Archaeological Report No. 30

Fisherfolk, Farmers, and Frenchmen

Archaeological Explorations on the Mississippi Gulf Coast

John H. Blitz and
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Mississippi Department of Archives and History
Jackson, Mississippi
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Cover Illustration:
A ceramic effigy smoking pipe of the "Kneeling Human" style, *ca.* AD 1200-1350, from the Singing River site.

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— J.H.B.
C.B.M.

1 Archaeology on the Coast

If Gulf Coast archaeologists agree on one point without hesitation, it is that Mississippi represents the major gap in published archaeological data. Much of the speculation about the causes of prehistoric cultural similarities between the lower Mississippi valley and Florida could either be strengthened or laid to rest if more were known about the Woodland and Mississippian prehistory of coastal Mississippi — Davis 1984a:125.

The Mississippi Coast is the least known archaeological region of the northern Gulf Coast — Lewis 1988:109.

The Mississippi Gulf Coast is a distinctive archaeological region (Figure 1.1). Situated between the well-known archaeological cultures of the Lower Mississippi Valley and Mobile Bay/northwest Florida regions, the prehistory of the Mississippi Gulf Coast reflects this intermediate geographical location. The east–west trending Mississippi coastline is 155 miles in length, the shortest of the Gulf Coast states. Bounded by the shallow waters of Mississippi Sound, the region is drained by two major river drainages: the Pascagoula River system to the east and the Pearl River system to the west. A physiographic zone, the Coastal Meadows, borders the entire length of Mississippi Sound, extending from the coastline into the interior for 15–20 miles. The discrete spatial limits of these physiographic features and the shared culture history of the prehistoric inhabitants is the basis for defining the Mississippi Gulf Coast as an archaeological region (cf. Willey and Phillips 1958:19). Barry Lewis (1988), in an important archaeological overview, has labeled this area the Mississippi Sound region.

Purpose of the Study

As the quotes above indicate, the prehistory of the Mississippi Sound region is very poorly known. The available archaeological overviews emphasize the cultural distinctiveness of Gulf Coast prehistoric cultural development in general (Davis 1984a; Steponaitis 1986) and the Mississippi Sound region specifically (Blitz 1982, 1983; Walker and Taylor 1982; Mistovich et al. 1983; Greenwell 1984; Brown 1984, 1988; Lewis 1982, 1988, 1991; Morgan 1992; Hinks et al. 1993), but bemoan the lack of investigation (Davis 1984b; Steponaitis 1986). Despite massive, ongoing site destruction, there have been few archaeological studies. The lack of institutions of higher learning with active archaeological programs in the region and the fact that the region has not had large-scale cultural resource management projects may explain the low level of research. Until the initiation of our project, no local archaeological phase sequences had been established anywhere in this region. As a result of this neglect, all of the previous archaeological overviews cited above lack a detailed time-space framework. Chronological order has been dependent on a rather crude form of cross-correlational dating, in which inadequately known local artifact attributes are compared with the better known sequences to the east and west. Indeed, so little published research is available for the region that we will forego the customary "Previous Research" section, and relegate comment on the meager literature of past archaeological investigations to appropriate points in the text.

In an effort to change this unsatisfactory situation and motivated by the alarming rate of site destruction in the region, we conducted the Mississippi Gulf Coast Archaeological Project from 1992–1994. The Mississippi Sound region, as defined above, can be further divided into two subregions or areas of

roughly equivalent size on the basis of physiography and a shared (but slightly divergent) culture history. The western subregion encompasses the Pearl River system and the smaller Jourdan River–Wolf River system that drains into St. Louis Bay. The eastern subregion includes the Pascagoula River system and the smaller Biloxi River–Tchoutacabouffa River system that empties into Biloxi Bay. We confined our investigation to the eastern subregion, which encompasses all of Mississippi south of Township 7S and east of Range 11W (Figure 1.2).

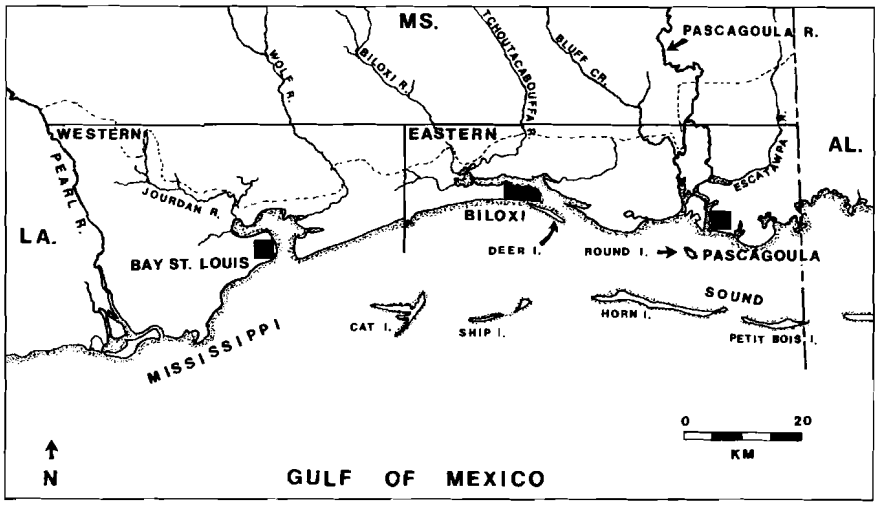


Figure 1.1. The Mississippi Sound region. Dotted line indicates the northern boundary of the Coastal Meadows Physiographic Zone.

The goals of our project, while modest, were fundamental. Our objectives were (1) to establish a chronological framework for archaeological sites in the study area, in the form of an archaeological phase sequence for the interval from 1200 BC to AD 1775; (2) to identify components present at a large number of previously recorded but uninvestigated archaeological sites in the study area, if possible assign these components to period or phase intervals, and arrange these data into a series of site distribution maps; (3) to secure a sample of ecofacts from pre-AD 1000 and post-AD 1000 contexts in order to gain insights into coastal subsistence practices and seasonality of site occupation, especially as these factors relate to the much-debated issues of sedentism and maize agriculture; and (4) to synthesize all that is known about the Native American archaeology of the Mississippi Sound region and so provide a foundation for future research. This volume presents the results of the study.

Doing Archaeology on the Coast

As was the case in prehistory, the Mississippi Sound region today has a distinctly regional environmental and cultural character. The region presents the visitor with a tapestry of typical landscapes: open savannas of pine and palmetto scrub; quiet gardens of antebellum homes set beneath canopies of moss-draped oaks; humid swamplands and tidal marshes; sun-raked beaches and bays; and picturesque fishing fleets juxtaposed against the garish concrete strips of casino and surf tourist havens. Over the last 40 years, this once tranquil region of fishing villages, small ports, and vacation homes has experienced rapid population growth, urbanization, and diverse economic development. Despite the rapidity of change, the modern inhabitants have continued to self-identify themselves with "the Coast." A nonagricultural maritime orientation, a high incidence of Roman Catholicism, three hundred years of continuous Euro-American and Afro-American settlement, and a significant degree of cultural diversity has continued to foster a distinctive regional identity. In these and many other ways, "the Coast" is culturally divergent from the rest of Mississippi and the interior South; it shares closer demographic, economic, and cultural similarities with adjacent portions of the Gulf Coast. As we shall see, in some respects a similar pattern prevailed in prehistory.

Regional conditions affect the structure of archaeological research and the nature of the archaeo-

logical record in ways that archaeologists do not always communicate in print. Environmental conditions, ground cover, modern land use practices, attitudes and values of the local populace, logistical constraints of time and funding, the training and goals of the investigators all shape how archaeology is conducted and what results are obtained. This study was not a textbook archaeological survey. We faced certain conditions that led us to reject a strategy that we have used successfully in other times and places: drawing a probabilistic sample of landforms, surveying the landforms to locate sites, then following up with excavations at selected discovered sites. Such a strategy could not accommodate certain factors we needed to address. We faced a mosaic of urban, suburban, and rural landscapes with numerous small holdings and absentee ownership that prevented the sort of unrestricted access that lends itself to transect or quadrat sampling. We inherited a legacy of previously recorded archaeological sites that had never been examined by professional archaeologists (the majority remain unexamined). And we did not want to ignore interested local citizens and landowners, many of whom had extensive artifact collections from local sites, and therefore potentially useful information to contribute toward project goals. Site destruction has been intense, especially along the narrow coastal strand so favored by recent real estate developments, and this too demanded a broad, flexible research strategy.

For all of the above reasons, we chose a strategy that would make the most of two pre-existing but under-utilized sources of data: unanalyzed, well provenienced artifact collections and previously discovered archaeological sites. On the basis of information provided by collections analysis, state site files, and local informants, we selected sites for field inspection. We then chose a subset of the best preserved sites for test excavations. For initial research in a poorly known region, we consider this method to be both appropriate and pragmatic, given the conditions outlined above. The strategy makes possible a rapid, first-level approximation of the archaeological resources in a region. It enables archaeologists to identify quickly a greater range and diversity of cultural components than would be possible if the archaeologists were to obtain this information unaided, within the time constraints of the project. The artifact collections that we examined were gathered by resident owners of the sites, by members of the Gulf Coast chapter of the Mississippi Archaeological Association (MAA), or were in the possession of local museums. Well provenienced collections and local informants were often the only source of information for destroyed sites (such as leveled earthen mounds), which nevertheless remain important for the interpretation of regional prehistory. Instead of allowing that information to be wasted, the efforts of conscientious individuals were incorporated into the research. While these sources of information are biased to-

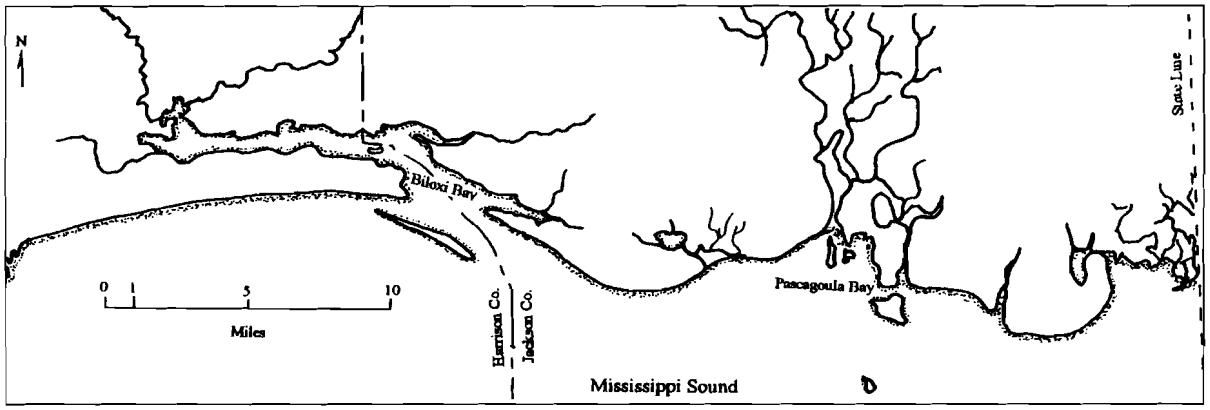


Figure 1.2. The eastern subregion study area.

ward the largest or most conspicuous sites, it is these sites that are most likely to have intact deposits. A total of 26 site collections were analyzed. Selected aspects of collections research are synthesized in the present volume; individual site inventories are presented in detail elsewhere (Blitz and Mann 1993).

In this study we summarize the results of field investigations, mostly small-scale test excavations, at eleven archaeological sites. These site summaries include both our own investigations as well as the efforts of other archaeologists. In our research, archaeological sites were selected for investigation because collections analysis and field inspection suggested that these locations contained intact deposits representative of limited temporal intervals. Two sites (22-Hr-534, 22-Hr-591) were chosen because they faced imminent destruction; in both cases we entered into a contract with the developers that permitted emergency salvage archaeology. At all sites, investigations were conducted with standardized procedures to maximize comparability. Sites were mapped, then cored with a hand-held bucket auger. Auger results delimited site dimensions and determined the placement of test excavation units. Excavation units were dug by hand in 10 cm levels, sometimes subject to adjustment if stratigraphic changes or disturbances could be detected. All soil from auger tests and excavation units was passed through 1/8th-inch mesh. Standardized one gallon matrix samples were taken from each undisturbed level, feature, or stratum. These samples were later processed for retrieval of ecofacts through sieving and flotation. Radiocarbon samples were taken from strata associated with specific pottery styles thought to be of use in constructing the chronological sequence. We were aided in our field and laboratory work by students from the University of Southern Mississippi, by members of MAA, and by local volunteers.

This volume is organized in the following manner. Chapter 2 provides a brief overview of the natural environment, relevant geological conditions, climate, fauna, and flora. Chapters 3 through 6 summarize field investigations at specific sites. A synthetic interpretation is sketched out for each of the ten archaeological phases, spanning the interval from 1200 BC to AD 1775. Chapter 7 discusses methods used to identify and order the cultural components. The morphological, functional, and temporal characteristics of selected artifact classes are presented. A regional cultural sequence based on the relative and absolute dating of components is summarized.

Chapter 8 explores the relationship of site frequency to a number of cultural and environmental variables. A measure of regional occupation intensity is offered, and site distribution data are synthesized. The final chapter interprets the cultural sequence in the Mississippi Sound region in relation to larger patterns in the prehistory of the greater Southeast. Firstly, temporal trends in ceramic diversity, relative abundance of nonlocal materials, presence of ceremonial centers, and evidence for technological and population change are summarized in order to identify such factors as the direction of interregional cultural interaction and the intensity of regional social integration. Secondly, competing theoretical and interpretive perspectives concerning the importance of maize agriculture and the seasonality of site occupation for coastal Mississippian societies are reviewed and evaluated. In light of new evidence, we reject previous interpretations that claim Mississippi period sites in the region were created only by temporary or seasonal visits of small task groups from the interior.

Finally, explanations of artifact analysis, definitions, and tabular data are condensed into a series of appendices placed at the end of the volume. Appendices C and D analyze pre-AD 1000 and post-AD 1000 faunal and botanical remains to provide important insights into prehistoric subsistence practices and the seasonality of site occupations.

2 Where the Forest Meets the Sea

We consider the obligatory section on natural environment in archaeological reports to be akin to setting the stage upon which the cultural process unfolds. Like a theatrical stage, the natural environment is both backdrop and undergirding foundation. The natural world imposes restricting conditions on the cultural actors, of course, but the degree to which environment determines the content or direction of the processual drama is difficult to measure. We view the natural environment not as prime mover but as one of several significant variables that directed the course of human events in the study area. For the pre-industrial peoples who made the Mississippi Gulf Coast their home, climate, landform, and biotic communities established a range of potential opportunities and placed constraints on daily activities. Technological innovations, such as the dugout canoe, bow and arrow, and agriculture, periodically altered culture-environment dynamics. Over time, the ways in which people arranged themselves across the landscape and mobilized their available technology to engage the natural environment shaped cultural traditions that are distinctly "coastal." But the inhabitants did not merely respond to local conditions in isolation; the rivers and waters of the region were avenues that repeatedly introduced new ideas, products, and people from elsewhere. It is the very nature of a coast to have permeable boundaries.

Physiography

The study area and archaeological region introduced in the previous chapter lies on the northern coast of the Gulf of Mexico, part of the Gulf Coastal Plain physiographic province. Within the study area, the Gulf Coastal Plain is further subdivided by geographers into two generalized physiographic zones: the Coastal Meadows and the Longleaf Pine Hills (Cross et al. 1974). The Coastal Meadows zone is a low expanse of pine-palmetto flatwoods, a formation Late Pleistocene in age, that extends from the coastline inland a distance of 15 to 20 miles (24–32 km) to meet the Longleaf Pine Hills. The Longleaf Pine Hills zone is a region of older, eroded uplands of low to moderate relief. This zone is covered by a forest of longleaf pine, once part of a nearly unbroken belt that stretched across the coastal plain from Georgia to Texas (Harper 1943). The Longleaf Pine Hills establishes the northern boundary of the study area, which mostly encompasses the Coastal Meadows zone. However, these two generalized zones are not sufficiently detailed for our purposes. Following others (Swanson et al. 1979; Lewis 1982), we subdivide the study area into smaller environmental units based on landform: (1) Mississippi Sound, (2) Tidal Marsh-Estuary, (3) Sangamon Beach Ridge, (4) Coastal Prairie-Terrace, and (5) Citronelle Uplands (Figure 2.1).

Mississippi Sound

The Mississippi Sound is a shallow body of the Gulf that extends west from Mobile Bay along the Mississippi coastline to the mouth of Pearl River. It comprises a distinctive barrier island and lagoon coastal system on the continental shelf. A chain of six major barrier islands (Cat — West Ship — East Ship — Horn — Petit Bois — Dauphin) lie 0.5 to 20 km offshore, sheltering a coastline of river deltas, bays, and beaches. The barrier islands are Holocene linear sand formations, from 4 km to 24 km

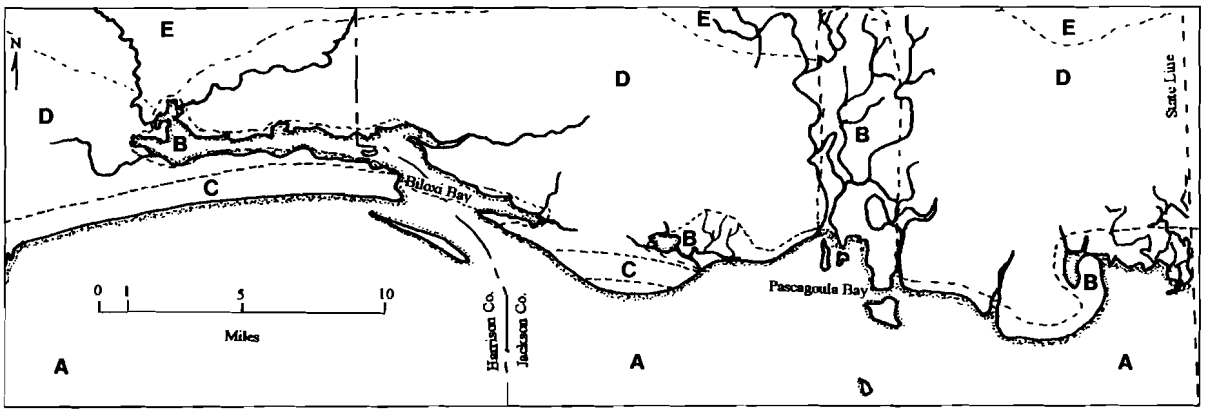


Figure 2.1. Landforms in the study area: a, Mississippi Sound; b, Tidal Marsh-Estuary; c, Sangamon Beach Ridge; d, Coastal Prairie-Terrace; e, Citronelle Uplands.

in length, with east–west long axes oriented roughly parallel to the mainland shoreline. The major islands lie south of the study area. Two smaller islands, Deer and Round, are in the study area. Shallow sandy shoals form off the islands, but elsewhere the sea floor is composed of silts and clays, with grass beds and oyster reefs. The Sound waters are no more than 10 to 20 ft (3–6 m) deep. The saline content varies both seasonally and spatially, influenced by the variable freshwater discharge from numerous bayous and rivers. Although some archaeological sites are on barrier islands, the Sound was important to prehistoric peoples primarily as a food source and as an avenue of transport and communication.

Tidal Marsh-Estuary

The Tidal Marsh-Estuary unit consists of shallow, nearshore waters, river-bayou deltas and mouths, and salt marshes that constitute the littoral zone between land and sea. Within this zone, a mosaic of biotic communities is created by a saline gradient from freshwater to saltwater. The spatial extent of tidal salt marsh is determined by the volume of fresh water entering Mississippi Sound. At present, the Pascagoula River tidal marsh-estuary is as much as 4 miles (6.5 km) wide and extends 7 miles (11 km) inland from the river mouth; at least 11,000 hectares of salt marsh are within this area (Eleuterius 1973; Steele and Perry 1990). Other expanses of tidal marsh are associated with the Biloxi-Tchoutacabouffa River system where it enters Biloxi Bay. The current distribution of the Tidal Marsh-Estuary zone is a geologically recent product of Holocene sea level stabilization ca. 5000–4000 years ago (Otvos 1973; Lamb 1983). Ecofact data gathered in this study (Appendix C) indicate that the Tidal Marsh-Estuary zone supplied the bulk of wild food resources for Mississippi Sound peoples throughout late prehistory. Littoral ridges and other recent sediment deposits surrounded by the tidal marshes create tree-covered hammocks or islands of slight elevation that upon inspection almost always produce evidence of prehistoric utilization in the form of shell middens.

Sangamon Beach Ridge

This landform is a late Pleistocene littoral beach and dune complex that runs parallel to the mainland coastline. It extends 57 km in length, from Belle Fontaine Point across the Harrison County coastline to the mouth of St. Louis Bay in Hancock County. It is a flat ridge of well drained soils, 1.5 to 4.0 km in width, and elevated 4 to 10 m AMSL. Otvos (1973:17–18) has designated these deposits the Gulf Formation and has determined that the beach ridge formed during the Sangamon interglacial ca. 40,000 years ago. The Sangamon Beach

Ridge has advantages for settlement location; it borders portions of the rich littoral zone, it is supplied with potable water sources, and it is sufficiently elevated to afford some protection from storm surges.

Coastal Prairie-Terrace

This is the largest landform in the study area and constitutes most of the Coastal Meadows physiographic zone. To judge from the frequency of recorded site components (Chapter 8), it was also the landform least utilized by indigenous peoples. The Coastal Prairie-Terrace consists of two geological formations. The more extensive of these is the Prairie Formation, a relatively thin layer of silts and sands deposited as floodplains, channels, and levees by the Pascagoula River and other streams during the late Pleistocene Epoch (Otvos 1973:17–18). A second, somewhat less extensive formation consists of slightly younger alluvial deposits, remnants of terrace features cut into the Prairie Formation by late Pleistocene streams. All this erosion and meandering by ancient watercourses resulted in this landform's most salient characteristic: it is exceedingly flat, almost level. Large expanses are poorly drained and seasonally inundated by shallow water. Away from areas where the Coastal Prairie-Terrace abuts the food-rich littoral zone or riverine-swamp habitats, this landform was neither extensively used nor permanently settled by prehistoric populations.

Citronelle Uplands

This landform lies mostly north of the study area and is isomorphic with the previously mentioned Longleaf Pine Hills physiographic zone. It is a landform of low to moderate relief composed of eroded, pre-Pleistocene sediments. Until recently, little was known about the prehistoric occupation of the Longleaf Pine Hills zone except that sites of all cultural periods were present (Lewis 1988:Figure 4). New investigations by archaeologists from the University of Southern Mississippi and the USDA Forest Service are now expanding our knowledge of regional site distributions (Jackson et al. 1995). At various periods in prehistory, social groups may have scheduled a round of seasonal movements between the coast and the Citronelle Uplands, but our present state of regional research is still too rudimentary to address this issue. However, we do know that populations in the study area made frequent use of toolstone sources that outcrop in the Citronelle Uplands. The yellow to buff-colored Citronelle cherts that occur as deposits of pebbles 8–10 cm in length were the most frequently utilized lithic source for all culture periods in the study area. Utilized stone sources of the Citronelle Uplands include ferruginous sandstone, siltstone, limonite, hematite, and petrified wood.

Geomorphology

The distributional relationship between landforms, biotic communities, and geomorphological units in the study area is summarized in Figure 2.2. For the present study, we need only briefly address long-term factors that shaped the landscape and thus influenced archaeological site distribution and preservation.

At the height of the last glacial advance some 20,000 to 17,000 years ago, sea level was 77 to 160 m below the modern level and the shoreline was many kilometers south of the present strand (Lamb 1983). Consequently, the Pascagoula River and other streams became deeply entrenched into the previously established Prairie Formation as the grade of watercourses adjusted to the lower sea level. With the onset of the early Holocene warming ca. 10,000 years ago, the sea covered what is now the Mississippi Sound. Between 9000–6000 years ago, the valleys of the Pascagoula River and other streams were drowned by the encroaching sea to form the series of bays along the Mississippi coastline. As the sea level stabilized at modern levels ca. 5000–4000 years ago, lower stream grades and increased sediment deposits formed the extensive

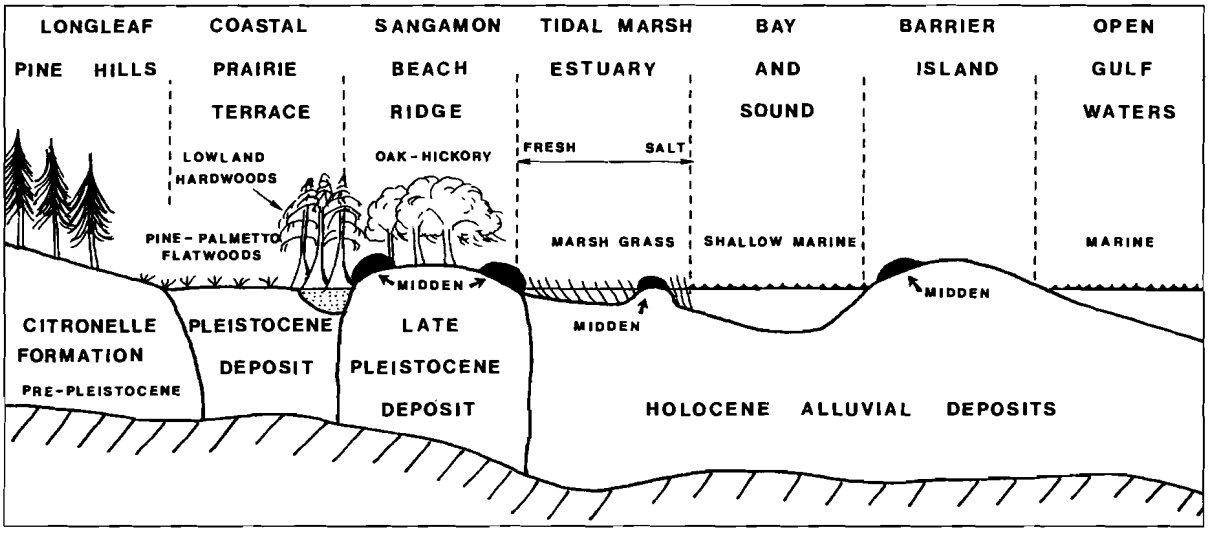


Figure 2.2. Relationship between landforms, biotic communities, and geomorphological units in the study area.

tidal marsh-estuary system (Otvos 1973; Lamb 1983). Archaeological sites on the pre-stabilization coastline are now inundated by the Gulf of Mexico. Oyster harvest operations occasionally tong up artifacts, raising the possibility that some Mississippi Sound oyster reefs are drowned archaeological sites (Lewis 1982:10).

Erosion and subsidence have had a significant impact on archaeological sites in the study area. Away from the coastline, erosion has deflated some archaeological deposits and buried others under alluvium or colluvium. On the coastline, wave action has eroded numerous post-1000 BC sites; redeposited artifacts are often encountered on beaches and some distance out into the Sound. Working with archaeological site file data, Lewis (1982:9–11) assessed the impact of regional and local subsidence on Mississippi Sound sites. He concluded that regional subsidence, caused by the weight of the Mississippi River delta sediment load west of Mississippi Sound, had little effect on post-Late Archaic sites because the expected east–west site submergence pattern was not reflected in the data. In contrast, Lewis concluded that local subsidence, a time-dependent process that enfolds at an equal rate along the coastline, has had a significant impact because: (1) sites older than 2000 years are under-represented in the Tidal Marsh-Estuary zone; and (2) frequencies of tidally inundated sites younger than 2000 years increase steadily with each cultural period even as the frequency of sites on older, stable landforms for these same periods remain constant (Lewis 1982:10–11). Lewis acknowledged that subsistence practices and population growth may also be factors that shaped the site frequency-distribution data. Still, it is clear that natural processes such as erosion, subsidence, and site deposition, together with site destruction by modern land use practices, have transformed and altered much of the regional archaeological record.

Flora and Fauna

The Tidal Marsh-Estuary littoral zone represents the maximum biomass concentration in the region. Together with the shallow marine waters of Mississippi Sound, this ecosystem serves as a nursery to myriad forms of aquatic life. The modern fishing fleets of the region are predominantly focused on these nearshore waters; hundreds of tons of gulf menhaden (*Brevoortia patronus*), shrimp (*Palaemonetes* sp.), blue crab (*Callinectes sapidus*), oyster (*Crassostrea virginica*), mullet (*Mugil* sp.), and red drum (*Sciaenops ocellata*) are commercially har-

vested annually (Cross et al. 1974). Not surprisingly, fish and aquatic reptiles from the littoral zone were the major prehistoric protein source; a discussion of the economically important species is presented in Appendix C. Within the tidal marsh, the saline gradient determines species distribution, perhaps most dramatically in the floral transition from saltmarsh cordgrass (saline) to bulrush (low saline). The saline gradient also determines the location of marine bivalve beds such as oyster (high saline) and marsh clam (*Rangia cuneata*, low saline). Shellfish beds create a rich habitat for numerous other species and they were an important location of prehistoric subsistence activities (Shenkel 1984b:65–67). Bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), brown pelican (*Pelecanus occidentalis*), great blue heron (*Ardea herodias*), and great egret (*Casmerodius albus*) are found in the littoral zone as are numerous shorebirds and waterfowl (U.S. Department of Interior 1978).

The freshwater riverine-swamp biotic community is found along the Pascagoula River system, Biloxi-Tchoutacabouffa River system, numerous bayous, and thus it effectively cross-cuts the major interior environmental-landform zones. These areas are covered in typical lowland Southeastern hardwood vegetation: baldcypress (*Taxodium distichum*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), water oak (*Quercus nigra*), water tupelo (*Nyssa aquatica*), and sweetbay (*Magnolia virginiana*). The more elevated, loamy sand soils such as found on the Sangamon Beach Ridge and first terrace locations in the Coastal Prairie-Terrace landform support trees such as southern magnolia (*Magnolia grandiflora*), live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), beech (*Fagus grandifloria*), pignut hickory (*Carya glabra*), cabbage palm (*Sabal palmetto*), slash pine (*Pinus elliottii*) and a diverse understory of various trees, shrubs, woody vines, and other plants.

Small mammals that range across these floral communities include swamp rabbit (*Sylvilagus aquaticus*), eastern cottontail rabbit (*Sylvilagus floridanus*), muskrat (*Ondatra zibethica*), otter (*Lutra canadensis*), mink (*Mustela vison*), striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale putorius*), longtailed weasel (*Mustela frenata*), opossum (*Didelphis marsupialis*), eastern grey squirrel (*Sciurus carolinensis*), eastern fox squirrel (*Sciurus niger*), raccoon (*Procyon lotor*), grey fox (*Urocyon cinereoargenteus*), and red fox (*Vulpes fulva*) (U.S. Department of the Interior 1978). Large animals of economic importance to the early human inhabitants—whitetail deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), and black bear (*Ursus americanus*)—reach their greatest abundance in these forests because hardwood mast foods are concentrated there. Three large predators, the eastern panther (*Felis concolor*, now regionally extirpated), the red wolf (*Canis niger*, recently reintroduced to Horn Island), and bobcat (*Lynx rufus*, still common) once ranged widely across environmental zones. Reptiles and amphibians are legion throughout the study area. The impressive alligator (*Alligator mississippiensis*) is common on the barrier islands, low saline areas of the Tidal Marsh-Estuary zone, and in lowland riverine-swamp habitats.

Beyond the narrow galleries and pockets of lowland Southeastern hardwood forest that follow the river and stream courses, the Coastal Prairie-Terrace zone is a vast flatwoods that often has an open, savanna-like appearance. The poorly drained acidic soils support longleaf pine (*Pinus palustris*), slash pine (*Pinus elliottii*), pitcher plants (*Sarracenia* sp.), saw palmetto (*Serenoa repens*), and various grass species. Although some of the mammals mentioned above may be found in the flatwoods, birds predominate, most notably an endemic subspecies of sandhill crane (*Grus canadensis*). Another commonly seen inhabitant, the nine-banded armadillo (*Dasypus novemcinctus*), was not present in the region in prehistoric times.

As the Coastal Prairie-Terrace landform grades into the Citronelle Uplands, marking the transition from the Coastal Meadows to the Longleaf Pine Hills, a park-like forest prevails or was present prior to historic lumbering activities. The forest is dominated by a single overstory tree species, longleaf pine. This floral community, under climax condi-

tions, is an environment where frequent fires limit the understory to grasses and short herbaceous plants (Harper 1943). In sandy areas, patches of xeric vegetation such as prickly pear (*Opuntia sp.*) and yucca (*Yucca aliofolia*) are common. Here, burrows of the gopher tortoise (*Gopherus berlandieri*) create an unique habitat frequented by the burrowing owl (*Athene cunicularia*) and the eastern diamondback rattlesnake (*Crotalus adamanteus*).

Climate

The modern climate of the region is one of long, hot summers and short, mild winters (Cole and Dent 1964; Cross et al. 1974:12–19; Smith 1975). It is warm and moist much of the year. The average annual temperature is 68 degrees F (20 degrees C), and the average annual number of days with freezing temperatures is 20. Between May and September, humidity is high and the average daily temperature is 81 degrees F (27 degrees C). Diurnal temperature differences between land and water create onshore breezes that moderate extremes in summer temperatures along the Sound. Prevailing winds are from the northeast in fall and from the north in winter. Rainfall levels are higher on the coast than on the interior Gulf Coastal Plain, ranging from 58 inches to 65 inches annually. Nearly half of the rainfall is from June to September, mostly in the form of thunderstorms. At Biloxi, the mean number of days with thunderstorms is 87. Tropical lows generate periodic hurricanes that roar in from the Gulf of Mexico. In modern times, hurricanes or tropical storms have struck the Mississippi coastline an average of once every three years, arriving between June and October. However, storms with sustained winds of 100 mph or more are infrequent (U.S. Department of Commerce 1963; Sullivan 1987). Hurricanes exert long-term influence on coastal climate, vegetation, and physiography.

Early European observers report that the native coastal inhabitants were well adjusted to the climate. In the warm months, Pascagoula men and boys wore only breechclout, leggings, and moccasins; women and girls wore a short skirt of Spanish moss (McWilliams 1953:18). In cooler weather, deerskins and a feather cloak or pelt robe were added to the costume of both sexes (Hudson 1976:264). A light, dome-shaped structure constructed of cane and palmetto was used by coastal Choctawan peoples as a temporary or warm weather shelter (see Swanton 1946:Plate 61); heavier, wattle-and-daub buildings with bark roofs were erected as long-term or cold season shelters (McWilliams 1953:19). Smoke was used to repel mosquitoes (Hudson 1976:19).

Watercraft

It should be clear from the preceding overview that coastal peoples had to negotiate the intersection of land and sea. Perhaps the most fundamental technological requirement for an efficient littoral adaptation is some form of watercraft. Historic Southeastern Indians utilized canoes shaped and hollowed ("dugout") from tree trunks. Dugout canoes were employed by both interior and coastal groups (Swanton 1946:589–598). Canoes varied in size from a few meters in length to large vessels capable of holding many people. Panfilo de Narvaez's 1528 expedition destroyed 30 canoes near Pensacola and, shortly thereafter, Alvar Núñez Cabeza de Vaca rafted west through Mississippi Sound and encountered canoes along the coast (Swanton 1946:589). The natives of Mississippi Sound were using canoes in 1699 when the French first encountered them. Early in that year, Iberville met a group of more than 50 men, women, and children (probably Biloxis or Pascagoulas) as they passed from Deer Island to the mainland in six canoes (McWilliams 1953:43).

Sites with Middle Woodland period artifacts on Mississippi Sound barrier islands (e.g. 22-Ja-625, 22-Hr-500) imply that watercraft were in the region 2000 years ago, and no doubt much earlier. Preserved dugout canoes from Florida have been radiocarbon dated as far back as 5120 BP (Milanich 1994:70). Transportation of the considerable volume of raw stone that moved along the coast and

interior waterways as part of the Poverty Point exchange system certainly required the canoe. Several canoes from Alabama and Mississippi have been radiocarbon dated from 605 BP to 200 BP (Stowe 1974; McGahey 1986). These pre-AD 1900 examples vary from 4.2 to 7.3 m in length and 0.30 to 0.72 m in width; baldcypress was the favored wood source. Dugout canoes (*pirogues*) were in common use by Euro-Americans of the region until the mid-twentieth century.

Although barrier island sites and early historic accounts leave no doubt that indigenous coastal peoples readily navigated Mississippi Sound, theirs was not a true maritime culture. Prehistoric midden samples contain no pelagic species as would be expected if fishing on the open seas had been practiced (Appendix C). Recurrent claims by local historians and artifact collectors that regional prehistoric ceramic styles reflect distant Mesoamerican influences (e.g. Greenwell 1984:137) are in error.

3 Middens in the Marshes

Apple Street (22-Ja-530)

On a slight rise elevated only 1.52 m AMSL is an extensive dark earth midden known as the Apple Street site (Figure 3.1). The soil color reflects a high organic content due to anthropogenic enrichment. Despite this enrichment, preservation of faunal and botanical materials in the porous, poorly drained sand is negligible. The midden forms a linear arrangement, 180 m north–south and 60 m east–west. One hundred meters to the north and east of Apple Street is Graveline Bayou, a tidally influenced stream surrounded by salt marsh. Graveline Bayou drains Graveline Bay, a brackish-water embayment 300 m northwest of the site. Mississippi Sound, accessible by watercraft through Graveline Bayou, is 1.1 km due south. Apple Street, one of a grid of dirt lanes in the Ocean Beach Estates subdivision, bisects the midden. Most lots are undeveloped, no doubt due to the frequently wet conditions. Large, unfilled looter's holes are concentrated in the northern half of the site where the midden deposit appears to be the deepest. While the site has been damaged, it still has intact deposits.

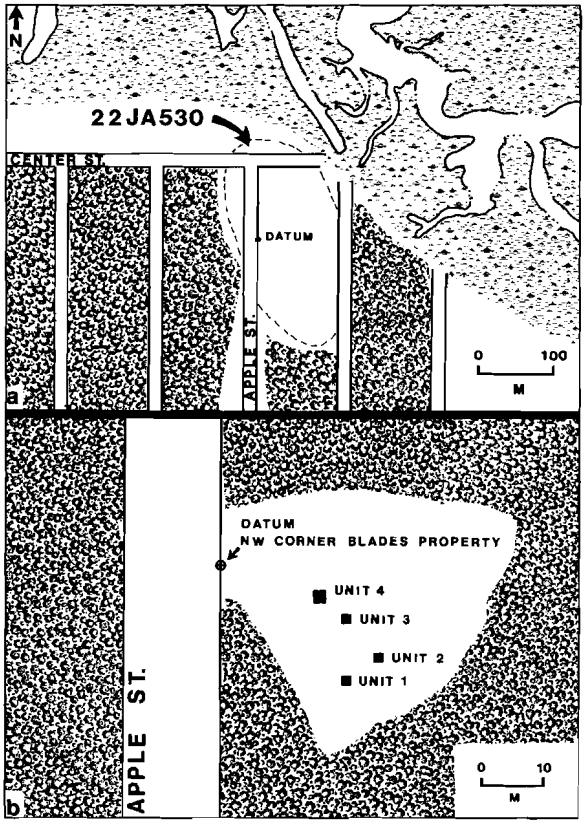


Figure 3.1. Plan of Apple Street site (22Ja530): a, site locale and site dimensions (dotted line); b, location of excavation units.

Once the site was exposed by road construction in the 1960s, it soon became the focus of artifact hunting. Collections from the site came to the attention of Webb (1977), who included Apple Street in his survey of Poverty Point sites. Webb listed the following "diagnostic traits" of the Poverty Point culture as present at Apple Street: Poverty Point objects, ground stone plummets, "consistent" projectile points, fiber-tempered pottery, and linear site arrangement (Webb 1977:Table 15). Additional artifacts from Apple Street have been illustrated (Greenwell 1984) but no published excavations had occurred prior to our 1992 investigation.

Investigation

Our objectives at Apple Street were to isolate cultural components in excavation units, determine when the site was occupied, and identify some of the site activities. Examination of midden exposed in road cut profiles and drainage ditches permitted us to trace the deposit and, together with a few hand-auger tests, effectively establish site boundaries. However, no attempt was made to sample the site systematically for two reasons: not all landowners could be contacted and, more disturbingly, ac-

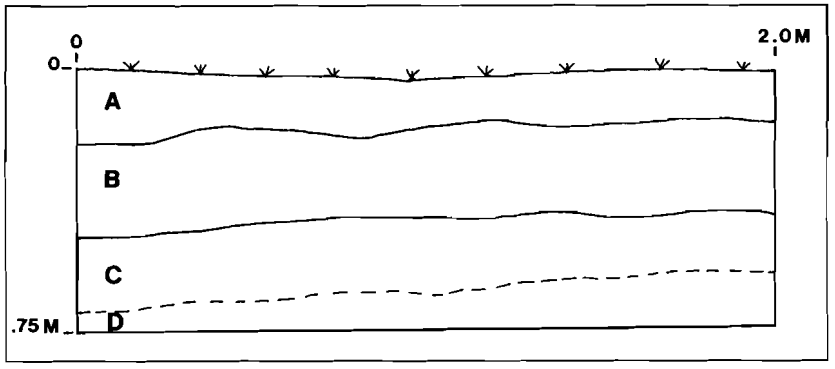


Figure 3.2. East Profile, Unit 4, Apple Street: a, sod/humus, dark loamy sand, 10YR3/1; b, earth midden, scattered oyster shells, dark loamy sand, 10YR3/4; c, light-tan sand with some organic staining, 7YR4/4; d, grading to tan-white sand subsoil, 10YR6/3.

tive alligator nests were present! Given the large size of the site, the heavy ground cover, and the limited extent of our excavations, the investigation was strictly exploratory. Four excavation units (three 1 x 1 m units, one 2 x 2 m unit) were placed on the Blades family property in areas with no visible disturbance. All four units revealed a similar stratigraphic sequence, exemplified by Unit 4 (Figure 3.2). A dark loamy sand midden (strata A, B), composed of artifacts and scattered oyster shells, extended from ground level to 45–50 cm in depth. Strata C and D are the original sand surface on which the midden was formed, with leached organic material and a few artifacts (C) grading into a sterile coarse sand (D) (for profiles of Units 1–3, see Blitz and Mann 1993). No cultural features were encountered in any unit. Preservation of organic remains was minimal.

Two different artifact samples are available from Apple Street: a large collection amassed by the Blades family, and the materials excavated from Units 1–4 (Appendix B, Tables B.1–4). Some 1451 fragments of prehistoric ceramics were recovered in Units 1–4, of which 9% are decorated. The distribution of temper-ware groups in the plain pottery sample from Units 1–4, in rank order of frequency, is grit-sand tempered (91.5%), Tchefuncte ware (8%), and fiber tempered (0.5%). Decorated type-varieties recovered from Units 1–4, in rank order of abundance, include Bayou La Batre Stamped, Alexander Incised, Tchefuncte Incised (herringbone motif), Alexander Pinched, Alexander Punctated *var. Tibbee*, Alexander Punctated *var. Chappepeela*, and Lake Borgne Incised. There is a single example of Wheeler Punctated (fiber tempered). In sum, the Apple Street ceramic sample is dominated by ceramic types of the Alexander and Bayou La Batre series, with lesser quantities of Tchefuncte series ceramic types. Minor amounts of fiber-tempered pottery are part of the ceramic complex.

The Blades collection contains hafted bifaces fashioned from local and nonlocal stone which conform to Pontchartrain, Gary, Kent, Delhi, Shumla, and other PP/K types. The absence of flaked stone debitage in the Blades collection was an expected bias but we were surprised at the low frequency of flakes, a total of 10 g, recovered from all excavation units. Debitage was composed of Citronelle chert, grey chert, and Tallahatta quartzite. The only core was a white quartzite cobble fragment (36 g) from Unit 4. Similarly, only 3 PP/Ks were recovered by excavation, all from Unit 4 (Figure 7.5). In short, little can be said about flaked tool production at the site other than the fact that the inhabitants had access to distant raw materials from several sources.

In contrast to the low frequency of flaked tools and debitage, the raw materials for the production of ground stone tools are relatively abundant. Unmodified, regionally available (Citronelle Uplands) sandstone, hematite, petrified wood, siltstone, and breccia chunks are ubiquitous at the site. Sandstone was used as an abrader and a gouge. Siltstone was ground to produce a bannerstone, a bar gorget, a perforated boatstone, and two plummets; all are incomplete fragments (Figure 7.2, 7.3). Webb (1977:Table 15) reports "hematite, magnetite plummets" from Apple Street. Nine slabs of petrified

wood (858 g) have been roughly shaped, ground, and utilized along one edge; they probably functioned as saws.

Artifacts of steatite, red jasper, and slate, all distant non-regional materials, are present at Apple Street (Figure 7.3). Steatite bowl fragments were found in the excavation unit samples (n=3; 18.6 g) and in the Blades collection (n=46; 1.18 kg). A steatite bowl rim in Unit 4, level 3, has notches on the lip that duplicates a common lip mode found on Apple Street phase ceramic vessels. Steatite passing through the Poverty Point exchange network has been traced to sources in the Alabama-Georgia Piedmont (Smith 1981), the probable source of the Apple Street finds. One scrap of slate (<1 g) was recovered from Unit 3 and one ground piece of slate (25 g) is in the Blades collection. Slate ornament production is reported at the Slate site (22-Hu-655) in the Yazoo Basin, Mississippi (Lauro and Lehmann 1982). The Slate site is thought to date to the Poverty Point period, and slate ornaments occur at other Poverty Point period sites. After about 500 BC, slate is apparently uncommon or absent at Late Gulf Formational sites elsewhere in Mississippi and Louisiana.

Cultural Activities at the Apple Street Site

The large Apple Street midden was formed during the Apple Street phase (800–100 BC), an interval in which Alexander, Bayou La Batre, and Tchefuncte ceramic series were in contemporaneous use. No clear patterning in the vertical distribution of ceramic types in Units 1–4 was evident; ceramic types from all three ceramic series were found in association in midden contexts, together with minor amounts of fiber-tempered pottery. No evidence indicates significant activities at Apple Street prior to or after this time span.

The extent of the deposits, density of artifacts, diversity of ceramic types, and quantity of nonlocal stone at the site is impressive. Both tools and ornaments of nonlocal stone were recovered. While evidence for significant production of flaked tools at the site was meager, production evidence was substantial for ground stone implements. Rather than a site formed by repeated small-group visits, Apple Street's artifact diversity suggests a settlement or base camp occupied by multiple-family groups engaged in various activities for extended periods.

Big Greenwood Island (22-Ja-516)

Once an island, Greenwood Island is now a low-lying peninsula of loamy sand that projects into Mississippi Sound, connected to the mainland by earth fill. Originally, Bayou Casotte delimited the eastern shore; Bayou Chicot formed the western shore, and salt marsh surrounded the rest of the island. A prehistoric earth-shell midden, now destroyed by dredging, looting, and erosion, occupied a linear knoll that paralleled Bayou Casotte (Figure 3.3). The Big Greenwood Island midden extended 100 m north–south and 75 m east–west, but rose only 1 m AMSL. A smaller midden (22-Ja-618,

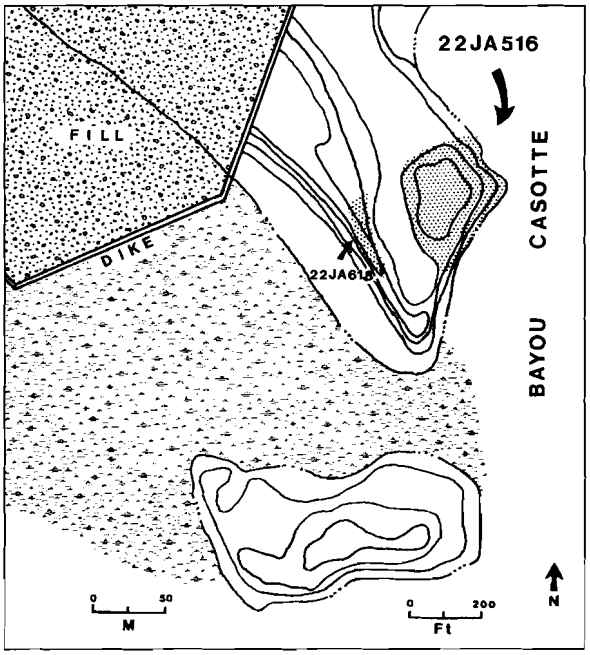


Figure 3.3. Plan of Big Greenwood Island site (22Ja516) (Redrawn from Solis and Walling 1982). Contour intervals equal one foot.

Little Greenwood Island) was present about 40 m to the west.

Investigations

Big Greenwood Island was revealed in the 1960s when the Bayou Casotte shipping channel was dredged. The island was soon frequented by collectors, who gathered artifacts and human skeletal remains along the eroded bayou beach and dug into the site. A number of human burials, variously described as "two dozen" (Mistovich et al. 1983:82) and "six" (Greenwell 1984:140) were grubbed out of the midden. In 1971, the Big Greenwood Island site came to the attention of a trained archaeologist, Mark Williams, who conducted systematic excavations with members of the Gulf Coast chapter of the Mississippi Archaeological Association. The excavation revealed a stratigraphic sequence from the Poverty Point to historic periods. Results of this fieldwork remain unpublished, but the investigators "encountered the Poverty Point evidences stratigraphically below the Gulf Formational component in some part of the site" (Mistovich et al. 1983:6).

Subsequently, Webb (1975) recorded artifact collections from the site which included: Poverty Point objects, Wheeler, Tchefuncte, Bayou La Batre, and Marksville series pottery; flaked/ground stone tools, items of nonlocal stone such as copper beads, galena cubes, quartz crystals, and a Hopewellian copper bicymbal earspool (Figure 7.3). He described the site profile as "a sandy and very black midden, about 18–24 in., then a layer of oyster shells, about 1 foot in thickness, then clay...pottery sherds seem to be confined to the black sandy midden" He concluded that the major period of occupation was in "Marksville times" (Webb 1975), but included the site in his survey of Poverty Point sites (Webb 1977:10, Table 15).

The site was extensively looted through the 1970s, when it was discovered to be a source of 19th-century bottles; "hundreds" were removed (Mistovich et al. 1983:82). In 1979, three coffins were discovered eroding from the site. Upon analysis by MDAH archaeologists, the bodies proved to be 19th-century U.S. soldiers from a short-lived post, Camp Jefferson Davis/Camp Twiggs (1848–1853) (Geiger 1979; Fisher 1979; Wright 1979). This garrison, hospital, and cemetery was established on Greenwood Island to receive wounded soldiers upon their return from the Mexican War. The abandoned property remained an unused military reservation until 1903. Four years later, some of the dead were disinterred for reburial in the National Cemetery at Mobile (Mistovich et al. 1983:25–39).

In anticipation of further site destruction, four 50 x 50 cm test units were placed in the Big Greenwood Island midden (Solis and Walling 1982) and a large surface collection was obtained (Mistovich et al. 1983). Unfortunately, the deposits were thoroughly disturbed; historic artifacts were mixed with prehistoric materials in all test unit levels. A final test excavation by MDAH archaeologists recovered a bundle burial (Lehmann et al. 1991). The grave pit outline was indistinct in the dark midden. Because a fiber-tempered sherd was found "adjacent to the lower right leg," the excavators suggested the burial might date to the Middle Gulf Formational (Poverty Point) period (Lehmann et al. 1991:6). An intact feature contained plain Tchefuncte ware, Bayou La Batre Scallop Impressed, Shumla and Macon PP/Ks, and 60 biconical Poverty Point objects. The feature is important evidence that these artifact categories were contemporary for some portion of their time spans (Lehmann et al. 1991:8–9).

Summary: Cultural Activities at the Big Greenwood Island Site

The history of investigations at Big Greenwood Island mirrors the history of archaeological research in the Mississippi Sound region as a whole: accelerated site destruction, too much attention too early by looters, and too little attention too late by professional archaeologists. Conscientious amateurs and others salvaged what information they could,

but lacked the necessary resources. Despite intermittent professional investigation, no radiocarbon or ecofact data are available.

In an attempt at synthesis, we have compiled the prehistoric artifacts listed in previously published tables (i.e. Solis and Walling 1982:Tables 4, 5, 6, 7, 8, 9; Mistovich et al. 1983:Table 1; Blitz and Mann 1993:Table 8, 22-Ja-516) into a single table (Appendix B, Table B.5). While there are two minor post-AD 200 components at the site (i.e. Graveline phase, Singing River phase), two major occupations were responsible for most of the site formation process: the Middle Gulf Formational (Poverty Point) component, which we designate the Claiborne phase (1200–800 BC), and the early Middle Woodland Greenwood Island phase (100 BC–AD 200) component. There is a hiatus of occupation between these two phases. Only one sherd of Alexander pottery, locally common during the intervening Apple Street phase (800–100 BC), was recovered. That this absence of Alexander pottery at Big Greenwood Island is a temporal, not spatial, phenomenon is attested by the presence of large quantities of Alexander pottery at site 22-Ja-550 just a short distance to the east (Blitz and Mann 1993:Table 8, 22-Ja-550).

Given the apparent vertical separation between the Claiborne phase (Poverty Point) component and later occupations observed in Williams' 1971 investigation, it is possible that this 700-year occupational hiatus corresponds to the stratigraphic breaks mentioned by Webb. In addition, it is highly probable that the secondary (tightly flexed or bundle) burials date to the Greenwood Island phase and were intrusive into the earlier Claiborne phase deposit. The copper earspool and rolled copper beads were found in association with secondary burials by the collectors (Cary Geiger, 1992, personal communication). Such a mortuary pattern is not characteristic of Poverty Point sites. Moreover, mass secondary burials with Hopewellian copper ornaments occur at Middle Woodland coastal sites contemporary with the Greenwood Island phase to the east and west (Stowe 1977a; Brose et al. 1983: Appendix D; Shenkel 1984a).

With few exceptions, the non-ceramic artifacts cannot be assigned to a specific component. Many of the PP/K types — Shumla, Pontchartrain, Kent, Gary, Macon — may span the interval between the Claiborne and Greenwood Island phases. Several artifact categories are probably from the Claiborne component because they are found in panregional Poverty Point contexts but are not characteristic of Middle Woodland assemblages: steatite bowl fragments, a perforated slate pendant, two-hole slate gorgets, a cylindrical novaculite bead, and cylindrical-grooved Poverty Point objects. Production of flaked and ground stone tools occurred on site. Both the unsystematic collections and the screened test units produced cores, chert debitage, and ground stone fragments. Bar-shaped gorget preforms of siltstone indicate ornament production at the site. Raw materials, all introduced into the site matrix, included: citronelle chert, hematite, limonite, sandstone, and siltstone from nearby sources; and white quartzite, Tallahatta quartzite, quartz crystals, grey chert, banded chert, black chert, and slate from distant sources.

The Big Greenwood Island sequence may now be summarized. The midden development began with a Claiborne phase occupation; these inhabitants participated in the Poverty Point interaction sphere, and lived at the site for lengths of time sufficient to produce fiber-tempered pottery, tools, ornaments, and midden accumulation. The site was again occupied during the Greenwood Island phase, when a cemetery was established for secondary burials, some accompanied by nonlocal Hopewellian symbols. Domestic activities produced midden, stone tools, and large quantities of potsherds. Post-AD 200 prehistoric site activities were less intense.

East Bayou LaMotte (22-Ja-555)

All along the coast, as small streams or bayous debouch into Mississippi Sound, they deposit their rich nutrient load and create salt marshes. Relict shorelines or other sediment deposits form hammocks that rise slightly above the wetlands. Referred

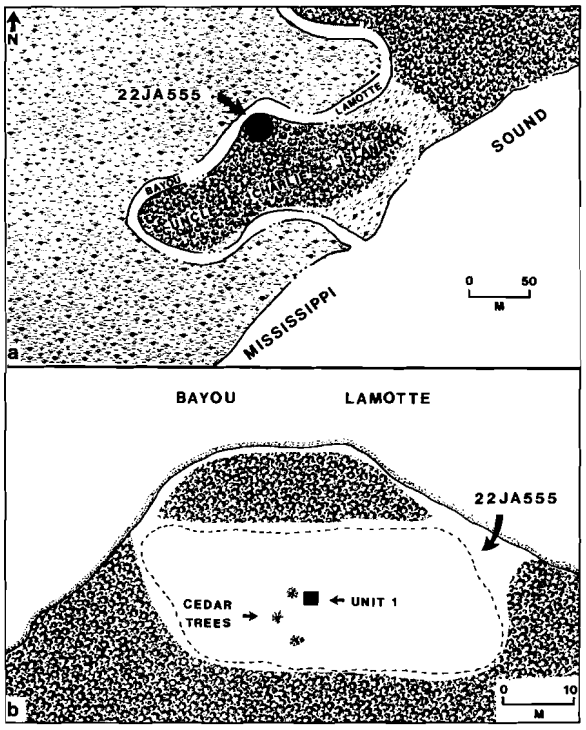


Figure 3.4. Plan of East Bayou LaMotte site (22Ja555): a, site locale; b, site dimensions (dotted line).

to locally as "tree islands," these locations were favored by the prehistoric inhabitants, and the middens they left behind are often present. The East Bayou LaMotte site is a 40 x 20 m shell midden situated on the north side of Uncle Charlie's Island, a hammock near the community of Gautier (Figure 3.4). The narrow island covers about 4.5 acres. Uncle Charlie's Island is on the eastern side of Bayou LaMotte, at the point where this small stream empties into Mississippi Sound. The north shore fronts the bayou and the south shore faces the Gulf. A dense understory of shrubs, herbs, and woody vines covers the hammock, shaded by a canopy dominated by live oaks. Botanical species that are calciphiles, such as southern red cedar (*Juniperus silicola*) and red buckeye (*Aesculus pavia*), mark the extent of the shell midden. There is no potable water on the hammock but springs issue from the higher land a short distance east. Site inhabitants had immediate access to the rich food sources of the salt marsh, bayou, and Gulf.

At its highest point, the site rises 2 m AMSL. Here, in the center of the midden, shells overlie the original sand surface to a depth of 70 cm, becoming shallower around the edge of the deposit. At the time of our visit, the island was owned by the Shepard family. Steve Shepard noted that periodic storm surges had reduced and spread the midden over many years. The damage was particularly acute around the perimeter of the deposit. Neither artifacts nor midden were found on the south side of the island facing Mississippi Sound, so perhaps the site location was chosen to provide a leeward shelter from the open water.

Investigation

Assisted by Shepard's knowledge of the site configuration, and after several exploratory hand-auger tests, we delineated an area protected by three red cedar trees near the center of the midden. Here we placed a single 2 x 2 m excavation (Unit 1) where the deposit was deepest and, we hoped, least disturbed. Unit 1 exposed 70 cm of cultural deposits (Figure 3.5). The stratigraphy is not complex. Stratum A, a layer of humus and pulverized shell, represents a disturbed upper zone that overlay the bulk of the intact shell midden (stratum B). Stratum B

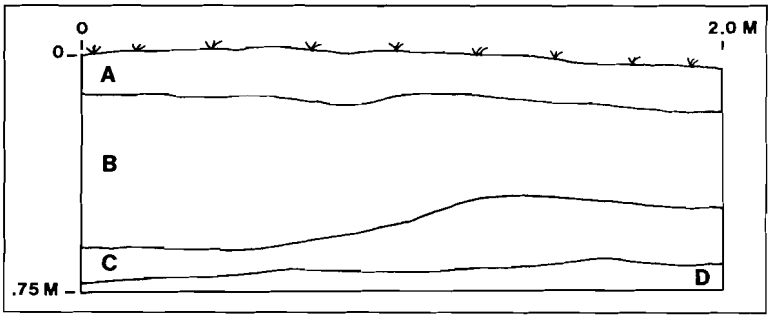


Figure 3.5. South Profile, Unit 1, East Bayou LaMotte: a, sod and pulverized shell; b, coarse, high-density shell midden; c, dark, organically stained loamy sand with light-density shell inclusions, 10YR3/4; d, sterile, buff-colored sand.

was composed of oyster shells, *rangia* shells, fish bone, other faunal remains, charcoal, and prehistoric artifacts. Whereas stratum A was composed of pulverized shell and contained the historic artifacts, stratum B contained mostly whole shells and lacked historic artifacts. Based on these observations, stratum B appeared to be less disturbed than stratum A.

Stratum B rested upon an undulating zone (stratum C) of dark loamy sand mixed with moderate amounts of shell. Stratum C constituted an interface zone between the coarse-matrix shell midden and the sterile sand matrix (stratum D) underlying the site. What process formed stratum C is unclear. It may represent an activity surface used prior to the initial deposition of the shell midden or, alternatively, merely represents the top of stratum D enriched by the downward percolation of organic material and small artifacts from stratum B. No cultural features were discovered in Unit 1.

Two different artifact samples are available from East Bayou LaMotte: the materials recovered from the Unit 1 excavation (Appendix B, Table B.6); and a surface collection amassed by Steve Shepard (Appendix B, Table B.7). A total of 497 sherds of prehistoric pottery was found in Unit 1, of which less than 8% is decorated. Temper-ware groups in the plain pottery sample, in rank order of frequency, are grog tempered (55%), sand tempered (40%), Tchefuncte ware (3%), and fiber tempered (2%). Decorated type-varieties, in rank order of frequency, include Bayou La Batre Stamped, Bayou La Batre Scallop Impressed, Mandeville Stamped *var. Mandeville*, Indian Bay Stamped *var. Spencer Bayou*, Alexander Incised *var. Ponchitolowa*, Lake Borgne Incised *var. Lake Borgne*, Deptford Simple Stamped, and Santa Rosa Stamped. No pattern in the vertical distribution of ceramic types in Unit 1 is apparent. The same type-varieties excavated from Unit 1 are also present in the Shepard collection ceramics, with the addition of Mabin Stamped *var. Crooks*, Greenwood Stamped *var. Greenwood*, Deptford Bold Stamped, and Chinchuba Brushed *var. Chinchuba*.

Few flaked stone tools or debitage are present in the samples. Two complete PP/Ks, both of local Citronelle chert, were recovered in Unit 1. One of these (Figure 7.5; See Chapter 7) is 4.2 cm long with a tapered stem and conforms to the Gary "typical" type (Ford and Webb 1956:52). Hammerstones and a single decortication flake, all of local chert, indicate that on-site lithic reduction was minimal. Also recovered were two cores of nonlocal white quartzite and 23 g of associated shatter. Ground stone tools consist of two abraders and two small mortar/anvils, both of local sandstone. Unit 1 produced four small bone tool fragments of uncertain function. The most complete of these tools is a 3.8 cm long object with a notched, tapered end (Figure 7.4; See Chapter 7). In the Shepard collection is a cylindrical, notched bone fragment, 5 cm long, that we interpret as an atlatl hook (Figure 7.4).

Cultural Activities at the East Bayou LaMotte Site

The site on Uncle Charlie's Island is very similar in size and environmental setting to dozens of small prehistoric shell middens along the Mississippi Gulf Coast. Our objective was to determine the temporal interval of site occupation and identify some of the activities that transpired there. The whiteware sherds, clay pipe stem, and bottle glass in stratum A indicate a minor 19th-century presence at the site. The ceramic types Marksville Incised *var. Yokena* (n=1), Evansville Punctated (n=5), and Mound Place Incised (n=1), all from the Shepard surface collection, identify minor activities or visits during late prehistoric times. Except for these seven sherds, all ceramics from Unit 1 and the Shepard collection predate AD 200. Because most of the decorated type-varieties recovered from Unit 1 have use intervals that span both the Late Gulf Formational Apple Street phase (800–100 BC) and the Middle Woodland Greenwood Island phase (100 BC–AD 200), our dilemma is this: do we have one component or two?

We think the extant midden accumulated during the Greenwood Island phase for the following reasons: (1) the high frequency in Unit 1 of plain

grog-tempered pottery, which first appears during the early Middle Woodland period in the region; (2) the presence of Mabin Stamped *var. Crooks* and Greenwood Stamped *var. Greenwood* (a sand-tempered cognate of *var. Crooks*), diagnostic markers of the Greenwood Island phase; and (3) the presence of Indian Bay Stamped *var. Spencer Bayou.* This *var. Spencer Bayou* decorative treatment is a grog-tempered cognate of Bayou La Batre Scallop Impressed. *Var. Spencer Bayou* first appears in the Greenwood Island phase, where it represents the continuation of an earlier decorative treatment on the new grog-tempered ware. The only possible indication of a pre-Greenwood Island phase use of the site are five eroded fired-clay fragments with fibrous inclusions from Unit 1. It seems unlikely that fiber-tempered ceramics (if that is what these small fragments represent) continued to be used this late in time.

The modest size of the shell midden and the presence of PP/Ks, an atlatl hook, and bone tools imply occupation by a small group engaged in hunting, fishing, and shellfish gathering. Given the paucity of debitage, stone tool production was minimal at the site. Sandstone abraders indicate on-site fashioning of bone or wood implements. The ground sandstone slabs have anvil-like surfaces for pounding raw materials and were probably used to process plants. Several useful plants grow at the site today. One of these is the buckeye tree (*Aesculus pavia*). Not only is the buckeye a calciphile indicator species for the anthropogenic soil conditions associated with shell middens on the Mississippi coast (Eleuterius and Otvos 1979), but it was an important source of fish poison used by Southeastern natives (Hudson 1976:284; Swanton 1946:341–343). The observation that red buckeye, red cedar, and other economically useful caliciphile floral species are infrequent in the region's predominantly acidic soil habitats, except on the chemically altered anthropogenic soils such as shell middens (Eleuterius and Otvos 1973:110–111), poses an interesting question: were these species introduced to the anthropogenic soil "islands" as a result of prehistoric human use?

Two artifact categories point to activities other than subsistence pursuits. Three fragments of cut shell by-product (conch or whelk species) present in the Shepard collection suggest production of ornaments. In Level 2 of Unit 1, 13 g of fired grog-tempered pottery coils were recovered. Evidence of shell ornament production and pottery-making at the site is a clue that the use of Uncle Charlie's Island in early Middle Woodland times involved longer-term and more diverse activities than just brief visits by single-sex task groups.

The Claiborne Phase (1200–800 BC)

Gulf Formational is the name given to the unique Coastal Plain cultural development considered by Walthall and Jenkins (1976) to represent an intermediate stage between the Late Archaic and Middle Woodland periods. Marked by the advent of pottery integrated into Late Archaic assemblages, the Gulf Formational spans the interval also known as the Early Woodland period. On the Mississippi Gulf Coast, the Middle (1200–800 BC) and Late (800–100 BC) Gulf Formational periods may be recognized by pottery from five ceramic series: Wheeler, St. Johns, Bayou La Batre, Alexander, and Tchefuncte. The oldest of these series, the fiber-tempered Wheeler series and the chalky, temperless St. Johns series, were probably introduced into the region from the east, where similar or identical pottery was temporally precedent. Bayou La Batre, Alexander, and Tchefuncte are indigenous developments of the western Gulf Coastal Plain. All five ceramic series are products of the ceramic tradition known as Gulf (Caldwell 1958; Jenkins et al. 1986).

In the Mississippi Sound region, the Middle Gulf Formational period corresponds in time to the climax of an elaborate exchange network or interaction sphere known as the Poverty Point culture (ca. 1500–600 BC) Webb 1977). Prior to ca. 1400–1200 BC, Late Archaic/Poverty Point sites are aceramic. Much of the existing information on the Poverty Point occupation in coastal Mississippi

comes from Cedarland (22-Ha-506) and Claiborne (22-Ha-501), two semicircular earth and shell middens (now destroyed) at the mouth of Pearl River in the western Mississippi Sound region (Gagliano and Webb 1970; Coastal Environments 1977; Bruseth 1980, 1991).

The Cedarland and Claiborne sites had somewhat divergent artifact assemblages. Radiocarbon dates suggested that Cedarland predated Claiborne; Cedarland was aceramic, and it is the type site for the Late Archaic Pearl River phase (Gagliano 1963). The larger Claiborne site was a horseshoe-shaped midden 250 m across and 30 to 65 m in width. A full Poverty Point assemblage was found at Claiborne, second only to the Poverty Point site in quantity and diversity of artifacts. Plain and punctated Wheeler pottery, together with minor quantities of plain and incised temperless pottery, were recovered from Claiborne. It is unclear if the temperless pottery represents direct imports of St. Johns ware or if this pottery is an autochthonous, proto-Tchefuncte innovation. Artifacts of nonlocal stone — stone vessels, microblades, PP/Ks, plummets, jasper beads, adzes, 2-hole gorgets, pendants, bannerstones, boatstones, celts, and sandstone saws — were abundant at Claiborne. A few radiocarbon dates suggest that Claiborne was occupied ca. 1400–1200 BC. As a regional exchange center several times larger than other contemporary sites along the coast, Claiborne most likely served as a conduit that dispersed valued goods from the Mississippi Sound region northward and westward to the Lower Mississippi Valley and perhaps the Poverty Point site in Louisiana (Webb 1977).

Fiber-tempered pottery of comparable age is found to the east on the Alabama and northwest

Table 3.1. Characteristics of Claiborne and Apple Street Phase sites.

SITE	ENVIRONMENT	SIZE	TYPE	CONDITION	INVESTIGATION	REFERENCE
CLAIRBORNE						
22-Ja-504	Heron Bay, Terrace	20x50m	Midden, Burial	Destroyed	Collection	Blitz & Mann 1973
22-Ja-516	Coast, Estuary	100x75m	Midden, Burial	Destroyed	Excavation, collection	This report
22-Ja-531	Graveline Bay, Estuary		Midden	Intact	Collection	Blitz & Mann 1993
22-Ja-537	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Ja-543	Escatawpa River, Riverine	12x23m	Midden	Destroyed	Excavation	Marshall 1982
22-Ja-558	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Ja-687	Graveline Bay,	?	Midden	Destroyed	Collection	MDAH files
APPLE STREET						
22-Ja-504	Heron Bay, Estuary	50x20m	Midden, Burial	?	Collection	Blitz & Mann 1993
22-Ja-529	Coast, Estuary	40x15m	Midden	Intact	Collection	Blitz & Mann 1993
22-Ja-530	Graveline Bay, Terrace	180x60m	Midden	Intact	Excavation, collection	Blitz & Mann 1993
22-Ja-537	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Ja-543	Escatawpa River, Riverine	12x23m	Midden	Destroyed	Excavation	Marshall 1982a
22-Ja-544	Escatawpa River, Riverine	15x18m	Midden	Destroyed	Excavation	Marshall 1982a
22-Ja-558	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
St. Andrews	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Ja-724	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Ja-696	Graveline Bay, Terrace	?	Midden	Destroyed	Collection	MDAH files

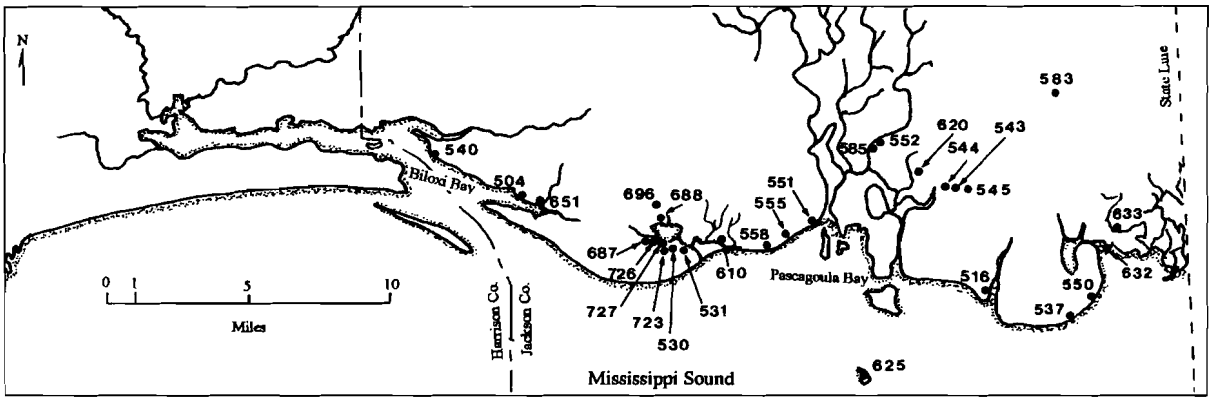


Figure 3.6. Distribution of Claiborne and Apple Street Phase sites.

Florida coasts (Lazarus 1965; Trickey and Holmes 1971; New World Research 1988; Thomas and Campbell 1991) and to the west in the lower Mississippi Valley (summarized in Webb 1977:31–33, Table 3). In addition to early pottery, the one thing these far-flung sites share in common is participation in the Poverty Point exchange network. Jenkins (1975, 1986) has proposed that the fiber-tempered pottery and the temperless pottery were introduced to the western Gulf Coastal Plain from the Lower Chattahoochee River region. Steatite bowls and fragments, some of which have been traced to eastern Piedmont sources within the Chattahoochee drainage (Smith 1981), are found together with fiber-tempered and temperless ceramics at Claiborne phase and other Poverty Point-affiliated sites (Webb 1977:35–36, Table 3). This association, together with the observation that both steatite and pottery vessels sometimes have similar lip-notching decoration, underscores the possibility that both forms of container technology entered the interaction sphere through east to west movement along Mississippi Sound (Jenkins et al. 1986; Jenkins and Krause 1986:33).

The Claiborne phase designates an interval in which Mississippi Sound inhabitants participated in the florescence of the Poverty Point exchange network (Table 3.1). This phase is marked by artifact assemblages like that found at the Claiborne center: plain and punctated Wheeler pottery, plain and incised St. Johns pottery, stone bowl fragments, other nonlocal lithics, and Poverty Point objects in diverse forms. In the study area, we have recovered these materials in surface contexts only, usually at sites that also have Late Gulf Formational period components (Alexander, Bayou La Batre, and Tchefuncte pottery). In other words, we have been unable to locate and excavate a "pure" fiber-tempered pottery component in undisturbed contexts. Although a Claiborne phase component was apparently excavated at Big Greenwood Island (22-Ja-516), the documentary evidence necessary to confirm this is not available for restudy (although the requisite artifact types are present in collections from 22-Ja-516). Although the Poverty Point components in the eastern study area are some distance from Claiborne, they replicate much of the Claiborne site artifact assemblage. In an interim report, we introduced a provisional phase, Belle Fontaine, to describe this interval in the study area (Blitz and Mann 1993). With additional information, however, we now discard that term. Instead, it seems more useful to consider all of these sites as part of the same cultural phenomenon: the Claiborne phase.

Our knowledge of Claiborne phase settlement and subsistence patterns is meager (Figure 3.6). Limited excavation and the multicomponent nature of most known sites presently hinders definition of site sizes and functions. While there is no known regional center in the eastern Mississippi Sound study area, local populations could have

reached the Claiborne center in two days of travel time by dugout canoe. As a rough comparison of site size, if we let the size of 22-Ja-516 (100 m x 75 m) represent the maximum possible extent of the Claiborne phase component there, then the Claiborne phase occupation of Big Greenwood Island was approximately half the size of the Claiborne center (and possibly much less). Researchers have suggested a hierarchy of Poverty Point-affiliated sites in the Lake Pontchartrain area just west of the Claiborne center: small, seasonal sites oriented toward harvesting aquatic foods, and larger base camps (Duhe 1976; Coastal Environments 1977:259; Bruseth 1991). Some years ago these Louisiana sites (Bayou Jasmine, Garcia, Lindsey) were lumped into the Bayou Jasmine-Garcia phase (Phillips 1970:874–875; Coastal Environments 1977:255–266). Some of these sites may have articulated with the nearby Claiborne center, but some are preceramic and predate Claiborne by centuries.

Two contrasting interpretations of Poverty Point centers such as Poverty Point and Claiborne exist: large, sedentary communities occupied year-round (Gibson 1987; Lewis 1988) or places of large-scale, periodic, short-term aggregation by dispersed populations (Jackson 1986). Small, unsystematic "grab samples" of faunal remains from Claiborne have been described, revealing a mix of aquatic and terrestrial species, plus the domestic dog (Henebry 1983; Smith 1985). A fall–winter occupation at Claiborne was suggested by the presence of a four to six month old deer, as estimated from dentition (Smith 1985:147–148).

The Apple Street Phase (800–100 BC)

The Late Gulf Formational period occupation in the eastern Mississippi Sound region is the Apple Street phase. A hallmark of the ceramic complex is stylistic diversity. Before we define the phase, we first must consider some of the historical contingencies that created this stylistic diversity. Three contemporaneous ceramic series first appeared during this interval: Bayou La Batre, Alexander, and Tchefuncte. Each of these ceramic series had separate geographical centers of popularity on the Gulf Coastal Plain during their intervals of use. In these areas, the pottery was first recognized by archaeologists and, consequently, Bayou La Batre, Alexander, and Tchefuncte are often considered distinct archaeological "cultures" (e.g. Willey and Phillips 1958; Jeter et al. 1989). However, these ceramic series co-occur at sites on the western Gulf Coastal Plain where temporal-spatial distributions overlap, and this is the case on the Mississippi coast.

