Archeology and Bioarcheology of the Lower Mississippi Valley and Trans-Mississippi South in Arkansas and Louisiana

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Prepared by the Arkansas Archeological Survey

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ABSTRACT

This volume is the sixth and final regional cultural resource overview prepared by the Arkansas Archeological Survey for the U.S. Corps of Engineers, Southwestern Division. The overview takes in all of Louisiana except for the western portions of two parishes that were included in the Gulf Coastal Plains overview. It also covers the Arkansas counties that were not discussed in the Ozark Mountains-Arkansas River-Ouachita Mountains overview. In the opening chapters of the volume, previous archeological investigations are reviewed in detail, and the history of cultural resource management in the area is summarized. The overview then unfolds the area's archeological past in its entirety, from prehistoric, through protohistoric, to historic. The latter period is discussed not only in terms of Native Americans, but of Euramericans, African-Americans, and Asian-Americans as well. The bioarcheology of the Louisiana-Arkansas region is analyzed in later chapters; numerous tables and appendixes contain pertinent analyses of data from Native American burials. Areas where further research is needed are clearly delineated. A final chapter synthesizes the archeological and bioarcheological evidence in adaptive terms.

CONTENTS

CHAPTERS

APPENDIXES

FIGURES

TABLES

TABLES, CONTINUED

TABLES, CONTINUED

ACKNOWLEDGMENTS

Working on this overview of virtually all of Louisiana and "the best parts of Arkansas" (Jeter and Williams 1988) has been something like running a marathon — if the marathon were a team sport. We covered a lot of mileage (both physically and in the literature), it took a long time, and many people helped us. It was a gruelling ordeal, exasperating at times, but ultimately rewarding.

For the record, we began in mid-May, 1987, and finished our final draft in early February, 1988. The manuscript then went into a "holding pattern" behind several previously submitted overviews of other regions; it was returned to us in the desktop-publishing equivalent of galley proofs in early April, 1989. Our final corrections and changes were returned to the Arkansas Archeological Survey's Fayetteville headquarters in mid-April, 1989.

We would like to begin our acknowledgments by thanking Larry Banks, Division Archaeologist of the Southwestern Division, U.S. Army Corps of Engineers, in Dallas, Texas. Larry never quit trying to obtain funding for this sixth and final regional overview, even when it seemed impossible, and he always came through with whatever was needed in the way of support as the project continued. Similarly, Fred Limp, Assistant Director of the Arkansas Archaeological Survey, was also instrumental in "making it happen" in the first place and in administering the project and supporting our work.

For the Arkansas portion of the overview, we were "preadapted" by having the unparalleled resources of the Arkansas Archeological Survey readily available. Survey Director Charles R. McGimsey III and State Archeologist Hester A. Davis provided us with information, rare publications, even rarer unpublished reports, and other assistance on numerous occasions. Station Archeologists Dan Morse, Martha Rolingson, Frank Schambach, Ann Early, Leslie (Skip) Stewart-Abernathy, John House, and H. Edwin (Ed) Jackson furnished copious amounts of "ground truth" data, clarifications of fine points, and good advice about the archeology of their research territories, which were at least partly overflown by us overviewers, and of nearby regions. Dan and Phyllis Morse's (1983) book, *Archaeology of the Central Mississippi Valley* was a godsend, as were several recent publications of the various Station Archeologists, especially those in the *Arkansas Archeology in Review* volume (Trubowitz and Jeter 1983) and in the *Arkansas State Plan* (Davis 1982). Also, Station Archeologist George Sabo, whose northwest Arkansas territory was beyond the range of our telescopes, got us off to an optimal start with sage advice based on his own Region 1 overviewing experiences.

We were also fortunate to have the support of numerous members of the Survey's staff. Production Editor Mary Lynn Kennedy's experience with previous overviews, and her services in coordinating the editorial process, were invaluable. Sharon Shugart singlehandedly produced this volume using Ventura desktop publishing. Graphic Artist Jane Kellett produced the maps, plus slides for our paper (Jeter and Williams 1988) summarizing this Overview at a Society for American Archaeology meeting. Survey Registrar Jerry Hilliard and his erstwhile assistant John Riggs provided abundant information from the site files and the AMASDA data base. Jim Farley, Ian Johnson, Bob Harris, Debbie Mott Harris, David Waddell, Karen Wagner, and (again) Mary Lynn Kennedy all helped in guiding us through the intricacies of computerized word-processing systems. Ellen Zahn Waddell and James Harcourt coordinated the production of the computerized bibliography, assisted by Erik Parker and Viktoria Baker.

Michael Hoffman of the University of Arkansas Department of Anthropology also provided information and references based on his researches in and near our overview territory. Marvin Kay of the Department of Anthropology furnished comparative data and references to the Plains literature.

Our efforts to overview Louisiana would have been futile without the congenial cooperation of numerous colleagues down in the Sportsman's Paradise. They corrected many (but perhaps not all) of our misconceptions and furnished us with not only "ground truth" but also a good bit of "marsh truth" and even some "underwater truth" about archeology in the vicinity of sea level. After a series of informative phone calls and some very useful preliminary correspondence, we made two fact-finding trips which were critically important in this effort.

The first Louisiana trip, from June 14 to June 24,1987, began by taking Jeter, Williams, and Rose to Baton Rouge, where we had some productive conferences with State Archaeologist Kathleen (Kass) Byrd and her assistant Phillip (Duke) Rivet, after which they graciously guided us through their site files and their voluminous library of reports. Of invaluable assistance here was their annotated bibliography, which we had perused in Fayetteville to prioritize our photocopying.

While in Baton Rouge, we also visited the offices of Coastal Environments, Inc., where we learned a great deal in conversations with archeologists Charles Pearson, Richard Weinstein, David Kelley, and George Castille; and Louisiana State

University, where we had similarly informative meetings with Robert W. Neuman, author of the very useful recent (1984) book, *An Introduction to Louisiana Archaeology,* with archeologists Ann Ramenofsky and Charles Orser, and with physical anthropologist Douglas Owsley. We also had the pleasure of dining with the emeritus "dean" of Louisiana archeologists (and raconteurs), William G. (Bill) Haag, formerly of L.S.U. and now of New Roads, Louisiana.

Rose had to return to Fayetteville from Baton Rouge due to his departmental chairmanship duties, but Jeter and Williams continued southward to New Orleans. There we conferred with archeologists and environmental specialists at the New Orleans District, Corps of Engineers, including Howard "Rick" Bush, Carroll Kleinhans, Mike Stout, Ed Lyon, Jim Chase, and Caroline Albright, who gave us a number of insights into the special problems and potentials of southern Louisiana and "lowest" Mississippi Valley archeology, and provided access to several otherwise unavailable reports.

We also visited the University of New Orleans for very informative meetings with archeologists Malcolm Webb, Richard Shenkel, and Richard Beavers. We were unable to meet with Tulane University archeologists while in New Orleans, due to scheduling conflicts, but did later obtain information from Harvey Bricker and Dave D. Davis via telephone.

Finally, we had productive meetings in New Orleans with R. Christopher Goodwin and Eric Poplin of Goodwin and Associates, Inc., and with Jill-Karen Yakubik, Herschel Franks, and staff members of Earth Search, Inc. Departing the Crescent City, we made a final stop at the Vicksburg District, Corps of Engineers, where we gathered data and citations on the upstream segments of the Mississippi, Ouachita, Red and Pearl river valleys and the intervening uplands from archeologists Shelia Lewis, Sam Brookes, and Tommy Birchett.

The second Louisiana expedition, by Jeter and Williams, began on August 30 and ended on September 5, 1987. Our conferences on this trip actually began in Prescott, southwest Arkansas, where we enjoyed the hospitality and informative conversation of S. D. (Sam) Dickinson, whose scholarly researches into the archeology and ethnohistory of this and nearby regions (and states) go back to the 1930s. Next, we crossed the state line and had a similarly enjoyable and productive meeting in Shreveport with Clarence H. Webb, veteran Louisiana amateur also since the 1930s (recognized for his work by the Society for American Archaeology's first Crabtree Award in 1985), and his long-time associate David Jeane, a leading amateur archeologist in both Louisiana and Arkansas.

From there, we proceeded down the Red River Valley to the historically (and prehistorically) significant Natchitoches locality, where we were welcomed by archeologist Hiram F. (Pete) Gregory and his associates at Northwestern State University. In addition to a very interesting show-and-tell session with regional artifacts and literature, and his always informative and stimulating comments, Pete also took us on a memorable field trip to the Los Adaes historic contact site, scene of his long-term research efforts, and gave us copies of his "hot off the press" report on his recent project in the Catahoula Basin of east-central Louisiana. We also had a productive visit to the Watson Library at the University.

Our next stop was at Lafayette, in the heart of the Cajun country, where archeologist Jon Gibson of Southwestern Louisiana University *(Universit des Acadiens)* provided many insights into the regional archeology and his extended research on the unique Poverty Point procurement, exchange, and cultural interaction systems. We are also grateful to Jon for loaning us a number of out-of-print reports, for introducing us to Glen Conrad and his staff at the University's Center for Louisiana Studies, and for a memorable introduction to Cajun musical culture.

From Lafayette, we traversed the Atchafalaya Basin and returned briefly to Baton Rouge. There we conferred with paleoclimatologists Kam-Biu Liu and Katie Hirschboeck, and her graduate student Sue Smith, in the L.S.U. Department of Geography and Anthropology, and again with Charles Pearson, plus Donald Hunter, at Coastal Environments. Finally, we revisited Kass Byrd and Duke Rivet in the State .Archaeologist's office, and photocopied some literature we had missed earlier.

Returning to Vicksburg, we enjoyed the hospitality of Sam and Marilyn Brookes and made a very informative visit to the Vicksburg Corps of Engineers' Waterways Experiment Station. There we conferred at length with Roger Saucier, the Lower Mississippi Valley's leading geologist and geomorphologist, and with his associate Lawson Smith. We returned to Arkansas in convoy with Ed Jackson (who had just moved to the University of Southern Mississippi), and discussed Lower Valley archeology with him at the Survey's UAM Station before returning to Fayetteville.

We also obtained a great deal of useful information through discussions at meetings and/or correspondence with colleagues based in other regions who have research interests in or near portions of our overview's territory. These include Stephen Williams, Jeffrey P. Brain, Ian W. Brown, and T. R. Kidder of the Lower Mississippi Survey (LMS), Peabody Museum, Harvard University; David H. Dye of Memphis State University; Vincas Steponaitis, then of the State University of New York at Binghamton; David Anderson, then of Garrow & Associates, Atlanta, Georgia; paleoecologists Paul and

Hazel Delcourt of the University of Tennessee; Larry Aten of the National Park Service; and our overviewing neighbors to the west, Dee Ann Story and Jan Guy of the University of Texas in Austin. Patricia Galloway of the Mississippi Department of Archives and History not only furnished a number of insights into the early historic situation, but also provided invaluable advice about computerized word-processing to Jeter during the last stages of manuscript production.

Additional insights into various relevant matters came from several colleagues who briefly visited Fayetteville in late 1987. John Belmont, formerly of the LMS, visited in early October, along with northeast Louisiana amateurs Reca Jones and Dwain Kirkham. In early November, Bruce D. Smith of the Smithsonian Institution gave a very interesting colloquium, plus informal discussions, on prehistoric subsistence. And Leonard W. Blake of St. Louis, a leading amateur archeologist since the 1930s (and archeobotanist since the 1950s, honored for his efforts by the SAA's second Crabtree Award earlier in 1987), visited in mid-November.

We thank all of the above for their vital information, opinions, and advice, but absolve them of any responsibility for our subsequent writings. We also beg the forgiveness of any deserving individuals whose names were inadvertantly omitted above.

We would like to dedicate this Overview to Larry Banks for all his tireless efforts, hinted at above; to Fred Limp, who shared with Larry the vision of overviewing the archeology of the lands from the Four Corners country to Plaquemines Parish (or from the Rio Grande to the Great River); and also to two of our esteemed former colleagues in the archeology of the Lower Mississippi Valley and the Trans-Mississippi South in Louisiana and Arkansas: John S. Belmont and E. Thomas Hemmings. John and Tom are no longer active in these fields, due to the vagaries of academic and contract archeology, but their substantive and conceptual contributions will endure, as will be clear to readers of the following pages. Thank you all very much, gentlemen.

Marvin D. Jeter
Monticello, Arkansas; April, 1989

CHAPTER 1

INTRODUCTION

Marvin D. Jeter

This volume presents the sixth and final regional cultural resource overview prepared by the Arkansas Archeological Survey for the U.S. Army Corps of Engineers, Southwestern Division. This overview covers the southeastern half of Arkansas, plus virtually the entire state of Louisiana. More specifically, it includes all of the Arkansas counties which were not covered by the Ozark Mountains-Arkansas River-Ouachita Mountains overview (Sabo et al. 1988), and all of Louisiana except for the western portions of two parishes adjacent to Texas, which had already been assigned to the Gulf Coastal Plains overview before the present overview was authorized (Figure 1).

This region differs from all of the previously designated regions, in that it extends beyond the boundaries of the Civil Works Directorate of the Southwestern Division, to include lands within the Division's Military Directorate.

In terms of geological, geomorphological, physiographic, and geographic provinces, the study area includes the Lower Mississippi Alluvial Valley and the West Gulf Coastal Plain in Arkansas and Louisiana, plus a portion of the southern Ouachita Mountains in Arkansas and a portion of the East Gulf Coastal Plain in southeast Louisiana. The physical and biological environmental characteristics of these regions are

Figure 1. The location of the Louisiana-Arkansas region in the Southwestern Division.

discussed in Chapter 2, by Marvin D. Jeter and G. Ishmael Williams, Jr.

This entire territory is within the southeastern U.S., as defined by many, and perhaps most, prehistoric archeologists and cultural anthropologists. Within the Southeast (in this broad sense), two major culture areas are involved: the Lower Mississippi Valley and the Trans-Mississippi South. Chapter 2 also includes a discussion of the varying definitions of these areas, and of the regions within them.

Chapter 3, also by Jeter and Williams, summarizes previous archeological investigations in the study area. It deals not only with the history of substantive archeological research, but also with that of cultural resource management (CRM) efforts. Here, and in Chapters 5-7, Jeter contributed the non-coastal sections, and Williams wrote the coastal sections.

Chapter 4, by Jeter, reviews the key archeological concepts that have been applied to the study area or portions of it. In the context of this methodological-theoretical review, conceptual devices are established for dealing with the spatial, temporal, and cultural dimensions for the purposes of this overview.

Chapters 5 through 7, by Jeter and Williams, summarize more than 10,000 years of the rather complex prehistory of this enormous study area, in chronological order. Emphasis is placed on the "big picture" in terms of lithic horizons and archeological cultures — their locations, apparent lifeways, rise and fall, and relationships.

Chapter 8, by Jeter, provides an ethnohistorically documented, but archeologically oriented, overview of the study area's numerous and diverse Protohistoric and Historic Native American groups. Chapter 9, by Williams, similarly summarizes the equally complex congeries of Historic Euramericans, Afro-Americans, and Asian-American peoples and their archeological record.

Chapters 10 and 11, by Jerome C. Rose and Anna M. Harmon, deal with bioarcheology. Chapter 10 includes a history of bioarcheology in the study area and an outline of the nature of the bioarcheological data base by regions and cultural affiliations. Chapter 11 provides a bioarcheological synthesis of these data, with emphasis on evidence for adaptive trends through time.

Chapter 12, by Jeter, Rose, Williams, and Harmon, is an overall synthesis of the archeological and bioarcheological evidence, in terms of adaptation types which transcend the stylistically based cultural boundaries in both space and time. The authors also call attention to major gaps in the data base for the study area.

