	1.11	24.44
Rec sh	-10.75	-12.25	- 1.33	- .64	-17.14	-9.14	-7.33	-8.00	-24.21	——	-24.44	- 1.11
Cur gr	12.16	10.54	5.91	13.18	8.75	17.5	7.46	6.78	- 1.11	24.44	——	25.45
Cur sh	-10.54	-12.16	-13.18	-5.91	-17.5	-8.75	-6.78	-7.46	-24.44	1.11	-25.45	——

X^2 value, S. Couper Field = 134.04. $\alpha_{.05}$ = 11.07, $\alpha_{.01}$ = 15.09, 5 d.F.

Z Significance Levels: $\alpha_{.05}$, Z = 1.96; $\alpha_{.01}$, Z = 2.58

Table 26

Indian Field Ceramic Typology

Combination	Frequency significant $\alpha_{.05}$	Frequency significant $\alpha_{.01}$
Significant Attribute Combinations		
Rectilinear complicated-stamped, grit temper	7	5
Curvilinear complicated-stamped, grit temper	8	7
Intermediate Combinations (Significant in Minority of Comparisons)		
Cord-marked, grit temper	4	4
Plain, sherd temper	3	3
Check-stamped, grit temper	2	2
Check-stamped, sherd temper	2	2
Cord-marked, sherd temper	2	2
Cob-marked, sherd temper	2	1
Cob-marked, grit temper	1	-
Plain, grit temper	1	-
Significant in 0 Comparisons		
Rectilinear complicated stamped, shered temper		
Curvilinear complicated stamped, sherd temper		

Table 27

North Couper Field Ceramic Typology

Combination	Frequency significance $\alpha_{.05}$	Frequency significance $\alpha_{.01}$
Significant Attribute Combinations		
Curvilinear complicated stamped, grit temper	9	8
Cord-marked, grit temper	9	8
Rectilinear complicated stamped, grit temper	9	7
Plain, grit temper	7	7
Intermediate Combinations (Significant in Minority of Comparisons)		
Check stamped, grit temper	4	4
Check stamped, sherd temper	4	4
Cob marked, grit temper	4	5
Plain, sherd temper	3	2
Cob marked, sherd temper	3	-
Significant in 0 Comparisons		
Cord marked, sherd temper		
Cuvilinear complicated stamped, sherd temper		
Rectilinear complicated stamped, sherd temper		

Table 28

South Couper Field Ceramic Typology

Combination	Frequency significant $\alpha_{.05}$	Frequency significant $\alpha_{.01}$
Significant Attribute Combinations		
Curvilinear complicated stamped, grit temper	10	10
Rectilinear complicated stamped, grit temper	8	8
Cord-marker, grit temper	7	6
Check-stamped, grit temper	6	5
Intermediate Combinations (Significant in Minority of Comparisons)		
Plain, sherd temper	4	4
Cob-marked, sherd temper	4	4
Cob-marked, grit temper	4	2
Plain, grit temper	2	2
Cord-marked, sherd temper		
Check-stamped, sherd temper	1	1
Significant in 0 Comparisons		
Rectilinear complicated stamped, sherd temper		
Curvilinear complicated stamped, sherd temper		

types. Additionally, it will be possible through visual inspection of the seriation to determine the relative synchronicity or diachronicity of the sites investigated. Essentially, this involves noting whether or not similar type percentages are observed at the sites in question. If this is the case, then the horizontal "strip" or percentages for one such site could be interchanged with the horizontal strip for another such site without significant disturbance of the appearance of the histograms within the seriation.

As a final note we wish to point out that the attribute combinations of the above methodology are not intended to replace in archeological discourse the conventional ceramic labels for the Georgia coastal strand, but rather to provide them with a more extensive quantitative substantiation. In this regard, we believe that our own statistically-based labels could be related as shown below to the types of the traditional nomenclature.

The seriation of the three sites according to percentages of the five significant types (i.e., significant at one or more of the sites) is provided below. Inspection of the five histograms provides us with both a site chronological sequence and evidence of the general synchonicity of the sites discussed at length in earlier chapters. This latter aspect is evident in the comparison of South

Table 29

Alternative Designations for
Statistically-Based Ceramic Types*

Rectilinear complicated-stamped, grit temper	San Marcos complicated-stamped
Curvilinear complicated-stamped, grit temper	Pine Harbor complicated-stamped
Cord-marked, grit temper	Savannah fine cord marked
Check-stamped, grit temper	Savannah fine check-stamped
Plain, grit temper	Savannah plain

*The equivalency is based upon ceramic descriptions provided in The Irene Mound Site: Chattam County, Georgia (Caldwell and McCann 1941) and discussions with Jerald T. Milanich, University of Florida, July, 1975.