The Bayou La Batre series is a coarse-textured, grit-sand-tempered ware found in the Mobile Bay region, the lower Tombigbee River, the Pascagoula River basin, and the Mississippi Sound region. The most common decorative motif is dentate stamping and impressing with a scallop shell; plain rocker stamping is a minority treatment. The Tchefuncte ceramic series, with a distribution centered on the Lower Mississippi Valley and adjacent coast, is very similar to Bayou La Batre, but the ware is composed of a poorly prepared, contorted or laminated paste, temperless or with bits of silt/clay inclusions. Tchefuncte decorative treatments are more diverse than those of Bayou La Batre, and include incising, drag-and-stab, pinching, punctation, and rocker stamping. The two ceramic series share similar vessel shapes; the most common forms are simple bowls and globular or beaker-like vessels with wide, unrestricted orifices, both with annular, slab, or podal support bases. Bases are smaller than orifices, giving vessels a top-heavy appearance.

Some investigators believe that there is little significant difference between Bayou La Batre and Tchefuncte, the former being merely a regional variant of the latter (Phillips 1970:162–163; Griffin 1979:270). Others emphasize decorative distinctions and argue that Bayou La Batre may predate and influence the development of Tchefuncte (Walthall and Jenkins 1976:45). Uncertainty prevails because Bayou La Batre is poorly dated. The oldest date is from the Bryants Landing site in Alabama (1140 ± 200 BC), where Bayou La Batre ce-

ramics were found associated with plain fiber-tempered pottery (Trickey and Holmes 1971); some consider this date too early for Bayou La Batre (Stowe 1990). Other Bayou La Batre radiocarbon assays post-date 500 BC (Brose et al. 1983; Brose 1985).

Radiocarbon dates, mostly from Pontchartrain phase sites in southeastern coastal Louisiana, bracket the Tchefuncte series there between 500 BC and AD 100 (Shenkel 1984a, 1984b; Weinstein 1986; Jeter et al. 1989:117–127). However, Jenkins et al. (1986:551–552) identify the Tchefuncte component at the Jaketown site, a Poverty Point regional center in the Yazoo Basin (Ford, Phillips, and Haag 1955), as an early Tchefuncte complex estimated to date as early as 800 BC; they consider the Pontchartrain phase sites to be a late Tchefuncte complex. Indeed, it has been clear for some time that temperless, poorly fired "Tchefunctoid" pottery in the Lower Mississippi Valley can be traced back far earlier than the conventionally defined "Tchefuncte period" (ca. 550–100 BC) (Gibson 1991). Not only is temperless, Tchefuncte-like pottery coeval with fiber-tempered pottery throughout the occupation spans of both the Poverty Point and Claiborne sites, ca. 1400–1200 BC (Webb 1977), but temperless pottery is found on numerous Lower Mississippi Valley sites as early as 800–700 BC (Gibson 1991). Whether this pottery is to be classified as St. Johns or Tchefuncte may not be as important as recognizing that temperless pottery has a long period of development in Louisiana and Mississippi prior to 500 BC

The third ware that composes the Apple Street phase ceramic complex, the sand-tempered Alexander series, is widespread in Alabama and Mississippi. Alexander ceramics combine many of the decorative modes and vessel shapes of Tchefuncte and Bayou La Batre, but also include unique shape and decorative attributes. The use of coarse sand temper in both Alexander and Bayou La Batre may suggest a common origin, but Alexander types are often finer wares with more elaborate decoration. Incising, pinching, punctation, and dentate stamping all occur, sometimes placed in complex arrangements of decorative fields. Alexander series pottery occurs as a minority ware on Tchefuncte sites in the Lake Pontchartrain area, where it is referred to by Louisiana researchers as the Mandeville series (Shenkel 1984b). Some of the Mandeville series type-varieties duplicate established Alexander type-varieties, while others such as Chinchuba Brushed and Mandeville Stamped indicate a uniquely coastal derivation. For reasons discussed in Appendix A, we subsume the Mandeville series types into the Alexander series. A series of radiocarbon dates from the upper Tombigee River Valley, especially the single-component Sanders site (22-Cl-917), provide a beginning age estimate for Alexander at around 800 BC (O'Hear 1990).

In an elaborate scenario briefly summarized here, Jenkins and his colleagues (1986; also see Shenkel 1984b) trace the cultural-historical links between the five ceramic series we have discussed. Around 1200 BC, plain and punctated fiber-tempered pottery, together with plain and incised temperless pottery (St. Johns series), spread across the western Gulf Coastal Plain from eastern sources (i.e. the Middle Stallings Island complex) through the Poverty Point exchange network and, by 800 BC, triggered the indigenous development of Bayou La Batre, Tchefuncte, and Alexander ceramics. The paste and incising attributes of St. Johns pottery were the progenitors of the early Tchefuncte complex. St. Johns Incised was also the inspiration for Alexander Incised. Wheeler Punctated provided the source for punctation in Tchefuncte and Alexander ceramics. New indigenous ceramic attributes appeared as well. Bayou La Batre, Tchefuncte, and Alexander are the earliest ceramics with plain/dentate rocker-stamped decoration and podal supports to be found north of Mesoamerica.

This brief review and the excavated sample of Apple Street phase materials lead us to three observations about the Late Gulf Formational period in the western Gulf Coastal Plain. First, the appearance of Bayou La Batre, Tchefuncte, and Alexander pottery is not a post-Poverty Point interaction sphere

phenomenon as has often been presented (e.g. Williams and Brain 1983). The Poverty Point exchange network, through which flowed nonlocal materials such as steatite bowls, continued until ca. 600–500 BC (Webb 1977:61; Gibson 1980, 1994:169–170), overlapping in time the initial appearance of these three ceramic series. Our second observation is that Webb's (1977:Table 15) Poverty Point "diagnostics" such as fiber-tempered pottery, baked-clay Poverty Point objects, plummets, certain projectile point types, and linear settlement arrangements represent traits that are not restricted to a Poverty Point "culture" but overlap chronologically with the advent of Bayou La Batre, Alexander, and Tchefuncte ceramics ca. 800 BC. This realization has gained greater acceptance in recent years (Byrd 1991). Finally, Wheeler, Bayou La Batre, Tchefuncte, and Alexander ceramics overlap temporally and spatially during their intervals of use.

This last conclusion requires further documentation, because earlier researchers were inclined to interpret these ceramic series as markers of unitary "cultures" that followed each other in a stage-like progression; if found together, they were sometimes considered (by definition) to be from mixed contexts (e.g. Phillips, in Ford, Phillips, and Haag 1955:65–66; Phillips 1970:530–532). Wheeler fiber-tempered pottery occurs in apparent association with Tchefuncte pottery in midden contexts at Jaketown (Ford, Phillips, and Haag 1955:66), Little Woods (Ford and Quimby 1945:56), and Beau Mire (Weinstein and Rivet 1978:82); in none of these situations, however, can the possibility of mixed components be ruled out. An initial pure Wheeler assemblage was found in the lowest levels at the Wills site (22-Hi-512) on the upper Pearl River; Wheeler pottery continued into the upper levels where it was associated with Tchefuncte and Bayou La Batre pottery (Rands 1959). Wheeler ceramics are associated with Bayou La Batre pottery types at several sites in the Mobile Bay region (Wimberley 1960:Table 18; Trickey and Holmes 1971). The fact that Wheeler and Alexander co-occur as part of the same component at several sites is beyond doubt. Not only is this clear from deep midden excavations in the Middle Tennessee River Valley (Walthall 1980:102–103; O'Hear 1996) and upper Tombigbee River Valley (Bense 1987), but it is documented at the short-term, single-component Saunders site (Henson Springs phase) in the central Tombigbee River Valley (O'Hear 1990:42).

Closer to the Mississippi Sound region, in the interior Pascagoula River basin, plain, punctated, and simple stamped Wheeler pottery (composed of sandy pastes tempered with Spanish moss, *Tillandsia usneoides*) was found in association with an incised and pinched Alexander vessel at site 22-Ld-515 (Conn 1978:32). At the Archusa Creek site (22-Ck-526), also in the upper Pascagoula River basin, Marshall found Alexander, Bayou La Batre, Tchefuncte, and Wheeler sherds in association in closed-context pit features (Marshall 1982b:Table 6). On the Gulf Coast, as was mentioned earlier, Alexander ceramics occur as minority types at late Tchefuncte Pontchartrain phase sites. Further east, Tchefuncte types occur as minority types in association with Bayou La Batre ceramics at Bryant's Landing phase sites in Alabama (Wimberley 1960:Table 18). Whether Alexander ceramics also sometimes co-occur is unclear, but examples have been recovered from Bryants Landing phase sites in surface contexts (Brose et al. 1983:230). In short, there can be no doubt that Wheeler, Bayou La Batre, Tchefuncte, and Alexander were in contemporary use for a significant portion of their long durations of use. These series are often present together in single component contexts where their geographical distributions overlap, such as the Mississippi Sound region.

In the Apple Street phase ceramic complex, Alexander and Bayou La Batre types predominate, with lesser frequencies of Tchefuncte and Wheeler plain pottery (Table 3.2). As exemplified by the Apple Street site materials, all four ceramic series occur together in midden contexts, together with nonlocal stone and Poverty Point objects. The Apple Street phase differs from contemporary phases to the east (Bryants Landing phase) by the significant presence of Alexander pottery, differs from the Henson Springs

Table 3.2. Apple Street Phase ceramic complex.

TEMPER-WARE GROUPS:

fiber tempered
grit-sand tempered
Tchefuncte Plain

TYPE-VARIETIES:

Alexander Series
Alexander Incised
var. Prairie Farms, Crump, Bodka Creek, Pleasant Valley, Clay, Negro Slough, Ponchitolowa, Smithsonia
Alexander Pinched
var. Pineapple, Catalpa
Alexander Punctated
var. Columbus, Tibbee, Chappepeela
Mandeville Stamped
var. Mandeville
Chinchuba Brushed
var. Chinchuba

Bayou La Batre Series
Bayou La Batre Scallop Impressed
Bayou La Batre Stamped

Bayou La Batre Series (continued)
Santa Rosa Stamped
Santa Rosa Punctated

Tchefuncte Series
Lake Borgne Incised
var. Lake Borgne
Tammany Punctated
var. Tammany, Brittany, Dutchtown
Tchefuncte Incised
var. Tchefuncte
Tchefuncte Stamped
var. Tchefuncte

OTHER TYPES:

Wheeler Punctated

MODES:

rim bosses
podal supports (wedge, conical)
rim-top impressions/notches

phase to the north by the significant presence of Tchefuncte ceramic types, and differs from the Pontchartrain phase to the west by the significant presence of Bayou La Batre ceramic types. Despite Marshall's (1982a:63) assertion to the contrary, Bayou La Batre pottery is far more abundant on sites in the study area than is Tchefuncte pottery.

Unfortunately, little is known about Apple Street phase settlement or subsistence. Middens are composed of either marine shell or anthropogenic earth. Apple Street is the largest known site; smaller middens and artifact scatters also occur (Table 3.1; Figure 3.6). The absence of Late Gulf Formational period ceramics at the large Claiborne regional center implies that it was abandoned by the beginning of the Apple Street phase ca. 800 BC. No Apple Street ecofact remains have been analyzed. Two contrasting pictures of subsistence practices from contemporaneous populations in coastal Louisiana are available; investigators of the large Morton Shell Mound concluded that terrestrial species were of primary importance (Byrd 1976), while samples from the smaller Big Oak Island site suggested that aquatic species were most important (Shenkel 1984b). This variation may reflect site function and seasonality: a base camp-processing station dichotomy (Jeter et al. 1988:126). In addition to gathering a variety of wild plants, coastal populations cultivated squash and bottle gourds (Byrd 1976). Since contemporary Apple Street phase populations occupied a similar environmental zone and possessed an identical technology, a similar way of life is probable.

Greenwood Island Phase (100 BC–AD 200)

The Greenwood Island phase is the early Middle Woodland period occupation in the eastern Mississippi Sound region (Table 3.3; Figure 3.7). It was during this interval that the region's inhabitants acquired some of the pan-Eastern Woodlands copper symbols identified with the Hopewell interaction sphere. Ceramic stylistic diversity, as measured by the number of ceramic traditions and series, is greater for this phase than for any other interval in regional prehistory. Evidence for mortuary activities, known only at the largest habitation sites, is found for the first time in the region,

Table 3.3. Characteristics of Greenwood Island Phase sites.

SITE	ENVIRONMENT	SIZE	TYPE	CONDITION	INVESTIGATION	REFERENCE
22-Ja-504	Heron Bay, Terrace	50 x 20m	Midden, Burial	?	Collection	Blitz & Mann 1993
22-Ja-516	Coast, Estuary	100 x 75m	Midden, Burial	Destroyed	Collection, excavation	This report
22-Ja-543	Escatawpa River, riverine	12 x 23m	Midden	Destroyed	Excavation	Marshall 1982a
22-Ja-537	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Ja-550	Grand Bay, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Ja-555	Coast, Estuary	40 x 20m	Midden	Intact / Destroyed	Excavation	This report
22-Ja-647	Coast, Estuary	?	Midden	Intact / Destroyed	Collection	Blitz & Mann 1993

and takes the form of mass secondary interments. Despite these intriguing developments, our evidence for significant technological or social change from the preceding phase, other than an increase in recorded component frequencies, is equivocal. Many of the stemmed PP/Ks of earlier times continued to be used. Poverty Point objects continued to be used, but only the biconical form has been recovered in this phase. With the exception of mortuary activities, there is no detectable change in site locations, sizes, or functions; these appear in every respect similar to sites of the preceding phase and reinforce an impression of cultural continuity.

Strong ceramic continuity and the sharing of ceramic styles found in adjacent Louisiana and Alabama characterizes the Greenwood Island phase. The Greenwood Island phase ceramic complex is a direct indigenous development out of the antecedent Apple Street phase (Table 3.4). Some Bayou La Batre and Tchefuncte ceramic type-varieties and vessel shapes continue from the Apple Street phase, as do podal supports. However, a new tempering agent, grog (crushed sherds), appears for the first time. Enough experimental materials testing exists (Gertjejansen and Shenkel 1983) to suggest that grog temper represents a gradual, superior technological refinement of the low-fired, often temperless Tchefuncte paste. The greater thermal resistance of the new grog-tempered pottery probably increased direct-fire cooking efficiency.

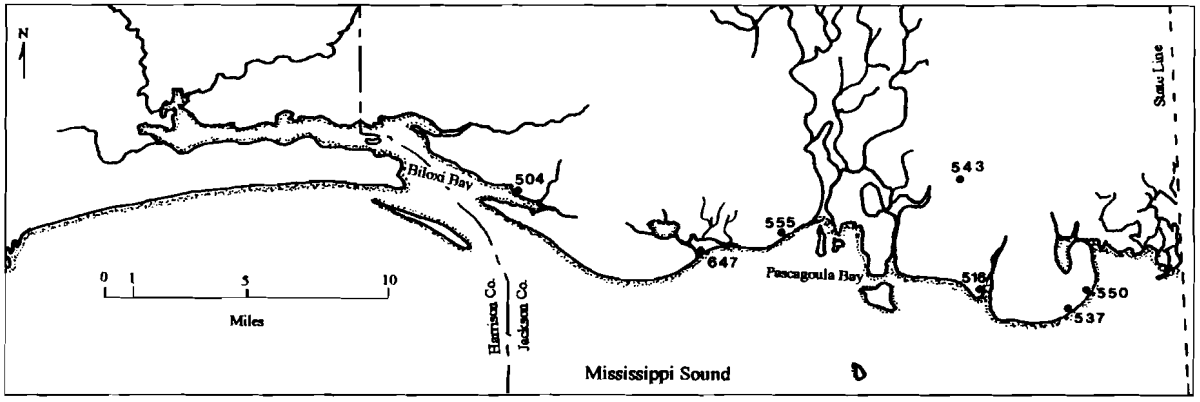


Figure 3.7. Distribution of Greenwood Island Phase sites.

Table 3.4. Greenwood Island Phase ceramic complex.

TEMPER-WARE GROUPS:

grit/sand tempered
fine sand tempered
grog tempered

TYPE-VARIETIES:

Alexander Series
Alexander Incised
var. Ponchitolowa
Mandeville Stamped

Bayou La Batre/Santa Rosa Series
Greenwood Stamped
var. Greenwood
Bayou La Batre Scallop Impressed
Bayou La Batre Stamped
Santa Rosa Stamped
Santa Rosa Punctated

Deptford Series
Deptford Simple Stamped
Deptford Linear Check Stamped
Deptford Bold Check Stamped

Marksville Series
Catahoula Zoned Red
Indian Bay Stamped
var. Spencer Bayou
Mabin Stamped
var. Crooks
Marksville Stamped

Tchefuncte Series
Lake Borgne Incised
Tammany Punctated
var. Tammany
Tchefuncte Incised
Tchefuncte Bold Check Stamped
Tchefuncte Scallop Impressed

MODES:

"Marksville" crosshatched, cambered rim
Twin Lakes rim mode (herringbone)
podal supports (wedge, conical)
rim-top impressions/notches
red pigment (rare)

A new ceramic style, rocker stamp decoration zoned by broad U-shaped incision, made its initial appearance. Diagnostic stylistic attributes of the Greenwood Island phase are Mabin Stamped *vars. Crooks* and *Point Lake*, Greenwood Stamped *var. Greenwood* (a sand-tempered cognate of *var. Crooks*), crosshatched and herringbone rim modes, and vessels with cambered rims. Other identifiable vessel shapes include simple bowls, restricted globular vessels, and conical or beaker-like vessels with wide, unrestricted orifices and small, flat bases or podal supports. Alexander Incised *var. Ponchitolowa* and Mandeville Stamped, two types of the Alexander series with a uniquely coastal distribution, continued to be produced in this phase for some time after all other Alexander ceramics disappear. Deptford series pottery is sometimes present at Greenwood Island phase sites in small quantities, indicating at least a detectable level of interaction with populations farther east in Alabama or Florida. A single example of Swift Creek Complicated Stamped, another eastern pottery type, occurs as a surface find on a site with Greenwood Island components. Both Deptford and Swift Creek pottery are products of the South Appalachian tradition.

No radiocarbon dates are available for the Greenwood Island phase, so our estimated time span of 100 BC to 200 AD is based on interregional cross-dating of ceramic attributes and association with classic Hopwellian artifacts. Along the coast, in the Lake Pontchartrain area, an early Middle Woodland period (early Marksville) component has been identified by Shenkel (1984a) at the Big Oak Island site (16-Or-6). Radiocarbon dates for this component at Big Oak Island fall around 100 BC. Diagnostic ceramic markers for early Marksville at this and other regional sites are similar to the Greenwood Island phase: Mabin Stamped *var. Crooks* and *var. Point Lake*, raptorial bird motifs, and crosshatched rims (Shenkel 1984a; Toth 1988). This southeastern Louisiana early Marksville ceramic complex is known as the LaBranche phase (Phillips 1970:898). To the east of Mississippi Sound, in the Mobile Bay region, the local early Middle Wood-

land period occupation is known as the Blakeley phase (Fuller 1990), marked by the appearance of the Santa Rosa series, a sand-tempered ware. A sand-tempered cognate of Mabin Stamped *var. Crooks* (Greenwood Stamped) and a herringbone motif rim mode (Twin Lakes rim mode) are the diagnostic markers of the Blakeley phase. The Blakeley phase is estimated to date between 200 BC and AD 150 (Fuller 1990). Excavations in Alabama at 1-Ck-45 and 1-Ba-229-A confirm that prototypes of the Santa Rosa series originated in the Bayou La Batre series; two available radiocarbon dates place this transition 200 BC to AD 1 (Brose et al. 1983; Brose 1985). Similarly, the simultaneous appearance of incised and stamped Marksville styles in the Lake Pontchartrain area represents an indigenous ceramic development out of the earlier Tchefuncte wares (Shenkel 1984a). In short, the Greenwood Island phase is contemporaneous with the LaBranche and Blakeley phases, and exhibits a parallel local continuity of the Gulf tradition.

An earlier generation of scholars conceived of the Hopewell phenomenon as a unitary cultural package of traits disseminated by wave-like diffusion or migration from either a northern (Griffin 1967; Phillips 1970) or a southern (Ford and Willey 1941) hearth. The current conception of Hopewell is that of an "interaction sphere" (Caldwell 1964); a diffuse network of interacting populations that differentially incorporated widely circulating products and ideas into variable regional and local traditions. Of course, this does not mean that specific cultural elements cannot be traced to regional sources or antecedent traditions. On the Gulf Coastal Plain, certain artifacts such as copper symbols and raw stone originated from distant northern sources; however, the assertion that burial mound ceremonialism or specific ceramic attributes are northern introductions is problematic (e.g. Williams and Brain 1983:401–403; Toth 1988). Moreover, it is apparent that many of the attributes of "Hopewell-style" ceramics so long considered a Midwestern innovation (e.g. Griffin 1966:122–123) actually originated on the Gulf Coastal Plain. As Shenkel (1984a) and others have pointed out, there is little reason to evoke contact with Ohio or Illinois Hopewell societies as an explanation (e.g. Phillips 1970:16–17; Toth 1979, 1988) for such widespread Middle Woodland ceramic styles as zoned dentate stamping, zoned rocker stamping, and the raptorial bird motif. These attributes were anticipated in such precedent Gulf tradition pottery types as Orleans Punctated, Bayou La Batre Stamped, Smithsonia Zoned Stamped, and the "key" motif of Alexander Incised, a relationship recognized more than forty years ago (Ford 1952:354).

Greenwood Island phase burial mounds have not yet been identified among the many uninvestigated earthen mounds along the coast. The closest excavated mounds that can be dated to the early Middle Woodland interval (100 BC–AD 200) are the McRae Mound in the interior Pascagoula River basin (Blitz 1986) and the McQuorquodale Mound on the lower Tombigbee River (Wimberly and Tourtelot 1941). Both of these mounds are low mortuary platforms with secondary burials; some individuals were furnished with classic Hopewell copper artifacts and nonlocal pottery. Mass secondary burials, some with distinctive copper ornaments, were interred in middens at habitation sites at Louisiana LaBranche phase sites (16Or6) (Shenkel 1984a) and at Alabama Blakeley phase sites (1-Ck-209; 1-Ba-229) (Stowe 1977a; Brose et al. 1983). As was mentioned previously, the secondary burials with copper beads and a copper bicymbal earspool at the Big Greenwood Island site apparently represent a similar, ossuary-like mortuary treatment. The copper beads, panpipes, and earspools found at these coastal sites circulated briefly but widely in the Eastern Woodlands as part of the Hopewell exchange networks ca. AD 1–300 (Griffin et al. 1970; Seeman 1979). And yet the practice of secondary or bundle burials predates the Hopewell era on the Gulf Coast (Neuman 1984:115–116; Weinstein 1986:112), again suggesting a basic continuity of indigenous cultural traditions altered only slightly by a new phenomenon: the adornment of certain burials with special nonlocal objects.

4 Painted Pots and Platform Mounds

Godsey (22-Hr-591)

The Godsey site is located on the coastal strand of southern Harrison County, about 1 km west of Biloxi Bay and 0.10 km north of Mississippi Sound. It is a prehistoric midden of earth and shell deposited on the Sangamon Beach Ridge complex. Here the relict beach is a level area of well drained, loamy sand soil 2–3 m AMSL, an ecotone where the forest meets the shore. The Godsey site is in urban Biloxi (Figure 4.1). Original site size and configuration are difficult to determine due to extensive site destruction by modern activities. As delineated by auger testing, the original site was 100 m long, 20 m wide, and oriented SW–NE. These dimensions are approximate because the site may continue onto unexamined private property to the north.

A number of early maps were perused to learn more about the original landscape. The most informative map is the "U.S. Coast Survey Map of the Harbor and Back Bay of Biloxi, Topographic Survey of May and June 1851" (Blitz et al. 1993: Figure 3). This map depicts details of the natural landscape prior to modern alteration. The linear midden distribution conforms closely to the upper southern edge of an elevated portion of the beach ridge then known as "Red Bluff." Adjacent to the site to the west was a small, marshy slough (now destroyed) fed by springs issuing from the beach ridge. The slough could have provided the site occupants with a sheltered landing for watercraft and passage to Mississippi Sound, now 0.10 km due south. Much of the area between the site and the ocean has been created since 1851 with the by-products of the local seafood processing industry, along with fill dirt and dredge materials. Prior to modification, the shoreline consisted of narrow sand beaches dissected by numerous sloughs and bayous.

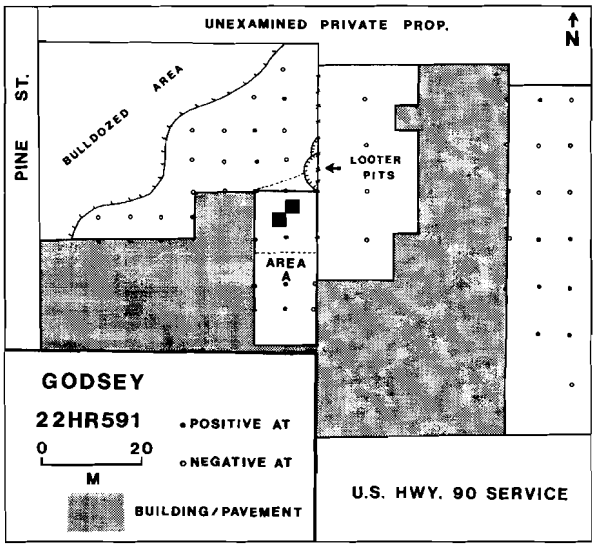


Figure 4.1. Plan of Godsey site (22-Hr-591). The extent of intact midden is indicated by the dotted line in Area A.

Investigation

What now remains of the Godsey site lies beneath a casino parking lot. At the time of our June 1993 investigation, the site was scheduled to be bulldozed. As site destruction was imminent, the investigation was organized to (1) determine if intact cultural deposits existed at 22-Hr-591; (2) delimit the spatial extent, depth, and condition of intact deposits; and (3) secure an undisturbed sample of artifacts and ecofacts (Blitz et al. 1993). Investigations were confined to the project area in Figure 4.1. The site was mapped, a surface collection secured (Blitz et al. 1993:Table 1), and a series of 55 auger tests (AT) were bored and screened for artifacts (Blitz et al. 1993: Appendix A). As a result, the spatial extent of the

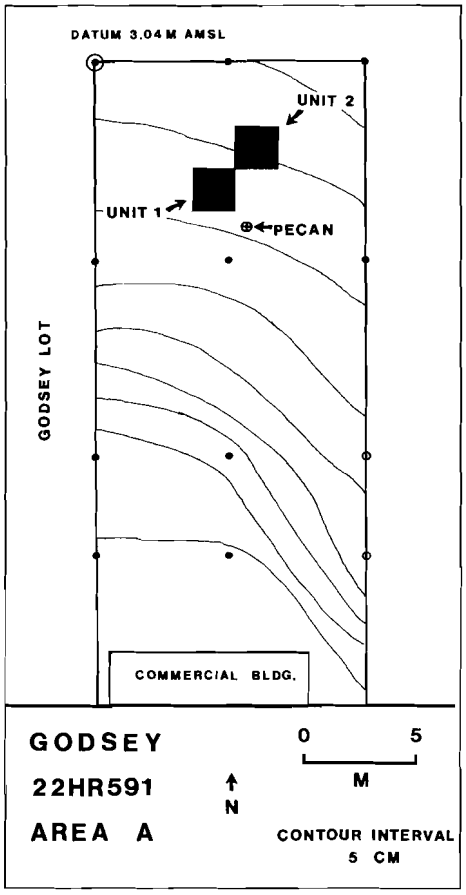


Figure 4.2. Plan of Area A, Godsey site.

Godsey site was delineated, and it became clear that most of the site had been destroyed by modern activities. Fortunately, a small area of intact midden, roughly 17 x 12 m, was preserved around a large pecan tree (Area A, Figure 4.2).

Two 2 x 2 m excavation units were placed in Area A. When our examination of Godsey Unit 1 produced clear evidence of extensive modern disturbance to the prehistoric midden, we terminated our efforts there and began a second 2 x 2 m unit, Godsey Unit 2. Here we had more luck. Godsey Unit 2 exposed 1.05 m of prehistoric cultural deposits (Figure 4.3). Stratum A was a layer of sod, humus, and pulverized marine shell that varied from 10 to 30 cm in thickness. Stratum A represents the disturbance zone of modern and historic activities at the site, for both prehistoric and historic artifacts were found in this layer. Stratum B was a coarse-matrix midden of whole oyster shells, *rangia* shells, other marine shells, potsherds, and well preserved faunal remains. Beneath the coarse shell stratum was a dark brown earth midden (stratum C) composed of charcoal, animal bone, and potsherds. Stratum D was a thin lens of shell and charcoal. Stratum E was composed of organically stained sand, grading into a sterile tan to white sand subsoil (stratum F) at about 1.05 cm below ground surface. Stratum E was enriched by the downward percolation of organic matter from stratum D as a result of various natural and cultural processes. We interpret strata A, B, C, and D as midden accumulated on top of stratum E, the ground surface at the initial time of prehistoric occupation. Recovered prehistoric cultural materials are presented in Appendix B:Table B.8. At the interface of strata D and E, several soil stains appeared and were recorded as features. Several were clearly postmolds, but we were unable to determine whether the posts were iso-

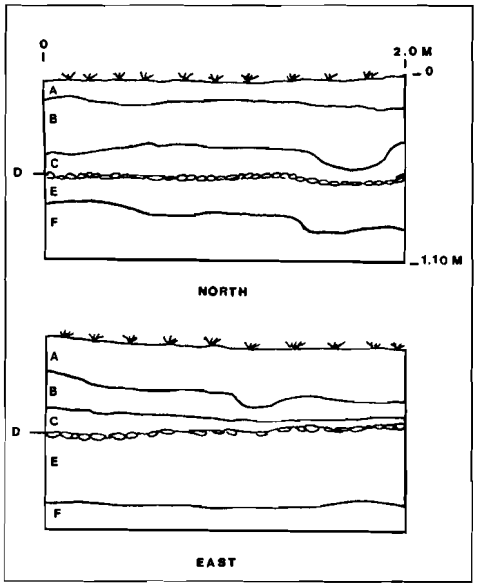


Figure 4.3. North and East Profiles, Unit 2, Godsey: a, sod/humus, and pulverized shell, 10YR4/1; b, coarse, high-density shell midden; c, dark-brown earth midden, sandy loam, 10YR3/3; d, lens of shell and charcoal; e, dark sand, organic staining, 10YR5/3; f, grading to sterile tan-white sand subsoil, 10YR7/4.

lated placements or part of a larger structure (Blitz et al. 1993:Figures 9,10; Table 4).

Out of a total of 662 sherds of prehistoric pottery recovered from auger tests and excavation units 1 and 2 at the Godsey site, 70% (N=462) are grog-tempered plain. Relatively few decorated type-varieties are present, constituting a relatively homogeneous sample. With plain and indeterminate sherds removed from further consideration, decorated type-varieties, in rank order of frequency, are: Marksville Incised *var. Yokena* (n=60, 56%); Marksville Stamped *var. Godsey* (n=18, 17%); Churupa Punctated *var. Thornton* (n=13, 12%); Marksville Stamped *var. Troyville* (n=8, 7%); Indian Bay Stamped *var. Spencer Bayou* (n=6, 6%); Churupa Punctated *var. Churupa* (n=1, 1%); and Marksville Stamped *var. Marksville* (n=1, 1%).

A small clay discoidal was recovered. The function of such objects is unknown, but they are often interpreted as gaming pieces; it presages the site's present function as a casino by 1500 years. A small quantity (24 g in Unit 2) of what appeared to be fired daub was an unexpected discovery. Impressions of small sticks or canes serve to distinguish this daub from other amorphous fired clay/sand fragments. The fragments may be the fired remains of a mud plaster used for insulating shelters, but their small size precludes certain identity.

Stone tools are conspicuously absent at the Godsey site. A small stemmed PP/K represents the only complete stone tool (Chapter 7: Figure 7.5). A few decortication flakes (n=4) indicate at least some tool production at the site. The projectile point and debitage are of local Citronelle chert. Unmodified small fragments of limonite, siltstone, sandstone, and hematite, all available locally or a short distance inland, occur in small quantities. A mass of prepared red mineral pigment (ocher) was found in Unit 2, Level 7. Another ocher lump was discovered adhering to the interior surface of a large sherd. No ground stone tools were encountered, but a stone plummet was found at the site some years ago by Edmond Boudreaux, Jr., a local Mississippi Archaeological Association member.

Three bone artifacts came from the midden in Unit 2. One of these objects is a cut and smoothed bone fragment (L=5.1 cm) of a large mammal, probably deer (Chapter 7: Figure 7.4). A hole 8 mm wide was drilled through the bone at the midpoint of the long axis. A second hole was drilled perpendicular to the first hole in order to intersect. The bone was shaped and smoothed around the drill holes. The function of this object is unknown, but it appears designed to accept a line through the holes. Perhaps it was a toggle or piece of fishing gear.

Summary: Cultural Activities at the Godsey Site

Three components or occupation intervals were identified through analysis of artifact samples from the Godsey site. The presence of whiteware and other historic artifacts indicates a minor nineteenth- and twentieth-century component (see Blitz et al. 1993). Six shell-tempered sherds mark a very minor prehistoric Pensacola culture component at the site. Both the historic materials and the Mississippian sherds were confined to stratum A. The major component at the Godsey site is a late Middle Woodland period (AD 200–400) occupation characterized by a homogeneous assemblage of the Marksville (Issaquena) ceramic series. We have designated this and similar components in the region the Godsey phase. The Godsey phase inhabitants created the earth-shell midden, and the other two minor components are incidental to the site formation process. The rich midden, projectile points, plummet, and bone implements provide ample evidence that the prehistoric occupants were engaged in fishing, hunting, and shellfish gathering, but important questions remain: Was the site formed by multiple short-term visits or was this place a sizeable, long-term community of fisherfolk? Given the limited nature of our investigations and site preservation conditions, impressions gained from the extent and depth of the midden are insufficient to answer these questions. The excavation results, however, do provide a few clues.

Postmolds were found, but we cannot be certain if the posts were elements of houses or served other purposes such as temporary racks for preserving foodstuffs by smoking or drying. If the fired clay fragments with stick or cane impressions are daub, we may infer the presence of shelters insulated for cold season occupation. The presence of prepared red mineral pigments and a clay discoidal hints at activities other than those associated with the food quest. The faunal and botanical remains document spring and summer use of the Godsey site (Appendices C and D). Site occupancy at other times cannot be ruled out. In sum, people inhabited Godsey for at least a portion of the year, perhaps longer, but we cannot specify the size or composition of the occupying group. The resulting midden accumulated to a depth of 1 m over a period not greater than 200 years.

Harvey (22-Hr-534)

The Harvey site is a prehistoric earth and shell midden in urban Biloxi. Harvey is located 1 km west of the Godsey site. The two sites occupy nearly identical environmental settings along the southern edge of the Sangamon Beach Ridge. The original dimensions of the Harvey site are now impossible to determine precisely, due to modern alteration of the landscape. As determined by auger testing, prehistoric artifacts and midden extend 129 m E–W and 114 m N–S. The highest portion of the site is 3.7 m AMSL. Midden thickness or depth below surface ranges from 50 cm to 1 m. Midden was somewhat thicker immediately surrounding several huge live oak trees than it was in intervening areas of the site, suggesting that some removal or spreading of midden had occurred in the past. The 1851 U.S. coastal survey map depicts a narrow beach between the Harvey site and Mississippi Sound to the south. Elderly informants recalled that a large spring of fresh water once existed 500 m NE of the site. During the nineteenth century, the site was contained within the lawns and gardens of two antebellum homes. One of these, the Tullis-Toledano home (built 1856), still stands just beyond the eastern site limits (the site may extend into this untested property).

Previous Investigations

Local amateur archaeologists dug at the Harvey site in the 1980s, and a report of the investigation was privately published (Greenwell 1986). Postmold patterns, a small number of human burials, stone and bone artifacts, abundant pottery, and food remains were uncovered. The site was identified as multicomponent, with the major part of the midden attributed to a "Marksville-Troyville" occupation. Additionally, similarities between pottery styles at Harvey and the Lower Mississippi Valley Issaquena phase were noted. The report received an unfavorable review by a professional archaeologist (Jackson 1988). The reviewer cited poor organization and inappropriate or incorrect use of archaeological terminology as among the report's deficiencies. Artifact provenience was not presented in the report in sufficient detail to determine the associations or contexts of the finds.

Investigations

At the time of our September 1993 investigation, the Harvey site location was scheduled for development as a condominium apartment complex. Because human remains, protected from disturbance by state law, had been found, the developer engaged us in a brief archaeological evaluation of the site (Mann 1993). The purpose of the investigation was to (1) determine the spatial extent of the archaeological deposits at the site, (2) determine if the archaeological deposits remained intact, and (3) evaluate the likelihood that undisturbed human remains existed at the site.

A topographic map was made, the site was gridded, and 87 hand auger tests were sunk to a depth of 2 m at 7.6 m (25 ft) intervals (except in areas covered by concrete pads, old house foundations, and driveways) (Figure 4.4). Four 2 x 2 m units and two 1 x 1 m test units were excavated. Two narrow trenches,

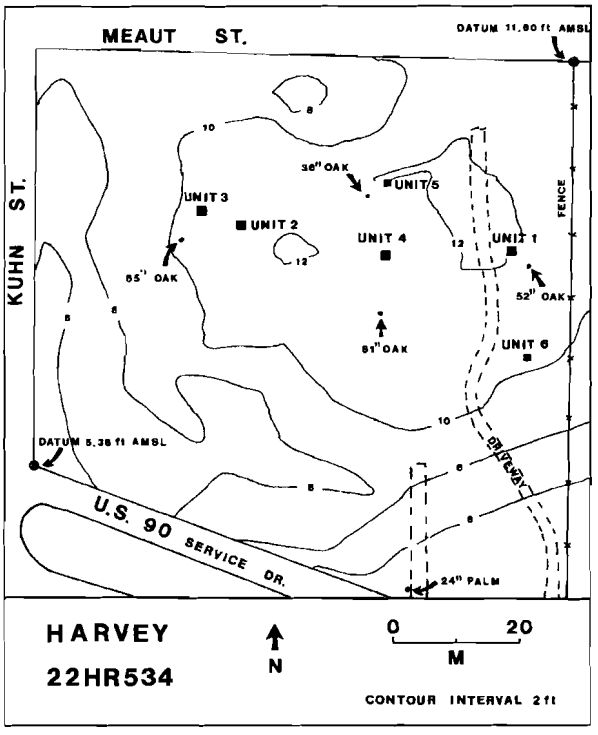


Figure 4.4. Plan of Harvey site (22-Hr-534).

one 225 ft (68.5 m) and the other 36 ft (11 m) in length, were dug for sewer pipelines. These trenches were monitored for artifacts and their profiles drawn. The auger tests, test excavation units, and the two trenches provided an extensive sample of artifacts and ecofacts. No human burials were encountered (Mann 1993). It was determined that most of the site had been destroyed by modern activities. Disturbed prehistoric deposits were identified by the presence of intrusive nineteenth- and twentieth-century artifacts. Fortunately, small areas of prehistoric midden remained intact, covered by the massive root systems of ancient live oak and magnolia trees. The developer elected to preserve these magnificent trees and their associated middens from destruction.

Four provenience groupings contained the prehistoric artifacts considered here: (1) all surface and disturbed contexts (Appendix B:Table B.9); (2) Harvey Unit 3, a 2 x 2 m excavation (Appendix B:Table B.10); (3) Harvey Unit 4, Stratum D of a 2 x 2 m excavation (Appendix B:Table B.11); and (4) Harvey Unit 6, a 1 x 1 m excavation (Appendix B:Table B.12). In Units 3 and 4, Stratum D, and in Unit 6, historic artifacts were absent or restricted to the upper 20 cm of the units. On this basis, we judged these three units to be the midden samples least disturbed by post-depositional activities.

The sequence of midden deposition, exemplified by Harvey Unit 3 (Figure 4.5), is relatively simple. Stratum A, a disturbed layer of sod and humus, overlay a dense oyster shell midden, strata B and C. Stratum B was the pulverized and disturbed upper portion of the coarse-matrix shell midden; stratum C was the more intact lower portion. Stratum D was a midden of anthropogenic earth and moderately dense concentrations of oyster shell, no doubt enriched by the downward leaching of organic materials from the upper strata. Stratum D graded into the sterile sand matrix (E) at about 50 cm below ground surface, representing the original surface of the Sangamon Beach Ridge upon which the midden had formed. No prehistoric features were encountered in Unit 3 nor in any other unit at the site. Analysis of other provenience units and historic artifacts are presented elsewhere (Mann 1993).

Of 1909 sherds of prehistoric pottery recovered at Harvey, 96% are grog tempered and 4% are sand tempered. Eighty-one percent of the pottery is un-

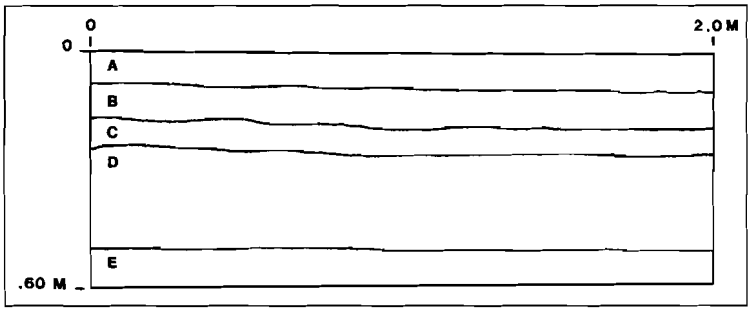


Figure 4.5. North Profile, Unit 3, Harvey: a, sod/humus, 10YR4/1; b, pulverized, disturbed, high-density shell midden; c, intact, high-density shell midden; d, dark earth midden, moderate-density shell, 10YR3/3; e, grading to sterile tan-white sand subsoil, 10YR7/4.

decorated. Decorated type-varieties, in rank order of abundance, are: Marksville Stamped *var. Godsey* (n=77), Marksville Incised *vars. Leist* (n=22) and *Yokena* (n=21), and Marksville Stamped *var. Troyville* (n=5). Other grog-tempered decorated type-varieties represented by less than five examples include: Marksville Incised *vars. Goose Lake* and *Steele Bayou*; Churupa Punctated *vars. Churupa*, and *Thornton*; Marksville Stamped *vars. Manny*, and *Marksville*, and Indian Bay Stamped *var. Spencer Bayou*. Two sand-tempered decorated types were present: Carrabelle Punctated (n=2) and Weeden Island Incised (n=1). No meaningful stratigraphic or vertical distribution in temper-ware groups or decorated type-varieties could be determined. Fired clay coils and fired prepared paste, concentrated in Harvey Unit 3, are clear indicators of pottery production at the site.

As was the case at the Godsey site, the prehistoric inhabitants at Harvey made relatively little use of stone tools. Only two complete PP/Ks were found (Figure 4.6); neither of which is temporally or culturally diagnostic. Just over a kilogram of unmodified chert cobbles was recovered, but the overall lack of debitage (a total of 55 g of heated shatter) implies very low levels of flaked stone tool production on site. The PP/Ks, cobbles, and shatter are all of local Citronelle chert. Similarly, ground stone tools were rare; these consisted of two sandstone mortar/anvils. Small amounts of unmodified hematite and limonite scattered throughout the midden probably served as a pigment source.

Two bone projectile points were found; one has a hollow base for socketing to a shaft (Chapter 7: Figure 7.4). Three slender shafts of bone, abraded to sharp points, perhaps served as bodkin/pins (Figure 7.4). One deer ulna awl (Figure 7.4), two cut-perforated fish vertebrae, and one cut/worked bone fragment of uncertain function complete the bone artifact inventory.

Summary: Cultural Activities at the Harvey Site

The prehistoric occupation of the Harvey site produced an earth-and-shell midden located in an environmental setting similar to the Godsey site. Also like the Godsey site, the Harvey midden was formed by a single prehistoric component, but Harvey was occupied later in time than Godsey. Both radiocarbon dates and ceramic seriation (Chapter 7) confirm this chronological order (although the Godsey and Harvey radiocarbon dates permit temporal overlap for a portion of the site occupations). The Harvey ceramic assemblage has most of the same decorated type-varieties as does Godsey, plus the addition of Marksville Incised *vars. Leist, Spanish Fort, Goose Lake,* and *Steele Bayou*. Significantly, the sand-tempered Weeden Island series is present in low frequency: Weeden Island Incised, Carrabelle Punctated, and fine sand-tempered plain. The Weeden Island series pottery is infrequent enough to imply the occasional import rather than local manufacture. Red pigment treatment (Larto Red, Weeden Island Red) is present. Polychrome painted pottery, identified as Landon Red on Buff, was found at Harvey by the amateur group (Greenwell 1986). These characteristics of the Harvey ceramic assemblage serve to underscore the temporal distinction between Harvey and Godsey. We have designated regional components such as that found at Harvey as the Graveline phase (AD 400–700).

Given the limited scope of investigations at Harvey, we can say little about the size or organization of the social group that produced the Harvey site midden. As no ecofact analyses are available, we are in no position to measure the seasonality of site occupation. The extensive, deep midden could have been formed by a sedentary long-term community or by multiple seasonal encampments. But the presence of postmolds in the form of structure patterns, human burials, on-site pottery production, heavy mortar/anvils, the raw materials for mineral pigments, and painted fineware pottery does not conform to the pattern of a temporary, limited-activity site or occupancy by small task groups engaged only in extracting littoral foodstuffs. Instead, the limited evidence suggests both men and women at the site, perhaps multiple-family groups, pursuing a broad range of activities for extended periods of time.

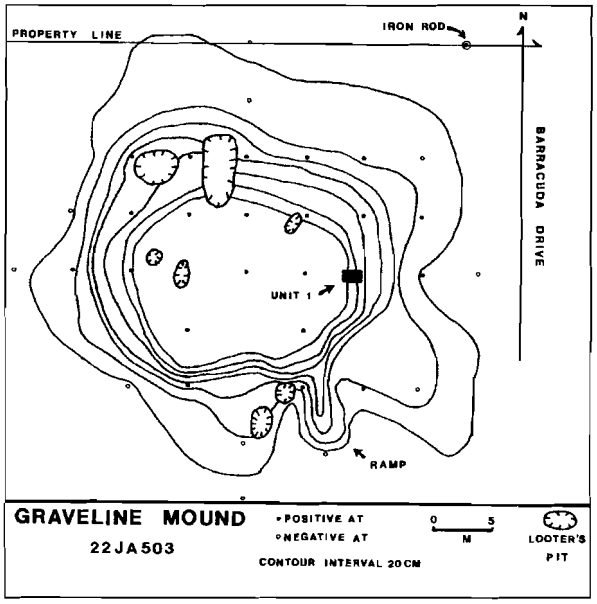


Figure 4.6. Plan of Graveline Mound (22-Ja-503).

Graveline Mound (22-Ja-503)

The Graveline Mound rests upon a flat surface of the Pleistocene Prairie Formation 146.6 m north of Mississippi Sound. Small unnamed bayous flow into the Gulf near the mound, one 60 m to the east and one 93 m to the west; thus the site is readily accessible by watercraft. The mouth of Graveline Bayou is approximately 375 m due west of the mound. Site 22-Ja-503 is a small, ramped, platform mound located on an undeveloped lot in a residential subdivision of Gautier, Mississippi (Figure 4.6). The original mound contours have been modified by erosion, but it is clear that the mound was constructed in a rectangular shape. The long axis of the mound is oriented approximately NE–SW, with a length of 30 m. The short axis runs approximately NW–SE for 25 m. The single ramp is oriented S–SE and is 8 m long and 5 m wide. Auger tests and the excavation unit profile reveal the mound to be 1.65 m high, although post-construction erosion has undoubtedly reduced the original height to an unknown degree. At the time of our investigation in June, 1992, the mound and surrounding area were in second-growth forest, with live oak, pignut hickory, and magnolia among the predominant tree species. The mound is encircled (but not noticeably damaged) by a paved road.

Previous Investigations

The Graveline Mound is one of seven mounds near the mouth of Graveline Bayou investigated by Moore (1905:29). Moore found six small conical mounds and a larger seventh mound which he describes as a rectangular platform. The dimensions of Moore's largest mound correspond well to those of the Graveline Mound. Excavations in all seven mounds produced some potsherds, but Moore does not discuss the finds nor does he provide a site map. The site is mentioned in Brown's (1926:33) survey of Mississippi archaeology, but Brown merely provided an excerpt of Moore's limited comments.

A member of the Gulf Coast chapter of MAA illustrated three complete or nearly complete pottery vessels exposed when the road and associated drainage ditch encircling the mound were constructed in 1976 (Stone 1977). These finds are discussed below. Subsequently, local amateurs dug into the mound in the 1970s. No report of the investigation was published, but a brief interpretation concluded that the mound was constructed in the "Issaquena-Weeden Island Ib or II period" over a Marksville "village midden" (Greenwell 1984:147). Several large, unfilled holes that pocket the mound were attributed by the landowner to the amateur group's activities. In 1987, the Graveline Mound was placed on the National Register of Historic Places as the Graveline Mound site (22-Ja-503), but the NRHP nomination form is inaccurate in several respects, including site description and location (Lauro 1986). Neither of these recent investigations produced much of interpretive value because no primary documentation was provided.

Investigation

We identified the location of two additional mound groups near the Graveline Mound. A west-

ern group of two small conical mounds (also designated 22-Ja-503; a third mound was destroyed here in the 1960s) are at the mouth of Graveline Bayou about 375 m west of Graveline Mound. The two mounds are surrounded by suburban development. An eastern group of three (possibly four) small mounds (no state site number) is situated .4 km east of Graveline Mound in a nearly identical environmental setting. Perhaps these two groups comprise Moore's group of seven. The intervening areas and the remaining mounds have not yet been investigated, and so we can say nothing of their history or possible interrelationship. All are threatened with imminent destruction by suburban development.

The purpose of our investigation was to determine the construction history and cultural affiliation of the Graveline Mound and, if possible, identify some of the activities that occurred there. We selected only those procedures that would inflict no significant damage on the mound. A topographic map was made and hand auger tests, sunk to a depth of 2 m, were placed at 5 m intervals across the entire feature and some distance off-mound. No adjacent habitation area was located, but off-mound subsurface investigation was restricted to the area depicted in Figure 4.6, so habitation deposits may lie undetected nearby. On-mound auger soil samples revealed alternating layers of loose and compacted sand (interpreted as stages of mound construction), established the height (or thickness) of the mound stages, and delineated the mound perimeter. A midden dump was detected along the mound's eastern edge. Unit 1, a single 1 x 2 m unit, was excavated at the interface of the platform and dump, and a small, undisturbed sample of artifacts and organic remains was recovered.

Seven distinct episodes or stages of mound construction were visible as strata in the exposed 2 m profile (Figure 4.7). Together with the auger test results, the Unit 1 profile permits reconstruction of the mound-building sequence. Episodes I, II, and III (strata I, H, G) are thin layers of alternating light and dark sand deposited over sterile white sand (stratum J), the premound ground surface. The strata incline toward the mound center, suggesting initial stages of mound use. The alternating light sand and dark sand reflect organic staining on occupation surfaces (I, G) separated by sterile sand fill (H) that added height and breadth to the mound dimensions. Episode IV (stratum F) also appears to be another fill layer, capped by Episode V (stratum E), a thin layer of loose sand. Possibly Episode V was an occupation surface for a period of time; the loose, indistinct outline is perhaps the result of surface erosion. Also, at this point in the construction sequence, the rectangular form of the mound can be recognized.

Episode VI (stratum C) doubled the height of the mound and retained the earlier rectangular shape. Unit 1 exposed only about a 60 cm long segment of the mound summit at this stage of construction. It was from this summit surface that a dump (stratum D), composed of dark sandy soil

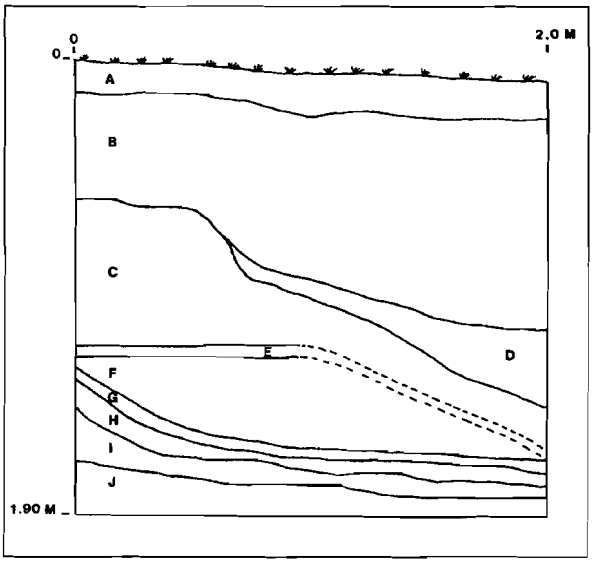


Figure 4.7. North Profile, Unit 1, Graveline Mound: a, sod/humus; b, final construction Episode VII, sand cap; c, construction Episode VI, compact sand, charcoal flecks; d, midden dump from summit, charcoal, light-density shell; e, construction Episode V, organic-stained dark sand (dotted lines indicate indistinct boundary); f, construction Episode IV, compact tan-white sand; g, construction Episode III, organic-stained dark sand; h, construction Episode II, tan-white sand; I, construction Episode I, organic-stained dark sand; j, sterile subsoil, compact white sand.

with potsherds and charcoal, was deposited down the side of the mound. Episode VII (stratum B) represents the final mound construction layer. It was a sand cap, containing few artifacts, piled over the entire surface of Graveline Mound. Presumably the mound was abandoned thereafter, for stratum A is the post-construction humus layer. A single feature was encountered at the interface of strata D and C: a postmold containing charcoal, *rangia* shells, and a small, spent core of coastal agate. This postmold was the only cultural feature discovered in the excavation.

Only small quantities of cultural remains were recovered in the investigation of Graveline Mound. Most of the associated materials consisted of potsherds (n=34) recovered from the mound-side dump (Appendix B:Table B.13). All of the pottery was grog tempered and consisted of both undecorated utilitarian ware (Baytown Plain) and decorated fineware. Several of the undecorated plain sherds are thick, coarsely tempered, and most likely represent vessels used for cooking. The decorated sherds consist of Churupa Punctated, Landon Red on Buff, and undiagnostic incised or punctated pottery. These sherds came from small, fineware vessels that had a non-cooking function; they were probably used for serving food.

Landon Red on Buff is diagnostic of a painted pottery horizon style distributed from Florida to Louisiana. Belmont and Williams (1981) refer to these styles and associated ceramic attributes as the Quafalorma horizon. The Landon Red on Buff sherds (n=5) at Graveline Mound represent a minimum of two vessels with different rims. One Landon rim is folded to the exterior, with red over buff applied as a band confined to the exterior rim and red stripes applied vertically from the rim over a buff background. The second vessel fragment is similar in decoration except that the exterior rim fold was smoothed over and a groove or thinning was cut parallel to the rim just below the lip of the vessel interior. Another Landon Red on Buff sherd probably represents a third vessel because it has black dots applied over the red stripes, essentially a polychrome treatment. The only other regional site that has produced Landon Red on Buff pottery is the Harvey site (Greenwell 1986).

The vessels collected from the road cut at the mound's periphery by Stone (1977) are informative (Appendix A: Figure A.8). Vessel A, the size of a modern coffee mug, has a thick, round rim and complex design with excisions at the line terminals. Vessel B is an incised beaker, a late variety of Marksville Incised. Vessel C is barrel-shaped with an incurvate rim. These are attributes associated with Quafalorma horizon assemblages. In addition, a small collection of sherds was obtained from the road cut immediately adjacent to the mound (Blitz and Mann 1993:Table 8). Besides both sand-tempered and grog-tempered plain pottery (some of it red filmed), the only informative artifacts found were a few sherds of Marksville Incised *var. Spanish Fort* and a single sherd of Indian Pass Incised. Given the uncontrolled nature of this sample and its separate provenience, we cannot be certain if it is part of the same component as the mound sample. However, based on the chronological sequence in Chapter 7, we assign these ceramic types as well as those found in the mound sample to the Graveline phase.

Preservation of organic materials in this deposit was poor. However, small fragments of carbonized matting or basketry woven from plant fibers (species unidentified) were discovered in stratum D, as were scattered oyster shells, *rangia* shells, a few faunal remains, and carbonized wood particles. Jewell (1993a) identified the paltry faunal remains as marine catfish, drum fish, unidentified marine fish, unidentified large mammal, oyster, and marsh clam.

Cultural Activities at the Graveline Mound Site

While modest in scope, the 1992 excavations at the Graveline Mound revealed much about the mound and its place in regional prehistory. A ramped multiple-stage platform structure, it is the largest of seven mounds first recorded earlier this

century. Auger tests and the mound-side dump exposed in Unit 1 reveal that some stages were occupation surfaces with associated food consumption activities that deposited faunal remains, broken utilitarian and fineware pottery, carbonized wood, charred fragments of basketry or matting, and fired clay. Lithic reduction of local Citronelle chert and local coastal agate also took place on these surfaces. Horizontal exposure of occupation surfaces was too limited to determine if structural remains were present on the mound summit; at least one post was placed at the mound base perimeter. The ceramic sample, although small, is a highly distinctive assemblage diagnostic of a painted pottery horizon style distributed across the Gulf Coastal Plain from Florida to Louisiana (Willey 1949; Ford 1952; Sears 1977; Belmont and Williams 1981).

To summarize, the Graveline Mound was constructed in the early Late Woodland period (AD 400–700), an interval in the local sequence we designate the Graveline phase. It is the largest mound of what may be a multiple-mound center, although the cultural affiliation of the other mounds in the vicinity is unknown. If the mounds are coeval, Graveline is the only known coastal multiple-mound center between the Florida northwest coast and Louisiana participating in the Quafalorma horizon and, presumably, an associated ceremonialism. The Graveline Mound appears to be one of a class of pre-Mississippian, multiple-stage platforms that were the scene of various non-domestic group activities. These facilities yield highly decorated ceramics, nonlocal materials, and, in some cases, evidence for communal feasting (Knight 1990:166–172; Brown 1994:52–54; Jefferies 1994; Lindauer and Blitz 1997).

The Godsey Phase (AD 200–400)

Although we have recovered as much or more evidence concerning this interval as any in our regional prehistory, the changes that mark this phase reveal some cultural puzzles that remain very much unresolved. By ca. AD 200 or slightly later, the fleeting Hopewellian contacts had waned. There was a dramatic reduction in ceramic stylistic and paste diversity. A sharp reduction in the evidence for nonlocal stone use also occurred, initiating a long-term trend that de-emphasized lithic tools. Poverty Point objects were no longer made, ending production of an item in common use for at least 1400 years. While the overall impression of the Godsey phase is one of cultural isolation, this interpretation must be reconciled with the appearance of a regional ceremonial center, the first constructed since the Poverty Point era.

The Godsey ceramic complex, in dramatic contrast to the preceding phase, is characterized by stylistic homogeneity (Table 4.1). Only one ceramic series was in common use: the grog-tempered Marksville (Issaquena) series. Although grog tempered, many sherds have a distinctly sandy texture. Identifiable vessel forms are hemispherical bowls, shallow bowls, restricted globular bowls, and flat-based beakers. With the Greenwood Island phase to Godsey phase transition, variety *Crooks*-like treatments and crosshatched rims disappeared. Podal supports reduced in size and frequency; only small, conical podal supports attached to flat bases occur. Rim/lip modes include wedge-shaped, rounded, or flattened, thickened rims, some with deep, narrow notches. The rims are similar to the "DeSha" and "Arcadia" rim modes that Phillips (1970:757–858) identifies with the Issaquena ceramic "complex." Red-filming (Larto Red) of pottery vessels occurs as a minor decorative mode.

While the similarities in shared technology, settlement patterns, and particularly ceramic styles are striking, the Godsey phase can be differentiated from contemporary coastal phases to the west and east. The Godsey phase is temporally equivalent to the late Marksville period in the Lower Mississippi Valley, and can be considered a local expression of the "Coastal Issaquena culture" (Jeter et al. 1989:138–141). The term "Issaquena" was originally defined as a local phase (Greengo 1964), then later as a ceramic complex (Phillips 1970), and most recently, as a widespread archaeological cul-

Table 4.1. Godsey Phase ceramic complex.

TEMPER-WARE GROUPS:

grog tempered
fine sand tempered (uncommon)

TYPE-VARIETIES:

Marksville (Issaquena) Series
Churupa Punctated
var. Thornton
Indian Bay Stamped
var. Spencer Bayou
Marksville Incised
var. Yokena
Marksville Stamped
var. Godsey, Marksville, Troyville

OTHER TYPES:

Alligator Bayou Stamped
Basin Bayou Incised

MODES:

rim-top impressions/notches
rounded, thickened rim
red pigment
small conical podal supports

ture distinct from Marksville (Jeter et al. 1989). We use the term "Issaquena" to label a ceramic subseries: a temporally discrete group of attributes within the Marksville ceramic series continuum (see Appendix A). Taxonomic issues aside, the main point here is that Godsey phase populations appear oriented to cultural developments in the Lower Mississippi Valley ca. AD 200–400.

To the west of the Godsey phase, the late Marksville period occupation of the Lake Pontchartrain area is the Magnolia phase (Phillips 1970:898–899). Separation of components at the type site, Magnolia Mound, is somewhat ambiguous (Jeter et al. 1989:139). Nevertheless, varieties *Yokena, Troyville,* and *Thornton* are considered good Issaquena or late Marksville period markers in southern Louisiana (Weinstein 1974:34–38; Jeter et al. 1989:139), as they are elsewhere in the Lower Mississippi Valley (Phillips 1970:542). Magnolia phase sites include mounds and earth or shell middens. In terms of ceramic style, technology, and settlement, the two phases appear to be very similar. As currently defined, the Godsey phase differs from the Magnolia phase by the high incidence of Marksville Stamped *var. Godsey,* but given the widespread stylistic similarities of this era, we would not be surprised if the *var. Godsey* treatment is found in coastal southeastern Louisiana.

To the east, the Porter phase is a late Middle Woodland period occupation in the Mobile Bay region (Fuller 1990) that is coeval with the Godsey phase. Coastal Porter sites include small sand mounds, such as Coden Bayou Mound and Salt Marsh Mound, as well as shell middens (Wimberley 1960). The Porter ceramic complex consists of the sand-tempered Santa Rosa series. Many Porter pottery types are sand-tempered cognates of the grog-tempered Marksville (Issaquena) series types found in the Godsey phase; vessel shapes and rim/lip modes are also similar. Both the Santa Rosa series and the Marksville (Issaquena) series are regional expressions of the indigenous Gulf tradition. A few examples of the Santa Rosa series types Alligator Bayou Stamped and Basin Bayou Incised are present in surface colections from sites in the study area, so presumably there was at least some interaction with eastern coastal groups. While shared tradition explains the cognate styles, it is unclear what cultural dynamics created the mutually exclusive spatial distributions of pottery temper during this time period along the Gulf Coast.

Limited aspects of Godsey phase subsistence and settlement are known (Table 4.2, Figure 4.8). Godsey phase faunal and botanical remains are treated at length in the appendices. At least two site categories have been identified: large, deep, shell middens (e.g. 22-Hr-591) and a second site category that consists of a single unique example. In the western Mississippi Sound region at the mouth of Pearl River, a late Marksville or Issaquena component similar to the Godsey phase has been identified at the Jackson Landing Earthwork site (22-Ha-515). This extensive site consists of an semicircular earthen wall, a low mound, and midden areas (Williams 1987). The wall or embankment is 1500 feet (457 m) long and in some places 12–13 feet high, one of the largest

Table 4.2. Characteristics of Godsey Phase and Graveline Phase sites.

SITE	ENVIRONMENT	SIZE	TYPE	CONDITION	INVESTIGATION	REFERENCES
GODSEY						
22-Ja-504	Heron Bay, Terrace	50 x 20m	Midden, Burial	Destroyed	Collection	Blitz & Mann 1993
22-Ja-516	Coast, Estuary	100 x 75m	Midden, Burial	Destroyed	Collection, excavation	This report
22-Ja-558	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Hr-591	Coast, Estuary	100 x 20m	Midden	Destroyed	Excavation	Blitz et al 1993
GRAVELINE						
22-Ja-504	Heron Bay, Terrace	50 x 20m	Midden, Burial	Destroyed	Collection	Blitz & Mann 1993
22-Ja-543	Escatawpa River, Riverine	12 x 23m	Midden	Destroyed	Excavation	Marshall 1982a
22-Ja-558	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Hr-534	Coast, Estuary	129 x 114m	Midden, Burial	Intact / Destroyed	Excavation	This report
22-Ja-647	Coast, Estuary	?	Midden	Intact / Destroyed	Collection	Blitz & Mann 1993
22-Ja-503	Coast, Estuary	?	Midden, Mound	Intact	Excavation, collection	This report
22-Ja-590	Heron Bay, Terrace	?	Midden	?	Collection	MDAH files

earthworks in Mississippi and the northern Gulf Coast. Two radiocarbon dates secured from the wall and late Marksville sherds from the adjacent middens place earthwork construction and much of the midden formation into the AD 200–400 interval (Williams 1987:27,61). The mound remains undated. We interpret 22-Ha-515 as a ceremonial center of regional influence, and given the intermediate location, the site perhaps attracted both Magnolia and Godsey phase populations.

Although 22-Ha-515 is the only known ceremonial center of this type in the Mississippi Sound region, Mark Williams (1987:61) observes that distinctive, semicircular earthworks similar to 22-Ha-515 are found at Leist and Spanish Fort in the Yazoo Basin. He further notes that Phillips (1970:544–545) dates these sites to the late Marksville (Issaquena) period, and thus they are roughly contemporaneous with 22-Ha-515. Steven Williams and Jeffrey Brain discount the limited evidence presented by Phillips (1970:305–315), and propose that the semicircular earthwork sites in the Yazoo Basin were erected in the Poverty Point period (although they caution that confirmatory excavation data are lacking), and that Issaquena populations perhaps had "a very low order of social development" (Williams and Brain 1983:352,360–361,396,403). They further speculate that the increased number of Issaquena sites in the Yazoo Basin was due to population dispersal, not absolute population growth, sparked by the introduction of shifting maize cultivation, and that this shifting settlement pattern generated the characteristic stylistic homogeneity of this period (Williams and Brain 1983:403). In other words, Issaquena in the Yazoo Basin is interpreted by Williams and Brain as a cultural and sociopolitical decline following the integrative Hopewellian dynamism of early Marksville.

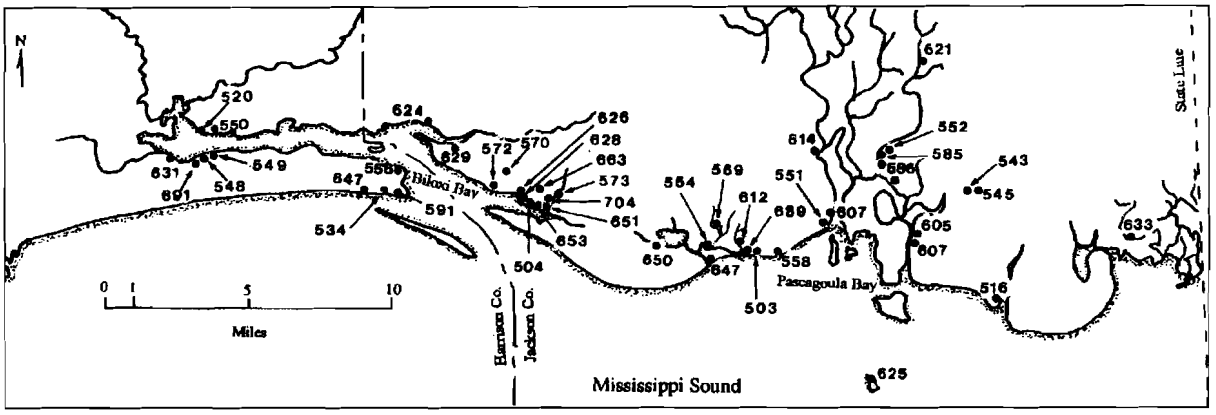


Figure 4.8. Distribution of Godsey and Graveline Phase sites.

The accumulation of new evidence over the last decade render the interpretations of Williams and Brain improbable on all these points. Evidence of maize cultivation is lacking for this period in the Lower Mississippi Valley, and recent research indicates that it was not an important factor in this region until very late in prehistory (Kidder 1993; Kidder and Fritz 1993). We agree with Mark Williams that the semicircular earthwork site plan at 22-Ha-515, Leist, and Spanish Fort are part of the same late Marksville phenomenon. Recent excavations at Little Spanish Fort (22-Sh-522), another semicircular earthwork site in the Yazoo Basin, provide further corroboration of this relationship (Jackson 1994). This type of earthwork site appears a little late to be derived from northern Hopewell forms, which it resembles only superficially. At none of these sites is there sufficient evidence to determine if the semicircular walls only served to demarcate a symbolic space or had a defensive function.

Regardless of these differing interpretations, it is evident to all researchers that the AD 200–400 interval produced new cultural and social changes. It is equally clear that these changes remain unexplained. From the Lower Mississippi Valley to Mobile Bay, populations shared very similar ceramic styles (although use of temper-ware groups differed) and artifact categories derived from the indigenous Gulf tradition. Burial mound construction continued in scattered locales (e.g. Thornton and Indian Bayou sites, Bitgood 1989:47–48,120–121), and ceremonial centers with distinctive earthworks were established in certain areas, including the coast. Yet these same populations appear locally oriented, with little evidence of nonlocal stone or distant ceramic imports, a definite change from the preceding period of Hopewellian interaction. However, to interpret the absence of long-distance imports as a cultural decline (esp. Williams and Brain 1983) glosses over the evidence for significant regional social integration: distinctive ceremonial centers with impressive earthworks, mound building, and uniformity in artifact style.

The Graveline Phase (AD 400–700)

As usual, pottery styles are our primary critera for phase definition (Table 4.3). Continuity of ceramic types and decorative treatments from the preceding Godsey phase — zoned incised, zoned punctation, and zoned plain or dentate rocker stamped — is strong. Into this preexisting ceramic ensemble a new decorative element was introduced, one that emphasized closely spaced, fine-line incision, and excision at the line terminals. Most of these styles occur as cognate type-varieties, executed on either grog-tempered Marksville series or sand-tempered Weeden Island series pottery. Identifiable vessel forms include hemispherical bowls, shallow bowls, restricted globular bowls, flat-based beakers, and barrel-shaped beakers. Thickened, rounded, "Weeden Island" rims are common. Podal

supports were no longer in use. Red-filming continued in popularity as a minor but ubiquitous attribute. In sum, the Graveline phase ceramic complex is marked by increased diversity: (1) late varieties of Marksville Incised make their appearance; (2) examples of the sand-tempered Weeden Island series occur as low frequency, minority cognate types; and (3) a polychrome painted pottery is found as a special-use fineware.

The Graveline phase can be considered a local expression of the "Coastal Troyville culture," if one accepts the rationale outlined by Jeter et al. (1989:152–156). Troyville is another Lower Mississippi Valley concept that has evolved from an arbitrary but useful temporal-spatial unit based on ceramic attributes (Ford 1952) to an archaeological culture (Belmont 1982; Bitgood 1989). We acknowledge the utility of the Troyville concept but restrict it here to a ceramic subseries: the terminal expression of the long-lasting Marksville ceramic series continuum (see Appendix A). To the east of Mississippi Sound, coastal sites in the Mobile Bay region occupied during the AD 400–700 interval have been defined as a local expression of the Weeden Island culture (Fuller 1990). The Graveline phase differs from contemporary coastal and interior Troyville phases to the west by the presence of small quantities of Weeden Island pottery and the absence of cord-marked pottery, and differs from contemporary Weeden Island phases to the east by the greater frequency of grog-tempered pottery. In short, the Mississippi Gulf Coast was where the Coastal Troyville and Weeden Island spheres of influence overlapped. For this reason, what we have learned of the Graveline phase throws new light on prehistoric cultural dynamics that have been debated for more than forty years.

Table 4.3. Graveline Phase ceramic complex.

TEMPER-WARE GROUPS:

- grog tempered
- fine sand tempered

TYPE-VARIETIES:

Marksville (Troyville) Series

- Churupa Punctated
  - *var. Churupa, Thornton*
- French Fork Incised
- Landon Red on Buff
- Marksville Incised
  - *var. Goose Lake, Leist, Steele Bayou, Spanish Fort, Yokena*
- Marksville Stamped
  - *var. Godsey, Manny, Troyville*

Weeden Island Series

- Carrabelle Punctated
- Carrabelle Incised
- Indian Pass Incised
- Weeden Island Incised

MODES:

- rounded, thickened rim
- pigmentation (red, buff, black)

Hypothetical cultural exchanges between Troyville and Weeden Island societies have played an important role in various culture history scenarios in Southeastern prehistory. Until recently, much of this dialogue unfolded without benefit of archaeological research in the intermediate Mississippi Sound region. Due to efforts in cross-dating regional sequences, Troyville-Weeden Island ceramic similarities were recognized quite early (e.g. Ford 1952). Most researchers have asserted a Weeden Island to Troyville direction of primary influence (Ford 1952; Phillips 1970:970; Belmont 1982:92–93), but some have proposed the opposite dynamic for selected traits (Sears 1977). Others have suggested that an entire constellation of cultural practices such as platform mounds, maize cultivation, and hierarchical social organization was adopted by Troyville groups from Weeden Island sources (Webb 1982). However, the entire issue may be framed inappropriately. Rather than a wave-like dissemination of a unitary cultural "package" from a single point of origin, we may once again confront an interregional interaction sphere in which widely circulating products and ideas were differentially incorporated into local cultural traditions. As is generally the case in the Southeast, these panregional horizons are often too brief to determine time-transgressive patterns or directions of influence.

Questions of directionality and priority may not be entirely moribund, however, if we unpack the concept of a unitary cultural package and look at the contents. Proponents of a Weeden Island to Troyville cultural transmission present two arguments. First, the frequency of Troyville ceramic attributes diminishes with distance from the coast. This diminution in Weeden Island-like ceramic styles (i.e. Marksville Incised *var. Leist* and *var. Steele Bayou*, French Fork Incised, Quafalorma horizon types) occurs from south to north in the Lower Mississippi Valley (Belmont 1982; Bitgood 1989:120,141). Secondly, it is claimed that platform mounds were introduced to Troyville groups via the Weeden Island connection, an impression reinforced by the Weeden Island-like ceramic styles found in association with the monuments (Webb 1982).

The veracity of the first argument is securely established by quantified studies of ceramic distributions (e.g. Bitgood 1989), but the second argument requires modification. When the distribution of early platform mounds in the Southeast is examined, no clear center of origin is apparent, nor are platform mounds confined to a pan-Southeastern horizon (Knight 1990:166–172; Lindauer and Blitz 1997). If by a platform mound we mean ramped, flat-topped, multiple-staged mounds that typically exhibit evidence of multiple functions (Knight 1990:166–172; Jefferies 1994; Lindauer and Blitz 1997), then evidence for these in the Lower Mississippi Valley area occurs prior to the Troyville era, in the early Marksville period (i.e. Crooks Mound: Ford and Willey 1940; Marksville Mound 2: Vescelius 1957:419). Early Marksville platform mounds are not anomalies, for platform mounds are widespread in the Middle Woodland period (Lindauer and Blitz 1997). Indeed, in the Lower Mississippi Valley as in other areas of the Southeast, it is possible to trace an *in situ* evolution of earthen mounds from low platforms with primarily a mortuary function and few or no episodes of rebuilding to multi-stage, ramped construction with additional ritual activities appended to the mortuary functions (Belmont 1967:31–32; Bitgood 1989:144). While claims of eastern priority should be discarded, the relevant observation is that the AD 400–700 interval in the Lower Mississippi Valley *did* witness a proliferation of platform mound construction (or, at least, an increase in recorded examples). Moreover, some of these platform mounds have multiple, superimposed occupation surfaces associated with thick midden, a new pattern that implies a new set of mound-top activities involving food consumption was added to the older mound-building tradition.

The concept of an interaction sphere linking Louisiana and Florida is most developed with regard to the distinctive painted pottery horizon style. Belmont and Williams (1981) refer to these styles as the Quafalorma horizon. Diagnostic ceramic attributes of this horizon style are rounded and thickened rims, use of two or more colors of paint, barrel-shaped restricted orifice vessels, red-painted rim bands with red stripes over buff interiors (Landon Red on Buff), and polychrome ceramic human effigies (Belmont and Williams 1981:27–32). All of these attributes were present at Graveline Mound except effigies. Landon Red on Buff sherds were also reported present at the non-mound Harvey site (Greenwell 1986). We interpret the painted pottery vessels as functioning in a special-purpose serving assemblage of finewares, in contrast to a mundane domestic coarseware assemblage used for utilitarian purposes. Belmont and Williams' (1981:34) time span estimate for the Quafalorma horizon is AD 300–500, but the two radiocarbon dates from Graveline Mound imply a later temporal placement (AD 400–700).