ENVIRONMENTAL SETTING AND VARIABILITY

Marvin D. Jeter and G. Ishmael Williams, Jr.

> The student of prehistory in the Lower Mississippi Valley ...must attempt to reconstruct cultures that no longer exist, in an environment that exists only in a profoundly modified state. This is no simple undertaking. (Phillips et al. 1951:36)

INTRODUCTION

The present study area includes significant portions of three major physiographic provinces: the Lower Mississippi Valley (Fenneman 1938:83–99; Fisk 1944), the West Gulf Coastal Plain (Fenneman 1938:100ff), and the Ouachita Mountains (Fenneman 1938:663ff). It also includes a small coastward portion of the East Gulf Coastal Plain (Fenneman 1938:65ff).

The first of these provinces is more or less congruent with a biogeographic area which is also usually referred to as the Lower Mississippi Valley (Phillips et al. 1951). Another biogeographic (and cultural) area, called the Trans-Mississippi South, includes both the Ouachitas and the relevant portion of the West Gulf Coastal Plain (Schambach 1971, 1982a:133). The East Gulf Coastal Plain is part of the biogeographic and cultural Southeast (Smith 1986).

This study area differs quantitatively, if not qualitatively, from all of the others in the Southwestern Division Overview project, in that it includes enormous areas which have been and continue to be profoundly modified by natural processes, as well as by human technologies. Although environment does not determine culture, specific environments do provide potentials and constraints for cultural adaptations, especially for relatively simple low-energy technologies.

It is impossible to understand the cultural adaptations and changes in and near the Lower Mississippi Valley without understanding the basic characteristics and variability of this extremely dynamic environment. Since the late Pleistocene, major rivers have changed their courses by tens to hundreds of kilometers on a time scale of centuries to millennia, and have flooded and meandered on scales of months or years to decades or centuries. Coastlines have changed significantly with prolonged fluctuations in sea level, and deltaic plains have changed perhaps most drastically of all, in a variety of ways and on a variety of time scales (Fisk 1944; Saucier 1974; Gagliano 1984). Ecosystems respond to such changes over a similarly wide range of spatial and temporal scales (Delcourt et al. 1983).

Lower Valley archeologists and associated geoscientists have gained a fair understanding of major variations in the physical environment, and of cultural adjustments to them. As will be seen, archeology and the geosciences have grown up together in this area during the twentieth century. But, we are only in the beginning stages of research into prehistoric variations in the biological environment, cultural exploitation of wild plant and animal species, and the processes of domestication and cultivation of both native and imported plant species.

The Ouachita Mountains and Coastal Plains are generally upland areas which have been relatively stable in recent centuries and millennia. However, the streams which dissect them, particularly the Red River and the Ouachita River, have been subject to significant variations in their general regimes, especially in their lower reaches, where they have joined the Lower Valley and/or the Gulf of Mexico. Again, knowledge of prehistoric biological environmental variation, exploitation, domestication, etc., is still in the incipient stages.

The following sections will summarize the salient and relevant characteristics of the physical, climatic, and biological environments — and paleoenvironments — of the study area.

PHYSICAL ENVIRONMENTS

Lower Mississippi Valley

> Everywhere you look, the Mississippi River is evident. It created the topography. Even many of its modern tributaries flow in its relict channels. No one can live here and not be aware of the river; it influences everyone's life. It was also the most important environmental influence on human behavior in the past. (Morse and Morse 1983:1)

> This all adds up to a very interesting, not to say peculiar, environment, one which might be assumed to have fostered, aboriginally, an amphibious type of culture.... The dominant note in the landscape is muddy water. (Phillips et al. 1951:10)

The Lower Alluvial Valley of the Mississippi River is an extensive lowland that extends southward from the vicinity of Cairo, Illinois, and Cape Girardeau, Missouri, to the Gulf of Mexico. The following descriptive summary is derived from data presented by Fenneman (1938:83ff), Fisk (1944, 1947), Saucier (1974) and Cry (1978).

Geography and Hydrology. The Lower Valley is about 965 km in length, and averages about 120 km in width. The river's natural meandering course from Cairo to the Gulf was more than 1700 km long, but this has been shortened by man-made cutoffs to about 1600 km. The Lower Valley reaches a maximum width of about 200 km in the latitude of Helena, Arkansas, and is only about 40 km wide just above Natchez, Mississippi.

The Lower Valley is bordered in its northern part by abrupt walls which rise over 60 m (ca 200 feet) above its floor. The uplands that form these walls gradually decrease in elevation southward and eventually disappear beneath the marshlands that border the coast. The alluvial plain which forms the present valley floor is interrupted by two major north-south ridges (erosional remnants), both west of the present Mississippi River. Crowley's Ridge rises some 60 m above the plain and extends over 300 km from Commerce, Missouri, to Helena, Arkansas. Macon Ridge, generally less than 15 m higher than the plain, extends from Eudora, Arkansas, to Sicily Island, Louisiana, a distance of about 160 km.

The Lower Mississippi River is the trunk channel for waters from one of the world's largest drainage systems, involving an area of about 3.3 million km^2. Its average discharge is about 560,000 cubic feet per second; during the great flood of 1927, a maximum discharge of more 2,400,000 cfs was estimated. The maximum measured stage variation before the construction of artificial levees was about 15 m at Cairo, and nearly 4 m at New Orleans.

Because of the great extent of its drainage basin, the Lower Mississippi River's discharge is not necessarily in phase with winter and spring water surpluses across the Lower Valley, according to Muller and Willis (1978:60), who noted:

> Large proportions of the Mississippi River discharge originate in the Ohio, Tennessee, and Arkansas river basins, and during recent flood seasons, the lower Mississippi River Valley alone has probably contributed less than 10% of the total discharge.

Tributaries. The Lower Mississippi River is formed by the junction of its two major tributaries, the Tennessee–Ohio and the Missouri–Upper Mississippi, near Cairo. The Ohio system's flow contributes almost twice as much water, on the average, as that of the Upper Mississippi.

South of Cairo, the major tributaries of the Lower Mississippi, except for the Yazoo River, flow into it from the west. The St. Francis River joins the Mississippi just north of Helena, and together they collect the drainage of the Eastern Lowlands (east of Crowley's Ridge). The White River and its tributaries drain the Ozark Plateau, Western Lowlands, northernmost Ouachita Mountain ridges and valleys, and Grand Prairie, joining the Mississippi in northeastern Desha County, Arkansas.

The Arkansas River, a major stream with its headwaters in the Rocky Mountains, traverses the Great Plains and northern Ouachitas, and presently joins the Mississippi just downstream from the White River juncture. The Arkansas is the only tributary of the Lower Mississippi which carried outwash from mountain glaciers during the Pleistocene. As will be seen, its lower course (meander belt), downstream from present-day Pine Bluff, Arkansas, was subject to tremendous changes during the Holocene.

The Yazoo River drains the eastern part of the Lower Valley below Memphis and joins the Mississippi near Vicksburg, Mississippi. The drainage pattern of this river and its tributaries (the Sunflower and Coldwater–Tallahatchie rivers) has given rise to the generic term "yazoo streams" for streams that originate near a larger stream (here, the Mississippi), but are unable to break through its natural levees, and parallel it for long distances. In colloquial speech, the Yazoo Basin of northwestern Mississippi is famous as the "Delta country," as are to a lesser extent the Lower Valley floodplains of eastern Arkansas and northeastern Louisiana. These agricultural lowlands, historically the home of cotton plantations and "blues" music, should not be confused with the true Deltaic Plains of the Mississippi Valley in southeastern Louisiana.

The Ouachita River, while not particularly large, is a notable tributary in that it has recently been the subject of extensive geoscientific and archeological research (Fleetwood 1969; Saucier and Fleetwood 1970; Gibson 1983a). At times during the late Pleistocene and Holocene, it was a tributary of south-trending meander belts of the Arkansas River. It is presently joined by a yazoo stream called the Tensas River in east-central Louisiana to form the Black River, which continues southward to join the Red River, a short distance above the Red's present mouth.

The Red River is the southernmost of the Mississippi's present major tributaries. It originates in western Oklahoma, flows across the plains of the Texas Panhandle to become the Oklahoma–Texas border, enters southwest Arkansas and takes its Great Bend southward into Louisiana, and traverses that state southeastward to its present mouth. At various times in the geological past, it has joined the Mississippi farther south than at present, or, after entering the Lower Valley, has pursued its own south-southeastward course to the Gulf without joining the Mississippi.

Transition Zone. The Red River's present mouth marks a transition. Above and for some distance below this locality, the Mississippi River is joined by *tributaries* in V-shaped junctures pointing downstream. Below this locality, the tributaries diminish, and *distributaries* leave the Mississippi, with V-shaped forks pointing upstream. The last tributary is Thompson's Creek, which enters the Mississippi just north of Baton Rouge (Hiram F. Gregory, personal communication). Between this locality and the Deltaic Plains lies an enormous backswamp, the Atchafalaya Basin, bounded on the east by the present Mississippi meander belt and on the west by an old Mississippi meander belt which is presently occupied by Bayou Teche.

Just west of the Red River's present mouth, the head of the Atchafalaya River has recently begun capturing the flow of the Red River. The Atchafalaya has a steeper gradient than the Mississippi, and without human intervention, the Mississippi would have already been diverted through the Atchafalaya, abandoning cities such as Baton Rouge and New Orleans (Russell 1967:63). At present, the Atchafalaya is the major emergency spillway of the Mississippi in the Corps of Engineers, New Orleans District's flood-control program (Fisk et al. 1952; Cowdrey 1977:46, 52-57).

Coastal Zone

The coast of Louisiana can be defined as the zone of interaction between terrestrial systems and marine systems stretching some 514 linear km roughly east-west along the margin of the Gulf of Mexico from the Pearl River at the Mississippi state border to the Sabine River at the Texas state line. This zone encompasses wetlands and associated uplands of the Mississippi River Deltaic and Chenier Plain subzones where coastal systems operate in a dynamic cascade linking inland riverine watersheds to estuarine and ocean systems. This 10 to 40 km wide band of interlocking coastal systems, also known as the shore zone, takes in a diverse array of wetland types and landforms, including rivers, distributaries, marshes, lakes, levees, beach ridges, dunes, salt domes, terraces, and island remnants of former deltas. This zone reaches maximum width in the Mississippi Delta area where the river has formed a series of delta lobes jutting out to the south-southeast along former courses of the Mississippi River. The active shore zone narrows in the Chenier Plain to the west where, beyond the effects of the Mississippi River, long straight barrier beaches have developed (Gagliano 1984).

The present shore zone represents the latest in a series of constantly changing landform configurations that have evolved through time since the origin of the Gulf. Geological data indicate that the present Mississippi Delta and Chenier Plain systems have been active in their present position since sea level reached its present stand about 3500 years ago. The relict features of previous positions of the active shore zone are situated both landward and seaward of the active shore zone.

Seaward 30 to 220 km of the present shore zone and to water depths of about 160 m lies the continental shelf, where relict terrestrial features indicate the positions of former shore zone landforms active in the interval between the last major low stand of sea level during the Wisconsin full glacial (ca 20,000 years B.P.) and the present sea level stand. These relict landforms were part of the active shore zone before and during the Paleo-Indian and Archaic periods, and any surviving drowned archeological sites could hold the key to understanding an important part of the prehistory of the coast (Coastal Environments 1977). Extending landward from the active shore zone is the Coastal Plain, a complex of sedimentary deposits accreted over a long period of time. Much of this zone is made up of the coastal trending Prairie terrace unit, a complex of deposits that includes barrier island, lagoonal, and shoreline features deposited during the Sangamon stage 120,000 to 130,000 years ago during a sea level rise 6 to 7 m above present (Saucier n.d.:45–46).

The Mississippi Deltaic and Chenier Plain coastal ecosystems are the products of formation processes driven by the dynamic interplay between geological factors, riverine forces, marine systems, and climatic change that have operated from the Pleistocene to the present. These formation processes have given each of the two coastal systems a distinctive character in terms of the type and distribution of landforms and associated plant and animal communities. The diverse habitat types found in each zone have in turn provided unique arrays of possible human subsistence and settlement alternatives, which are reflected by very different cultural adaptations in these areas compared to noncoastal inland riverine and upland areas. In addition, environmental and geomorphological variability have resulted in some important differences between the Mississippi Deltaic and Chenier Plain during prehistory and history within the general coastal shore zone, which will be detailed later.

Deltaic Plain. The Deltaic Plain of eastern Louisiana encompasses the late Holocene Deltaic Plain and subaqueous deltaic area of the Mississippi River system. The major streams that flow through this area are the Mississippi River and its main distributary, the Atchafalaya River, which flows through the western part of the Deltaic Plain. The Deltaic Plain consists of one active and numerous inactive deltaic features extending approximately 288 km across southeastern Louisiana. The boundary between the Mississippi alluvial valley to the north and the marine-influenced Deltaic Plain has been defined by Saucier (1969, 1974) and others (Krinitzsky and Smith 1969) roughly along a northeast to southwest trending line 6 km northwest of Houma, Louisiana.

Chenier Plain. The Chenier Plain of Louisiana is a 24 to 32 km wide strip of Holocene age deposits stretching 225 km (140 miles) from west of Vermilion Bay to Sabine Lake. The cheniers are characterized by a relatively flat plain, rarely exceeding a meter above sea level, and dominated by large expanses of marsh and mudflats interspersed with streams, rivers, ponds, and lakes. The relatively featureless plain is broken by long narrow coast-trending ridges made up of coarse grained sediments overlying the fine grained marsh and mudflat plain. These chenier ridges range in height from 1 to 3 m and in width from a few meters to 500 m and extend for many kilometers. These are the live-oak covered beaches to which the French Louisianans applied the term *chenier*, meaning place of the oaks (Saucier 1974:14; n.d.:38; Kaczorowski and Gernant 1980:1).

Ouachita Mountains

The Ouachita Mountain province (Fenneman 1938:663ff), in west-central Arkansas and adjacent southeast Oklahoma, includes by far the highest elevations in the present study area, exceeding 300 m. Even higher elevations, on the order of 600 m, are found in the Ouachitas outside this study area.

The Ouachitas are folded and faulted mountains, characterized by ridge and valley terrain, with the ridges and valleys generally trending east-west. The rocks which outcrop here include not only Paleozoic sandstones, limestones, and other sedimentary types, but also such metamorphic rocks as slate and novaculite, the "Arkansas stone" used presently for whetstones and widely circulated prehistorically for projectile points.

West Gulf Coastal Plain

This portion of the Coastal Plain province is a classic belted coastal plain formed on relatively recent (Cretaceous and younger) deposits that are progressively younger from the Ouachitas to the present coast. The deposits are generally unconsolidated or poorly consolidated, and dipping gently seaward, so that the more resistant deposits form inland-facing cuestas or gentle scarps.

East Gulf Coastal Plain

This is another portion of the Coastal Plain province, separated from the West Gulf Coastal Plain by the Mississippi Embayment. Again, the classic belted coastal plain physiography is present. However, the present study area only includes some of the most recent coastal plain formations from this province, in the "Florida Parishes" of southeast Louisiana.

CLIMATIC VARIABILITY

Knowledge of the modern climate of the Lower Mississippi Valley has recently been summarized as follows (emphasis added):

> From a global perspective, the climate of the lower Mississippi River Valley is generally classed as humid subtropical, with sultry summers and wet, mild winters.... In summer, the climate is truly subtropical everywhere in the lower Valley, but winter temperatures become progressively colder upstream, near the southern margins of the humid continental climates of North America. However, it is well known that generalizations such as climatic classifications based on *averages* have rather limited application, and that significant spatial and temporal *variation* is characteristic of most climatic regions. Indeed, temporal *variability* profoundly affects almost all aspects of human activity. (Muller and Willis 1978:55)
>
> Much is known about the *average* climates of the lower Mississippi River Valley. However, the *variable* nature of climatic elements is considerable, and this *variability* is little inventoried, understood, or appreciated, and its interplay in terms of climatic hazards with economic and environmental responses has been virtually ignored. (Muller and Willis 1978:63)

These authors particularly emphasized the effects of climatic variability on modern agriculture, which is buffered by mechanized technology, including irrigation. It is clear, therefore, that prehistoric, low technology horticultural systems would have been affected significantly by the vagaries of droughts, frosts, and excessive rainfall, not to mention major storms.