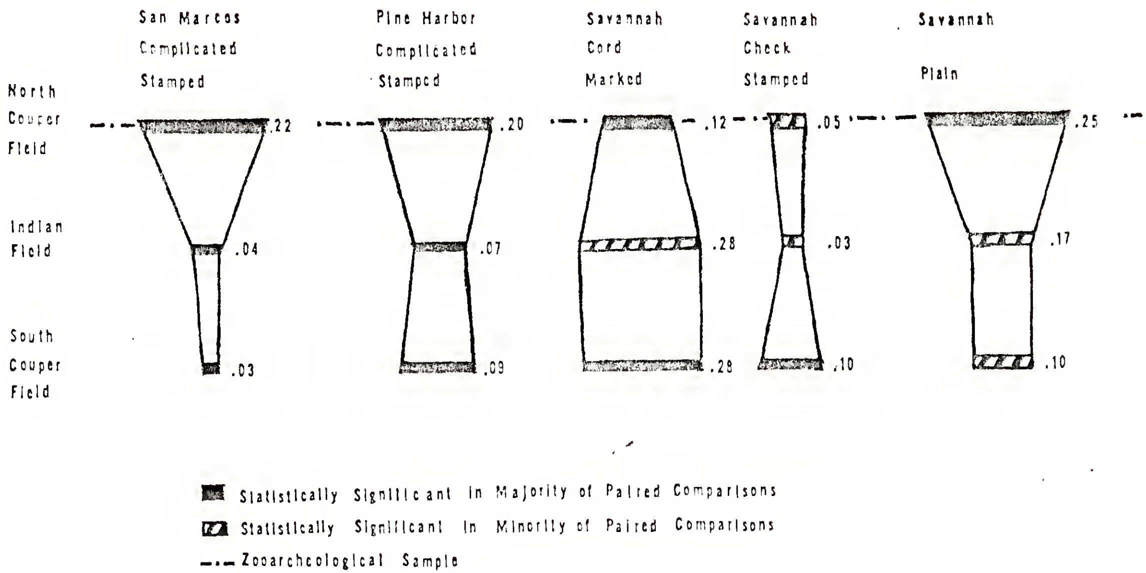

Figure 48. Ceramic Seriation and Site Chronological Sequence

Couper Field with those of Indian Field. The ratio for Indian Field percentages (reading horizontally) is .04/.07/.28/.03/.17, while for South Couper Field it is .03/.09/.28/.10/.10. This similarity results in a near interchangeability of the Indian Field percentage strip with that of South Couper Field. The direct sociocultural implication is the close contemporaneity of these two sites: the same types of pottery were being manufactured in approximately the same relative amounts. The rest is a matter of deductive logic. Analyses of the burial complexes at Taylor Mound and South Couper Field, as well as ethnohistorical information relating to ossuary and ceremonial mound structures and their significance, both provided evidence of the general contemporaneity of these two sites. Ceramic evidence, on the other hand, indicates the contemporaneity of South Couper Field with Indian Field. Thus, the three sites are generally synchronic, and may therefore be utilized (as we have done above) in the testing of hypotheses regarding a single sociocultural population.

In all the preceding, we have been concerned with the procedures, the findings, and the limitations of our various lines of investigation. In our next and final chapter, we shall attempt to synthesize the results of our inquiry into integrated sociocultural picture. While some of these results are admittedly tenuous, we are nonetheless hopeful that we have provided a moderately integrated ethnographic outline of the Georgia coastal tribes at the onset of European contact.

CHAPTER IX

SOCIOCULTURAL CONCLUSIONS—A SYNOPSIS

In this final chapter a synopsis of sociocultural conclusions is presented. Since the lines of evidence, their respective problems, and consequent degrees of reliability have been the subject of seven of the previous chapters, they will not be discussed again here. In the following summary then, it should be borne in mind that, while many of the statements made are epistemologically "more equal than others," all must nevertheless be presented in order to produce an integrated account. The following, then, is the tentative concluding reconstruction of the social organization of the Guale.

At the time of European contact, the Guale Indians inhabited the region between the St. Mary's River and the Savannah River, an area commonly referred to as the "Golden Isles" or the Georgia coastal strand, as well as the adjacent inland areas. In all, the territory they occupied extended an unknown distance inland and between 75 and 100 miles along the coast. This region is characterized by multiple (and highly different) habitats: the inland pine forest that borders the tidal flats, the inland river valley forests, the tidal flats themselves, the high-hammock forest of the barrier islands, and the beach-and-dune habitat on the eastern side of the island chain.