Graveline Mound is roughly contemporary with such Troyville ceremonial centers as Gold Mine (Belmont 1982), Manny mounds E and F (Bitgood 1989:120–121; Greengo 1964), Mt. Nebo (Jeter et al. 1989:151), Lake St. Agnes (Bitgood 1989:131; Toth 1979) and Troyville (Belmont 1982; Neuman 1984:170–177) in Louisiana, and perhaps early Weeden Island culture sites such as Buck Mound (Lazarus 1979) and McKeithen (Milanich et al.

1984) in Florida, and Kolomoki (Sears 1956) in Georgia. Clearly, the Graveline Mound site and its attendant populations at habitation sites such as Harvey (22-Hr-534) represent an expected but previously undocumented regional node of interaction that linked the early Weeden Island and Troyville spheres in the fourth to seventh centuries A.D. Evidence of this interregional interaction is restricted to ceramic style, however, for there is no indication of raw material exchange.

Our knowledge of Graveline phase settlement patterns is rather sketchy (Table 4.2; Figure 4.8). If we look for comparative excavated components in the western Mississippi Sound region, we find only two sites. Indian Camp (16-St-6), at the mouth of Pearl River in St. Tammany Parish, Louisiana, lies very close in time to the Graveline phase components. The non-mound shell midden site, Diamondhead (22-Ha-550), on St. Louis Bay, also produced a small quantity of Weeden Island pottery (Jackson et al. 1993; Sims 1997). The Indian Camp site consists of a damaged flat-topped mound with dimensions similar to the Graveline Mound and an associated earth-shell midden. Based on ceramic cross-dating, Webb (1982:241) identifies Indian Camp as an "early Troyville" site that was in "an ideal location for the reception of new ideas coming in from the east." The Indian Camp component differs from the Graveline phase by the absence of Weeden Island pottery, the absence of Quafalorma painted pottery, and the presence of some Lower Mississippi Valley pottery types not found in Graveline components. It is unclear if these differences are temporal or spatial, but it seems likely that Indian Camp populations represent a separate, possibly coeval phase—perhaps the ill-defined Whitehall phase (cf. Phillips 1970:911). Thus we have at least two culturally related mound centers in the Mississippi Sound region, coastal links in the Troyville-Weeden Island interaction sphere. In addition to the mound sites, the only other known Graveline phase site category is the earth-shell midden habitation site, of which Harvey is the prime example.

Information about Graveline phase subsistence practices is very limited and consists of nothing more than a short list of identified faunal remains from the mound midden dump at Graveline and a bigger inventory at Harvey (Greenwell 1986). An unremarkable range of aquatic and terrestrial species was found, but at neither site do the samples permit any insight into relative resource importance, nor are they likely to represent the full range of exploited species.

Tates Hammock Phase (AD 700–1200)

This phase was defined to encompass Late Woodland period sites with check-stamped pottery in the Mobile Bay region (Walthall 1980:171–172), a temporal span and material expression that previously had been labeled "Weeden Island–Coles Creek" (Wimberly 1960). Here we extend that phase designation to similar remains in the eastern Mississippi Sound region, even though there are indications that ceramic complexes vary somewhat between the two regions. This rather gross lumping exercise reflects the poor state of knowledge about regional prehistory during this interval. This ignorance is due, in part, to our failure to isolate regional components in excavated samples. While these data are limited, we can still sketch out the culture-historical implications of ceramic style change, identify an important technological change, and even venture to suggest some social dynamics that stimulated these phenomena.

At ca. AD 700, check-stamped pottery of the South Appalachian tradition appeared on coastal sites from Mobile Bay into southern Louisiana (Brown 1984). From Mobile Bay to the east, the use of sand temper predominated (Wakulla Check Stamped), while to the west in Louisiana, check-stamped vessels were tempered with grog (Pontchartrain Check Stamped). Typical of the intermediate geographical position of Mississippi Sound, both cognate types are present in the region. Prior to this time, check-stamped decoration had been in use for centuries farther to the east

and north. In fact, the check-stamped style had appeared briefly in early Middle Woodland times along the Mississippi-Louisiana coast as infrequent imports or local copies of the eastern Deptford series. Then, after a hiatus of several centuries, check stamping reappeared once more, this time as a pervasive style.

While the earlier introduction of check stamping was the consequence of a local population's desire for exotic items obtained through the far-flung Hopewellian exchange networks, resort to such an explanation is unconvincing the second time around. There is little or no evidence for the exchange of exotic materials across the Gulf Coast during the Late Woodland period (although marine shell flowed in ever-increasing volume from unknown coastal sources to the interior in the latter portion of this period). Stone artifacts of any sort are uncommon on coastal sites of this era in Louisiana (Brown 1984:107), Alabama (Walthall 1980:171), and Mississippi. Some mound construction, with associated but mostly unadorned burials indicative of local social integration, was practiced in coastal areas adjacent to the Mississippi Sound region. No such mounds have been confirmed in coastal Mississippi, perhaps due to the low level of investigation. Despite some regional or local variability in mound building, Gulf Coast populations of this era appear to be locally oriented, with no detectable emphasis on distant resources.

In Louisiana, the infusion of check-stamping into the indigenous Gulf tradition ceramic continuum has been defined as the Coastal Coles Creek culture (Jeter et al. 1989:152–153). In this study, we restrict that concept to a ceramic series. Tates Hammock phase ceramic samples retrieved from surface collections in the study area differ from Coastal Coles Creek ceramic complexes to the west by the consistent co-occurrence of sand-tempered Weeden Island series types (equivalent to Wakulla or the late Weeden Island period in Florida). These sand-tempered types are the majority wares on contemporaneous sites in the Mobile Bay region, but appear to be minority wares in the study area (Mistovich et al. 1983:8). Even if this is the case, the frequency of Weeden Island series pottery in the Mississippi Sound region increases noticeably when compared to the preceding Graveline phase.

Northern tradition pottery (Mulberry Creek Cord Marked, Furrs Cord Marked) occurs on Mississippi Sound sites for the first time during the Tates Hammock phase, and it seems to be as abundant as check-stamped pottery. Once again, we are faced with the abrupt regional appearance of a ceramic tradition with distant origins. In this case, cord-marked pottery has a long history in northern Mississippi and western Alabama prior to its use on the coast. Seemingly rapid intrusions of northern cord-marked pottery into new areas happened in other regions as well, notably the northern portion of the southern Lower Mississippi Valley, between AD 400–800.

In his synthesis of the Baytown period in the southern Lower Mississippi Valley, Bitgood (1989:141–143) is skeptical of earlier explanations that sought to explain the dramatic cultural discontinuity between northern Troyville phases and the Woodland elements of the Deasonville-related phases as the result of maize agriculture (Williams and Brain 1983:404). Instead, he calls attention to the correlation of cord-marked pottery and the initial appearance of the bow, as indicated by small triangular or stemmed projectile points. He proposes that bow technology permitted hunting intensification, population growth, and the territorial expansion of Woodland groups (also see Blitz 1988).

Such a scenario is applicable to the Tates Hammock phase as well. Diminutive triangular and stemmed arrow points (Collins, Madison) are a post-AD 700 phenomenon in the region, and to judge from the stratigraphic evidence obtained in WPA-era excavations (Wimberly 1960:217), this is also true of the Mobile Bay region. Those few PP/Ks recovered in earlier components are larger, heavier, and correspond to forms with considerable antiquity (e.g. Gary points); they probably functioned as dart points or knives. Arrow points have only been recovered from surface or potentially mixed-com-

Table 4.4. Characteristics of Tates Hammock Phase sites.

SITE	ENVIRONMENT	SIZE	TYPE	CONDITION	INVESTIGATION	REFERENCE
22-Ja-618	Coast, Estuary	90 x 35m	Midden	?	Excavation, collection	Mistovich et al. 1983
22-Ja-657	Graveline Bay, Terrace	80 x 50m	Midden	Intact	Collection	MDAH files
22-Ja-659	Graveline Bay, Terrace	25 x 25m	Midden	Intact	Collection	MDAH files
22-Ja-537	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann 1993
Hidden Midden	Graveline Bay, Terrace	20 x 20m	Midden	Intact/Destroyed	Collection	Blitz & Mann 1993
22-Ja-663	Heron Bay, Terrace	100 x 53m	Midden	Intact/Destroyed	Excavation	Walker & Taylor 1982
22-Ja-647	Coast, Estuary	?	Midden	Intact/Destroyed	Collection	Blitz & Mann 1993
22-Ja-504	Heron Bay, Terrace	50 x 20m	Midden, Burial	?	Collection	Blitz& Mann 1993
22-Ja-695	Graveline Bay, Terrace	?	Midden	Intact	Collection	MDAH Files
22-Ja- 531	Graveline Bay, Terrace	?	Midden	Intact	Collection	Blitz & Mann 1993
22-Ja- 521	Pascagoula River, Riverine	20 x 20m	Midden	Intact/Destroyed	Excavation, collection	This report
22-Ja-543	Escatawpa River, Riverine	12 x 23m	Midden	Destroyed	Excavation, collection	Marshall 1982a

Table 4.5. Tates Hammock Phase ceramic complex

TEMPER-WARE GROUPS:

grog tempered plain
fine sand tempered plain

TYPE-VARIETIES:

Coastal Coles Creek Series
Alligator Incised
var. Oxford
Beldeau Incised
var. Beldeau
Coles Creek Incised
var. Hardy
Evansville Punctated
(hemiconical, round, sharp point, square)
French Fork Incised
Mazique Incised
var. Mazique, Manchac
Pontchartrain Check Stamped
var. Pontchartrain, Fire Island,Onion Lake

TYPE-VARIETIES (*continued*):

Miller Series
Furrs Cord Marked
Mulberry Creek Cord Marked

Weeden Island Series
Wakulla Check Stamped
Weeden Island Incised
Weeden Island Punctated

OTHER TYPES:

Salomon Brushed
Wheeler Check Stamped

MODES:

rim strap/fold
pigmentation

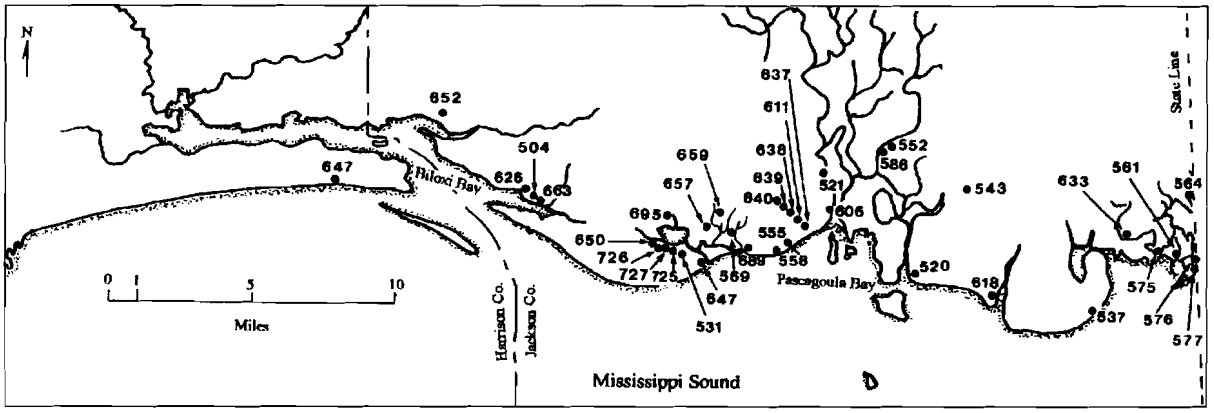


Figure 4.9. Distribution of Tates Hammock Phase sites.

ponent contexts in the study area, although in each case post-AD 700 components are present. Marshall (1982a) excavated a substantial Tates Hammock component at 22-Ja-543. Collins and Madison points were also recovered. Unfortunately, Marshall failed to present artifact counts per provenience unit in the report on this multicomponent site, thus artifact associations and component separation were obscured.

Characteristics of Tates Hammock sites are presented in Table 4.4 and site distributions are mapped in Figure 4.9. Artifact inventories from surface collections at Tates Hammock sites are presented elsewhere (Blitz and Mann 1993:Table 8). Tates Hammock ceramic attributes are summarized in Table 4.5. For both check-stamped and cord-marked vessels, an unrestricted conoidal jar form is common. Rim fold/straps are characteristic of check-stamped vessels. Other identifiable vessel shapes in the ceramic complex are simple bowls, restricted bowls, and beakers.

5 Fisherfolk and Farmers

Singing River (22-Ja-508, -520, -578)

The Singing River site occupies the Pleistocene Prairie Formation on the east bank of the Pascagoula River, 2 km upstream (north) from where the river meets Mississippi Sound. This sandy land surface is a geologically recent alluvial formation deposited as the Pascagoula-Escatawpa River system responded to rising sea levels (Lamb 1983). From the river's edge, the land rises 2 m AMSL, then levels out in a low, broad terrace. The site is adjacent to the tidal marsh-estuary littoral zone. By means of dugout canoes, inhabitants would have had rapid access to salt marshes, the open water of Mississippi Sound, and the interior river system.

Singing River is a large, complex site in urban Pascagoula (Figure 5.1). It consists of a badly damaged mound and an associated earth-shell midden oriented N–S, parallel with the river bank. A spring (now land-filled) that flowed to the river divided the site, with the midden to the north and the mound to the south of the intervening wet area. Over the years, the site has received multiple names and site numbers. The midden north of the spring drainage has two state site numbers (22-Ja-508, "Delmas"; 22-Ja-520, "Shirley") and the mound is recorded as a separate site (22-Ja-578, "Michelle Mound") but both midden and mound can be considered a single, complex archaeological site. Approximate site dimensions, including 22-Ja-520, -578, and the wet area, are 245 m north–south and 50–75 m east–west.

Ancient live oaks help stabilize the site. Intact deposits are on residential properties, nineteenth-century homes that are part of Pascagoula's Front Street Historic District. Despite this quasi-protected status, considerable portions of the site and one antebellum home have been destroyed by commercial development even after designation as a historic district. The original dimensions of the site are now obscured by streets, a storage area for shipping containers, and other commercial developments. The mound has been contoured and altered to such a degree that the original form and dimensions cannot now be determined from surface inspection alone. It stands about 2.5 m in height, with the summit 4.2 m AMSL. Inspection of the least damaged side (east) is the basis for an estimated mound length of 25–30 m. In 1992, a mobile home rested atop the mound.

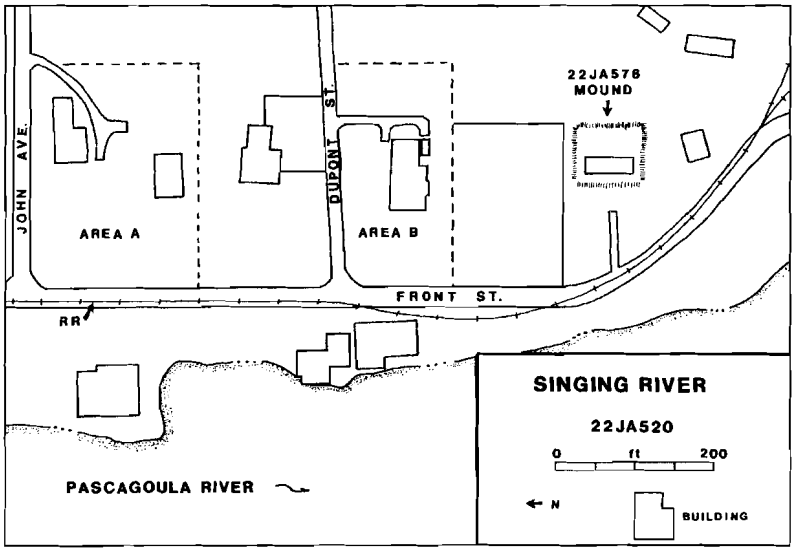


Figure 5.1. Plan of Singing River site (22-Ja-520).

Previous Investigations

The Singing River site is probably the "Delmas Place" recorded by Moreau Chambers in a 1933 Mississippi Department of Archives and History survey of sites along the Mississippi Gulf Coast (WPA 1940). Chambers was informed by local residents that an "Indian burying ground" existed at the site and that a "carved stone frog" had been dug up and sent to the Smithsonian Institution. Not until the mid-1950s did the site again come to the attention of archaeologists. Human bones and a large ceramic human effigy pipe (cover illustration) were found eroding from the shell driveway on the A. W. Pinola (J. Delmas house) property (Lazarus 1959a, 1960a,b), part of the earth-shell midden (22-Ja-520). Lazarus examined the site and acquired a small collection of artifacts and human skeletal material. Lazarus considered the site to have Pensacola and Weeden Island components. He mentions that Robert Rands, then of the University of Mississippi, placed an excavation unit in the site and discovered deep midden. We were unable to learn anything further about this excavation. In 1966, Neitzel assigned the "Delmas Place" a site number, 22-Ja-508. Singing River is almost certainly the "huge midden in downtown Pascagoula" identified by Sears (1977:177) as a Pensacola culture site. Neither Sears, Neitzel, Lazarus, nor Chambers mention the mound.

In the 1970s, amateur archaeologists dug into both the midden and the mound, and additional site numbers were assigned by the state (22-Ja-520, 22-Ja-578). A brief report summarizes the activities (Greenwell 1981). Human skeletal remains were encountered in the earth-shell midden (22-Ja-520) in the vicinity of the earlier discoveries reported by Lazarus. Amateur digging in the mound (22-Ja-578) produced burned wood, ash, fired areas, apparent postmolds, and potsherds, observations corroborated by the landowner. Human remains were reported eroding from the damaged mound slopes. Thirty-eight meters of exposed midden, up to 1.5 m in depth, was revealed when sewer pipe was laid along Front Street, the western site boundary. Potsherds from the trench backdirt indicated a Pensacola component (Mann 1989).

Investigation

Because we did not excavate into the mound, we have no additional evidence independent of the information presented above that 22-Ja-578 is an earthwork. Our 1992 field investigation was confined to the earth-shell midden (22-Ja-520). Two areas of the site appeared least disturbed: Area A, the Pinola property (Figure 5.2) and Area B, the Lewis property (Figure 5.3). Both properties were mapped and 42 auger tests were placed in a north–south grid at 5–10 m intervals, each sunk to a depth of 2 m. In Area A, auger tests revealed that much of the area between the J. Delmas house (built ca. 1830) and Front Street was covered by fill dirt. Most of the area from the J. Delmas house east to Frederick Street was not augered due to apparent

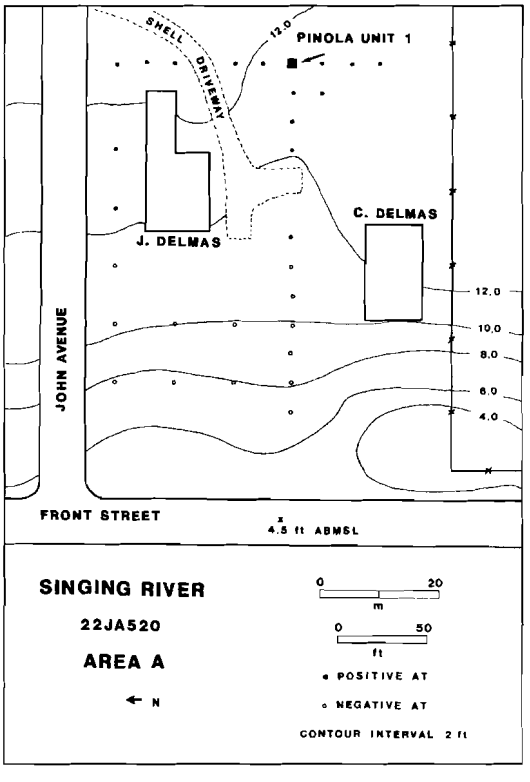


Figure 5.2. Plan of Area A, Singing River site.

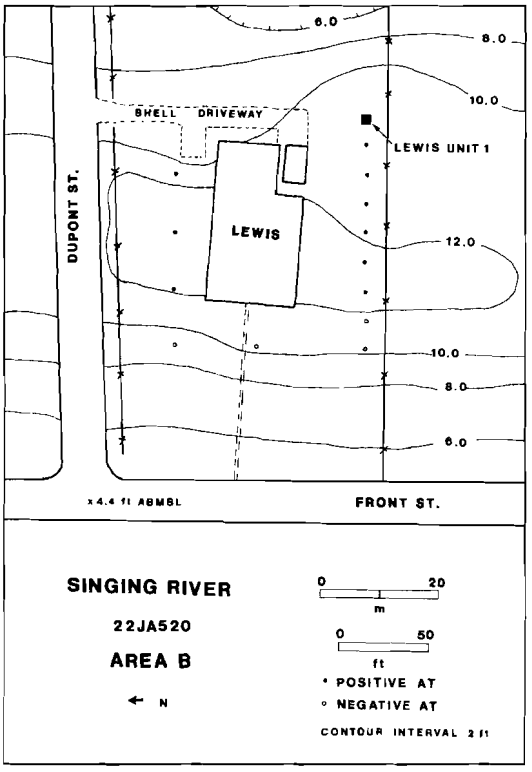


Figure 5.3. Plan of Area B, Singing River site.

modern disturbance (cement pads, shell-paved driveways). A single 2 x 2 m unit was excavated between the J. Delmas house and the C. Delmas house (built ca. 1890), where auger tests detected deep midden.

This Area A test excavation, Pinola Unit 1, exposed more than one meter of cultural deposits. As seen in the south profile (Figure 5.4), stratum A was the disturbed sod/humus layer. Stratum B was an earth-and-crushed-shell midden that overlay a thick layer (stratum C) of whole oyster shells, *rangia* shells, other well preserved faunal remains, and potsherds. We interpret stratum B as merely the pulverized upper portion of stratum C, and not a significantly different depositional episode. Beneath the coarse shell stratum was a dark brown earth midden (stratum D) composed of ash, charcoal, faunal remains, and potsherds. Sterile white sand subsoil (strata E and F) underlay stratum D. A mounded mass of this sand (E, Feature 1) was encountered at a higher level and was more compact than the matrix from which it was derived (F). Perhaps this sand mass was a cultural feature, possibly a structure floor, but this conclusion is problematic because so little of stratum E was exposed horizontally. Without doubt there were past activities at the interface of D, E, and F, for we encountered two midden-filled postmolds (Features 2 and 3), considerable ash, and a fired-clay hearth fragment along the periphery of E. Prehistoric artifacts recovered from Pinola Unit 1 were almost exclusively potsherds (Appendix B:Table B.14).

Pinola Unit 1 produced a total of 1134 potsherds. The composition of the temper-ware groups in the plain pottery sample is grog tempered (46%), shell tempered (37%), shell-grog tempered (16%), and sand tempered (1%). Most of the grog-tempered sherds are terminal Coastal Coles Creek/early Plaquemine series types of the indigenous Gulf ceramic tradition, while the shell-tempered pottery represents the initial presence of the Middle Mississippian ceramic tradition in the region. Of special interest is the mixed shell-grog-tempered pottery, which incorporates attributes of both ceramic traditions. Also, a single example each of Weeden Island Plain and Weeden Island Punctated are present. No check-stamped pottery was present,

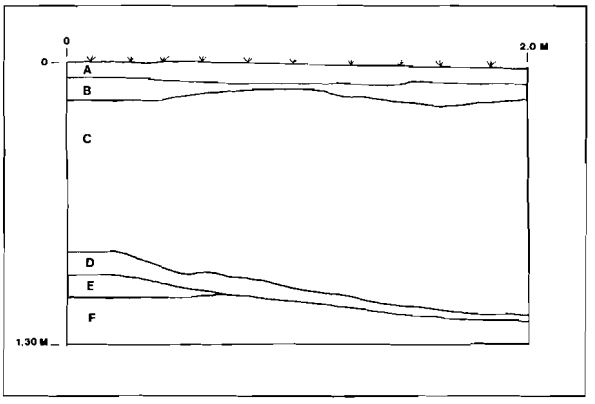


Figure 5.4. South Profile, Pinola Unit 1, Area A, Singing River: a, sod/humus, sandy loam, 2.5YR2/0; b, pulverized shell midden, sandy loam, 10YR4/1; c, dense shell midden, whole shells, ash, charcoal; d, earth midden, sandy loam, 10YR3/3; e, Feature 1, sterile white sand derived from f, 10YR7/4; f, sterile white sand subsoil similar to e but less compact.

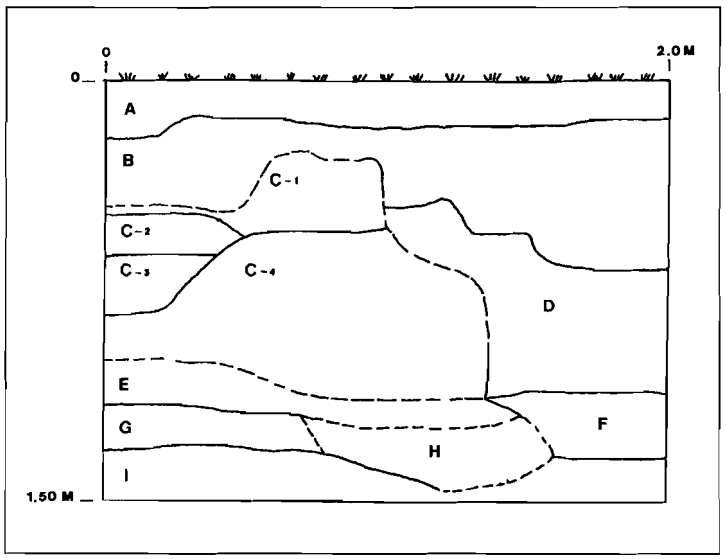


Figure 5.5. West Profile, Lewis Unit 1, Area B, Singing River: a, sod/humus, sandy loam, 10YR2/1; b, pulverized shell midden, sandy loam, 10YR4/1; c, Feature 1 (c-1: silt, ash, 10YR5/3; c-2: dense shell; c-3: silt, ash, 10YR5/3; c-4: dense shell, ash); d, dense shell midden; e, earth midden, ash, 5YR2.5/2; pulverized shell, earth midden, 10yr4/1; g, dense shell; h, dense shell, ash, silt; I, sterile white sand subsoil, water encountered at 1.50 m.

suggesting that this component post-dates the use of that decorative treatment. Decorated pottery, in rank order of frequency, includes unclassified grog-tempered incised, unclassified shell-grog-tempered incised, Evansville Punctated, Barton Incised, Moundville Incised, and Mulberry Creek Cord Marked. At the bottom of the Pinola Unit 1 were sherds of a salt pan ware, Kimmswick Fabric Impressed, strong evidence of on-site salt production.

Auger tests at Area B, the Lewis property, brought up midden and artifacts from depths up to 1.30 m below ground surface, indicating a very intensive use of the area in late prehistory. Midden is spread in a narrow linear band, parallel to the river and Front Street, along the levee-like deposit upon which the W. Lewis home (built 1889) rests. The midden is confined to the area surrounding the house, on the highest part of the property.

Here we placed a 2 x 2 m excavation, Lewis Unit 1 (Figure 5.5). Beneath the sod line (stratum A) was a layer of pulverized shell and earth midden (stratum B). Stratum B overlay a deposit (stratum D) of whole oyster, *rangia*, other marine shells, animal bone, ash, charcoal, and ceramics. This coarse matrix was intruded into by a series of distinct dumping episodes (strata C-1, 2, 3, 4), perhaps a cultural feature (enclosed in dotted lines and designated Feature 1), but certainly prehistoric in origin. Feature 1 was excavated separately from the other strata, although most of it extended into the profile wall beyond the confines of the unit. Underneath strata C and D there were other strata (E, F, G) which varied mainly in the degree to which shell was whole or pulverized. Stratum H (dotted line) appeared to be a distinct dumping episode or possible feature, but too little was exposed horizontally to provide clarification. Stratum I is the Pleistocene sand subsoil, devoid of artifacts, that was the original ground surface at the time of initial midden deposition. Although the stratigraphy appears complex, with the exception of the disturbed stratum A, all strata are temporally insignificant episodes in a single component deposit. Prehistoric cultural materials recovered from Lewis Unit 1 are listed in Appendix B, Table B.15.

A total of 1155 pottery artifacts were recovered from Lewis Unit 1. In contrast to Pinola Unit 1, almost all of the plain pottery sample is shell tempered (99%), and the rest is grog tempered. The shell-tempered pottery is comprised of Moundville series and Pensacola series type-varieties. Typical of Mississippian assemblages, the shell-tempered pottery is composed of coarse utilitarian ware (Mississippi Plain) and a burnished-black fineware (Bell Plain). Decorated type-varieties, in rank order of abundance, include Moundville Incised *var. Indeterminate*, Moundville Incised *var. Singing River*, Mound Place Incised *var. Indeterminate*, D'Olive Incised (all varieties), and Moundville Incised *var. Moundville*.

Three small artifact collections acquired by local residents supplement the controlled excavations.

Area A and Area B collections (Appendix B:Table B.16) are both dominated by plain shell-tempered ceramics, but a minor Tates Hammock phase (Pontchartrain Check Stamped) and La Pointe phase (Gulf Historic Fineware) presence at the site is indicated. The third collection consists of pottery dug from the mound by amateurs and stored at a local museum (Appendix B:Table B.17). These sherds are almost all decorated finewares, representing bowls, beakers, and plates of Pensacola Incised and D'Olive Incised. Artifacts recovered from the Singing River site are almost exclusively pottery. A coastal agate hammerstone, a single bifacial thinning flake, and small amounts of unmodified sandstone, limonite, and hematite complete the lithic inventory. Historic Euro-American artifacts of the nineteenth and twentieth centuries, restricted to the uppermost strata of the Pinola and Lewis excavation units, are listed elsewhere (Blitz and Mann 1993:Tables 5, 6).

The most impressive artifact from Singing River is the ceramic human effigy pipe (cover illustration). The pipe is a female figure, kneeling with both legs tucked beneath the body, and clad in a red-painted skirt. Around the upper arms, wrists, calves and ankles are depicted segmented strands, painted white, and therefore almost certainly meant to represent strings of shell beads. The head has a turban-like headpiece or hairstyle, the eyes are highlighted with white pigment, and the ears are slightly protuberant. Presumably a woman is depicted, as the figure has small modeled breasts. The pipe is illustrated by Dilworth (1979:145,Pipe 12), which she describes as a "human effigy pipe...10.0 cm high and 10.0 cm long on a side at the base. It weighs close to four pounds. In addition to the bowl and stem opening there is a tiny hole leading from the bowl to the effigy mouth." By means of the passage connecting the bowl to the effigy mouth, a smoker could exhale and cause the figure to extrude smoke. Examination of the find spot identified the pipe's provenience as the Area A midden a few meters from Pinola Unit 1, circumstantial evidence for a Pinola phase association.

Greenwell (1984:Figure 5.14) illustrates the Singing River site pipe, but he erroneously attributes it to a Weeden Island origin. Instead, the pipe belongs to a panregional "kneeling human" effigy pipe style produced ca. AD 1200–1500. Pipes of this style vary individually but share one or more of such recurrent features as the definitive kneeling posture, protuberant ears and lips, segmented strands on the limbs, and bun or turban hairstyle. This pipe style is sometimes referred to as a "kneeling prisoner" pipe by those who interpret the figures as rope-bound captives (e.g. O'Connor 1995:91). However, the segmented strands on the limbs are shell beads, not rope, for they are placed on the limbs in the same positions as are the strings of shell beads so often depicted with elaborately costumed humans on the more detailed media of copper plates and shell engravings (e.g. Fundaburk and Foreman 1957:Plates 24,30,46,49).

Several kneeling human pipes, similar or identical in style to the Singing River pipe, are known from Mississippi. A ceramic pipe from the Pocahontas Mound in the Big Black River valley replicates the Singing River pipe style closely; this site has both Plaquemine and Middle Mississippian pottery. Another example that matches the Singing River pipe style is a kneeling human pipe of stone, said to be from the Emerald Mound in the Natchez Bluffs region, but this provenience is unconfirmed (Brose et al. 1985:Plate 131). The remaining kneeling human pipes diverge from the Singing River style to some degree. One stone pipe, with the figure's arms crossed, is definitely from the Plaquemine-affiliated Emerald Mound (Dye and Wharey 1989:327; Brown 1992:Figures 219, 225). Moore (1911:Plate 29) retrieved a kneeling human effigy pipe, crudely made of limestone with little detail, at Shadyville Landing above Greenville in Washington County. Farther north, Brown (1992:255,Figure 214) illustrates a kneeling human pipe plowed up many years ago near Clarksdale, Coahoma County (now at the Winterville Mounds museum). In short, Pinola phase residents of the Singing River site had access to a highly symbolic

pipe style that was distributed across the Plaquemine and Middle Mississippian cultural boundaries.

Summary: Cultural Activities at the Singing River Site

Singing River is a large, multicomponent site. Three occupations or use episodes were minor or incidental to the site formation process: a scattering of Tates Hammock phase materials (AD 700–1200) represent the initial period of site use; a La Pointe phase (AD 1699–1775) component, indicated by Gulf Historic fineware and a honey-colored gunflint, was the terminal Native American presence at the site; and pearlware, whiteware, and modern detritus mark the final segment of site occupation by Euro-American/Afro-Americans (AD 1775–present). The major occupation dates to the Mississippi and Protohistoric periods (AD 1200–1699), when the midden formed and the earthen mound was constructed. We interpret the Singing River site as a single-mound local center of civic-ceremonial importance, the central place of a small Mississippian polity or simple chiefdom. The Mississippian occupation of Singing River is subdivided into three sequential components: the Pinola phase, the Singing River phase, and the Bear Point phase.

Pinola phase (AD 1200–1350) populations established a long-term presence at the Singing River site. Pinola phase residents apparently erected dwellings, as indicated by the postmolds and prepared clay hearth fragment in Pinola Unit 1. Fired pottery coils indicate that ceramic vessels were made at the site. Detailed analyses of ecofact remains, presented in the appendices, reveal that inhabitants used the site in spring, summer, and fall; winter site use cannot be ruled out but definitive indicators are lacking. Food remains are predominantly fish and other estuarine species. The inhabitants grew maize and engaged in salt production. Human burials, at least one accompanied by the human effigy pipe, were interred in the Area A midden.

The Mature Mississippi period component, the Singing River phase (AD 1350–1550), is exemplified in Lewis Unit 1. During this interval, the focus of site use shifted from Area A to Area B, the Area B midden formed, and the earthen mound was in use. Human remains and pottery vessels were deposited on the mound. Again, fired pottery coils recovered from midden contexts indicate on-site pottery production. No clear evidence of Singing River phase dwellings was uncovered. No implements or tools were found except potsherds. Seasonality of site occupation indicators imply that inhabitants were at the site throughout the warm months and into the fall (Appendices C and D). While year-round site use cannot be confirmed, it is clear that the Singing River phase inhabitants lived in a long-established center where they engaged in a variety of economic, sociopolitical, and ritual activities.

Fewer pottery types of the Protohistoric period Bear Point phase (AD 1550–1699) are present at Singing River. These late Pensacola series type-varieties overlay the Singing River component in Lewis Unit 1, where they were confined to the disturbed uppermost level. Bear Point phase sherds were also among the materials dug from the mound by the amateur group. Site occupation intensity or duration was less than in earlier phases. Perhaps the site ceased to be an important civic-ceremonial center early in the AD 1550–1699 interval.

Deer Island (22-Hr-500)

At the mouth of Biloxi Bay there is a small barrier island, named by the French *Isle aux Chevreuils*, because deer were abundant there. About 5.5 miles long but only .5 miles wide, Deer Island is a sandy expanse of pines, oaks, salt marsh, and palmetto scrub. At the western end, Deer Island lies about 150 yards offshore from the city of Biloxi. Even at this highest point, the remnants of a prehistoric mound, the island rises only a few meters above Mississippi Sound. Despite repeated alteration by storm tides, Deer Island is covered with the human habitation debris of centuries. On the west end is one of the largest Mississippian sites in the region.

Although vast amounts of pottery and human bone have been gathered from the Deer Island site since early in this century, the archaeological excavations required to interpret the site fully have yet to take place. Here we summarize all available information on the Deer Island site and identify the cultural components.

Deer Island has an odd settlement history. From the French Colonial period until the 1960s, a few hardy families sustained themselves on the island primarily by fishing, turpentine production, and keeping cattle (Boudreaux n.d.). The residential population always remained low, although some did their best to increase it. One island settler, Grandma Aken (1839–1940), gave birth to 17 children and adopted 25 more (Sibley 1970:24). Deer Island has attracted more than its share of dubious development schemes, some of which were literally harebrained. In 1717, a French settler requested permission from local authorities for a concession of land on the island in order to raise rabbits (Boudreaux n.d.)! Twentieth-century ventures included a failed amusement park, communities that never materialized, and other real estate debacles defeated by lack of access, mosquitos, and hurricanes.

The prehistoric midden is on the high west end of the island. Brown (1926:31–32) noted in 1916 that the midden was as much as 15 feet deep; it contained "great quantities of human bones," a "circular hut-ring," and potsherds. In 1969, Hurricane Camille destroyed much of the site. The post-Camille midden is 215 m long and covers 4 ha (10 acres). Deposits 1–1.2 m in depth are exposed along the northern beach (Lauro 1986b). The midden is composed primarily of marine shells (mostly oyster), animal bone, anthropogenic earth, and shell-tempered pottery. Non-ceramic artifacts are uncommon. Fired-clay fragments with stick impressions, possibly significant as an indicator of daubed cold weather structures, have been collected from the midden, but a prehistoric origin is uncertain. At least one mound stood on the pre-Camille midden (Kraus 1966; Joseph Jewell, personal communication, 1993), and it was the site of Grandma Aken's house (Sibley 1970:29). Several burials were dug from the mound (Greenwell 1984:153), as well as shell-tempered pottery, but there is no adequate documentation. Mound dimensions are unavailable and it is unclear how much of the monument still exists.

There have been no systematic excavations at the Deer Island site. In a brief site inspection, a MDAH archaeologist identified a Pensacola component related to the Bottle Creek phase and illustrated some of the ceramics (Lauro 1986b). A more precise age estimate for the Deer Island site was needed; a large surface collection served this purpose (Appendix B:Table B.18). Jewell (1993b) identified faunal remains in a Deer Island midden sample. By weight and number of individual species, shallow-water marine fish species far exceeded mammal, reptile, and bird remains. Other identified species were white-tailed deer, black bear, raccoon, alligator, and various turtles.

Lewis (1988:117–119) observed that while the Deer Island site suggested the possibility of a long-term or sedentary Mississippian settlement on the coast, he considered this to be unlikely, due to supposed environmental conditions that would limit or preclude local maize production. So it is interesting to note that Grandma Aken was renowned for the bounty of her Deer Island farm, where she produced a variety of vegetables, including corn, in such surplus as to supply the tables of the Montross Hotel in the late nineteenth and early twentieth centuries (Sibley 1970:29; Boudreaux n.d.).

While reliable information about the Deer Island site is scanty, several conclusions are possible. Artifact collections from the Deer Island site contain Dalton (San Patrice), Big Sandy, various other Archaic PP/Ks, a few Marksville series sherds, and eighteenth-century Native American/Euro-American items such as pottery, gunflints, and kaolin pipe fragments (MDAH 1995). The eighteenth-century native artifacts may have been deposited by the Capinans (a.k.a. Moctobi, Swanton 1946:103–104), for a 1738 French document mentions the abandonment of their Pascagoula River settlement that year and subsequent relocation to Deer Island (Rowland,

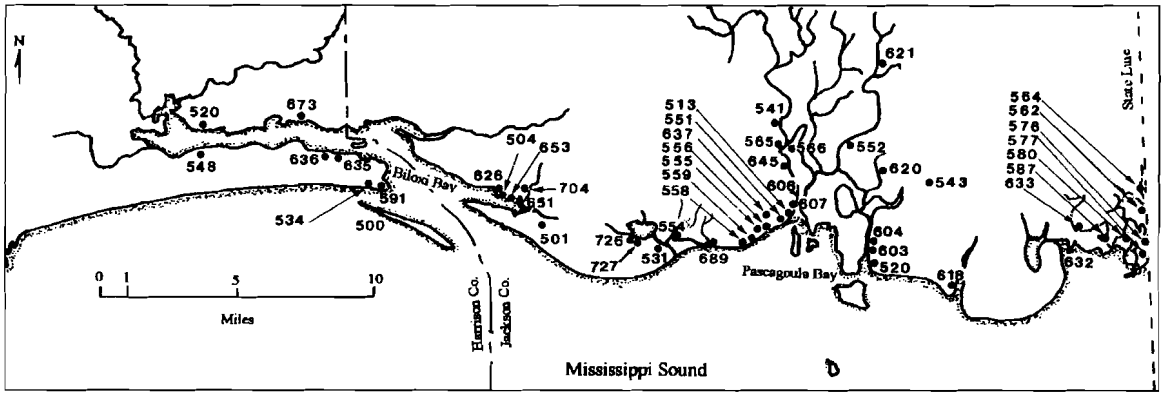


Figure 5.6. Distribution of Pinola, Singing River, and Bear Point Phase sites.

Sanders, and Galloway 1984:156). However, Deer Island is primarily a large prehistoric site with a mound and midden area. Much of the midden formed during the Singing River phase (AD 1350–1550) and continued to be occupied in the Bear Point phase (AD 1550–1699). Sometime in this interval, Deer Island served as a civic-ceremonial center with one mound and associated human burials. Like the contemporaneous Singing River site, Deer Island was probably the central place of a small, independent polity, but we have little or no direct evidence about community composition, seasonality of site occupation, or subsistence practices.

The Pinola Phase (AD 1200–1350)

A technological innovation ushered in the Pinola phase: new pottery vessel forms tempered with crushed shell. The new technology is a hallmark of the Eastern Woodlands cultural development known as the Mississippian. Mississippian societies represent the zenith of prehistoric cultural complexity in eastern North America. Although locally and regionally diverse in terms of demography, sociopolitical organization, and subsistence practices, Mississippian populations possessed common characteristics: varying practice of maize agriculture, fortified communities with monumental earthen mounds, regional settlement hierarchies, evidence of inherited social rank indicative of chiefdoms, and a widespread corpus of rituals and symbols focused on fertility, ancestor worship, and war.

The Mississippian concept is most developed for those societies in interior riverine settings. There have been far fewer studies of the coastal Mississippian phenomenon. Systematic comparison of riverine and coastal Mississippian has only recently begun. We address this issue in the final chapter. For now, we review the limited information available about the Pinola phase and assess its implications for one important concern: the origins of the coastal Mississippian culture known as Pensacola. Characteristics of Pinola phase sites are summarized in Tables 5.1 and Figure 5.6.

The Pinola phase ceramic complex is the product of a regional Gulf tradition society exposed to cultural innovations emanating from interior Mississippian populations. Once again we see that Mississippi Sound populations produced a fusion of the old and the new, the local and the distant, reflected in the contemporaneous use of several ceramic series. Each series reveals a distinct culture-historical lineage (Table 5.2). Three temper-ware groups are involved: grog temper, shell temper, and a mixed shell-grog temper (sand temper is present in negligible quantities). Most of the grog-tempered pottery consists of late Coastal Coles Creek/early Plaquemine series type-varieties. These ceramic types, together with very minor amounts of Weeden Island and Miller series pottery, represent the terminal expression of

Table 5.1. Characteristics of Pinola Phase, Singing River Phase, and Bear Point Phase sites.

SITE	ENVIRONMENT	SIZE	TYPE	CONDITION	INVESTIGATION	REFERENCE
PINOLA						
22-Ja-520	Pascagoula River, Riverine	245 x 75m	Midden	Intact	Excavation, collection	This report
22-Ja-531	Graveline Bay, Estuary	?	Midden, Burial	Intact	Collection	Blitz & Mann1993
22-Ja-558	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann1993
SINGING RIVER						
22-Ja-520	Pascagoula River, Riverine	245 x 75m	Midden, Burial, Mound	Intact	Excavation, collection	This report
22-Ja-529	Coast, Terrace	40 x 15m	Midden	Intact	Collection	Blitz & Mann1993
22-Ja-531	Graveline Bay, Estuary	?	Midden	Intact	Collection	Blitz & Mann1993
22-Ja-558	Coast, Estuary	?	Midden	Destroyed	Collection	Blitz & Mann1993
22-Ja-607	Pascagoula River, Riverine	?	Midden	Intact	Collection	Blitz & Mann1993
22-Hr-500	Barrier Island	4ha	Midden, Burial, Mound	Intact/Destroyed	Collection	This report
22-Ja-618	Coast, Estuary	90 x 35m	Midden	?	Excavation, collection	Mistovich et al.1983
22-Ja-637	Upland	25 x 15m	Midden	Destroyed	Collection	MDAH files
BEAR POINT						
22-Ja-520	Pascagoula River, Riverine	140 x 76m	Midden, Burial, Mound	Intact	Excavation, collection	This report
22-Ja-556	Coast, Estuary	?	Midden	Intact	Collection	Blitz & Mann1993
22-Ja-618	Coast, Estuary	90 x 35m	Midden	?	Excavation, collection	Mistovich etal.1983
22-Hr-500	Barrier Island	4ha	Midden, Burial, Mound	Intact/Destroyed	Collection	This report

the indigenous Gulf-South Appalachian-Northern ceramic traditions in the region. As we have seen, these traditions coalesced regionally in the preceding Tates Hammock phase (AD 700–1200).

Pinola phase shell-tempered pottery includes several type-varieties with specific culture-historical implications: Moundville Incised *var. Moundville* (Moundville series), and D'Olive Incised (Pensacola series); as well as Winterville Incised, Barton Incised, Parkin Punctated, and Kimmswick Fabric Impressed. Although exceedingly widespread (fabric-impressed salt pans might be considered a ho-

Table 5.2. Pinola Phase ceramic complex.

TEMPER-WARE GROUPS:
grog tempered
sand tempered
fine shell tempered (Bell Plain)
coarse shell tempered (Mississippi Plain)
shell-grog tempered

TYPE-VARIETIES:

Moundville Series
Moundville Incised
var. Snows Bend, Moundville

Pensacola Series
D'Olive Incised

Coastal Coles Creek Series
Alligator Incised
Coles Creek Incised
var. Hardy, Mott
Evansville Punctated
var. Evansville, Rhinehart
Mazique Incised
Medora Incised

OTHER TYPES:
Barton Incised
Carter Engraved
var. Shell Bluff
Kimmswick Fabric Impressed
Mulberry Creek Cord Marked
Parkin Punctated
shell-grog tempered incised
shell-grog tempered engraved
shell-grog tempered punctated
Weeden Island Punctated
Winterville Incised

MODES:
red pigment
scalloped rim
handles
lip nicks/notches
rim fold/strap

rizon phenomenon), these latter types have a spatial distribution centered on the Central Mississippi Valley. Clearly, shell-tempered pottery heralds the arrival of the Middle Mississippian ceramic tradition in the region, an introduction from the Moundville and Central Mississippi Valley areas.

From these distant sources came at least two new vessel forms: the handled globular jar and the salt pan. The origin of a third new vessel shape, the plate form, is uncertain. Perhaps the plate form originated from a Plaquemine source (Fuller 1995:9) or from a Moundville-inspired prototype. Regardless, we have not identified plates in the Mississippi Sound region prior to this phase (shallow bowls do occur earlier, but none are as uniformly shallow and plate-like as the shell-tempered forms). Apart from the culture-historical connections, the new vessel forms mark an important technological shift in food preparation. The superior thermal durability of shell temper (Bronitsky and Hamer 1986) and the increased cooking and storage advantages of handled globular jars correlate with greater consumption of maize in the prehistoric Southeast. The appearance of new vessel forms tempered with shell on the coast corresponds with the earliest evidence of maize production in the region. In addition, the physiological and economic need for greater quantities of salt, as indicated by the advent and diffusion of salt pan ware, is an additional correlate of maize intensification (Brown 1980).

Of special interest is the mixed shell-grog-tempered pottery, which incorporates attributes of the indigenous ceramic tradition and the intrusive Middle Mississippian ceramic tradition. Specifically, shell temper was added to the grog-tempered paste of indigenous vessel forms (i.e. beakers, bowls). The mixed shell-grog-tempered ceramics do not correspond to any previously defined type-varieties; these "unclassified" sherds are decorated by incision, punctation, engraving, and by red-filmed interior surfaces, treatments consistent with the continuity of Gulf tradition styles.

What was the cultural process that sparked the adoption of Mississippian innovations in the region? There is no sharp discontinuity in the use of Mississippian and indigenous pottery as might be expected in a cultural process of population displacement by the arrival of Mississippian groups

from the interior. Nor is there any basis to assert the independent invention of shell temper and the new vessel forms by coastal groups. Instead, a process of acculturation through interaction that resulted in the "Mississippianization" of coastal populations is indicated. For example, there were changes in the Pinola ceramic complex over time: from bottom to top in Pinola Unit 1, shell-tempered ceramics increase in frequency as grog-tempered pottery and mixed shell-grog-tempered pottery decrease in frequency. D'Olive Incised and Moundville Incised *var. Moundville* are concentrated in the uppermost levels. This vertical distribution reveals an interval of progressive transformation from the old technology to the new forms. In a typical example, the Pinola phase vessel illustrated in Figure A.12(E) is an indigenous vessel form, but shell as well as grog were added to the paste as temper. Such combinations of ceramic attributes imply a process of experimentation and adoption of new innovations through cultural interaction, not population replacement. For these reasons, we do not consider the mixed shell-grog-tempered pottery to be idiosyncratic or socially insignificant, although the interval of production may have been short-lived.

Perhaps exchange of salt with interior peoples, accompanied by marriage alliances that injected foreign potters into local groups, was the avenue of communication that exposed Pinola phase populations to Mississippian ideas. Whatever the specific circumstances involved, it must have been a social dynamic that permitted some stylistic continuity and a fusion of ceramic traditions. In that sense, the Pinola phase must be considered a transitional interval of contact between indigenous coastal and interior Mississippian societies. The Pinola phase may be characterized as "proto-Pensacola."

Currently, there is no other archaeological phase within the geographical distribution of Pensacola culture that is directly equivalent to the Pinola phase, but perhaps the Andrews Place phase comes closest. In some respects, the two phases are similar. The Andrews Place ceramic complex, the initial Mississippian phase in the Mobile Bay region, is defined by early Moundville series type-varieties found "in association with minor numbers of terminal Weeden Island (i.e. Wakulla) and transitional Coles Creek pottery" (Fuller 1995:Appendix A). Discussing this component at the multiple-mound Bottle Creek site, Fuller (1995:15) observes:

> Ceramic styles and relative dating indicate the Andrews Place phase is roughly contemporary with the late Moundville I and early Moundville II phases to the north. My analysis suggests there was a rather sudden appearance of Moundville styles, possibly a result of classic site-unit intrusion. So far, no transitional or "emergent" pottery complex, such as would indicate an in-place Woodland to Mississippian transition, has been identified at the site.

The mixed shell-grog-tempered pottery found in the Pinola phase is apparently absent in the Andrews Place phase components, so perhaps the social dynamics that created Pensacola are regionally variable. An additional complication concerns the estimated temporal spans for these two phases, which are not in agreement. The age estimate of AD 1100–1250 for the Andrews Place phase is based on a relative ceramic chronology (Fuller 1995), while the Pinola phase age estimate of AD 1200–1350 has the additional benefit of two radiocarbon dates (Chapter 7). Not too much should be made of the different age estimates given the minimal level of investigation of either phase.

To the west, into southeastern coastal Louisiana, sites lumped into the catch-all Bayou Petrie phase (Phillips 1970:951–953; Davis 1984c; Weinstein 1985) often yield a mix of Plaquemine and Mississippian pottery but chronological resolution is lacking. The Bayou Petrie phase represents an extension of the Pensacola Mississippian tradition into the territorial heartland of the Plaquemine Gulf tradition. Plaquemine culture, in eastern Louisiana and southern Mississippi, represents a cultural continuity out of Coles Creek and the Gulf

tradition; absent are such Mississippian traits as shell-temper, certain vessel forms, the Southeastern Ceremonial Complex (a few exceptional examples are known), and intensive maize agriculture (Jeter et al. 1989:205–206). Early Plaquemine begins around AD 1200 in coastal Louisiana (Weinstein 1985). This Plaquemine-Mississippian cultural frontier also occurs immediately north of the Mississippi Sound region, in south-central Mississippi. Investigations at Pearl Mounds (22-Lw-510), a 13 ha multiple-mound center on the middle Pearl River, revealed an intriguing mix of decorated Plaquemine pottery similar or equivalent to the Anna phase (ca. AD 1200–1350) in apparent association with abundant utilitarian shell-tempered pottery (Mann 1988). Until larger samples and additional dates are forthcoming, much will remain uncertain about regional Mississippian relationships and the emergence of Pensacola.

The Singing River Phase (AD 1350–1550)

This phase represents the regional expression of the Mississippian archaeological culture known as Pensacola. Pensacola sites are distributed along the coast and lower river systems from northwestern Florida to southeastern Louisiana. The origins, social organization, technology, and subsistence practices of Pensacola societies have generated considerable interest among Southeastern archaeologists. In part, this is because Pensacola culture manifests all of the outward appearances of interior riverine Mississippian societies, but most sites exist in a radically different environmental zone — the coast. Because there have been few modern excavations, much less is known about coastal Mississippians compared to their interior riverine contemporaries. Rather than attempt a summary of the Pensacola concept here, we refer the reader to the relevant overviews (i.e. Fuller and Stowe 1982; Knight 1984; Stowe 1985; Mikell 1992; Milanich 1994:380–387; Bense 1994:234–238).

Almost nothing is known about Singing River phase material culture other than durable pottery. Like other late prehistoric coastal societies, Singing River phase peoples used few stone tools. Madison and other stone arrow point types are occasionally found on Singing River phase sites, but lithic materials are very scarce in all contexts. Singing River phase pottery, like other Pensacola ceramic complexes, is an expression of the Middle Mississippian ceramic tradition. However, some Gulf tradition stylistic elements, especially the emphasis on punctated decoration, continued to be expressed, and in this sense Pensacola ceramics represent an amalgam of two traditions. Two ceramic series are present: Moundville and Pensacola (Table 5.3). Vessel forms include jars with noded or peaked loop and strap handles, beakers, bowls, plates, bottles, and cane-impressed salt pans. Southeastern Ceremonial Complex motifs, especially the skull and the hand, decorate pottery vessels. As discussed above, Moundville series and other Middle Mississippian-derived pottery types appeared in the preceding Pinola phase,

Table 5.3. Singing River Phase ceramic complex.

TEMPER-WARE GROUPS:
fine shell tempered (Bell Plain)
coarse shell tempered (Mississippi Plain)

TYPE-VARIETIES:

Moundville Series
Moundville Incised
var. Carrollton, Snows Bend, Bottle Creek, Singing River
Moundville Engraved

Pensacola Series
D'Olive Incised
var. D'Olive, Dominic, Mary Ann
Mound Place Incised
var. McMillan, Walton's Camp
Pensacola Incised
var. Gasque, Jessamine
Salt Creek Cane Impressed
var. Salt Creek

MODES:
lip nicks/notches
rim fold/strap
effigy rim adornos
handles

introduced from interior regions. However, that which is uniquely "Pensacola," and specifically, the Pensacola ceramic series as we have defined it here, must be considered an in-place development that began when Mississippian ideas were fitted to coastal needs.

Our AD 1350–1550 time span estimate is supported by both relative and radiocarbon measurements. Currently, there are insufficient data to subdivide the Singing River phase, but temporally sensitive trends in type-variety frequencies may be suggested. In Lewis Unit 1, Moundville Incised *var. Moundville* is concentrated in the lowest levels, while *var. Singing River* and *var. Bottle Creek* are concentrated in upper levels and absent in lower levels (Appendix B:Table B.15). In most respects, the Singing River phase duplicates type-varieties found in the Bottle Creek I–II phases, the Pensacola occupation in the Mobile Bay region (Fuller and Stowe 1982; Brown and Fuller 1993; Fuller 1995). The distinctiveness of the Singing River phase is emphasized, however, by the presence of Moundville Incised *var. Singing River.* The near equivalence of the Singing River phase with the Bottle Creek I (AD 1250–1350/1400) and Bottle Creek II (AD 1350/1400–1550) phases permits interregional cross-dating of a rough sort.

Pensacola components closely related to the Singing River phase extend throughout the western Mississippi Sound region, where the only excavated sample available is from the multicomponent Diamondhead site (22-Ha-550), a shell midden on St. Louis Bay (Jackson et al. 1993). Further west, Pensacola components are present around the mouth of Pearl River and continue into southeastern coastal Louisiana, where they are placed in the ill-defined Bayou Petrie phase (ca. 1200–1500). Again, lack of excavation and chronological controls hamper direct comparison. It has long been recognized that the Mississippi River delta represents a prehistoric cultural frontier between Gulf tradition (Plaquemine) and Middle Mississippian tradition (Pensacola) societies (Phillips 1970:951–953; Davis 1984c; Weinstein 1985; Jeter et al. 1989:191–193). Mound centers and middens, some with both Plaquemine and Pensacola pottery, occur in the delta but detailed studies are limited (Davis 1984c:220–224; Weinstein 1985:98–101). Even less is known about the distribution of Pensacola components in interior southeastern Mississippi. Until the 1990s, this region was an archaeological *terra incognita* (Jackson et al. 1995). The Plaquemine-Pensacola cultural frontier may have existed here as well (Galloway 1995:63). Both Plaquemine ceramics and plain shell-tempered pottery occur on the middle Pearl River (Mann 1988). Pensacola ceramics are found beyond the tidewater limit on the Pascagoula River (Lazarus 1959b), and continue into the Longleaf Pine Hills zone (Reams 1996:11).

Because issues of subsistence and settlement are addressed in later chapters, only a few observations are necessary here. Site characteristics and settlement distributions are summarized in Table 5.1 and Figure 5.6. At present, we recognize two gross settlement types: single-mound centers with midden and mortuary remains, and non-mound sites. Non-mound sites are mostly shell middens (e.g. 22-Ja-618) but earth middens also occur (e.g. 22-Ja-529). Non-mound sites vary greatly in size. Data are insufficient to assess whether non-mound sites represent temporary food-collecting stations, semi-permanent homesteads, or some combination; nor is there information available to interpret how non-mound sites articulate with mound centers. Two Singing River single-mound centers are known: Singing River and Deer Island. Evidence that earthen mounds are part of the Mississippian components at Singing River and Deer Island is based on information that we have not confirmed independently with excavations. Other uninvestigated mound groups in the study area, such as 22-Ja-500, may prove to be Mississippian centers. Each mound center was probably the civic-ceremonial focal site of an independent polity or simple chiefdom.

The Bear Point Phase (AD 1550–1699)

This phase was defined to encompass Protohistoric sites in the Mobile Bay region (Fuller

Table 5.4. Bear Point Phase ceramic complex.

TEMPER-WARE GROUPS:
fine shell tempered (Bell Plain)
coarse shell tempered (Mississippi Plain)
TYPE-VARIETIES:
Pensacola Series
D'Olive Incised
var. Arnica
Pensacola Incised
var. Matthews Landing, Pensacola, Perdido Bay
MODES:
lip nicks/notches
effigy rim adornos
rim fold/strap

1985). Here we extend that designation to similar remains in the eastern Mississippi Sound region. Our recognition of the Bear Point phase is based on the presence of diagnostic late Pensacola series pottery types and rim modes that correlate with the relative ceramic chronology established for the Mobile Bay sequence (i.e. Fuller and Stowe 1982; Fuller and Brown 1993). The Protohistoric period approximates the time span from initial European contact to first European colonization. Unfortunately, our understanding of this period on the Mississippi Gulf Coast is so rudimentary that we can do no more than identify some of the sites and artifacts that occur there.

The Bear Point ceramic complex is a direct stylistic development out of the Pensacola series pottery of the earlier Pensacola phases (Table 5.4). Moundville series types were reduced to low frequencies or discontinued. Vessel forms established in the preceding phases continued, but carinated bowls and bowls with short, vertical collars or rims became common. Southeastern Ceremonial Complex motifs such as the skull, hand, and ogee, executed on pottery vessels, were rendered with greater abstraction than those found in the preceding phase (Fuller and Stowe 1982).

Our identification of Bear Point components in the region is based solely on the presence of late Pensacola series type-varieties recovered from surface or disturbed contexts only. In Lewis Unit 1 at the Singing River site, late Pensacola series pottery was confined to the disturbed uppermost level, which overlay a Singing River component. A larger sample of Bear Point phase pottery is present in the surface collection from Deer Island. In an interim report, we introduced a provisional phase, Deer Island, to describe these components in the study area. We now prefer to include these materials in the Bear Point phase. Due to inadequate samples, it is not yet possible to define the full content of the local Protohistoric ceramic complex. Considerable stylistic variation is present (i.e. "unclassified" varieties of D'Olive Incised), but the temporal placement of these styles is unclear. Indeed, once adequate samples become available, local Protohistoric occupations may prove to be sufficiently distinct from the Bear Point phase to warrant a separate phase designation.

Site characteristics and distributions are presented in Table 5.1 and Figure 5.6. The basic settlement pattern of single-mound center and nonmound middens, established in the preceding phase, continued into the Protohistoric period. Although Bear Point phase ceramics were recovered from the mound at the Singing River site, the Bear Point component there is relatively minor compared to earlier components. Perhaps the site population declined or the Singing River center was abandoned during the Protohistoric period. Size estimates of Bear Point middens are imprecise because most sites are multicomponent. Nothing is known about local Bear Point phase subsistence practices.

In the Mississippi Sound region, the exact date of first European contact or influence is uncertain. Recorded European explorations between the years 1500–1699 were largely peripheral to the region. It has long been suspected, based on cartographic evidence, that the Spanish explored portions of the northern Gulf Coast by the first decade of the sixteenth century. Certainly, the Pineda expedition entered Mississippi Sound in 1519 and passed by offshore, without any recorded encounter with the Indians. In 1528, survivors of the abortive Narvaez

expedition, including Alvar Núñez Cabeza de Vaca, floated west through Mississippi Sound. The later *entradas* of Soto and Luna occurred far from Mississippi Sound, but perhaps local inhabitants felt indirect effects. Much later, in 1682, Robert Cavelier, Sieur de La Salle, and Henri de Tonti descended the Mississippi to the Gulf of Mexico and claimed a huge domain for France. They named the midcontinent Louisiana in honor of the French monarch, Louis XIV. Encounters between Europeans and Native Americans probably escalated in the region late in the seventeenth century, especially after Spain increased its presence along northern Gulf shores upon learning of La Salle's short-lived enclave at Matagorda Bay (Texas).

Throughout the Southeast, the Protohistoric period was a time of cultural change as native populations responded to European contact, most notably the impact of Old World diseases. Although the effects of contact were not uniform, population decline, relocation, social reorganization, and the fragmentation of powerful chiefdoms were widespread (Smith 1987; Galloway 1995). Some aspects of Mississippian social rank and chiefdom organization, indicated by the presence of elite copper symbols, spatulate stone axes, and the occupation of mound centers, continued during the Bear Point phase in the Mobile Bay region (Fuller 1985; Stowe 1989). Beginning at least by the end of the 1500s, however, Bear Point populations participated in the Burial Urn horizon, a custom of secondary burial in which human remains were placed in or covered by pottery vessels. This burial practice is considered by some to correlate with social reorganization and the diminution of social rank. Bear Point urn and secondary burials were sometimes placed in mounds, together with a few late sixteenth-century Spanish beads, coins, and other artifacts (Stowe 1989). Other than a single urn burial from a Pascagoula shell midden, described and illustrated by Dickson (1848), these Mobile Bay area burial practices have not been recorded on the Mississippi Coast.

6 Native and Newcomer

Because the story of the Louisiana Colony is well known, we need only touch upon those events and circumstances that surround some of the important early historic sites in the eastern Mississippi Sound region. Drawing on the relevant sources (Higginbotham 1967, 1968a, 1969, 1977; Giraud 1974; McWilliams 1953, 1981), and a previous archaeological review (Blitz et al. 1995), a brief historical sketch is in order.

The Mississippi Sound Region in the French Colonial Period

On February 10, 1699, an expeditionary force of 200 sailors, soldiers, laborers, and Canadian frontiersmen dropped anchor in the waters of Mississippi Sound. It had been seventeen years since La Salle had claimed all lands drained by the Mississippi River for France. France had been slow to secure Louisiana, but now the little flotilla of four ships had arrived to do just that. The leader of the expedition was a Canadian, Pierre LeMoyne d'Iberville (1661–1706). Iberville's mission was to locate the Mississippi River and establish a permanent French presence in the region. Iberville found a sheltered harbor at Ship Island, twelve miles offshore. From the Ship Island base, a French party explored the lower Mississippi River but failed to find a suitable settlement site. Instead, Iberville chose a site for his colony on the eastern shore of Biloxi Bay. There a wooden fort was erected and designated Fort Maurepas, in honor of the French Minister of the Marine, Comte de Pontchartrain.

Fort Maurepas was a Vauban-style fortification and palisade that enclosed about one-half acre; within the walls were barracks, magazines, storehouses, and other buildings (Figure 6.1). Cannons were removed from Iberville's two frigates and mounted on the parapets. With construction of the fort completed and his tiny outpost established, Iberville set sail for France. Ensign Sauvole was left in command of 76 men and 10 officers, among them Jean Baptiste LeMoyne de Bienville (1680–1768), Iberville's younger brother and future governor of Louisiana. Sauvole's journal records that

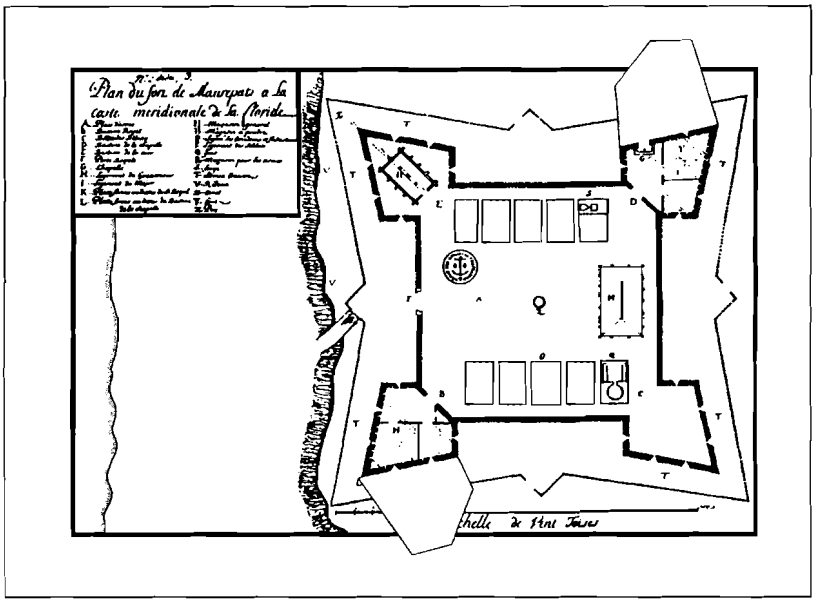


Figure 6.1. Detail from Plan du Fort de Maurepas a la coste meridionale de la Floride, *1699. The unsigned map is probably by Remy Reno, Iberville's draftsman. (Source: photocopy on file, MDAH; original in the Biliothèque Nationale de France, Paris).*

the nascent colony was plagued by drought, biting insects, disease, and internal bickering. Unable or unwilling to sustain themselves by farming, the desperate garrison obtained food from local Indians in exchange for trade goods. The Fort Maurepas locale became known as Biloxi.

Sauvole perished but the Biloxi settlement did not. Over the next two years, the French gained a foothold on the Gulf Coast, explored the hinterland, acquired native allies, averted a Spanish threat, and strengthened the colony with more settlers and supplies. In 1701, Iberville resolved to move his colony to a new location (Old Mobile) at Twenty-Seven Mile Bluff on Mobile River. Biloxi Bay was too shallow to harbor ships efficiently at Fort Maurepas, and the bay afforded no major river route to the interior. France and Spain had recently become allied against England, and the new location was closer to Spanish Pensacola. Early in 1702, the new fort (Fort Louis de la Louisiane) was occupied, and Fort Maurepas was abandoned. Years later in 1719, after storms and floods had damaged the Mobile Bay settlements, the French returned their capital to the "old fort of Biloxi" on Biloxi Bay. Now known as Vieux Biloxi, the reestablished settlement was of importance only briefly (1719–1721), while a new site (Nouveau Biloxi) was under construction across the bay. But the New Biloxi location was inadequate and the French colonial capital was moved yet again, this time to New Orleans in 1722.

During this period in the Gulf South, the profound social and technological forces unleashed by the Europeans rapidly transformed native societies. The Pascagoulas and the Biloxis, occupants of the region at the time of French colonization, were rapidly reduced by disease and Chickasaw slave raids to small, marginalized participants in the colonial economic and political sphere. The Pascagoulas were closely related to the Choctaws in speech and custom. The Biloxis, an isolated tribe of Siouan-speakers, are thought to have migrated to the Gulf Coast from a northern homeland late in prehistory. A 1686 Spanish document identifies the Biloxis as the "Estananis" and places them on a river of that name, now known to be the Pascagoula River (Swanton 1946:96; Lankford 1981:16–17). The French visited both groups on the Pascagoula River in 1699. When Iberville ascended the Pascagoula River the following year, he found the Biloxi's palisaded village of 30 to 40 cabins recently abandoned. Iberville says this place was 6.5 leagues (about 16 miles) from the river mouth (McWilliams 1981:139). Iberville continued upstream to the Pascagoula village, 18 leagues (about 43 miles) from the river mouth (McWilliams 1981:140–141).

By ca. 1703, the Biloxis had departed the Pascagoula River to relocate first in the Lake Pontchartrain region, and then to the lower Pearl River in 1722. They may have returned to the vicinity of their former Pascagoula River settlement after 1730, but there is some uncertainty about this (Dorsey and Swanton 1912:7). The Pascagoulas remained on the river named for them throughout the French Colonial period. By 1763, both the Pascagoulas and the Biloxis had moved west of the Mississippi River. Afterward, the region was largely devoid of resident native inhabitants, serving primarily as a foraging territory for interior Choctaw groups.

The first serious attempt to establish a plantation economy in the Mississippi Sound region began in the 1710s, when three royal concessions on the Pascagoula River were granted to Chaumont, Graveline, and La Pointe. Cotton, tobacco, wheat, and livestock were produced, but the plantations were small and isolated. Throughout the French Colonial period, the regional population remained quite low; the plantation families, their descendants and slaves, and a dwindling number of Pascagoula Indians were the few permanent residents (Higginbotham 1967:4–11). Although Biloxi served as a somnolent little port for traffic between New Orleans and Mobile, the region was relatively unimportant to the Louisiana Colony after 1722. Once the Treaty of Paris ended France's colonial aspirations on the midcontinent, the region passed first to British dominion (1763–1783) and then to Spanish rule (1783–1810). Colonial rule ended in 1810

when the abortive Republic of West Florida was created, but the United States annexed the region that same year. Mississippi became a state in 1817.

Fort Maurepas and Vieux Biloxi (22-Ja-534)

> In the founding of the first settlement in Mississippi and one of the first on the Gulf of Mexico, the building of the fort around which it grew is a matter of much interest, especially since the site is today to Mississippi what Jamestown is to Virginia and Plymouth Rock is to Massachusetts (Rowland 1925:149).

For more than one hundred years, scholars have combined archival and archaeological evidence in attempts to locate two important French Colonial sites on the Gulf Coast: Fort Maurepas (1699–1702), the first European colony in what is now Mississippi; and Vieux Biloxi (1719–1721), capital of French Louisiana for a brief period. The general location of the two settlements, within the city limits of Ocean Springs, has long been established by historical documentation, but only recently has Vieux Biloxi's exact location been confirmed by a comprehensive review of the evidence (Blitz et al. 1995). The site of Fort Maurepas remains a mystery. Two Ocean Springs locations may be the site of Fort Maurepas: the Vieux Biloxi–Lover's Lane locale (22-Ja-534) on Fort Point peninsula; and the Stone Marker locale (no state site number) just southeast of Plummer's Point (Figure 6.2).

At the end of the nineteenth century, scholarly interest in French Colonial America was on the rise. Consensus public opinion believed the site of Iberville's colony to be at the city of Biloxi, but in 1896 Schuyler Poitevent read a paper before the Louisiana Historical Society in which he argued that the first European settlement was at Ocean Springs (Schmidt 1957). From the 1880s until his death in 1936, Poitevent gathered a large collection of eighteenth-century artifacts from his own and adjacent properties at the Vieux Biloxi–Lover's Lane locale.

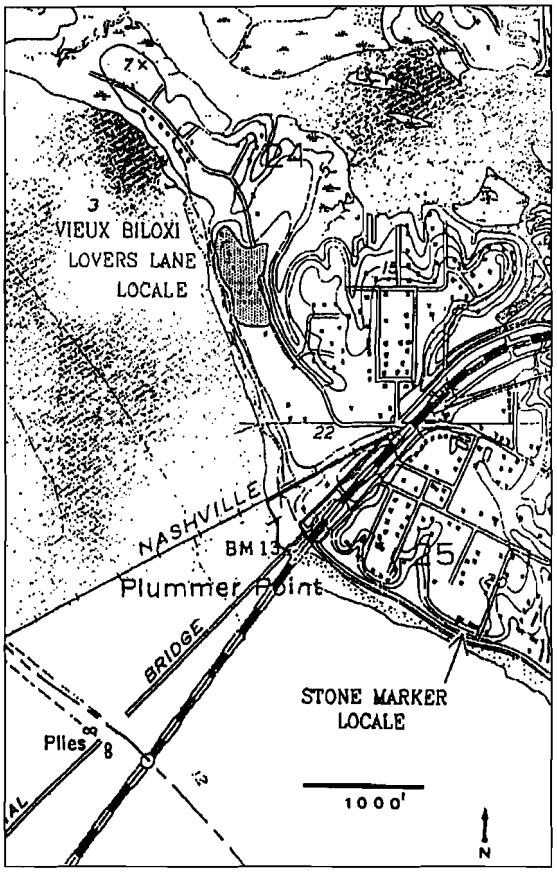


Figure 6.2. The Vieux Biloxi and Stone Marker locales in Ocean Springs.

Poitevent documented his finds in several unpublished manuscripts now at MDAH (Poitevent n.d.). His artifact discoveries influenced prominent historians, such as Dunbar Rowland and Peter J. Hamilton, to accept the Vieux Biloxi–Lover's Lane locale as the site of the two French colonies.

Poitevent's conclusion was soon thrown into doubt. In 1909, a caretaker at the W. D. Schmidt estate in Ocean Springs discovered a slab of marble bearing the following inscription:

COLONIE^{S}
FRANCOISES
1699
Pe.L^{e} MOYNE
S^{R} de-IbVle
L.P. P.L.

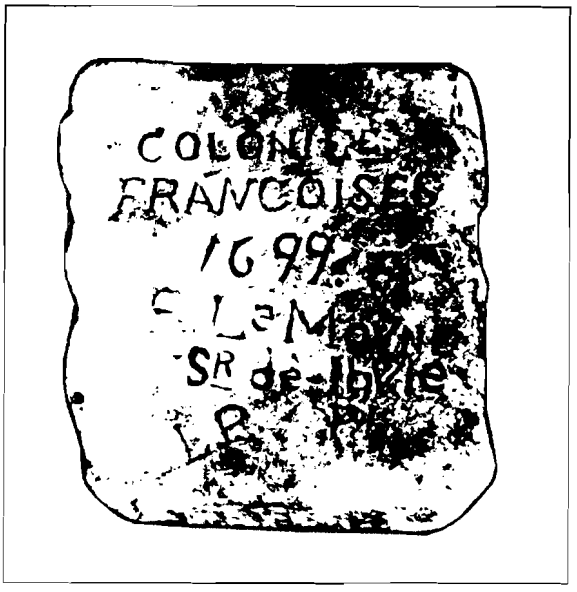


Figure 6.3. The Stone Marker found in Ocean Springs in 1909 (Source: Caraway 1951).

The stone marker, about eleven by nine inches, is presently at the Cabildo in New Orleans (Figure 6.3). Many scholars now concluded that the stone marker find-spot was the site of Fort Maurepas (Caraway 1951), but others disagreed. Poitevent (n.d.) insisted that the inscribed stone was an eighteenth-century commemorative marker placed at the site of a French battery and not the fort's true location. Higginbotham (1968a:74–80) advanced several observations in favor of the Vieux Biloxi–Lover's Lane hypothesis: (1) the artifacts recovered from Poitevent's property; (2) the Joussette map; (3) the Minutes of the Council of Commerce of Louisiana in 1719 and 1720, which record the reestablishment of the French capital at "the old fort of Biloxi"; and (4) the 1721 map of Le Blond de La Tour, which clearly places Vieux Biloxi at Poitevent's property on Lover's Lane.