In an interesting Southwestern study, Plog (1978) quantified the Colorado Plateau's east-west climatic variability and called attention to its correlation (especially the frequency and length of drought periods) with geographic and temporal variations in Puebloan agricultural practices and social organization. In an independent characterization of a portion of the present study area, Schambach (1982a:133) has remarked that the Trans-Mississippi South is:

> ecologically different from other Southeastern woodland areas east of the Mississippi, and particularly from the Lower Mississippi Valley, because of its drier climate and above all its very volatile short and long term rainfall patterns. It is an area that looks lush, green and Southeastern most of the time, but one that is actually subject to frequent long and short term droughts alternating with periods of excessive, damaging rainfall. Every environment has its unique challenges and thereby puts its mark on the cultures that adapt to it. In the Trans-Mississippi South, the challenge...was extremely varied and unpredictable rainfall.

Unfortunately, temporal climatic variability is inadequately documented in the present study area. Accurate temperature and precipitation records are only available for the historic time span of about a century for much of the area, though there is some hope for at least a general characterization over a much longer period (see below).

In their study of Lower Valley climatic variability, Muller and Willis (1978) emphasized instead the spatial dimension, north versus south. Primarily, they contrasted temperature and precipitation variability in southern Louisiana and western Tennessee. With regard to temperature, they noted several patterns which are of relevance here (1978:55–58):

> 1. Each year, the pattern of long waves of the westerly flow apparently determines much of the temperature variability over the entire Lower Valley. E.g., warmer periods in the northern and southern portions tend to be correlated, as do cooler periods.
>
> 2. There was a strong tendency for warmer and colder than average months to cluster together, with a persistence of three to six months or more.
>
> 3. Baton Rouge, situated only about 120 km upstream from New Orleans, experienced many more days below freezing and lower minimum temperatures.

It should be emphasized that most of these findings were based on relatively short period, for the standard 30-year period from 1931 through 1960. As for precipitation, the following general patterns were discerned (1978:58–59):

> 1. Clusters of wetter and drier months occurred, again of about three to six months' duration.
>
> 2. Extended wetter periods in the northern portion of the Lower Valley were not precisely in phase with those of the southern portion.
>
> 3. Extended drier periods, though, did tend to be in phase.

Despite the above caveats about modern average climatic data, maps of such data can provide at least a general picture of geographic variability.

SOILS

Soils develop over periods of hundreds to thousands of years, through complex interactions among parent materials, climates, and ecosystems. As noted by Miller (n.d.), the use of soil science in reconstructing the Quaternary geologic history of the study area has been limited. Miller (n.d.) has recently summarized the findings of published and unpublished data from soil surveys, theses, dissertations, etc. This summary will be published by the Geological Society of America (Roger Saucier, personal communication); an advance copy of the manuscript was obtained, but the accompanying maps are not yet available. Consequently, Miller's findings will merely be outlined here.

The oldest soils in the study area appear to be Ultisols or buried Ultisols in the Ouachitas and older Coastal Plain deposits, or buried by the Upland Graveliferous complex of uncertain Pleistocene age, or by Late Pleistocene loess. The soils developed on deposits of that complex (perhaps 15 different soil series) are also generally Ultisols. Ultisols are sandy to loamy in the near-surface zones, and clayey in the subsoil. They are not productive for agriculture, and support pine and mixed hardwood forests.

Soils on the Intermediate Terrace complex of Pleistocene deposits tend to be Ultisols and Alfisols, with the latter sometimes highly weathered. Alfisols have loamy, sometimes thin, upper zones, and very clayey subsoil, and are often poorly drained. Locally, clayey Inceptisols have begun to develop in deposits of this complex which are presumed to be of Arkansas or Red River origin.

The Prairie Terrace complex, which includes large areas in east-central Arkansas, southeast Louisiana, and southwest Louisiana, includes a varied mix of Ultisols and Alfisols (and some Inceptisols) in the northern portions of the study area. The coast-trending portion of this complex is younger, and the soils include buried Inceptisols, Entisols, and Alfisols. The Entisols are clayey and rich in organic matter. Modern soils developed in the Prairie Terrace complex are highly variable, with Ultisols predominating to the north and Alfisols predominating in the south.

The Wisconsinan Valley Train Deposits of the Mississippi Valley are of highly variable age and dominated by sandy to loamy Alfisols, with some Entisols and Inceptisols. The youngest valley train deposits were probably the source of the Peoria Loess, which is absent on their surfaces. The latter are probably very late Pleistocene or early Holocene Mississippi River alluvium. Alfisols and Inceptisols have developed on these natural levee deposits.

The soils of the Deweyville Terrace complex vary according to the river valley involved and include Ultisols, Alfisols, and Inceptisols. The age of the Deweyville terrace is a somewhat controversial subject, with estimates ranging from earlier than 20,000 years ago (Saucier 1974) to Holocene or Altithermal (Alford and Holmes 1985). Miller suggests on the basis of soils that an older date, at least partially correlated with loess deposition, is correct.

The Loess Deposits of the Lower Mississippi Valley have been subdivided into five distinct episodes of deposition. These have been found in superposition only on Crowley's Ridge in northeast Arkansas. The three oldest contain buried Alfisols. The next youngest loess, of late Wisconsinan age, contains a buried Inceptisol with minimal development. The youngest loess (Peoria or Vicksburg) contains Alfisols, Mollisols (high in organic matter), and Inceptisols.

The Holocene soils of the study area are of two basic kinds: soils developed on the alluvial plains of the Mississippi River and other streams, and soils developed in the Deltaic and Chenier Plains of the Louisiana coastal zone.

The recent alluvial soils are the ones most significant for both modern agriculture and for prehistoric agriculturalists (and less directly for prehistoric hunter-gatherers). They are highly variable from one river valley to the next, and the best readily available sources of information are the numerous county and parish soils maps prepared by the U.S. Department of Agriculture. Miller's summary will include tabulations of general soil characteristics from high natural levees to low backswamps (phrased in the Soil Survey Staffs 1975 terminology, which the veteran geologist C. B. Hunt aptly referred to as "incredibly horrendous", e.g., Typic Udipsamment, Vertic Haplaquept and Typic Medisaprist), but for practical purposes, archeologists will probably prefer the county/parish soils maps.

It should be emphasized that these soils maps are not infallible. Their scales are too large to include small areas of certain soil types that may have been important for prehistoric or early historic settlement. Also, the section and township lines as indicated on these photomaps, and even on U.S. Geological Survey quadrangle maps, are not necessarily correct. The official sections were established by the General Land Office surveyors in the early to middle 1800s. Along the Mississippi River, they include some very oddly shaped sections derived from the preceding French *arpent* system, and in some cases, from Spanish practices.

The Deltaic and Chenier Plains, especially the former, are dominated by Histosols. These form in thick, highly organic deposits and range from slightly decomposed peats to highly decomposed mucks. Numerous buried Holocene soils occur in thin horizons in these settings, which are subject to subsidence.

BIOLOGICAL ENVIRONMENTS

The ecological base which supports almost all life on earth is "primary production — the binding of sunlight energy into organic matter by plants" (Lieth and Whittaker 1975:v). The distributions, abundance, production, and combinations of plant species strongly influence the distributions and abundance of wild animals, directly in the case of herbivores or indirectly for carnivores. In turn, these characteristics of plant species are strongly influenced, and ultimately forced, by variations in the physical environment, climate, and ecological interactions. The subsistence and settlement strategies of prehistoric hunter-gatherers and of hunter-gatherer-horticulturists were adjusted to exploit and cope with variations in local and regional ecosystems.

The modern and recent historical plant and animal communities of the study area are not representative of those of the early historic or prehistoric past. Massive changes have occurred. In most regions of the Lower Mississippi Valley, the bottomland hardwoods were heavily logged during the late 1800s and early 1900s and almost totally eliminated to clear the way for mechanized agriculture after World War II (Holder 1970). In the Ouachita Mountains, "the last great virgin forest east of the Rockies" was logged between 1900 and 1950 (K. Smith 1986). In Louisiana, the bottomland hardwoods were heavily logged after 1900, and in the early 1940s, the war effort logged off the last virgin cypresses in the Tensas Basin of northeast Louisiana (Hiram F. Gregory, 1987 personal communication). Much of the upland mixed forest in both the West Gulf and East Gulf Coastal Plains has been converted into commercial pine forest. The coastal marshes of the Deltaic and Chenier Plains have been diminished and endangered by subsidence and a variety of twentieth century economic activities.

The potential natural vegetation of the study area has been broadly defined and a few more specific studies of presettlement vegetation, as noted by early to middle nineteenth century land surveyors, have been made, but these patterns cannot be simply projected back into the prehistoric past for at least two reasons. One is the tremendous variability, already noted, in the physical environments of the study area during the prehistoric past. The other, more general, reason is the gradually attained realization that plant communities are not entities with a sort of self-contained existence, but are simply coincidental co-occurrences of individual plant species at any given place and time (Colinvaux 1987).

PALEOENVIRONMENTAL DATA

A major aspect of paleoenvironmental variability in and near the Lower Mississippi Valley has been dramatic change in major riverine meander belts and coastal zones. These changes have been fairly well documented by geoscientific studies which have used either archeological dating or their own chronometric analyses (generally radiocarbon dating). Schematic paleogeographical maps, displaying the most important riverine and coastal situations at various times, will be presented to accompany the prehistoric culture-historical discussions in Chapters 4 through 8 and will have the cultural situations overlaid on them. The coastal zone of Louisiana is unique in the entire overview, so a summary of its geologic processes and history is detailed at the end of the present chapter.

Dendroclimatology. There is as yet nothing in the Southeastern approaching the Southwestern tree-ring paleoclimatological data base (Dean and Robinson 1978; Dean et al. 1985), which extends back to A.D. 1 in some regions. Beginnings have been made, though, toward establishing a bald-cypress-based paleoclimatic reconstruction for the Lower Mississippi Valley and adjacent Southeast (Stahle, Cook and White 1985; Stahle, Cleaveland and Hehr 1985), and another such reconstruction, based on post oak, in portions of Texas and Oklahoma near the western margin of the present study area (Stahle and Hehr 1984).

Palynology. A potentially important but underdeveloped source of paleoclimatic and paleobiological data for the study area is palynology. Whitehead (1973) tentatively reconstructed the full-glacial vegetation zones of eastern North America, but had no pollen sites close to the present study area. Delcourt and Delcourt (1977) analyzed pollen and plant macrofossil samples from terrace deposits in West Feliciana Parish, Louisiana (northwest of Baton Rouge), with emphasis on late Pleistocene and early Holocene environments. King and Allen (1977) reported on a long pollen sequence from a southeast Missouri locality, which has been used as a general indicator of northern Lower Valley conditions (i.e., by Delcourt and Delcourt 1979). Delcourt et al. (1980) obtained additional pollen and macrofossil sequences from the Memphis locality and integrated these with previous data in an overview of Quaternary vegetation change in the Mississippi Embayment. Kolb and Fredlund (1981) analyzed pollen sequences from salt domes in southeastern and northcentral Louisiana. Kam-Biu Liu of Louisiana State University (personal communication) is beginning analyses of Holocene palynological samples from the coastal zone.

These and studies from other regions have been used by Delcourt and Delcourt (1981, 1984, 1987) to reconstruct late Quaternary vegetation in eastern North America. They have also used these data to reconstruct the general paleoclimatic situations that existed and the major changes that took place in this enormous area during this period Although the overall maps are based on data from 162 fossil pollen sites, only two of these are in Louisiana and none are in Arkansas (Delcourt and Delcourt 1987:Figure 4.1).

One of these maps (Delcourt and Delcourt 1981:Figure 5) shows the maximum Late Wisconsinan continental glaciation, about 16,000 B.C., with the ice sheet extending southward beyond the Great Lakes well into east-central Illinois and adjacent Indiana. Sea level was depressed at least 100 m below the present level due to the great volume of water locked up in the glaciers, resulting in approximately a doubling of the subaerially exposed area of the Florida peninsula (with virtually all of the increase on the Gulf side), and a significant expansion of subaerially exposed terrain now under water off the Gulf coasts of Louisiana and adjacent states.

It may have been about this time that the braided Mississippi River, perhaps in response to increased volume of glacial outwash, abandoned the Western Lowlands to occupy the Eastern Lowlands (Saucier 1974:19). In a major and possibly related vegetation change, the Cypress–Gum association of the Lower Mississippi Valley was replaced by an unusual ecotype of Spruce forest extending all the way to the Gulf.

White spruce and larch were apparently isolated on "extensive sand flats of braided streams" in the southern part of the Valley. The flanking mixed hardwoods remained more or less in place. The Oak–Hickory–Southern Pine forest shifted its northern border slightly southward and extended its southern extent onto the newly exposed coastal terrain. The Oak Savannah, however, was also dramatically replaced by a Spruce–Jack Pine forest covering the Great Plains, the unglaciated Midwest, and the Ozark and Ouachita mountains (Delcourt and Delcourt 1981:145).

The climatic regime at this time was dominated by a west-east flowing Pacific airmass across the middle latitudes, including the northeasternmost part of the study area. The narrow Polar frontal zone immediately to the south also sliced across the northeast portion of the study area. The remainder of the study area was dominated by a Maritime tropical airmass (Delcourt and Delcourt 1987:101, 104).

A second map (Delcourt and Delcourt 1981:Figure 6) depicts the vegetation patterns that existed around 12,000 B.C. showing the results of a minor climatic warming beginning around 14,500 B.C. Delcourt and Delcourt 1987:104). The ice sheet had retreated about to the present Great Lakes, but remained continuous across Canada and the northern U.S. The Gulf coastlines had receded almost to their present locations. The vegetation patterns in and near the present study area remained about the same as those at 16,000 B.C.

A major climatic amelioration began around 10,500 B.C.; at about this time, the Lower Valley Spruce forest began to be replaced by Cypress–Gum forest (Delcourt and Delcourt 1981:147). Also about this time, an ice-free corridor was opening between the continental ice sheets (Haynes 1987:83-84; see below). As noted in Chapter 4 (cf. Haynes 1987), the earliest widely accepted evidence for the arrival of Paleo-Indians in the present U.S. is dated around 10,500 B.C.

A third map (Delcourt and Delcourt 1981:Figure 7) depicts a time around 8000 B.C. and indicates the overall trends of the changes which took place after 10,500 B.C. The Spruce–Jack Pine forest of the Plains and northern portions of the present study area was replaced by several different vegetation communities. In northern and western Arkansas and the southern Midwest, an Oak–Chestnut forest developed. To the west of the present study area, along the eastern margin of the Plains, a narrow north-south front of Oak Savannah reappeared, this time with prairie to the west. The Oak–Hickory–Southern Pine forest remained in place on the Coastal Plain and expanded its northern border somewhat northward. The Lower Mississippi Valley had become dominated by the Cypress–Gum Bottomland Hardwood forest type, replacing the Spruce forest type.

A complex climatic situation existed to the north of the study area around 8,000 B.C., due to penetration of the Arctic airmass through the ice-free corridor. However, the entire study area was dominated by the Maritime tropical airmass by this time (Delcourt and Delcourt 1987:104–105).