The coastal position (as well as the midden heaps left behind) would seem to indicate that much of the aboriginal technology centered around the procurement of shellfish, but such specialization was not in fact the case. More than anything else, the Guale were a hunting, collecting, and fishing society practicing an incipient cultivation of maize and other cultigens (such as peas), a cultivation which was becoming more extensive at the time of European contact. This technological system, moreover, involved seasonality, territoriality, and resource redistribution, all of which must be considered in turn if their environmental adaptation, as well as many aspects of their social organization, are to be fully appreciated and understood.

The "yearly round" of the Guale would find them gathered together in settled village life only during the spring and summer of the year. During these months, the planting and cultivation of the maize, peas, and other crops would take place (on the islands themselves, and on the inland fields as well), but this cultivation was occurring in conjunction with other technological activities. Foremost among these were hunting and fishing. Until the maize ripened and provided them with grain, the Guale could rely on the food resources provided by the forests, the marsh, rivers, and the sea. In this preharvest time before the surplus was obtained and the granaries were filled, the good hunter and the good fisherman were the prestigious figures among the Guale. These were the individuals that could "tide the village over" until the plenteous time of harvest in the fall. On the coast, they accomplished this task by concentrating primarily upon the forest and sea resources that provided much food for their time and effort. Thus, while some time on the beach would be devoted to fishing for sea catfish, sheepshead, drum, and other smaller fish, this was supplementary to the greater emphasis upon the huge Atlantic sturgeon. The time of greatest needs was the spring of the year, the time where, fortunately, the sturgeon entered the inland rivers and streams to spawn. These were netted and killed in the shallows of the stream, and the meat supply was brought back to the village. Similarly, the high-hammock and river valley forests provided small-mammal resources such as raccoon and opossum, but the primary forest staple was the white-tailed deer.

This day-to-day necessity to find food until the harvest made extensive mobility a necessity. To limit hunters and fishermen to a small, restricted stretch of the forest or the beach would be to risk the possibility of their returning to the village empty-handed. The problem was met, however, by a system of marital alliances that united the various Guale villages and their respective island (and inland) territories. Thus, if a hunter (and his companion) could not find deer in a territory belonging to his natal village, he could use a territory belonging to the village of his wife. In this way, the Guale achieved some control over the concentration of the food supply, which could possibly shift from day to day.

It should not be supposed, however, that this safeguard always worked. More accurately, it can be said that it worked for some groups better than for others. The consequence of this was an added adaptive measure: the rivalrous redistribution ceremony. Every two months, the villagers of several islands would gather together for a pooling and redistribution of their food supply. In the five times that this would occur before the harvest, there would be an exchange of the preserved, butchered meat of fish and mammals. Mental accounts were kept (by designated officials) of the contributions of each group, and group-leader prestige was concurred as a result of the amount of food that was provided.

In the fall of the year, the Guale entered upon a somewhat more comfortable time. The maize was harvested, and the surplus was placed in the village granaries. This was the time of the year's most significant redistributive ceremony, the one that insured that every village among the Guale had an adequate food supply to sustain them through the fall and the coming winter. Once again, it was noted which group had contributed how much, and the importance of this harvest festival was underscored by religious observances that surrounded technological achievement with the atmosphere of a pious duty.

Following this, the Guale become dispersed. The "village pattern," as such, completely disappeared, but a full-time nomadism did not displace it. Instead, the Guale during the fall and the winter were characterized by what has been called a "central-based nomadism" pattern. Specifically, this meant that, scattered along the coast, and inland as well, were large, oval-shaped pavilions that would serve as temporary residence for a seminomadic group of Guale. Carrying their portion of the surplus of the harvest, they would move into the structure, repair it if necessary, and remain there only so long as there were nearby resources of fish and game. Subsequently, if these hunting-and-fishing resources waned, they would move along the coast to another longhouse structure and another seminomadic "base."

It should be noted, too, that like the technological system of the Guale, the settlement pattern just described additionally was undergoing change. At the time of European contact, the continued expansion of Guale agricultural activities was producing a greater surplus of food, and a more sedentary, "nucleated-village" pattern. Given time, it is entirely possible that the six-month semi-nomadism would eventually have been entirely abandoned, and replaced with a full-time village life.

It is hardly surprising that a culture such as Guale, inhabiting a scattered-resource zone that necessitated close ties of economic interdependence and exchange, should have many features of its social organization closely adapted to surrounding ecological conditions. Of central importance as an adaptive mechanisms was the matrilocal, postmarital residence pattern. This system, mentioned briefly above, not only insured the possibility of greater territory and mobility for hunters and fishermen, but provided as well a network of exogamous linkages between the various coastal villages that served the Guale well whenever a unified sociocultural effort (e.g., rebellion against missionization) was required.