Archival and cartographic evidence leaves no doubt that the Vieux Biloxi settlement was located on the high ground of Fort Point peninsula now designated 22-Ja-534. The maps of Joussette and Le Blond de La Tour (Blitz et al. 1995:Figures 4,5) are sufficiently detailed to support this conclusion. Bellande's (1993) careful comparison of the 1721 Le Blond de La Tour map with the modern topography of 22-Ja-534 provides a definitive match. Even though primary archival sources seem to indicate that Vieux Biloxi was built on the site of Fort Maurepas (e.g. Rowland and Sanders 1932:265), the site of the fort still remains uncertain. In part, this is because the earliest French maps lack detail. The Joussette map is the most instructive, for it shows the old fort at the Vieux Biloxi locale, and a battery very close to the Stone Marker locale (Figure 6.4). To complicate matters, several highly detailed nineteenth-century maps and legal documents place the "old fort" at the Stone Marker locale (Blitz et al. 1995:38–42). Poitevent found cannonballs at the Stone Marker locale that matched those from Vieux Biloxi. Additional evidence, in the form of French bricks and historical documents, place a brickworks at or near the Stone Marker locale. So it is not difficult to conclude that a colonial-era site exists at the Stone Marker locale, but this place has not produced the volume of artifacts one would expect if Fort Maurepas once stood there.

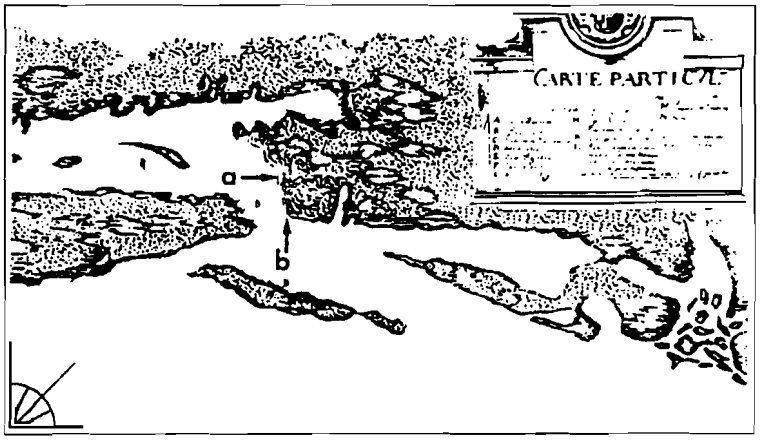


Figure 6.4. Detail from Carte particuliere des environs du Fort de Maurepas et de la baye de Biloxy, *1722. The unsigned map has been attributed to F. Joussette. (Source: photocopy on file, MDAH). Inserted arrows mark the location of Fort Maurepas (a) and the proposed battery (b).*

MDAH archaeologists made an unsuccessful search for Fort Maurepas in the early 1970s (MDAH 1973; Connaway 1981). Efforts were focused just south of the shaded area (Vieux Biloxi) in Figure 6.2. Some eighteenth-century artifacts were unearthed but no structural remains of the fort were discovered. That so few French artifacts were found suggested to others that the fort site had not been located (Hudson 1973). Unfortunately, MDAH archaeologists were denied permission to excavate in precisely those areas where Poitevent and Higginbotham had argued both Fort Maurepas and Vieux Biloxi were to be found. MDAH archaeologists entertained the possibility that the remains of both French settlements had eroded into Biloxi Bay.

In 1995, new archival, cartographic, and archaeological evidence was presented (Blitz et al. 1995). Among Poitevent's manuscripts are "relic lists" in which he describes his artifact discoveries and keys the find-spots to a sketch map of the Vieux Biloxi–Lover's Lane locale. From these sources, Ray Bellande prepared a map of 22-Ja-534 on which were plotted Poitevent's artifact finds and his proposed locations for specific French structures (Figure 6.5). Poitevent's extant artifact collection plus additional artifacts recovered by Lover's Lane residents were also examined (Blitz et al. 1995:Tables 2,3,4). An impressive array of eighteenth-century artifacts have been found at 22-Ja-534: cannonballs, iron shot, musket balls, musket parts, gunflints, a flagstaff point, French and Spanish coins, brass, silver, and bone buttons; brass buckles, French tin-glazed and lead-glazed tablewares, historic Native American pottery, glass bottle and drinking glass fragments, a large quantity of glass trade beads, knives, axe heads, nails, spikes, and bricks (see Blitz et al. 1995 for illustrations).

From this review, we arrive at the following conclusions. The settlement of Vieux Biloxi (22-Ja-534) was situated on the high ground along Lover's Lane on Fort Point peninsula. Archival and cartographic sources, as well as the distribution map of Poitevent's artifact finds, pinpoint the 1719–1721 settlement with a high degree of accuracy. In contrast, archival, cartographic, and artifact evidence for the location of Fort Maurepas is ambiguous. The old maps and documents are contradictory and lack the detail required to reject either the Vieux Biloxi–Lover's Lane hypothesis or the Stone Marker hypothesis. The issue can only be resolved with additional archaeological research. Certainly, the Vieux Biloxi site has produced far more eighteenth-century French artifacts than has the Stone Marker locale. While this evidence helps to confirm the 1719–1721 settlement location, our artifact analysis forced us to conclude that the "artifact collections alone do not have the chronological resolution that permit separation of Fort Maurepas artifacts from

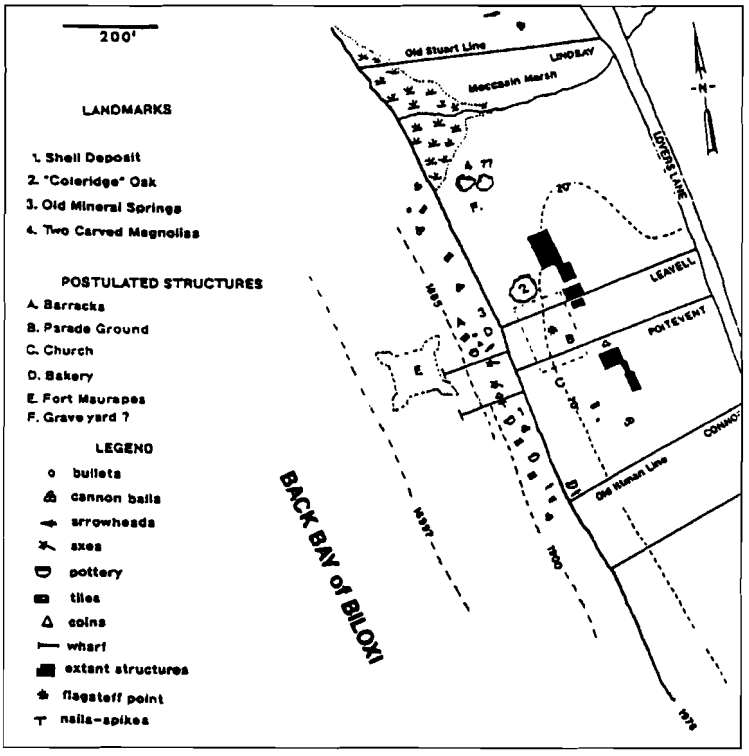


Figure 6.5. Distribution of Poitevent's artifact finds and his interpretation of the structure locations, Vieux Biloxi (22-Ja-534). Map by Ray Bellande (Blitz et al. 1995).

those of Vieux Biloxi, if indeed artifacts from both settlements are mixed in the collections" (Blitz et al. 1995:55). If Fort Maurepas was located at Vieux Biloxi, there is a high probability that most or all of the old fort remains have long since eroded into the bay. We arrive at this conclusion based on two observations: storm tides caused the bluff edge at Poitevent's property to retreat at least 85 feet between 1900–1933 alone, and presumably even more land has been lost since 1702; and Poitevent's artifacts were retrieved from the eroding bluff face, from the beach where they had been redeposited by erosion, and from the shallow waters of the bay. Evidence of the fort site's destruction is equivocal, however, and until archaeological excavations are conducted at both the Vieux Biloxi and Stone Marker locales, the site of the first European settlement in Mississippi will remain unknown.

Old Spanish Fort / Krebs House (22-Ja-526)

There are dozens of places designated "old Spanish fort" scattered across the South. Like most of these sites, Old Spanish Fort/Krebs House (22-Ja-526) is neither "Spanish" nor is it a fort. It is a fascinating archaeological site, however, wisely preserved as a park and museum in the city of Pascagoula. The site is on high level land, part of the Coastal Prairie-Terrace landform, near the confluence of the Pascagoula and Escatawpa Rivers. On the site stands a small one-story building known as the Krebs House (Figure 6.6). Renovated numerous times in the past, it was originally a single-room house 21 by 28 feet, constructed of vertical cypress logs in the *colombage* style, with walls of tabby (oyster-shell concrete). Later building episodes added extensions, double fireplaces, and walls of *bousillage* (a building material of clay and Spanish moss). For many years, this humble little house was claimed to be the oldest standing structure in Mississippi, but as recent investigations reveal, local lore is no substitute for the objective discoveries of archaeology.

In 1980, the first of three historical, architectural, and archaeological assessments of the Krebs House began to strip the layers of mystery from the old edifice (Building Conservation Technology 1980). Documentary evidence indicated that the 22-Ja-536 site was once part of a 1715 land grant to Joseph Simon de La Pointe, who established a plantation in the immediate vicinity around 1718. A German, Hugo Krebs, acquired the plantation in 1751, and the house remained in the Krebs family until the 1940s. In 1772, Bernard Romans credited Krebs with the invention of a productive cotton gin; if true, it preceded Eli Whitney's famous device by two decades (Cain 1953:74–76). A plan of the La Pointe concession is depicted on Dumont de Montigny's map of the lower Pascagoula ca. 1726, but the Krebs House does not correspond to any of the illustrated buildings. Researchers were

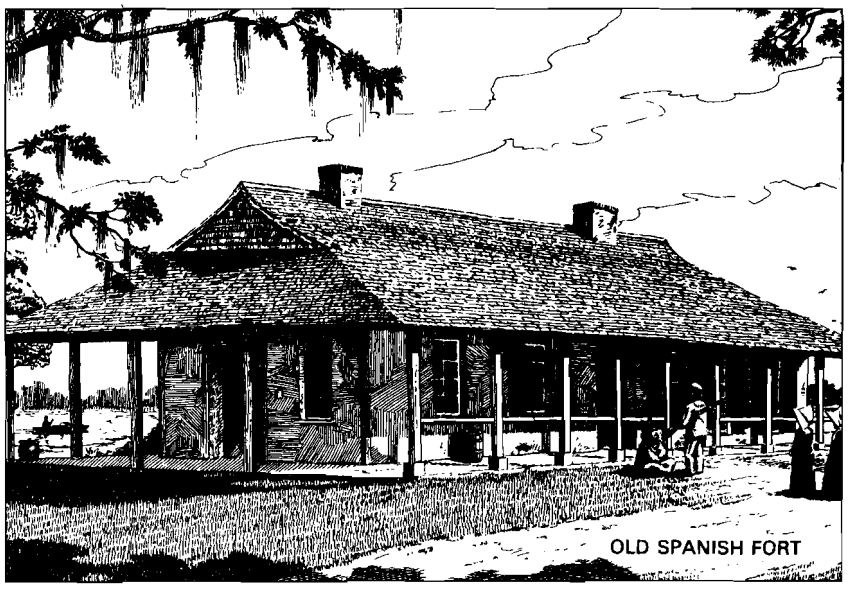


Figure 6.6. Old Spanish Fort / Krebs House (Courtesy of the Old Spanish Fort Museum).

unwilling to sever the La Pointe connection on this slim basis, so the possibility was entertained that the Krebs House was an unillustrated auxiliary building, perhaps a carpenter shop. Excavation beneath and around the Krebs House produced quantities of historic Native American pottery but only one French faience sherd (Building Conservation Technology 1980).

In 1992, the hidden history of the Krebs House was unraveled still further (Hinks et al. 1993). The 1992 investigators rejected the possibility that the Krebs House dated to the time of the La Pointe plantation. The standing structure, they observed, cut into underlying deposits which contained post-French artifacts. They cited Bernard Romans' account of the hurricane of 1772, which seemed to imply that none of La Pointe's buildings survived the storm. A large amount of Native American pottery was found beneath and mixed into house floor layers (Table B.19). Mann attributed the Indian pottery to the Pascagoulas (Hinks et al. 1993:97). Because only one trade bead was recovered, however, the possibility that Indians occupied the house site was rejected. The 1992 team concluded that "subsequent erection of the existing Krebs House may have occurred anytime between ca. 1760s and 1780s," but probably after the 1772 storm (Hinks et al. 1993:155).

The most recent and extensive archaeological investigations at 22-Ja-526 confirmed that the Krebs House postdates the French Colonial period (Waselkov and Silvia 1995). Excavations clarified the date of the Pascagoula Indian component; this midden of animal bone, shell, and artifacts underlies and predates house construction (Table B.20). The midden formed between 1750–1775, an age span attributable to the associated artifacts: French green-glazed earthenwares and tin-glazed faience, glass trade beads, a honey-colored gunflint, and Rupert lead shot. The presence of pre-1763 bead types, the absence of colono ware (Native American pottery made in European forms), and the fact that Indian pottery far exceeds French ceramics in quantity underscores the Indian origin of the midden (Waselkov and Silvia 1995:27). Sometime "around 1775" the initial Krebs House structure was erected over the Indian midden (Waselkov and Silvia 1995:34). Shell from the midden deposit was used in the tabby construction. It was not French custom to use tabby concrete; this is another clue that the house postdates 1763 (Waselkov and Silvia 1995:34). The archaeologists used nail types and other architectural elements to document various nineteenth-century and twentieth-century alterations to the Krebs House. It is possible, even likely, that preserved remains of the La Pointe plantation await discovery nearby.

Homestead (22-Ja-645)

Located on the west side of West Pascagoula River, 1 km above the mouth of Sioux Bayou and 3.1 km above where the river meets Mississippi Sound, is a high bluff with a commanding river view. Low ground, marsh, and water surrounds a broad, rectangular tongue of flat land that rises 7.6 m above the river (Blitz and Mann 1993:Figure 11). Here the Pascagoula is an extensive tidal marsh-estuary ecosystem 4.5 km in width. It is an attractive spot today, as it must have been when Native Americans established a settlement here early in the era of European colonization.

Investigation

The Homestead site consists of prehistoric and historic artifacts distributed in small, dense clusters immediately adjacent to the bluff edge. We conducted auger tests at two locations previously recorded as separate archaeological sites, but neither place had ever been examined by archaeologists. One of these sites (22-Ja-521) was a shell midden in the side yard of the Dees property, situated on the southeastern bluff edge. Auger tests revealed a shallow deposit of marsh clams covering a 50 x 40 m area, with a smaller core area of heavy-density shell surrounding a massive live oak tree. Residents confirmed that modern land use had

spread the light-density material outward from the heavy-density core deposit. Prehistoric potsherds were recovered with the auger, but modern glass, nails, and other trash indicated considerable disturbance throughout the deposit, so no further work was conducted at 22-Ja-521.

We turned our attention to a second artifact cluster, 60 m north of 22-Ja-521, at the northeastern bluff edge. At this artifact cluster (22-Ja-645), a light density of early eighteenth-century Euro-American artifacts and Native American pottery was scattered over a 25 x 25 m area along the bluff edge between the Smith property and the river. From auger test results, it became apparent that no intact deposits remained at this location due to severe erosion and house construction. Although the shell midden is limited to 22-Ja-521, it is not now possible to determine if artifact distributions between 22-Ja-521 and 22-Ja-645 are continuous, because private residences intervene. We refer to both locations collectively as the Homestead site.

Two different artifact collections are available from Homestead. The 22-Ja-521 collection, gathered by MAA members in the 1970s and stored at the Tullis-Toledano Manor in Biloxi, was examined (Table B.21). Residents had collected a small quantity of artifacts from 22-Ja-645, and our investigation produced additional materials (Table B.22). At least two components can be identified in both collections. A Late Woodland period Tates Hammock phase occupation (AD 700–1200) is easily recognized by the presence of diagnostic ceramic type-varieties: Mulberry Creek Cord Marked, Pontchartrain Check Stamped *var. Pontchartrain*, French Fork Incised, and Coles Creek Incised.

While creamware, pearlware, and whiteware sherds signal an expected late historic period presence, it is the early eighteenth-century component that is most intriguing. The site has produced French ceramics, glass trade beads, "rose-head" nails and spikes, brass and iron kettle fragments, musket balls and parts, and historic native pottery. Several artifacts are good early to middle eighteenth-century markers. Drawn bead type IIA6 and wire-wound bead type WIIA3 are found on European/Native American sites prior to 1760 (Brain 1979:102,110). The brass trade bell (Blitz and Mann 1993:Plate 31,E) is a key type, *var. Flower Key*, and dates to the first half of the eighteenth-century (Brain 1979:198). The kettle handle (Blitz and Mann 1993:Plate 31,D) and iron hoe (Blitz and Mann 1993:Plate 29,A) are typical forms for the first half of the 1700s (Brain 1979:134,144). Coarse earthenware sherds, one green-glaze with buff paste and one transparent lead-glaze over a brown-red paste, are similar to others commonly encountered on eighteenth-century French sites in the lower Southeast (Stowe 1977b; Brain 1979; Hinks et al. 1993).

The eighteenth-century Native American pottery at Homestead may be placed into the Gulf Historic tradition (Fuller 1991). All are finely tempered with angular shell and incised with scrolls, line-filled triangles, and lip notches. These sherds are local varieties of Port Dauphin Incised (Stowe 1977b; Fuller 1991). Coarse shell-tempered plain sherds (Mississippi Plain) with everted rims pinched to create a crude "pie-crust" effect are also present. This rim mode is widespread on seventeenth and eighteenth-century Native American sites in Mississippi (e.g. Blitz 1985). In short, most of the diagnostic European/Native American artifacts are attributable to the French Colonial era, AD 1699–1763.

Summary

Archaeological deposits may no longer be intact at Homestead, but we can say where and when people lived there. Two artifact clusters are evident. The 22-Ja-521 cluster is a prehistoric Tates Hammock phase shell midden with a veneer of eighteenth-century artifacts. Site 22-Ja-645 produced eighteenth-century European/Native American artifacts and a small quantity of Tates Hammock phase pottery. One gains the overall impression that the eighteenth-century artifact concentrations mark widely spaced house locations, a settlement pattern

that was very common for eighteenth-century native communities in Mississippi (Blitz 1985; Brown 1985). Just who was living at Homestead in the 1700s? We will present additional evidence below that the Homestead site was the location of a Pascagoula Indian community.

The La Pointe Phase (AD 1699–1775) and the Pascagoulas

We will not discuss the various artifacts of European manufacture found on La Pointe phase sites; detailed descriptions are available in the reports cited above. Instead we continue our focus on native materials and traditions, with the realization that the European/African presence altered the social context of native artifact manufacture and use. European, African, and American Indian exchanged ideas and products, of course, and this is revealed in the ubiquitous presence of Native American pottery on French Colonial sites along the Gulf Coast (Waselkov 1989). Separation of Native American and European/African components, especially in disturbed contexts, is often problematical.

The eighteenth-century Native American pottery at Vieux Biloxi, Old Spanish Fort/Krebs House, and Homestead may be placed into the Gulf Historic tradition (Fuller 1991). Pottery of this ceramic tradition is found on numerous eighteenth-century and early nineteenth-century Indian sites from the Tombigbee to the Mississippi. The Gulf Historic tradition is thought to be a direct consequence of European/African acculturation of native peoples. Compared to the earlier Gulf and Middle Mississippian traditions, there was a widespread simplification of vessel forms and decoration, perhaps because European containers replaced indigenous ones for many purposes (Fuller 1991). Small jars and simple bowls are the basic forms. "Colono ware" attributes of European origin, such as cup handles and ring bases, are present in some assemblages, but have yet to be identified in the Mississippi Sound region. Decorative styles are a simplification of antecedent themes: multiple, parallel lines arranged in bands to create rectilinear and curvilinear designs. Scrolls encircling the vessel and line-filled triangles on the upper part of the vessel are common motifs. Lines were applied several at a time with a multiple-toothed implement ("combed") or individually applied with a single-pointed tool. Line application ranges from dry-paste incision to engraving. Burnished, filmed, or slipped surfaces, usually black or red, are common.

The La Pointe phase is the regional ceramic complex of the Gulf Historic tradition (Table 6.1). The La Pointe phase ceramic complex is composed of a utilitarian, unburnished coarseware tempered with angular shell (Mississippi Plain) and a hard, compact fineware (Gulf Historic fineware) with diverse tempering agents. The La Pointe ceramic complex is very similar to the Port Dauphin phase (AD 1700–1770) materials found at French Colonial sites in the Mobile Bay region (Stowe 1977b; Fuller 1991). The La Pointe phase ceramics appear

Table 6.1. La Pointe Phase Ceramic Complex.

TEMPER-WARE GROUPS:

Gulf Historic fineware
Coarse shell temper (Mississippi Plain)
fine sand temper

TYPE - VARIETIES:

Choctawan Series:
Port Dauphin Incised
Chickachae Incised
Fatherland Incised
var. *Fatherland*
Owens Punctated
var.Muir
Chickachae Combed
La Pointe Combed
Kemper Combed

MODES:

lip nicks/notches (Nicked Rim Incised)
pinched "pie-crust" rim
pigmentation (red, black, brown)

to differ from the Port Dauphin phase ceramics by the significant presence of combed pottery. Whether these perceived differences are spatial or temporal has yet to be worked out. The La Pointe phase combed and incised pottery indicates the expected cultural relationship to identical ceramic types found on eighteenth-century Choctaw sites farther north in central Mississippi (Blitz 1985, 1995; Galloway 1995:266–276). The La Pointe phase time span is an estimate based on associated European artifacts with known dates of manufacture.

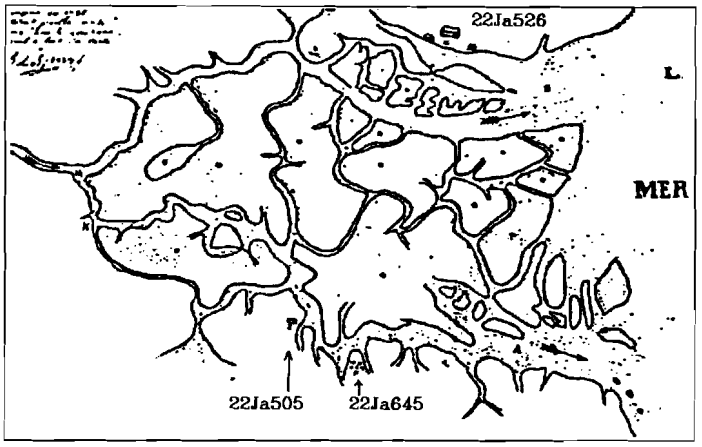


Figure 6.7 Detail from Carte de la Riviere des Pascagoula *by Dumont de Montigny, 1720s (Source: photocopy on file, MDAH). Inserted site numbers mark proposed correlations with mapped settlements.*

For the archaeologist, the Gulf Historic ceramic tradition presents very homogeneous stylistic attributes, but there is a subtle regional and local variability that is poorly understood. It is suspected that ethnic distinctions are one factor responsible for this variation (Galloway 1995:266–276). The correlation of local phases with known historic groups is an important goal. However, this requires linking specific archaeological sites to native groups identified with archival and cartographic evidence.

One map that can serve this purpose in our region is Dumont de Montigny's depiction of the lower Pascagoula River, drafted between 1722 and 1726 (Figure 6.7). Natural landmarks such as Sioux Bayou, Bluff Creek, and other tributaries are easily identifiable. This attention to detail makes it feasible to correlate settlements depicted on the map with archaeological sites. Among the important settlements on the map are the La Pointe concession (on or near Old Spanish Fort/Krebs House, 22-Ja-526), the Chaumont concession, the Graveline concession, and the "village of the Pascagoulas."

Higginbotham (1974) places Madame Chaumont's plantation (no state site number) at Pritchard's Landing, 37 miles from the river mouth, and Jean-Baptise Baudreau de Graveline's settlement at the Martin's Bluff site (22-Ja-505). Artifacts collected from the Martin's Bluff site in the 1930s by Schuyler Poitevent, now curated at the Department of Anthropology, Tulane University, include eighteenth-century French ceramics and bricks, and La Pointe phase pottery similar to materials at the Homestead site. The Dumont de Montigny map clearly depicts the Pascagoula village on the West Pascagoula River between Sioux Bayou to the south and Martin's Bluff to the north, on the west side just south of Dead River and the junction of Cedar Bayou with the river (Figure 6.7). This is the precise location of the Homestead site, 22-Ja-645. In the 1720s, the Pascagoulas moved down river from their earlier settlement to be near the French (DuPratz, in Swanton 1911:305; Higginbotham 1968b:15) and this is where they were when recorded by Dumont de Montigny.

If Homestead was the village of the Pascagoulas ca. 1726, what about the Indian pottery assemblage at Old Spanish Fort, 22-Ja-526, which postdates the Dumont de Montigny map? Mann (Hinks et al. 1993:97; Blitz and Mann 1993:53–56) attributed the 22-Ja-526 Indian ceramics to the Pascagoulas. Likewise, after a review of the historic maps and documents, Waselkov and Silvia (1995:19–20) concluded that the Pascagoulas were the only known native group in the vicinity of 22-Ja-526 when the midden formed ca. 1750–1775. Bear in mind, however, that archaeologists have not located the Biloxi and

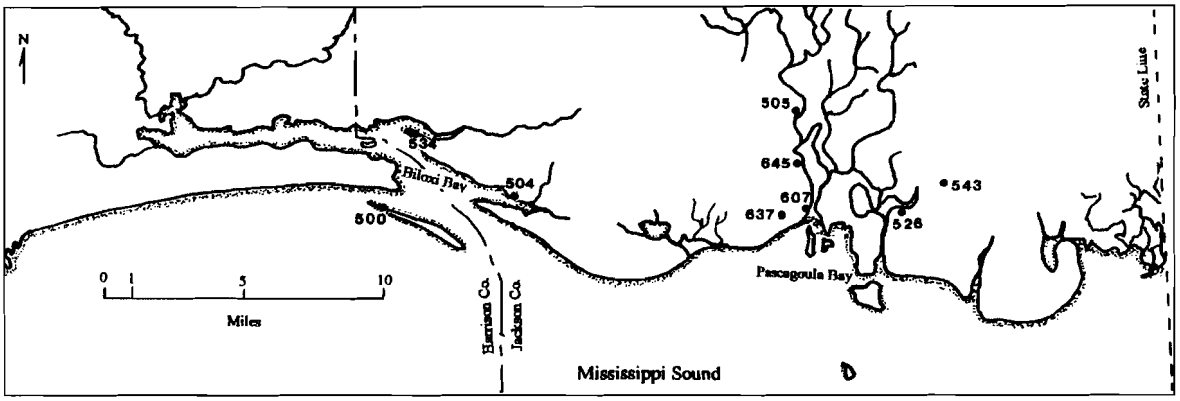


Figure 6.8. Distribution of La Pointe Phase sites.

Table 6.2. Characteristics of La Pointe Phase sites.

SITE	ENVIRONMENT	SIZE	TYPE	CONDITION	INVESTIGATION	REFERENCE
22-Ja-504	Heron Bay, Terrace	50 x 20 m	Midden, Burial	?	Collection	Blitz & Mann 1993
22-Ja-505	Pascagoula River	?	?	Destroyed	Collection	Blitz & Mann 1993
22-Ja-526	Pascagoula River	?	Midden	Intact	Excavation, collection	Hinks et al. 1993, Waselkov & Silvia 1995
22-Ja-534	Biloxi Bay, Terrace	?	Midden	Intact/Destroyed	Collection	Blitz et al. 1995
22-Ja-543	Escatawpa River	12 x 23 m	Midden	Destroyed	Excavation, collection	Marshall 1982a
22-Ja-607	Pascagoula River	?	Midden	Intact	Collection	Blitz & Mann 1993
22-Ja-637	Terrace	?	?	Destroyed	Collection	MDAH files
22-Ja-645	Pascagoula River, Riverine	25 x 25 m	Midden	Destroyed	Collection	Blitz & Mann 1993
22-Hr-500	Barrier Island	4 ha	Midden, Burial, Mound	Intact/Destroyed	Collection	This report

Pascagoula villages visited by Iberville. No attempt has been made to correlate a mapped Biloxi village with archaeological materials. Until such investigations generate additional samples in well dated contexts, distinctions between Biloxi and Pascagoula archaeological components, if any, remain unknown.

One detectable difference in assemblages from La Pointe phase sites is the presence or absence of combed pottery. There is considerable evidence elsewhere in Mississippi and Alabama that combed decoration is a time-sensitive attribute in Choctawan series ceramic complexes; it is rare or absent in pre-1750 assemblages, increases in popularity in 1750–1800 assemblages, and is the predominant decoration in early nineteenth-century samples (Galloway 1984; Fuller 1992; Blitz 1995). Combed ceramics are absent from the Homestead and Martin's Bluff collections, which also contain early to middle eighteenth-century European artifacts. Combed ceramics are present in the post-1750 Old Spanish Fort/Krebs House samples. On this slim basis, we suspect that the combing technique was introduced into the region ca. 1740–1750. Unfortunately, our database is too rudimentary to determine if this difference is the result of social, chronological, or sampling factors. For now, we must rather grossly lump all Colonial-era Native American Indian pottery into the La Pointe phase. The distributions and characteristics of La Pointe phase sites are presented in Figure 6.8 and Table 6.2.

7 The Cultural Sequence

Earliest Inhabitants (9000–1200 BC)

Post-Archaic Native American cultural developments in the Mississippi Sound region are the primary concern of this study, a focus imposed on us, in part, by the scanty material record of earlier periods. For now, a cursory summation of the Paleoindian and Archaic occupation must suffice as a prologue to the later periods. Regional Paleoindian through Late Archaic remains occur as surface finds of diagnostic artifacts, mostly projectile point/knife (PP/K) styles with time spans established by research elsewhere in the Southeast (Table 7.1). No pre-1200 BC regional sequence has been established, so cross-correlational relative dating is based on similarity in artifact morphology. We have excluded from Table 7.1 many PP/Ks and other artifacts observed in local artifact collections that are undiagnostic of a time period. In addition, the geomorphological conditions outlined in Chapter 2 are not particularly conducive to the preservation of early sites. These two factors have created a limited and biased data set, such that the frequency of Paleoindian/Archaic sites in the region is under-represented in Table 7.1 and in the state site files for the region (Appendix E).

Almost all of the existing information on the Paleoindian and Archaic periods in the region is summarized by McGahey (1992a, 1992b) and Giliberti (1995). These authors raise two important issues. First, they note that while widespread PP/K styles attributable to all early periods are present in the region, enough distinctive PP/K forms exist to suggest the presence of previously undescribed styles, possibly endemic to southern Mississippi in the Middle to Late Archaic periods. Second, recorded Paleoindian and Archaic component frequencies are low when compared to other physiographic regions in the state. Possible reasons for this low archaeological visibility are addressed in Chapter 8.

Published information is available for only three Archaic sites in the Mississippi Sound region: Cedarland (22-Ha-506), Escatawpa I (22-Ja-543), and Escatawpa III (22-Ja-545). Cedarland and an adjacent site, Claiborne (22-Ha-501), were two semicircular shell middens (now destroyed) near the mouth of the Pearl River. These extensive, deep middens had many similar artifacts. However, Cedarland was preceramic Late Archaic and the type site for the Pearl River phase (Gagliano 1963). The larger Claiborne site, with a full assemblage of Poverty Point artifacts and fiber-tempered pottery, was occupied later in time (Gagliano and Webb 1970). Webb (1977:27) argued that the two sites represented sequential occupations by the same peoples, developmental episodes that span the transition from Late Archaic to Poverty Point (see Bruseth 1991 for an alternative interpretation). Small-scale test excavations (mostly unreported) and large artifact collections amassed by nonprofessionals constitute the primary documentation for both sites. Cultural materials at Cedarland included Gary, Macon, Pontchartrain, and Kent PP/Ks of local and exotic stone; winged, prismatic, and cylindrical atlatl weights; stone plummets, red jasper beads, and amorphous baked-clay lumps associated with clay-lined features (Bruseth 1991).

The two excavated Archaic sites in the study area are Escatawpa I and III, and they are not very informative. At Escatawpa I, Richard Marshall isolated a possible preceramic Late Archaic stratum that was overlain by a zone containing pottery.

Table 7.1. Characteristics of Paleoindian and Archaic sites.

SITE	GEOLOGICAL CONTEXT	PERIOD	REFERENCE	COMMENT
22-Ja-516	Holocene Surface	Paleoindian	Walker and Taylor 1982:7	"three lancelate projectile points," probably redeposited
22-Ja-530	Gulfport Formation	Late Paleoindian/EarlyArchaic	This report	Dalton point
22-Ja-545	Holocene Surface (?)	Late Archaic	Marshall 1982a	Abbey point
22-Ja-563	?	Unspecified Archaic	MDAH Files	—
22-Ja-591	Holocene Surface	Late Archaic	MDAH Files	Wade Point
22-Ja-592	Holocene Surface	Unspecified Archaic	MDAH Files	—
22-Ja-610	Holocene Surface	Unspecified Archaic	MDAH Files	—
22-Ja-611	Holocene Surface	Middle to Late Archaic	Blitz 1993b	Zoomorphic stone bead, bannerstone, Kays point
22-Ja-645	Prairie Formation	Early & Middle Archaic	This report	Greenbriar, White Springs points
22-Ja-647	Gulfport Formation	Early Archaic	MDAH Files	Greenbriar point
22-Ja-658	Holocene Surface	Early Archaic	MDAH Files	—
22-Ja-673	Holocene Surface	Late Archaic	MDAH Files	—
22-Ja-687	?	Late Archaic	MDAH Files	—
22-Ja-688	?	Late Archaic	MDAH Files	—
22-Ja-728	Holocene Surface (?)	Middle to Late Archaic	Blitz 1993b	Zoomorphic and tubular stone beads
22-Ja-731	Holocene Surface (?)	Middle Archaic	This report	White Springs points
22-Ja-727	Gulfport Formation	Early Archaic	This report	Greenbriar point
22-Hr-500	Barrier Island	Paleoindian/Early Archaic	MDAH Files	Dalton, Big Sandy points
22-Hr-647	?	Unspecified Archaic	MDAH Files	—

Marshall identified the Late Archaic component based largely on negative evidence: the absence of pottery and Poverty Point objects. In fact, the cultural affiliation of this stratum is unknown. No diagnostic stone artifacts were recovered, but amorphous baked-clay lumps were abundant, a characteristic that Marshall (1982a:57–59) considered to be common at other Late Archaic sites in Mississippi (e.g. Cedarland). He interpreted the clay lumps as heat-conducting elements used in pit ovens and found several features that may have functioned in this manner. Marshall's excavation at Escatawpa III also produced clay lumps and pit features, as well as a Late Archaic Abbey PP/K, but later components were mixed with these materials. Based on low levels of debitage, Marshall (1982a:50) concluded that the Late Archaic components at the Escatawpa sites were temporary activity locations. These limited assemblages provide little basis for identification of similar components in the region.

Identifying and Ordering Components

Our database for constructing a chronological sequence for the study area consists of surface artifact collections and stratigraphic test excavations. Most sites are shallow, multicomponent, earth-shell middens. Surface collections from such sites do not provide the short-duration artifact samples conducive to a successful seriation. Small-scale excava-

tions into shell middens also present potential problems for chronological control. Strata are often difficult to recognize, trace, and isolate in what are essentially piles of shell and sediment. The complex, unknown processes of site formation and the coarse shell matrix virtually guarantee some vertical displacement of artifacts, a displacement that can not be entirely mitigated by excavation in either "arbitrary" or "natural" provenience units. We do not deny that there is a potentially detectable order to the formation of individual shell midden sites, but to "decipher" in detail how each formed is a project unto itself. Limited time and funds precluded pursuing that laudable goal to the fullest.

Given that our primary goal was establishment of a regional sequence, we attempted to reduce these problems by selecting for excavation those sites with the deepest deposits formed over the shortest identifiable time span. Few sites are "single component" in the strictest sense because there is often a thin veneer of later artifacts confined to the disturbed, uppermost strata. However, we were successful in locating sites where the midden formed during a single phase. Native American pottery samples from these sites were the basis for our sequence, augmented by additional surface collection samples from short-duration sites.

Seriation

To establish the cultural sequence, we must arrange the pottery samples into a series that is thought to represent their relative order in time. The resultant series must be oriented with the aid of additional chronological evidence such as stratigraphy or absolute dates, so that the early and late ends of the seriation can be identified. One consequence of our decision to focus on short-duration sites was that superposition of components was only rarely encountered (e.g. Greenwood Island over Claiborne at 22-Ja-516, Bear Point over Singing River at 22-Ja-520). So superposition of components was relatively unimportant in constructing the sequence. Instead, cross-correlational relative dating of ceramic styles known from adjacent regions, ten radiocarbon assays (see below), and the occurrence of eighteenth-century Euro-American artifacts of known age served to orient the seriation. Three ceramic attribute measures were used for seriation: temper-ware groups, type-varieties, and modes. These are categories defined by the ceramic fabric, surface finish, or vessel form. The reader is referred to Appendix A for an explanation of the ceramic analysis. Ceramic artifact counts used in the seriations are tabulated by site-provenience unit in Appendix B.

A chronological ordering of attributes can be achieved with two basic methods: frequency seriation and occurrence (presence-and-absence) seriation. These two techniques are no less accurate for being simple and descriptive, for they make no unwarranted demands on the limited database, and provide a visually intuitive assessment of the relative sensitivity of each attribute to the dimension of time. In a frequency seriation, attribute samples are arranged in increasing or decreasing frequency around the sample of maximum abundance. Units or samples with similar attribute frequencies are grouped together and assumed to represent the waxing and waning of attribute use through time (the dimension of space may also affect the ordering). Table 7.2 presents a frequency seriation of eight temper-ware groups found in 12 site assemblages. Temper-ware frequencies were calculated only for the undecorated pottery in these samples, which always composes the majority of pottery found at regional sites. Table 7.3 presents a frequency seriation of 28 decorated pottery type-varieties. Type-varieties chosen for seriation were those that had the basic prerequisites to serve as useful historical types: sufficient abundance and short duration. The following ceramic samples were used in Table 7.3:

A. 22-Ja-530, Unit 4, Level 4–6
B. 22-Ja-530, Unit 4, Level 1–3
C. 22-Ja-555, Unit 1 and surface
D. 22-Ja-516, aggregate units and surface collection
E. 22-Hr-591, Unit 2, Level 5–8

Table 7.2. Seriation of temper-ware groups.

ASSEMBLAGE	TOTAL SHERDS	FIBER	GRIT-SAND	TCHEF.	GROG	F. SAND	SHELL-GROG	SHELL	G. HIST
EARLY									
22-Ja-530, Unit4, Level 4-6	209	–	199 95%	10 5%	–	–	–	–	–
22-Ja-530, Unit 4, Level 1-3	712	4 1%	656 92%	52 7%	–	–	–	–	–
22-Ja-555, Unit 1	465	5 2%	163 35%	14 3%	258 5%	25% 5%	–	–	–
22-Ja-516, Aggregate Units and Surface	708	21 2%	182 26%	45 6%	400 57%	60 8%	–	–	–
22-Hr-591, Unit 2	282	–	1 –	–	281 99%	–	–	–	–
22-Hr-534, Surface	889	–	–	–	836 94%	53 6%	–	–	–
22-Ja-726, Surface	64	–	–	–	43 67%	21 33%	–	–	–
22-Ja-520, Pinola Unit 1, Level 7-12	415	–	–	–	283 68%	–	79 19%	53 13%	–
22-Ja-520, Pinola Unit 1, Level 1-6	602	–	–	–	195 32%	1 1%	62 10%	344 57%	–
22-Ja-520, Lewis Unit 1, Level 3-12	416	–	–	–	12 3%	–	–	404 97%	–
22-Ja-520, Lewis Unit 1, Level 1-2	547	–	–	–	–	–	–	547 100%	–
22-Ja-526:1992 + 1994 Aggregate	674	–	–	–	–	–	–	167 25%	507 75%
LATE									

F. 22-Hr-591, Unit 2, Level 1–4
G. 22-Hr-534, surface
H. 22-Hr-534, Units 3 and 6
I. 22-Ja-543 (reference: Marshall 1982a)
J. 22-Ja-520, Pinola Unit 1, Level 7–12
K. 22-Ja-520, Pinola Unit 1, Level 1–6
L. 22-Ja-520, Lewis Unit 1, Level 3–12
M. 22-Ja-520, Lewis Unit 1, Level 1–2
N. 22-Ja-526, aggregate units, 1992 and 1994

Site samples with low ceramic counts or mixed components were not used in the seriations, with two exceptions to the latter requirement. In these two samples, ceramics considered to be out of chronological context were omitted from the Table 7.3 seriation sample. In sample C, a few shell tempered sherds present in the surface collection were omitted as an obviously later addition to a Middle Woodland period midden. Because the only available samples of grog-tempered check stamped or Mulberry Creek Cord Marked pottery available were from mixed component contexts, earlier Bayou La Batre and later Gulf Historic pottery were removed from sample I.

Table 7.4 displays the occurrence distribution of thirty material traits (ceramic modes, ceramic series/subseries, artifact classes) in ten phases. Each seriation in Tables 7.2–7.4 provides a satisfactory and complementary chronological order. The seriations and the association of attributes that occur together

Table 7.3. Seriation of decorated type-varieties.

CERAMIC TYPE-VARIETIES	ASSEMBLAGES[1]													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
EARLY														
Alexander Incised	21	23	22	–	–	–	–	–	–	–	–	–	–	–
Alexander Punctated/Pinched	14	39	–	<1	–	–	–	–	–	–	–	–	–	–
Bayou La Batre Stamped	8	14	13	35	–	–	–	–	–	–	–	–	–	–
Tchefuncte Incised/Stamped	57	16	–	4	–	–	–	–	–	–	–	–	–	–
Lake Borgne Incised	–	4	7	<1	–	–	–	–	–	–	–	–	–	–
Bayou La Batre Scallop Imp.	–	4	15	21	–	–	–	–	–	–	–	–	–	–
Deptford Simple/Check Stamped	–	–	4	12	–	–	–	–	–	–	–	–	–	–
Mandeville Stamped	–	–	13	3	–	–	–	–	–	–	–	–	–	–
Mabin Stamped *Crooks*	–	–	7	15	–	–	–	–	–	–	–	–	–	–
Indian Bay Stamped	–	–	17	5	6	6	2	–	–	–	–	–	–	–
Marksville Inc. *Yokena*	–	–	2	3	51	61	17	15	–	–	–	–	–	–
Marksville Stamped *Troyville*	–	–	–	<1	3	6	10	–	–	–	–	–	–	–
Churupa Punctated	–	–	–	–	40	1	4	1	–	–	–	–	–	–
Marksville Stamped *Marksville*	–	–	–	–	–	1	4	–	–	–	–	–	–	–
Marksville Stamped *Godsey*	–	–	–	–	–	25	42	71	2	–	–	–	–	–
Marksville Incised *Leist*	–	–	–	–	–	–	21	13	–	–	–	–	–	–
Grog-Tempered Check Stamped[2]	–	–	–	–	–	–	–	–	48	–	–	–	–	–
Mulberry Creek Cord Marked	–	–	–	–	–	–	–	–	50	6	4	–	–	–
Unclass. Shell-Grog Inc./Punct.	–	–	–	–	–	–	–	–	–	86	33	–	–	–
Evansville Punctated	–	–	–	–	–	–	–	–	–	8	43	–	–	–
Moundville Incised (Other)[3]	–	–	–	–	–	–	–	–	–	–	13	19	36	–
D'Olive Incised	–	–	–	–	–	–	–	–	–	–	7	8	16	1
Moundville Incised *Moundville*	–	–	–	–	–	–	–	–	–	–	–	24	4	–
Moundville Incised *Singing River*	–	–	–	–	–	–	–	–	–	–	–	3	20	–
Mound Place Incised	–	–	–	–	–	–	–	–	–	–	–	32	13	–
Pensacola Incised	–	–	–	–	–	–	–	–	–	–	–	14	11	2
Gulf Historic Incised[4]	–	–	–	–	–	–	–	–	–	–	–	–	–	56
Gulf Historic Combed[5]	–	–	–	–	–	–	–	–	–	–	–	–	–	41
LATE														

[1] Type-variety values in each assemblage column are percentages.
[2] Includes Pontchartrain Check Stamped, Wheeler Check Stamped.
[3] Includes *unspecified, indeterminate, Carrollton, Bottle Creek, Snows Bend.*
[4] Includes Fatherland Incised, Port Dauphin Incised, Chickachae Incised, Leland Incised.
[5] Includes Kemper Combed, Chickachae Combed, La Pointe Combed.

Table 7.4. Distribution of thirty traits by phase.

	Claiborne	Apple Street	Greenwood Island	Godsey	Graveline	Tates Hammock	Pinola	Singing River	Bear Point	La Pointe
EARLY										
Fiber Temper	X	X								
Povert Point Objects	X	X								
Rim Bosses		X								
Wedge-Shaped Podal Supports		X	X							
Alexander Series		X	R							
Bayou La Batre Series		X	X							
Tchefuncte Series		X	X							
Rim-top Impressions / Notches		X	X	X						
Conical Podal Supports		X	X	X						
Deptford Series			R							
Cambered Cross-Hatched Rim			X							
Herringbone Punctations on Rim			R							
Marksville Series (Early)			X							
Issaquena Subseries				X						
Rounded Thickened Rim				X	X					
Weeden Island Series (Early)					X					
Troyville Subseries					X					
Polychrome Pottery					R					
Coles Creek Series						X	X			
Miller Series						X	R			
Weeden Island Series (Wakulla)						X	R			
Rim fold						X	?	X	X	
Arrow Points						X	X	X	X	
Moundville Series							X	X		
Loop / Strap Handles							X	X	?	
Pensacola Series							X	X	X	
Lip Nicks / Notches								X	X	X
Choctawan Series										X
Pinched Rims										X
European Artifacts										X
LATE										

X = present; R = present, but rare; ? = uncertain.

in provenience sample units serve as a guide to component definition. We can see from the seriations that some attributes are more sensitive than others. The initiation of new attributes demarcates the divisions between phases. As expected, both continuity and discontinuity of attributes are evident, even if identification of the cultural dynamics responsible for change remains problematic. For example, the Claiborne phase, as presently delineated, has no defining attributes that are not also found in the succeeding Apple Street phase. Most likely this is due to an over-reliance on a limited number of defining traits (fiber-tempered pottery, Poverty Point objects) that have long time spans. Despite a tendency for frequency seriations to represent cultural change as gradual, we can detect a dramatic discontinuity in shared attributes between the Graveline and Tates Hammock phase samples.

Radiocarbon Samples

At the late end of the sequence, La Pointe phase contexts have associated eighteenth-century Euro-American artifacts with known time spans. Age span estimates for prehistoric phases are based on the presence of ceramic styles shared with adjacent regional phases, some of which have associated radiocarbon dates. Cross-dating of ceramic styles has considerable potential for error, however, because some phases in adjacent regions have few or no reliable radiocarbon dates. Table 7.5 summarizes the ten radiocarbon dates for the sequence. Godsey, Graveline, Pinola, and Singing River phases have associated radiocarbon dates. With the exception of the Claiborne phase components at 22-Ha-501 in the western subregion, the other prehistoric phases in the sequence remain undated by chronometric methods. Artifacts associated with dated provenience units are identified in Appendix B. We will abstain from playing the "good date, bad date" game so dear to archaeologists (well, this time anyway). All dates are "acceptable" in that none appear to be radically out of line with expectations generated by ceramic style cross-dating, nor are they inconsistent with the stratigraphic position of the samples.

The post-Archaic Native American cultural sequence for the eastern Mississippi Sound region is charted in Figure 7.1. We harbor no delusions about the infallibility of this chronological scheme, which hopefully will be refined as regional research continues. For now, however, we think it is accurate (if somewhat coarse-grained) and adequate as the necessary foundation for initial inquiries into culture history and process.

Prehistoric Tools and Ornaments

Artifacts other than potsherds were rarely encountered in either test excavations or surface col-

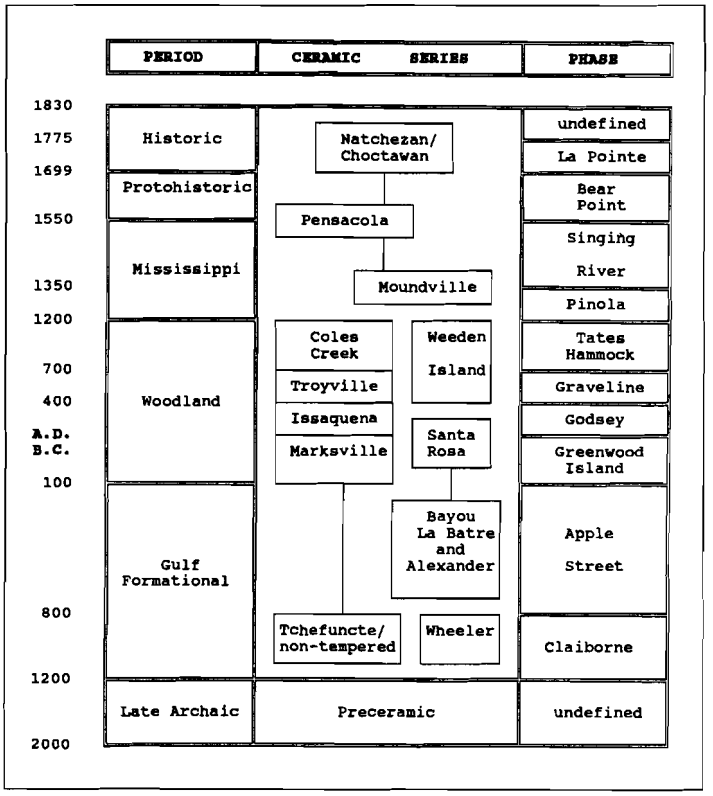


Figure 7.1. Native American cultural chronology: Eastern Mississippi Sound region.

Table 7.5. Radiocarbon dates for the eastern Mississippi Sound region.

LAB. NO.	MATERIAL	RCYBP[1]	SIGMA CALIBRATED AGE RANGES[2]	PROVENIENCE
Beta 66109	Carbonized Wood, Charcoal	1720+/-70BP	AD244 (341) 416	22-Hr-591, Unit 2, Stratum C
Beta 66711	Marine Shell	1660+/-80BP	AD264 (412) 532	22-Hr-591, Unit 2, Stratum B
Beta 66664	Marine Shell	1690+/-70BP	AD256 (389) 428	22-Hr-534, Unit 3, Stratum D
Beta 66663	Marine Shell	1590+/-60BP	AD415 (445) 548	22-Hr-534, Unit 3, Stratum C
Beta 66712	Marine Shell	1430+/-80BP	AD562 (641) 668	22-Ja-503, Unit 1, Stratum D
Beta 66112	Carbonized Wood, Charcoal	1330+/-60BP	AD644 (668) 768	22-Ja-503, Unit 1, Stratum D
Beta 78091	Marine Shell	970+/-60BP	A1275 (1315) 1395	22-Ja-520, Pinola Unit 1, Stratum C,Level 9
Beta 78090	Marine Shell	920+/-60BP	AD1300 (1360) 1425	22-Ja-520, Pinola Unit 1, Stratum C, Level 3
Beta 78089	Marine Shell	910+/-90BP	AD300 (1385) 1445	22-Ja-520, Lewis Unit 1, Stratum D
Beta 78088	Marine Shell	650+/-60BP	AD1485 (1550) 1660	22-Ja-520, Lewis Unit 1, Stratum B

[1] Radiocarbon years before AD1950 (shell dates C13/C12 adjusted).
[2] Intercept of radiocarbon age with calibration curve in parenthesis (ref. Stuiver et al. 1993).

lections. In artifact collections made by local nonprofessionals, nonceramic artifacts were somewhat better represented because the collectors emphasized these categories over plain potsherds, and sites that produced them were more heavily collected. Sites with the most abundant lithic artifacts have substantial pre-AD 200 components. Because most materials are not diagnostic of a discrete time period and come from disturbed contexts at multicomponent sites, we have not pursued in-depth analyses. These artifacts, some of which have been inventoried elsewhere (Blitz and Mann 1993), are best summarized in a series of distribution tables and illustrations of representative examples. Lithic debitage categories, raw materials, and nonceramic artifacts that could be associated with specific components were previously described in the discussion sections on each site.

Poverty Point Objects (Table 7.6 , Figure 7.2)

These are hand-molded, baked-clay objects (Webb 1977). At sites that produce them, they are usually ubiquitous in midden contexts, an indication that they were in common use. A wide variety of functions for these enigmatic objects have been proposed, ranging from the merely plausible (missiles) to the exceedingly unlikely (tokens used as a medium of exchange). Heat-conducting elements used in pit oven cooking is the conventional interpretation. The amorphous baked-clay lumps found at Late Archaic sites, mentioned previously, may be prototypes. A variety of widespread morphological types were produced. Given their supposed mundane heating function, it is unclear why Poverty Point objects underwent such stylistic elaboration. Some forms are perforated, grooved, or otherwise shaped as if they were meant to receive an attached line, which leads to speculation about additional functions such as net sinkers, bola weights, or similar stone substitutes. Regionally, Poverty Point objects were in use during the Claiborne, Apple Street, and Greenwood Island phases.

Ground Stone Implements (Table 7.7, Figure 7.2)

Perforated boatstones (siltstone) and grooved plummets (siltstone, hematite) are artifacts known to be associated with Poverty Point period assemblages elsewhere. The 1.36 kg of steatite bowl fragments from 22-Ja-530 represents one of the larger

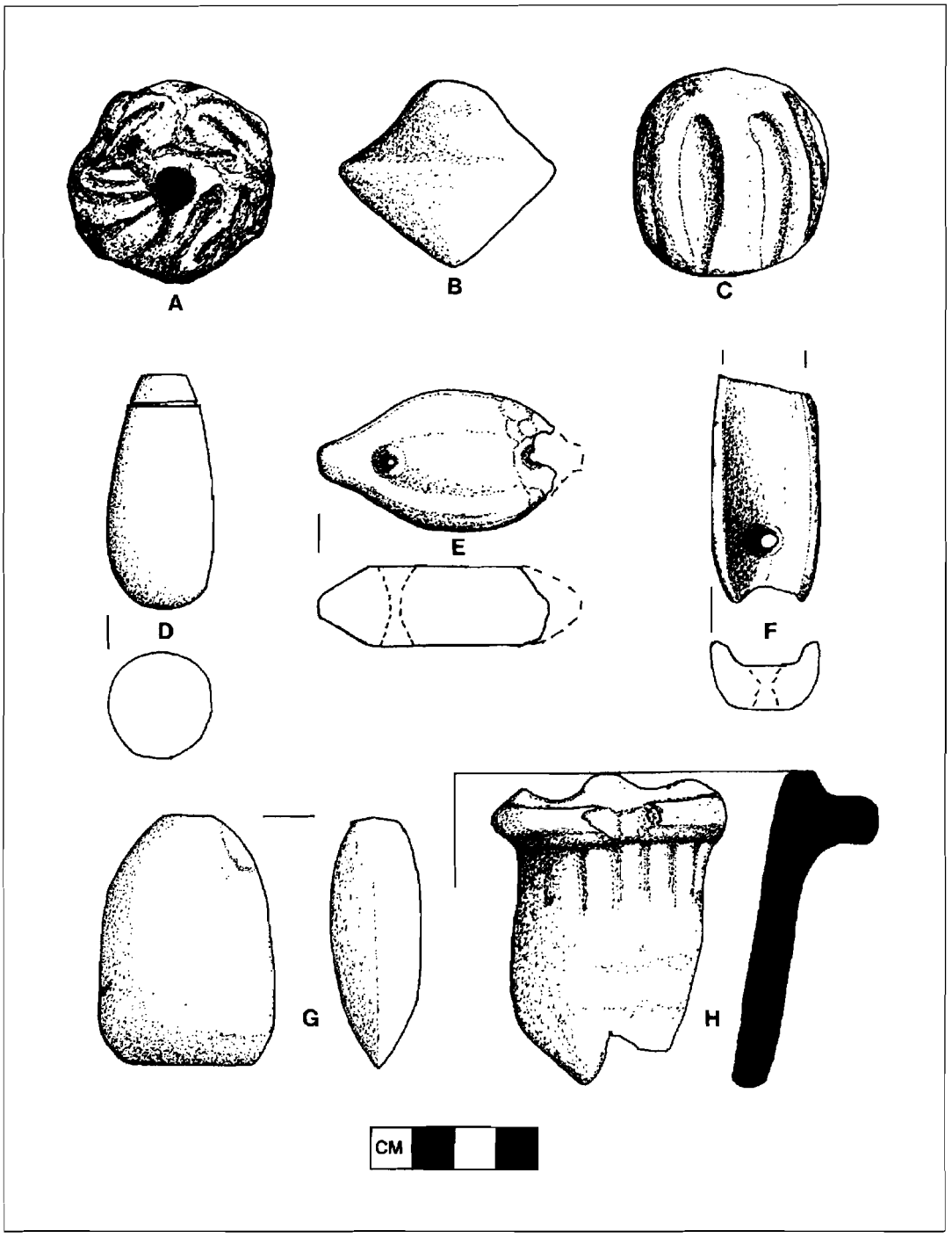


Figure 7.2. Poverty Point Objects and ground stone artifacts: a, perforated, spheroidal, roughened PPO; b, biconical PPO; c, spheroidal, grooved PPO; d, siltstone plummet; e,f, siltstone boatstones; g, sandstone celt; h, steatite bowl rim with lug handle. Provenience: g, 22-Ja-647; all others, 22-Ja-530.

Table 7.6. Distribution of Poverty Point Objects (Jackson County).

	SITE										
PPO	**516**	**516-Feat.**	**530**	**726**	**ON**	**725**	**550**	**555**	**632**	**662**	**687**
Biconical	200	60	19	—	2	1	X	—	—	—	X
Biconical, Grooved	1	—	2	—	1	—	—	—	—	—	—
Spheriodal, Roughened	—	—	10	5	5	—	—	—	—	—	—
Spheroidal, Roughened, Perforated	—	—	7	—	—	—	1	—	—	—	—
Melon-Shaped	—	—	4	—	—	—	X	—	—	—	—
Cylindrical, Groved, Perforated	2	—	2	2	—	—	—	—	—	—	—
Other / Indeterminate	—	—	—	X	X	X	—	X	X	X	X

X = present, not counted; NL = North Laura; ON = Oak North; ST = St. Andrew's

Table 7.7. Distribution of ground stone implements.

	GROUND STONE IMPLEMENTS								
SITE	**Perforated Boatstone**	**Steatite Bowl Frag.**	**Mortar / Anvil**	**Pestle / Hammerstone**	**Abrader**	**Celt**	**Plummet: Grooved**	**Plummet: Perfor.**	**Plummet: Indet.**
Ja-723	1	—	—	—	—	—	—	—	—
Ja-516	1	4	—	—	—	1	2	—	1
Ja-530	1	49	—	—	1	—	—	—	3
Ja-531	—	1	—	—	—	—	—	—	—
Ja-504	—	1	—	—	—	—	—	—	—
Ja-618	—	1	—	—	—	—	—	—	—
Ja-550	1	—	2	1	3	1	3	1	—
Ja-555	—	—	2	3	2	—	—	—	—
Hr-534	—	—	2	—	—	—	—	—	—
Ja-647	—	—	—	—	1	1	—	—	—
Ja-543	—	—	—	—	7	—	—	—	—
Ja-544	—	—	—	—	1	—	—	—	—
Hr-591	—	—	—	—	—	—	—	—	1
Ja-520	—	—	—	—	—	—	—	—	—

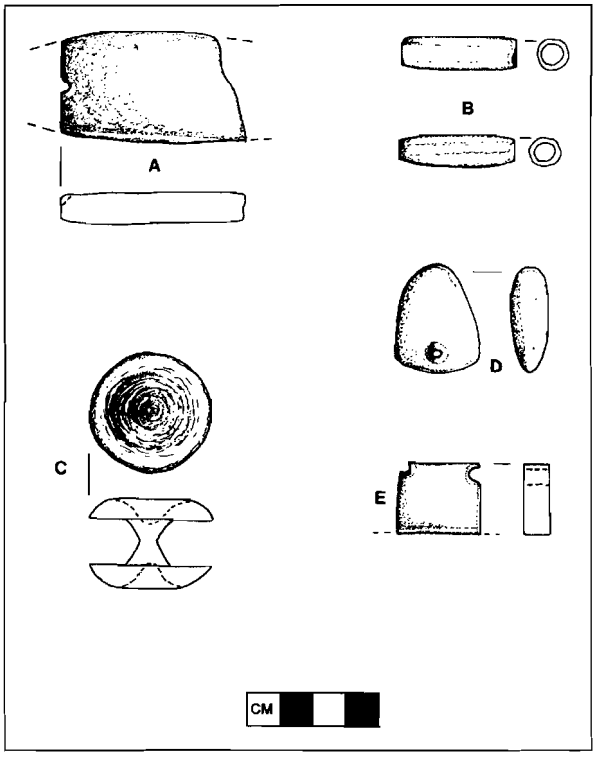


Figure 7.3. Ground stone and copper artifacts: a,e, perforated siltstone bar gorgets; b, red jasper beads; c, copper bicymbal earspool; d, siltstone pendant. Provenience: a,c,e, 22-Ja-516; b, 22-Ja-530; d, 22-Ja-647.

finds of this nonlocal material from a Mississippi site. Small abraders (sandstone) probably served to shape soft materials such as bone and wood. The sandstone mortar/anvil examples are small and crude; they could have been used for various pounding/grinding tasks, such as plant processing. Artifacts that could function as heavy wood-working tools are limited to the two celts.

Stone and Copper Ornaments (Table 7.8, Figure 7.3)

Perforated bar gorgets (local siltstone) and tubular stone beads (red jasper, novaculite) are known to be associated with Poverty Point assemblages elsewhere, while the perforated reel-shaped gorget (unidentified stone) is a Middle Woodland artifact style. The copper bicymbal earspool from 22-Ja-516 is a classic Hopewellian prestige item, and circumstantial evidence presented in Chapter 3 suggests that the rolled copper beads also date to the Middle Woodland period. The copper artifacts are from burial contexts; all other items have only a general site provenience.

Bone and Antler Artifacts (Table 7.9, Figure 7.4–7.5)

Projectile points of bone or antler tine were probably used throughout late prehistory in the region; examples are recorded in Greenwood Island, Godsey, and Graveline phase contexts. Several examples have hollowed bases for socketing to a shaft. Slender, polished bone shafts with pointed ends, all fragmented, are glossed as pin/bodkins. Several large fish vertebrae, cut and modified, may be "beads," but again, function is uncertain. Likewise, "perforated/cut objects" is a catch-all label for

Table 7.8. Distribution of stone and copper ornaments.

	ORNAMENTS						
SITE	Perforated Gorget: Bar	Perforated Gorget: Reel-Shaped	Tubular Stone Bead	Copper Bead: Cylindrical	Copper Bead: Tubular	Copper Bicymbal Earspool	Stone Pendant
Ja-530	1	—	2	—	—	—	—
Ja-516	2	1	1	19	3	1	2
Ja-531	1	—	—	—	—	—	—
Ja-550	—	—	1	—	—	—	2
Ja-647	1	—	—	—	—	—	—

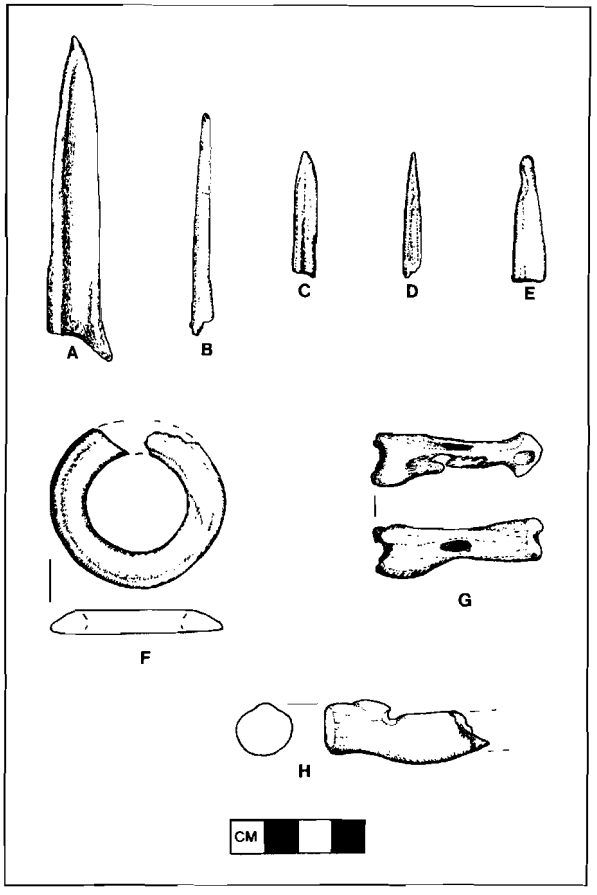


Figure 7.4. Bone/antler artifacts: a, awl; b-d, pin/bodkins; e, notched tool; f, ring-shaped object; g, perforated/cut object; h, atlatl hook. Provenience: a-d, 22-Hr-534; e,h, 22-Ja-555; f, 22-Ja-520; g, 22-Hr-591.

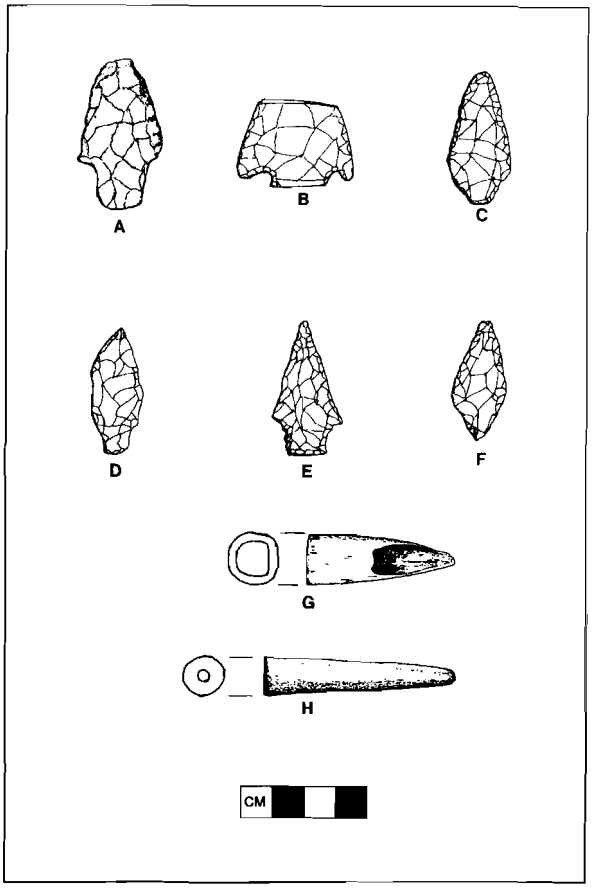


Figure 7.5. Projectile Point/Knives: a-f, pp/ks of local cert; g, hollow-base bone point; h, hollow-base antler point. Provenience: a-b, 22-Ja-530; c, 22-Ja-555; d, 22-Hr-591; e-f, 22-Ja-534.

Table 7.9. Distribution of bone/antler artifacts.

BONE/ANTLER ARTIFACTS

SITE	Projectile Point	Awl	Pin / Bodkin	Perforated / Cut Object	Fish Vertebra Bead	Fishhook	Atlatl Hook	Ring-Shaped Object
Ja-504	5	1	1	2	—	—	—	1
Ja-516	1	4	1	3	X	1	—	—
Ja-550	2	2	—	1	—	—	—	—
Ja-555	—	—	—	4	—	—	1	—
Hr-591	1	—	1	1	—	—	—	—
Hr-534	1	1	3	1	2	—	—	—

X = present, not counted

Table 7.10. Distribution of Post-Archaic Projectile Point/Knife types.

SITE PP/K	Ja-592	Ja-591	Ja-530	Ja-727	Ja-723	Ja-516	Ja-550	Ja-555	Ja-596	Hr-534	Hr-591	Ja-647	Ja-726	Hr-500	Ja-543
Pontchartrain-Kent (2000BC-500BC)	X		X	X			X	X							
Motley-Delhi-Wade (2000BC-500BC)		X	X												
Marshall-Shumla (1500BC-100BC)			X	X	X										
Gary (1200BC-AD700)			X	X			X	X	X	X	X	X	X		
Bradley Spike (AD200-800)				X				X					X		
Collins (AD700-Historic Period)													X		
Alba (AD700-Historic Period)													X	X	X
Madison (AD700-Historic Period)														X	X

artifacts of unknown use. The atlatl hook is associated with a Greenwood Island component. The ring-shaped object was carefully shaped and highly polished; perhaps it was a labret or similar ornament.

Stone Projectile Point/Knives (Table 7.10, Figure 7.5)

These artifacts are bifaces that were originally hafted to create a projectile point/knife. PP/Ks that conformed to one of eight common stylistic clusters were recorded for post-Archaic components. In Table 7.10, PP/K clusters are arranged in temporal order to reveal some diachronic patterns in the distribution. A temporal shift toward smaller, lighter PP/Ks in the Southeast after AD 600, locally represented by Collins, Alba, and Madison types, is thought to coincide with adoption of the bow. As these various styles are well known, we illustrate only those excavated PP/Ks that can be assigned a specific phase.

8 Sites and Settlement

We turn now to consider archaeological sites and settlement in the eastern Mississippi Sound region. Here we summarize what are best described as "site distributions." As we shall see, these data are not robust enough to yield detailed "settlement patterns," let alone anything as intricate as a "subsistence-settlement system." Our goal is to sift through 30 years of randomly accumulated archaeological site records to identify temporal trends in regional occupation intensity and determine what kinds of locations were favored for settlement. First, previous characterizations of archaeological site distributions on the coast are briefly reviewed. Next, the relationship of site frequency and distribution to a number of cultural and environmental variables is explored. To accomplish this, the state site inventory maintained by the Mississippi Department of Archives and History (MDAH) is examined. Finally, the findings are summarized to produce a synthesis of site distribution data. Because of inadequacies in the current data set, apparent patterns should be considered untested hypotheses; these propositions provide the foundations for future research efforts.

Previous Research

Prior to the Mississippi Gulf Coast Archaeological Project, so few archaeological investigations had been conducted that chronological control in the form of a regional sequence was unavailable. Not surprisingly, settlement pattern studies were lacking. Nevertheless, previous researchers offered two kinds of generalizations about site distributions: a predictive site location model focused at the local level and a comprehensive regional summation of site distributions.

Swanson et al. (1979) created the only predictive model for prehistoric site locations in the region. Their project was designed specifically to aid an archaeological survey of the Mississippi Sandhill Crane National Wildlife Refuge. Following conventionally accepted methods, ecological factors such as elevation, soil type, and access to water were proposed as critical variables in predicting site location. Actual field survey was insufficient to test the model. In fact, no prehistoric sites were found! Still, some of their proposed site location variables are relevant to the issues discussed below.

The most comprehensive study was made by Barry Lewis (1988). Lewis utilized MDAH site files to examine site distributions throughout the Mississippi Sound region in order to identify "cultural adaptive patterns" (Lewis 1988:109). In his study, Lewis considered sites recorded in all of the Coastal Meadows physiographic zone as well as a portion of the interior Pine Hills zone (i.e., Mississippi south of 31 degrees, 00' N latitude). As a result, he advanced several broad propositions: (1) pre-Late Archaic use of the region was likely to have been intense, but those sites are now obscured or inundated by Holocene sea level fluctuations; (2) Late Archaic and Poverty Point (Middle Gulf Formational) period societies had large, permanent villages; and (3) post-Poverty Point period sites were seasonal occupations by task groups engaged in harvesting littoral resources (Lewis 1988:121). In addition, Lewis considered that there was a lower frequency of Late Woodland period mounds and sites on the Mississippi Coast in comparison to adjacent coastal Louisiana. Lewis suggested that this diminution of occupation intensity, if real, may have been caused by environmental factors:

> ...the erosion of the St. Bernard delta westward, and the consequent loss of many hectares of marsh across the Mississippi Sound region may have indirectly affected local resource exploitative patterns or scheduling to the extent that comparable resources were utilized differently along the Mississippi Coast than in the Louisiana marshes (1988:116).

Archaeological overviews prepared by MDAH in the late 1980s and early 1990s attempted to generalize about past settlement in the Mississippi Sound region. Other than the observation that all Paleoindian and Archaic chronological periods were represented in surface collections, little could be said about the earliest inhabitants of the coast (McGahey 1992a,b). Only sixteen Late Archaic sites were identified in the Coastal Meadows physiographic zone (Giliberti 1995). Coastal Meadows Paleoindian/Archaic site numbers are low compared to counts in other physiographic zones in the state (McGahey 1992a:Figure 2) or even compared to the southern portion of the Pine Hills zone immediately north of the Coastal Meadows (Lewis 1988:Figure 4). If the coast was less attractive to Paleoindian/Archaic populations, the reasons are not apparent. Some diagnostic projectile point types used to recognize Middle Archaic components elsewhere are absent from southern Mississippi, while other poorly defined types suggest artifact complexes specific to the region (McGahey 1992a:2). Regional Late Archaic components are also difficult to isolate from other components in surface collections due to the lack of chronologically sensitive artifact types. Given the uncertainties about component recognition and the site inundation factor, it is unlikely that the number of recorded Paleoindian/Archaic sites accurately reflects occupation intensity.

David Morgan (1992) prepared the MDAH overview of the post-Archaic to Colonial period occupation on the coast. Like Lewis, Morgan examined temporal settlement trends with the aid of the state site records. However, Morgan confined his sample to the Coastal Meadows zone, a less extensive area than that considered by Lewis. Morgan (1992:14) noted a population increase (based on component totals) through the Middle Woodland period, followed by a subsequent reduction in component numbers in the Late Woodland period. Although Morgan noted there were more Mississippian sites on the coast than sites of any other period, both Morgan (1992:15) and Lewis (1988:117–121) considered the coast marginal for maize agriculture and thus unconducive to permanent Mississippian settlement. A reflection of established ideas derived from the archaeological literature (e.g. Larson 1980), the seasonal occupation theory was tenable in the absence of site subsistence and seasonality data. However, both Morgan and Lewis were troubled by the presence of some late prehistoric sites with extensive midden,

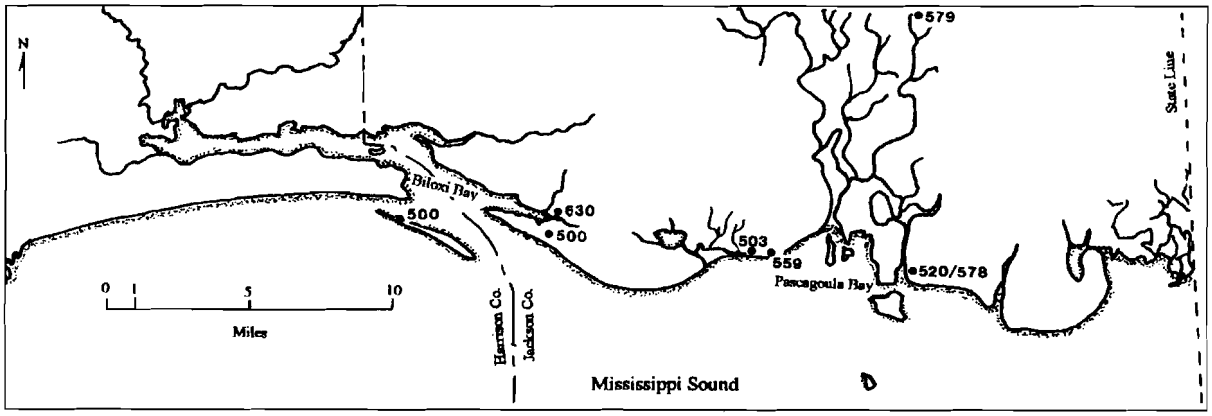


Figure 8.1. Distribution of sites with mounds.

mounds, or earthworks (i.e. Ramsey 22-Ha-528, Claiborne-Jackson Landing sites 22-Ha-500, 22-Ha-504, 22-Ha-515; Graveline Mounds 22-Ja-503, Singing River 22-Ja-578, and Deer Island 22-Hr-500). Such evidence cast doubt on the seasonal occupation theory (Figure 8.1).

Regional Occupation Intensity

The MDAH site files were searched to generate a total inventory of 136 recorded sites (245 pre-AD 1900 components) in the study area (Appendix E). This inventory, augmented with our site collection and excavation research, is the basis for the series of site distribution maps presented in the previous chapters. Phase attributions were assigned only to those sites and collections that we examined directly. This left a large number of previously recorded sites for which the only information available is a site card. Like most states, Mississippi's archaeological site file database has accumulated through the use of site cards. These standardized forms for site information may be filled out and mailed in by a variety of interested individuals. If a site card has the requisite locational coordinates, and there are no mitigating circumstances to doubt the veracity of the information, the reported site is assigned a number and added to the files. This means that many recorded sites have never been visited by archaeologists. Of course, this system evolved as a pragmatic response to the harsh fact that there are many sites, few archaeologists, and unrelenting site destruction. Unfortunately, this practice virtually guarantees that a number of potential sources for error are inherent in the database: mislocated sites, misidentified components, and incomplete site cards (Baca and Giliberti 1995; Galloway 1995:47–48).