The Hypsithermal (or Altithermal) period of generally warmer climate peaked from about 6700 B.C. to 4500 B.C. (King and Allen 1977). A fourth map (Delcourt and Delcourt 1981: Figure 8), representing approximately the period 4000–3000 B.C., shows the results of this significant change. The Lower Valley was still dominated by the Cypress–Gum Bottomland Hardwood forest type. The Oak–Hickory–Southern Pine forest type which formerly dominated the Coastal Plain, i.e., most of the southern Trans-Mississippi South, had been displaced in those regions by the Southern Pine forest type, which essentially blanketed Louisiana and southern Arkansas, west of the Lower Valley. This was the result of the major expansion of southern pines which occurred around 4000 B.C. (Wright 1976: 586). A remnant Oak–Hickory–Southern Pine forest type now survived well to the north of its former habitat, in northern and eastern portions of Arkansas. The Oak Savannah may have impinged on northwest Arkansas and approached southwest Arkansas and western Louisiana.

By this time, the continental glaciers were not significant climatic factors in eastern North America. The study area was still dominated by the Maritime tropical airmass but was being impinged upon by a wedge of the Pacific airmass (Delcourt and Delcourt 1987:105).

A final map (Delcourt and Delcourt 1981:Figure 9) shows conditions in the centuries just before and after European contact and settlement. In general, the patterns are quite similar to those shown in the preceding map.

Presettlement Vegetation. More specific data on the vegetation of the presettlement (actually the early historic settlement) period are available through analyses of the General Land Office (GLO) surveyors' notes for particular localities. Only a few such studies have been made in and near the study area, however. In the first, Hazel Delcourt (1975) reconstructed the presettlement forest communities of West Feliciana Parish. In a more extensive study (H. Delcourt 1975), she characterized the early nineteenth century vegetation of portions of five parishes (LaSalle, Caldwell, Catahoula, Winn, and Grant) in northeast Louisiana. Martha Rolingson (1976), in conjunction with an archeological survey along Bayou Bartholomew in southeast Arkansas, analyzed GLO data for that locality. Also, as ancillary studies to Rolingson's research on the Toltec Mounds site in central Arkansas and John House's excavations at the Powell Canal site in extreme southeast Arkansas, Nancy McCartney (1982) and Frances King (1982a) prepared reports on GLO data from those localities.

Natural Vegetation Studies. In Arkansas, two studies of natural vegetation communities have recently been published (Pell 1984; Dale 1986). Pell's study was organized on the basis of geographically mappable natural divisions and characterized the typical vegetation within each of these divisions with variant vegetation community types described. Dale's study included a large map and was also based on the plant community concept, but its methodology was more clearly specified (Dale 1986:10–12). He made detailed observations of more than 500 plots covering 1/100 acre each, selected for lack of disturbance. On the basis of these data, four major vegetation groups were defined, mapped, and characterized on their own terms (Dale 1986:13ff), rather than within predefined natural divisions. Both studies deal with modern or relatively recent vegetation and mainly provide data for comparisons with prehistoric situations. However, it should be emphasized that the concept of vegetation communities as having any coherence of their own over long spans of time has been disproved recently (Colinvaux 1987; Delcourt and Delcourt 1987:107–330, Figures 5.1–5.39).

GEOLOGIC PROCESSES AND HISTORY OF THE COASTAL ZONE

The geologic history of the Louisiana coast has, in large part, been driven by glacial cycles controlling the rise and fall of sea level and riverine outwash. Figure 2 summarizes these changes in sea level from the early Pleistocene through the late Holocene. As the graph illustrates, the sea level has undergone two major low stands which correlate with the maximum glacial events of the Mid-Wisconsin and the Late Wisconsin period.

Although most concrete evidence for the presence of humans in the New World points to a date of around 10,500 B.C., some researchers accept that early man entered the New World from Asia across the Bering Land Bridge during the latter glacial episode, the Late Wisconsin glacial advance around 20,000 years ago (cf. Neuman 1984b; Coastal Environments, Inc. 1977). At this time, the accumulation of the Laurentide ice sheet reached a maximum thickness of over 3 km in places and sea level dropped 90 to 130 m below the present day level (Bryson and Wendland 1967; Gagliano et al. 1982); during the low stand in sea level, the Louisiana shoreline was as far as 160 km south of its present position on the margins of the Gulf continental shelf (Kolb and Van Lopik 1958; Smith et al. 1986).

The exact nature and extent of the Late Wisconsin shoreline on the Gulf Coast has not been defined, but geological studies are beginning to sort out and correlate submerged landform features on the continental shelf with the Quaternary eustatic episodes and to shed light on the geomorphological processes responsible for their formation. Several geoarcheological studies in the project area have reviewed the evidence for landform correlation with the sea level curve and have assessed the archeological potential of these now-submerged areas (Coastal Environments, Inc. 1977; Pearson et al. 1986).

The earliest geological deposits of interest in coastal Louisiana are associated with the Prairie Terrace formation (equivalent to the Beaumont terrace in Texas), a complex of depositional units from multiple glacial-interglacial cycles of which the primary aggradation cycles probably spanned the Sangamonian to Farmdalian substages. In Louisiana it includes two terraces along the Red River, a broad coast-trending area in southwestern Louisiana that includes a fluvial and deltaic

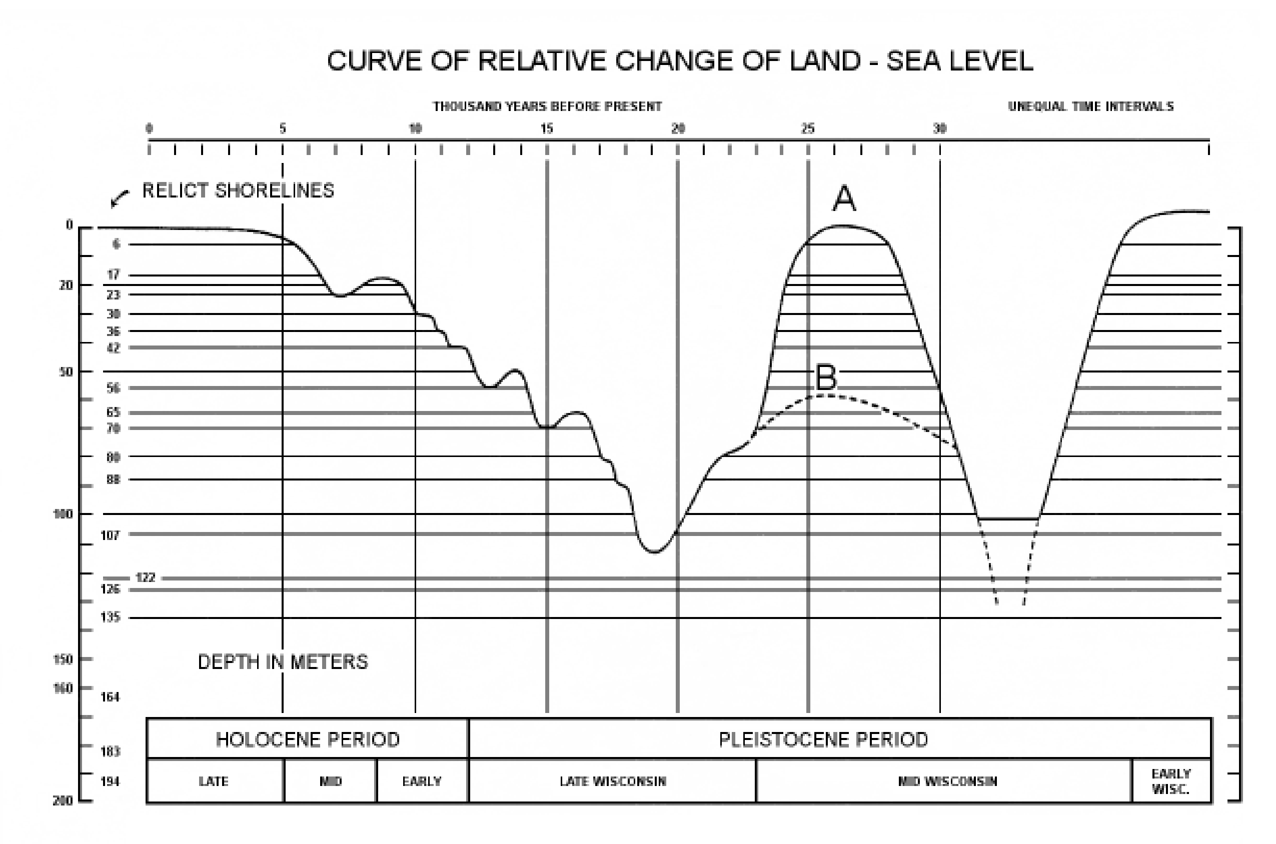


Figure 2. Relative changes in the level of land and sea during the late Quaternary (Gagliano et al. 1978).

unit, known as the Lafayette meander belt (Autin n.d.:20-24; Saucier, personal communication, 1987), and a comparable belt along the Florida Parishes–Lake Pontchartrain area, consisting of deltaic lobes from the Amite, Tangipahoa, and Pearl rivers (Coastal Environments, Inc. 1977:312). The coast-trending terrace of southwest Louisiana consists of an initial marine-transgressive depositional sequence that formed the Ingleside barrier trend during the Sangamonian substage 120,000 to 130,000 years ago, when sea level peaked 6 to 7 m above present (Saucier n.d.:24). A later marine-transgressive depositional sequence attributed to rising sea level during the Farmdalian stage 23,000 to 30,000 years B.P. resulted in significant aggradation in the upper part of the Mississippi Valley, causing the river to shift westward (Coastal Environments, Inc.1977:98).

This westward shift of the Mississippi River cut across the older Sangamonian age marine deposits of the Prairie terrace surface, creating the Lafayette meander belt. The Lafayette meander belt trends from Avoyelles Parish south through the towns of Opelousas and Lafayette, and, by some estimates, reaches as far west as Mud Lake in Cameron Parish (Coastal Environments, Inc. 1977:98, 314). South of Lafayette, the trunk channel of the Mississippi River branched into three delta lobes, extending into the Gulf of Mexico south of Vermilion and Cote Blanche bays. One of these is identified as the Sabine Bank Delta lobe, the other is known as the Tiger Shoal lobe, and the third is unnamed (Coastal Environments, Inc. 1977:97, 98, 314). Following the Farmdalian, sea level began to drop with the glacial advance of the Late Wisconsin, and when sea level receded to 90 m below present levels, the Prairie Terrace formation became exposed (Saucier n.d.:25).

As sea level subsided over the existing Prairie terrace during the Late Wisconsin glacial, Gulf-flowing streams became entrenched and extended their courses directly to the new shoreline, contributing the bulk of their sediment loads directly to the shelf (Coastal Environments, Inc.1977:96). The entrenchment of the Mississippi River formed the Mississippi Trough, an alluvial valley 16 to 40 km wide trending southeast from approximately 25 km west of Houma, Louisiana (Kolb and Van Lopik 1966). During this period, the Mississippi River was not building a subaerial delta, but was discharging directly into the deep waters of the shelf through the trough, forming a great submarine fan. Data from borings in the vicinity of the modern birdfoot delta indicate that the trough functioned between 25,000 and 15,000 years B.P. (Coastal Environments, Inc. 1977:97). Farther inland, the entrenchment of the streams and their tributaries led to a remobilization of sediments deposited in valleys during previous periods of floodplain aggradation. This led to a general increase in the amount of sediment load deposited on the shelf, despite the fact that streams were diminished in volume as a result of the glacial ice storage (Coastal Environments, Inc. 1977:161).

Following the last glacial maximum during the Late Wisconsin around 18,000 B.C., sea level underwent a rapid rate of rise for several thousand years. Relict shore trends on the continental shelf, attributed to the interval of rapid rise, suggest short term halts or reductions in sea level rise that may have persisted for a few hundred years each (Gagliano 1984:15). During this period of sea level rise, streams filled in the old entrenched valleys, deposition of coarse sediments was forced farther up the alluvial valley, and closer to the Gulf, shallow marine deposits were laid down over the coarse fluvial sediments as the shoreline transgressed northward (Kolb and Van Lopik 1966; Smith et al. 1986).

Chronologically, the next formation of importance in this discussion of the geomorphology of the coastal zone is the Deweyville terrace complex, a multilevel degradational sequence of fluvial origin, lying stratigraphically between the Prairie terrace formation and Holocene floodplains (Autin n.d.: 29). Although the Deweyville terrace has no surficial exposure along the coast or in the Lower Mississippi Valley, it has been documented seaward on the inner continental shelf where it is found along entrenched extensions of coastal streams (Gagliano et al. 1982). Where it is exposed, the Deweyville terrace surface is characterized by the presence of giant meander belt features three to six times larger than those of the present, which could have accommodated four to seven times the modern capacity of rivers (Gagliano and Thom 1967; Saucier and Fleetwood 1970; Saucier 1974). Saucier (Autin n.d.:30) notes that the greater size of meander features is a result of changes in the seasonality and intensity of rainfall in combination with vegetation changes, rather than a general annual increase in stream discharge. The fact that Deweyville terraces are found in coastal streams that would not have been affected by glacial meltwater implies that a wet climate associated with warm season precipitation resulting from tropical storms prevailed.

Estimates of the age of the Deweyville terrace vary depending on the nature, location, and presumed origin of the formation and range between 40,000 to 30,000 years B.P. (Autin n.d.: 30). Aten (1983) placed the age of the formation between 13,000 and 10,000 years B.P. and recognized an older Deweyville terrace associated with rising sea level during the Twocreekan Interstadial (13,000 to 11,000 B.P.) and a younger Deweyville formation with the reversal during the Valders glaciation (11,000 to 10,000 B.P.). In contrast, Saucier's (1981) age assignment of 25,000 to 20,000 B.P. for the Deweyville terrace implies a correlation with the end of the Farmdalian Interstadial and the onset of the Woodfordian glaciation. Saucier also observed that based on stratigraphic relationships with meander belts and archeological evidence, the Deweyville formation could not be Holocene in age (Autin n.d.:31) and would have to have originated more than 12,000 years ago (Saucier, personal communication).

Deltaic Plain

As a result of intensive study of the Mississippi Delta by a number of researchers (cf. Fisk and McFarlan 1955; Kolb and van Lopik 1958; McIntire 1958; McFarlan 1961; Coleman and Gagliano 1964; and Frazier 1967), the process and relative chronology of delta formation is fairly well understood. The formation of the deltaic complexes has followed a predictable cycle of sedimentary deposition, distributary development and landscape formation in response to the controlling fluvial and marine processes as well as sea level rise and landform subsidence. The following summary of the deltaic cycle is drawn from the studies conducted by Coastal Environments, Inc. who, under the leadership of Sherwood Gagliano, have made wide use of the model in cultural resource studies to bring into focus the geomorphological processes influencing prehistoric cultural development in the region.

The deltaic formation cycle begins when the river diverts to a new course or develops a major crevasse and begins discharging sediments into a bay, lagoon, or other shallow body of water. As the new course becomes established, flow becomes restricted by natural levees that form as narrow subaqueous ridges ahead of the advancing distributary mouth and eventually emerge as subaerial levees. Where the sediment load drops out at the mouth of the distributaries, subaqueous sand and silt bars build up causing frequent bifurcation or branching of the stream, though most of these branches will be abandoned in favor of a dominant single branch. As the distributary-levee system advances seaward, additional sediments are deposited ahead of and between streams, resulting in the development of intertidal mudflats and leading eventually to delta marshes interspersed with shallow ponds and lakes. These forward brackish and saline marshes are colonized by grasses, sedges, and rushes; further inland, where fresh water dominates, cypress and gum swamps are predominant (Saucier 1974:12). The decay of marsh and swamp vegetation to form peat beds also contributes to interdistributary basin fill (Coastal Environments, Inc. 1972:34).