Beyond this, the matrilocal residence pattern resulted in the existence of corporate groups, groups that bore a close relation to the various technological procurement systems, as well as the aboriginal political structure. A group might well consist of a man and his wife, her parents, and the married couple's children. This group, like all the other groups, would hunt the high-hammock country, fish, and cultivate the gardens of maize. If, at the time of the redistributive ceremony, the group contributed a noticeably large share to the pool common resources, this group became more prestigious within the Guale culture. Politically, this meant that leaders of the most productive groups became village chiefs, or micos, while subordinate (and less politically significant) offices such as aliaguita and manador, which were primarily village diplomatic positions, or for that matter the official positions of presiding over the redistributive festivals themselves, were accorded to the noteworthy, but less productive residential groups.

Presiding over the entire technologically based (and thus, continually changing) hierarchy was the territorial chieftain: the mico mayor. This office was vested in males and was hereditary, being transmitted from the chieftain to his sister's son, i.e., along matrilineal kinship lines. The territorial chieftain was responsible for negotiations on behalf of the villages in his charge, and consequently made freqent visits to the various encampments, meeting with local micos, and demonstrating his political capability. He was, as we might expect, received honorifically whereever he travelled, and was accorded the privilege of polygynous marriage, otherwise infrequent among the Guale.

Reinforcing these cultural patterns, according them both stability and justification throughout time, were the beliefs of the coastal religious system. If a group moved to a nearby territory of forest or beach or tidal flat when resources were less plentiful in another territory, or if they participated regularly in rivalrous redistribution, it was because they knew of an earlier time when the tailed people had not behaved this way: they had eaten raw fish until the fish disappeared; they were sated, but ultimately they had starved.[1]

Beyond this, the religion of the Guale provided a degree of emotional security concerning the universal questions of the origin and the destiny of the soul. The chief gods were at the antipodes: Mateczunga in the north, Quexuga in the south, and the Guale's beliefs regarding origin and fate, as well as their symbolization in ritual activities, were inextricably linked with the directional orientation of the gods.[2] Souls had their origin in the cold regions of the north, where Mateczunga ruled, they passed their time on earth and then departed. Prestigious groups (and young infants) went directly to Quexuga: an appropriate eulogy was delivered by the priest, and the

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[1] Similar beliefs have been reported for the Cherokee and Alabama (Swanton 1922:43).

[2] This was also true of the Chickasaw (Swanton 1922:44).

body was interred, and never subsequently disturbed, in a ceremonial mound elaborated on the south to symbolize the region of Quexuga.

For other groups, however, less honorific in life, a markedly different ritual was observed. These individuals were placed in a mortuary structure, attended by shamans who provided them with food, while their souls existed in a temporary state in the region of Mateczunga until their expiation was fulfilled. At that time, they were removed from the mortuary and reburied, with kin attending, along the southern wall of the dwelling—a practice simultaneously symbolic of the arrival of the world of Quexuga, and of reincorporation of the spirit back into the world of daily life.

An investigation ends, but many problems remain. Our answers lead to questions—as well as to a questioning of the answers. How far did the Guale extend to the north? How extensive were their ties with the Creek to their west—or the Eastern Timucua to the south? Are their similarities to the Creek the end result of longterm acculturation, or are they the result of an earlier migration of inland Muskogheans to the coast? And what of agriculture? Was it an indigenous development on the southern coastal strand, an "import" occurring with migration to the coast, or was it gradually diffused north and south along the chain from the ceremonial center at Irene? These and other matters will only be resolved through excavations both inland as well as along the coastal strand. Hopefully, these subsequent excavations will involve multiple investigatory techniques to provide a greater degree of certitude for the sociocultural statements that are made.

In the meantime, ex nihilo nihil fit: out of nothing, there is nothing that is created. Just as the present investigation owes much of its direction to the findings of the earlier researchers, it is hoped that our present findings will lend some added specificity to future research hypotheses regarding the protohistoric cultures of the strand. Ultimately such efforts will increase our understanding not only of one culture in one area of the world, but of the manner in which all cultures are adapted to their regions—in the manner in which they have survived. "Ce n'est que le provisoire qui dure," Rene Dubos has written. "It is only the provisional that survives." It is the understanding of this provisionality—of how cultures have adapted, or have failed to adapt—that is one of the most challenging problems in contemporary archeology. It is the one with the greatest importance for our time.

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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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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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