Were there time periods when the coast was more or less attractive as a place to settle or occupy? To answer this question, we need a method to assess occupation intensity. Although they partitioned components in different ways, both Lewis (1988:Table 1) and Morgan (1992:Table 1) used the number of recorded components per period as an indicator of prehistoric occupation intensity. This assumption is unrealistic because it ignores the different time spans of the periods that are compared. To increase the probability that component frequencies adequately reflect historical reality, they must be time-adjusted (e.g. Galloway 1995).

The first step was to subdivide the number of identified components in the study area into gross time periods. Time periods must be broad to ensure accuracy. In other words, we were skeptical that all observers correctly identified "Early Mississippi period" or "Late Mississippi period" on site cards, but quite confident that a broad chronological marker such as shell-tempered pottery was correctly identified. So the potential margin of error is greatly reduced when all such components are collapsed into a single Mississippi/Protohistoric period. In short, we were willing to sacrifice the precision of shorter intervals for increased accuracy. This procedure was relatively straight forward but two component categories remained unassigned to a time period: undiagnostic Gulf Formational (n=7) and undiagnostic Woodland (n=16). Rather than disregard these components, we assigned the undiagnostic Gulf Formational category to the Late Gulf Formational period. This solution seemed reasonable because the sites in question lacked other components with which these materials might be confused. The undiagnostic Woodland component category was divided and assigned to the Middle Woodland period (n=10) and Late Woodland (n=6) in proportion to the different durations of each period. Next, we divided the number of recorded components in each period by the number of years in the period, then multiplied by 100 to magnify the effect for comparative purposes (Table 8.1).

While hardly infallible, we now have a crude index of occupation intensity that suggests the following scenario. Occupation intensity increased through time. As expected, the number of Paleoindian and Archaic components (n=19) is low. By the Gulf Formational periods (1200–100 BC), coastlines had become relatively stable (Lamb 1983). If enrichment of coastal ecosystems followed

Table 8.1. Time-adjusted component frequencies.

PERIOD	NO. OF COMPONENTS	TIME SPAN	DURATION OF PERIOD	OCCUPATION INTENSITY INDEX (COMPONENTS/YR X 100)
Unspecified Historic	29	AD1700-1900	200 years	14.5
Colonial	9	AD1700-1810	110 years	8.2
Mississippi/ Protohistoric	50	AD1200-1700	500 years	10.0
Late Woodland	44	AD700-1200	500 years	8.8
Middle Woodland	58	100 BC-AD 700	800 years	7.3
Late Gulf Formational	27	800-100 BC	700 years	3.9
Middle Gulf Formational	9	1200-800 BC	400 years	2.3
Paleoindian/ Archaic (all periods)	19	8000-1200 BC	6800 years	0.3

stabilization, this (and the inundation factor) may explain the dramatic increase in Gulf Formational occupation intensity when compared to earlier times (Lewis 1988:112–113).

Occupation intensity increased steadily throughout late prehistory, then crashed in the Colonial period. In contrast to the observations of Lewis and Morgan, there was no decline in occupation intensity during the Late Woodland period. Instead, the escalation in Late Woodland occupation conforms to a similar increase recorded for the same period in adjacent coastal Louisiana (Jeter et al. 1989:154) and in interior Mississippi (Galloway 1995:Table 7, Figure 5). If the deterioration of the La Loutre lobe of the St. Bernard delta at this time did result in tidal marsh contraction, as hypothesized by Lewis, it is not possible to detect any negative effect on occupation intensity with the current data set.

Historical records document the calamitous population decline visited upon American Indians by Euro-American/African-American settlers during the Colonial period in coastal Mississippi (Galloway 1995:Table 1). The drop in Colonial period occupation intensity in Table 8.1 conforms to this expectation and increases our confidence in the relative accuracy of the index. Indeed, the post-Archaic trajectory of the coastal occupation intensity index does not appear out of line with temporal trends in other proxy prehistoric population measures for the state as a whole (cf. Galloway 1995:Figure 9). If the coastal environment exerted unique limitations upon late prehistoric occupation or settlement, as suggested by Lewis and Morgan, we do not detect it here.

It would be helpful to have a standard measure of archaeological site density, so that ancient settlement in the Coastal Meadows could be compared to site densities in other physiographic zones. Cultural resource surveys, searches for historic and archaeological sites mandated by Federal law, have the potential to generate the requisite database. As of December, 1995, 121 such surveys had been completed in the study area. A total of 6013.5 acres of land was surveyed and 56 previously unrecorded archaeological sites were located, or an average of one site per 107.4 acres. The average survey was 49.7 acres and one site was found for every 2.2 surveys conducted. The good news is that archaeological sites are being found and recorded prior to destruction. The bad news is that we cannot accurately compare these site density figures with other regions because survey methods are not standardized. Recent efforts to remedy this situation have been initiated by MDAH and such agencies as the USDA Forest Service (Peacock 1996).

Environmental Factors

Our next concern is to examine the relationship of site distribution to a number of variables: land-

form, micro-environmental setting, elevation, and soil type. Because of constraints in the MDAH computerized file system, this search was restricted to the Jackson County portion of the study area.

The relationship between recorded site frequencies and landform implies a strong preference for site locations adjacent to bodies of water. Of those Jackson County sites with exact locational data (n=130), the majority (n=85) occur directly along shorelines, estuaries, or on river banks and bluffs (Figure 8.2). Most of the other sites (n=40) occur on first terraces (relict shoreline formations) adjacent to coastal bayous or estuaries. Only 5 of the 130 sites occur in an upland/inland setting (>200 m from a body of water). Preference for site locations with direct access to water is further evident when the micro-environmental setting is considered (Figure 8.3). All but 26 sites are directly adjacent to Mississippi Sound or a major coastal estuary. Of those that are not, 21 are associated with other, smaller estuaries such as Bayou LaMotte and Bayou Casotte. The areas most often exploited, in rank order of recorded site numbers, are the Pascagoula River estuary, other smaller estuaries, the immediate coastal strand of Mississippi Sound, Graveline Bay, and Grand Bay/Point aux Chenes Bay. In the study area, elevations range only 0–55 feet AMSL. Given the landform and micro-environmental preferences, it is unremarkable that most sites occur below 20 feet AMSL (Figure 8.4). More than fifty sites are located between 0 and 5 feet above AMSL.

The distribution of major soil associations in the Jackson County study area is mapped in Figure 8.5. The relationship of recorded site frequencies to soil type and soil association was examined (Table 8.2) using classifications in the Jackson County soil survey (Cole and Dent 1964). In rank order of site frequencies, the preferred soil types are Klej loamy sands, Tidal Marsh, Plummer loamy sands, and Lakeland loamy sands. Soil associations are groups of related soil types that share common properties. When soil associations are compared with site frequencies,

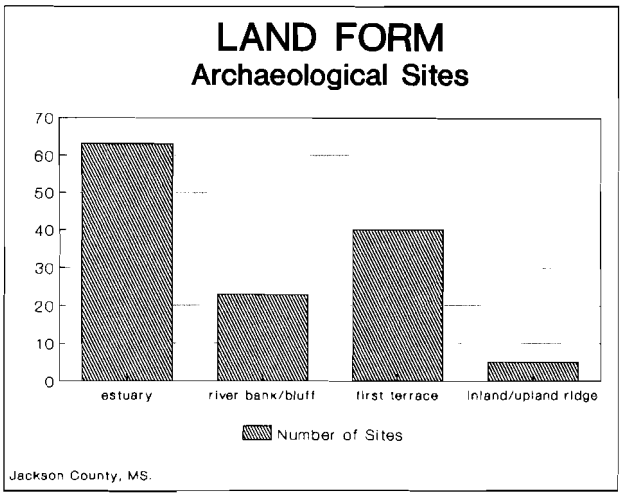


Figure 8.2. Relationship of sites and landform.

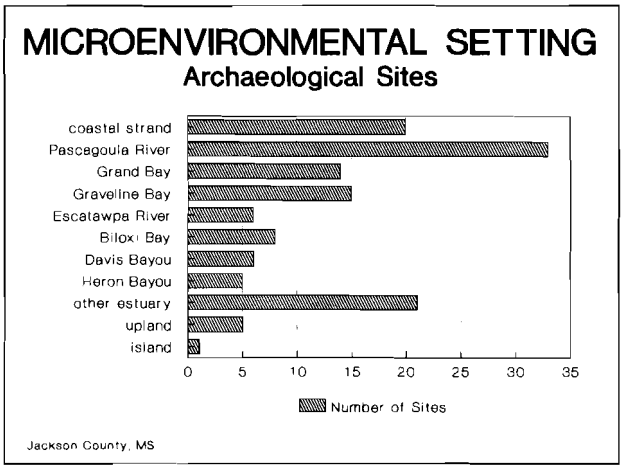


Figure 8.3. Relationship of sites and microenvironmental setting.

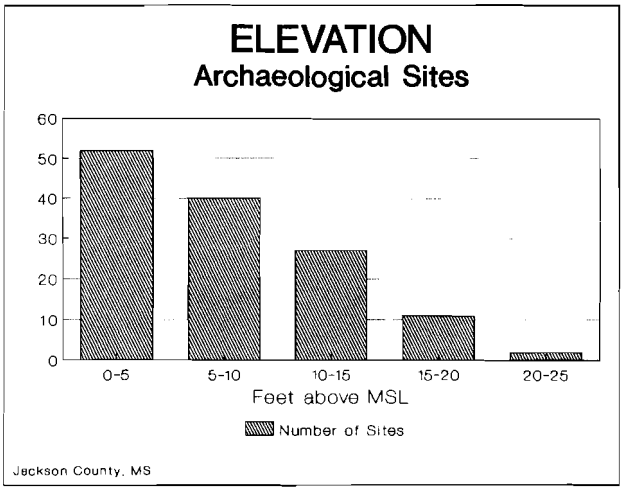


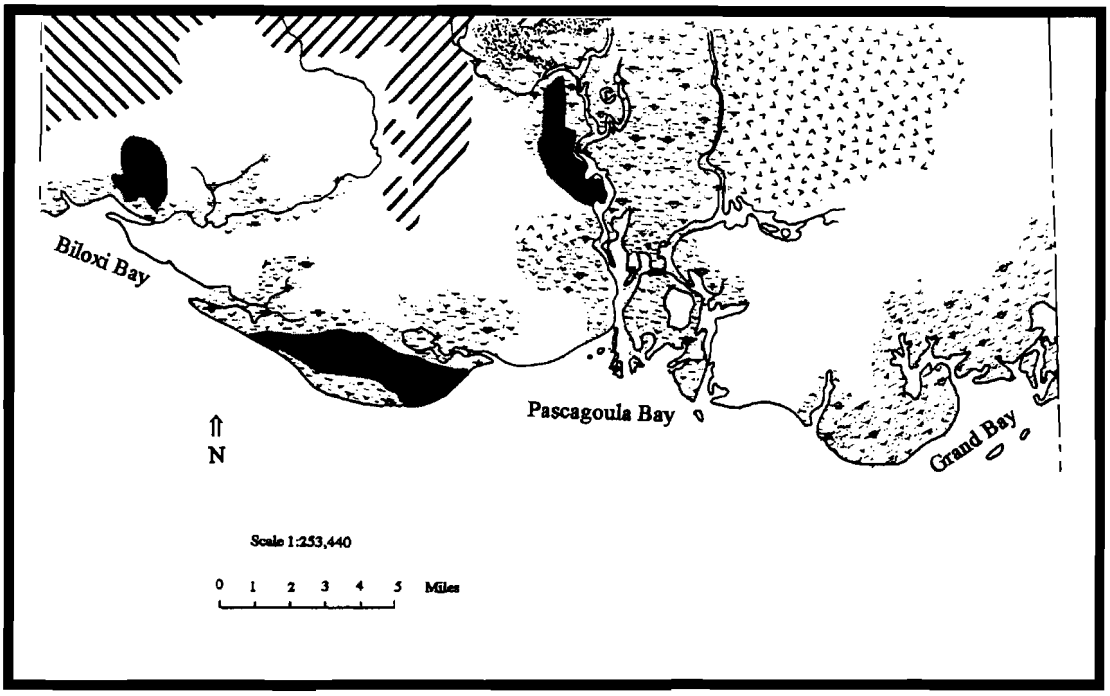
Figure 8.4. Relationship of sites and elevation.

Table 8.2. Relationship of sites and landform.

Soil Type	Number of Sites	Soil Association
KsB Klej loamy sand, 0-5% slopes	41	2
Tm Tidal Marsh	21	8
Pm Plummer loamy sand	14	1
LaB Lakeland loamy sand, 0-5% slopes	10	2
Ad Alluvial land	6	7
KsD Klej loamy sand, 5-12% slopes	5	2
Cb Coastal beach	5	Coastal Beach
Lyb Lynchburg very fine sandy loam, 2-5% slopes	3	1
EuC Eustis and Lakeland sands, 0-8% slopes	3	2
EsB Eustis loamy sand, 0-5% slopes	3	2
RoB Ruston and Orangburg fine sandy loams, 2-5% slopes	2	3
NoB Norfolk fine sandy loam, 2-5% slopes	2	4
Cx Coxville silt loam	2	5
ScA Scranton loamy sand, 2-5% slopes	1	*
DbA Dunbar loam, 0-2% slopes	1	5
GoB Goldsboro loam, 2-5% slopes	1	4
Ma Made land	1	Made Land
DbB Dunbar loam, 2-5% slopes	1	5
BoA Bowie loam, 0-2% slopes	1	6
FaB Fairhope very fine sandy loam, 2-5% slopes	1	*
GoC Goldsboro loam, 5-8% slopes	1	4
Sw Swamp	1	7 Swamp

Soil associations used in table (Jackson County Soil Survey, U.S. Conservation Service 1964:68):

1 Rains-Lynchburg-Plummer-Goldsboro association: Level or nearly level, poorly drained loamy soils.
2 Eustis-Klej-Lakeland association: Rolling sandy soils.
3 Ruston-Orangeburg-Norfolk association: Rolling sandy and loamysoils.
4 Goldsboro-Lynchburg-Norfolk association: Gently sloping loamy soils.
5 Bayboro-Coxville-Dunbar association: Level or nearly level, poorly drained soils that have clayey subsoil.
6 Susquehanna-Boswell-Bowie association: Rolling soils that have clayey subsoil.
7 Alluvial Land association: Low flood plains.
8 Tidal Marsh association: Level, wet land.



SOIL ASSOCIATIONS

1. **Rains-Lynchburg-Plummer-Goldsboro association: Level or nearly level, poorly drained loamy soils.**
2. **Eustis-Klej-Lakeland association: Rolling sandy soils.**
4. **Goldsboro-Lynchburg-Norfolk association: Gently sloping loamy soils.**
5. **Bayboro-Coxville-Dunbar association: Level or nearly level, poorly drained soils that have clayey subsoil.**
7. **Alluvial Land association: Low flood plains.**
8. **Tidal Marsh association: Level, wet land.**

Figure 8.5. Soils in the study area.

sites cluster on Eustis-Klej-Lakeland soils, Tidal Marsh, and Alluvial Lands (soil associations 2, 8, 7, in Table 8.2). The untested prediction by Swanson et al. (1979:13–16), that these soils would have a high probability for prehistoric site location, is supported. In terms of characteristics that may have influenced site choice, the site-soil association relationship appears to sort out into two important groups: sites on well drained soils (soil association 2) and littoral-oriented sites (soil associations 8, 7, 1). We suspect that the latter soils were not chosen for their specific properties but merely as a consequence of their proximity to aquatic resources.

Site locations on Plummer loamy sands were not predicted by the Swanson team because of poor drainage. At first, the occurrence of 21 sites on these soils seemed puzzling. However, most are shell middens in coastal marshes. These sites are more appropriately grouped together with the littoral-oriented soil associations. The only other soil type with more than two sites is Lynchburg fine sandy loam. Closer scrutiny of these three sites revealed that they are all located in the Pascagoula River tidal marsh. Thus the preference for either littoral-oriented site locations or Eustis-Klej-Lakeland site locations becomes even more apparent.

Larson (1980), among others, has proposed that the poor soils of the lower Coastal Plain retarded prehistoric corn agriculture and thus limited the development of large Mississippian population centers. Similarly, Lewis (1988) has suggested that these same conditions probably applied to the Mississippi Sound region, rendering the coast attractive to interior-based agriculturalists primarily as a temporary or seasonal source of littoral resources.

Data in the Jackson County soil survey provide some insights into the question of soil types and potential corn productivity. Fifty-two percent of the archaeological sites in Table 8.2 occur on soil types that cannot be cultivated (Cole and Dent 1964:11–12), further indication that Native peoples occupied these littoral-oriented locations for reasons other than the productive properties of the soils. Of those soils capable of sustaining corn agriculture, only the Eustis-Klej-Lakeland soil association has more than two associated sites (n=54, or about 42% of all sites in Table 8.2). A glance at Figure 8.5 reveals that the Eustis-Klej-Lakeland soil association is not extensively distributed in the study area. Although the Eustis-Klej-Lakeland soil association has an estimated corn yield of 50 bushels per acre under ideal modern management, actual corn yields are 20% to 35% less, ranging from 29 to 40 bushels per acre (Cole and Dent 1964:11–12). How does the corn yield of these coastal soils compare with the corn yield of soils in the vicinity of a riverine Mississippian population center such as Moundville, in Tuscaloosa County, Alabama? Midpoints of average yields of corn in bushels per acre for the six most fertile soil types in Tuscaloosa County range from 30 to 45 bushels (Peebles 1978:Table 13.5). In comparison, the Eustis-Klej-Lakeland soils of coastal Jackson County have a midpoint of 34 bushels per acre, squarely in the middle of the range for the Moundville locale. In short, the most fertile soils in riverine Tuscaloosa County are capable of higher corn yields than are the most fertile soils in coastal Jackson County. The difference, however, is not extreme. Of course, this cursory comparative exercise begs the questions of whether such relative distinctions are inherent in the natural properties of the soils, or whether these differences would hold true under Native American farming conditions. On the one hand, there is some basis to assert that much of Jackson County was ill-suited for prehistoric corn production, a possible constraint on settlement by Mississippian agriculturalists as proposed by Larson and Lewis. On the other hand, it was possible to grow maize on some soils. We will return to the issue of prehistoric agriculture in Chapter 9.

Overview

Our knowledge of ancient sites and settlement in the region is deficient in many ways. No large archaeological surveys based on probabilistic sampling techniques have been conducted. Further hampering efforts at identifying settlement patterns is the fact that less than one third of the sites in the available sample have been investigated in more than a cursory fashion. Such basic information as the specific identity of site components is often unavailable. More detailed data, such as on-site activities and seasonality of site occupation, are few indeed. Still, some useful information has been gleaned from this situation.

While all prehistoric chronological periods are present on the coast, the post-Archaic periods are the most frequently recorded. As measured by time-adjusted component frequencies, coastal occupation escalated steadily from the Middle Gulf Formational period through the Mississippi/Protohistoric periods, then declined drastically in the Colonial period. It comes as no surprise to confirm that the vast majority of sites of all time periods are located directly adjacent to bodies of water. A strong focus on littoral food sources and a reliance on watercraft are the obvious implications. Most sites occur below 20 feet in elevation, primarily in estuarine environments, or on the well drained Eustis-Klej-Lakeland soils which may be found in close proximity to estuaries. Few sites are

recorded for poorly drained soils away from waterways: the wet savannas and pine flatwoods that spread across vast expanses of the Coastal Meadows zone.

Site locations concentrate where fresh water and salt water meet, a choice that conferred both subsistence and social advantages to the inhabitants. Here, biodiversity reaches a regional zenith. These rich biotic communities, centered on shellfish beds, serve to concentrate marine life in the shallow waters. Bayou and river mouth locations also facilitated travel across ecotones and maximized possibilities for communication with other social groups, either to the interior or along the bays and waters of Mississippi Sound. The same situation prevails in adjacent coastal Louisiana, where site placement near shellfish beds at the salt water-fresh water intersection was the predominant preference for Woodland and later time periods, a pattern that Shenkel (1984b:65–66) attributes to a littoral subsistence adaptation that remained relatively unchanged for centuries. In the Mississippi Sound region, the high incidence of multicomponent sites (82% of all recorded sites) suggests that such concerns were primary throughout prehistory.

Lewis (1988:113,115–116) proposed that changes in late prehistoric component frequencies might be correlated with the successive development of Mississippi River deltaic lobes. Eastward expansion of the Metairie and La Loutre lobes, coinciding with a steady increase in components through the Middle Woodland period, probably lowered salinity levels and increased tidal marsh habitats along Mississippi Sound (Coastal Environments 1977:316–318). By Late Woodland times, deltaic lobe building shifted farther west, perhaps contracting marsh habitats, and contributing to what Lewis perceived to be a decline in occupation intensity (Lewis 1988:116). To repeat, we detected no such decline, but instead we think there was an increase in Late Woodland occupation intensity. Whether or not such an increase is connected to the postulated environmental dynamics, we cannot say. It is of interest to note, however, the appearance on the coast of new cultural traits (cord-marked pottery, arrow points) with antecedents to the north, an indicator that the region was of some interest to interior peoples during Late Woodland times. Deltaic lobe building is not a factor in the subsequent boom of Mississippi period components. We suggest the Mississippian increase was due to the incorporation of small-scale maize production into the ancient littoral subsistence regimen.

The environmental variables we have partitioned here were clearly important factors that influenced choice of site location, because subtle changes in these variables demarcate diverse plant and animal communities. Understanding why certain places were favored for settlement involves, in part, gaining further insights into subsistence practices. Analyses of animal and plant remains from the excavated sites, presented in Appendices C and D, represent initial steps towards this goal.

9 Archaeology of the Eastern Mississippi Sound Region

We have now arrived at the point where we may place the post-Archaic cultural sequence of the eastern Mississippi Sound region in broader perspective. First, we provide a sequence synopsis that summarizes temporal changes in some key cultural variables. The possible implications of these changing variables are brought to bear on issues of culture process and history. Secondly, we take a closer look at a specific issue: the nature of coastal Mississippian societies in the region. Alternative theoretical and interpretive perspectives are reviewed and evaluated in light of new archaeological findings.

In the sequence synopsis that follows, these variables are emphasized for each phase: ceramic diversity, relative abundance of nonlocal stone, the presence of ceremonial centers, and evidence of significant technological and population change. Ceramic diversity and nonlocal stone are indicators of interregional connections or ties that imply the movement of ideas, products, or people. The presence or absence of ceremonial centers suggests changes in the intensity or manner in which regional populations were socially integrated. Identifying the timing and impact of technological and population change is an important prerequisite to understanding cultural change.

Some measures for these variables have already been presented in previous chapters. Ceramic diversity (cd) is measured simply as the total number of ceramic traditions and ceramic series present in each phase. Definitions of series and tradition, as well as the rationale for using these concepts to identify interregional interaction, are presented in Appendix A. Artifacts of nonlocal lithics (e.g. steatite, slate, novaculite, Tallahatta quartzite, white quartzite, quartz crystals, copper) appear to be restricted to pre-AD 200 components. Nonlocal stone was not found in any test excavation samples of post-AD 200 components. Similarly, surface collections from sites with only post-AD 200 components did not contain nonlocal stone (Blitz and Mann 1993:Table 8). Given limitations inherent in the available sample, it is premature to conclude that the regional use of nonlocal stone declined after AD 200. For now, we treat this perception as an untested working hypothesis. The evidence for technological change is restricted to morphological changes in ceramics and stone tools with specific functional implications. A regional occupation intensity index, based on time-adjusted component frequencies, was presented in Chapter 8 and serves as a proxy measurement of population change. While we acknowledge that merely highlighting the temporal patterns in these variables does not constitute explanation (and the database is too rudimentary to test cause-and-effect propositions empirically), ignoring them altogether is unacceptable, especially given the attention these variables have received in the recent archaeological literature of the Gulf Coast (Brown 1984, 1988; Davis 1984b,c; Jenkins et al. 1986; Jeter et al. 1989:126–127,141,156; Lewis 1988, 1991; Shenkel 1984a,b).

Claiborne Phase, 1200–800 BC

This phase designates an interval in which Mississippi Sound populations participated in the florescence of the Poverty Point exchange network. The Claiborne site, a ceremonial center in the western subregion, was a hub in the predominantly east–west flow of nonlocal materials that linked the region to Poverty Point centers in the Lower Missis-

sippi Valley and to smaller participating communities in northwest Florida. Nonlocal stone from eastern and western sources is present at Claiborne and at a number of smaller sites. Pottery appeared in the Mississippi Sound region for the first time (fiber-tempered ceramics, temperless ceramics), introduced from eastern sources.

Apple Street Phase, 800–100 BC

Ceramic diversity expands in this phase (cd=5); there were four ceramic series in contemporaneous use, all part of the evolving Gulf tradition. Two indigenous ceramic series, with geographical distributions centered to the west (Tchefuncte) and to the east (Bayou La Batre), spatially overlap in the Mississippi Sound region. The Alexander series, widespread in interior Mississippi and Alabama, was also commonly produced in the region during this phase. All three series share some cognate decorative and vessel shape attributes. Fiber-tempered pottery and nonlocal stone continued to be used for some portion of this interval, but the Claiborne center was abandoned and the Poverty Point exchange network waned, probably around 800–600 BC. Other than the diversification of ceramic vessel shape and temper, no significant technological changes can be detected.

Greenwood Island Phase, 100 BC–AD 200

Ceramic diversity reaches a prehistoric zenith in the region (cd=8); two ceramic traditions (Gulf, South Appalachian) and six ceramic series were in use. The predominant series are of the Gulf tradition; they are represented by late types of the Bayou La Batre and Tchefunte series, and by the initial appearance of the Marksville series as an autochthonous development out of Tchefuncte. Production of late type-varieties of the Alexander series terminated during this phase. Mississippi Sound inhabitants shared cognate ceramic styles and similar mortuary practices with other coastal populations from Lake Pontchartrain to Mobile Bay. The Greenwood Island phase contrasts with contemporary coastal phases to the east by the higher incidence of grog-tempered pottery, diverges from contemporary coastal phases to the west by the presence of Bayou La Batre types, and differs from contemporary phases in interior northern Mississippi by the absence of Middle Eastern and Northern tradition (fabric marked and cord marked) pottery. Infrequent examples of Deptford series and Swift Creek series pottery signal contacts with South Appalachian tradition potters to the east. Copper beads and a copper earspool reveal participation in the Hopewellian interaction sphere, but no mound centers are known. Stone vessels were no longer in use.

Godsey Phase, AD 200–400

Ceramic diversity declines sharply (cd=3). Only Gulf tradition pottery was in use and only one series was predominant: the Issaquena subseries of the Marksville series continuum. These grog-tempered ceramics closely replicate styles geographically centered on the Lower Mississippi Valley. Godsey phase ceramics share some cognate decorative elements with the sand-tempered Santa Rosa series centered to the east; however, only a few examples of Santa Rosa series types (Alligator Bayou Stamped, Basin Bayou Incised) are found on Mississippi Sound sites. The transition to grog-tempered pottery was technologically significant; grog temper permitted greater efficiency in direct-fire cooking. Consequently, Poverty Point objects, baked-clay heating elements in pit-oven cooking, were no longer produced. Jackson Landing Earthwork, a large ceremonial center that corresponds in plan to contemporary centers in the Yazoo Basin, appeared in the western subregion, perhaps indicating a new form of regional social integration. There is no evidence of stone or ceramic imports. Only local or nearby toolstone has been recovered from Godsey phase sites; stone tools and debitage are very scarce in all contexts.

Graveline Phase, AD 400–700

Continuity of Gulf tradition ceramic types from the preceding phase is strong; the Troyville subseries is the terminal expression of the Marksville series continuum (cd=3). Similarities in ceramic style suggest that Mississippi Sound populations remained in the greater cultural sphere of the Lower Mississippi Valley. However, the ubiquitous, low-frequency presence of early Weeden Island series pottery implies interaction with eastern coastal populations. Mississippi Sound was at the geographical center of a painted pottery horizon style that linked the Lower Mississippi Valley with northwestern Florida. A ceremonial center (Graveline) with a platform mound, associated painted pottery, and midden dump was in use. There is no evidence of imported stone; stone tools and debitage are uncommon at mound and habitation sites. There is no indication of significant technological change.

Tates Hammock Phase, AD 700–1200

Ceramic diversity increases dramatically in comparison to the homogeneity of the previous phase (cd=6). The ceramic complex is a mix of three traditions and three series. The grog-tempered Coastal Coles Creek series represents a panregional infusion of the South Appalachian check-stamped pottery tradition into the Gulf tradition. The sand-tempered late Weeden Island (Wakulla) series is common on sites in the region. Cord-marked Miller series pottery, a product of the Northern tradition, appeared in the Mississippi Sound region for the first time, even though it had been in use for centuries on the interior Gulf Coastal Plain of Mississippi and Alabama scarcely 200 km to the north. Small stemmed and triangular projectile points herald the arrival of bow-and-arrow technology. Cord-marked pottery and arrow points indicate the adoption of these northern products by coastal inhabitants or the movement of northern peoples to the coast. Small mounds were constructed by Tates Hammock phase peoples in the Mobile Bay region, but none have been identified in Mississippi.

Pinola Phase, AD 1200–1350

This phase was initiated by the appearance of shell-tempered pottery and mixed shell-grog-tempered pottery; this new pottery marked a fusion of the Gulf tradition with the Middle Mississippian tradition. The Pinola ceramic complex (cd=5) was the product of indigenous producers of late Coastal Coles Creek/early Plaquemine series pottery exposed to Middle Mississippi tradition ideas, products, or people emanating from the interior Southeast. Technological changes included the adoption of maize production, local salt production, and vessel shape and temper conversions probably related to the efficient processing of maize. A widespread Mississippian symbolic artifact, the human effigy pipe, was present. Occupation of a local civic-ceremonial center, the Singing River site, was initiated.

Singing River Phase, AD 1350–1550

The Singing River phase is the local expression of the Pensacola culture, a very homogeneous manifestation of material culture spread across 200 miles of the northern Gulf Coast. Ceramic diversity is low (cd=3); the ceramic complex is composed of a single tradition (Middle Mississippi) and two series (Moundville, Pensacola). Although we classify Pensacola as Middle Mississippian, the continuation of some Gulf tradition stylistic elements gives Pensacola ceramics their distinctive characteristics. The Singing River phase differs from Pensacola components in the Mobile Bay region (Bottle Creek phase) by the high frequency of a regional type-variety, Moundville Incised *var. Singing River.* Not enough survey work has been done to delineate the western and interior spatial limits of the Singing River phase, but Pensacola sites extend west across Mississippi Sound. There is no evidence for sig-

nificant technological change. Local maize production was present. At least two civic-ceremonial centers were in use (Singing River, Deer Island).

Bear Point Phase, AD 1550–1699

This phase spans the Protohistoric period of initial European contact. Ceramic diversity continues to be low (cd=2); only late Pensacola series types were in use. Both the Singing River and Deer Island sites continued to be occupied during this phase. Urn burial and associated European artifacts are found on Bear Point sites in the Mobile Bay region, but have rarely been found on the Mississippi coast. Little is known about this phase in the region.

La Pointe Phase, AD 1699–1775

This interval roughly conforms to the era of European colonization. The phase is marked by the appearance of the Gulf Historic Fineware tradition, locally expressed as Natchezan-Choctawan series pottery (cd=2, excluding Euro-American wares). That significant technological change occurred is indicated by the association of eighteenth-century European artifacts with Native American artifacts. The La Pointe phase assemblages at the Krebs House–Old Spanish Fort and Homestead sites are thought to be the product of the Pascagoulas. No mounds or ceremonial centers are known; European settlements probably replaced native ceremonial centers as the primary foci of regional social interaction. For the first time since 1200 BC, regional occupation intensity declined, no doubt due to the negative effects of European colonization on the regional native population.

By way of summary, we flag some of the more obvious general trends and patterns that demand future attention. Few of these circumstances are unique to the region in any absolute sense, but parallel cultural developments elsewhere in the Southeast. At such an initial level of resolution, none of these factors can be linked together in causal correlations in any convincing manner at this time.

- There was a net increase in regional occupation intensity, as measured by time-adjusted component frequencies, from 1200 BC to AD 1699.

- Analysis of faunal and botanical samples, limited to Middle Woodland and Mississippi period contexts, revealed few detectable differences in the wild foods of importance, seasons of site occupation, or procurement strategies. In both earlier and later periods, the emphasis was on littoral foods from shallow estuarine waters — small fishes, turtles, shellfish — and the sites were occupied from spring through fall. Plant production evidence was limited to the Mississippi period samples.

- Technological shifts in container and cooking technology occurred through time. Changes in temper and vessel shapes improved the thermal resistance and durability of pots and, by implication, permitted new methods of food preparation (i.e., clay vessels replaced stone vessels, direct-fire cooking replaced pit-oven/clay-ball cooking).

- Nonlocal stone artifacts are only known from pre-AD 200 components. We think this may indicate a regional decline in the use of nonlocal stone through time.

- Ceramic diversity, as measured simply by the number of traditions and series per phase, fluctuated through time. We consider these fluctuations to signal intervals of greater or lesser interregional interaction. As a general temporal trend, interregional ceramic similarities with adjacent coastal regions were stronger than with interior regions. Ceramic complexes in the study area often represent a mix of series, with spatial centers of distribution centered on the Lower Mississippi Valley to the west or the Mobile Bay/northwest Florida regions to the east, a reflection of an intermediate geographical location. Series distributions exhibit clinal variations in-

dicative of a continuous chain-like process of cultural transmission over short distances between groups with quite permeable, rather than distinct, social boundaries. Phases of low ceramic diversity suggest increasing regionalization of local populations and a lesser degree of long-distance interaction. Injection of traits from distant traditions into the long Gulf tradition continuum suggests intervals when interregional connections were maximally extended via social networks, or perhaps the movement of peoples with distant origins into the region.

- Ceremonial centers marked by mounds/earthworks were present in some phases and absent in others. Prior to AD 400, only a single large place was present at any one time, and apparently these centers served to integrate social groups at the regional scale (i.e., Claiborne, Jackson Landing). After AD 400, multiple centers were present per phase, and appear to have served more localized populations (i.e., Graveline, Singing River, Deer Island). As a caveat, we add that several mounds remain uninvestigated and undated.

Coastal Mississippians on the Mississippi Coast

The concept of a Mississippian "stage" of cultural evolution is derived from decades of research at interior riverine sites. Indeed, the consensus view of Mississippian societies is one of chiefdoms supported by floodplain maize agriculture (esp. Smith 1978). Much less is known about those contemporaneous coastal societies that possessed a material culture similar to the riverine Mississippians. Did the coastal societies practice intensive maize agriculture? Or was maize merely a supplement to age-old littoral subsistence practices? Do Mississippian sites on the Gulf of Mexico represent sedentary communities or the seasonal fishing encampments of interior-based agriculturalists? Did coastal Mississippians achieve the same levels of population density and sociopolitical complexity as riverine Mississippian chiefdoms? If not, why not? In what ways were they different? While we cannot offer definitive answers to these questions, current interpretations of coastal Mississippians in the Mississippi Sound region (Lewis 1988, 1991, 1992) are inadequate in light of the new data presented in this volume. We must first review the conflicting models of coastal Mississippian subsistence and society before turning to the archaeological evidence from Pensacola culture sites in general and Mississippi Sound sites in particular.

Although all Mississippian societies were dependent on wild food sources, Bense (1994:186–191) identifies commitment to crop production as the key difference between riverine and coastal Mississippian subsistence practices. In her dichotomy, the riverine Mississippian subsistence pattern was one of intensive field agriculture on floodplain soils annually renewed by flooding. In contrast, farming was less important in coastal regions where suitable soils were limited and dispersed. Coastal Mississippians cultivated small plots that were not annually enriched by flooding. In this form of swidden agriculture, soil nutrients were rapidly exhausted, and frequent shifts to new plots were necessary. Consequently, the pre-Mississippian focus on littoral foods remained primary, supplemented by limited crop production. Although Bense's definition of a coastal Mississippian subsistence pattern is drawn from early historic period accounts of Oriste-Guale practices on the Georgia Atlantic Coast (see Larson 1980), similar documentary evidence exists for the northern Gulf Coast (Leonard 1939). Because maize intensification is so often identified as a primary factor in the formation and maintenance of Mississippian chiefdoms, the greater and lesser maize production of riverine and coastal subsistence patterns carries with it the expectation of differing degrees of sedentism, population nucleation, and sociopolitical complexity.

Two models of Pensacola culture subsistence practices have been offered. Curren's (1976) model was developed to interpret Pensacola sites in the

Mobile Bay-Delta region. Mississippian populations in this area of the Gulf Coast, according to Curren, scheduled their movements between permanent agricultural villages in the delta and dispersed, seasonally utilized extractive camps that included coastal shell middens. Because the intensive maize production of delta villagers was dependent on annual floodplain replenishment, the cycle of population aggregation and dispersal was coordinated with the flood periods of the Mobile River delta. Curren maintains that while some people remained in the villages year-round, much of the population spent a considerable portion of the year in small-group encampments.

Curren's subsistence-settlement model was rejected by Knight (1984) as inappropriate, in part because it was based on the early historic practices of interior Choctaw groups. Instead, Knight proposed an alternative model derived from early eighteenth-century accounts of the Mobile-Tomeh peoples inhabiting the Mobile-Tensaw River delta above Mobile Bay. The French described a population living in dispersed family farmsteads and practicing intensive field agriculture on floodplain soils. Farmsteads articulated with several permanent villages that served as civic-ceremonial centers where chiefs resided. The Knight and Curren models differ substantially only in the lesser degree of residential mobility implied by Knight's addition of farmsteads to the subsistence-settlement system. There is little that is explicitly "coastal" about these two models of Pensacola subsistence. Both models depict an agricultural system equivalent to Bense's riverine Mississippian subsistence pattern, only in this case it was practiced in close proximity to the coastal strand. In both models, coastal strand sites are interpreted as seasonal extractive camps, not permanent communities.

The subsistence-settlement models of Curren and Knight were both tailored specifically for the Mobile Bay-Delta region. As Knight (1984:214) was quick to point out, the Gulf Coast is not a uniform environment. A large river delta in close proximity to the coastal strand, such as the Mobile Bay-Delta system, is more the exception than the rule. For many of the smaller bay systems, such as Pensacola Bay or Biloxi Bay, large tracts of arable floodplain soils are absent. Under such circumstances, subsistence practices akin to Bense's coastal Mississippian pattern would have been a viable option: shifting, small-plot agriculture integrated into a subsistence economy focused on littoral foods. If Pensacola populations on the small bays and large river deltas of the coast were engaged in different levels of maize production, one might expect the two different environments to exhibit differing degrees of population nucleation and sociopolitical complexity. Knight (1984:214–215; also Bense 1994:236) suggests that such a distinction is manifest in the different settlement hierarchies that characterize Pensacola sites in large river deltas and small bay systems.

One or more Pensacola single-mound centers are known to exist on most, if not all, bay systems along the Alabama-northwest Florida coast (Knight 1984:215; Bense 1994:234); such is the case for coastal Mississippi as well. Each single-mound center was probably the civic-ceremonial site of a small polity or simple chiefdom. The exception to this pattern was Bottle Creek (1Ba2), a 20 ha civic-ceremonial center with 18 mounds, one of which is 14 m high. Located 18 miles (35 km) above Mobile Bay in the Mobile-Tensaw River delta, Bottle Creek is interpreted as the seat of a complex chiefdom far more populous and powerful than the single-mound coastal strand sites (Fuller and Brown 1993). Recent investigations confirm that the site was occupied primarily during the Bottle Creek I–II phases (AD 1250–1550). Thus it was contemporary with the Singing River and Deer Island single-mound centers in coastal Mississippi.

Presently, it is unclear whether the small quantities of maize thus far recovered from Pensacola sites reflect the limited extent of archaeological investigations or the abundance of corn as a prehistoric food item. However, we do know that corn was grown in both delta and bay environments. Maize has been recovered at the Bottle Creek cen-

ter (Gremillion 1993), at the Singing River center (Scarry, this volume), and at non-mound shell middens on Mobile Bay (Knight 1984:207) and Choctawhatchee Bay (Bense 1994:234). These samples do not as yet permit a measure of the relative intensity of production or overall importance of maize in the diet (but see Appendix D).

Barry Lewis (1988, 1991, 1992) has presented an interpretation of Mississippian subsistence and settlement in the Mississippi Sound region based on ethnographic analogy and site distribution data. He proposes that post-Poverty Point period sites on the coast, including Mississippian sites, represent seasonal use by interior-based task groups engaged in extracting littoral foods. In support of his seasonal settlement model, Lewis cites the unsuitability of coastal soils for maize agriculture, the low opinion of the region's agricultural potential held by the initial French settlers, and the fact that early eighteenth-century Pascagoula and Biloxi settlements were situated above tidewater on the Pascagoula River, where village inhabitants practiced floodplain maize agriculture. Lewis makes several specific proposals about Mississippian utilization of the coast: late spring was the most likely time that interior-based task groups occupied coastal sites for fishing and collecting; there is no evidence of salt processing; no confirmed mound centers or evidence of a settlement hierarchy exist; and regional Mississippian populations did not appear to increase significantly over Late Woodland populations.

But the new evidence, unavailable to Lewis, casts doubt on all of these propositions. Two Mississippian ceremonial centers and numerous smaller sites form a simple two-tiered settlement hierarchy in the study area. We think the Singing River and Deer Island sites are single-mound ceremonial centers similar to those found elsewhere in the Mississippian Southeast. However, the exact nature of the mounds — accretional midden deposits or intentional earthworks — will remain uncertain until adequate excavations are conducted. Whatever the case, we consider the characterization of these two large sites as ceremonial centers to be appropriate, in the sense that the presence of human burials, a supralocal symbol (the human effigy pipe), and evidence of salt and pottery production indicates something more than mere task group fishing activities. Of course, it is possible that Singing River and Deer Island may represent ceremonial places used only for periodic or seasonal population aggregations by interior-based populations. On the other hand, ecofacts from the Singing River center indicate that site occupation was not restricted to late spring, but extended at least throughout the warm months, from spring into fall. Winter site occupation has not been confirmed, but neither can it be ruled out. Although it could be argued that the small amount of corn recovered at Singing River was transported to the site during temporary visits, we doubt it. The presence of cob cupule fragments together with kernels suggest to us that the corn was grown nearby, for it is unlikely that maize would be transported any great distance in cob form.

At present, what little we know about Mississippian subsistence and settlement in the Mississippi Sound region is consistent with the emerging information elsewhere on the northern Gulf Coast: single-mound centers on bay systems supported by maize production integrated into a littoral-oriented food economy. The advent of maize production, even at the small scale we assume, was certainly not a simple additive process, but must have required changes in labor organization and scheduling. Still unresolved is the relationship between interior riverine sites and coastal strand sites. As Lewis (1988:118) has stressed, the palisaded villages and agricultural fields observed by the French on the Pascagoula River in 1699–1700 must be factored into the subsistence-settlement equation. These settlements and fields were determined by the French to be as close as 4.5 to 6.5 leagues (10.8 to 15.7 miles, or approximately 25 km) from the sea (and the Singing River site) (McWilliams 1981:139). What we are dealing with here is a situation in which interior riverine and coastal strand environments are in close geographical proximity, easily linked into a continuous subsistence-settlement sphere via rapid canoe transport.

The ease with which inhabitants could bridge these environmental zones suggests an even greater degree of subsistence-settlement flexibility than now admitted in the interior riverine–coastal dichotomy. Indications of such flexibility are scattered in the early historic documents. For example, in the late seventeenth-century, the Spanish commented about coastal agriculture on the shores of Mobile Bay:

> ...judging by the tumbledown bohios, or fisherman's huts, on the banks, it is doubtless much frequented by the Indians in the summer time, which is the season when they come down to their fisheries on the seacoast after preparing their inland cornfields (Leonard 1939:172).

Also present on the bay were "little patches of corn, beans, squash, tomatoes and chilli" (Leonard 1939:80; also see Arnold and Weddle 1978:173–175). It is possible that coastal inhabitants had the option of a multiple-planting system: dispersed small garden plots and large fields that were planted in different zones and harvested at different times. There is both archaeological and ethnohistorical evidence of multiple-planting systems in interior Mississippi and Alabama (e.g. Blitz 1993:124–125). We also call attention to evidence of winter use of the coast: Iberville encountered a group of more than 50 men, women, and children on Deer Island in February, 1699 (McWilliams 1981:44). Until Mississippian sites above the tidewater limit on the lower reaches of the Pascagoula and Pearl Rivers are investigated and comparative artifact and ecofact samples are secured, little more of substance can be said about interior–coast relationships in the Mississippi Sound region.

In emphasizing the potential flexibility of coastal subsistence practices, we would not go so far as the view expressed by Mikell:

> Whether or not coastal Fort Walton and Pensacola groups practiced plant food production to any great extent through small-scale gardening or cleared field agriculture (the former seems more likely) is really a moot point considering the subsistence value of estuarine shellfish collection, fishing, and hunting within the rich coastal environments (1992:54).

We reject this conclusion in light of the evidence that the formation of simple and complex Pensacola chiefdoms on the coast, as identified by the correlation of single-mound and multiple-mound sites with environmental zones of differing agricultural potential, was at least in part tied to the ability to maintain a minimum level of maize production.

Having said this, we do not endorse an interpretation that would focus on environmental conditions to the exclusion of sociopolitical factors, nor would we label the coast as marginal or unimportant in the Mississippian world, a place merely utilized but not occupied (e.g. Lewis 1991, 1992). Small-scale chiefdoms and two-tiered settlement hierarchies were the norm in the interior Southeast just as they were on the coast. Furthermore, the complex site of Bottle Creek exists at the intersection of the interior riverine and coastal zones (a delta), and this positioning suggests that factors other than just the prerequisite maize production requirements were important in this chiefdom's rise to regional influence. Mississippian groups in such ecotones enjoyed an advantage not held by their contemporaries immediately upriver or on the coast: they were in a middleman position favorable to the manipulation or domination of any coast–interior exchange network.

We agree with Lewis's (1991, 1992) assessment that (1) there is little evidence of coastwise Mississippian traffic in raw materials; (2) this was because one coastal strand locale merely duplicated the same resources found in another; and (3) that the dispersed nature of coastal resources provided no natural "bottlenecks" or "pressure points" that could be controlled to fuel the rise of elites. But just such a "bottleneck" at Bottle Creek is a plausible scenario, for it was a place that could support population nucleation and permit elites to expe-

dite the flow of both coastal resources (e.g. shell for ornaments, preserved foods) and valuables from the interior population centers (e.g. salt, prestige goods, or supralocal symbolic items). Recently, archaeological evidence of shell ornament production and salt production has been found at the Bottle Creek site (Brown and Fuller 1993). Although it is debatable, in light of the discussion above, whether Bottle Creek should even be characterized as a "coastal" site, the more important point is that inhabitants of this polity were positioned to exploit the benefits that both environmental zones had to offer.

We know that the Mississipian Southeast was a geopolitical landscape in which polities large and small competed for access to prestige goods and other valuables. Long-term success in this arena was one key factor in propelling a polity to the top of regional political dominance. Assuming that Mississipian communities sought the most efficient routes to the largest population centers, those rivers that drained the most extensive territories had greater strategic advantages in expanding exchange networks than did those watercourses with smaller drainage basins. This may be another reason why Bottle Creek is located where it is — near the mouth of the largest river system between the Mississippi and the Apalachicola — while near the mouths of the lesser river systems only smaller Mississippian centers have been found. Perhaps Bottle Creek functioned as a "gateway community": a place uniquely situated to control the greatest volume of traffic within or across regions (Hirth 1978). Specifically, the Bottle Creek center and polity had the potential to control the major water route between coast and interior for a vast segment of the northern Gulf Coast.

While we need to learn more about coastal Mississippians before such concepts as gateway community can be evaluated, it is clear that the locations, sizes, and histories of centers are not to be explained by environmental factors alone. We will have to examine more closely the link between the subsistence economy and the political economy. Understanding the links between coastal and interior Mississippians will require a perspective that might be labeled "Mississippian geopolitics."

Appendix A: Ceramic Classification and Illustrations

The ceramic classification we used in this study is composed of three categories of measurement at the scale of the individual artifact: (1) temper-ware groups, (2) decorated type-varieties, and (3) modes. Each of these categories is discussed below. Our choice of classification methods was inspired more by pragmatism than formal taxonomic theory. We selected methods that would accomplish a primary goal of this study: the establishment of a regional cultural sequence based on a relative ceramic chronology. In the laboratory, a screen with 1/2 inch mesh was used to separate small, difficult to analyze "sherdlets" from the rest of the pottery. Sherdlets were weighed but analyzed no further.

Type-variety classification systems are well suited for constructing relative ceramic chronologies. The type-variety system uses three variables to classify pottery: temper, surface finish, and decorative technique. We chose this methodology because (1) our pottery samples are composed of small sherds; the method permits every sherd to be incorporated into the analysis; (2) the ceramics are described in a standardized manner that facilitates comparison; (3) the type-varieties are chronologically and spatially specific; and (4) these characteristics permit the development of time-space frameworks that reveal interconnections between sites and regions. We employed an extension of the typologies developed for the Lower Mississippi Valley (Phillips 1970), the Black Warrior–Tombigbee River regions (Jenkins 1981; Steponaitis 1983), and the Mobile Bay region (Fuller and Stowe 1982). The reader should refer to these sources for an in-depth discussion of the methodology. We chose to emphasize decorated pottery in our type-variety analysis; plain pottery was assigned to temper-ware groupings.

I. Temper-Ware Groups

We created eight temper-ware groups; these classes are based on combinations of temper (material, particle size), surface finish (burnished, unburnished), or characteristics of the ceramic fabric (texture, hardness) that produce a distinctive pottery ware. These eight temper-ware groups, defined below, encompass previously named types and varieties sometimes used by Southeastern archaeologists to classify ware attributes (type names enclosed in brackets below). All forms of tempering aplastics are naturally available throughout the region, thus choice of temper was governed by cultural preferences, not natural distribution. Temper-ware groups are quantified by tabulation in the Appendix B artifact tables and by seriation in Chapter 7.

Fiber temper: fibrous vegetable matter added to paste [Wheeler Plain].

Fine sand temper: sand grains no greater than 1 mm in size added to paste [Baldwin Plain].

Grit-sand temper: coarse sand grains or crushed rock more than 1 mm in size added to paste, gritty texture [O'Neal Plain; Bayou La Batre Plain].

Grog temper: crushed potsherds added to paste [Baytown Plain].

Gulf Historic Fineware: The ware is very hard, compact, well fired, fine textured; surfaces are smoothed, often burnished. A variety of finely pulverized tempering agents are in the paste, alone or in any combination: sand, grog, shell, micaceous material, carbon flecks [Addis Plain *var. St. Catherine*, Chickachae Plain or Lafitte

Plain *var. Three Rivers*; Bell Plain *var. Graveline*]. Despite the variation in temper, the ware is distinctive and easy to separate from other temper-ware groups.

Shell temper: crushed shell added to paste; the unburnished utility ware is tempered with coarse, angular shell [Mississippi Plain] and the burnished fineware is tempered with fine shell particles [Bell Plain].

Mixed shell-grog temper: This group includes all pottery that contains both shell and grog temper in the paste, but does not conform to the characteristics of Gulf Historic fineware. This temper-ware group is characteristic of the Pinola phase. We elected not to define a series or type-varieties for this group due to the small sample size.

Tchefuncte Ware: a soft-textured ware, often "chalky" to the touch; in cross-section the paste has a laminated or contorted composition; it is poorly fired. Clay/silt lumps may have been added intentionally to the paste or may be merely the result of poor preparation; often no temper is apparent (i.e., "temperless") [Tchefuncte Plain, St. Johns Plain].

II. Decorated Type-Varieties

Within each temper-ware group, types were defined on the basis of decorative techniques. Types were further subdivided into varieties based on minor variations in temper, decorative treatment, or design motif. Varieties are identified by an italicized name. Sherds that were too small, too eroded, or otherwise could not be assigned to an established type were placed in a residual descriptive category ("unclassified"). Similarly, not all sherds sorted into types received an additional variety designator because (1) it did not fit an established variety; (2) it was too small or eroded for further description; (3) no defined varieties exist for some pottery types; or (4) we did not consider it useful or appropriate to create a new variety. In the Appendix B artifact tables, we have exercised the option of placing a descriptive term enclosed in parentheses after the type name in lieu of a variety name, or instead of the conventionally used but uninformative "*variety Unspecified*" or the redundant "*variety Indeterminate.*" The descriptive term identifies sherds with recurrent shared attributes that may be promoted to useful varieties at a more advanced stage of research. We use the term "cognate type-variety" for identical decorative treatments executed on different temper-ware groups; these cognate type-varieties are presumed to share identical historical sources or origins. Type-varieties are quantified by tabulation in Appendix B and by seriation in Chapter 7. Also included below are type-varieties identified in surface collections from sites in the study area tabulated elsewhere (Blitz and Mann 1993).

Key to Abbreviations

Tradition

FG=Formative Gulf	N=Northern
G=Gulf	MM=Middle Mississippi
SA=South Appalachian	GH=Gulf Historic

Series

WH=Wheeler	W=Weeden Island
A=Alexander	CC=Coles Creek
B=Bayou La Batre	ML=Miller
T=Tchefuncte	MD=Moundville
SR=Santa Rosa	P=Pensacola
D=Deptford	CH=Choctawan
M=Marksville	

Fiber Tempered Type-Varieties

Wheeler Punctated: punctation; FG, WH; phase: Claiborne, Apple Street; relationships: Stallings Island Punctated; reference: Sears and Griffin 1950.

Fine Sand Tempered Type-Varieties

Alligator Bayou Stamped: rocker stamping zoned by broad U-shaped lines; G, SR; phase: Green-

wood Island, Godsey; reference: Willey 1949. Comment: This is a catch-all type badly in need of subdivision by the type-variety system. It includes plain, dentate, and crenelated-scallop decoration; these treatments are sand tempered cognates of varieties of Marksville Stamped.

Basin Bayou Incised: broad, round-bottom incisions, lines>1.5mm, complex designs; G, SR; phase: Greenwood Island, Godsey; relationships: Marksville Incised *var. Yokena* is a cognate; reference: Willey 1949.

Carrabelle Incised: close-spaced, parallel fine lines; lines<1.5mm wide; rectilinear decoration, no punctations; G, W; phase: Graveline, Tates Hammock(?); reference: Willey 1949.

Carrabelle Punctated: rows of punctation in field on upper vessel; field zoned by incision; G, W; phase: Graveline; reference: Willey 1949.

Englewood Incised: rectilinear bands of punctations alternate with plain bands; G, W; reference: Willey 1949. Comment: One example from surface collection (22-Ja-558).

Furrs Cord Marked: stamped with a cord-wrapped implement; N, ML; phase: Tates Hammock; reference: Jenkins 1981.

Greenwood Stamped: crenelated-scallop tool impressions (*not* rocker stamped), zoned by broad U-shaped incisions; phase: Greenwood Island. Comment: This type is a sand-tempered cognate of Mabin Stamped *var. Crooks. Var. Crooks* is an important diagnostic of the early Marksville period in Louisiana (Toth 1988). That a sand-tempered cognate of *var. Crooks* is present on the northern Gulf Coast has been recognized for some time (Toth 1988: 227; Fuller 1991); here we formalize it as a type-variety. The concept of zoned, stamped decoration (Marksville Stamped, Alligator Bayou Stamped) probably developed out of the antecedent Alexander type, Smithsonia Zoned Stamped (Alexander Incised *var. Smithsonia*), which was then combined with stamping similar to Bayou La Batre Scallop Impressed.

***Greenwood*:** as above. Vessel shapes and decorative motifs have not been determined but appear comparable to Mabin Stamped *var. Crooks*. As with *var. Crooks*, the spatial distribution is coastal; *var. Greenwood* is coincident with the Santa Rosa series, from the eastern Mississippi Sound region to northwestern Florida. Reference: this report.

Indian Pass Incised: multiple, close-spaced, parallel fine lines; curvilinear decoration; G, W; phase: Graveline; relationships: Marksville Incised *var. Leist* is a cognate type; reference: Willey 1949.

Mound Field Net Marked: impressions of open-mesh netting; phase: uncertain; reference: Willey 1949. Comment: Two examples from 22-Ja-555.

St. Andrews Complicated Stamped (early variety): rectilinear complicated stamping; SA; reference: Willey 1949. Comments: In the study area, only one example has been found, in surface contexts at site 22-Ja-504. Presumably, the sherd represents an imported vessel or a local copy of this eastern style.

Swift Creek Complicated Stamped (early variety): curvilinear complicated stamping; SA; reference: Willey 1949. Comment: In the study area, only one example has been found, in surface contexts at site 22-Ja-504. Elsewhere in the Pascagoula River basin, this type has been found as a minority type at the McRae Mound in association with a Hopewellian copper-covered panpipe (Blitz 1986). Presumably, these sherds represent rare imported vessels or infrequent local copies of eastern styles.

Twin Lakes Punctated: punctations with a plain-edged implement form herringbone decorations on the rim; G; phase: Greenwood Island; reference: Phillips 1970. Comment: As defined, this type is essentially a rim mode and might be more

useful as such. This mode has the characteristics of a horizon style; it is a good early Middle Woodland period (100 B.C.–A.D. 200) marker in interior Mississippi (Toth 1988), the Mobile Bay region (Fuller 1991), and the Mississippi Sound region.

Wakulla Check Stamped: paddle-stamped checks, uniform lands<1mm; SA, W; phase: Tates Hammock; relationships: Pontchartrain Check Stamped; reference: Willey 1949.

Weeden Island Incised: fine line, plain design with background hatched/punctated; accents or excisions at line terminals are common; G,W; phase: Graveline, Tates Hammock; relationships: French Fork Incised; reference: Willey 1949.

Weeden Island Punctated: small punctations form close-spaced lines, may zone fields of small punctations; G,W; phase: Tates Hammock; reference: Willey 1949.

Grit-Sand Tempered Type-Varieties

Alexander Incised: rectilinear incision; G,W.

***var. Bodka Creek*:** chevron-filled rectangles bordered by line-filled triangles; phase: Apple Street; reference: Jenkins 1981.

***var. Clay*:** panels of tool punctations with panels of zone incisions; phase: Apple Street; reference: O'Hear 1992.

***var. Chappepeela*:** punctations zoned by fine lines; designs include the "key" motif; phase: Apple Street; relationships: Orleans Punctated. Comments: *Chappepeela* was defined as a variety of Mandeville Punctated (Shenkel 1993). Following the rules of "sortability and continuity" (Phillips 1970:26–27), we reject Mandeville Punctated as a useful typological unit. We subsume the zoned variety of Mandeville Punctated into this variety of Alexander Incised.

***var. Crump*:** incised lines with lands interrupted by punctations; phase: Apple Street; reference: O'Hear 1990, 1992.

***var. Negro Slough*:** sloppy, narrow, cross-hatched lines; phase: Apple Street; reference: Jenkins 1981.

***var. Pleasant Valley*:** parallel lines below rim; phase: Apple Street; reference: Jenkins 1981.

***var. Ponchitolowa*:** fine, pointed, drag-and-jab incision; phases: Apple Street, Greenwood Island; relationships: Lake Borgne *Lake Borgne.* Comments: Pontichitolowa has been defined as a variety of Mandeville Incised (Shenkel 1993). Following the rules of "sortability and continuity" (Phillips 1970:26–27), we reject Mandeville Incised as a valid typological unit, and subsume Mandeville Incised into Alexander Incised.

***var. Prairie Farms*:** complex design with "key" motif; phase: Apple Street; reference: Jenkins 1981.

***var. Smithsonia*:** dentate stamping zoned by fine lines; designs include "key" motif; phase: Apple Street; Comment: O'Hear (1992) has reduced Smithsonia Zoned Stamped to this variety.

Alexander Pinched: clay squeezed between two fingers; G, A.

Comments: Archaeologists in southern Louisiana routinely classify pinched or punctated decoration on sandy ware as varieties of Mandeville Punctated. Following the rules of "sortability and continuity" (Phillips 1970:26–27), we reject Mandeville Punctated as a useful typological unit. We subsume all unzoned varieties of Mandeville Punctated into varieties of Alexander Pinched or Alexander Punctated.

***var. Catalpa*:** finger-thumb marks of alternate pinches intersect in "V" shape; phase: Apple Street; reference: O'Hear 1992.

*var. **Pineapple***: closely spaced pinching with corrugated effect; phase: Apple Street; reference: O'Hear 1992.

Alexander Punctated: punctation; G,A.

*var. **Columbus***: rows of tool punctations; phase: Apple Street; reference: O'Hear 1992.

*var. **Tibbee***: fingernail punctated; phase: Apple Street; reference: O'Hear 1992.

Bayou La Batre Scallop Impressed: rows of crenelated, scallop-shell impressions; G, B; phases: Apple Street, Greenwood Island; reference: Wimberly 1960.

Bayou La Batre Stamped: overall dentate stamping with scallop shell; G, B; phases: Apple Street, Greenwood Island; reference: Wimberly 1960.

Chinchuba Brushed: brushed/combed with a fine-toothed implement; G, A.

*var. **Chinchuba***: as above; phase: Apple Street; reference: Phillips 1970. Comment: This type has a uniquely coastal derivation and distribution. This type was previously classified as part of the Mandeville series (Shenkel 1984b). We reject the Mandeville series as a useful classification device and subsume its members into the Alexander series to reflect the probable culture-historical relationships.

Deptford Bold Check Stamped: paddle stamped with checks; lands>2mm; SA, D; phase: Greenwood Island; reference: Wimberly 1960.

Deptford Linear Check Stamped: paddle stamped with checks, elongated rectangles; SA, D; phase: Greenwood Island; reference: Willey 1949.

Deptford Simple Stamped: paddle-applied grooves>2mm; SA, D; phase: Greenwood Island; reference: Willey 1949.

Mandeville Stamped: stamping in rows with a deticulated implement; G, A.

*var. **Mandeville***: square-end impressions; phases: Apple Street, Greenwood Island; reference: Phillips 1970. Comment: the comments on Chinchuba Brushed also apply to this type (see above).

Santa Rosa Stamped: plain rocker stamping, zigzag pattern; G, B; phases: Apple Street, Greenwood Island; relationships: Tchefuncte Stamped; reference: Willey 1949.

Santa Rosa Punctated: punctations zoned by broad line incisions; G, B/SR; phases: Apple Street(?), Greenwood Island; reference: Willey 1949. Comment: uncommon.

Grog Tempered Type-Varieties

Alligator Incised: crude incised lines, not overhanging; G, CC.

*var. **Oxford***: wet, sloppy incisions, no pattern; phase: Tates Hammock, Pinola (?); reference: Phillips 1970; Jenkins 1981.

Beldeau Incised: band of crosshatching, upper vessel; G, CC.

*var. **Beldeau***: punctation at center of each diamond; phase: Tates Hammock; relationships: Keith Incised; reference: Phillips 1970.

Carter Engraved: fine lines incised on dry paste/engraved; G, CC.

*var. **Shell Bluff***: very fine engraving/excision on fine-textured ware; phase: Pinola; reference: Williams and Brain 1983.

Catahoula Zoned Red: red pigment zoned by incision; G, M; phase: Greenwood Island: reference: Phillips 1970. Comment: one example from disturbed context (22Ja516).

Churupa Punctated: punctation zoned by broad, U-shaped insision; G, M; relationship: Santa Rosa Punctated.

*var. **Churupa***: deep hemiconical punctations; phase: Godsey; reference: Phillips 1970.

*var. **Thornton***: shallow round punctations; phase: Godsey, Graveline; reference: Phillips 1970.

Coles Creek Incised: rectilinear incision parallel to rim; G, CC.

*var. **Hardy***: crude incisions, not overhanging; phase: Tates Hammock, Pinola; reference: Phillips 1970.

*var. **Mott***: closely spaced, overhanging inisions; phase: Pinola; reference: Phillips 1970.

Evansville Punctated: unzoned punctations; G, CC.

*var. **Evansville/Rhinehart***: as above; phase: Tates Hammock; relationships: Weeden Island Punctated; reference: Phillips 1970; comment: We have not found the established varieties of this type useful.

French Fork Incised: complex fine-line zoned designs, textured backgrounds, excision, punctation at line terminals; G, M, CC; phase: Graveline, Tates Hammock; relationships: Weeden Island Incised; reference: Phillips 1970.

Indian Bay Stamped: rows of rocker stamping; G, M.

*var. **Spencer Bayou***: stamping with a crenelated shell edge; phase: Greenwood Island, Godsey; reference: Phillips 1970. Comment: We have included treatments that are impressed but not rocked. Probable progenitor: Bayou La Batre Stamped.

Landon Red on Buff: red pigment on buff background; decoration on bowl interiors and rim bands; G, M; phase: Graveline; reference: Phillips 1970. Comment: black pigment may also be present.

Larto Red: We classified the attribute of red-filming on plain pottery as a mode; phase: Godsey, Graveline, Tates Hammock; reference: Phillips 1970.

Mabin Stamped: stamping, not rocked, zoned by broad U-shaped incision; G, M.

*var. **Crooks***: crenelated-scallop implement; phase: Greenwood Island; relationship: Greenwood Stamped *var. Greenwood* is a cognate type; reference: Toth 1988.

*var. **Mabin***: cord-wrapped stick impressions; phase: Greenwood Island; reference: Toth 1988.

*var. **Point Lake***: notched implement; phase: Greenwood Island; reference: Toth 1988.

Marksville Incised: incision; G, M.

*var. **Goose Lake***: broad U-shaped, dry-paste incisions, line-filled triangles; phase: Graveline; reference: Phillips 1970.

*var. **Leist***: wet-paste; sharp point, closely spaced incisions; phase: Graveline; relationship: Indian Pass Incised; reference: Phillips 1970.

*var. **Marksville***: broad U-shaped, dry-paste incisions; line width equals space between lines; phase: Greenwood Island; reference: Phillips 1970.

*var. **Spanish Fort***: broad wet-paste incisions, concentric meander patterns; phase: Graveline; reference: Phillips 1970.

*var. **Steele Bayou***: broad U-shape, dry-paste incisions, lobate designs; excision at line terminals is common; phase: Graveline; reference: Phillips 1970.

*var. **Yokena***: broad U-shape, dry-paste incisions; phase: Godsey, Graveline; relationship: Basin Bayou Incised; reference: Phillips 1970.

Marksville Stamped: rocker stamping zoned by broad U-shaped incisions; G, M; relationships: Alligator Bayou Stamped.

*var. **Godsey***: zoned rocker stamping with a crenelated-scallop edge tool; phase: Godsey, Graveline; reference: Blitz et al. 1993.

*var. **Manny***: zoned, crude dentate stamping; stamping is the design; phase: Graveline; reference: Phillips 1970.

*var. **Marksville***: fine, dentate stamping is background for design; phase: Greenwood Island; reference: Phillips 1970.

*var. **Newsome***: zoned, fine dentate stamping; stamping is the design; phase: uncertain; reference: Phillips 1970.

*var. **Troyville***: zoned plain rocker stamping; phase: Godsey, Graveline; reference: Phillips 1970.

Mazique Incised: band of incisions around upper vessel, line-filled triangles; G, CC; relationships: Alligator Incised.

*var. **Mazique***: overhanging lines; phase: Tates Hammock, Pinola; reference: Phillips 1970.

*var. **Manchac***: wet paste incisions; phase: Tates Hammock, Pinola; reference: Phillips 1970.

Medora Incised: line-filled bands; G; reference: Phillips 1970. Comment: Two examples from the Pinola phase component at 22-Ja-520.

Mulberry Creek Cord Marked: stamped with a cord-wrapped implement; N, ML; phase: Tates Hammock, Pinola; reference: Phillips 1970.

Pontchartrain Check Stamped: paddle stamped with checks<4mm; SA, CC; relationships: Wakulla Check Stamped.

*var. **Pontchartrain***: square or rectangular impressions; phase: Tates Hammock; reference: Phillips 1970.

*var. **Fire Island***: large diamonds found over checks; phase: Tates Hammock; reference: Brown 1984. Comment: One example found in surface collection (22-Ja-504).

Salomon Brushed: crude brushing on coarse paste ware; G, CC; phase: Tates Hammock; reference: Phillips 1970. Comment: uncommon.

Wheeler Check Stamped: paddle stamped with checks>4mm; SA, CC; phase: Tates Hammock; reference: Phillips 1970. Comment: uncommon.

Gulf Historic Fineware Type-Varieties

Barataria Incised: parallel, narrow incisions zone curvilinear bands of narrow line cross-hatching; GH, CH; phase: La Pointe.

*var. **Barataria***: as above. Comment: The temper is fine sand; reference: Fuller 1991.

Chickachae Combed: bands of parallel fine lines applied with a toothed implement; GH, CH; phase: La Pointe. Comments: Fine sand is the diagnostic temper (grog and shell are absent); some examples are essentially temperless. The paste may contain carbon flecks and micaceous clay. Blitz (1993c) suggested that varieties be created based on the number of applied lines. Reference: Haag 1953.

Chickachae Incised: fine incised lines, usually applied as bands of parallel lines; GH, CH; phase: La Pointe. Comments: Paste characteristics duplicate those of Chickachae Combed. This provisional type is a sand-tempered cognate of Port Dauphin Incised and Fatherland Incised. It may be equivalent to Doctor Lake Incised (Fuller 1991). If so, some redefinition may be in order.

Fatherland Incised: fine-line incision, usually applied as bands of parallel lines to form curvilinear motifs; GH, CH; phase: La Pointe; reference: Brown 1985. Comment: The type is common on historic Natchez and Choctaw sites in interior Mississippi.

*var. **Fatherland***: two–three line running scrolls.

Kemper Combed: bands of parallel fine lines applied with a toothed implement; GH, CH; phase: La Pointe; Comments: Fine grog is the diagnostic temper; fine shell or sand may also be in the paste but are not diagnostic attributes. Blitz (1993c) suggested that varieties be created based on the number of applied lines. Reference: Blitz 1985.

La Pointe Combed: bands of parallel fine lines applied with a toothed implement; GH, CH; phase: La Pointe. Comments: This provisional type is *exclusively* tempered with fine shell; it is the shell tempered cognate of Kemper Combed and Chickachae Combed. Mann identified 17 examples of shell-tempered combed pottery from the Krebs House midden (Hinks et al. 1993:88). Blitz and Mann (1993:67) observed: "The combed designs on La Pointe Combed are more widely spaced and not as well executed as combed pottery on nineteenth-century Choctaw sites located further north in central Mississippi. We suspect that La Pointe Combed represents the introduction of combing after 1750..." No varieties have been defined. Reference: Blitz and Mann 1993; this report.

Leland Incised: broad lines incised on burnished vessels; reference: Phillips 1970; Brain 1988. Comment: Local examples are tempered with fine grog and shell and conform to characteristics of Gulf Historic Fineware.

Nicked Rim Incised: This former provisional type (Voss and Blitz 1988) is more usefully defined as a rim mode (Mooney 1992; Blitz 1993c, 1995). Limited evidence from eastern Mississippi indicates a pre-1750 temporal placement. However, two examples occur at the Krebs House midden in a post-1750 context (Hinks et al. 1993:84; Waselkov and Silvia 1995:19). Probable progenitor: Barton Incised.

Owens Punctated: zoned punctations.

***var. Muir*:** broad, shallow incisions zone punctations; GH, CH; phase: La Pointe. Comments: This type is tempered with fine angular shell, with or without the addition of fine sand (Waselkov 1991).

Port Dauphin Incised: fine incised lines, curvilinear/rectilinear designs; GH, CH; phase: La Pointe.

***var. Port Dauphin*:** as above. Comments: This pottery type is tempered with fine shell, with or without the addition of fine sand in the paste. In the 1970s, this type was defined as the result of excavations at early French settlements on Mobile Bay (Stowe 1977b). It is a shell tempered cognate of Fatherland Incised. The motifs and temper-ware characteristics clearly place all of these related types (Port Dauphin Incised, Fatherland Incised, Chickachae Incised) into the Gulf Historic tradition (Fuller 1991). As presently defined, however, Port Dauphin Incised may duplicate Cracker Road Incised (see Brain 1988). If so, some redefinition may be in order.

Shell Tempered Type-Varieties

Barton Incised: incised line motifs on the neck of vessels; MM; phase: Pinola; reference: Phillips 1970. Comment: Three small examples at 22-Ja-520; this type is widely distributed.

Carthage Incised: burnished vessels incised with broad U-shaped lines; MM, MD; phase: Singing River; relationships: Pensacola Incised; reference: Steponaitis 1983.

D'Olive Incised: lines incised on the burnished fineware interiors of shallow bowls/plates; MM, P.

***var. Arnica*:** same as *var. D'Olive* except each arch contains two sets of multiple, parallel incisions oblique to the rim; phase: Bear Point; reference: Fuller and Stowe 1982.

***var. D'Olive*:** repeated incised arcs suspended from a single line incised below and parallel

to rim; phase: Pinola, Singing River; reference: Fuller and Stowe 1982.

***var. Dominic*:** multiple lines incised parallel to rim; phase: Singing River; reference: Fuller and Stowe 1982.

***var. Mary Ann*:** same as *var. D'Olive* except each arc filled with multiple lines perpendicular to rim; phase: Singing River.

Grace Brushed: crude brushing on exteriors; reference: Williams and Brain 1983. Comment: uncommon; phase uncertain.

Kimmswick Fabric Impressed: fabric impressions on "salt pan" vessels; MM; phase: Pinola; reference: Phillips 1970.

Mound Place Incised: two or more parallel lines incised horizontally on the exterior below the lip on a burnished fineware; MM; reference: Phillips 1970. Comment: This type is widely distributed in the lower Mississippi Valley north of the Plaquemine culture area and it is commonly found in Moundville and Pensacola culture assemblages. Presumably, the decorative treatment was borrowed from the type Coles Creek Incised.

***var. McMillian*:** six or more straight, close-spaced, parallel fine lines; phase: Singing River; reference: Fuller and Brown 1993. Comment: The lines appear to have been applied with a toothed implement rather than free-hand.

***var. Walton's Camp*:** Two to five lines; festoons may be present; phase: Singing River; reference: Fuller and Brown 1993.

Moundville Engraved: fine lines engraved on burnished fineware; MM, MD; reference: Steponaitis 1983. Comment: A single sherd, recovered at 22-Ja-520, is too small to identify motif.

Moundville Incised: incised arcs placed end to end encircle the upper portion of the vessel; unburnished surfaces predominate; MM, MD. Comment: This type is widely distributed; it is most commonly associated with handled, standard jars.

***var. Bottle Creek*:** two rows of punctations above arcs; phase: Singing River; reference: Fuller and Stowe 1982.

***var. Carrollton*:** arcs unembellished with any secondary design elements; phase: Singing River; reference: Steponaitis 1983.

***var. Moundville*:** a series of incisions radiate above the arcs to create an "eyelash" motif; phase: Pinola; reference: Steponaitis 1983.

***var. Singing River*:** three or more rows of punctations or short, gash-line incisions placed above the arcs; often a single line is incised below the rim, creating a zoned field of punctations/gashes above the arcs; phase: Singing River; reference: Blitz and Mann 1993. Comments: This variety is very common on Singing River phase sites. We would not be surprised if *var. Singing River* is present on Pensacola sites in adjacent regions but we have not encountered it in the literature (e.g., Fuller and Stowe 1982; Brown and Fuller 1993). *Var. Singing River* might conceivably be classified as a variety of Owens Punctated (broadly defined) but the arc motif clearly connects the style to Moundville Incised.

***var. Snows Bend*:** a single row of punctations creates arcs above the incised arc; MM, MD; phase: Pinola, Singing River; reference: Steponaitis 1983. Comments: Although Steponaitis' original variety description did not specify or limit punctation row numbers, we follow Fuller and Stowe's (1982:63–64) rationale and restrict *Snows Bend* to a single row of punctations.

Parkin Punctated: punctations applied to an unburnished surface; MM; phase: Pinola;

Phillips 1970. Comment: This type is widely distributed.

Pensacola Incised: lines incised on burnished fineware exteriors; MM, P; relationships: Carthage Incised; reference: Willey 1949.

*var. **Gasque**:* free-standing naturalistic motifs—skull, hand, bone; phase: Singing River; reference: Fuller and Stowe 1982.

*var. **Jessamine**:* three to five wide-spaced, curvilinear lines; fine hatch filler (incised/engraved) may occur; phase: Singing River; reference: Fuller and Stowe 1982.

*var. **Mathews Landing**:* close-spaced, fine (<1mm lines); multiple rectilinear/curvilinear elements; phase: Bear Point; reference: Fuller and Brown 1993.