This pattern of delta growth continues until the river diverts upstream or begins forming a new distributary system in another part of the deltaic plain. When this occurs, the amount of sediment discharge to the existing lobe decreases, and erosion and land subsidence become dominant processes. As a result, landforms begin to erode landward, coarse sediments are winnowed to form beaches which gradually develop into barrier islands, lakes and bays within the interdistributary areas expand, and distributaries fill in and become tidal channels. Eventually, abandoned deltas are completely destroyed or drowned by subsidence and perhaps become buried by new delta growth. This process of delta development may involve a cycle of growth and decay taking a few hundred years for a subdelta lobe and several thousand years (Figure 3) for a delta complex, depending on the stability of the trunk channel upstream and other factors such as sea level fluctuation (Saucier 1974:12, 13).

One significant result of the delta cycle on coastal ecological systems is that the total assemblage of environments and general biological productivity may vary systematically throughout the various stages of deltaic formation. The developmental stages of deltaic formation (the early building stage, the mature delta stage, and the terminal stage of delta deterioration) are all paralleled by corresponding stages of ecological succession. Since the state of delta formation across the coastal zone as a whole will include, at any particular time, most if not all of the various stages, the coastal zone will also

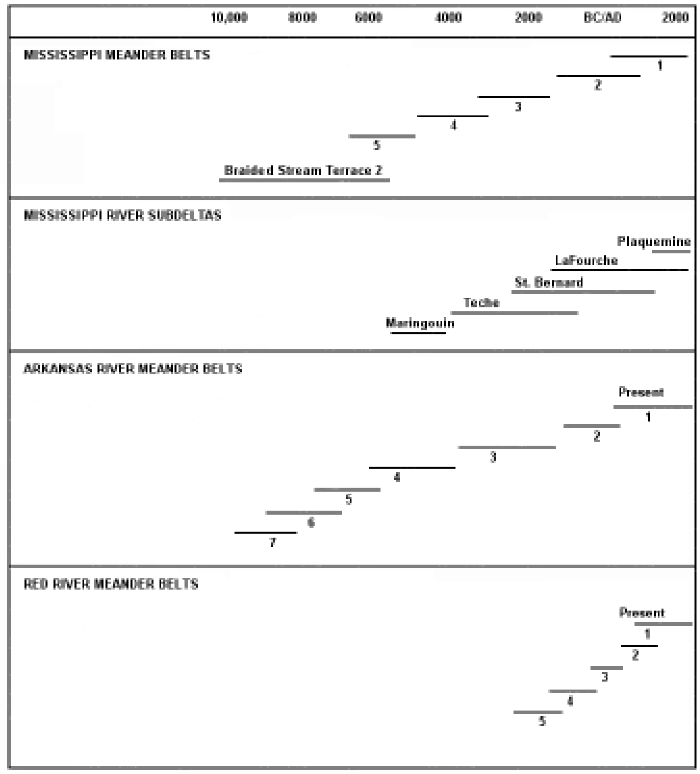


Figure 3. Chronology of Holocene riverine features (modified from Autin n.d.)

be characterized by differing states of ecological succession and biological productivity (Gagliano et al. 1978:3–34, 35).

As indicated in Figure 4, initial human occupation often occurs in the early stages of subaerial development. However, it is during the early stages of landform deterioration that biological productivity is greatest and when exploitation of the delta lobes by hunting, gathering, and fishing peoples may be the most intensive (Gagliano et al.1978:2–36). Human abandonment of delta lobes occurs when deterioration reaches the stage in which biological productivity can no longer sustain cultural systems.

Another major component of delta formation that is a particularly crucial factor in archeological site preservation is land subsidence. Because the Mississippi Delta lies within the Gulf Coast geosyncline, an area characterized by rapid rates of down-warping, land loss through subsidence has been a continuous process in this area for millions of years. Based on the radiocarbon dating of buried organic deposits, the rate of subsidence has been estimated at 15 to 21 cm per century over the past 2000 years for the Barataria Basin area in Plaquemines and Jefferson parishes. North of Lake Pontchartrain is a hinge, north of which land surfaces are being uplifted, while south of the hinge they are subsiding. As a result of human intervention in the delta cycle in modern times through land development and construction of flood control structures, the rate of land subsidence over the past three to four decades

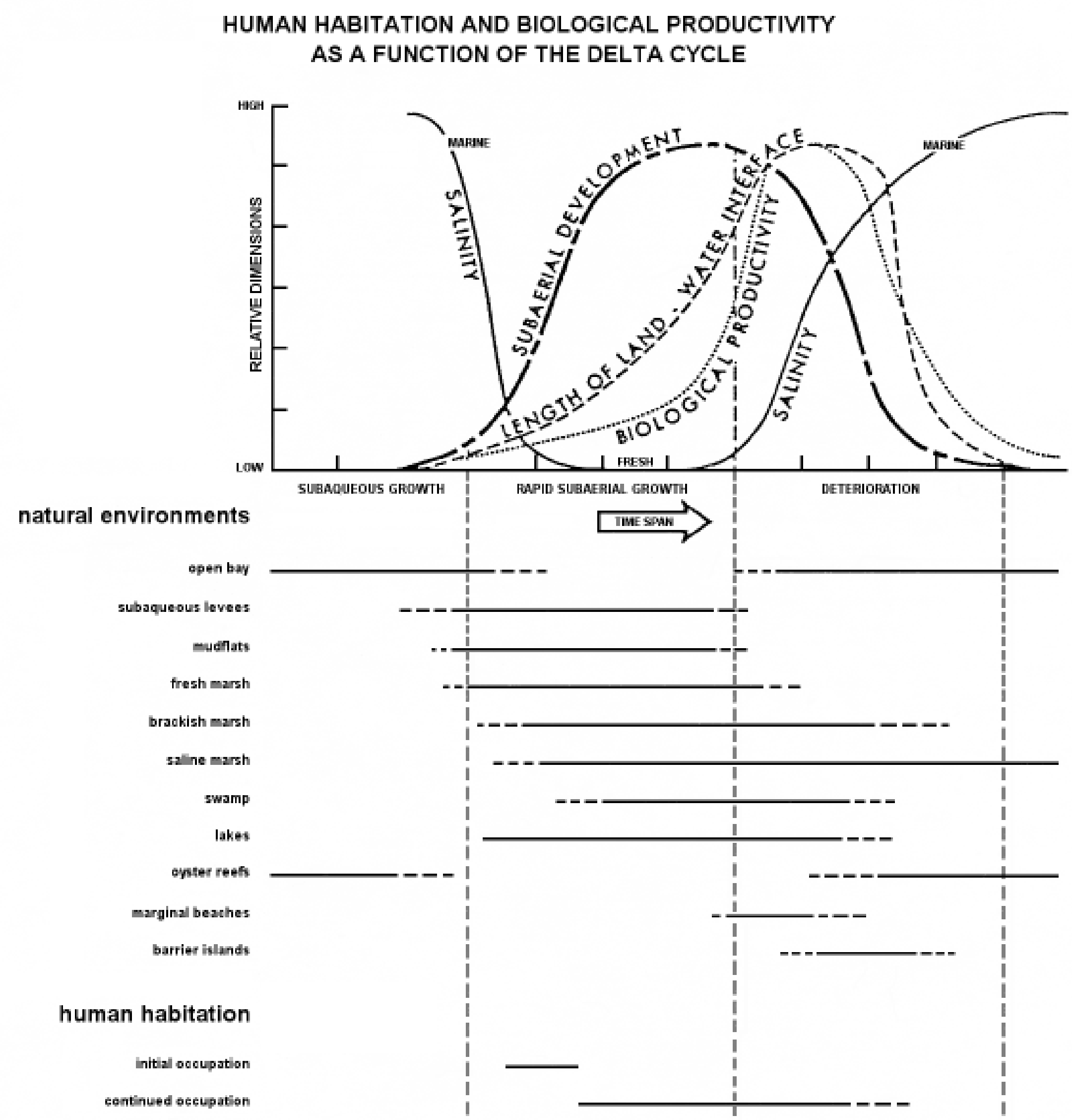


Figure 4. Environmental succession of an idealized subdelta cycle (after Coastal Environments 1977) (Gagliano et al. 1978.

has accelerated to a rate of 60 to 120 cm per century (Gagliano et al.1978:3-38).

Delta development on the Mississippi River began after the rise in sea level following the glacial maximum, which resulted in the abandonment of the great trough around 15,000 B.P. (Coastal Environments, Inc. 1977:97). The Mississippi River began forming deltas in central coastal Louisiana across the Prairie terrace formation on the present continental shelf 12,000 years ago when sea level was approximately 60 m below present level. During the period between 12,000 and 8000 years B.P., the Mississippi River followed the present course of Bayou Teche to the Gulf (Mississippi meander belt 5) and deposited the pre-Maringouin subdelta (Autin n.d.:39) also known as the Ship Shoal complex (Coastal Environments, Inc. 1977: 318). This entire subdelta has subsided and become drowned by rising sea level. Little stratigraphic data are available for this subdelta, since it was deposited at a base level lower than present (Autin n.d.:39). The Holocene delta lobes that date after about 8000 years B.P. (Figure 3) are much better known and have been correlated with archeological data to provide somewhat more reliable chronological placement.

The Maringouin complex (Figures 3 and 5), the next oldest delta feature in the Mississippi River delta, was active from approximately 8000 to 6000 years B.P. (Saucier 1974). At its peak, this subdelta was a broad feature encompassing a widespread area extending 65 to 80 km south of the present shoreline. This delta was initiated by a slowdown in the rate of sea level rise at a level 12 to 18 m below present and the abandonment of Mississippi River meander belt 5 and activation of meander belt 4 along present-day Bayou Tortue. During this reversal, the new river course cut into the old Lafayette meander belt and formed a pronounced erosional scarp east of the town of Lafayette which became the western rim of the modern alluvial valley (Coastal Environments, Inc. 1977:324). Coincident with the meander belt and delta shift at this time, there was a general diminishment of coastal wetlands and an increase in the radius of the curvature of coastal plain streams such as the Sabine, Pearl, and Trinity rivers suggesting greater water discharge. The Maringouin subdelta is presently almost completely destroyed or buried beneath younger deltaic deposits (Autin n.d.:40).

Sea level resumed its slow rise approximately 6000 years ago and drowned the Maringouin delta complex, beginning the initial progradation of the Teche delta complex (Figures 3 and 5). The Teche subdelta began formation in the western part of the Deltaic Plain around 5800 years B.P. and gradually shifted eastward toward the present town of Houma, then prograded in a southeasterly direction until about 4600 B.P. (Figure 3). During the first thousand years of subdelta growth, Mississippi River meander belt 4 was abandoned and meander belt 3 became the active course of the river (Coastal Environments, Inc. 1977:326–327; Smith et al. 1986:38; Autin n.d.:39–40).

Sea level began to approach its present stand and a major delta lobe, the St. Bernard subdelta, began progradation between 4000 and 3000 B.P. (Figure 3) in the eastern part of the Deltaic Plain. During this time, the Teche subdelta was still active on the western side of the Deltaic Plain and the two subdeltas contributed sediments concurrently to the growing Holocene deltaic margin. The St. Bernard subdelta prograded until approximately 2000 B.P., creating a marginal deltaic basin in the area occupied by Lakes Maurepas and Pontchartrain where a large embayment had existed. During the life span of the St. Bernard subdelta, the Mississippi River occupied meander belts 2 and 3 (Coastal Environments, Inc. 1977:327; Autin n.d.:40).

The Lafourche subdelta complex became active around 3500 B.P. (Figure 3) after the development of a distributary system at the junction of Bayou Lafourche and the Mississippi River. For about a thousand years, deltaic plain progradation occurred simultaneously on the Lafourche, St. Bernard, and Teche subdeltas. During the initial period of progradation of the Lafourche delta, Mississippi meander belt 3 was abandoned and meander belt 2 became dominant (Autin n.d.:40).

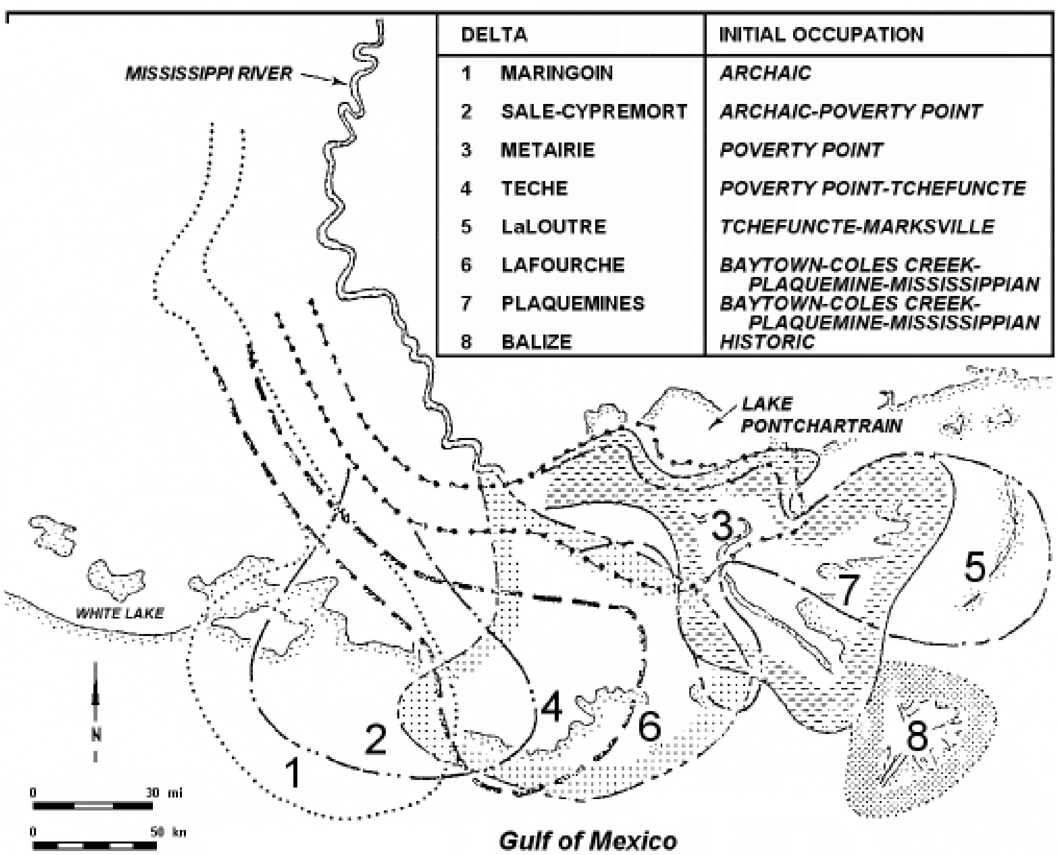


Figure 5. Major delta complexes and archeological site associations in the Mississippi River deltaic plain (Gagliano et al. 1978).

The Teche subdelta was abandoned between 2500 and 2800 B.P., leaving the Lafourche and the St. Bernard subdeltas still active. The Lafourche subdelta progradation dominated that of the St. Bernard after about 2000 B.P., and by approximately 1000 B.P. the St. Bernard subdelta had been abandoned (Figure 3). The modern Plaquemines–Modern subdelta became active by 1000 B.P., while the growth of the Lafourche subdelta began to decline and entered a transgressive erosional phase between 400 and 800 B.P. (Autin n.d.:41). The Lafourche subdelta continued to grow until its source of sediments, Bayou Lafourche, was closed artificially in 1904 (Frazier 1967).

At approximately 600 B.P., the Plaquemines–Modern subdelta initiated progradation of a subdeltaic feature termed the Balize Delta, also known as the "bird-foot" delta (Figures 3 and 5), the last of the major Mississippi River deltas to form. The birdfoot delta departs from the model of delta formation discussed earlier in this section in a number of ways. These differences principally involve the smaller number and greater permanency of distributaries, the slow growth rate of subdelta lobes and predominance of subsidence over progradation, and the unusually great influence of marine over freshwater processes. This has been explained as a factor of the position of this deltaic feature in relatively deep waters of the Gulf at the edge of the continental shelf (Saucier 1974:13).

The process of deltaic progradation also continues today in Atchafalaya Bay, where a small lobe is being formed as a result of the diversion of a portion of the discharge of the Mississippi River down the Atchafalaya River (Autin n.d.:41). This diversion to the Atchafalaya began in the fifteenth century A.D. and threatened by the midtwentieth century to completely capture the discharge of the Mississippi River and effect a total course change as the Mississippi had done periodically in the past. This diversion was stemmed by the construction of the Old River Control Project by the U.S. Army Corps of Engineers in 1956; however, sediment flow continues today to add to a grow-ing subdelta in the Atchafalaya Bay (Cowdrey 1977:50–53).

The Salt Dome Region

The salt dome region in the western part of the Deltaic Plain contains the oldest landforms in the coastal zone. The five distinctive topographic highs or hilly features in this area are piercement salt domes that are related to the uplifting of plugs of hard salt. The salt plug which makes up the core of these domes was originally deposited on the bottom of the sea floor during the Jurassic or Triassic, millions of years ago. The hilly outer cores of the domes are comprised of Pleistocene age deposits and older sediments uplifted by the underlying salt plug. The surface of these domes is highly irregular due to the movement and near exposure of the underlying salt plug and includes fault-controlled ridges, steep-sided gullies, radial drainage, and solution ponds. More recent Holocene age deposits were laid down over the past 6000 to 8000 years around the bases of the salt domes to form the surface of the flat prairie and marsh areas. Though not really islands, the five salt domes appear as such against the flat expanse of prairie and coastal marsh and bear names such as Avery Island, Weeks Island, and Cote Blanche Island (Gagliano 1967a:2).

As a readily accessible source of rich minerals, particularly rock salt, the salt dome region has played an important role at times in the economies of the prehistoric and historic populations in the region. There is no indication yet of salt extraction during the early prehistoric period, although evidence of occupation of this region by Paleo-Indian groups and exploitation of the chert gravel resources has been reported (Gagliano 1967a). The first clear evidence of prehistoric salt exploitation during the sixteenth or seventeenth century A.D. late Mississippian culture occupation of the region probably consisted of a process involving brine boiling in ceramic salt pans to extract the salt (Gagliano 1967a:7; Brown and Brown 1978:1). Brine solution mining of the salt springs by Europeans was taken up soon after the rediscovery of this resource in the eighteenth century, and when rock salt was found in the 1860s continued via pit mining. Modern salt mining by the International Salt Company utilizes a process of subsurface pillar and gallery extraction and modern purifying and crushing techniques (Gagliano 1967a:102).

Chenier Plain

The model for the development and chronology of the Chenier Plain is based on the work of Russell (1940), Fisk (1944, 1948), Price (1955), Byrne et al. (1959), Gould and McFarlan (1959), and Kaczorowski (1979, 1980). According to these interpretations, the development of the Chenier Plain was controlled by changes in the flow direction of the Mississippi River over the last 2800 years. The southernmost chenier, Grand Chenier, has been radiocarbon dated to 1220 years B.P. or ca 750 B.C. (Kaczorowski and Gernant 1980:61), making it one of the most recent chenier features and establishing a general terminal date for formation of the chenier region.

The chenier formation process is closely related to the fluctuation of subdelta development on the Mississippi River which is the down-drift sediment source for the cheniers via longshore currents. According to the classic flip/flop model (Kaczorowski 1980), accumulation of mudflats in the chenier area occurred when the Mississippi River was building a subdelta or lobe toward the western side of the Deltaic Plain and pumping a relatively large amount of sediment into the offshore currents. This sediment drifted westward where it was deposited on mud-flats seaward of the beachline. When the focus of the delta lobe development on the river shifted to the eastern side of the Deltaic Plain, less sediment was contributed to the offshore currents, the mudflats ceased growing and began to erode under wave action. As the shoreline retreated inland and wave action reworked mudflat deposits, coarse sediments were winnowed, combined with shell debris, and piled up to form the narrow chenier ridges. When Mississippi River distributary growth alternated to the western side of the delta, the cycle was reinitiated and mudflat development extended seaward leaving the beach ridges stranded in the marsh, where they were soon colonized by woody vegetation (Saucier 1974:14, 15; Autin n.d.:38; Kaczorowski and Gernant 1980:1–4).

Upon close scrutiny, some inconsistencies can be found with the flip/flop model (Kaczorowski 1980). For instance, the modern southwestern Louisiana coast exhibits a much more complex landform than a simple strandline consisting of either ridges or mudflats that the model predicts. Landforms vary considerably morphologically; beach ridges, recurved spits, storm berms, and other types are all lumped under the term chenier. In addition, the radiocarbon dates of the relict cheniers do not directly correlate with the Mississippi River delta/lobe dates obtained from radiocarbon dating, which were the presumed sources of the sediments, and the Chenier Plain growth rate curve is also inconsistent with the model. It has also been noted that a higher concentration of ridges exists in the western portion of the cheniers suggesting that local river influx may play a significant role in the formation of the Chenier Plain, as well as such factors as offshore bathymetry, storm surges, and tidal current influence, especially near major estuaries. Truncation of some chenier ridges and evidence that ridges have been formed or reworked continuously regardless of the Mississippi River discharge direction also suggests a lack of continuity in the process of chenier development (Kaczorowski 1980:4–13).

Gibson (1984) has also raised concern over present interpretations of the ages of the chenier ridges. As noted earlier, the formation chronology of the chenier ridges has been determined by radiocarbon dates to range between 2800 to 1200 years B.P. However, the presence of an apparent Late Archaic period cemetery at the Copell site on Pecan Island (Grand Chenier), which is purported to be one of the youngest of the chenier ridges, calls into question the proposed date of 1220 B.P. for this landform. If as Gibson (1984:22) notes, the cemetery dates as early as 3500 B.P. (or between about 1500 to 1000 B.C.), as is expected based on currently accepted chronologies for the Late Archaic, then the Grand Chenier–Pecan Island landform would have been stranded about 700 years earlier than is currently assumed. In addition, all of the older cheniers situated north or inland of Grand Chenier would have been in place even earlier (Gibson 1984).

SUMMARY OF PREVIOUS INVESTIGATIONS

Marvin D. Jeter and G. Ishmael Williams, Jr.

As befits its status as "America's Nile" in terms of archeological remains, the Lower Mississippi River has played a highly significant and colorful role in the history of American archeology. Some of the country's major institutions, leading individual researchers, and most noteworthy projects have involved the Lower Mississippi River and its tributaries, parallel streams, and some of the adjacent uplands, both in the Lower Valley itself and in the Trans-Mississippi South. The latter area has been researched by some of the same institutions and individuals but has also seen the development of its own specialists and traditions.

This chapter will summarize these previous investigations within a four-part structure. First, a few recently published and widely available reviews of the history of archeology of portions of the study area will be cited. Second, an overview of the entire study area will present a chronological review of significant large studies and site reports, with special attention given to influential individuals and schools of thought, and to the evolution of taxonomic and methodological concepts. Third, an overview of the evolution of concepts and development of programs of conservation and cultural resource management will be given. Finally, histories of investigations within major macroregions (e.g., northeast Arkansas) in the study area will be presented in north-to-south order down the Lower Valley, with east-to-west excursions from these north-south increments.

RECENT HISTORICAL SUMMARIES

Before plunging into the details of archeological history in these areas, it should be noted that two recent and widely circulated books have included summaries of archeological investigations in the majority of the present study area. Morse and Morse (1983:17–30) have provided a history of archeological investigations, with emphasis on the earlier work, for that portion of the Mississippi Valley which includes northeast Arkansas. They also included some details on more recent research later in their volume, with occasional citations of contract projects. Similarly, the early history of Louisiana archeology, from its early nineteenth century beginnings through the 1930s, has been rather thoroughly covered in a lengthy introductory chapter by Neuman (1984a:6–55). Later "pure research" investigations are discussed in other portions of Neuman's volume, but there is virtually no coverage of contract archeology.

Several other recent and readily available publications include historical summaries which cover the intervening territory (south Arkansas), or augment the discussions by Neuman and the Morses. Early (1983) has summarized the history of archeology in the Ouachita Valley of Arkansas, including some of the contract investigations. In the same volume, Gibson (1983b) contributed an extended evaluatory history of archeology in the Ouachita Valley of Louisiana, with a thorough coverage of both the classical and contract literature. To the east and west of the Ouachita Valley, Jeter (1982a:82–83) has provided a brief outline of previous work in southeast Arkansas, as has Schambach (1982b:2) for the Great Bend region of southwest Arkansas.

HISTORICAL–CONCEPTUAL OVERVIEW OF THE ENTIRE STUDY AREA

The present project area has not suffered from lack of interest by individual researchers and institutions interested in large archeological projects and syntheses and in archeological concepts and methods. Major portions of it have been the subjects of numerous studies from various perspectives or have been included in syntheses or overviews of even larger areas. Particular attention will be given here to influential individuals and schools of thought, to their fieldwork on significant sites and projects, and to the landmark site reports and syntheses that resulted.

Squier and Davis

Squier and Davis (1848), in their *Ancient Monuments of the Mississippi Valley*, made what has been called "the first serious effort to organize knowledge of eastern North American archaeology" (Greengo 1964:3). However, their work focused on the earthworks of the Ohio Valley; they mentioned only three mound sites in Louisiana, and none in Arkansas.

Early Smithsonian Institution Syntheses

The first major synthesis based on detailed and systematic investigations in the Lower Valley was Cyrus Thomas's (1894) *Report on the Mound Explorations of the Bureau of Ethnology*. This massive volume (more than 700 pages), which was reprinted in a paperback version by the Smithsonian Institution in 1985, covered the eastern United States and sounded the death-knell for the myth of a lost race of non-Indian Mound Builders. One of the major areas of coverage was eastern Arkansas, which had been investigated for this project in the early 1880s by Dr. Edward Palmer and others (see the regional discussions, below), but Louisiana was barely mentioned.

The Mound Survey report was followed by William Henry Holmes's (1903) equally imposing *Aboriginal Pottery of the Eastern United States*, containing more than 200 pages, 79 figures, and 177 plates, several of them in color. This volume, which unfortunately has not been reprinted, drew upon the collections made by the Mound Survey and such other institutions as the Davenport Academy of Sciences. Again, great emphasis was placed on the Mississippi Valley, especially northeast Arkansas.

C. B. Moore and His Successors

Although his publications are more on the order of descriptive, well illustrated catalogs of sites and finds than syntheses, the work of Clarence B. Moore deserves some mention here. In his steamboat, the *Gopher*, he traversed the Southern rivers and coasts excavating sites during the cooler months from the late 1890s almost to 1920, usually completing his reports during the following summer. He worked in Arkansas and/or Louisiana during five field seasons (Moore 1908, 1909, 1911, 1912, 1913), producing overviews of the archeology — or at least, of the later and relatively artifact-rich mortuary sites — of the various drainages. In all (as summarized by Greengo 1964:128, Appendix 1), Moore investigated 60 sites on six drainages in Arkansas, and 111 sites on 11 drainages in Louisiana.

Moore's (1912) successes along the Red River in northwest Louisiana, southwest Arkansas, and extreme northeast Texas may be said to have opened the field of Caddoan archeology. Following upon his work, a New York institution, the Museum of the American Indian, Heye Foundation, commissioned Mark R. Harrington to conduct additional excavations along that river in southwest Arkansas. However, due to flooding in early 1916, the riverine sites were inaccessible, and Harrington ultimately made a significant decision:

> We finally concluded to proceed inland...and met with such success that the expedition which had left New York with the idea of returning in about six weeks, remained in the field for a period of no less than twenty months. (Harrington 1920:17)

Harrington had discovered the prehistoric upland Caddoan mortuary complex of southwest Arkansas, often involving burials accompanied by numerous pottery vessels and other artifacts. His report, *Certain Caddo Sites in Arkansas* (Harrington 1920) provided descriptions of several classic sites with numerous artifact illustrations but went beyond the descriptive stage. The last six chapters contained extensive discussions of early historic Caddoan subsistence, clothing, games, houses, beliefs, ceremonies, warfare, and mortuary customs, based primarily on descriptions by early French explorers, with comparative references to his archeological finds. Harrington's efforts thus constitute a real synthesis, and it is unfortunate that his significant report has long been out of print and is quite rare.

Also worthy of mention is Calvin Brown's (1926) *Archaeology of Mississippi*. Although its coverage did not include the present study area proper and it was primarily a descriptive catalog, it did provide a valuable new source of comparative data for investigators working in Arkansas and Louisiana. This volume is also out of print and rarely encountered.

Once again, the Red River Valley attracted the attention of an eastern institution. Gerard Fowke, who appears to have been something of a character and was also known as Kentucky Q. Smith (cf. Indiana Jones; Bruce D. Smith, personal communication) was a widely traveled archeologist for the Smithsonian Institution during the early twentieth century (cf. Neuman 1984a:41). He spent three months in 1926 visiting sites near Shreveport, Natchitoches, Alexandria, and Marksville. To Fowke belongs the credit for the discovery and relatively accurate mapping of the Marksville site and the nearby Greenhouse site. He excavated in several of the burial mounds at Marksville and wrote both preliminary and final descriptive reports on his investigations (Fowke 1927, 1928).

All of these reports, catalogs, overviews, and attempts at synthesis were crippled by a lack of chronological control over prehistoric remains. Finds of European trade goods in association with some aboriginal artifacts were noted, but prehistoric materials (or, for that matter, historic aboriginal materials not associated with trade goods) were relegated to an undifferentiated prehistoric past, of uncertain antiquity. This situation began to be resolved during the 1930s.

Winslow Walker and the Beginnings of Scientific Archeology

In 1931, finds in the Red River Valley yet again led to a significant archeological summary. The U.S. Bureau of Fisheries, while excavating a fish hatchery near Natchitoches in central Louisiana, encountered Caddoan burials with European trade goods and horse skeletons. The Smithsonian Institution was contacted, and an experienced archeologist, Winslow Walker, was sent to the scene. In his brief report on the salvage of data from the Fish Hatchery site, Walker (1935:5–8) followed Harrington's precedent by reviewing the ethnohistoric literature of the region. He also compared the site's aboriginal pottery with similar specimens found by Moore and others, and with dissimilar (earlier) vessels found by Harrington (Walker 1935:12–14). Finally, he initially called attention to the significance of excavation of historic aboriginal sites as a means of gaining some culture–historical control (Walker 1935:1, 15). According to Neuman (1984a:48), Walker's publication on this site "may well stand as the first really scientific archaeological report relative to Louisiana antiquities."

Walker's work and influence did not stop here, however. After leaving Natchitoches in 1931, he briefly examined several Louisiana mound sites (Walker 1932a) and learned of the ongoing destruction of the great mound at the famous Troyville site in east-central Louisiana. He conducted salvage excavations there in 1931 and 1932, later producing both a preliminary report and a comprehensive final report (Walker 1933, 1936).