*var. **Pensacola**:* two to five lines, 1–2mm wide; curvilinear/rectilinear designs (scrolls, festoons, guilloches); phase: Bear Point; reference: Fuller and Brown 1993.

*var. **Perdido Bay**:* scroll-loops with triangular elements; phase: Bear Point; reference: Fuller and Stowe 1982.

Salt Creek Cane Impressed: cane matting impressions on "salt pans;" MM, P.

*var. **Salt Creek**:* as above; phase: Singing River; reference: Fuller and Stowe 1982.

Winterville Incised: curvilinear ("trailed") wet paste incisions on an unburnished surface; MM.

*var. **Winterville**:* as above; phase: Pinola; reference: Phillips 1970.

Tchefuncte Ware Type-Varieties

Lake Borgne Incised: drag-and-stab incised lines; G, T.

*var. **Lake Borgne**:* rectilinear designs; phase: Apple Street, Greenwood Island; relationships: Alexander Incised *var. Ponchitolowa*; reference: Phillips 1970.

Tammany Punctated: punctation/pinching; G, T.

*var. **Tammany**:* fingernail impressions; phase: Apple Street, Greenwood Island; relationships: Alexander Punctated *var. Tibbee*; reference: Phillips 1970.

*var. **Brittany**:* pinched; phase: Apple Street; relationships: Alexander Pinched; reference: Weinstein and Rivet 1979.

*var. **Dutchtown**:* hollow-point tool punctations; phase: Apple Street; reference: Weinstein and Rivet 1979.

Tchefuncte Bold Check Stamped: paddle stamped with checks; G, T; phase: Greenwood Island; relationships: Deptford Bold Check Stamped; reference: Shenkel 1993. Comment: A rare type that probably represents local copies of Deptford ceramics.

Tchefuncte Incised: incised lines; G, T.

*var. **Tchefuncte**:* as above; phase: Apple Street, Greenwood Island; relationships: Alexander Incised; reference: Phillips 1970.

Tchefuncte Stamped: plain rocker stamping, zigzag pattern.

*var. **Tchefuncte**:* as above; phase: Apple Street; relationships: Santa Rosa Stamped; reference: Phillips 1970.

III. Modes

Modes are attribute clusters that crosscut the type-varieties. In this study, we examined four mode categories: (1) vessel shape, (2) rim/lip treatment (decoration or form), (3) appendage (podal supports, handles, and effigy adornos), and (4) pigmentation (paint, film, or slip). Like type-varieties, modal analysis may reveal chronological and spa-

tial patterns. However, modes (like temper-ware attributes) may be more useful than type-varieties for investigating pottery vessel technology, function, and the social implications of ceramic assemblages. For now, our data base is insufficient to pursue these broader issues in detail, and while we comment elsewhere on the technical and functional aspects of modes, we used modal analysis in the present study primarily for culture-historical purposes. Selected modes are seriated in Chapter 7 and depicted in the Appendix A ceramic illustrations.

Vessel Shape

We have not attempted an extensive reconstruction of vessel shapes for two reasons: small sample size and the highly fragmented nature of much of the pottery. It is also clear that many vessel shapes had very long periods of use. Only for the Singing River phase do we have a rather complete picture of the total range of shapes in use. In the sections discussing the ceramic complex of each phase in the preceding chapters, we have listed the known vessel shapes, using conventional terminology (i.e. Shepard 1971).

Key Modes:

rim bosses

wedge-shaped podal supports

conical podal supports

rim-top impressions/notches

cambered crosshatched rim ("Marksville rim")

herringbone punctations on rim ("Twin Lakes Punctated")

rounded, thickened "Weeden Island rim"

rim strap/fold

effigy rim adornos

handles (loop, strap, lug)

lip nicks/notches

pinched "pie-crust" rim

pigmentation

IV. Additional Archaeological Units

In addition to the categories of measurement at the scale of the individual artifact, defined above, a few other concepts were used to organize the ceramic artifacts into more inclusive culture-historical units: series, complex, component, phase, tradition, and regional sequence. These concepts are well established in Americanist archaeology, but it is appropriate to provide brief definitions. By ceramic series we mean a consistent set of attributes or decorative treatments, usually formalized as historical types, which occur on the same ware and have recognizable time-space distributions (Willey 1949; Sears and Griffin 1950; Rouse 1972); a subseries is a temporal-spatial subdivision within a single series continuum. Put another way, a ceramic series is composed of "varying percentages of different varieties of the same types" (Jenkins 1981:2). In practice, archaeologists often equate a ceramic series with an archaeological culture or variant. In actuality, more than one series may be present in an assemblage from an archaeological context. A ceramic complex (Phillips 1970:30) is the sum total of types, varieties, modes, (and series) present during a time interval, or phase, in a regional sequence. A component is the manifestation of a phase at a specific site; a chronological series of such phases constitutes a regional sequence (Willey and Phillips 1958:21–25). Ceramic traditions are long-term manifestations of distinct pottery decorations and shapes; such traditions are composed of multiple ceramic complexes, and are distributed across an extensive geographical area. The ceramic traditions we identify are those defined by Caldwell (1958).

We emphasize that the concepts used for ceramic classification are only heuristic or analytical devices for partitioning clusters of ceramic attributes in time and space. Both style and function

are expressed in these concepts. For our present purposes we need not attempt to untie the style-function Gordian knot, for both are governed by processes of cultural transmission: innovation, diffusion, and migration. Beyond such broad generalities, however, it is rarely possible to isolate the specific, multiple, social causes of stylistic (ceramic) diversity or change, even with ethnographic data (see Conkey and Hastorf 1990). In the Mississippi Sound region, ceramic types and series exhibit time-space distributions that overlap. Furthermore, when viewed from a geographical perspective that includes adjacent regions, these ceramic distributions manifest clinal variation at a scale that must have crosscut social group boundaries. It follows, then, that these ceramic concepts identify cultural phenomena that need not correspond to social, political, or linguistic boundaries.

V. Ceramic Illustrations

In the illustrations that follow, we have selected representative examples that help reveal vessel shape as well as decorative treatment. Additional illustrations and photographs of Mississippi Sound ceramic artifacts are in Blitz and Mann 1993. The reader is referred to the references in section II above as a source for other illustrations of type-varieties.

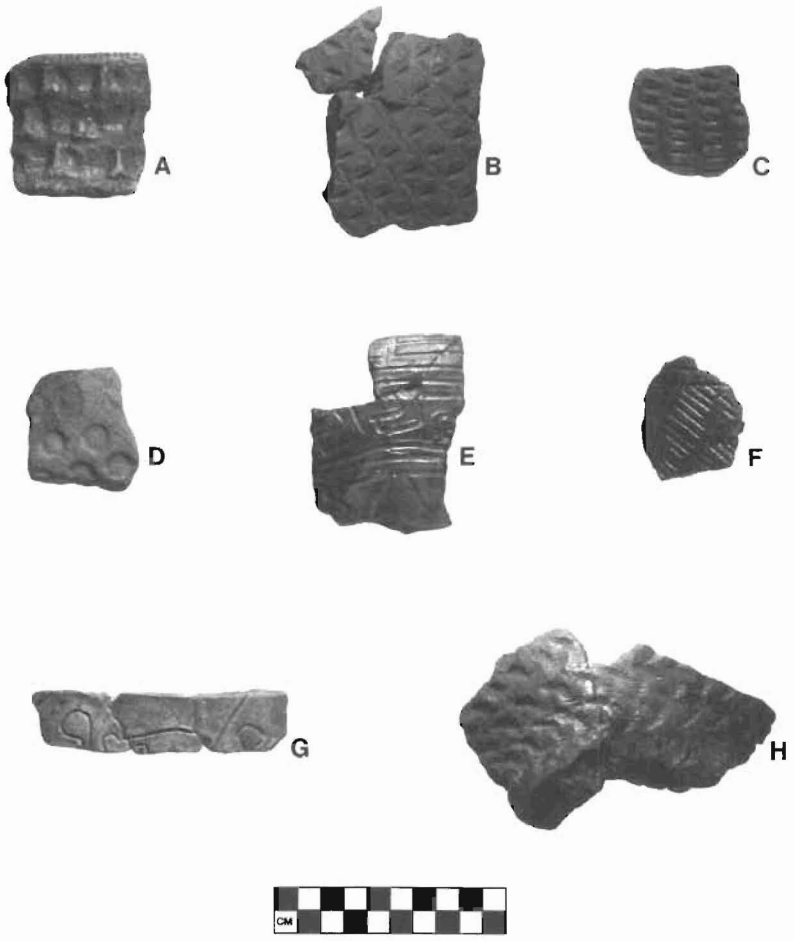


Figure A.1. Apple Street Phase and Greenwood Island Phase ceramics: a, Alexander Pinched var. Pineapple*; b-c, Alexander Punctated* var. Tibbee*; d, Alexander Punctated* var. Columbus*; e, Alexander Incised* var. unspecified*; f, Alexander Incised (nested rectangles); g, Alexander Incised* var. Prairie Farms*; h, Bayou La Batre Stamped. Provenience: 22-Ja-530.*

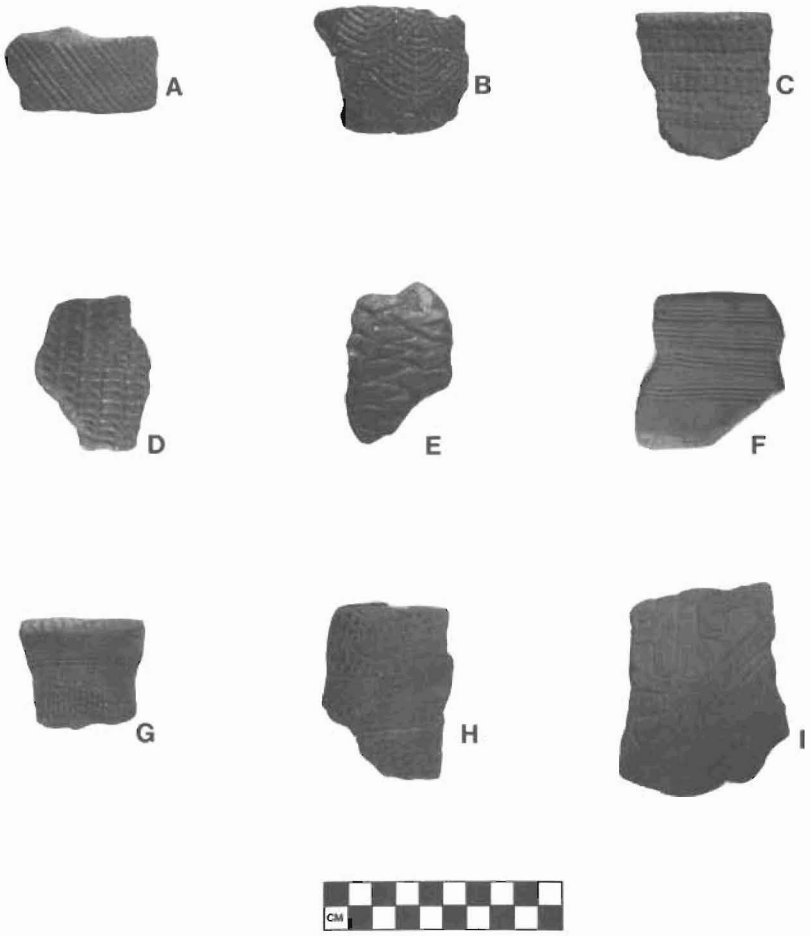


Figure A.2. Apple Street Phase and Greenwood Island Phase ceramics: a-b, Alexander Incised var. Ponchitolowa*; c, Mandeville Stamped* var. unspecified*; d, Tammany Punctated* var. unspecified*; e, Santa Rosa Stamped; f, Chinchuba Brushed var. Chinchuba; g-h, Alexander Incised* var. Chappepeela*;i, Alexander Incised* var. Smithsonia. *Provenience: 22-Ja-530.*

Figure A.3. Apple Street Phase and Greenwood Island Phase podal supports: a, conical forms; b, wedge-shaped forms. Provenience: 22-Ja-530.

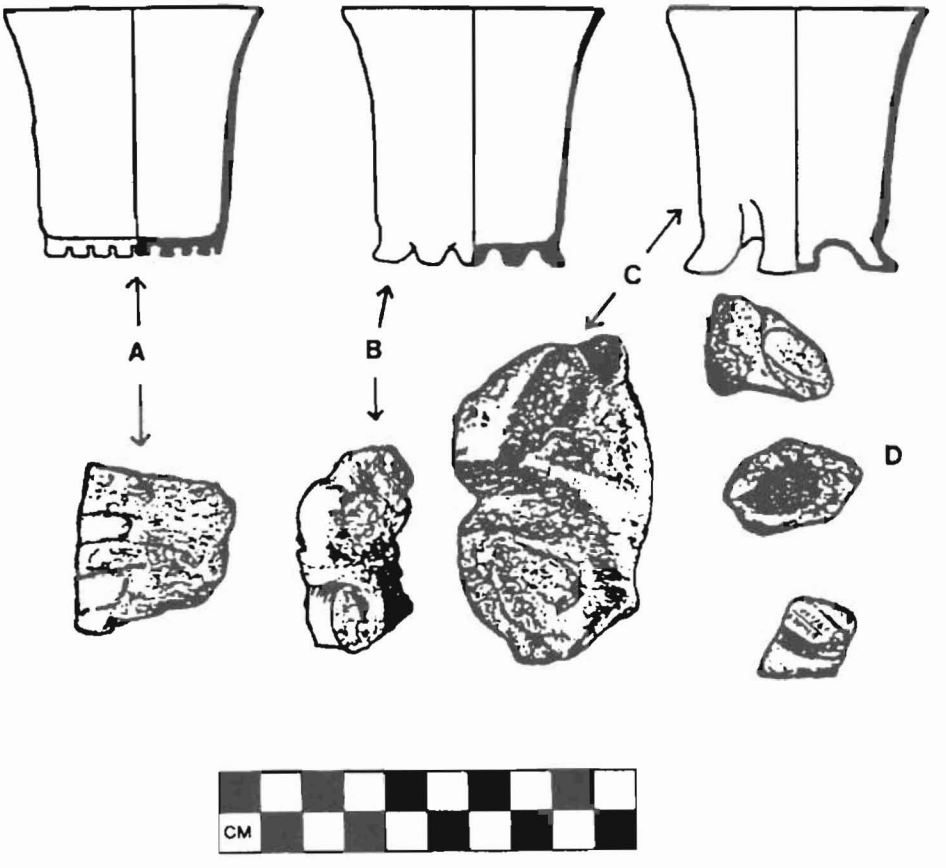


Figure A.4. Apple Street Phase and Greenwood Island Phase podal supports and bases: a, notched slab base; b, small wedge-shaped supports; c, large wedge-shaped supports; d, small, hollow conical supports. Provenience: 22-Ja-530.

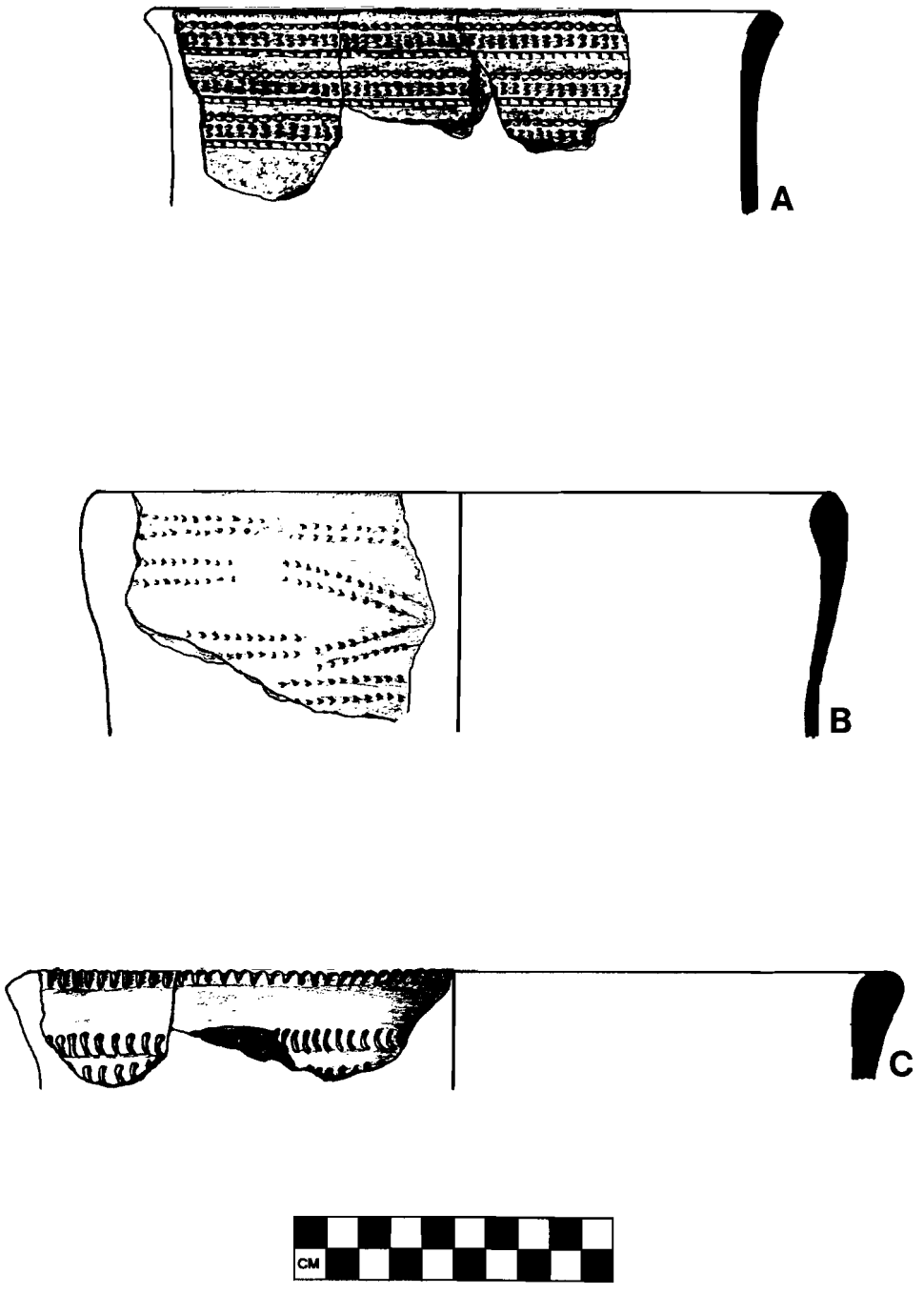


Figure A.5. Apple Street and Greenwood Island Phase ceramics: a, Mandeville Stamped var. unspecified*; b, Tchefuncte Stamped (dentate rocker stamped); c, Alexander Punctated* var. Columbus. *Provenience: 22-Ja-530.*

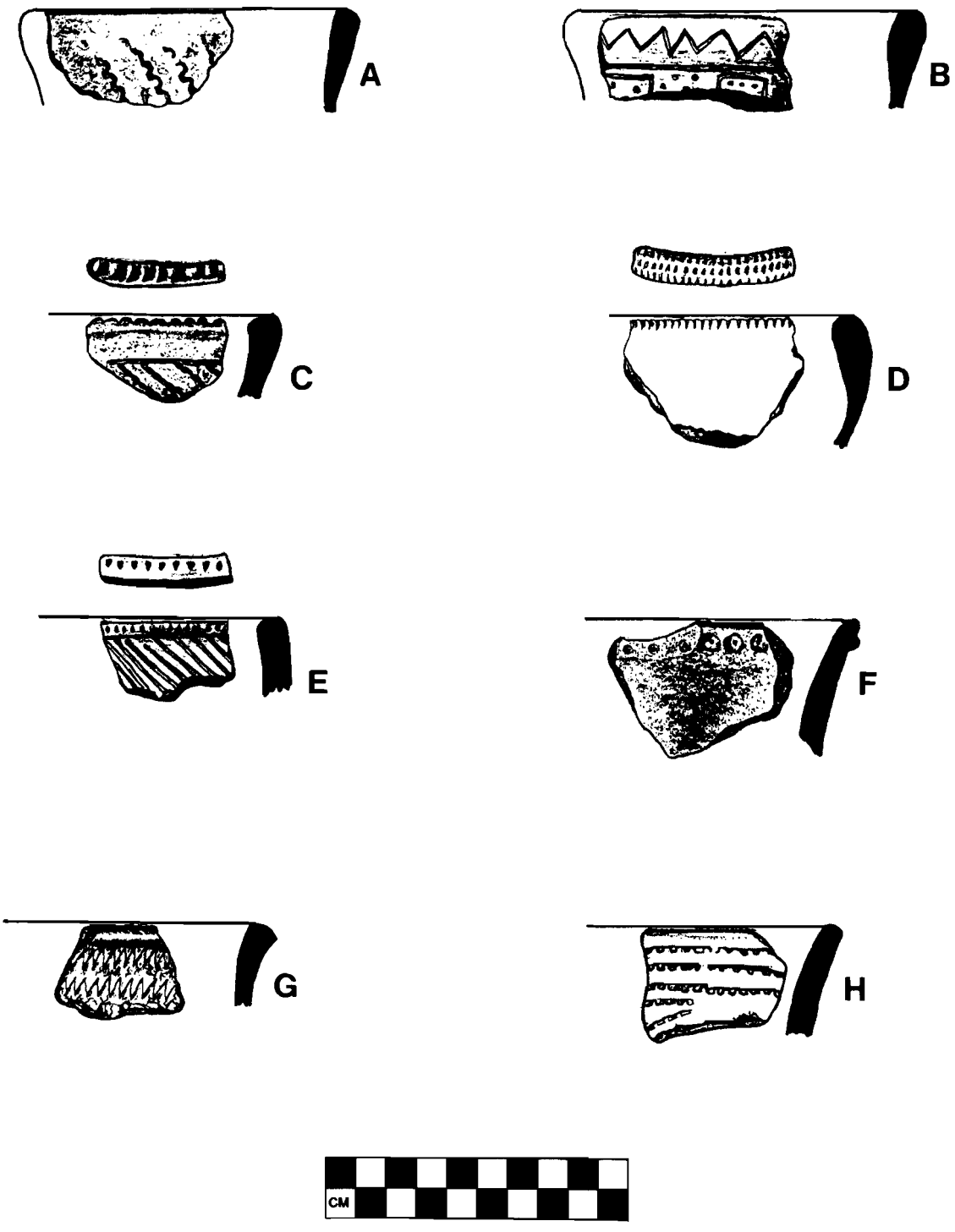


Figure A.6. Apple Street Phase and Greenwood Island Phase ceramics: a, Bayou La Batre Scallop Impressed; b, Alexander Incised var. Chappepeela*; c, Alexander Incised* var. Ponchitolowa*; d, grit-sand-tempered plain with rim-top punctation; e, Tchefuncte Incised* var. Tchefuncte*; f, grit-sand-tempered plain with rim bosses; g, Tchefuncte Stamped* var. Tchefuncte*; h, Indian Bay Stamped var. Spencer Bayou. Provenience: a-g, 22-Ja-530; h, 22-Ja-555.*

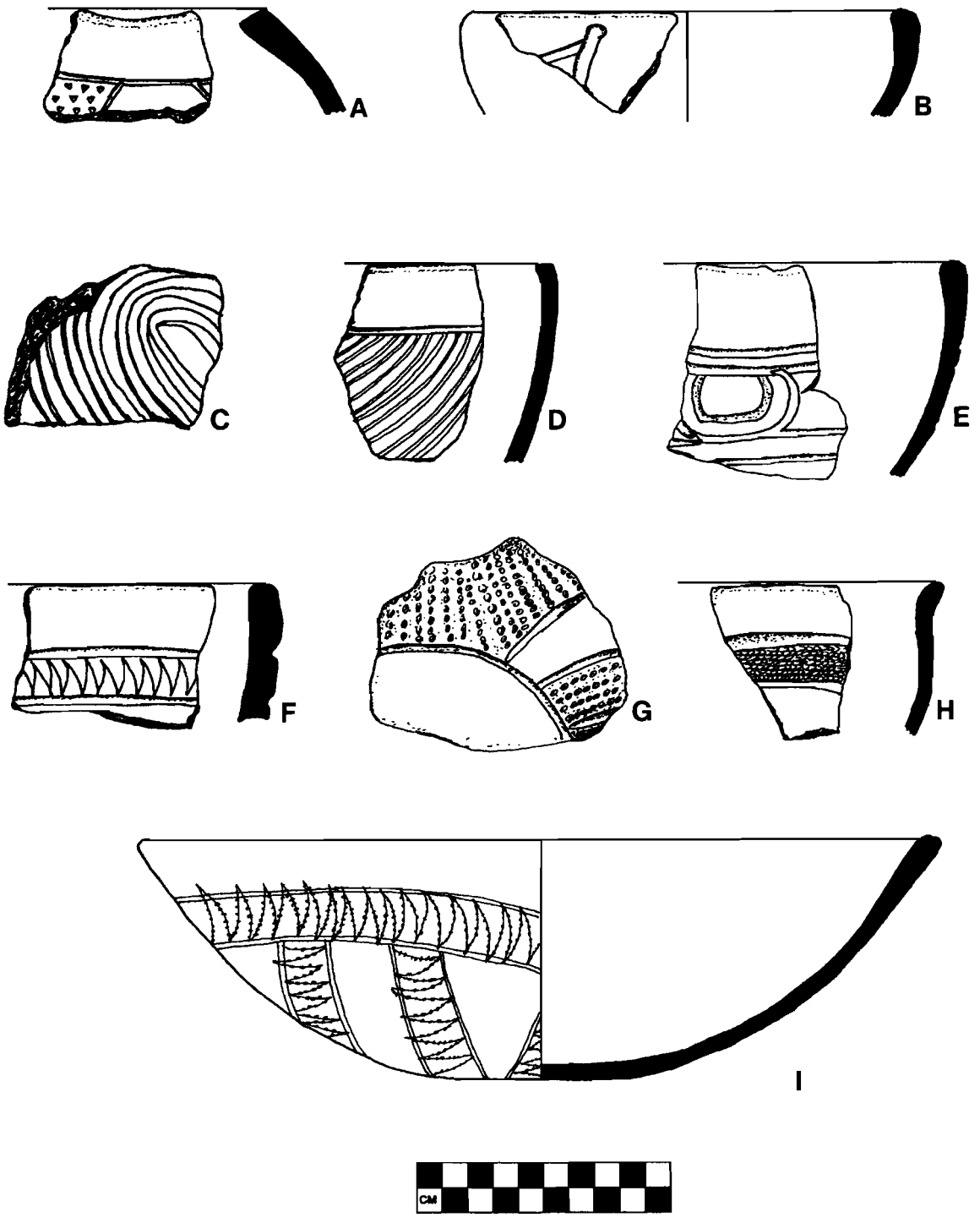


Figure A.7. Greenwood Island Phase, Godsey Phase, and Graveline Phase ceramics: a, Churupa Punctated var. Churupa*; b,e, Marksville Incised* var. Yokena *bowls; c, Marksville Incised* var. Leist*; d, Marksville Incised* var. Spanish Fort*; f, Marksville Stamped* var. Troyville*; g, Alligator Incised (dentate stamping); h, Marksville Stamped* var. Marksville*; I, Marksville Stamped* var. Godsey *bowl. Provenience: a,d,g, 22-Ja-647; b-c,e-f,h, 22-Hr-534; I, 22-Hr-591.*

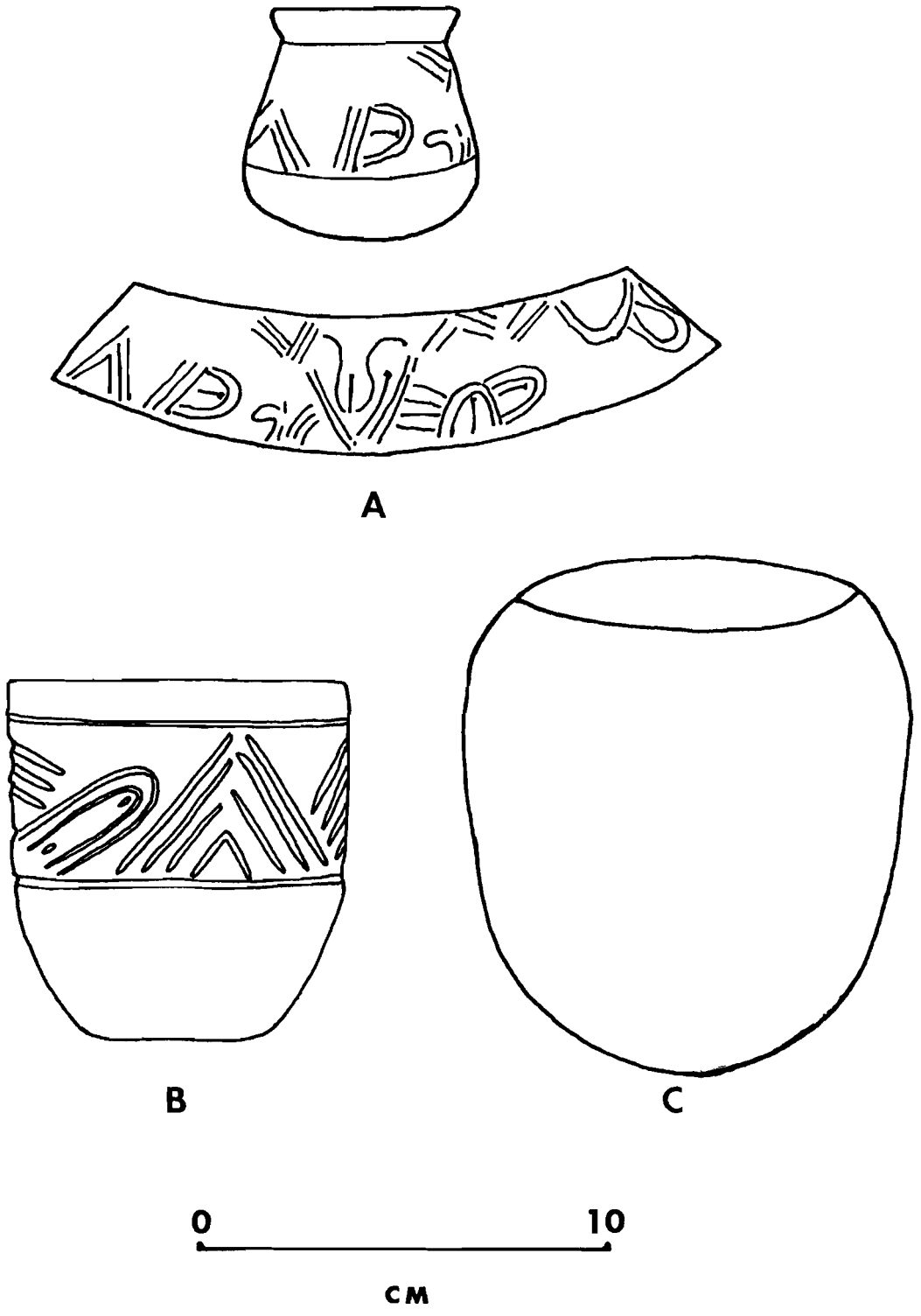


Figure A.8. Vessels found in road cut at Graveline Mound: a, Marksville Incised var. Steele Bayou*; b, Marksville Incised* var. Spanish Fort*; c, grog-tempered plain. Redrawn from Stone 1977.*

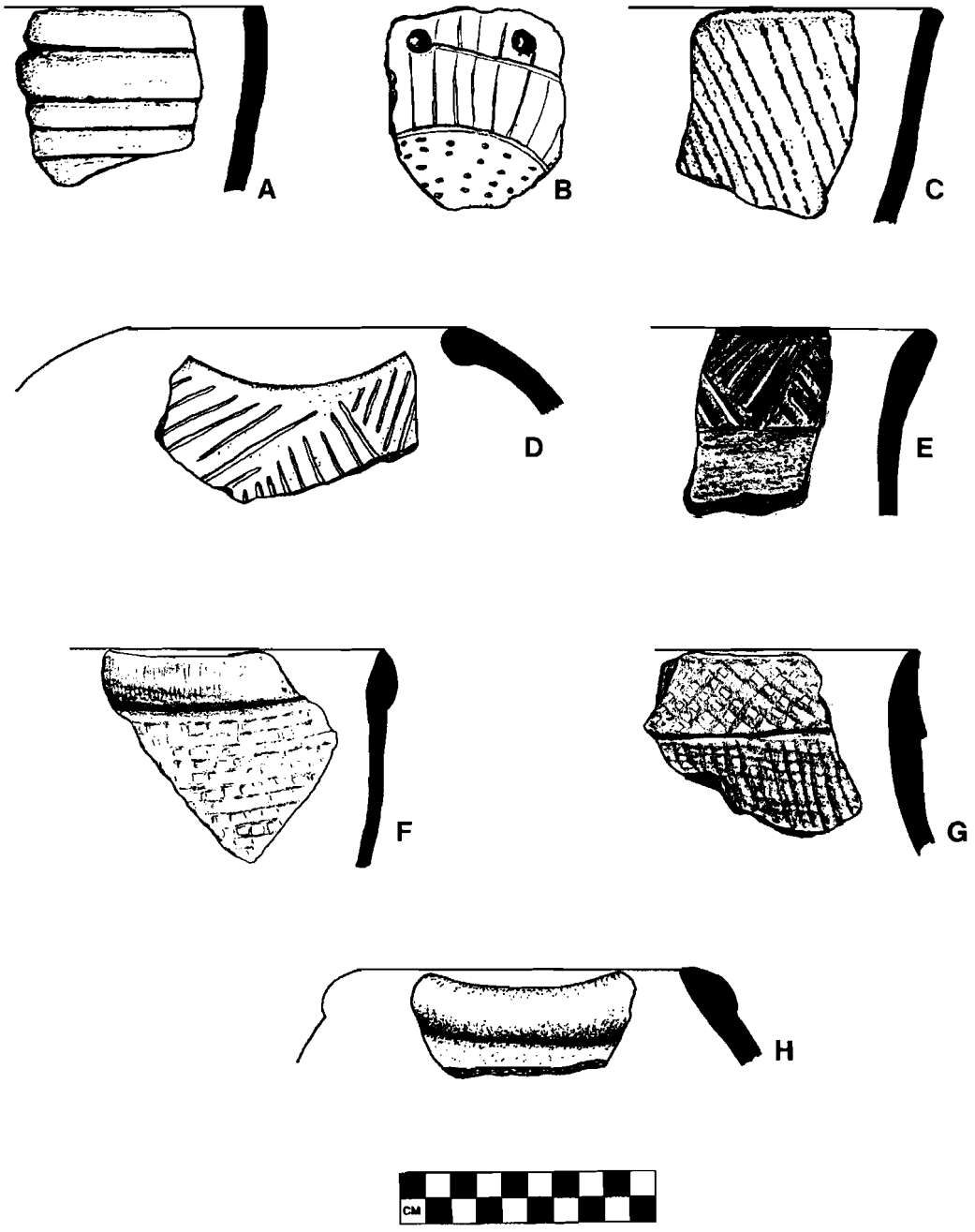


Figure A.9. Graveline Phase, Tates Hammock Phase, and Pinola Phase ceramics: a, Coles Creek Incised var. unspecified*; b, French Fork Incised* var. unspecified*; c, Mulberry Creek Cord Marked* var. unspecified*; d, Mazique Incised* var. Manchac*; e, Mazique Incised* var. Mazique*; f, Pontchartrain Check Stamped* var. Pontchartrain *with rounded, thickened "Weeden Island" rim mode (cf. Brown 1984, "Onion Lake" rim mode); g, Pontchartrain Check Stamped* var. Pontchartrain *with rim fold/strap; h, fine sand-tempered plain with "Weeden Island" rim mode. Provenience: a-b,d-e,h, 22-Ja-647; c, 22-Ja-531; f-g, 22-Ja-726.*

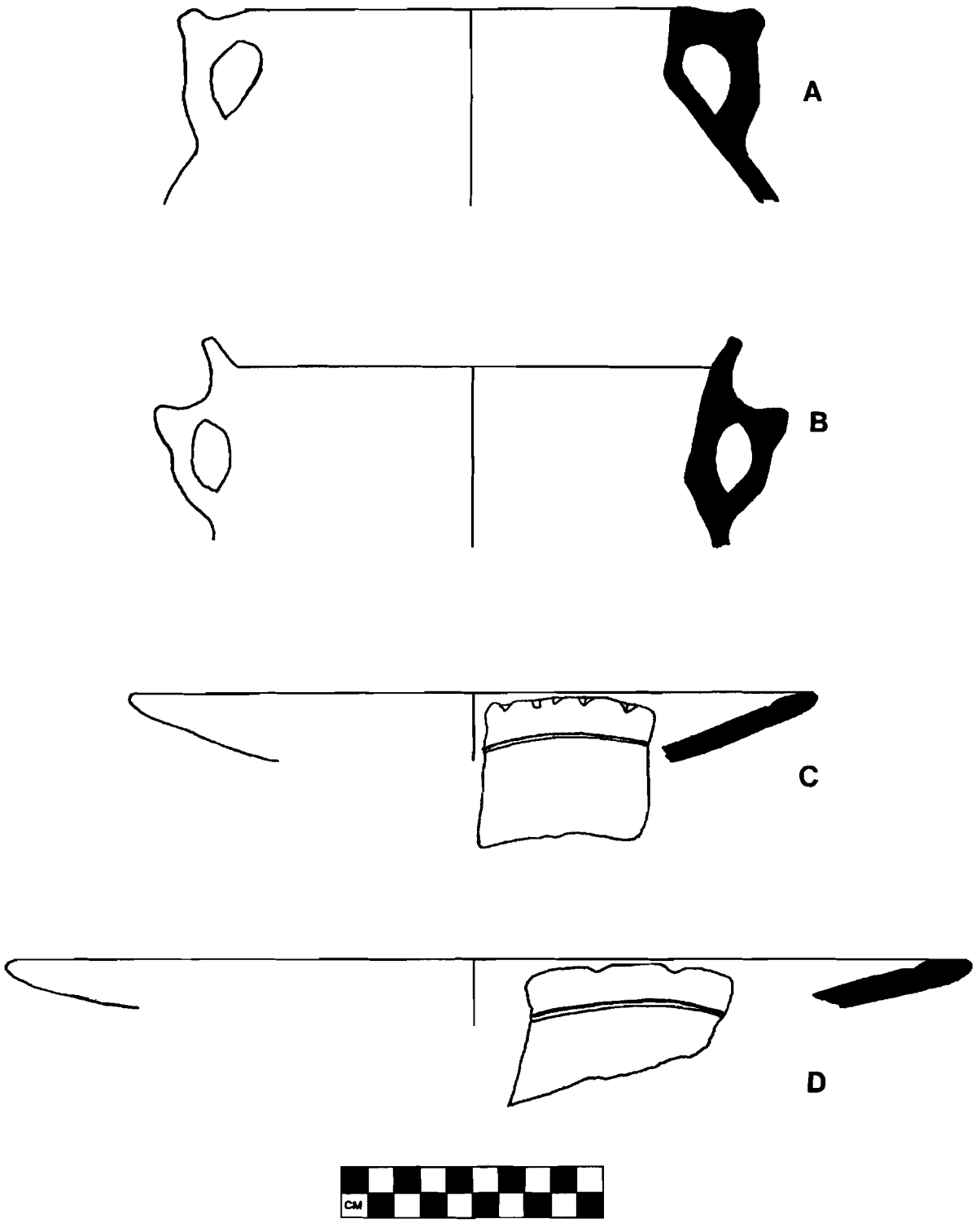


Figure A.10. Shell-tempered vessels: a-b, handled jars; c-d, shallow bowls or plates. Provenience: a-b, 22-Ja-578; c-d, 22-Hr-500.

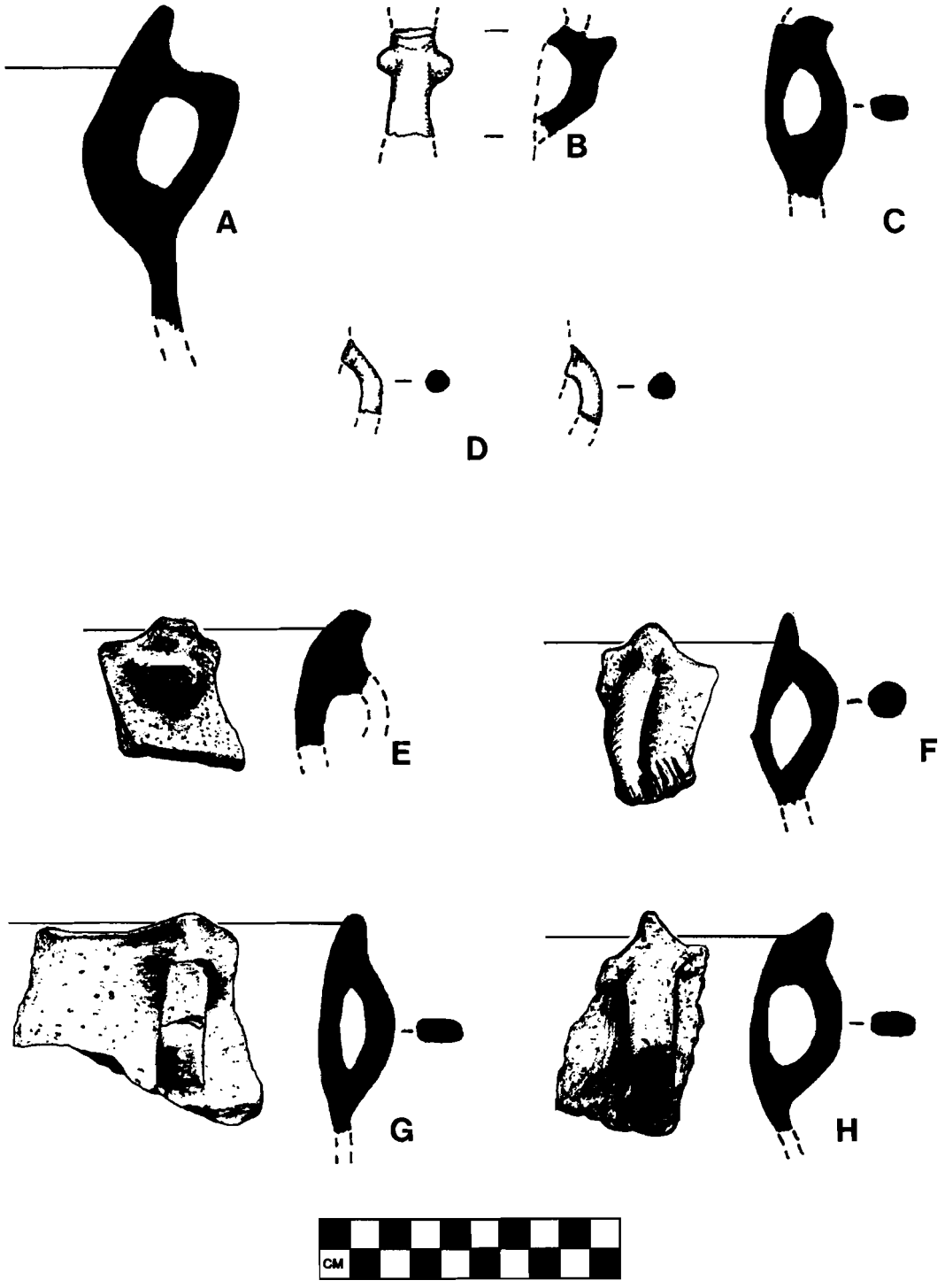


Figure A.11. Shell-tempered handles: a,e,g-h, strap handles from jars with peaked rims; b-c, noded handles; d, looped handles; f, Moundville Incised var. Moundville *jar fragment with loop handle and peaked rim. Provenience: a,f, 22-Ja-520; b-d, 22-Ja-578; e,g-h, 22-Ja-531.*

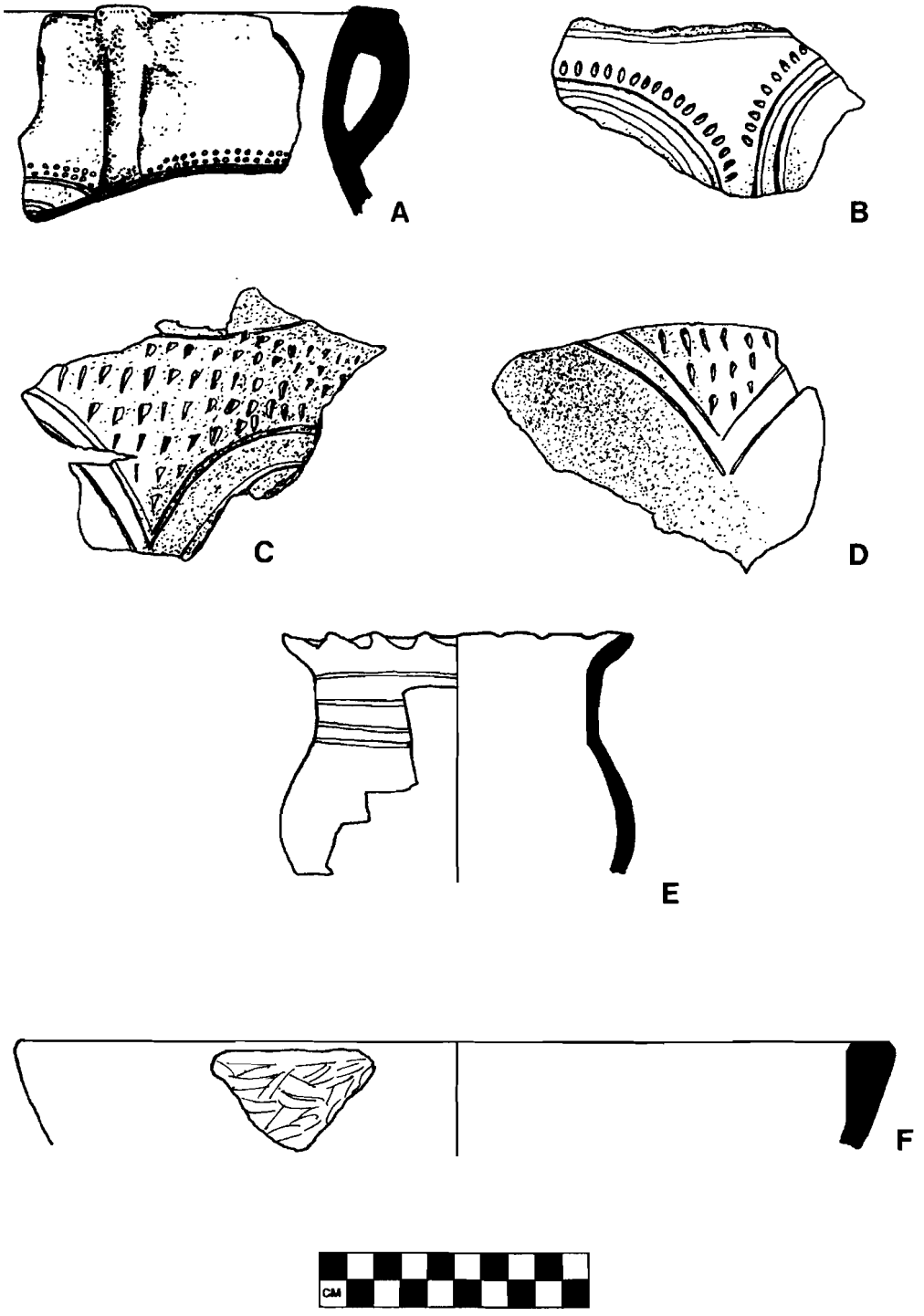


Figure A.12. Pinola Phase and Singing River Phase ceramics: a, Moundville Incised var. Bottle Creek *jar; b, Moundville Incised* var. Snows Bend *jar; c-d, Moundville Incised* var. Singing River *jar; e, mixed shell-grog-tempered jar; f, Salt Creek Cane Impressed "salt pan." Provenience: a,c-d, 22-Ja-578; b,f, 22-Hr-500; e, 22-Ja-520.*

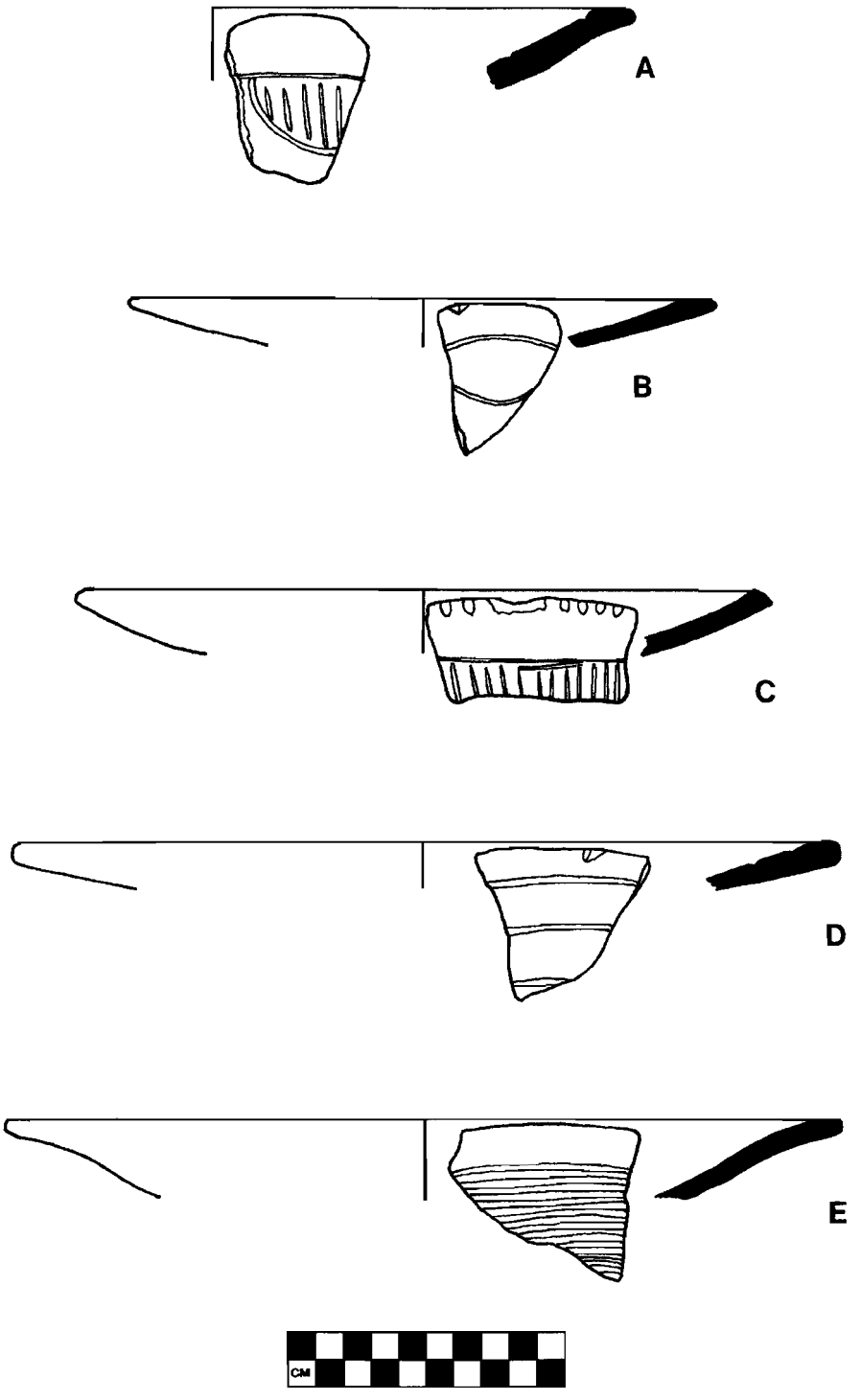


Figure A.13. Singing River Phase shallow bowls/plates: a, D'Olive Incised var. Mary Ann*; b, D'Olive Incised* var. D'Olive*; c-d, D'Olive Incised* var. unspecified*; e, D'Olive Incised* var. Dominic. Provenience*: a, 22-Ja-531; b,d-e, 22-Hr-500; c, 22-Ja-578.*

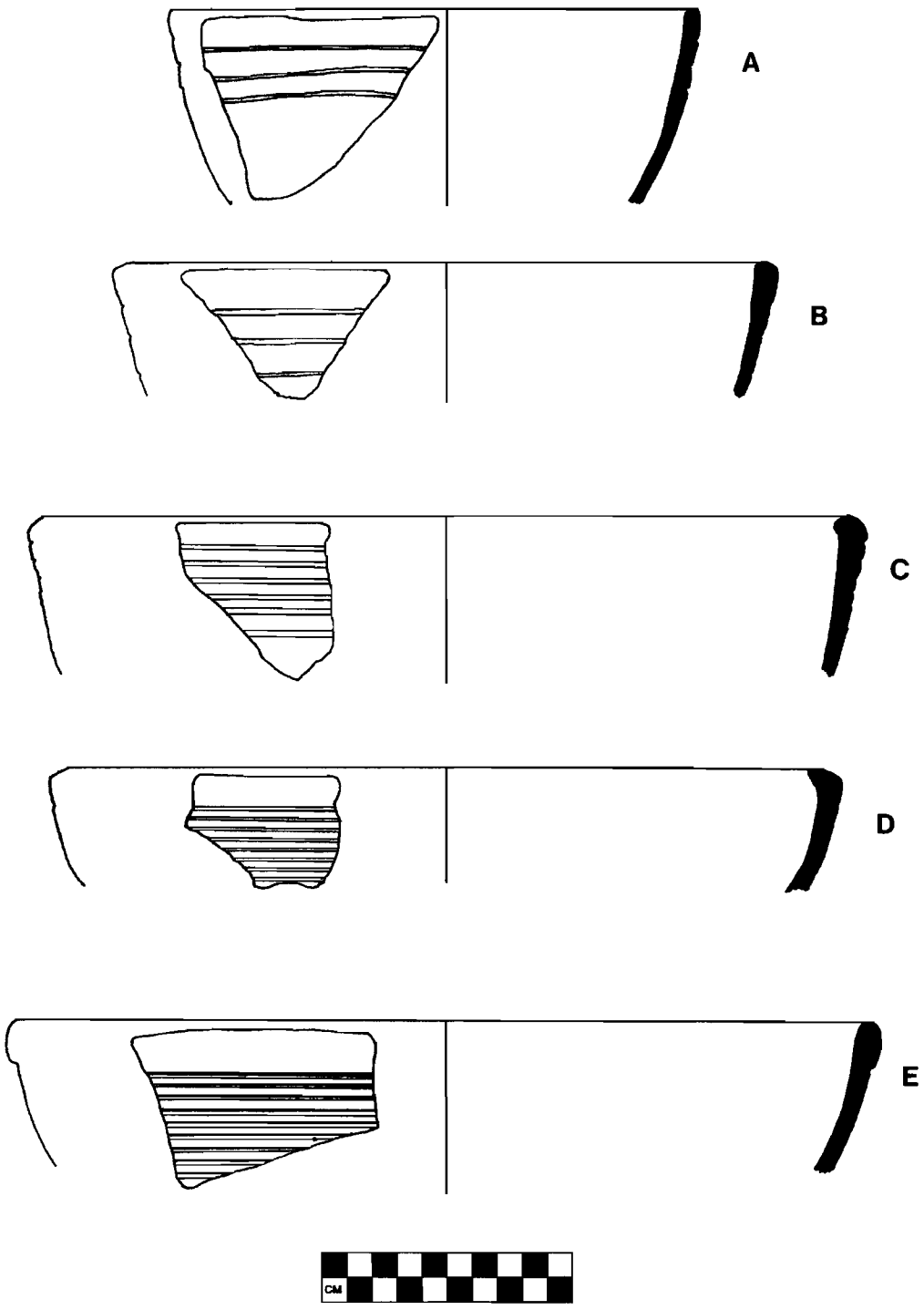


Figure A.14. Singing River Phase bowls: a-b, Mound Place Incised var. Walton's Camp*; c-e, Mound Place Incised* var. McMillian. *Provenience: 22-Hr-500.*

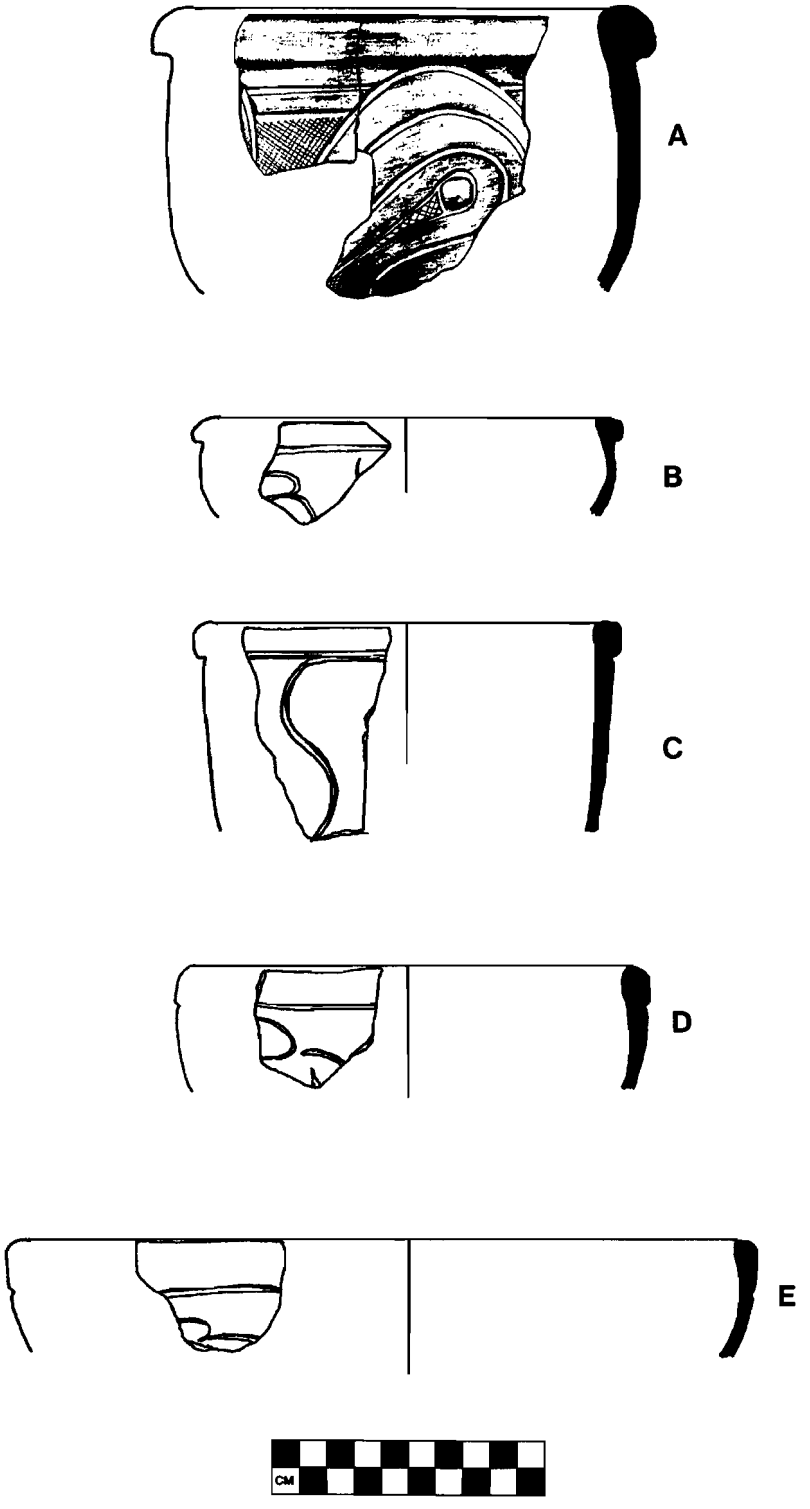


Figure A.15. Singing River Phase Ceramics bowls and beakers: a, Pensacola Incised var. Jessamine*; b-e, Pensacola Incised* var. Gasque. *Provenience: a, 22-Ja-578; b-e, 22-Hr-500.*

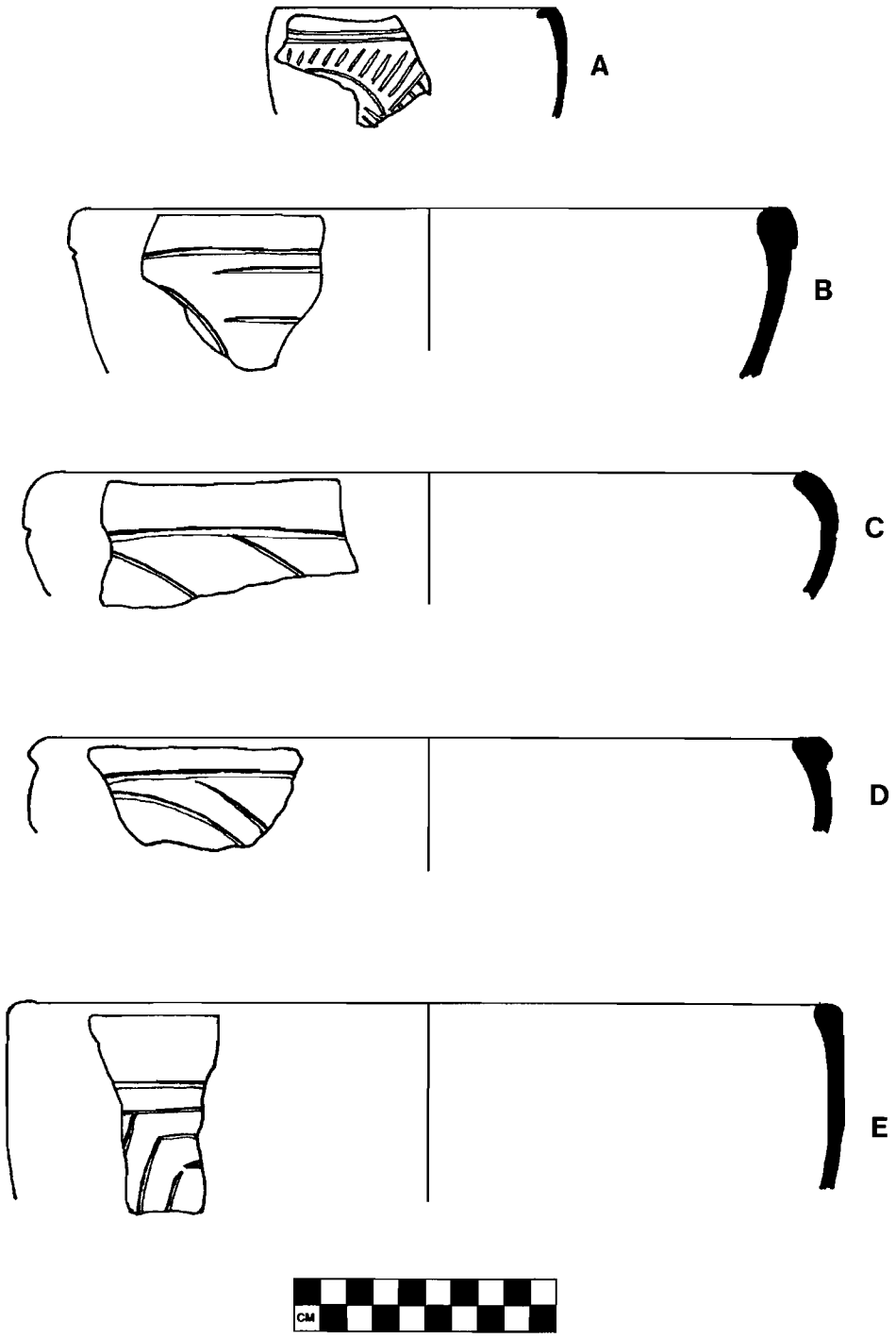


Figure A.16. Bear Point Phase Bowls: a, Pensacola Incised var. unspecified*; b-e, Pensacola Incised* var. Pensacola. *Provenience: a, 22-Ja-578; b-e, 22-Hr-500.*

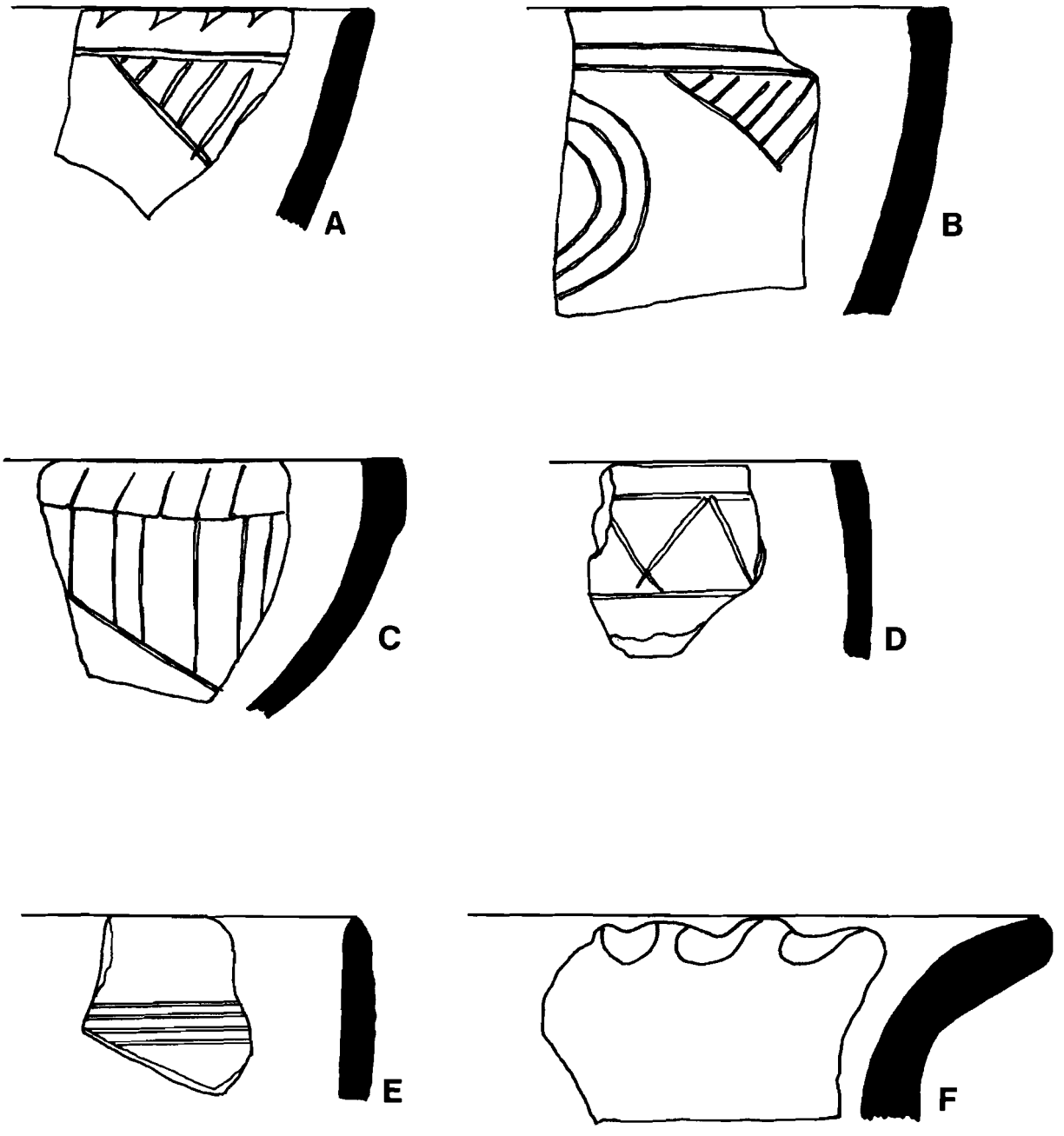


Figure A.17. La Pointe Phase Ceramics: a-d, Port Dauphin Incised (c is red-filmed); e, Chickachae Combed; f, unburnished shell-tempered plain, pinched "pie crust" rim mode. Provenience: a-c,f, 22-Ja-645; d, 22-Ja-505; e, 22-Ja-534.

Appendix B:
Provienience of Artifacts from Key Sites

Table B.1. Cultural materials, Unit 1, Apple Street (22-Ja-530).

	Level 1 0-10 cm		Level 2 10-20 cm		Level 3 20-30 cm		Level 4 30-40 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS								
Alexander Pinched	1	5	1	2	—	—	—	—
Bayou LaBatre Stamped	1	4	3	4	—	—	—	—
Alexander Incised	3	4	—	—	—	—	—	—
Grit/Sand Tempered Plain	25	30	22	428	7	41	3	7
Tchefuncte Plain	4	11	5	12	2	3	1	7
Fired Clay/Sand	*	4	—	—	*	6	*	4
TOTAL CERAMICS	**34**	**58**	**31**	**446**	**9**	**50**	**4**	**18**
LITHICS								
Unmodified Hematite	*	7	—	—	—	—	—	—
Unmodified Limestone	*	3	—	—	—	—	—	—
Unmodified Sandstone	—	—	*	1	—	—	*	8
TOTAL LITHICS	*	**10**	*	**1**	—	—	*	**8**

* = not applicable
Wt. = weight in grams

Table B.2. Cultural materials, Unit 2, Apple Street (22-Ja-530).

	Level 1 0-10 cm		Level 2 10-20 cm		Level 3 20-30 cm		Level 4 30-40 cm		Level 5 40-50 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS										
Alexander Pinched	1	10	5	26	—	—	—	—	—	—
Bayou La Batre Stamped	3	8	4	7	1	4	—	—	—	—
Lake Borgne Incised	1	2	1	5	1	11	1	1	—	—
Alexander Incised	1	2	—	—	—	—	1	30	—	—
Grit/Sand Tempered Plain	23	80	53	241	22	133	19	161	2	5
Tchefuncte Plain	5	13	8	23	1	2	—	—	—	—
Fired Clay/Sand	—	—	—	—	—	—	*	1	—	—
TOTAL CERAMICS	**34**	**115**	**71**	**302**	**25**	**150**	**21**	**193**	**2**	**5**
LITHICS										
Steatite Bowl Fragment	—	—	—	—	—	—	1	10	—	—
Unmodified Hematite	—	—	*	2	—	—	—	—	—	—
Unmodified Sandstone	—	—	—	—	*	34	—	—	—	—
TOTAL LITHICS	**—**	**—**	*****	**2**	*****	**34**	**1**	**10**	**—**	**—**

* = not applicable
Wt. = weight in grams

Table B.3. Cultural materials, Unit 3, Apple Street (22-Ja-530).

	Level 1 0-10 cm		Level 2 10-20 cm		Level 3 20-30 cm		Level 4 30-40 cm		Level 5 40-50 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS										
Alexander Incised	1	2	1	2	—	—	1	26	—	—
Alexander Pinched	—	—	—	—	1	10	—	—	—	—
Alexander Punctated	—	—	—	—	1	2	—	—	—	—
Bayou La Batre Stamped	2	6	2	4	4	15	1	3	—	—
Fiber Tempered	—	—	1	2	1	1	—	—	1	2
Grit/Sand Tempered Plain	13	77	26	79	58	230	11	104	1	2
Tchefuncte Plain	—	—	6	5	5	17	6	31	—	—
Fired Clay/Sand	—	—	—	—	—	—	*	1	*	3
TOTAL CERAMICS	**16**	**85**	**36**	**92**	**70**	**275**	**19**	**165**	**2**	**7**
LITHICS										
Steatite Bowl Fragment	—	—	—	—	—	—	—	—	1	2
Secondary Flake	—	—	1	2	1	1	—	—	1	<1
Unmodified Hematite	—	—	*	1	—	—	*	4	—	—
Unmodified Slate	—	—	—	—	—	—	*	<1	—	—
TOTAL LITHICS	**—**	**—**	**1**	**3**	**1**	**1**	**—**	**4**	**2**	**2**

* = not applicable
Wt. = weight in grams

Table B.4. Cultural materials, Unit 4, Apple Street (22-Ja-530).

	Level 1 0-10 cm		Level 2 10-20 cm		Level 3 20-30 cm		Level 4 30-40 cm		Level 5 40-50 cm		Level 6 60-70 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS												
Alexander Incised	—	—	3	18	5	4	6	13	2	3	—	—
var. Ponchitolowa	1	4	—	—	—	—	1	12	—	—	—	—
(panels of zoned incising)	—	—	—	—	1	5	—	—	—	—	—	—
Alexander Pinched	—	—	2	11	—	—	—	—	—	—	—	—
var. Pineapple	—	—	—	—	1	8	—	—	—	—	—	—
Alexander Punctated												
var. Tibbee	—	—	—	—	7	44	—	—	1	6	—	—
var. Columbus	—	—	1	2	3	8	—	—	—	—	—	—
var. Chappepeela	1	2	2	10	—	—	2	8	2	5	1	7
Bayou La Batre Scallop Impressed	—	—	2	6	—	—	—	—	—	—	—	—
Bayou La Batre Stamped	4	26	—	—	2	6	3	24	—	—	—	—
Lake Borgne Incised	—	—	—	—	2	8	—	—	—	—	—	—
Tchefuncte Incised	—	—	1	1	4	18	1	1	2	7	5	5
(herringbone)	—	—	—	—	—	—	4	19	12	11	—	—
Tchefuncte Stamped *var. Tchefuncte*	2	32	—	—	—	—	—	—	—	—	—	—
Wheeler Punctated	—	—	—	—	1	10	—	—	—	—	—	—
Unclass. Incised (grit/sand tempered)	—	—	2	9	—	—	—	—	—	—	—	—
Unclass. Punctated (grit/sand tempered)	1	2	1	1	3	10	1	6	—	—	—	—
Fiber Tempered Plain	—	—	3	6	1	7	—	—	—	—	—	—
Grit/Sand Tempered Plain	177	556	203	645	336	1620	165	937	30	134	4	10
Tchefuncte Plain	12	31	7	15	33	186	10	10	—	—	—	—
Poverty Point Object (biconical, grooved)	—	—	—	—	—	—	—	—	1	8	—	—
Fired Clay	*	18	—	—	*	50	*	76	*	4	*	11
TOTAL CERAMICS	**198**	**671**	**227**	**724**	**399**	**1984**	**195**	**1106**	**50**	**178**	**10**	**33**
LITHICS												
PP/K	1	19	—	—	—	—	—	—	—	—	—	—
PP/K Kent	—	—	—	—	—	—	1	11	—	—	—	—
PP/K Delhi	—	—	—	—	—	—	1	10	—	—	—	—
Steatite Bowl Fragment	—	—	—	—	1	7	—	—	—	—	—	—
Primary Flake	—	—	—	—	1	1	—	—	—	—	—	—
Secondary Flake	—	—	—	—	1	1	—	—	2	1	2	4
Cobble Fragment	—	—	—	—	—	—	1	36	—	—	—	—
Unmodified Sandstone	—	—	—	—	*	34	—	—	—	—	—	—
TOTAL LITHICS	**1**	**19**	**—**	**—**	**3**	**43**	**3**	**57**	**2**	**1**	**2**	**4**

* = not applicable
Wt. = weight in grams

Table B.5. Prehistoric pottery, aggregate totals from disturbed contexts, Big Greenwood Island (22-Ja-516).*

DECORATED CERAMICS	Ct.
Alexander Punctated *var. Columbus*	1
Bayou LaBatre Stamped	53
Bayou LaBatre Scallop Impressed	32
Mandeville Stamped	4
Lake Borgne Incised	2
Greenwood Stamped *var. Greenwood*	3
Santa Rosa Stamped	4
Deptford Linear Check Stamped	15
Deptford Bold Check Stamped	3
Alligator Bayou Stamped	3
Basin Bayou Incised	4
Tchefuncte Incised	1
Tchefuncte Punctated	1
var. Tammany	8
Tchefuncte Stamped	5
Marksville Stamped	6
var. Marksville	2
var Troyville	1
Mabin Stamped	
var. Crooks	23
var. Point Lake	5
Indian Bay Stamped	4
var. Spencer Bayou	3
Marksville Incised	6
var. Marksville	1
var. Yokena	4
var. Spanish Fort	2
var. Goose Lake	1
Catahoula Zoned Red	1
Twin Lakes Punctated	1
Mazique Incised	1
Evansville Punctated	3
Wheeler Check Stamped	1
Weeden Island Punctated	2
Moundville Incised	
var. Moundville	1
var .Singing River	7
Barton Incised	1
Leland Incised	1
D'Olive Incised *var. Dominic*	1
TOTAL DECORATED CERAMICS	**217**

* Only formal type-varieties are included in the decorated ceramics tabulation.

PLAIN CERAMICS	Ct.
Grog-temperedRim Effigy "spoon bill"	1
Grit/Sand Tempered Plain	182
Grog TemperedPlain	400
Tchefuncte Ware Plain	45
Fiber TemperedPlain	21
Fine Sand Tempered Plain	60
Shell Tempered Plain	26
TOTAL PLAIN CERAMICS	**735**

Table B.6. Cultural materials, Unit 1, East Bayou LaMotte (22-Ja-555).