At the end of 1932, Walker attended the Conference on Southern Pre-History in Birmingham, Alabama, sponsored by the National Research Council. This meeting has been called "one of the most influential archaeology conferences ever staged" (Gibson 1983b:48). However, the collected papers were marked "Not for Publication" and were generally unavailable until they were published as a historical document by the Southeastern Archaeological Conference in 1980. At the Birmingham conference, Walker (1932a) presented a paper which has been called "the first critical review and evaluation of archaeological knowledge in the state of Louisiana" (Neuman 1970:8; cf. Gibson 1983b:49–50; Neuman 1984a:49–50). In it, he perceptively identified most of the major issues and problems in cultural historical investigations in Louisiana and even conceived of methods and means of investigation, organization, and interpretation that would shortly become the corpus of archaeological methodology. (Gibson 1983b:50)

James A. Ford and the Development of Methods and Sequences

As noted by Neuman (1984a:51), although Walker differentiated prehistoric from historic aboriginal remains, neither he nor others working in the study area had yet deciphered the prehistoric cultural sequences. This was accomplished largely through the efforts of the most outstanding figure in the history of Lower Valley archeology, James A. Ford (1935a, b, c, 1936a, 1936b).

A brief biography of Ford has been published (Brown 1978d), and his work in developing Lower Valley culture history has been reviewed recently by Gibson (1983b:48–64); only a few highlights of his career will be summarized here. He was born in northern Mississippi in 1911 and began his archeological career there in the late 1920s; he soon expanded this research into eastern Louisiana and eventually worked extensively in eastern Arkansas, thus effectively (and influentially) dealing with much of the territory covered by the present overview.

Ford's original work in and near the Lower Valley was done for the Mississippi Department of Archives and History (Ford 1936b:1). He attended the Birmingham conference in 1932, and was "soundly influenced" in the direction of problem-oriented research in general and toward the problem of Lower Valley prehistoric chronology in particular (Gibson 1983b:48; cf. Ford 1936b:4).

In 1933, he extended his surveys and excavations into northeastern and east-central Louisiana, sponsored by a grant from the National Research Council (Ford 1936b:1; Gibson 1983b:53). He also assisted Frank M. Setzler of the Smithsonian in major excavations at the Marksville site in late 1933. He became affiliated with the School of Geology at Louisiana State University in 1934. Early in 1935, he published two semi-popular preliminary articles in (appropriately) the *Louisiana Conservation Review*. The first, "An Introduction to Louisiana Archeology" (Ford 1935a), emphasized the first step of beginning with historically documented sites but also mentioned in passing the prehistoric Coles Creek people and the still more ancient Hopewell people.

In his second preliminary article, "Outline of Louisiana and Mississippi Pottery Horizons," Ford (1935b) elaborated on the pottery complexes of both the historic and prehistoric Indian groups. He identified four of the former (Choctaw, Natchez, Tunica, and Caddo) and three of the latter (Coles Creek and Deasonville, considered roughly coeval and intermediate, and Marksville, considered oldest).

These articles were succeeded by Ford's (1935c) first technical site report (and the first *Anthropological Study* published by the Louisiana Department of Conservation, Louisiana Geological Survey) on his work at the Peck Village site in eastern Catahoula Parish. This report has been summarized by Gibson (1983b:51–52), as follows:

> Never before or again in the history of Lower Valley archaeology has so much been done with so little. Four 10-foot square sectioned cuts were dug in a shallow midden, 15-22 inches thick.... Thus, the foundation of Lower Mississippi Valley culture history rests on what today would hardly have been considered an adequate test excavation, much less a pivotal cornerstone of a regional culture history.
>
> Not only did the Peck site report present the earliest demonstration of chronological sequencing based on stratigraphy, it provided the first sophisticated effort at pottery typology in the Lower Mississippi Valley. Ford (1935c: 18ff, Figures 6–9) demonstrated the apparently gradual replacement of Marksville types by Deasonville and Coles Creek types from the earlier/lower levels to the later/upper ones in his pits. This was augmented by comparative data on the distributions of these types from his surveys (1935c:1–4, Figures 1–2).

Early the next year, Ford published a very brief summary, "Archaeological Methods Applicable to Louisiana" (Ford 1936a). These methods, briefly, were direct-historical site location and collection, general survey and seriation, stratigraphic excavation, and paleogeographic correlation. This was the precursor of an article on seriation, "A Chronological Method Applicable to the Southeast" (Ford 1938), published in *American Antiquity*.

Later in 1936, Ford's first real magnum opus was published. This monograph, *Analysis of Indian Village Site Collections from Louisiana and Mississippi* (Ford 1936b), the second Louisiana Geological Survey Anthropological Study, synthesized his fieldwork in both states. In Gibson's (1983b:54–55) words, this volume

> may be appropriately recognized as the single most important study in the history of Louisiana archaeology.... This magnificent work not only charted the direction and defined the goals of archaeological research in the Lower Mississippi Valley, it explicitly set forth a methodology which even today remains a commanding

> prescription for "proper" archaeological activity and philosophy.... It diverted archaeological attention to village sites and away from mounds, and it created a fixation on potsherds as the single most important carriers of cultural historical information.

Ford's methods (and their results) will be discussed further in the Introduction to Chapter 4. For now, it will suffice to note that they were followed as basic organizing principles in the massive projects sponsored by LSU for the Work Projects Administration (WPA) during the later 1930s and early 1940s (Lyon 1976, 1982; Gibson 1983b:57f; Neuman 1984a:148ff, 178ff).

S. D. Dellinger and the University of Arkansas Museum

The University of Arkansas Museum also became involved in the archeology of the present study area during the 1930s. Its director, S. D. Dellinger, had become alarmed at the prospect of "foreign" institutions "skimming off the cream" of Arkansas archeology and had begun an intensive program of bluff shelter excavations in northwest Arkansas, near his Fayetteville institutional base. (These are summarized by Sabo et al. 1988.)

Dellinger's staff members were also dispatched in 1932 to sites as distant as Nodena in northeast Arkansas (Morse 1973b) and Kinkead-Mainard near Little Rock (Hoffman 1977). From 1938 to 1941, Dellinger was in charge of WPA excavations in the middle and upper Ouachita Valley. Unfortunately, no formal site or project reports were published by Dellinger or any of his staff members. Some of the collections and notes have, however, been more recently analyzed and reported upon in a series of theses and articles (summarized by Jeter 1989); the most outstanding example is Schambach's (1970) dissertation on pre-Caddoan cultures of the Trans-Mississippi South, based largely on the WPA excavations at the Cooper and Means sites in Hot Spring County.

Developments in Texas, Southwest Arkansas, and Northwest Louisiana

The Texas Archeological and Paleontological Society was organized in Abilene in 1928 and started publishing its *Bulletin* in 1929. Its earlier issues dealt primarily, if not exclusively, with Texas archeology. During the mid-1930s, though, two residents of southwest Arkansas, Judge Harry J. Lemley and S. D. Dickinson, started investigating sites and localities in that region and elsewhere, publishing articles in the Texas *Bulletin* (Lemley 1936; Dickinson 1936; Lemley and Dickinson 1937; Dickinson and Lemley 1939).

Lemley became Arkansas's most prolific artifact collector; his collection was later acquired by the Gilcrease Institute of Tulsa, Oklahoma. Dickinson became affiliated with Dellinger on several projects, but left the field of archeology for journalism in the 1940s; since his retirement, he has again become involved in ethnohistory. Because there were no other regional journals at the time, the Texas *Bulletin* became the place of publication for articles dealing with regions as far away as extreme southeast Arkansas (Lemley and Dickinson 1937) and the Lower Arkansas Valley (Dickinson and Dellinger 1940).

Meanwhile, Dr. Clarence H. Webb, a Shreveport pediatrician, had begun in 1935 (Gregory 1980b:20) what was to become a most distinguished second career as an amateur archeologist. (This was recognized by the presentation of the Society for American Archaeology's first Crabtree Award to him in 1985.) Early in 1936, Webb started his salvage excavations at the Belcher Mounds north of Shreveport. This work continued until 1941 and was resumed in the 1950s, with the final report published as an *Society for American Archaeology Memoir* (Webb 1959:v, 12). Webb also published frequently in the Texas *Bulletin* (e.g., Webb and Dodd 1939b, 1941; Webb 1940).

Expansion and Intensification by Ford and Associates

In the fall of 1937, Ford enrolled in the M.A. program at the University of Michigan. He became closely associated with James B. Griffin, who was then working in the Ceramic Repository at the University's Museum of Anthropology, analyzing the ceramics from two major Tennessee Valley Authority (TVA) salvage projects in Alabama and Tennessee and from the Ohio Valley (Griffin 1976:25–26). They were instrumental in organizing the Southeastern Archaeological Conference, which first met in Griffin's office in May, 1938, and held its first "Southeastern" meeting in Birmingham in November, 1938 (1976:26).

Meanwhile, under the WPA–LSU auspices, major excavations were conducted in 1938–1939 at two east-central Louisiana sites, Crooks and Greenhouse, with minor excavations at the Marksville and Baptiste sites. Ford designed and directed the work, which was supervised in the field by Robert S. Neitzel and other pioneers of Lower Valley archeology. A laboratory was set up in New Orleans (later moved to LSU in Baton Rouge), supervised by Gordon R. Willey.

The only one of these sites immediately reported upon was Crooks (Ford and Willey 1940), which produced numerous Marksville (and some other) burials and artifacts. The report was basically descriptive, with a brief comparative conclusion summarizing the other Hopewell-like manifestations of the Mississippi Valley and eastern U.S. (1940:137–143). A detailed synthesis was deferred, pending the report on the Marksville site itself which was never completed by either Setzler or Ford. The Greenhouse site report was delayed by World War II but was finally completed by Ford (1951).

Also during this time, Philip Phillips of Harvard University had developed an interest in the archeology of the Mississippi Valley; he completed an unpublished and therefore little read, but auspicious, dissertation on the subject (Phillips 1939). Meanwhile, Ford and Willey used their accumulated published, unpublished, and comparative data to produce an influential synthesis of eastern U.S. prehistory, which was published in the *American Anthropologist* (Ford and Willey 1941). They introduced a sequential scheme of older Burial Mound and more recent Temple Mound periods (each divided into two subperiods) and attempted to estimate the calendrical ages of these (see the Introduction to Chapter 4).

Krieger, Webb, and Caddoan Taxonomy

Alex Krieger had arrived at the University of Texas in the late 1930s and had begun conferring about Caddoan archeology with Webb and others (Gregory 1980b:22). These meetings evolved into the Conference on Caddoan Archeology, now known as the Caddo Conference (Krieger 1947). Although he was based outside the present study area, Krieger had an important impact upon it in that he and Webb set the Trans-Mississippi South (Caddoan area) firmly upon a cultural-taxonomic course different from that of the Lower Mississippi Valley. This was the Midwestern Taxonomic System (McKern 1939; Willey and Sabloff 1974:112–113), which had been introduced quite early into Texas archeology (Kelley et al. 1940). Ford had been aware that this system was being developed in the mid-1930s but had explicitly rejected it (Ford 1936b:7f) on the grounds that it demanded “a comprehensive number of carefully excavated sites” whereas he was more interested in rapidly gaining knowledge of the cultural sequences of large regions by working with surface collections of potsherds.

Nevertheless, the McKern-Midwestern system was introduced into the Caddoan area in reports by Krieger (1946) and Webb (1948a), again published in Texas. A more detailed consideration of this system is presented in the next chapter.

The Lower Mississippi Archaeological Survey and Its Successors

In the fall of 1939, Ford approached Griffin and Phillips with a plan for survey and testing of “the northern two-thirds of the alluvial valley of the Lower Mississippi River — roughly from the mouth of the Ohio to Vicksburg, Mississippi” (Phillips et al. 1951:v). This ambitious project, originally known as the Lower Mississippi Archaeological Survey (1951:v), was approved later in 1939 as a joint undertaking of the LSU School of Geology, the University of Michigan Museum of Anthropology, and the Peabody Museum, Harvard University. Fieldwork began in 1940 and continued in 1941 but was interrupted by the war in 1942. Ford moved to the American Museum of Natural History in New York in 1946; fieldwork was resumed on a small scale that year and completed in 1947.

The project’s actual coverage fell short of that originally intended, going north only to extreme northeast Arkansas and south only to the latitude of the Arkansas–Louisiana state line (Phillips et al. 1951:Figure 2). In actuality, the great bulk of the fieldwork was done in the St. Francis Basin of northeast Arkansas and the northern three-quarters of the Yazoo Basin in northwest Mississippi (1951:426). Continuing interest in Lower Valley archeology by Phillips and others at Harvard resulted in the southward extension of related research and the institutionalization of a renamed Lower Mississippi Survey (LMS) within the Peabody Museum at Harvard. As will be noted, the LMS continues to be active in the archeology of western Mississippi and eastern Louisiana, providing a valuable tradition of continuous research with a pan-areal perspective that is not confined by state lines.

Following up on the project in the opposite direction, Griffin was instrumental in forming a University of Michigan Central Mississippi Valley Archaeological Survey to proceed northward from the northeast Arkansas state line to the mouth of the Illinois River. Work started in 1949 (Griffin and Spaulding 1952) and led to a Yale dissertation by Stephen Williams (1954) on the southeast Missouri cultural sequence. This research has had a significant comparative influence on northeast Arkansas archeology (Morse and Morse 1983:27). Also, Williams became affiliated with the LMS, eventually succeeding Phillips as its director and leading the southward extension of its research interests.

Postwar Reports and Syntheses

A flurry of long-delayed site reports and syntheses appeared after the wartime hiatus, and archeological activity generally reintensified. Several should be mentioned here, as they filled in the roster of cultural entities. The first was Ford and Quimby’s (1945) report on the Tchefuncte culture, which synthesized artifact and mortuary (Snow 1945) data from several sites and localities, mainly in southern Louisiana. It provided the basic definition of the Lower Valley’s earliest culture with abundant ceramics, clearly earlier than Marksville (Ford and Quimby 1945:93).

The first postwar pan-Eastern synthesis to appear was Griffin’s (1946) “Cultural Change and Continuity in Eastern United States Archaeology.” It appeared in a volume which focused on northeastern North America and had relatively little direct effect on Lower Valley archeology.

An extra-areal publication which did have significant influence on Lower Valley and Trans-Mississippi South archeology was the report on the George C. Davis site in east Texas (Newell and Krieger 1949). The site had been excavated in 1939–1941 by a WPA–University of Texas project directed by H. Perry Newell, who had partly completed the site report before entering wartime service. He died unexpectedly in 1946, and the completion of the report was taken up by Krieger, who had already become involved in synthesizing the Caddoan literature. The comparative and concluding sections of the report defined the Alto focus, as found at Davis and elsewhere, as the earliest manifestation of Caddoan culture (1949:186–219), suggesting that it might significantly predate the Early Mississippi or Temple Mound I cultures of the Lower Valley, including Coles Creek and Troyville (1949:219–224, 236–237, Figure 66).

The Greenhouse site report by Ford (1951) presented the basic evidence behind his concepts of the Troyville and Coles Creek culture periods. It concluded with a brief comparative section (1951:124–130) in which he suggested a correlation of his Red River Mouth or Lower Valley cultural sequence with that developed by Krieger (Newell and Krieger 1949) for east

Texas and adjacent Louisiana. Specifically, Ford suggested that the Alto focus was no earlier than his Plaquemine period, i.e., post-Coles Creek. This was vigorously contested in a review by Krieger (1952); the debate continued for years (e.g., Krieger 1961; Ford 1961a). Also, as will be seen in Chapter 4, Ford's methodology for defining the Troyville period marked a departure from his earlier work and was strongly criticized by Phillips (1970:900ff).

Another long-awaited site report briefly summarized the WPA–LSU excavations at the Medora site near Baton Rouge (Quimby 1951). This defined the Plaquemine culture for the first time, inserting another prehistoric culture period between Coles Creek and the historic Indians.