	Level 1 0-10 cm		Level 2 10-20 cm		Level 3 20-30 cm		Level 4 30-40 cm		Level 5 40-50 cm		Level 6 50-60 cm		Level 7 70-80 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS														
Alexander Incised *var. Ponchitolawa*	—	—	—	—	1	4	—	—	—	—	—	—	—	—
Bayou La Batre Scallop Impressed	—	—	1	3	2	6	1	1	1	4	—	—	—	—
Bayou La Batre Stamped	—	—	4	57	2	21	—	—	—	—	—	—	—	—
Deptford Simple Stamped	—	—	—	—	1	4	—	—	—	—	—	—	—	—
Indian Bay Stamped *var. Spencer Bayou*	1	9	—	—	—	—	—	—	1	3	—	—	—	—
Lake Borgne Incised *var. Lake Borgne*	1	5	—	—	—	—	—	—	—	—	—	—	—	—
Mandeville Stamped *var. Mandeville*	—	—	3	23	—	—	—	—	—	—	—	—	—	—
Santa Rosa Stamped	1	6	—	—	—	—	—	—	—	—	—	—	—	—
Unclass. Stamped/Punctated														
(grit/sand tempered)	1	9	—	—	2	8	1	10	1	5	—	—	—	—
Unclass. Incised														
(grit/sand tempered)	—	—	1	9	—	—	1	4	—	—	—	—	—	—
(grog tempered)	—	—	—	—	—	—	—	—	1	3	—	—	—	—
Fiber Tempered Plain	—	—	—	—	2	4	1	1	1	2	1	3	—	—
Grit/Sand Tempered Plain	20	149	56	310	34	167	32	223	14	85	1	10	6	34
Fine Sand Tempered Plain	—	—	5	34	5	27	6	20	2	4	7	9	—	—
Tchefuncte Plain	—	—	4	20	5	17	3	13	2	7	—	—	—	—
Grog Tempered Plain	58	210	53	225	49	246	24	170	17	83	48	162	9	35
Fired Clay	*	59	*	21	*	37	*	2	—	—	*	452	*	216
Fired Coils	—	—	4	13	—	—	—	—	—	—	—	—	—	—
TOTAL CERAMICS	**82**	**447**	**131**	**715**	**103**	**541**	**69**	**444**	**40**	**196**	**57**	**636**	**15**	**285**
LITHICS														
PP/K (distal end)	1	4	—	—	—	—	—	—	—	—	—	—	—	—
PP/K Gary	—	—	1	6	—	—	—	—	—	—	—	—	1	6
Sandstone Mortar/Anvil	—	—	—	—	—	—	1	66	—	—	—	—	—	—
Sandstone Abrader	—	—	—	—	1	36	—	—	—	—	—	—	—	—
Ground Sandstone Fragment	—	—	—	—	—	—	—	—	—	—	1	51	—	—
Primary Flake	—	—	1	2	—	—	—	—	—	—	—	—	—	—
Utilized Flake	—	—	—	—	1	1	—	—	—	—	—	—	—	—
Tertiary Flake	—	—	1	1	—	—	—	—	—	—	—	—	—	—
Shatter (white quartzite)	—	—	*	23	—	—	—	—	—	—	*	5	—	—
Unmodified Sandstone	*	135	*	123	*	31	*	2	*	15	*	76	*	32
TOTAL LITHICS	**1**	**139**	**3**	**155**	**2**	**68**	**1**	**68**	*****	**15**	**1**	**132**	**1**	**38**
BONE ARTIFACTS														
Perforated/Cut Object	2	9	—	—	—	—	—	—	1	2	1	1	—	—
Pin/Bodkin (distal end)	—	—	—	—	1	1	—	—	—	—	—	—	—	—
TOTAL BONE ARTIFACTS	**2**	**9**	**—**	**—**	**1**	**1**	**—**	**—**	**1**	**2**	**1**	**1**	**—**	**—**

* = not applicable
Wt. = weight in grams

Table B.7. Cultural materials, surface and disturbed contexts (Shepard Collection), East Bayou LaMotte (22-Ja-555).

CERAMICS	**Ct.**
Alexander Incised	8
var. Pleasant Valley	1
Mandeville Stamped	3
Bayou LaBatre Scallop Impressed	2
Deptford Bold Check Stamped (rectangular)	1
Chinchuba Brushed *var. Chinchuba*	1
Santa Rosa Stamped	1
Mound Field Net Marked	2
Greenwood Stamped *var. Greenwood*	1
Lake Borgne Incised	2
Marksville Incised *var. Yokena*	1
Mabin Stamped *var. Crooks*	3
Indian Bay Stamped *var. Spencer Bayou*	6
Evansville Punctated	
(hemiconical)	2
(square tool)	3
Mound Place Incised	1
Grit/Sand Tempered Plain	X
Grog Tempered Plain	X
Poverty Point Object (amorphous)	2
Fired Clay	1
TOTAL CERAMICS	**41**
LITHICS	
Anvil/Mortar (sandstone)	1
Abrader (sandstone)	2
Core (white quartzite)	1
Hammerstones (local chert)	X
TOTAL LITHICS	**4**
BONE/SHELL	
Atlatl Hook	1
Cut Conch Shell Fragments	3
TOTAL BONE/SHELL	**4**

X=present, not counted.

Table B.8. Cultural materials, Unit 2, Godsey (22-Hr-591).

	Level 1 0-20 cm		Level 2 20-30 cm		Level 3 30-40 cm		Level 4 40-50 cm		Level 5 50-60 cm		Level 6 60-70 cm		Level 7 70-75 cm		Level 8 75-95 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS																
Churupa Punctated	—	—	—	—	—	—	1	2	—	—	—	—	—	—	—	—
var. Churupa	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—
var. Thornton	—	—	—	—	1	4	1	4	6	20	5	72	2	13	—	—
Indian Bay Stamped	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—
var. Spencer Bayou	—	—	1	6	1	3	—	—	—	—	—	—	1	7	1	4
Marksville Incised	6	27	13	48	8	47	7	18	6	20	5	19	3	13	2	9
var. Yokena	3	6	9	116	10	52	9	47	8	67	7	34	1	21	2	14
Marksville Stamped																
var. Godsey	3	8	2	10	7	26	—	—	—	—	—	—	—	—	—	—
var. Marksville	—	—	1	2	—	—	—	—	—	—	—	—	—	—	—	—
var. Troyville	—	—	—	—	1	1	2	11	1	2	—	—	—	—	—	—
Unclass. Incised																
(grog tempered)	—	—	—	—	1	27	—	—	—	—	—	—	1	8	—	—
Grog Tempered Plain	44	140	60	448	30	169	40	226	41	149	42	266	13	49	11	44
Grit/Sand Tempered Plain	—	—	—	—	—	—	1	5	—	—	—	—	—	—	—	—
Fired Clay/Sand	*	16	*	1	*	11	*	7	*	3	*	10	*	37	—	—
Daub	—	—	*	11	*	13	—	—	—	—	—	—	—	—	—	—
TOTAL CERAMICS	**56**	**197**	**86**	**642**	**59**	**353**	**62**	**321**	**62**	**261**	**60**	**402**	**21**	**148**	**16**	**71**
LITHICS																
PP/K	—	—	—	—	—	—	1	5	—	—	—	—	—	—	—	—
Primary Flake	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Secondary Flake	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Shatter (heated)	—	—	5	97	—	—	1	1	—	—	—	—	—	—	—	—
Mineral Pigment (red)	—	—	—	—	—	—	—	—	—	—	—	—	*	35	—	—
Unmodified Hematite	—	—	—	—	—	—	*	1	—	—	—	—	—	—	—	—
Unmodified Limonite	—	—	—	—	—	—	*	5	*	1	*	10	*	2	—	—
Unmodified Sandstone	*	21	*	12	*	4	*	3	*	171	*	79	*	10	*	502
TOTAL LITHICS	**2**	**23**	**5**	**109**	**—**	**4**	**2**	**15**	**—**	**172**	**—**	**89**	**—**	**47**	**—**	**502**
BONE ARTIFACTS																
Awl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Perforated/Cut Object	—	—	—	—	—	—	1	7	—	—	—	—	—	—	—	—
Projectile Point	—	—	—	—	—	—	—	—	1	2	—	—	—	—	—	—
TOTAL BONE ARTIFACTS	**—**	**—**	**—**	**—**	**—**	**—**	**1**	**7**	**1**	**2**	**—**	**—**	**—**	**—**	**1**	**1**

* = not applicable; Wt. = weight in grams

Table B.9. Cultural materials, surface and disturbed contexts (Unit 1, Unit 2, Unit 4: Strata A-C, Trench 1) Harvey (22-Hr-534).

CERAMICS	**Ct.**
Churupa Punctated	
var. Churupa	1
var. Thornton	1
Indian Bay Stamped	1
Marksville Incised	59
var. Goose Lake	1
var. Leist	11
var. Steele Bayou	1
var. Yokena	9
Marksville Stamped	7
var. Godsey	22
var. Manny	1
var. Marksville	2
var. Troyville	5
Unclass. Incised (grog)	22
(red painted)	9
Unclass. Incised (sand)	2
Grog Tempered Plain	836
Fine Sand Tempered Pain	53
TOTAL CERAMICS	**1,043**
LITHIC ARTIFACTS	
PP/K	2
Mortar/Anvil	1
TOTAL LITHICS	**3**
BONE ARTIFACTS	
Projectile Point	1
TOTAL BONE ARTIFACTS	**1**

Table B.10. Cultural materials, Unit 3, Harvey (22-Hr-534).

	Level 1 0-10 cm		Level 2 10-20 cm		Level 3 20-30 cm		Level 4 30-40 cm		Level 5 40-50 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS										
Marksville Incised	1	7	13	49	24	173	9	61	3	51
var. Goose Lake	—	—	—	—	—	—	—	—	2	14
var. Leist	—	—	—	—	5	19	1	7	3	11
var. Spanish Fort	—	—	—	—	1	25	—	—	—	—
var. Yokena	1	6	1	9	—	—	6	52	—	—
Marksville Stamped	1	2	—	—	—	—	3	10	1	3
var. Godsey	—	—	7	36	15	171	17	195	15	151
Unclass. Incised										
(grog tempered)	6	22	11	40	2	29	8	33	10	37
Grog Tempered Plain	79	415	171	658	137	918	106	777	30	303
Fine Sand Tempered Plain	1	9	1	2	—	—	—	—	—	—
Smoking Pipe Fragment	—	—	—	—	—	—	—	—	1	7
Fired Coils (grog)	1	2	1	1	3	6	—	—	—	—
Fired Prepared Clay	—	—	2	2	2	9	—	—	—	—
Fired Sand	—	—	*	4	—	—	—	—	*	5
Daub	—	—	—	—	—	—	*	73	*	42
TOTAL CERAMICS	**90**	**463**	**207**	**801**	**189**	**1350**	**150**	**1208**	**65**	**624**
LITHICS										
PP/K (distal end)	—	—	—	—	1	1	—	—	—	—
Mortar/Anvil	—	—	1	262	—	—	—	—	—	—
Shatter (heated)	—	—	2	4	6	51	—	—	—	—
Unmodified Chert Cobble	9	39	22	354	39	740	30	411	4	28
Unmodified Hematite	—	—	—	—	—	—	*	5	—	—
Unmodified Limonite	*	3	*	3	*	1	—	—	—	—
Unmodified Sandstone	—	—	*	1	—	—	*	69	—	—
TOTAL LITHICS	**9**	**42**	**25**	**624**	**46**	**793**	**30**	**485**	**4**	**28**
BONE ARTIFACTS										
Perforated/Cut Object	—	—	—	—	—	—	3	30	—	—
TOTAL BONE ARTIFACTS	**—**	**—**	**—**	**—**	**—**	**—**	**3**	**30**	**—**	**—**

* = not applicable
Wt. = weight in grams

Table B.11. Cultural materials, Unit 4, Stratum D (35-60 cm below surface), Harvey (22-Hr-534).

CERAMICS	**Ct.**	**Wt.**
Marksville Incised	1	6
var. Leist	1	6
Carrabelle Punctated	2	5
Weeden Island Incised	1	5
Unclass. Incised (grog)	1	2
Grog Tempered Plain	47	300
TOTAL CERAMICS	**53**	**324**
BONE ARTIFACTS		
Projectile Point	1	4
TOTAL BONE ARTIFACTS	**1**	**4**

Table B.12. Cultural materials, Unit 6, Harvey (22-Hr-534).

	Level 1 0-10 cm		**Level 2 10-20 cm**		**Level 3 20-30 cm**		**Level 4 30-40 cm**		**Level 5 40-50 cm**	
	Ct.	**Wt.**	**Ct.**	**Wt.**	**Ct.**	**Wt.**	**Ct.**	**Wt.**	**Ct.**	**Wt.**
CERAMICS										
Churupa Punctated	—	—	—	—	1	4	—	—	—	—
Marksville Incised	—	—	1	4	2	7	2	4	—	—
var. Leist	—	—	—	—	1	5	—	—	—	—
var. Yokena	—	—	4	26	—	—	—	—	—	—
Marksville Stamped										
var. Godsey	—	—	—	—	1	2	—	—	—	—
Unclass. Incised (grog)	—	—	2	4	—	—	—	—	—	—
(red painted)	—	—	—	—	1	6	—	—	—	—
Grog Tempered Plain	5	27	43	212	29	143	13	119	2	5
Fine Sand Tempered Plain	—	—	3	12	2	4	—	—	—	—
Fine Sand/Clay	—	—	—	—	*	5	—	—	—	—
TOTAL CERAMICS	**5**	**27**	**53**	**258**	**37**	**176**	**15**	**123**	**2**	**5**
LITHICS										
Unmodified Chert Cobbles	5	15	—	—	—	—	1	13	—	—
Unmodified Sandstone	*	5	—	—	—	—	—	—	—	—
TOTAL LITHICS	**5**	**20**	**—**	**—**	**—**	**—**	**1**	**13**	**—**	**—**

* = not applicable
Wt. = weight in grams

Table B.13. Cultural materials, Unit 1, Graveline Mound (22-Ja-503).

	Strata A/B		Stratum D		Auger/Surface	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS						
Churupa Punctated	—	—	1	—	—	—
Landon Red on Buff	—	—	4	—	—	—
(with black dots)	—	—	1	—	—	—
Unclass. Incised (grog)	—	—	2	—	—	—
Unclass. Punctated(grog)	1	—	1	—	—	—
Grog Tempered Plain	3	—	23	—	9	—
Fired Sand/Clay	*	122	*	73	—	—
TOTAL CERAMICS	**4**	**122**	**32**	**73**	**9**	**—**
LITHICS						
Primary Flake	—	—	6	—	—	—
Secondary Flake	—	—	1	—	—	—
Shatter	—	—	*	10	—	—
Core	—	—	1	25	—	—
Unmodified Stone	—	—	*	40	—	—
TOTAL LITHICS	**—**	**—**	**8**	**75**	**—**	**—**

* = not applicable
Wt. = weight in grams

Table B.14. Cultural materials, Pinola Unit 1, Singing River (22-Ja-520).

	Level 1 0-20 cm		Level 2 20-30 cm		Level 3 30-40 cm		Level 4 40-50 cm		Level 5 50-60 cm		Level 6 60-70 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS												
Barton Incised	—	—	—	—	—	—	—	—	3	17	—	—
Carter Engraved												
var. Shell Bluff	—	—	—	—	—	—	—	—	—	—	—	—
Coles Creek Incised	—	—	—	—	—	—	1	3	—	—	—	—
var. Mott	—	—	—	—	1	8	—	—	—	—	—	—
D'Olive Incised	—	—	1	15	1	39	—	—	—	—	—	—
Evansville Punctated												
var. Evansville	—	—	—	—	2	16	1	9	2	22	5	37
var. Rhinehart	—	—	—	—	—	—	—	—	—	—	—	—
(round punctation)	—	—	3	24	—	—	—	—	—	—	—	—
Kimmswick Fabric Impressed	—	—	—	—	—	—	—	—	—	—	—	—
Mazique Incised	—	—	—	—	—	—	1	15	—	—	—	—
Medora Incised	—	—	—	—	—	—	—	—	—	—	—	—
Moundville Incised	1	24	—	—	1	15	1	7	—	—	—	—
var. Snows Bend	—	—	—	—	—	—	1	21	—	—	—	—
Mulberry Creek Cord Marked	—	—	—	—	—	—	—	—	—	—	1	7
Parkin Punctated	—	—	—	—	—	—	—	—	—	—	1	6
Weeden Island Punctated	—	—	—	—	—	—	—	—	1	7	—	—
Winterville Incised	—	—	—	—	1	22	—	—	—	—	—	—
Unclass. Incised	—	—	—	—	—	—	—	—	—	—	—	—
(grog tempered)	—	—	3	33	2	15	2	7	1	9	—	—
(shell tempered)	—	—	2	18	1	18	—	—	2	15	—	—
(shell-grog tempered)	—	—	—	—	—	—	4	10	5	103	1	7
Unclass. Punctated												
(grog tempered)	—	—	—	—	—	—	—	—	—	—	1	5
(shell-grog tempered)	—	—	—	—	—	—	—	—	—	—	—	—
Unclass. Engraved (grog)	—	—	—	—	—	—	—	—	—	—	—	—
(shell-grog tempered)	—	—	—	—	—	—	—	—	—	—	—	—
Unclass. Red Painted (grog)	—	—	1	4	—	—	—	—	—	—	—	—
Fine Shell Tempered Plain	1	10	—	—	6	46	1	2	—	—	—	—
Coarse Shell Tempered Plain	19	61	72	368	88	334	68	327	49	304	40	172
Grog Tempered Plain	5	20	25	101	42	206	—	—	63	358	60	361
Shell-Grog Tempered Plain	4	17	1	13	1	10	—	—	28	222	28	275
Fine Sand Tempered Plain	—	—	—	—	1	10	—	—	—	—	—	—
Daub	—	—	—	—	*	15	—	—	—	—	—	—
Fired Coils	—	—	—	—	—	—	—	—	—	—	2	16
Hearth Fragments	—	—	—	—	—	—	—	—	—	—	—	—
Fired Clay/Sand	*	9	*	24	*	9	*	17	*	24	—	—
TOTAL CERAMICS	**30**	**141**	**108**	**600**	**147**	**763**	**80**	**418**	**154**	**1081**	**139**	**886**
LITHICS												
Chert Cobbles (heated)	*	15	—	—	—	—	—	—	—	—	—	—
Hammerstone	—	—	1	61	—	—	—	—	—	—	—	—
Unmodified Hematite	—	—	—	—	—	—	—	—	—	—	—	—
Unmodified Limonite	—	—	—	—	—	—	—	—	—	—	*	10
Unmodified Sandstone	—	—	—	—	*	4	*	22	*	25	*	21
Unmodified Siltstone	—	—	—	—	—	—	*	27	—	—	—	—
TOTAL LITHICS	*	**15**	**1**	**61**	*	**4**	*	**49**	*	**25**	*	**31**

* = not applicable; Wt. = weight in grams

	Level 7 70-80 cm		Level 8 80-90 cm		Level 9 90-100 cm		Level 10 100-110 cm		Level 11 110-120 cm		Level 12 B/L @ 120 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS												
Barton Incised	—	—	—	—	—	—	—	—	—	—	—	—
Carter Engraved												
var. Shell Bluff	—	—	—	—	1	9	—	—	—	—	—	—
Coles Creek Incised	1	4	—	—	—	—	—	—	—	—	—	—
var. Mott	—	—	—	—	—	—	—	—	—	—	—	—
D'Olive Incised	—	—	—	—	—	—	—	—	—	—	—	—
Evansville Punctated	—	—	—	—	—	—	—	—	—	—	—	—
var. Evansville	—	—	1	9	—	—	—	—	—	—	1	6
var. Rhinehart	1	5	—	—	—	—	—	—	—	—	—	—
(round punctation)	—	—	—	—	—	—	—	—	—	—	—	—
Kimmswick Fabric Impressed	—	—	—	—	2	20	—	—	1	25	—	—
Mazique Incised	—	—	—	—	—	—	—	—	—	—	—	—
Medora Incised	—	—	1	3	1	3	—	—	—	—	—	—
Moundville Incised	—	—	—	—	—	—	—	—	—	—	—	—
var. Snows Bend	—	—	—	—	—	—	—	—	—	—	—	—
Mulberry Creek Cord Marked	2	10	—	—	—	—	—	—	—	—	—	—
Parkin Punctated	—	—	—	—	—	—	—	—	—	—	—	—
Weeden Island Punctated	—	—	—	—	—	—	—	—	—	—	—	—
Winterville Incised	—	—	—	—	—	—	—	—	—	—	—	—
Unclass. Incised	—	—	—	—	—	—	—	—	—	—	—	—
(grog tempered)	1	19	1	11	5	117	—	—	—	—	—	—
(shell tempered)	—	—	—	—	1	3	—	—	—	—	—	—
(shell-grog tempered)	—	—	—	—	2	15	—	—	—	—	—	—
Unclass. Punctated	—	—	—	—	—	—	—	—	—	—	—	—
(grog tempered)	—	—	5	27	—	—	—	—	—	—	—	—
(shell-grog tempered)	—	—	—	—	—	—	18	250	9	57	2	9
Unclass. Engraved (grog)	—	—	—	—	—	—	1	7	—	—	—	—
(shell-grog tempered)	—	—	2	34	—	—	—	—	—	—	—	—
Unclass. Red Painted (grog)	—	—	—	—	—	—	—	—	—	—	—	—
Fine Shell Tempered Plain	—	—	—	—	—	—	—	—	—	—	—	—
Coarse Shell Tempered Plain	18	171	14	87	18	169	1	12	2	11	—	—
Grog Tempered Plain	56	374	39	369	146	1076	38	210	4	20	—	—
Shell-Grog Tempered Plain	19	222	24	215	28	317	5	79	3	3	—	—
Fine Sand Tempered Plain	—	—	—	—	—	—	—	—	—	—	—	—
Daub	—	—	*	1	*	2	—	—	—	—	*	1
Fired Coils	1	23	—	—	—	—	—	—	—	—	—	—
Hearth Fragments	—	—	—	—	1	388	—	—	—	—	—	—
Fired Clay/Sand	—	—	*	1	*	65	*	2	—	—	*	18
TOTAL CERAMICS	**99**	**828**	**87**	**757**	**205**	**2184**	**63**	**560**	**19**	**116**	**3**	**34**
LITHICS												
Chert Cobbles (heated)	*	—	—	—	—	—	—	—	—	—	—	—
Hammerstone	—	—	—	—	—	—	—	—	—	—	—	—
Unmodified Hematite	*	17	*	19	*	17	*	1	—	—	—	—
Unmodified Limonite	—	—	—	—	—	—	—	—	—	—	—	—
Unmodified Sandstone	—	—	—	—	—	—	—	—	—	—	—	—
Unmodified Siltstone	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL LITHICS	*	**17**	*	**19**	*	**17**	*	**1**	—	—	—	—

* = not applicable; Wt. = weight in grams

Table B.15. Cultural materials, Lewis Unit 1, Singing River (22-Ja-520).

	Level 1 0-30 cm		Level 2 30-40 cm		Level 3 40-50 cm		Level 4 50-60 cm		Level 5 60-70 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS										
Alligator Incised	—	—	—	—	—	—	1	3	—	—
Barataria Incised	2	4	—	—	—	—	—	—	—	—
Carthage Incised	—	—	1	23	—	—	—	—	—	—
D'Olive Incised	4	20	2	34	I	6	—	—	1	4
var. Armica	1	7	1	7	—	—	—	—	—	—
var. Dominic	4	20	1	29	—	—	—	—	—	—
Moundville Incised	13	57	11	48	—	—	2	9	—	—
var. Bottle Creek	1	7	1	4	—	—	1	3	—	—
var. Carrollton	—	—	—	—	2	12	—	—	—	—
var. Moundville	—	—	3	34	—	—	—	—	—	—
var. Singing River	12	46	4	10	1	1	—	—	—	—
var. Snows Bend	—	—	2	10	—	—	—	—	—	—
Mound Place Incised	3	28	7	42	6	58	3	21	1	8
Moundville Engraved	—	—	—	—	—	—	—	—	—	—
Pensacola Incised	2	12	2	7	2	26	2	10	—	—
var. Gasque	1	2	—	—	—	—	1	12	—	—
var. Moore	1	4	—	—	—	—	—	—	—	—
var. Pensacola	2	26	1	5	—	—	—	—	—	—
Shell-Tempered Incised	28	107	8	48	7	18	6	18	1	2
Grog-Tempered Plain	—	—	—	—	—	—	2	7	—	—
Fine Shell-Tempered Plain	18	48	34	99	4	13	9	20	1	1
Coarse Shell-Tempered Plain	270	1036	223	937	87	425	72	403	19	117
(with red pigment)	—	—	2	4	—	—	—	—	—	—
Ceramic Object	1	31	13	37	—	—	—	—	—	—
Fired Coil	—	—	—	—	—	—	—	—	—	—
Fired Sand/Clay	*	5	*	1	—	—	*	4	—	—
Daub	*	4	—	—	*	4	—	—	—	—
TOTAL CERAMICS	**363**	**1464**	**316**	**1379**	**110**	**563**	**99**	**510**	**23**	**132**
LITHICS										
Bifacial Thining Flake	1	2	—	—	—	—	—	—	—	—
Unmodified Sandstone	—	—	—	—	—	—	—	—	—	—
Unmodified Siltstone	1	4	—	—	—	—	—	—	—	—
TOTAL LITHICS	**2**	**6**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**

* = not applicable; Wt. = weight in grams

	Level 6 70-80 cm		Level 7 80-90 cm		Level 8 90-100 cm		Level 9 100-110 cm		Level 10 110-120 cm	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
CERAMICS										
Alligator Incised	—	—	—	—	—	—	—	—	1	1
Barataria Incised	—	—	—	—	—	—	—	—	—	—
Carthage Incised	—	—	—	—	—	—	—	—	—	—
D'Olive Incised	—	—	—	—	—	—	1	5	—	—
var. Armica	—	—	—	—	—	—	—	—	—	—
var. Dominic	—	—	—	—	—	—	—	—	—	—
Moundville Incised	—	—	1	4	—	—	—	—	1	4
var. Bottle Creek	—	—	—	—	—	—	—	—	—	—
var. Carrollton	—	—	—	—	—	—	—	—	—	—
var. Moundville	—	—	1	23	1	6	7	105	—	—
var. Singing River	—	—	—	—	—	—	—	—	—	—
var. Snows Bend	—	—	—	—	—	—	—	—	—	—
Mound Place Incised	—	—	2	7	—	—	—	—	—	—
Moundville Engraved	—	—	—	—	—	—	1	2	—	—
Pensacola Incised	—	—	—	—	—	—	—	—	—	—
var. Gasque	—	—	—	—	—	—	—	—	—	—
var. Moore	—	—	—	—	—	—	—	—	—	—
var. Pensacola	—	—	—	—	—	—	—	—	—	—
Shell-Tempered Incised	3	7	—	—	—	—	—	—	1	6
Grog-Tempered Plain	1	4	5	44	1	1	1	1	1	1
Fine Shell-Tempered Plain	—	—	—	—	—	—	2	4	—	—
Coarse Shell-Tempered Plain	18	136	65	394	38	208	59	428	32	360
(with red pigment)	—	—	—	—	—	—	—	—	—	—
Ceramic Object	—	—	—	—	—	—	—	—	—	—
Fired Coil	—	—	1	4	—	—	—	—	—	—
Fired Sand/Clay	—	—	—	—	—	—	—	—	—	—
Daub	—	—	—	—	—	—	—	—	—	—
TOTAL CERAMICS	**22**	**147**	**75**	**476**	**40**	**215**	**71**	**545**	**36**	**372**
LITHICS										
Bifacial Thining Flake	—	—	—	—	—	—	—	—	—	—
Unmodified Sandstone	1	3	—	—	—	—	—	—	—	—
Unmodified Siltstone	—	—	—	—	—	—	—	—	—	—
TOTAL LITHICS	**1**	**3**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**

* = not applicable; Wt. = weight in grams

Table B.16. Decorated pottery, Area A and Area B surface context (Mansfield and Lewis Collections), Singing River (22-Ja-520).

DECORATED CERAMICS:	Ct.
Area A	
Coles Creek Incised	
var. Hardy	1
Ponchartrain Check Stamped	
var. Pontchartrain	1
Moundville Incised	
var. Moundville	6
var. Bottle Creek	1
var. Singing River	2
Mound Place Incised	3
Leland Incised	2
Fatherland Incised	
var. Fatherland	1
Area B	
Pensacola Incised	
var. Gasque	1
Moundville Incised	2
TOTAL DECORATED CERAMICS	**20**

Table B.17. Decorated pottery, Singing River "Michelle Mound" (22-Ja-578), Tullis-Toledano Manor Collection.

DECORATED CERAMICS:	Ct.
Pensacola Incised	
var. Pensacola	5
var. Gasque	4
var. Jessamine	3
var. Perdido Bay	1
Moundville Incised	
var. Bottle Creek	1
var. Singing River	9
D'Olive Incised	
var. D'Olive	1
TOTAL DECORATED CERAMICS	**24**

Table B.18. Cultural materials, surface and disturbed contexts (Watkins Collection), Deer Island (22-Hr-500).

CERAMICS:	Ct.
D'Olive Incised	
var. D'Olive	3
var. Dominic	201
var. Mary Ann	11
var. Shell Banks	3
(single line)	23
(misc. curvilinear/rectilinear)	24
(hand, bone, skull)	4
Moundville Incised	
var. Bottle Creek	110
var. Carrollton	13
var. Moundville	31
var. Singing River	192
var. Snows Bend	354
Mound Place Incised	
var. McMillan	335
var. Walton's Camp	367
Pensacola Incised	
var. Gasque	153
var. Pensacola	118
var. Perdido Bay	6
var. Bear Point	1
Port Dauphin Incised *var. Port Dauphin*	2
Owens Punctated	1
Grace Brushed	1
Salt Creek Cane Impressed *var. Salt Creek*	X
Coarse Shell Tempered Plain	X
Fine Shell Temp Plain	X
TOTAL DECORATED CERAMICS	**1,953**

X = present, not counted

Table B.19. Native American ceramics, Old Spanish Fort/Krebs House (22-Ja-526), all provenience units, 1992 Excavations.*

DECORATED	Ct.
La Pointe Combed	17
Chickachae Combed (temperless)	2
Port Dauphin Incised	19
Chickachae Incised	12
Pensacola Incised	2
D'Olive Incised	1
Leland Incised	2
Gulf Historic Fineware	
Rectilinear Incised	14
Owens Punctated *var. Muir*	1
UNDECORATED	
Coarse Shell Tempered Plain	141
Gulf Historic Fineware	228
(with pigment)	96
Smoking Pipe Fragment	1
Ceramic Object	1
Fired Clay Coil	1
TOTAL CERAMICS	**538**

* Source: Hinks et al. 1993:82-99. For some categories, type names used in this study have been substituted for descriptive categories used in the source.

Table B.20. Native American ceramics, Old Spanish Fort/Krebs House (22-Ja-526), all provenience units, 1994 Excavations.*

DECORATED	Ct.
Chickachae Combed	3
Kemper Combed	15
Unspecified Combed	1
Grace Brushed	1
Leland Incised	1
Gulf Historic Fineware, incised	5
Gulf Historic Fineware, engraved	2
Owens Punctated *var. Muir*	1
UNDECORATED	
Coarse Shell-Tempered Plain	26
Gulf Historic Fineware	79
(with pigment)	104
TOTAL CERAMICS	**238**

* Source: Waskelkov and Silvia 1995:Appendix A. For some categories, type names used in this study have been substituted for descriptive categories used in the source.

Table B.21. Cultural materials, surface and disturbed contexts (Tullis-Toledano Manor Collection), Homestead (22-Ja-521, 22-Ja-645).

NATIVE CERAMICS	**Ct.**
French Fork Incised	1
Mulberry Creek Cord Marked	24
Salomon Brushed	1
Pontchartrain Check Stamped	
var. Pontchartrain	3
Port Dauphin Incised	4
Fine Shell-Tempered Plain	
var. (Gulf Historic fineware)	X
Coarse Shell-Tempered Plain	X
TOTAL NATIVE CERAMIC	**33**
OTHER	
Celt Fragment (greenstone)	1
Antler Tine Projectile Point	1
HISTORIC ARTIFACTS	
TIN-GLAZE EARTHENWARE	
Brown (Faience)	1
LEAD-GLAZE EARTHENWARE	
Red Paste, Transparent Glaze	1
White Paste, Brown/White Slip	1
Salmon Paste, Green Glaze	1
FINE EARTHENWARE	
Creamware, Undec.	1
Pearlware, Blue Transfer Print	1
Pearlware, Undec.	1
Whiteware, Undec.	1
IRON	
Square Nail	
(small)	1
(large)	1
GLASS	
Dark Olive-green Bottle Fragment	2
*Beads, drawn	
IIAI	2
Oval, Opaque Blue/White Stripe	1
TOTAL HISTORIC ARTIFACTS	**15**

* = glass bead typology from Brain 1979
X = present, not counted

Table B.22. Cultural materials, surface and disturbed contexts (Smith Collection), Homestead (22-Ja-645).

NATIVE CERAMICS	Ct.
Churupa Punctated	
var. Churupa	1
Coles Creek Incised	1
Port Dauphin Incised	4
Shell-tempered plain	
(Gulf Historic)	X
grog-tempered plain	X
TOTAL NATIVE CERAMICS	**6**
HISTORIC ARTIFACTS	
FINE EARTHENWARE	
Pearlware	3
IRON	
Kettle Fragment	2
Hoe Head	1
Chisel	1
Ax Head Fragment	1
"Rosehead" Spikes	3
"Rosehead" nails	
(Small)	3
(Large)	4
Misc. Square Nails	17
Indet. Nails	3
BRASS	
Elliptical Fragment (Epaulet?)	1
Musket Trigger Guard	1
Cut Triangular Object	1
Cut Kettle Fragment (Tinkler)	13
Cast Bell	
(key type, flower key)	1
Melted Lumps	2
LEAD	
Musket Balls	2
Melted Lumps	2
GLASS	
Dark Olive-green Bottle Fragment	2
*Bead, drawn	
IIBIO	1
IIA6	2
IIA3	1
IIB2	1
IIB3	1
IIA1	2
Bead, Wire-wound	
WIIA3	1
OTHER	
Gunflint, blonde	1
TOTAL HISTORIC ARTIFACTS	**75**

* = glass bead typology from Brain 1979
X = present, not counted

Appendix C: Fishing on the Mississippi Coast – Vertebrate Faunal Remains

Joseph D. Jewell

The vertebrate faunal materials from the Godsey site (22-Hr-591) and the Singing River site (22-Ja-520) add to a small but growing body of data on prehistoric subsistence practices in the Mississippi Sound region. Our purpose here is not merely to quantify the seemingly obvious: that foods from the fecund waters of the Mississippi coast sustained the peoples who once lived there. Instead, the faunal analysis is a necessary prerequisite to broader questions: were prehistoric coastal societies different from their interior counterparts? If so, how did coastal subsistence practices shape long-term cultural developments? Did subsistence practices remain unchanged through a 1000 year interval, reflecting a stable, centuries-old adaptation to littoral resources? Given that significant changes in faunal exploitation have been detected among interior Mississippian peoples after the advent of maize intensification ca. A.D. 1000 (e.g., Scott 1983; Blitz 1993:36–44), was this also the case for coastal Mississippian populations? Faunal remains from the Godsey and Singing River sites provide an opportunity to examine subsistence practices before and after southeastern maize intensification, in a coastal setting where the economic importance of maize remains uncertain.

In this appendix, vertebrate faunal remains from the two sites are identified, quantified, and compared in order to identify temporal patterns, the season of site occupation, and the technological means by which the foods were procured. Only four previous reports on prehistoric faunal remains from Mississippi Sound sites are available, all brief or preliminary: the Poverty Point-affiliated Claiborne site (22-Ha-501) (Henebry 1983; Smith 1985); the multicomponent Diamondhead site (22-Ha-550) (Jackson et al. 1993); and the Graveline phase Harvey site (22-Ha-534) (Greenwell 1986).

The vertebrate remains from the Godsey site and the Singing River site allow examination of both Middle Woodland period and Initial to Mature Mississippi period subsistence practices. The Godsey site, described in Chapter 4, is a late Middle Woodland period earth-shell midden of the Godsey phase (A.D. 200–400) (Blitz et al. 1993). Five one-gallon samples were collected from the Godsey Unit 2 excavation levels and the contents of seven features were examined (Table C.1). The Singing River site, discussed in Chapter 6, consists of a badly damaged mound and an associated earth-shell midden. Two discrete occupational phases were identified (Blitz and Mann 1993). The Initial or Early Mississippi period Pinola phase (A.D. 1200–1350) was represented by deposits

Table C.1. Provenience of faunal samples.

Godsey Site	Singing River Site	
Godsey Phase	**Pinola Phase**	**Singing River Phase**
1. 20-30 cm level	1. 30-40 cm level	1. 00-30 cm level
2. 30-40 cm level	2. 40-50 cm level	2. 30-40 cm level
3. 40-50 cm leve	3. 50-60 cm level	3. 40-50 cm level
4. 50-60 cm level	4. 60-70 cm level	4. 50-60 cm level
5. 60-70 cm level	5. 70-80 cm level	5. 60-70 cm level
6.*70-75 cm level	6.*80-90 cm level	6. 70-80 cm level
7.*75-95 cm level	7. 90-100 cm level	7. 80-90 cm level
Features:3, 4, 5, 6, 7, 8, and the SW CornerFeature	8. 100-110 cm level	8. 90-100 cm level
	9. 110 cm level	9.*100-110 cm level
		10. 110-120 cm level
		11. 120 cm level

* No sample was taken at this level

in Pinola Unit 1. Eight one-gallon samples were retrieved from excavation levels in Pinola Unit 1 (Table C.1). Mature Mississippi period Singing River phase (A.D. 1350–1550) materials were identified in Lewis Unit 1. Ten one-gallon samples were secured from this unit (Table C.1). This report discusses faunal materials recovered from all one-gallon samples and the seven features from the Godsey site.

Materials and Methods

Faunal remains were recovered in matrix samples taken from 10 cm levels at each site. In each sampled level, deposits were removed at random points across the unit floor. Samples were floated and separated into shell, botanical, and faunal materials (Watson 1976:78). The faunal materials were then screened through 1/8-inch mesh. All faunal remains greater than 1/8-inch were analyzed. Remains less than 1/8-inch consisted of highly fragmented fish bones. Because the samples less than 1/8-inch yielded few identifiable bones, they were not analyzed. Faunal remains were also caught in the 1/8-inch hand screens, removed, and bagged, but they were not analyzed for this report (see Jewell 1997).

Of the two sites, the Godsey site produced the smaller sample. Materials from the Godsey site numbered 2404 specimens and weighed 95.7 g. Despite the small sample size, the Godsey site yielded 53 individuals (Table C.2). In contrast, the Singing River site produced the majority of the bone analyzed. Faunal remains from the Singing River site, Pinola phase, numbered 7291 fragments, weighed 383.7 g, and represents the remains of at least 65 individuals (Table C.3). Total faunal materials from the Singing River site, Singing River phase, numbered 8168 fragments and weighed 273.2 g. At least 55 individuals are present in this sample (Table C.4).

Preservation of faunal materials was generally good. However, most of the bone material was extremely fragmented. High fragmentation of bone can, in part, be attributed to compaction over time of the earth-shell matrix. Approximately 88% of the faunal material from the Godsey site (number of identified specimens or NISP=2109), 92% from the Pinola phase (NISP=6701), and 91% from the Singing River phase (NISP=7449), was identifiable only to taxonomic class due to fragmentation. The only observed bone modification was burning (Table C.5). Approximately 18.4% of the faunal material from the Godsey site, 14.7% from the Pinola phase, and 5.6% from the Singing River phase exhibited signs of burning.

All faunal materials were analyzed using standard zooarchaeological methods. Bone identifications were made by comparing identifiable archaeological faunal material to skeletons in the author's comparative collection or in collections at the University of Southern Mississippi archaeological laboratory. The identification of several bones from the Godsey site were corroborated by Elizabeth Reitz and Dan Weinand of the zooarchaeological laboratory at the University of Georgia Museum of Natural History. Data gathered during analysis included element, symmetry, charring or other modification, the presence of age-related structures, bone count, and weight. For fish, size was also determined. Each identifiable element was compared to a series of skeletons of that taxon to determine the approximate length of the individual, estimated in 10 cm (or larger) increments. Standard length estimates were used for all species. Length data on larger individuals, which had no equivalent in the comparative collections, were estimated.

Several quantitative techniques were used to summarize data: bone count or number of identified specimens (NISP), minimum number of individuals (MNI), and bone weight. For each excavation unit, MNI was calculated by combining faunal materials from all proveniences. Combining the samples for analysis is appropriate because there did not appear to be more than one cultural component represented in any of the three excavation unit samples. Although excavation levels and features have been combined at the Godsey site, feature data have been listed separately (Table C.6).

In calculating MNI, paired elements, age, and fish size were taken into account. The association

Table C.2. Godsey Phase faunal remains, Godsey (22-Hr-591). Domestic chicken represents an intrusive element from the SW corner feature and is therefore not included in the totals.

SPECIES	NISP	% NISP	MNI	% MNI	Weight	% Weight
UID Fish	2080(364)	86.52	—	—	51.8	54.13
Lepisosteidae (Gar Family)	31(8)	1.29	1	1.89	3.7	3.87
Ariadae (Sea Catfishes)	101(28)	4.20	—	—	6.3	6.58
Bagre marinus (Gaftop Catfish)	9(1)	0.37	1	1.89	0.7	0.73
Arius felis (Hardhead Catfish)	46(10)	1.91	11	20.75	6.8	7.11
Archosargus probatocephalus (Sheepshead)	32(15)	1.33	4	7.55	6.3	6.58
Micropogonias undulatus (Atlantic Croaker)	10(2)	0.42	6	11.32	1.1	1.15
Pogonias cromis (Black Drum)	4(3)	0.17	1	1.89	0.5	0.52
Sciaenops ocellatus (Red Drum)	8(0)	0.33	3	5.66	1.0	1.04
Cynoscion sp. (Sea Trouts)	24(4)	1.00	10	18.87	3.9	4.08
Mugilidae (Mullet Family)	22(2)	0.92	6	11.32	1.7	1.78
Bothidae (Lefteye Flounder Family)	1(0)	0.04	1	1.89	0.3	0.31
UID Turtle	9(4)	0.37	2	3.77	2.1	2.19
Kinosternidae (Mud/Musk Turtle Family)	3(0)	0.12	1	1.89	0.7	0.73
Terrapene carolina (Eastern Box Turtle)	1(0)	0.04	1	1.89	0.1	0.10
UID Bird	2(0)	0.08	1	1.89	0.1	0.10
UID Small Mammal	1(0)	0.04	1	1.89	0.1	0.10
UID Large Mammal	17(0)	0.71	2	3.77	6.4	6.69
Odocoileus viriginianus (White-tailed Deer)	3(2)	0.12	1	1.89	2.1	2.19
TOTALS	**2404(443)**		**53**		**95.7 g**	
Gallus gallus (Domestic Chicken) 60-70 cm below surface	1(0)	—	1	—	5.53 g	—

Table C.3. Pinola Phase faunal remains, Singing River (22-Ja-520).

SPECIES	NISP	% NISP	MNI	% MNI	Weight	% Weight
UID Fish	6664(977)	91.04	—	—	238.0	62.03
Rajiformes (Skate/Shark)	2(0)	0.03	1	1.54	0.2	0.05
Lepisosteidae (Gar Family)	76(19)	1.04	1	1.54	10.6	2.76
Ariadae (Sea Catfishes)	63(8)	0.86	—	—	9.1	2.37
Bagre marinus (Gaftop Catfish)	16(0)	0.22	3	4.62	6.6	1.72
Arius felis (Hardhead Catfish)	13(2)	0.18	5	7.69	2.9	0.76
Archosargus probatocephalus (Sheepshead)	23(3)	0.32	3	4.62	5.2	1.36
Sciaenidae (Drum Family)	8(2)	0.11	—	—	2.3	0.60
Micropogonias undulatus (Atlantic Croaker)	15(1)	0.21	9	13.85	2.0	0.52
Pogonias cromis (Black Drum)	75(22)	1.03	5	7.69	28.4	7.40
Sciaenops ocellatus (Red Drum)	27(1)	0.37	6	9.23	14.9	3.81
Cynoscion sp. (Sea Trouts)	4(1)	0.05	3	4.62	1.0	0.26
Mugilidae (Mullet Family)	259(26)	3.55	17	26.15	18.6	4.85
Bothidae (Lefteye Flounder Family)	1(0)	0.01	1	1.54	0.1	0.03
UID Turtle	5(4)	0.07	1	1.54	1.2	0.31
UID Marine Turtle	13(0)	0.18	1	1.54	19.3	5.03
Chrysemys/Pseudemys (Pond/Marsh Turtles)	1(0)	0.01	1	1.54	4.0	1.04
UID Frog	2(0)	0.03	1	1.54	0.6	0.16
UID Bird	6(0)	0.08	2	3.08	0.9	0.23
Sciurus carolinensis (Gray Squirrel)	1(1)	0.01	1	1.54	0.1	0.03
c.f. Sciurus	1(0)	0.01	1	1.54	0.1	0.03
Sylvilagus floridanus (Eastern Cottontail Rabbit)	1(1)	0.01	—	—	0.3	0.08
UID Mammal	1(0)	0.01	1	1.54	0.3	0.08
UID Large Mammal	10(3)	0.14	1	1.54	1.8	0.47
Odocoileus virginianus (White-tailed Deer)	4(0)	0.05	1	1.54	15.2	3.96
TOTALS	**7291(1071)**		**65**		**383.7 g**	

between calculated MNI values from these sites and the actual individuals represented is not known and is probably unknowable. Unlike values for bone count and weight, which are absolute and unchanging regardless of how data are manipulated, calculations of MNI vary according to how analytical units are defined for a site. For the Godsey and Singing River site test units, each having one discrete cultural component, definition of analytical units is relatively straightforward. All proveniences from each excavated 2 x 2 m unit were combined to produce a grouping of data used to calculate MNI figures. This grouping of proveniences has probably served to depress MNI values (Scott 1995:244–246).

An important drawback of MNI calculations is that they are, by definition, minimums. The actual number of individuals lies somewhere between NISP and MNI for each taxon. Because frequently ex-

Table C.4. Singing River Phase faunal remains, Singing River (22-Ja-520).

SPECIES	NISP	% NISP	MNI	% MNI	Weight	% Weight
UID Fish	7401(417)	90.61	—	—	143.7	52.60
Rajiformes (Skate/Shark)	10(0)	0.12	1	1.82	0.9	0.33
Lepisosteidae (Gar Family)	130(13)	1.59	2	3.64	12.1	4.43
Ariadae (Sea Catfishes)	192(4)	2.35	—	—	12.9	4.72
Bagre marinus (Gaftop Catfish)	84(1)	1.03	3	5.45	17.4	6.37
Arius felis (Hardhead Catfish)	26(0)	0.34	2	3.64	3.4	1.24
Archosargus probatocephalus (Sheepshead)	29(0)	0.36	3	5.45	4.9	1.79
Sciaenidae (Drum Family)	9(0)	0.11	—	—	1.2	0.44
Micropogonias undulatus (Atlantic Croaker)	16(0)	0.20	8	14.55	2.2	0.81
Pogonias cromis (Black Drum)	39(3)	0.48	6	10.91	5.7	2.09
Sciaenops ocellatus (Red Drum)	8(0)	0.10	3	5.45	1.3	0.48
Cynoscion sp. (Sea Trouts)	9(1)	0.11	3	5.45	0.9	0.33
Mugilidae (Mullet Family)	156(7)	1.91	14	25.45	10.2	3.73
UID Reptile	2(0)	0.02	1	1.82	0.4	0.15
Alligator mississippiensis (Alligator)	5(0)	0.06	1	1.82	28.2	10.32
UID Turtle	20(1)	0.24	1	1.82	3.9	1.43
Terrapene carolina (Eastern Box Turtle)	4(0)	0.05	1	1.82	14.4	5.27
UID Lizard	2(0)	0.02	1	1.82	0.2	0.07
Colubridae (Snake Family)	2(0)	0.02	1	1.82	0.1	0.04
UID Frog	2(0)	0.02	1	1.82	0.2	0.07
UID Bird	2(0)	0.02	1	1.82	0.2	0.07
UID Small Mammal	3(1)	0.04	1	1.82	0.4	0.15
UID Large Mammal	17(11)	0.21	1	1.82	8.4	3.07
TOTALS	**8168(459)**		**55**		**273.2 g**	

Table C.5. Burnt bone.

SITE	NISP(Burnt)	% Burnt
Godsey Site (22HR591) — Godsey Phase	2404(443)	18.43
Singing River (22JA520) — Pinola Phase	7291(1071)	14.70
Singing River site (22JA520) — Singing River Phase	8168(459)	5.62

Table C.6. Godsey Phase faunal remains from features, Godsey (22-Hr-591).

Provenience	Species Name	NISP (Burnt)	Weight (g)	MNI
Feature #3	Unidentifiable Fish Fragments	38(5)	0.8	N/A
	Arius felis	7(2)	0.7	2
	Cynoscion	2(1)	0.3	1
Feature #4	Unidentifiable Fish Fragment	32(2)	0.5	N/A
	Lepisostidae	1(0)	0.1	1
	Pogonias cromis	1(0)	0.1	1
	Mugilidae	1(0)	0.1	1
	Unidentifiable Large Mammal	4(0)	0.9	1
Feature #5	Unidentifiable Fish Fragment	61(8)	1.3	N/A
	Aridae	1(0)	0.1	1
	Micropogonias undulatus	1(0)	0.2	1
	Mugilidae	1(0)	0.1	1
Feature #6	Unidentifiable Fish Fragment	51(9)	1.1	N/A
	Aridae	1(0)	0.1	1
	Archosargus probatocephalus	1(0)	0.1	1
	Sciaenops ocellatus	2(0)	0.1	2
	Cynoscion	3(0)	0.9	2
Feature #7	Unidentifiable Fish Fragment	55(14)	0.9	N/A
	Homo sapiens sapiens	1(0)	0.5	1
Feature #8	Unidentifiable Fish Fragments	78(9)	1.7	N/A
	Lepisostidae	18(0)	2.4	1
	Bagre marinus	1(0)	0.1	1
	Archosargus probatocephalus	5(1)	0.1	1
	Micropogonias undulatus	1(0)	0.2	1
	Cynoscion	1(0)	0.1	1
SW Corner Feature	Unidentifiable Fish Fragments	740(353)	23.9	N/A
	Lepisosteidae	3(0)	0.1	1
	Aridae	31(28)	2.3	N/A
	Arius felis	11(11)	2.7	6
	Archosargus probatocephalus	1(0)	1.2	1
	Sciaenidae	4(0)	0.3	N/A
	Micropogonias undulatus	17(15)	2.7	10
	Pogonias cromis	1(0)	0.3	1
	Cynoscion	6(5)	0.6	3
	Mugilidae	7(1)	1.6	2
	Unidentifiable Turtle	3(0)	0.9	1
	Gallus gallus	107(2)	16.6	1
	Unidentifiable Small Mammal	2(0)	0.1	1
	Unidentifiable Large Mammal	5(3)	1.6	1
	Odocoileus virginianus	1(0)	2.3	1

ploited species, at least theoretically, should be better represented in an archaeological deposit, more individuals may be concealed by MNI values for more commonly exploited species (see Grayson 1979). Certain species are undoubtedly under-represented in the archaeological record at these two sites because of fragility or chance, whereas others are disproportionately better represented because they possess durable or distinctive elements, such as the pharyngeal dental plates of drum fish (Curren 1978:37).

Because of these methodological shortcomings, much of the following analysis will rely on patterns discernable in bone count (NISP) and weight data. However, minimum number of individuals is used to monitor changes in fish exploitation through time. Although subject to the biases outlined above, fish

MNI has the advantage of accounting for differential sizes of individuals in the sample (Scott 1995:246).

The Faunal Samples

The analyzed faunal remains from the Godsey and Singing River sites consist of a few terrestrial taxa coupled with an abundance of marine fish. With the isolated exception of a single, porous chicken bone at the Godsey site, there was no evidence of leaching in the samples. Even delicate fish bones were well preserved. Because of good preservation, it is likely that any differential distribution of bone in these sites is the result of aboriginal depositional patterns rather than differential preservation.

The isolated chicken bone from the Godsey site, recovered from 60–70 cm below surface, represents an intrusion presumably related to the SW corner feature, which produced additional historic remains. This intrusive historic feature was isolated and pedestaled. The rest of the unit was then excavated down to sterile soil (Blitz et al. 1993:16–23). It is possible that the one gallon random sample was taken near this feature or that the chicken bone was translocated via bioturbation into the associated level. A near complete chicken skeleton, excluding the skull, was recovered in the feature. During excavation, the SW corner feature first became visible at 70–75 cm below surface and terminated at 95 cm below surface. The SW corner feature was essentially the same color as the upper midden deposit and was not detected until the unit was excavated to a level where surrounding soil contrasted enough for it to stand out. It is possible that the SW feature represents a continuation of the historic disturbance that occurred in the adjacent Godsey unit 1. The historic SW corner feature was excluded from the combined data because of potential mixing.

Although over twenty species are represented in the archaeological record at these two sites, marine fish remains dominate the faunal assemblages from both sites overwhelmingly. As is the case with other archaeological sites on the Gulf Coast (e.g., Curren 1976, 1978; Jackson et al. 1993), these fish are primarily members of the sea catfish and drum families, but include sharks, rays, sheepshead, mullets, and flounders. By weight, marine fish comprise approximately 88% of the Godsey phase samples, 89% of the Pinola phase samples, and 80% of the Singing River phase samples. At the Godsey site, mammal is the second most abundant taxon followed by reptile/amphibian, and bird. In the Pinola and Singing River phase samples, the reptile/amphibian taxon was the next most common, followed by mammal, and finally bird (Figure C.1).

Marine fish bones number 2,368 in the Godsey phase samples, 7,246 in the Pinola phase samples, and 8,109 in the Singing River phase samples. The eleven fish species, representing more than 80% of the faunal remains, are nearshore marine fish and do not include any offshore pelagic species (e.g., Cobia). Most of the marine fish species represented are catfish, drums, and mullet, which typically accumulate in large schools in shallow waters near the shoreline during the warmer months (early spring through late fall). The faunal samples also include small quantities of gar, shark/skate, sheepshead, and flounder.

Sea catfishes are common in estuary environments. The hardhead catfish is more abundant than the larger gafftop and tolerates a greater salinity range. Sea catfishes are present inshore year-round, although most leave during cold weather. Members of the drum family (*Sciaenidae*) are abundant in Mississippi Gulf Coast waters and are usually the most common marine fish at Gulf Coast archaeological sites (Curren 1976, 1978). Two species of mullet are found along the Gulf Coast: striped mullet and white mullet. Striped mullet spawn from September through April; white mullet spawn between March and September. The only freshwater fish taxa in these archaeological samples, gar, tolerate considerable salinity and are commonly found in coastal estuary settings. The dominance of marine fish at both of these sites clearly indicates that subsistence practices were directed toward procurement of littoral resources (cf. Curren 1976, 1978).

Based on percent bone weight, two temporal trends are detectable. First, there appears to be a

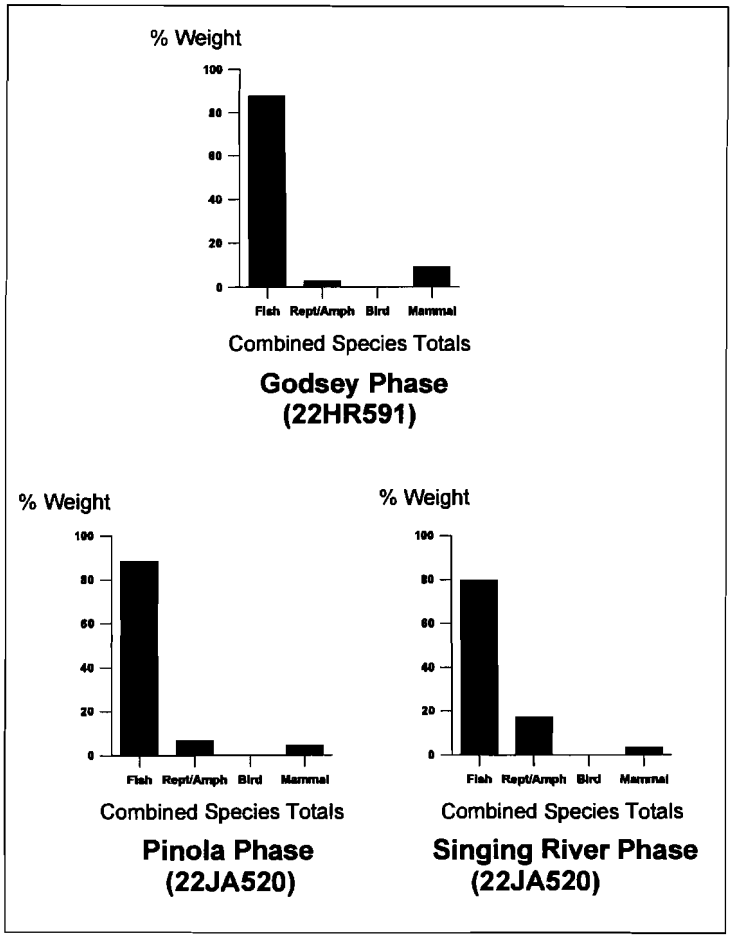


Figure C.1. Combined species totals: Godsey, Pinola, and Singing River Phase samples.

slight decrease in large mammal through time. At the Godsey site, mammals comprise 8.9% of the total sample, versus 4.6% in the Pinola phase, and 3.2% in the Singing River phase. At the Singing River site, where habitat conditions remain constant, mammal decreases over time, with the earlier Pinola phase having almost twice as much, by percent MNI, as the later Singing River phase. It is possible that the decrease in importance of mammal over time reflects territorial constriction due to increased regional population (e.g., Scott 1992:423–424), a constriction that may have stimulated increased emphasis on marine procurement. Of course, the actual importance of mammal at the two sites is difficult to evaluate because of small sample size.

The second apparent trend is a relative increase in reptile/amphibian through time, although again the significance of these minor differences is difficult to evaluate because of small sample size. Of interest is the occurrence of marine turtle in the Singing River site Pinola phase samples (Table C.3). Based on samples from the Diamondhead site (22-Ha-550), Jackson et al. (1993) suggested a greater emphasis on the procurement of marine turtle and alligator during the Mississippi period. At the Singing River site, the Mississippi period samples produced marine turtle and alligator, and neither were present in samples from the Godsey site. Perhaps this is a regional Mississippian trend, a narrowing of the food spectrum in late prehistory to focus on these species.

The Godsey and Singing River sites are located in similar, but slightly different environments. The Godsey site is on Mississippi Sound. The Singing River site is located at the Pascagoula River mouth. However, both are in the immediate vicinity of drowned river valley estuaries (Biloxi Bay, Pascagoula Bay). Such estuaries are more productive than adjacent offshore or freshwater areas because they trap nutrients and often have year-round photosynthesis (Odum 1971:354–357). Intertidal and adjacent shallow waters serve as nursery areas for a large number of organisms, further enhancing the natural richness of these ecosystems. Both site catchments contain the same resources, but the Pascagoula estuary has a much larger volume of these resources (Steele and Perry 1990), particularly marine fish.

In undisturbed estuary systems, shallow subtidal areas provide essential nursery habitat for most of the species present archaeologically (Table C.7). Marine drums (Atlantic Croaker, Black Drum, Red Drum), and the Sea Trouts are the most common

species present in the archaeological record at both sites. All of these species are commonly found nearshore and are easily exploited year-round. Most, if not all marine fish are influenced dramatically by salinity and water temperature (Gunter 1961:182–190). This is particularly true of the drum family. Drums tolerate a wide range of salinities and water temperature, but extreme lows or highs in these two parameters may cause drum to move to deeper areas of the estuary, deeper waters offshore, or areas that have more moderate conditions. All members of the drum family have life cycles that are tethered to coastal estuaries. Most drums in the Gulf of Mexico spawn offshore in winter. Larval forms migrate inshore to the nutrient-rich estuarine environment where they grow rapidly, usually attaining a length of 10–25 cm by the end of the first year (GSMFC 1993; Thomas et al. 1988:29).

Numerous species of freshwater fish are available within two miles of the Godsey site and within one mile of the Singing River site. However, none are represented in the archaeological samples. Two species represented in the sample, gar and mullet, tolerate and move between brackish and freshwater environments and thus do not necessarily indicate procurement from freshwater. The dominance of marine fish at both sites clearly indicates that subsistence practices were directed toward exploitation of coastal ecosystems and, more specifically, the use of immediate shoreline resources.

Fish Size

Establishing the size of fish species represented in the samples is a prerequisite step toward addressing such concerns as procurement practices and seasonality of site occupation. Problems of identification and sizing of archaeological fish remains have been widely treated in the literature (Barnett 1978; Casteel 1976; Wing and Brown 1979). To infer additional information, fish bones were sorted according to size range (Table C.8). Using NISP values, most of these bones consisted of vertebrae, although all other elements that could be sized were considered. Potential biases include a wide variation in vertebral numbers between and within the families present. Biases associated with using vertebrae exclusively for sizing was minimized by using other elements. Next, the bones were grouped in 20 cm categories. Because larger fish can have bones that crosscut the 20 cm categories, the smaller the size category the more accurate these data are. More than 95% of these bones from both sites are from fish less than 40 cm standard length. It is therefore likely that these bones accurately represent the size categories they are grouped into. Additionally, the 00–20 cm category was subdivided into 00–10 and 10–20 cm (Table C.8). This was done to further discriminate any possible trends.

Approximately 69.4% of bones from the Godsey site are in the 00–20 cm category. This drops to 4.6% in the Pinola phase sample, and rebounds to 38.1% in the later Singing River phase sample. The 20–40 cm category constitutes 30.2% of the Godsey phase sample, 91.5% in the Pinola phase sample, and 58.7% in the Singing River phase sample. These two categories (00–20 and 20–40 cm) contain more than 95% of sizeable bone (Figure C.2). The Godsey site size ranges reflect the greatest preference for smaller size classes of fish. The Singing River site has a larger percentage of 20–40 cm fish, particularly during the Pinola phase. The source of the trend may be in the 00–10 cm category: 42.1% of the Godsey site fish bone falls within this category, whereas it comprises only 1.9% in the Pinola phase, and 7.4% in the Singing River phase (Figure C.2). This size trend may reflect the practice of fishing in the spring and early summer as fish larvae were moving into the estuary and beginning to grow.

Determination of the seasonality of site occupation has proven to be a difficult task with this assemblage, partly because of the small sample size, and partly because diagnostic seasonal indicators are rare among the fauna represented. Most of the species represented in these samples were available all year-round, even if their abundances or accessibility varied seasonally. When seasonality is suggested on the basis of relative resource availability,

Table C.7. Fish spawning and size data.

Species Name	Spawning	Spawning Location	Maximum Size First Year
1. Gar (Lepisosteidae)	Not Available	Inshore — Coastal Rivers and Streams	Not Available
2. Hardhead Catfish	May through August	Mainland nearshore estuarine waters and outlets, open Mississippi Sound, Barrier Island nearshore waters and island passes	15-20 cm
3. Gafftop Catfish	May through August	Mainland nearshore estuarine waters and outlets, open Mississippi Sound, Barrier Island nearshore waters and island passes	15-20 cm
4. Sheepshead	January through March	Open Gulf of Mexico waters	15-30 cm
5. Atlantic Croaker	September through April	Barrier Island nearshore waters and island passes, open Gulf of Mexico waters	10-15 cm
6. Black Drum	February through March	Mainland nearshore estuarine waters and outlets, open Mississippi Sound, Barrier Island nearshore waters and island passes, open Gulf of Mexico waters	15-25 cm
7. Red Drum	August through December	Barrier Island nearshore waters and island passes, open Gulf of Mexico waters	20-35 cm
8. Spotted Seatrout	March through October	Open Mississippi Sound and Barrier Island nearshore waters and island passes	10-20 cm
9. White Seatrout	March through October	Barrier Island nearshore waters and island passes, open Gulf of Mexico waters	10-20 cm
10. Striped Mullet	October through March	Barrier Island nearshore waters and island passes, open Gulf of Mexico waters	10-20 cm
11. White Mullet	April through September	Barrier Island nearshore waters and island passes, open Gulf of Mexico waters	10-20 cm
12. Flounder (Bothidae)	September through March	Open Gulf of Mexico waters	10-20 cm

which in this case is greatest during the warmer months of the year, it is easy to demonstrate a spring/summer presence. However, such findings cannot confirm a winter absence, suggesting that such markers may not accurately pinpoint the season of occupation (Monks 1981:180–184).

Seasonal differences exist today in the abundance and size range of marine fish species near the two sites. While individuals can be caught year-round, most of the species represented in the archaeological record spawn offshore during the winter; larval forms then move to shallow estuary environments and remain there in the subadult stage of development. While inshore, these subadults are abundant and easily caught.

Within these samples there are indications for seasonality based on two factors: spawning season and fish size data. The spawning season of the represented species indicates the time of year they were captured. Catfish spawn during the summer months, May through August, near mainland nearshore waters and the open Mississippi Sound (Table C.7). They were most likely captured during the summer. Most drum species spawn in early spring through late fall. Spawning locations are usually offshore, in barrier island nearshore waters and passes and in open Gulf waters (Table C.7). Once spawning is complete, larvae move inshore to shallow estuarine waters. It is during this time that they are easily captured. Thus there is some indication for an early to late spring/summer and possible fall occupation. Evidence is less clear for a winter occupation of these sites. Several marine fish present in these samples, such as the Atlantic

Table C.8. Fish Size.

SIZE RANGE	NISP	% NISP
Godsey Site (22HR591) — Godsey Phase		
00-10 cm	236	42.1
10-20 cm	153	27.3
00-20 cm	389	69.4
20-40 cm	169	30.2
40-60 cm	2	00.4
	560	
Singing River Site (22JA520) — Pinola Phase		
00-10 cm	26	01.9
10-20 cm	35	02.6
00-20 cm	61	04.6
20-40 cm	1221	91.5
40-60 cm	46	03.4
>120 cm	6	00.5
	1334	
Singing River Site (22JA520) — Singing River Phase		
00-10 cm	101	07.4
10-20 cm	421	30.8
00-20 cm	522	38.1
20-40 cm	803	58.7
40-60 cm	36	02.6
60-80 cm	8	00.6
	1369	

Croaker and Gafftop Catfish, are notoriously absent during winter months (McClane 1978:83,119).

Fish size data have seasonal implications. The majority of fish species in the samples are within the maximum size range for first year growth (Table C.7). These fish tend to school in age classes in shallow estuary waters near both sites. The majority of the Godsey site fish are in the 00–20 cm category; this size suggests site occupation in early spring when juvenile fish are first entering the estuaries. It is possible the Godsey site served as a recurrent but seasonal residential site for early spring/summer fishing and shellfish gathering. The majority of Pinola phase fish are in the 20–40 cm category (Figure C.2), which suggests site occupation in the early summer after these species have begun to grow. The Singing River phase samples have large amounts of fish in both the 00–20 and 20–40 cm categories (Figure C.2). This suggests that, at least during this phase, the Singing River site was occupied earlier in the year and for a longer period of time.

Invertebrates have not been quantified or analyzed for this report. Some of the species noted in the samples include the eastern oyster (*Crassostrea virginica*), the common marsh clam (*Rangia cuneata*), and the blue crab (*Callinectes sapidus*). Oysters and marsh clams are predominant in Mississippi Sound shell middens, but other marine shells are also present. Growth-ring studies of oyster or rangia shells can be particularly helpful in determining seasonality, but there have been few such studies on the northern Gulf Coast. In one example, Claassen (1986) determined that at two Mississippian sites on Escambia Bay, shellfish were procured in late summer and fall.

Procurement Technology

Although proportions vary, the actual size range and species compositions of the samples from the Godsey and Singing River sites are similar. The exception to this statement is the preponderance of 0–10 cm fish in the Godsey site sample. The presence of similar species and size ranges suggest little difference in procurement technologies from these sites over time. Yet, despite all of the evidence for marine exploitation, no artifacts have been identified from either of these two sites that would illuminate just how these resources were captured.

Most of the fish in the samples from both sites came from shallow estuary or shoreline areas. These nearshore areas are particularly suited for capturing fish with nets. Many of the fishes in the archaeological samples are so small that it is most likely that nets or small traps were used to acquire them (Colley and Jones 1987:70; Strandberg and Tomlinson 1969:313–318; Weinstein 1992:199). Attenbrow and Steele (1995) have argued that specific fishing methods will result in the capture of fish of a particular species and of specific sizes. Fixed gill nets select smaller fish, particularly in comparison with those fish expected to be caught by the use of seine nets. Tidal traps (e.g., drum nets) cap-

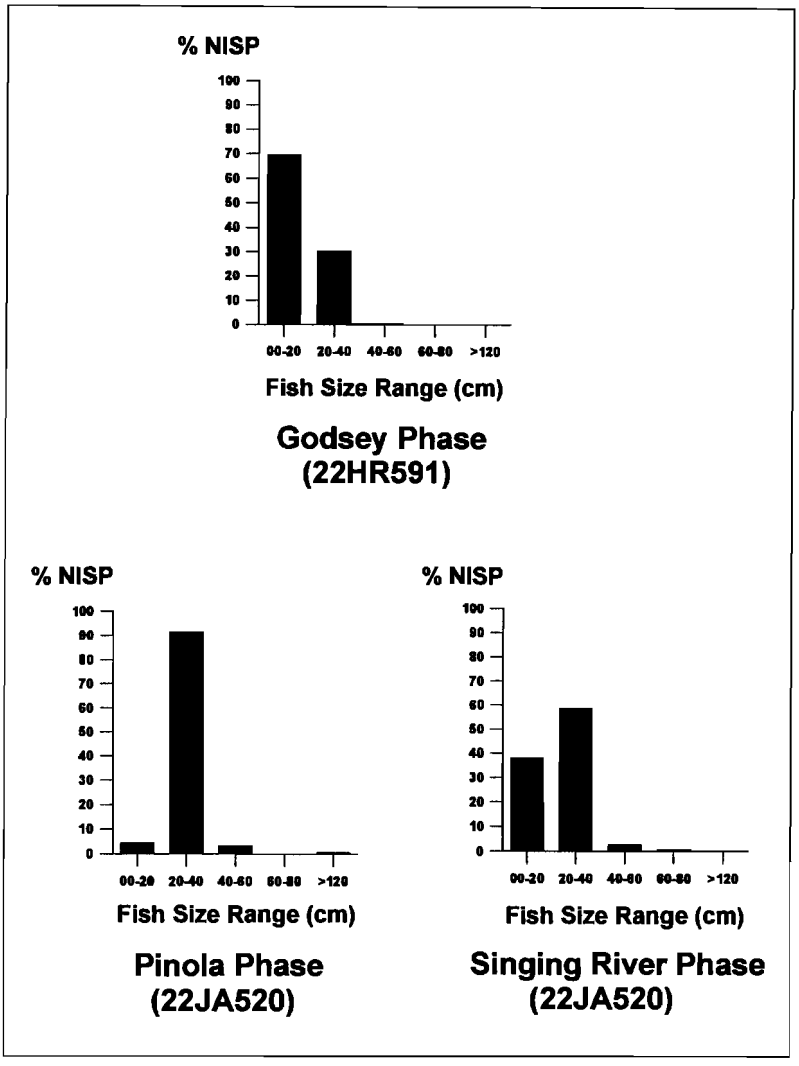


Figure C.2. Fish size ranges: Godsey, Pinola, and Singing River Phase samples.

ture a restricted range of species and select smaller fish (Attenbrow and Steele 1995:53). Curren (1978:37) has noted that tidal traps were used on the Gulf Coast by early historic period Native Americans and suggested that tidal traps were used for capturing fish species recovered at the multicomponent D'Olive site in Mobile Bay.

Given the restricted species and size range of marine fish from these sites, it is possible that tidal traps, scoop nets, or fixed gill nets were used. We have seen that juvenile fishes were frequently exploited and that the exploited species school in age classes in shallow estuary waters near the sites. It is probable that specific technologies were developed to capture these juvenile fishes.

Summary

The Godsey and Singing River site vertebrate faunal remains reflect extensive use of rich estuary resources. The archaeological evidence suggests that with few exceptions, similar estuarine resources were used throughout the prehistoric period covered by these two site occupations.

Minimally, both sites were occupied during the spring and summer, a conclusion based on species composition and size. Winter occupation is not apparent from these samples, but is nonetheless possible. It is possible that the Godsey site served as a recurrent, seasonal residential site for early spring/summer fishing and shellfish gathering. The larger Singing River site was occupied from early summer through the fall during the Pinola phase. During the subsequent Singing River phase, the site was occupied earlier, from early spring through the fall.

Faunal materials from both sites clearly suggest a coastal adaptation highly focused on marine fish. Acquired fish were overwhelmingly below 40 cm in length. This size restriction suggests that fish were taken with mass capture techniques during the first year of growth, while juveniles were nearshore in coastal estuaries. Fishing equipment probably included tidal traps, scoop nets, or a fixed gill net.

Appendix D: Foraging and Gardening on the Mississippi Coast – Plant Food Remains

C. Margaret Scarry

The basic set of plants that Native Americans used for food was more or less the same throughout much of the Eastern Woodlands. It is becoming increasingly evident, however, that the relative importance of gathered and cultivated plants not only changed over time but also varied considerably over space. There are clear differences between regions in patterns of nut use as well as in the production of native and later introduced crops (Fritz 1993; Johannessen 1993; Fritz and Kidder 1993; Scarry 1993b, n.d.). Because of such differences, "one size fits all" subsistence models hamper our ability to understand regional and local developments. This is particularly true for areas like the Gulf Coast that are environmentally distinct from the interior riverine settings that provided the data from which the generic models were constructed.

Given that the Gulf Coast of Mississippi and Alabama is ecologically distinct, it seems likely that at times the prehistoric people who lived on the coast employed subsistence strategies that varied from those of their inland contemporaries. The critical questions are, of course, what plant and animal resources did coastal people use and how did their use of resources change over time? For plant foods, we also want to know whether Woodland or Mississippian peoples cultivated native crops and whether Mississippian-era people, who lived on the coast, engaged in corn production to the extent that their neighbors in the interior did.

Unfortunately, there have been very few analyses of plant remains from coastal sites, and we have little evidence with which to answer such questions. For this reason, even small collections can provide new insights. In the following pages, I present the results of my analyses of plant remains from two sites on the Mississippi Gulf Coast. The remains come from limited test excavations and the assemblages are small. Nevertheless, they provide some data on late Middle Woodland and Mississippian subsistence practices on the coast.

Plant remains dating to the Late Middle Woodland period were recovered at the Godsey site (22-Hr-590). I analyzed plant samples from four 10 cm levels within the midden and from six features. Both midden and feature samples came from Godsey phase (ca. A.D. 200–400) contexts. Mississippian plant remains from the Singing River site (22-Ja-520) date to the Pinola phase (ca. A.D. 1350–1550). I analyzed plant samples from six 10 cm levels dating to the Pinola phase and from eight 10 cm levels dating to the later Singing River phase (Table D.1).

Methods and Materials

All of the plant remains that I analyzed from the Godsey and Singing River sites were recovered by flotation. At both sites, a 4 liter (1 gallon) composite sample of the deposit was collected from each 10 cm excavation level (see Pearsall 1989:96). Samples of equivalent volume were also collected from the features encountered at the base of the midden at the Godsey site. To extract the subsistence remains, the samples were processed in a SMAP-type flotation system (Watson 1976). The light fractions were caught on 1 mm mesh, while the heavy fractions were caught on 1/8-inch mesh. All of the material caught in the light fractions as well as the plant materials picked from the heavy fractions were sent to me for analysis.

The methods we used to process the plant remains from the flotation samples followed standard archaeobotanical procedures. The samples were weighed, then screened through a graded series (2 mm, 1.4 mm, .71 mm) of geological sieves to make sorting easier. All plant materials greater than 2 mm in size were sorted, identified, and quantified. Remains caught in the finer-mesh screens and in the bottom pan were scanned. Seeds and other plant food remains were removed and identified, but remains of less than 2 mm were not otherwise sorted. Marcus Brewer, my lab assistant, sorted the samples. I checked the materials he sorted and made or confirmed all identifications reported below.

Seeds and other non-wood plant parts are identified to the lowest possible taxonomic level. Size, shape, and surface texture were the primary characteristics I used to classify the seeds. My initial identifications were made by reference to pictorial seed manuals (e.g., Martin and Barkley 1961); when possible, I confirmed the identifications by reference to modern comparative specimens. Materials that I could not identify are classified in three categories. Unidentified seeds are ones for which taxonomic affiliations have not been determined. Unidentifiable seeds are fragments or damaged specimens that lack diagnostic characteristics. The third category, "unidentifiable," includes amorphous plant material that is probably not wood but that lacks recognizable structure.

For the purposes of analysis, the nutshell, seed, corn, and other plant remains are quantified by count. Each fragment was counted separately; I did not attempt to determine the actual number of nuts or seeds represented in the remains. The counts reported in the various tables are the numbers of specimens of each taxon. In effect, these counts are standardized by volume. That is, since all flotation samples were the same size, the counts represent the number of fragments of a taxon per 4 liters of matrix.

The results of the analysis are presented in a series of tables. Table D.1 lists the contexts from which the samples were collected and indicates the weight of the wood fragments as well as the weight of all plant remains (wood plus nutshells, seeds, etc.) in each sample. These figures are a measure

Table D.1. Flotation samples examined for botanical remains.

PROVENIENCE	PLANT WEIGHT (grams)	WOOD WEIGHT (grams)
Godsey Site 22-Hr-591 Godsey Phase (A.D. 200-400)		
30-40 cm level	4.52	4.34
40-50 cm level	2.75	2.68
50-60 cm level	6.16	5.76
60-70 cm level	5.22	5.08
Feature 3	0.65	0.65
Feature 4	6.77	5.13
Feature 5	0.91	0.9
Feature 6	5.91	5.89
Feature 7	42.71	42.65
Feature 8	1.89	1.84
Singing River Site 22-Ja-520 Pinola Phase (A.D. 1200-1350)		
50-60 cm level	5.6	5.36
60-70 cm level	12.56	12.53
70-80 cm level	4.31	4.3
90-100 cm level	19.53	19.14
100-110 cm level	10.61	10.23
110 cm level	1.96	1.82
Singing River Site 22-Ja-520 Singing River Phase (A.D. 1350-1550)		
40-50 cm level	14.92	14.92
50-60 cm level	11.33	11.33
60-70 cm level	8.87	8.85
70-80 cm level	9.5	9.48
80-90 cm level	23.52	23.51
90-100 cm level	12.64	12.61
110-120 cm level	16.1	15.99
120 cm level	5.55	5.54

Table D.2. Nuts, seeds, and other plant parts identified from the Godsey and Singing River sites. "Cf" denotes a tentative identification.

Common Name	Taxonomic Name	Season Available
Crops		
Corn	*Zea mays*	late summer-fall
Cucurbit cf.	*Cucurbitaceae*	late summer-fall
Sunflower cf.	*Helianthus annuus*	late summer-fall
Nuts		
Hickory	*Carya sp.*	fall
Acorn	*Quercus sp.*	fall
Fruits		
Blackberry/raspberry	*Rubus sp.*	summer
Elderberry	*Sambucus sp.*	summer-late summer
Hackberry	*Celtis sp.*	fall
Palmetto	*Sabal minor*	late summer-fall
Persimmon	*Diospyros virginiana*	fall
Sumac	*Rhus sp.*	late summer-fall
Prickly pear	*Opuntia sp.*	late summer-fall
Small grains and oil seeds		
Bearsfoot	*Polymnia uvedalia*	late summer-fall
Chenopod	*Chenopodium berlandieri*	late summer-fall
Goosefoot	*Chenopodium sp.*	late summer-fall
Cheno/am	*Chenopodium/Amaranthus*	late summer-fall
Smartweed	*Polygonum cf. Pennslyvanicum*	late summer-fall
Grass family	*Poaceae*	
Greens		
Cleaver	*Galium sp.*	summer
Purslane	*Portulaca sp.*	summer
Pokeweed	*Phytolacca americana*	summer
Miscellaneous		
Pine cone and seed	*Pinus sp.*	

of the abundance of plant remains in the various contexts. Table D.2 gives the common and taxonomic names of plants identified in the samples and indicates the season(s) in which the edible portions of those plants are available for harvest. Tables D.3 through D.5 show the distribution of food plant remains in the samples from the Godsey site and the two phases at the Singing River site.

Results

Before discussing the results of the analysis by site and phase a few general comments are in order. Given the relatively small volume of the flotation samples, plant remains are reasonably abundant in most contexts at both sites. Unfortunately for our purposes, most of the plant remains are wood fragments. Remains of food plants are consistently present, but in very small quantities (see Tables D.3–D.5). This is true for the matrix samples at both sites as well as for the feature samples from the Godsey site.

The relative abundance of wood charcoal suggests that the paucity of food remains cannot be attributed to poor conditions for plant preservation. It is, of course, possible that people did not usually deposit food debris in fires, where it would be preserved through carbonization. Likewise, it is possible that people deposited plant food refuse in pits, none of which were encountered in the units excavated at the two sites.

On the other hand, the general scarcity of food plant remains may be an indication that plants were not a major component of people's diets at these coastal sites. That is, plant foods may have played a minor role in diets composed largely of aquatic fauna (see Scarry and Newsom 1992 for an example from Florida in which this seems to be the case). We need additional analyses of assemblages from coastal sites to assess the importance of plants in people's subsistence strategies on the Gulf Coast. Nevertheless, we should be aware that plants may have been, at least seasonally, supplemental rather than staple foods.

Table D.3. Nutshells, seeds, and other plant parts in the Godsey site, Godsey Phase samples.

	Level 30-40	Level 40-50	Level 50-60	Level 60-70	Fea. 3	Fea. 4	Fea. 5	Fea. 6	Fea. 7	Fea. 8
NUTS										
Hickory		7	19	7		3		2	3	5
Acorn	2		4	7			1			
Acorn meat				1						
FRUITS										
Blackberry/raspberry			1							
Persimmon	2									
Prickly pear	1									
SMALL GRAINS AND OIL SEEDS										
Chenopod				1						
Cheno/am				4						
Smartweed					1					
Cleaver			1							
Pokeweed	1									
Purslane									1	
MISCELLANEOUS										
Pine cone						162		3		
Pine seed						1				
Unidentified seed									1	
Unidentifiable seed			1	2				1		
Unidentifiable	25								2	

Late Middle Woodland Plant Remains from the Godsey Site

The general scarcity of plant food remains in the samples from late Middle Woodland contexts at the Godsey site is readily apparent when we examine Table D.3. The most abundant remains are the pine cone fragments in Feature 3, and these are probably not food remains. The assemblage does contain seeds or nutshells from eleven taxa that may have been used for food.

At first glance the assemblage seems relatively varied, but nuts are the only plant food that are represented in more than a single sample. Hickory nutshells are present in seven of the ten samples, and account for 77% of the nut remains. Acorn shells are present in four samples—one of which also contains an acorn nutmeat—and account for 23% of the nutshells. It is worth noting that the two types of nuts are not dietary equivalents. Hickory nuts are good sources of fat and plant protein, while acorns are high in carbohydrates (McCarthy and Matthews 1984). This being the case, hickory nuts and acorns should be viewed as complementary resources rather than as alternative choices.

Seeds from three types of fruit are present in the Godsey samples. Two of these—blackberry and persimmon—are common in archaeobotanical assemblages from the Lower Southeast. Prickly pear, however, is rare at inland sites. Its presence in a small coastal assemblage probably reflects its greater availability in coastal environments.

The samples contain scant evidence for the use of wild grains and no evidence for cultivated ones. The single chenopod seed has the characteristics of the wild form of that grain (thick seed coat and convex margin; see Smith 1985). The cheno/am and smartweed seeds may have been gathered for use as grain, but they do not come from species known to have been cultivated.

Finally, the samples produced seeds from three plants that might have been used for greens. Cleaver, pokeweed, and purslane seeds are common in assemblages from the Southeast (Yarnell and Black 1985). The seeds themselves are unlikely to have been used for food, rather their presence is generally attributed to the use of the leaves or young shoots of these plants for greens.

Subsistence data can sometimes provide evidence about the season(s) during which a site was occupied. In this case, the plant remains provide at best limited clues. In the Lower Southeast including the coast, blackberries ripen in late spring or early summer. Greens are also late spring early foods, but the seeds of the plants used for greens ripen later in the summer. The rest of the plant foods represented in the Godsey samples are not ready for harvest until late summer or fall. Taken at face value, the plant assemblage suggests that the site was occupied, or at least visited, during the summer and fall. There are two problems with this assessment. First, since few plant foods ripen during the winter, the plant data cannot be used to conclude that people were not present at that time of year. Second, fall resources such as nuts and persimmons can be stored for later use, and in small quantities might be transported from one site to another. We can say that people ate these foods at the Godsey site, but not where they harvested them or when they consumed them.

During the Middle Woodland period, regional variation in plant use begins to be apparent in the archaeobotanical record from the Eastern Woodlands. At this time there is an increase in the consumption of starchy foods throughout much of the area. However, the plants that people use as their staple sources of carbohydrates differ. In the Midwest and parts of the Midsouth, people grew one or more of the starchy-seeded cultigens—chenopod, maygrass, little barley. In contrast, people living in the Lower Southeast grew fewer native grains but gathered substantially larger quantities of acorns than did their contemporaries to the north (Scarry 1996).

The Godsey site assemblage, while small, fits the general pattern for the Lower Southeast. There is no indication that the Middle Woodland people who lived there cultivated native grains or oil seeds. Instead, they obtained the plant foods they needed primarily, if not entirely, from the surrounding countryside. Insofar as we can determine, nuts were their major plant foods, with hickory nuts providing oil and acorns providing carbohydrates. Fruits and greens would have added important vitamins and minerals. I suspect that, overall, plant foods played a secondary role in a subsistence strategy and diet that was focused on intensive use of aquatic animal resources. This suggestion should be considered speculative, however, until we have further data to evaluate it.

Mississippian Plant Remains from the Singing River Site

The plant assemblage from the Singing River site includes remains from two Mississippian components, the Pinola phase (A.D. 1200–1350) and the Singing River phase (A.D. 1350–1550). The samples from both phases contain a mix of crop and wild plant food remains (Tables D.4 and D.5). The quantities of all remains are low, but the relative proportions of cultivated and wild taxa provide some evidence about crop production at this coastal site.

Remains from one definite and two possible crops are present in the assemblage. Corn is the only crop that is unquestionably present at the Singing River site. Kernels or cupules are present in five of the six Pinola phase samples. In contrast, only two of the eight Singing River phase samples produced corn cupules. A single, poorly preserved seed that may be a sunflower kernel is present in

Table D.4. Nutshells, seeds, and other plant parts in the Singing River site, Pinola Phase samples. "Cf" denotes tentative identification.

	Level 50-60	Level 60-70	Level 70-80	Level 90-100	Level 100-110	Level 110
CROPS						
Corn cupule				4	4	
Corn kernel	1	1	2	2		
Sunflower					1 cf.	
NUTS						
Hickory	11	1		3		3
Acorn			1	4	2	
Acorn meat					4	3 cf.
FRUITS						
Hackberry		1			1	
Palmetto	5	1	1	2	1	1
Persimmon				2	1	
Sumac					1	
SMALL GRAINS AND OIL SEEDS						
Chenopod		1				
MISCELLANEOUS						
Unidentified seed				1		
Unidentifiable seed		2			5	
Unidentifiable				26	33	

one of the samples from the Pinola phase. The condition of the seed prevents positive identification, but if it is a sunflower kernel, its size indicates it came from a cultivated plant. A small fragment of what appears to be the rind of either a gourd or a bottlegourd is present in a Singing River phase sample. If it is a cucurbit rind, then it too probably came from a cultivated plant.

Nut remains are more abundant than crop remains in the assemblage from the Singing River site. Hickory and acorn shell are present in the samples from both phases, but the proportions of the two nut types differ greatly between the phases (compare Tables 10.4 and 10.5). In the earlier Pinola phase, hickory occurs in more samples than acorn and accounts for 72% of the nutshell. In the Singing River phase, hickory occurs in one sample and accounts for only 23% of the nutshell.

Given the small size of the assemblage, fruit seeds are comparatively abundant at the Singing River site. Four types of fruit are represented in the Pinola phase samples and three in the Singing River phase samples. Aside from their relative abundance, the interesting thing about the fruit seeds is the regular presence of palmetto seeds. Palmetto seeds are common in sites from the Tensas Basin in the Lower Mississippi Valley (Kidder and Fritz 1993), but there are few reports of palmetto from sites elsewhere in the Lower Southeast. This probably reflects the paucity of analyses of remains from sites on the coastal plain where the plant is common.

As was the case for the Godsey site, there is no evidence for the cultivation of native grains and limited evidence for the use of wild grains, oil seeds, and greens. The Pinola samples produced only a single chenopod embryo. The Singing River phase samples also produced a seed from bearsfoot. This plant, which is a member of the composite family, has oily seeds that were probably used in a manner similar to sunflower and sumpweed seeds.

Most of the plants represented in the samples from both phases ripen in late summer or fall. While these resources can be stored for later use, it seems safe to assume that people were living at the site when these plants were harvested. Elderberry, which ripens earlier in the summer, is present in one Singing River phase sample. This suggests that in the later phase, and quite likely in the earlier one as well, people were also at the site in the summer. Of course, we cannot rule out winter and early spring occupation on the basis of the plant remains, as few plant foods are available for harvest in these seasons.

In the Mississippian period, people living in the interior portions of the Southeast were farmers

Table D.5. Nutshells, seeds, and other plant parts in the Singing River site, Singing River Phase samples.

	Level 40-50	Level 50-60	Level 60-70	Level 70-80	Level 80-90	Level 90-100	Level 110-120	Level 120
CROPS								
Corn cupule			2	1				
Cucurbit rind cf.				1				
NUTS								
Hickory							5	
Acorn			2	1	1	3	9	1
Acorn meat			2			1		1
FRUITS								
Elderberry							7	
Palmetto	1			1			6	5
Persimmon							1	
SMALL GRAINS AND OIL SEEDS								
Bearsfoot		1						
Chenopod				1			2	
Goosefoot							7	
Grass family			1					
Purslane						1	1	1
MISCELLANEOUS								
Unidentified seed							4	
Unidentifiable seed						1		
Unidentifiable		2					11	

who relied on their corn crops for much of their food (see for example Caddell 1983; Scarry 1986, 1993a). There has been considerable debate, however, whether their coastal contemporaries were as dependent on agriculture for their food (Knight 1984; Larson 1980). Recent investigations at the major mound center at Bottle Creek have indicated that, at least in the Mobile Delta, Mississippian people living near the coast were farmers (Gremillion 1993; Scarry 1995). The Singing River assemblage, however, suggests that not all Mississippian-era people living on the coast engaged in crop production to the same extent.

The residents of the Singing River site clearly consumed some agricultural products, most notably corn. The relative abundance of corn and nut remains at the Singing River site is, however, quite different from the proportions of these foods at other Mississippian sites in the Lower Southeast. At Moundville and its associated sites in the Black Warrior Valley of Alabama, corn remains are ubiquitous and in most instances far outnumber both hickory and acorn remains (Scarry 1986, 1993a; Scarry and Steponaitis 1997). The situation is similar at the Lubbub site in the Tombigbee Valley (Caddell 1983). At Bottle Creek, which is located near the coast, corn remains are ubiquitous and relatively abundant, but there are virtually no nut remains at all (Gremillion 1993; Scarry 1995). In contrast, corn remains are present at the Singing

River site, but in both phases nut remains are more abundant. Though the evidence is far from conclusive, I would argue that people living at the Singing River site farmed on a smaller scale than did their contemporaries in the interior and at major centers near the coast.

There is one final aspect of the Singing River assemblage that deserves comment. The abundance of corn and the relative proportions of hickory and acorn differ between the Pinola and Singing River phases. In the later assemblage, corn occurs in fewer samples and in smaller quantities than in the earlier phase. At the same time acorn is much more abundant in the Singing River phase than in the Pinola phase. This raises the intriguing possibility that the Pinola phase residents raised and consumed more crops than did their descendants. The increase in acorn in the later phase may reflect a return to the use of gathered over cultivated sources of carbohydrates.

Appendix E: Roster of Archaeological Sites

The roster is composed of 136 archaeological sites recorded within the study area as of December 1995. Gaps in the site number sequence represent numbers assigned to sites outside the study area. Additional numbers assigned to the same site are placed in parentheses. Twenty-two recorded sites lacked adequate locational or other information and were excluded.

In Mississippi, site numbers are identified by the Smithsonian Institution tripartite system: a number designation for the state, a letter code for the county, and a number for each site. Thus, site 22-Ja-500 should refer to the 500th site designated in Jackson County, Mississippi. However, when the system was adopted by the State of Mississippi in the 1960s, for some obscure reason it was decided to begin each county site number sequence at 500. As far as we know, this particular act of state's rights is peculiar to Mississippi. With one stroke, the state defeated the logic of the system and credited each county with 500 sites "site unseen."

KEY:

P = Unspecified Paleoindian
A = Unspecified Archaic
EA = Early Archaic
MA = Middle Archaic
LA = Late Archaic
MG = Middle Gulf Formational
LG = Late Gulf Formational
MW = Middle Woodland
LW = Late Woodland
M = Mississippian
C = Colonial
H = Unspecified Historic
G = Undiagnostic Gulf Formational
W = Undiagnostic Woodland
* = no state site number assigned at this writing.

County	Site Number(s)	Site Name	Components
Jackson	500	Point aux Chenes I	Unidentified prehistoric
	501	Paquette Point	LG, W, M
	503 (602)	Graveline Mound	LW
	504	Magnolia	MG, LG, MW, LW, M, C
	505 (548)	Martin's Bluff	C, H
	508 (520, 578)	Singing River	LW, M, H
	513	Gautier	M
	516	Big Greenwood Island	P, MG, MW
	521	Rudloff	LW
	526	Old Spanish Fort	C, H
	528	Fulmer	M
	529 (551)	Arquelles	LG, MW, M
	530	Apple Street	P, MG, LG
	531	North Elizabeth	MG, LW, M
	534 (538, 539)	Vieux Biloxi	C, H
	537	Bone Yard	MG, LG, MW, LW
	540	Ocean Springs	LG
	541 (614)	Borries	MW, M
	542	Underwater Shipwreck	H
	543	Escatawpa I	MG, LG, MW, LW, M, C
	544	Escatawpa II	LG
	545	Escatawpa III	LA, G, MW
	550	Point Aux Chenes II	LG, MW, H
	552	Griffin Point	LG, MW, LW, LM, H
	554	Old Shell Landing	MW, M
	555	East Bayou LaMotte	LG, MW, LW, M, H
	556	C.M. Shepard	M, H
	558	Seacliff	MG, LG, MW, LW, M
	559	West Bayou LaMotte	M
	562	Bayou Heron	M
	563	Poticaw	A
	564	Betty's	LW, M
	565	Bob's	W, M
	566	Big Lake	M
	568 (608)	Farragut Lake	W
	569	Dolphin	MW, LW
	570	Grant Shopping Center	MW
	571	Marble Springs	W, H
	572	Winchester	MW
	573	Blue Heron	MW
	575	Crooked Bayou I	LW
	576	Rigolets I	LW, M
	577	Rigolets II	LW, M
	579	—	W, H
	580	L'Isle Chaude I	W, M
	581	L'Isle Chaude II	LW
	582	L'Isle Chaude III	W
	583	—	LG, W
	584	Lundy Williams	W, M, H
	585	Griffin Cemetery II	LG, MW, LW
	586	Griffin Cemetery I	MW
	587	Crooked Bayou II	W, M
	590	Debbie T	W
	591	Shepard's Tree Farm	LA
	592	Bayou Rosa	LA, H
	596	Porteaux Bay	Unidentified prehistoric
	603	Quaker Oats South	MW, M, H
	604	Quaker Oats North	M, H
	605	Railroad	MW, H
	606	Old Place North	LW, M, H
	607 (549)	Gautier's Old Place	MW, M, C, H
	609	Turtle Pens	H
	610 (502)	Buena Vista	LA, G
	611	Swetman	MA, LA
	612	Marlin	MW
	618	Little Greenwood Island	LW, M, H

County	Site Number(s)	Site Name	Components
Jackson	620	Felts	G, MW, M, H
	621	Ladner	MW, M
	623	Gulf Hills	Unidentified prehistoric
	624	Riviera	MW
	625	Round Island	G, MW
	626	Four-H Club	MW, LW, M
	628	Eagle Point	MW
	629	Aunt Jenny's	MW, H
	630	Stark Bayou	Unidentified prehistoric
	632	Bang's Island West	G, W, M, H
	633	Bang's Island West	G, MW, LW, M
	634	—	Unidentified prehistoric
	636	Picnic	Unidentified prehistoric
	637	Hilltop	LW, M, C
	638	Upper Crossing	LW, H
	639	Office	LW
	640	Desk	LW
	641	Second Chance	LW
	642	Bank	Unidentified prehistoric
	643	Ladder	Unidentified prehistoric
	645	Homestead	EA, LA, M, C, H
	647	Perkin's Beach	EA, MW, LW
	650	Brown Street	MW, LW
	651	Reverend Stone	LG, MW, M, H
	652	Seymour Lane	LW
	653	Britt	MW, M
	654	Tyler	Unidentified prehistoric
	655	Carluse Bayou	Unidentified prehistoric
	656	Bilbo	Unidentified prehistoric
	657	RLB I	LW
	658	RLB II	EA
	659	RLB III	LW
	660	RLB IV	W, H
	662	Guis I	W
	663	Guis II	MW, LW
	668	Sawmill Point I	Unidentified prehistoric
	669	Sawmill Point II	Unidentified prehistoric
	672	CCC Camp	H
	673	Magnolia Park	LA, W
	674	—	W
	687	Cooking Ball Corner	LA, MG
	688	Mary Mahoney	LA, G, W
	689	Point Clear Pier	MW, LW, M
	695	—	LW
	696	—	LG
	697	—	W, H
	698	—	W, H
	704	—	MW, M
	723	Oak Island	MG
	724	Bayou Pierre	LG
	725	St. Andrew's	LG
	726	North Laura	LG, LW, M
	*	Hidden Midden	LW
	727	Davis	EA, G, LW, M, H
	728	Captain Grant	MA, LA
	731	Twelve Oaks	MA
Harrison	500	Deer Island	A, M, C
	520 (551)	—	MW, M
	534	Harvey	MW, LW, M
	548	—	MW, M
	549	—	MW
	550	—	MW
	556	—	MW
	591	Godsey	MW, M
	631	—	MW
	635	Richard	M
	636	Raymond Bass	M
	647	—	A, MW, LW
	673	—	M
	691	—	MW

Appendix F: Archaeological Phases of the Eastern Mississippi Sound Region

Biloxi Bay – Pascagoula Bay – Point Aux Chenes Bay
1200 BC– AD 1775

Claiborne Phase

Period: Middle Gulf Formational
Time: 1200–800 BC
Ceramic Series: Wheeler, St. John's
Ceramic Tradition: Gulf
Innovations: pottery, regional ceremonial center (22-Ha-501)
Key Sites: Big Greenwood Island (22-Ja-516), Bone Yard (22-Ja-537), Magnolia (22-Ja-504), and Sea Cliff (22-Ja-558).
Contemporary Relationships: Poverty Point interaction sphere.
Basic References: Blitz and Mann 1993, this report.

Apple Street Phase

Period: Late Gulf Formational
Time: 800–100 BC
Ceramic Series: Alexander, Bayou La Batre, Tchefuncte, and Wheeler
Ceramic Tradition: Gulf
Innovations: podal supports
Key Sites: Apple Street (22-Ja-530), Sea Cliff (22-Ja-558), and Point Aux Chenes (22-Ja-550).
Contemporary Relationships: Pontchartrain phase to the west, Bayou La Batre phases to the east.
Basic References: Blitz and Mann 1993, this report.

Greenwood Island Phase

Period: Middle Woodland
Time: 100 BC–AD 200
Ceramic Series: Alexander, Bayou La Batre, Deptford, Marksville, and Tchefuncte.
Ceramic Tradition: Gulf
Innovations: grog-tempered pottery, cemeteries, imported copper symbols.
Key Sites: Big Greenwood Island (22-Ja-516), East Bayou La Motte (22-Ja-555), Bone Yard (22-Ja-537), and Magnolia (22-Ja-504).
Contemporary Relationships: Hopewellian interaction sphere, Blakeley phase to the east, La Branche phase to the west.
Basic Reference: Blitz and Mann 1993, this report.

Godsey Phase

Period: Middle Woodland
Time: AD 200–400
Ceramic Series: Marksville (Issaquena)
Ceramic Tradition: Gulf
Innovations: regional ceremonial center (22-Ha-515)
Key Sites: Godsey (22-Hr-591), Magnolia (22-Ja-504), and Perkins Beach (22-Ja-647).
Contemporary Relationships: Porter phase to the east, Magnolia phase to the west.
Basic References: Blitz et al. 1993, this report.

Graveline Phase

Period: Middle/Late Woodland
Time: AD 400–700
Ceramic Series: Marksville (Troyville), Weeden Island
Ceramic Tradition: Gulf
Innovations: platform mounds
Key Sites: Graveline Mound (22-Ja-503), Harvey (22-Hr-534), and Perkins Beach (22-Ja-647).

Contemporary Relationships: painted pottery horizon, Whitehall phase.
Basic References: Blitz and Mann 1993, this report.

Tates Hammock Phase

Period: Late Woodland
Time: AD 700–1200
Ceramic Series: Coastal Coles Creek, Weeden Island, and Miller
Ceramic Tradition: Gulf–South Appalachian–Northern
Innovations: bow and arrow
Key Sites: Little Greenwood Island (22-Ja-618), Homestead (22-Ja-521), Goode Lake (22-Ja-543), and North/Laura (22-Ja-726).
Contemporary Relationships: late Weeden Island (Wakulla) phases to the east, Coastal Coles Creek phases to the west, late Miller phases to the north.
Basic References: Walthall 1980; Brose et al. 1983; Fuller 1991.

Pinola Phase

Period: Initial Mississippi
Time: AD 1200–1350
Ceramic Series: Terminal Coastal Coles Creek/early Plaquemine, Moundville, and Pensacola.
Ceramic Tradition: Gulf–Middle Mississippian
Innovations: shell-tempered pottery, salt pans.
Key Sites: Singing River (22-Ja-508, 22-Ja-520, 22-Ja-578), North/Elizabeth (22-Ja-531), and Sea Cliff (22-Ja-558).
Contemporary Relationships: Andrews Place phase, Moundville I–early Moundville II phase.
Basic References: Blitz and Mann 1993, this report.

Singing River Phase

Period: Mature Mississippi
Time: AD 1350–1550
Ceramic Series: Moundville, Pensacola
Ceramic Tradition: Middle Mississippian
Innovations: local mound centers, Southeastern Ceremonial Complex motifs.
Key Sites: Singing River (22-Ja-508, 22-Ja-520, 22-Ja-578), Deer Island (22-Hr-500), North/Elizabeth (22-Ja-531), and Gautier's Old Place (22-Ja-607).
Contemporary Relationships: Bottle Creek I–II phase, Bayou Petrie phase
Basic References: Blitz and Mann 1993, this report.

Bear Point Phase

Period: Protohistoric
Time: AD 1550–1699
Ceramic Series: Pensacola
Ceramic Tradition: Middle Mississippian
Innovations: burial urn horizon, European contact.
Key Sites: Singing River (22-Ja-508, 22-Ja-520, 22-Ja-578), Deer Island (22-Hr-500), C.M. Shepard (22-Ja-556), and Little Greenwood Island (22-Ja-618).
Contemporary Relationships: Alabama River phase, Four Mile Point phase.
Basic References: Fuller and Stowe 1982, Fuller 1985.

La Pointe Phase

Period: Early Historic (Colonial)
Time: AD 1699–1775
Ceramic Series: Natchezan–Choctawan
Ceramic Tradition: Gulf Historic
Innovations: European trade goods
Key Sites: Krebs House/Old Spanish Fort (22-Ja-526), Homestead (22-Ja-645), Martin's Bluff (22-Ja-505), and Vieux Biloxi (22-Ja-534).
Contemporary Relationships: Colonoware horizon, Port Dauphin phase, Natchezan–Choctawan ceramic complexes.
Basic References: Blitz and Mann 1993, this report.

References

Attenbrow, V., and D. Steele

1995 Fishing in Port Jackson, New South Wales—More than met the eye. *Antiquity* 69:47–60.

Arnold, J. B., III, and R. S. Weddle

1978 *The Spanish shipwrecks of 1554: The nautical archaeology of Padre Island.* Academic Press, New York.

Baca, K. A., and J. A. Giliberti

1995 The utility and potential of the Mississippi archaeological site file. In D. G. Anderson and V. Horak (eds.), *Archaeological Site File Management, A Southeastern Perspective,* 54–61. Readings in Archaeological Resource Protection Series 3, Interagency Archaeological Services Division, Atlanta, Georgia.

Barnett, G. L.

1978 *A Manual for the identification of fish bones: A guide to the comparative skeletal collection in the Department of Prehistory, Australian National University.* Australian National University, Canberra.

Bellande, R. L.

1993 Vieux Bilocxy, Comparison of the de La Tour map (1721) with USGS topo map (1976). Map on file, Mississippi Department of Archives and History, Jackson.

Belmont, J. S.

1967 The culture sequence at the Greenhouse site, Louisiana. *Southeastern Archaeological Conference Bulletin* 6:27–34.

1982 The Troyville concept and the Gold Mine site. *Louisiana Archaeology* 10:271–84.

Belmont, J. S., and S. Williams

1981 Painted pottery horizons in the southern Mississippi Valley. In F. H. West and R. W. Neuman (eds.), *Traces of prehistory, Papers in honor of William G. Haag,* Geoscience and Man 22:19–42.

Bense, J. A.

1987 *The Midden Mound project.* Report of Investigations 6, Office of Cultural and Archaeological Research, University of West Florida, Pensacola.

1994 *Archaeology of the southeastern United States: Paleoindian to World War I.* Academic Press, New York.

Bitgood, M. J.

1989 *The Baytown period in the Upper Tensaw Basin.* Bulletin No. 12, Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge.

Blitz, J. H.

1982 A brief outline and bibliography of southeastern Mississippi prehistory, Part I. *Mississippi Archaeology* 17(2):16–26.

1983 A brief outline and bibliography of southeastern Mississippi prehistory, Part II. *Mississippi Archaeology* 18(1):26–37.

1985 *An Archaeological study of the Mississippi Choctaw Indians.* Mississippi Department of Archives and History Archaeological Report 16, Jackson.

1986 The McRae Mound: A Middle Woodland site in southeastern Mississippi. *Mississippi Archaeology* 21(2):11–40.

Blitz, J. H.
1988 Adoption of the bow in prehistoric North America. *North American Archaeologist* 9(2):123–45.
1993a *Ancient Chiefdoms of the Tombigbee.* University of Alabama Press, Tuscaloosa and London.
1993b Locust beads and Archaic mounds. *Mississippi Archaeology* 28(1):20–43.
1993c Ceramics from Historic Choctaw sites, east-central Mississippi: Eastern and Southern Divisions. Paper presented at the Choctaw Archaeology Conference, University of Southern Mississippi, Hattiesburg, Mississippi.
1995 Choctaw Archaeology in Mississippi. *Journal of Alabama Archaeology* 41(2):135–161.

Blitz, J. H., and C. B. Mann
1993 *Archaeological investigations in coastal Jackson County, Mississippi.* Mississippi Gulf Coast Archaeological Project, Interim Report No. 1. Report submitted to the Mississippi Department of Archives and History, Jackson.

Blitz, J. H., C. B. Mann, and J. D. Jewell
1993 *Archaeological investigations at the Godsey site (22Hr591), city of Biloxi, Mississippi.* Mississippi Gulf Coast Archaeological Project. Report on file, Mississippi Department of Archives and History, Jackson.

Blitz, J. H., C. B. Mann, and R. L. Bellande
1995 Fort Maurepas and Vieux Biloxi: Search and research. *Mississippi Archaeology* 30(1):23–58.

Boudreaux, E., Jr.
n.d. Deer Island. Unpublished manuscript in possession of the author, Gulf Coast Chapter, Mississippi Archaeological Association, Biloxi.

Brain, J. P.
1979 *Tunica Treasure.* Papers of the Peabody Museum of Archaeology and Ethnology 71, Harvard University, Cambridge.
1988 *Tunica Archaeology.* Papers of the Peabody Museum of Archaeology and Ethnology 78, Harvard University, Cambridge.

Bronitsky, G., and R. Hamer
1986 Experiments in ceramic technology: The effects of various tempering material on impact and thermal shock resistence. *American Antiquity* 51:89–101.

Brose, D. S.
1985 "Willey-Nilley" or the archaeology of northwest Florida and adjacent borderlands revisited. *Florida Anthropologist* 38(1–2):156–62.

Brose, D. S., N. J. Jenkins, and R. Weisman
1983 *Cultural resources reconnaissance study of the Black Warrior–Tombigbee System corridor, Alabama: Vol. I, Archaeology.* Report to the U.S. Army Corps. of Engineers, Mobile District.

Brose, D. S., J. A. Brown, and D. S. Penney
1985 *Ancient art of the American Woodland Indians.* Harry M. Abrams, Inc. Publishers, New York.

Brown, C. S.
1926 *Archeology of Mississippi.* University, Mississippi.
1992 *Archeology of Mississippi.* University Press of Mississippi [Reprint of 1926 Edition].

Brown, I. W.
1980 *Salt and the eastern North American Indian, An archaeological study.* LMS Bulletin 6, Peabody Museum, Harvard University, Cambridge.

Brown, I. W.
1984 Late prehistory in coastal Louisiana: The Coles Creek period. In Dave D. Davis (ed.), *Perspectives on Gulf Coast prehistory*, 94–124. University Presses of Florida, Gainesville.
1985 *Natchez Indian archaeology: Culture change and stability in the Lower Mississippi Valley.* Mississippi Department of Archives and History Archaeological Report 15, Jackson.
1988 Some thoughts on the Shrimping Hypothesis and coastal ceramic diversity in the Lake Pontchartrain region. *Mississippi Archaeology* 23(1):34–42.
1994 Recent trends in the archaeology of the southeastern United States. *Journal of Archaeological Research*, 2(1):45–111.

Brown, I. W., and R. S. Fuller
1993 A Preliminary report on Gulf Coast Survey excavations at the Bottle Creek site, 1991. *Journal of Alabama Archaeology* 39 (1–2):151–69.

Bruseth, J. E.
1980 Intrasite structure at the Claiborne site. *Louisiana Archaeology* 6:283–318.
1991 Poverty Point development as seen at the Cedarland and Claiborne sites, southern Mississippi. In K. M. Byrd (ed.), *The Poverty Point culture: Local manifestations, subsistence practices, and trade networks*, 7–25. Geoscience and Man 29.

Building Conservation Technology, Inc.
1980 *Planning documents for the restoration of the Old Spanish Fort, Pascagoula, Mississippi.* Report submitted to the Jackson County Historical Society, Pascagoula.

Byrd, K. M.
1976 Tchefuncte subsistence: Information obtained from the excavation of the Morton Shell Mound, Iberia Parish, Louisiana. *Southeastern Archaeological Conference Bulletin* 19:70–75.

Byrd, K. M. (ed.)
1991 *The Poverty Point culture, local manifestation, subsistence practices, and trade networks.* Geoscience and Man 29.

Caddell, G. M.
1983 Floral remains from the Lubbub Creek Archaeological Locality. In C. Peebles (ed.), *Studies of material remains from the Lubbub Creek Archaeological Locality*, 194–271. University of Michigan. National Technical Information Services, Springfield, Virginia.

Cain, C. E.
1953 *Four centuries on the Pascagoula*, Vol. I. State College, Mississippi.

Caldwell, J. R.
1958 Trend and tradition in the prehistory of the eastern United States. *Memoir of the American Anthropological Association* 88.
1964 Interaction spheres in prehistory. In J. R. Caldwell and R. L. Hall (eds.), *Hopewellian studies*, 133–43. Illinois State Museum, Scientific Papers 12.

Caraway, M. R.
1951 The cornerstone of old Fort Maurepas. *Journal of Mississippi History* 13:101–4.

Casteel, R. W.
1976 *Fish remains in archaeology and palaeoenvironmental studies.* Academic Press, London.

Claassen, C.
1986 Shellfishing seasons in the prehistoric southeastern United States. *American Antiquity* 51:21–37.

Coastal Environments, Inc.
1977 *Cultural resources evaluation of the northern Gulf of Mexico Continental Shelf, Volume 1.* Coastal Environments, Inc., Baton Rouge, Louisiana.

Cole, W. A., and J. H. Dent, Jr.
1964 *Soil survey of Jackson County, Mississippi.* USDA Soil Conservation Service, Washington, D.C.

Colley, S. M., and R. Jones
1987 New fish bone data from Rocky Cape, north west Tasmania. *Archaeology in Oceania* 22:41–67.

Conkey, M. W., and C. A. Hastorf (eds.)
1990 *The Uses of style in archaeology.* Cambridge University Press, New York.

Conn, T. L.
1978 *Archaeological investigations at 22Ld515, Lauderdale County Northeast Industrial Park, Lauderdale County, Mississippi.* Department of Anthropology, Mississippi State University, Mississippi State, MS.

Connaway, J. M.
1981 *Archaeological investigations in Mississippi 1969–1977.* Mississippi Department of Archives and History Archaeological Report 6, Jackson.

Cross, R. D., R. W. Wales, and C. T. Traylor
1974 *Atlas of Mississippi.* University Press of Mississippi, Jackson.

Curren, C. B., Jr.
1976 Prehistoric and early historic occupation of the Mobile Bay and Mobile Delta area of Alabama with an emphasis on subsistence. *Journal of Alabama Archaeology* 22(1):61–84.
1978 The Zooarchaeology of the D'Olive Creek site (1BA196), Baldwin County, Alabama. *Journal of Alabama Archaeology* 24(1):33–51.

Davis, D. D. (ed.)
1984a *Perspectives on Gulf Coast prehistory.* University Presses of Florida, Gainesville.
1984b Perspectives on Gulf Coast prehistory: A roundtable discussion. In Dave D. Davis (ed.), *Perspectives on Gulf Coast prehistory,* 315–32. University Presses of Florida, Gainesville.
1984c Protohistoric cultural interaction along the northern Gulf Coast. In Dave D. Davis (ed.), *Perspectives on Gulf Coast prehistory,* 216–31. University Presses of Florida, Gainesville.

Dickeson, M. W.
1848 American antiquities V, ancient fortification, and burial place of the Beluxies. *The Lotus* 1(11):161–63.

Dilworth, A. L.
1979 Aboriginal pipes of the northern Gulf Coast. *Florida Anthropologist* 32(4):139–46.

Dorsey, J. O., and J. R. Swanton
1912 *A Dictionary of the Biloxi and Ofo languages.* Bureau of American Ethnology Bulletin 47, Washington, D.C.

Duhe, B. J.
1976 Preliminary evidence of a seasonal fishing activity at Bayou Jasmine. *Louisiana Archaeology* 3:33–74.

Dye, D. H., and C. Wharey
1989 Exhibition catalog. In P. Galloway (ed.), *The Southeastern Ceremonial Complex: Artifacts and analysis, the Cottonlandia Conference,* 319–78. University of Nebraska Press, Lincoln.

Eleuterius, L. N.
1973 The Marshes of Mississippi. In J. Y. Christmas (ed.), *Cooperative Gulf of Mexico estuarine inventory and study, Mississippi,* 147–97. Gulf Coast Research Laboratory, Ocean Springs, Mississippi.

Eleuterius, L. N., and E. G. Otvos, Jr.
1979 Floristic and geologic aspects of Indian middens in salt marshes of Hancock County, Mississippi. *SIDA Contributions to Botany* 8(1):102–12.

Fisher, A. K.
1979 Osteological analysis of the Greenwood Island skeletons. *Mississippi Archaeology* 14(2):5–6, 11–12.

Ford, J. A.
1936 *Analysis of Indian village site collections from Louisiana and Mississippi.* Anthropological Study 2, Department of Conservation, Louisiana Geological Survey, New Orleans.
1952 *Measurements of some prehistoric design developments in the southeastern United States.* Anthropological Papers of the American Museum of Natural History 44(3), New York.

Ford, J. A., and G. R. Willey
1940 *Crooks site, a Marksville period burial mound in La Salle Parish, Louisiana.* Anthropological Study 3, Department of Conservation, Louisiana Geological Survey, New Orleans, Louisiana.
1941 An Interpretation of the prehistory of the eastern United States. *American Anthropologist* 43:325–63.

Ford, J. A., and G. I. Quimby, Jr.
1945 *The Tchefuncte culture: An early occupation of the Lower Mississippi Valley.* Society for American Archaeology Memoir 2.

Ford, J. A., P. Phillips, and W. G. Haag
1955 *The Jaketown site in west-central Mississippi.* Anthropological Papers of the American Museum of Natural History 45, Part I, New York.

Ford, J. A., and C. H. Webb
1956 *Poverty Point, a Late Archaic site in Louisiana.* American Museum of Natural History, Anthropological Papers 46, Part I, New York.

Fritz, G. J.
1993 Early and Middle Woodland period paleoethnobotany. In C. Scarry (ed.), *Foraging and Farming in the Eastern Woodlands,* 39–56. University Press of Florida, Gainesville.

Fritz, G. J., and T. R. Kidder
1993 Recent investigations into prehistoric agriculture in the Lower Mississippi Valley. *Southeastern Archaeology* 12:1–14.

Fuller, R. S.
1985 The Bear Point phase of the Pensacola Variant: The Protohistoric period in Southeast Alabama. *Florida Anthropologist* 38(1–2):150–55.
1990 Pottery trends, traditions, and horizons: A stylistic approach to Woodland period culture-history in the Mobile Basin. Paper presented at the Southeastern Archaeological Conference, Mobile, Alabama.
1991 A Ceramic *Lingua Franca*? The origins, attributes, and dimensions of a Historic period Indian pottery tradition on the northern Gulf Coastal Plain. Ms. on file. Alabama Museum of Natural History, University of Alabama.
1992 An Early nineteenth-century assemblage from Fort Stoddert (1Mb100), southwest Alabama. Paper presented at the 13th Mid-South Archaeological Conference, Moundville, Alabama.
1995 Out of the Moundville shadow: The origin and evolution of Pensacola culture. Paper presented at the 52nd Southeastern Archaeological Conference, Knoxville, Tennessee.

Fuller, R. S., and N. R. Stowe
1982 A Proposed typology for late shell tempered ceramics in the Mobile Bay/Mobile-Tensaw Delta region. In C. Curren (ed.), *Archaeology in southwest Alabama*, 45–93. Alabama Tombigbee Regional Commission, Camden, Alabama.

Fuller, R. S., and I. W. Brown
1993 Analysis of Bottle Creek pottery at the Alabama Museum of Natural History. *Journal of Alabama Archaeology* 39(1–2):36–114.

Fundaburk, E. L., and M. D. F. Foremon (eds.)
1957 *Sun circles and human hands: The southeastern Indians' art and industries.* E. L. Fundaburk, Luverne, Alabama.

Gagliano, S. M.
1963 A Survey of pre-ceramic occupations in portions of south Louisiana and south Mississippi. *Florida Anthropologist* 16(4):105–32.

Gagliano, S. M., and C. H. Webb
1970 Archaic-Poverty Point transition at the Pearl River mouth. *Southeastern Archaeological Conference Bulletin* 12:47–72.

Galloway, P.
1984 Technical origins for Chickachae Combed ceramics: An ethnohistorical hypothesis. *Mississippi Archaeology* 19(2):58–66.
1994 Prehistoric population of Mississippi: A first approximation. *Mississippi Archaeology* 29(2):44–71.
1995 *Choctaw Genesis 1500–1700.* University of Nebraska Press, Lincoln and London.

Geiger, C. L.
1979 Greenwood Island coffin finds. *Mississippi Archaeology* 14(2):3–4.

Gertjejansen, D. J., and J. R. Shenkel
1983 Laboratory simulation of Tchefuncte period ceramic vessels from the Pontchartrain Basin. *Southeastern Archaeology* 2(1):37–63.

Gibson, J. L.
1980 Speculations on the origin and development of Poverty Point. In J. L. Gibson (ed.), Caddoan and Poverty Point archaeology: Essays in honor of Clarence Hungerford Webb. *Louisiana Archaeology* 6:319–48.
1987 The Poverty Point earthworks reconsidered. *Mississippi Archaeology* 22(2):14–31.
1991 Catahoula—An amphibious Poverty Point period manifestation in eastern Louisiana. In K. M. Byrd (ed.), *The Poverty Point culture: Local manifestations, subsistence practices, and trade networks,* 61–87. Geoscience and Man 29.
1994 Before their time? Early mounds in the Lower Mississippi Valley. *Southeastern Archaeology* 13(2):162–86.

Giliberti, J. A.
1995 The Late Archaic prehistory of the Coastal Pine Meadows. Unpublished manuscript, State Archaeological Plan, Mississippi Department of Archives and History, Jackson.

Giraud, M.
1974 *A History of French Louisiana,* Volume 1. Louisiana State University Press, Baton Rouge.

Grayson, D. K.
1979 On the quantification of vertebrate archaeofaunas. In M. B. Schiffer (ed.), *Advances in archaeological method and theory,* vol. 2, 199–237. Academic Press, New York.

Greengo, R. E.
1964 *Issaquena: An archaeological phase in the Yazoo Basin of the Lower Mississippi Valley.* Memoirs of the Society for American Archaeology 18.

Greenwell, D.
1981 *Archaeological survey report on Pascagoula Urban Waterfront and Moss Point Industrial (special management areas).* Report on file, Mississippi Department of Archives and History, Jackson.
1984 The Mississippi Gulf Coast. In D. D. Davis (ed.), *Perspectives on Gulf Coast prehistory,* 125–55. University of Florida Press, Gainesville.
1986 *Harvey, a prehistoric village of the Marksville/Troyville periods on the Mississippi Gulf Coast, at Biloxi.* Privately published, Biloxi, Mississippi.

Gremillion, K. J.
1993 Prehistoric maize from Bottle Creek. *Journal of Alabama Archaeology* 39(1–2):133–50.

Griffin, J. B.
1966 Mesoamerica and the eastern United States in prehistoric times. In R. Wauchope (ed.), *Handbook of Middle American Indians,* vol. 4, 111–31. University of Texas Press, Austin.
1967 Eastern North American archaeology: A summary. *Science* 156:175–91.
1979 An Overview of the Chillicothe Hopewell Conference. In D. S. Brose and N. Greber (eds.), *Hopewell archaeology: The Chillicothe Conference,* 266–79. Kent State University Press, Kent, Ohio.

Griffin, J. B., R. E. Flanders, and P. F. Titterington
1970 *The Burial complexes of the Knight and Norton mounds in Illinois and Michigan.* Memoir 2. Museum of Anthropology, University of Michigan.

Gulf States Marine Fisheries Commission (GSMFC)
1993 *The Black Drum fishery of the Gulf of Mexico, United States: A regional management plan.* Gulf States Marine Fisheries Commission, Ocean Springs, Mississippi.

Gunter, G.
1961 Some relationships of estuaries to the fisheries of the Gulf of Mexico. *Limnology and Oceanography,* 6(2):182–90.

Haag, W. G.
1953 Choctaw archaeology. *Southeastern Archaeological Conference Newsletter* 3:25–28.

Harper, R. M.
1943 *Forests of Alabama.* Geological Survey of Alabama Monograph 10, University of Alabama, Tuscaloosa.

Henebry, L. A.
1983 Vertebrate faunal analysis of the Claiborne site (22Ha501), Hancock County, Mississippi. Unpublished manuscript on file at the Mississippi Department of Archives and History, Jackson.

Higginbotham, J.
1967 *Pascagoula, Singing River City.* Gill Press, Mobile.
1968a *Fort Maurepas: The birth of Louisiana.* Colonial Books, Mobile.
1968b *Pascagoula Indians.* Colonial Books, Mobile.
1974 The Chaumont Concession: A French plantation on the Pascagoula. *Journal of Mississippi History* 36:353–62.
1977 *Old Mobile: Fort Louis de la Louisiane, 1702–1711.* University of Alabama Press, Tuscaloosa and London.

Higginbotham, J. (trans. and ed.)
1969 *The Journal of Sauvole.* Colonial Books, Mobile.

Hinks, S., J., Cohen, C. B. Mann, R. Draughon, Jr., P. V. Heinrich, and W. P. Attens
1993 *Archaeological testing at the Krebs House (Old Spanish Fort), Pascagoula, Mississippi.* R. Christopher Goodwin and Associates, Inc. Report on file at the Mississippi Department of Archives and History, Jackson.

Hirth, K. G.
1978 Interregional trade and the formation of prehistoric gateway communities. *American Antiquity* 43(1):35–45.

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

Hudson, J. C.
1973 *Field report and magnetometer survey analysis: Biloxi Bay, Mississippi.* Report prepared for the Mississippi Department of Archives and History by Gulf South Institute, Baton Rouge, Louisiana.

Jackson, H. E.
1986 Sedentism and hunter-gatherer adaptations in the Lower Mississippi Valley: Subsistence strategies during the Poverty Point period. Ph.D. dissertation, University of Michigan.
1988 Review of *Harvey, a prehistoric village of the Marksville/Troyville periods on the Mississippi Gulf Coast, at Biloxi. Mississippi Archaeology* 23(1):70–72.
1994 Little Spanish Fort: Investigation of a Middle Woodland enclosure in the Lower Yazoo Basin, Mississippi. *Southeastern Archaeological Conference Bulletin* 37:41–42 (abstract).

Jackson, H. E., D. R. Sims, and A. Montana
1993 Long term trends in culture and adaptation on the northern Gulf Coast: The Diamondhead shell midden, Hancock County, MS. Paper presented at the 1993 Meeting, Society for American Archaeology, St. Louis.

Jackson, H. E., M. Reams, and R. Reams
1995 Cultural and chronological trends of the Mississippi Gulf Coastal Plain: A synthesis of recent research. *Southeastern Archaeological Conference Bulletin* 38:25 (abstract).

Jefferies, R. W.
1994 The Swift Creek site and Woodland platform mounds in the southeastern United States. In Hally, D. J. (ed.), *Ocmulgee Archaeology 1936–1986,* University of Georgia Press, Athens and London, pp. 71–83.

Jenkins, N. J.
1975 The Wheeler series and southeastern prehistory. *Florida Anthropologist* 28(1):17–26.
1981 Gainesville Lake area ceramic description and chronology. In *Archaeological investigations in the Gainesville Lake area of the Tennessee Tombigbee Waterway,* vol. 2. Office of Archaeological Research, Report of Investigations 12. University of Alabama, Tuscaloosa.
1986 The Wheeler series: Space, time, and external relationships. In D. H. Dye and R. C. Brister (eds.), *The Tchula period in the Mid-South and the Lower Mississippi Valley,* 43–51. Mississippi Department of Archives and History Archaeological Report 17, Jackson.

Jenkins, N. J., D. H. Dye, and J. A. Walthall
1986 Early ceramic development in the Gulf Coastal Plain. In K. B. Farnsworth and T. E. Emerson (eds.), *Early Woodland archaeology,* 546–63. Kampsville Seminars in Archaeology 2, Center for American Archaeology Press, Kampsville, Illinois.

Jenkins, N. J., and R. A. Krause
1986 *The Tombigbee watershed in southeastern prehistory*. University of Alabama Press, Tuscaloosa.

Jeter, M. D., J. C. Rose, G. I. Williams, Jr., and A. M. Harmon
1989 *Archaeology and bioarchaeology of the Lower Mississippi Valley and Trans-Mississippi South in Arkansas and Louisiana.* Arkansas Archaeological Survey Research Series 37, Fayetteville, Arkansas.

Jewell, J. D.
1993a Graveline mound faunal analysis. Manuscript on file, Archaeology Laboratory, Department of Sociology and Anthropology, University of Southern Mississippi.
1993b Faunal remains from Deer Island. Manuscript on file, Archaeology Laboratory, Department of Sociology and Anthropology, University of Southern Mississippi.
1997 Prehistoric adaptation on the Mississippi Gulf Coast: Faunal exploitation at the Godsey site (22Hr591), Harrison County, and at the Singing River site (22Ja520), Jackson County, Mississippi. Master's thesis, Department of Anthropology and Sociology, University of Southern Mississippi.

Kidder, T. R.
1993 Timing and consequences of the introduction of maize agriculture in the Lower Mississippi Valley. *North American Archeologist* 13(1):15–42.

Kidder, T. R., and G. J. Fritz
1993 Investigating subsistence and social change in the Lower Mississippi Valley: The 1989 and 1990 excavations at the Reno Brake and Osceola sites. *Journal of Field Archaeology* 20(3):281–97.

Knight, V. J., Jr.
1984 Late prehistoric adaptation in the Mobile Bay region. In Dave D. Davis (ed.), *Perspectives on Gulf Coast prehistory*, 198–215. University Press of Florida, Gainesville.
1990 *Excavation of the truncated mound at the Walling site: Middle Woodland culture and Copena in the Tennessee Valley*, University of Alabama, Alabama State Museum of Natural History, Division of Archaeology, Report of Investigations 56, University.

Kraus, G. C.
1966 Notes on the Deer Island site, Harrison County (22Hr500). *Mississippi Archaeological Association Newsletter* 1(12):2.

Lamb, G. M.
1983 Changes in shoreline and general morphology of the Pascagoula area. In T. S. Mistovich, V. J. Knight, Jr., and C. Solis, *Cultural resources reconnaissance of the Pascagoula Harbor, Mississippi*, 131–38. OSM Archaeological Consultants, Inc. Submitted to the U.S. Army Corps of Engineers, Mobile District.

Lankford, G. E.
1981 A documentary study of Native American life in the Lower Tombigbee Valley, Draft Report. University of South Alabama. Submitted to the U.S. Army Corps of Engineers, Mobile District.

Larson, L. H., Jr.
1980 *Aboriginal subsistence technology on the southeastern Coastal Plain during the late prehistoric period.* University Presses of Florida, Gainesville.

Lauro, J.
1986a NRHS nomination form for the Graveline Mound site, 22Ja503. On file, Mississippi Department of Archives and History, Jackson.

Lauro, J.
1986b The Deer Island site and coastal archaeology. *Mississippi Archaeology* 21(2):50–61.

Lauro, J., and G. R. Lehmann
1982 *The Slate site, a Poverty Point lapidary industry in the southern Yazoo Basin, Mississippi.* Mississippi Department of Archives and History Archaeological Report 7, Jackson.

Lazarus, W. C.
1959a A. W. Pinola site, Pascagoula, Mississippi. Manuscript on file, Temple Mound Museum, Fort Walton Beach, Florida.
1959b Site "Fifteen Mile," up Pascagoula River, Mississippi. Manuscript on file, Temple Mound Museum, Fort Walton Beach, Florida.
1960a Supplemental report on the A. W. Pinola site, Pascagoula, Miss. Manuscript on file, Temple Mound Museum, Fort Walton Beach, Florida.
1960b Second supplemental report on the A. W. Pinola site, Pascagoula, Mississippi. Manuscript on file, Temple Mound Museum, Fort Walton Beach, Florida.
1965 Alligator Lake, a ceramic horizon site on the Northwest Florida coast. *The Florida Anthropologist* 18(2):83–124.

Lazarus, Y. W.
1979 *The Buck burial mound, a mound of the Weeden Island culture.* Temple Mound Museum, Fort Walton Beach, Florida.

Lehmann, G. R., M. C. Hill, and C. L. Geiger
1991 The Gulf Formational stage on the Mississippi Gulf Coast: Evidence from the Greenwood Island site (22Ja516). Paper presented at the 12th Annual Mid-South Archaeological Conference, Cobb Institute of Archaeology, Mississippi State University.

Leonard, I. A. (trans. and ed.)
1939 *Spanish approach to Pensacola.* The Quivira Society, Albuquerque, New Mexico.

Lewis, R. B.
1982 Archaeological site distributions on the Mississippi Gulf Coast. Paper presented at the 47th Annual Meeting, Society for American Archaeology, Minneapolis, Minnesota.
1988 Fires on the bayou: Cultural adaptations in the Mississippi Sound region. *Southeastern Archaeology* 7(2):109–23.
1991 Mississippi Gulf Coast economic and interregional exchange patterns: A.D. 100–1750. Presented at the 56th Annual Meeting, Society for American Archaeology. New Orleans, Louisiana.
1992 Mississippi Gulf Coast exchange patterns at A.D. 1000–1500. Unpublished manuscript in possession of the author, Department of Anthropology, University of Illinois at Urbana–Champaign.

Lindauer, O., and J. H. Blitz
1997 Higher ground: The archaeology of North American platform mounds. *Journal of Archaeological Research,* 5(2):169–207.

Mann, C. B.
1988 An Archaeological classification of ceramics from the Pearl Mounds (22Lw510), Lawrence County, Mississippi. Master's thesis, University of Southern Mississippi.
1989 *A Cultural resource monitoring project of the Front Street Urban Renewal Drainage System for the City of Pascagoula, Jackson County, Mississippi.* Submitted to the Mississippi Department of Archives and History, Jackson.
1993 *Archaeological investigations at the Harvey site (22Hr54), city of Biloxi, Mississippi.* Mann and Associates Archaeological Consultants, Bay St. Louis, Mississippi.

Marshall, R. A.
1982a *A Report on archaeological test excavations at Goode Lake, Jackson County, Mississippi.* Mississippi Department of Archives and History Archaeological Report 10, Jackson.
1982b *Survey and excavation along Archusa Creek.* Mississippi Department of Archives and History Archaeological Report 11, Jackson.

Martin, A. C., and W. D. Barkley
1961 *Seed identification manual.* University of California Press, Berkeley.

McCarthy, M. A., and R. H. Matthews
1984 *Composition of foods: Nut and seed products.* Agriculture Handbook 8–12. USDA, Washington.

McClane, A. J.
1978 *Field guide to saltwater fishes of North America.* Henry Holt and Company, New York.

McGahey, S.
1992a Paleoindian and Early Archaic data from Mississippi. Unpublished manuscript, State Archaeological Plan, Mississippi Department of Archives and History, Jackson.
1992b Middle Archaic in south Mississippi. Unpublished manuscript, State Archaeological Plan, Mississippi Department of Archives and History, Jackson.

McWilliams, R. G., (trans. and ed.)
1953 *Fleur de lys and calumet: Being the Penicaut narrative of French adventure in Louisiana.* University of Alabama Press, Tuscaloosa.
1981 *Iberville's Gulf journals.* University of Alabama Press, Tuscaloosa.

Mikell, G. A.
1992 The Fort Walton Mississippian variant on the northwest Florida Coast. *Southeastern Archaeology* 11(1):51–65.

Milanich, J. T.
1994 *Archaeology of precolumbian Florida.* University Press of Florida, Gainesville.

Milanich, J. T., A. Cordell, V. J. Knight, Jr., T. Kohler, and B. Sigler-Lavelle
1984 *McKeithen Weeden Island, the culture of northern Florida, A.D. 200–900.* Academic Press, Orlando.

Mississippi Department of Archives and History (MDAH)
1973 The establishment of the Fort Maurepas historical site. Manuscript, Official Records Collection, Record Group 31, MDAH, Jackson.
1995 Deer Island site file: Letter from E. Boudreaux to K. Baca, artifact photographs.

Mistovich, T. S., V. J. Knight, Jr., and C. Solis
1983 *Cultural resources reconnaissance of Pascagoula Harbor, Mississippi.* OSM Archaeological Consultants, Inc., Moundville, Alabama. Submitted to the U.S. Army Corps of Engineers, Mobile District.

Monks, G. G.
1981 Seasonality studies. In M. S. Schiffer (ed.), *Advances in archaeological method and theory* 4, 177–240. Academic Press, New York.

Moore, C. B.
1905 Certain aboriginal remains of Mobile Bay and Mississippi Sound. *Journal of the Academy of Natural Sciences of Philadelphia, Second Series* 13(2).
1911 Some aboriginal sites on Mississippi River. *Journal of the Academy of Natural Sciences of Philadelphia* 14:482–644.

Morgan, D.
1992 The post-Archaic prehistory of the Coastal Pine Meadows. Unpublished manuscript, State Archaeological Plan, Mississippi Department of Archives and History, Jackson.

Neuman, R. W.
1984 *An Introduction to Louisiana archaeology.* Louisiana State University Press, Baton Rouge.

New World Research
1988 *Cultural resource testing on the Mobile Bay Pipeline Project, Choctaw, Washington, and Mobile Counties, Alabama.* New World Research, Report of Investigations 167.

O'Connor, M. M.
1995 *Lost cities of the ancient southeast.* University Press of Florida, Gainesville.

Odum, E. P.
1971 *Fundamentals of ecology.* W. B. Saunders Company, Philadelphia.

O'Hear, J. W.
1990 *Archaeological investigations at the Sanders site (22Cl917), an Alexander midden on the Tombigbee River, Clay County, Mississippi.* Report of Investigations 6, Cobb Institute of Archaeology, Mississippi State University, MS.
1992 Alexander Series types and varieties. Unpublished manuscript in possession of the author, Mississippi State University.
1996 Reanalysis of major Wheeler and Alexander assemblages in Pickwick Basin. *Southeastern Archaeological Conference Bulletin* 39:41 (abstract).

Otvos, E. G., Jr.
1973 *Guidebook, geology of the Mississippi-Alabama coastal area and nearshore zone.* New Orleans Geological Society, New Orleans, Louisiana.

Peacock, E.
1996 Archaeological site survey in wooded environments: A field study from the Tombigbee National Forest, North-Central Mississippi. *North American Archaeologist* 17(1):61–79.

Pearsall, D. M.
1989 *Paleoethnobotany: A handbook of procedures.* Academic Press, San Diego.

Peebles, C. S.
1978 Determinants of settlement size and location in the Moundville Phase. In B. Smith (ed.), *Mississippian settlement patterns,* 369–416. Academic Press, New York.

Phillips, P.
1970 *Archaeological survey in the Lower Yazoo Basin, Mississippi, 1949–1955.* Papers of the Peabody Museum of Archaeology and Ethnology 60, Harvard University, Cambridge.

Poitevent, S.
n.d. Poitevent family papers, 2/1751 Series 5, Manuscripts Collection, Mississippi Department of Archives and History, Jackson.

Rands, R. L.
1959 The Willis site: Poverty Point–Woodland remains on the Pearl River, Mississippi. *Southeastern Archaeological Conference Newsletter* 6:15–18.

Rouse, I.
1972 *Introduction to prehistory, a systematic approach.* McGraw-Hill, New York.

Reams, R.
1995 The Central Midden, U.S. Forest Service. *Mississippi Archaeological Association Newsletter* 31(3):11.

Rowland, D.
1925 *History of Mississippi: The heart of the South,* vol. 1. S. J. Clarke Publishing Co., Chicago.

Rowland, D., A., G. Sanders, and P. Galloway (trans. and eds.)

1984 *Mississippi provincial archives: French dominion,* vols. 4 and 5. Louisiana State University Press, Baton Rouge.

Rowland, D., and A. G. Sanders, (trans. and eds.)
1927–32 *Mississippi provincial archives: French dominion,* vols. 1–3. Mississippi Department of Archives and History, Jackson.

Scarry, C. M.
1986 Change in plant procurement and production during the emergence of the Moundville chiefdom. Ph.D. dissertation, University of Michigan. University Microfilms, Ann Arbor.
1993a Plant remains from the Big Sandy Farms site (1Tu552), Tuscaloosa County, Alabama. In H. Ensor, *Big Sandy Farms,* 205–33. Report of Investigations 68. Office of Archaeological Research, University of Alabama, Tuscaloosa.
1993b Variability in Mississippian crop production strategies. In C. Scarry (ed.), *Foraging and farming in the eastern Woodlands,* 78–90. University Press of Florida, Gainesville.
1995 Preliminary assessment of food plant remains from excavations in mounds A, B, C, D, and L at the Bottle Creek site (1BA2). Manuscript on file, Gulf Coast Archaeological Survey, Alabama Museum of Natural History, Tuscaloosa.
n.d. Patterns of wild plant utilization in the prehistoric eastern Woodlands. In P. Minnis (ed.), *People and plants in ancient North America.* Manuscript under review.

Scarry, C. M., and L. A. Newsom
1992 Archaeobotanical research in the Calusa heartland. In W. Marquardt and C. Payne (eds.), *Culture and environment in the domain of the Calusa,* 375–402. Monograph No. 1, Institute of Archaeology and Paleoenvironmental Studies, University of Florida, Gainesville.

Scarry, C. M., and V. P. Steponaitis
1997 Between farmstead and center: The natural and social landscape of Moundville. In K. Gremillion (ed.), *People, plants, and landscapes: Studies in paleoethnobotany,* 107-122. University of Alabama Press, Tuscaloosa and London.

Schmidt, C. E.
1957 When Ocean Springs was young. *Ocean Springs News,* June 6, Ocean Springs, Mississippi.

Scott, S. L.
1983 Analysis, synthesis, and interpretation of faunal remains from the Lubbub Creek Locality. In C. S. Peebles (ed.), *Prehistoric agricultural communities in west-central Alabama: Studies of material remains from the Lubbub Creek Archaeological Locality,* vol. 2, 272–379. University of Michigan. National Technical Information Services, Springfield, Virginia.
1992 Appendix A: Temporal analysis of Lower Guadalupe River faunal remains. In R. A. Weinstein (ed.), *Archaeology and paleogeography of the Lower Guadalupe River/San Antonio Bay region,* 417–25. Report prepared for U.S. Corps of Engineers, Galveston District by Coastal Environments, Inc., Baton Rouge, Louisiana.
1995 Vertebrate faunal remains. In R. A. Weinstein and C. E. Pearson (eds.), *The Rock Levee site: Late Marksville through Late Mississippi period settlement. Bolivar County, Mississippi,* vol. III, 243–61. Coastal Environments, Inc., Baton Rouge, Louisiana.

Sears, W. H.
1956 *Excavations at Kolomoki, final report.* University of Georgia Series in Anthropology 5. University of Georgia Press, Athens.

Sears, W. H.
1977 Prehistoric culture areas and culture change in the Gulf Coastal Plain. In C. Cleland (ed.), *For the director: Essays in honor of James B. Griffin,* 152–85. University of Michigan Museum of Anthropology Anthropological Papers 61.

Sears, W. H., and J. B. Griffin
1950 *Prehistoric pottery of the eastern United States.* Museum of Anthropology, University of Michigan, Ann Arbor.

Seeman, M. F.
1979 Feasting with the dead: Ohio Hopewell charnel house ritual as a context for redistribution. In D. S. Brose and N. Greber (eds.), *Hopewell archaeology, the Chillicothe Conference,* 39–46. The Kent State University Press, Kent, Ohio.

Shenkel, J. R.
1984a An Early Marksville burial component in southeastern Louisiana. *Mid-Continental Journal of Archaeology* 9:105–34.
1984b Early Woodland in coastal Louisiana. In D. D. Davis (ed.), *Perspectives on Gulf Coast prehistory,* 41–71. University Presses of Florida, Gainesville.
1993 Ceramic classifications, Big Oak and Little Oak islands, New Orleans, Louisiana. Unpublished manuscript, Department of Anthropology, University of New Orleans.

Shepard, A. O.
1971 *Ceramics for the archaeologist.* Publication 609. Carnegie Institution, Washington, D.C.

Sibley, C.
1970 *Mothers are always special.* Doubleday and Company, Garden City, New York.

Sims, D.C.
1997 An analysis of the Diamondhead (22Ha550) ceramic collection. Master's thesis, Department of Anthropology and Sociology, University of Southern Mississippi.

Smith, B. D.
1978 Variation in Mississippian settlement patterns. In B. D. Smith (ed.), *Mississippian settlement patterns,* 479–503. Academic Press, New York.
1985 *Chenopodium berlandieri ssp. jonesianum:* Evidence for a Hopewellian domesticate from Ash Cave, Ohio. *Southeastern Archaeology* 4:107–33.

Smith, B. W.
1981 The Late Archaic–Poverty Point steatite trade network in the Lower Mississippi Valley: Some preliminary observations. *Florida Anthropologist* 34:120–25.
1985 A preliminary identification of faunal remains from the Claiborne site. In P. Galloway (ed.), *Anthology of Mississippi archaeology,* 143–50. Mississippi Archaeological Association, Jackson.

Smith, M. T.
1987 *Archaeology of aboriginal culture change in the interior Southeast: Population during the early Historic period.* Ripley P. Bullen Monographs in Anthropology and History 6. The Florida Museum, University of Florida Press, Gainesville.

Smith, W. I.
1975 *Soil survey of Harrison County, Mississippi.* USDA Soil Conservation Service, Washington, D.C.

Solis, C., and R. Walling
1982 *Archaeological survey and testing at Greenwood Island.* Office of Archaeological Research, Moundville, Alabama. Submitted to Jackson County Port Authority.

Steel, P., and H. M. Perry (eds.)
1990 *The Blue crab fishery of the Gulf of Mexico, United States: A regional management plan.* Gulf States Marine Fisheries Commission, Ocean Springs, Mississippi.

Steponaitis, V. P.
1983 *Ceramics, chronology, and community patterns: An archaeological study at Moundville.* Academic Press, New York.
1986 Prehistoric archaeology in the southeastern United States, 1970–1985. *Annual Reviews of Anthropology* 15:363–404.

Stone, C. H., Jr.
1977 Report of Indian ceramic vessels found while on a junior high school archaeology club trip. *Mississippi Archaeological Association Newsletter* 1:2–7.

Stowe, N. R.
1974 A preliminary report on four dugout canoes from the Gulf Coast. *Journal of Alabama Archaeology* 20(2):194–203.
1977a An archaeological/historical survey and test excavations at the Blakeley site. Report on file at the Archaeological Research Laboratory, University of South Alabama.
1977b *Archaeological excavations at Port Dauphin.* University of South Alabama Archaeological Research Series 1.
1985 The Pensacola variant and the Bottle Creek phase. *Florida Anthropologist* 38(1–2):144–49.
1989 The Pensacola variant and the Southeastern Ceremonial Complex. In P. Galloway (ed.), *Southeastern Ceremonial Complex, artifacts and analysis: The Cottonlandia Conference,* 125–32. University of Nebraska Press, Lincoln.
1990 The Gulf Formational stage on the north-central Gulf Coast. *Southeastern Archaeological Conference Bulletin* 33:28 (abstract).

Strandberg, C. H., and R. Tomlinson
1969 Photoarchaeological analysis of Potomac River fish traps. *American Antiquity* 34(3):312–19.

Sullivan, C. L.
1987 *Hurricanes of the Mississippi Gulf Coast, 1717 to present.* Gulf Publishing Company, Biloxi.

Swanson, M. T., J. H. Altschul, and L. J. Campbell
1979 *Archaeological survey of the Mississippi Sand Crane National Wildlife Refuge.* New World Research Report of Investigations 13, Pollock, Louisiana.

Swanton, J. R.
1911 *Indian tribes of the Lower Mississippi Valley and adjacent coast of the Gulf of Mexico.* Bureau of American Ethnology Bulletin 43. Washington, D.C.
1946 *The Indians of the southeastern United States.* Bureau of American Ethnology Bulletin 123. Smithsonian Institution, Washington, D.C.

Thomas, P. M., and L. J. Campbell
1991 The Elliot's Point complex: New data regarding the localized Poverty Point expression on the northwest Florida Gulf Coast, 2000 B.C.–500 B.C. In K. M. Byrd (ed.), *The Poverty Point culture, local manifestation, subsistence practices, and trade networks,* 103–19. Geoscience and Man 29.

Thomas, P., M. E. Westerman, P. F. Dehn, E. Norwocki, G. J. Holt, and C. R. Arnold
1988 Growth of juvenile red drum: Adenylate metabolism, RNA-DNA ratio and effects of ovine growth hormone. *Contributions in Marine Science* 50:29–36.

Toth, E. A.
1979 The Marksville connection. In D. S. Brose and N. Greber (eds.), *Hopewell archaeology, the Chillicothe Conference,* 188–99. Kent State University Press, Kent, Ohio.

Toth, E. A.
1988 *Early Marksville phases in the Lower Mississippi Valley and a study of culture contact dynamics.* Mississippi Department of Archives and History Archaeological Report 21, Jackson.

Trickey, E. B., and N. H. Holmes, Jr.
1971 A chronological framework for the Mobile Bay region: Revised, 1970. *Journal of Alabama Archaeology* 17:115–28.

U. S. Department of the Interior
1978 *Final environmental statement, Gulf Islands National Seashore.* Denver Service Center, National Park Service.

U. S. Department of Commerce, Weather Bureau
1963 Tropical cyclones of the North Atlantic ocean, tracks and frequencies of hurricanes and tropical storms, 1871–1963. *Weather Bureau Technical Papers* 55.

Vescelius, G. S.
1957 Notes on Mound 2 at Marksville. *American Antiquity* 22(4):416–20.

Walker, J. W., and B. J. Taylor
1982 *Davis Bayou Section, Gulf Islands National Seashore, archaeological investigations at sites 22JaGuis/D6-3 and 22JaGuis/D6-4.* Southeastern Archaeological Center, National Park Service, Tallahassee.

Walthall, J. A.
1980 *Prehistoric Indians of the Southeast. Archaeology of Alabama and the Middle South.* University of Alabama Press, University.

Walthall, J. A., and N. J. Jenkins
1976 The Gulf Formational stage in southeastern prehistory. *Southeastern Archaeological Conference Bulletin* 19:43–56.

Waselkov, G. A.
1989 A summary of French colonial archaeology in eastern "Louisiane." *Mississippi Archaeology* 24(2):53–69.

Waselkov, G. A., and D. E. Silvia
1995 *Archaeology at the Krebs House (Old Spanish Fort), Pascagoula, Mississippi.* University of South Alabama Center for Archaeological Studies, Mobile.

Watson, P. J.
1976 In pursuit of prehistoric subsistence: A comparative account of some contemporary flotation techniques. *Midcontinental Journal of Archaeology* 1:77–100.

Webb, C. H.
1975 Letter to Samuel O. McGahey, January 5. On file at the Mississippi Department of Archives and History, Jackson.
1977 *The Poverty Point culture.* Geoscience and Man 17.

Webb, M. C.
1982 Preliminary report on excavations at an early Troyville period site (16ST6) on the West Pearl River, Louisiana. *Louisiana Archaeology* 9:205–50.

Weinstein, R. A.
1974 An Archaeological survey of the Lower Amite River, Louisiana. M. A. thesis, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.
1985 Development and regional variation of Plaquemine culture in south Louisiana. In R. A. Marshall (ed.), *The Emergent Mississippian: Proceedings of the Sixth Mid-South Archaeological Conference 1985,* 85–106. Cobb Institute of Archaeology, Occasional Papers 87–01. Mississippi State University.

Weinstein, R. A.
1986 Tchefuncte occupation in the Lower Mississippi Delta and adjacent Coastal Zone. In D. H. Dye and R. C. Brister (eds.), *The Tchula Period in the Mid-South and Lower Mississippi Valley*, 102–27. Mississippi Department of Archives and History Archaeological Report 17, Jackson.

Weinstein, R. A. (ed.)
1992 *Archaeology and paleogeography of the Lower Guadalupe River/San Antonio Bay region.* Prepared for U.S. Army Corps of Engineers, Galveston District, by Coastal Environments, Inc., Baton Rouge, Louisiana.

Weinstein, R. A., and P. G. Rivet
1978 *Beau Mire: A late Tchula period site of the Tchefuncte culture, Ascension Parish, Louisiana.* Louisiana Archaeological Survey and Antiquities Commission Anthropological Report 1.

Willey, G. R.
1949 *Archaeology of the Florida Gulf Coast.* Smithsonian Miscellaneous Collections, vol. 113, Washington, D.C.

Willey, G. R., and P. Phillips
1958 *Method and theory in American archaeology.* University of Chicago Press, Chicago and London.

Williams, M.
1987 *Archaeological excavations at the Jackson Landing/Mulatto Bayou Earthwork.* Mississippi Department of Archives and History Archaeological Report 19, Jackson.

Williams, S., and J. P. Brain
1983 *Excavations at the Lake George site, Yazoo County, Mississippi 1958–1960.* Papers of the Peabody Museum of Archaeology and Ethnology 74. Harvard University, Cambridge.

Wimberley, S. B.
1960 *Indian pottery from Clarke County and Mobile County, southern Alabama.* Alabama Museum of Natural History Museum Paper 36, Geological Survey of Alabama, University.

Wimberly, S. B., and H. A. Tourtelot
1941 *The McQuorquodale Mound: A manifestation of the Hopewellian phase in south Alabama.* Geological Survey of Alabama, Museum Paper 19. University of Alabama.

Wing, E. S., and A. B. Brown
1979 *Paleonutrition, method and theory in prehistoric foodways.* Academic Press, New York.

Works Progress Administration (WPA)
1940 *Indian mounds and sites in Mississippi* (2 vols.). Unpublished typescript on file at the Mississippi Department of Archives and History, Jackson.

Wright, W. C.
1979 Buttons suggest burial date of Greenwood Island skeletons. *Mississippi Archaeology* 14(2):7.

Yarnell, R. A., and M. J. Black
1985 Temporal trends indicated by a survey of Archaic and Woodland plant food remains from Southeastern North America. *Southeastern Archaeology* 4:93–106.

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