The final report on the Lower Mississippi Archaeological Survey, by Phillips, Ford, and Griffin (1951), published by the Peabody Museum (Harvard), was truly a milestone in Lower Valley archeology. Indeed, it stands as a classic of the American archeological literature. This project's coverage, methods, and results will be discussed later in this chapter; here, it will suffice to outline its contents, which were divided into 10 sections, variously authored by the three colleagues (1951:vi).

Phillips wrote Sections I and II, on the geographic setting and the fieldwork. Section III, on pottery (the major artifact class by far), was essentially a joint effort. Griffin wrote Section IV, on Mississippian vessels. Ford wrote Section V, on seriation, and Phillips wrote Section VI, on stratigraphy; these sections contain the germs of their continuity vs. discontinuity debate which was to continue as a major theme of Lower Valley archeology. In Section VII, Phillips attempted to correlate the ceramic sequence with Fisk's (1944) chronology of Mississippi River meanders, now known to have been much too short. In Section VIII, Ford analyzed occupation site plans in chronological order. In Section IX, Phillips exhaustively explored the issues involved in attempting to identify archeological sites (primarily in northeast Arkansas) involved with the De Soto entrada of the early 1540s and Quapaw sites mentioned in early French accounts of the late 1600s and early 1700s. Section X, the Summary and Conclusions, was written variously by all three, and "patched together in consultation" (1951:iv). As already noted, this volume provided the jumping-off point for another decade of major research projects in the field.

Ford (1952) then produced yet another controversial publication, "Measurements of Some Prehistoric Design Developments in the Southeastern States." This had been intended as a section for inclusion in the Phillips, Ford, and Griffin (1951) report but had been objected to by Griffin "in both detail and principle" (1952:313). This was basically a study of the diffusion of ceramic designs over vast spatial and temporal dimensions. It was strongly criticized on methodological grounds in a review by Spaulding (1953), which precipitated a brief debate (Ford 1954; Spaulding 1954).

Another long-awaited volume on Eastern U.S. archeology, edited by Griffin (1952), also appeared at this time. It contained a chapter on the Lower Valley by Jesse Jennings (1952), who had worked only relatively briefly in the valley (cf. Williams and Brain 1983:12), and a chapter on the Caddoan area by Orr (1952), who brought an Oklahoma perspective, closely allied to Krieger's, to the task.

Another significant event for Caddoan archeology was the publication of *An Introductory Handbook of Texas Archeology*, by Dee Ann Suhm, Krieger, and Edward B. Jelks (1954). This volume was divided into two parts: the first described cultural complexes recognized in Texas; the second presented type descriptions of pottery and projectile point types. The pottery descriptions, in particular, are of relevance to this overview, since they dealt with types frequently found in the adjacent portions of Louisiana and Arkansas, and in fact used many illustrations of Arkansas vessels. The *Handbook* soon went out of print, but the second part was revised and reissued as *Handbook of Texas Archeology: Type Descriptions* (Suhm and Jelks 1962). It has also gone out of print and is a relatively rare collector's item but is still available in major research libraries and is indispensable for thorough studies of Caddoan ceramic assemblages.

New Research Frontiers and Methodologies

The next surge of research and publications in the Lower Valley focused on Poverty Point and other early cultures. Excavations at the Jaketown site in the Lower Yazoo Basin in 1946, 1950, and 1951 revealed a long, stratified sequence beginning in the Poverty Point culture period, as reported by Ford, Phillips, and Haag (1955). In northeast Louisiana, the immense Poverty Point site itself had been repeatedly surface collected by Webb and others; it was tested in 1942–1943 and 1955 and reported upon by Ford and Webb (1956). Related surveys by LSU geoscientists with archeological interests soon followed (McIntire 1958; Gagliano 1963; Gagliano and Saucier 1963). McIntire's (1958) study in particular is noteworthy, as it set a modern precedent for considering the Louisiana coastal zone as a special region or set of regions with problems distinct from those of the Lower Valley proper (see also Neuman 1977; Davis 1984).

Phillips resumed investigations in the Lower Yazoo Basin in 1949, and this work continued through 1955. Meanwhile, Phillips and Willey (who was also at Harvard by this time) had developed their interests in archeological method and theory and their applications. They published two journal articles on these subjects (Phillips and Willey 1953; Willey and Phillips 1955), combined and published as the influential book *Method and Theory in American Archaeology* (Willey and Phillips 1958). The authors specifically addressed the Lower Valley situation, and their concepts, especially the phase, were applied by Phillips (1970) in his report on his Yazoo Basin work.

Also, through his contacts with Southwestern and Mesoamerican archeologists (cf. Wheat et al. 1958; Smith et al. 1960), Phillips had become interested in the type–variety system of ceramic taxonomy. He published an *American Antiquity* article (Phillips 1958) endorsing its application to Eastern U.S. ceramics. Ford (1961b) protested, but Phillips persisted, and the type–variety system became another of the building blocks of his (1970) synthesis.

In May, 1958, a symposium on "Relationships Between the Caddoan Area and Neighboring Areas" was held at the Annual Meeting of the Society for American Archaeology in Norman, Oklahoma. The papers from that meeting and comments by discussants, along with the proceedings of the immediately previous Fifth Conference on Caddoan Archeology, were published in a special issue of the *Bulletin of the Texas Archeological Society*, edited by Davis (1961a, b). Of particular relevance for the present overview were symposium papers by Webb (1961) on "Relationships Between the Caddoan and Central Louisiana Culture Sequences" with comments by Krieger and Ford, and by Griffin (1961) on "Relationships Between the Caddoan Area and the Mississippi Valley" with comments by Phillips, Williams, and Krieger (1961). The Caddo Conference added numerous interesting discussions and several useful maps. Chronology and sequence correlations were major topics of virtually all of these papers and discussions, but the data base of radiocarbon dates was inadequate for resolution of these problems.

Also in early 1958, Ford began investigations at two significant sites in eastern Arkansas. The first was a National Park Service project at the Menard site on the Lower Arkansas River, which had been visited previously by Palmer in 1881–1882, Moore in 1908, and Phillips in 1940. In his report, Ford (1961c) compared the results of his 1958 excavations at Menard with the findings of the earlier work there and nearby, analyzed the French ethnohistoric reports of early contacts with the Quapaw Indians beginning in 1686 in this vicinity, and concluded that the Menard site had been the Quapaw village of Osotouy.

Two closely related reports should be mentioned in this connection. One of Ford's WPA–LSU excavations had been conducted at the Bayou Goula site near Baton Rouge. It was finally reported upon by Quimby (1957), who described a prehistoric Plaquemine component and an early historic (1699–1758) occupation by Bayogoula Indians and the French (cf. Brown 1976 for a reinterpretation). The other related publication is Robert S. Neitzel's (1965) report on his 1962 excavations and earlier work at the Fatherland site, the Grand Village of the Natchez described by the French in the early 1700s. The Menard, Bayou Goula, and Fatherland reports established the modern basis of direct historical Native American archeology in the Lower Valley. While working at Menard, Ford learned that the Helena Crossing site, a mound group at the southern tip of Crowley's Ridge overlooking the Mississippi Valley, was being destroyed for fill dirt. He arranged for funding through the American Museum of Natural History and in 1960 salvaged two of the mounds, encountering several rather sensational Hopewellian log-roofed tombs and other remains. Again, a report appeared promptly (Ford 1963).

Another excavation project of this period was carried out at a major mound center, the Lake George site in the southern Yazoo Basin, from 1958 to 1960. The report, however was long delayed (Williams and Brain 1983), and its discussion will be deferred.

Arkansas Programs and Publications

In 1960, Charles R. McGimsey III succeeded Dellinger as the director of the University of Arkansas Museum. The Arkansas Archeological Society was formed in 1960 and in 1964 began to sponsor summer excavations supervised by McGimsey and his staff, sometimes at sites in the present study area (Scheibel and Early 1982; Morse and Morse 1983:29). The Society's first newsletter evolved in January, 1962, into its Bulletin, *The Arkansas Archeologist*, providing a new regional publication outlet for both professionals and amateurs. (Several early issues included reprints of classic articles on Arkansas archeology that had been printed first in the Texas *Bulletin*.) A new newsletter, *Field Notes*, appeared in January, 1965, providing a medium for relatively rapid dissemination of information and an outlet for shorter articles and preliminary summaries of major projects.

New Overviews

Two overviews appeared in the early 1960s. The first, *The Southeastern United States* by William H. Sears (1961), was widely circulated and brought the author's East Gulf Coastal Plain perspectives to bear on the Lower Valley. The second, *The Eastern United States* by Williams (1963), was included in a National Park Service report of limited distribution and unfortunately is virtually unknown and uncited.

The New Archeology

The New Archeology movement which began in the 1960s (Binford 1962; Binford and Binford 1968; Willey and Phillips 1974:178ff) had little immediate effect in the Lower Mississippi Valley and Trans-Mississippi South. This is not the place for discussing the reasons for this, but it is related to the dominance of Lower Valley archeological systematics by the Lower Mississippi Survey and the Ford-Willey-Phillips tradition and the dominance of the modified Midwestern system in Caddoan archeology. Artifact typologies and related cultural chronologies were strongly emphasized in these traditions, but artifact functions, cultural ecology, and the more remote goal of explaining cultural processes were stressed in the new archeology (Binford 1965). (For further discussion of these issues, see Gibson 1979b and Jeter 1982a:110ff.)

LMS Extension into Louisiana

As Phillips completed his Yazoo Basin report during the 1960s, Williams and his students were extending the LMS research domain into the Tensas Basin of northeast Louisiana, beginning in 1963. A tentative overall sequence was soon produced and distributed widely (Williams 1964; cf. Gibson 1983b:42–43), followed by a more refined but still tentative sequence for the later phases (Hally 1967). In conjunction with these investigations, Belmont undertook a reanalysis of the materials from the nearby Greenhouse site and soon produced a preliminary, but much refined, revision of Ford's sequence (Belmont 19676).

Unfortunately, after these promising beginnings, the LMS Tensas Basin research has not yet produced any detailed and widely available site reports or syntheses. Belmont published the brief articles cited below in the relevant regional summaries, but he never completed his long-awaited dissertation on Troyville–Coles Creek ceramics and cultural relationships, a gap only partially mitigated by the recent completion of a Harvard senior honors thesis (Bitgood 1987) on two of the Baytown/Troyville phases in the Upper Tensas.

Hally (1972) did complete a lengthy, thorough, and well received dissertation on the late prehistoric to protohistoric (Plaquemine to Mississippian) phases of the upper Tensas Basin, but it has never been published and, due to Harvard policy, cannot even be reproduced by University Microfilms. It therefore remains virtually inaccessible. Later LMS projects in the Petite Anse region of the Louisiana coastal zone and in the Boeuf Basin of northeast Louisiana have been somewhat more productive in terms of published or accessible data.

The Arkansas Archeological Survey

In 1967, the Arkansas Archeological Survey was created and funded by the State legislature, with McGimsey as Director and Hester A. Davis as State Archeologist. At this time, the Survey started its state program with station archeologists at various institutions across the state, with their own research territories in which they conducted surveys and test or salvage excavations. Preliminary regional sequences were soon published by Survey station archeologists in an issue of *The Arkansas Archeologist* edited by McGimsey (1969). The Survey soon became involved in contract archeology.

Phillips's 1970 Synthesis

The major archeological publication of this period was Phillips's (1970) long-awaited Yazoo Basin and Lower Valley synthesis. This massive two-volume publication ran to 999 pages, plus maps, and thoroughly reorganized some of the major aspects of Lower Valley archeology. Between the Introduction and the Conclusion are five major sections, summarized briefly here.

Section I presents the ground rules and the application of the type–variety system to Lower Valley ceramics. Section II summarizes Phillips's 1949–1955 site survey in the Lower Yazoo Basin. Section III describes the 1954–1955 excavations at the Thornton and Manny sites in Issaquena County, Mississippi, in the lowermost Yazoo Basin above Vicksburg. Section IV describes and illustrates the Issaquena ceramic complex. Finally, Section V operationalizes the Willey and Phillips (1958) methodology by defining, describing, and mapping more than 80 Lower Valley phases, in southeastern Missouri, eastern Arkansas, western Tennessee, western Mississippi, and eastern Louisiana. The middle three sections, Sections II and III in particular, pertain to the Lower Yazoo Basin and are not highly relevant to this overview. The first and last sections, though, have had major effects on archeology throughout the Lower Valley and beyond.

Other Overviews

Somewhat overshadowed by Phillips's magnum opus was another landmark volume published in the same year. *Archeological and Historical Resources of the Red River Basin*, edited by Hester A. Davis (1970), became the first report in the Arkansas Archeological Survey's *Research Series* (which reached a total of 28 reports in 1987). Supported by the National Park Service, Corps of Engineers, and the University of Arkansas Museum, this volume included overviews of Red River Basin archeology in four states, by Robert W. Neuman (Louisiana), Michael P. Hoffman (Arkansas), E. Mott Davis (Texas), and Don G. Wyckoff (Oklahoma).

Also in 1970, three general background studies of the Lower Mississippi Valley were commissioned by the National Park Service. All three resulted in reports, but only one was published. This was *Quaternary Geology of the Lower Mississippi Valley*, by geologist Roger Saucier (1974). It proposed a radical revision of Fisk's (1944) interpretation and chronology of the Mississippi River's former courses. It was widely distributed and has recently been reprinted.

The other two studies were *The Lower Mississippi Valley in North American Prehistory*, by Jeffrey P. Brain (1971), who had recently completed his Yale dissertation (1969) on the Winterville site in the Yazoo Basin; and *The Lower Mississippi Valley: European Settlement, Utilization, and Modification*, by LSU geographer Fred Kniffen (1971). Although the latter studies were not published, they have been occasionally cited and quoted. Brain, who joined the Lower Mississippi Survey at Harvard in 1970, elaborated on his views of the relationships of the Coles Creek, Mississippian, and Plaquemine cultures in several subsequent publications (e.g., Brain 1978; Williams and Brain 1983). Also in 1971–1972, the LMS began another regional research program in the Natchez Bluffs (summarized by Brown 1985:1–10).

In 1971–1972, Neuman began another National Park Service project under contract with Louisiana State University. This archival inventory and limited field investigation of coastal sites in Louisiana resulted in a brief but widely available report (Neuman 1977) and renewed interest in the particular problems of coastal archeology and the endangered status of coastal sites.

Yet another National Park Service-sponsored project, the massive Lower Mississippi Region Comprehensive Study, produced a main report and 22 lengthy appendices, bound separately. Appendix P (Lower Mississippi Region Comprehensive Study Coordinating Committee 1974) dealt with archeological and historical resources in 10 Water Resources Planning Areas (WRPAs) in and adjacent to the Lower Mississippi Valley. Eight of these WRPAs included portions of the present study area, in eastern Arkansas and Louisiana. Although some emphasis was given to standing structures such as public buildings and historic houses, this report also inventoried what was then known about prehistoric components by counties and parishes and summarized then-current knowledge of culture history and cultural resources on a drainage-by-drainage basis, down to the levels of small rivers and creeks. This document is almost never cited and is probably unknown even to many professional archeologists but might still be of use in the beginning stages of investigations in a new region.

Louisiana Organizations, Meetings, Projects, and Publications

In 1974, the Louisiana legislature created the Louisiana Archaeological Survey and Antiquities Commission and the position of State Archaeologist. Also in 1974, the Louisiana Archaeological Society was formed (Gibson 1984) and published the first volume of its annual journal, *Louisiana Archaeology*, adding another valuable outlet for publications by both professionals and amateurs. In 1977, the Commission was transferred to the Department of Culture, Recreation and Tourism (Smith et al. 1983:5).

In 1978, a conference on Lower Valley archeology was held at Avery Island, Louisiana, the field headquarters for a new LMS long term research project in the Petite Anse region of the south-central Louisiana coastal zone. Participants reviewed and updated the status of phases, and a sorting manual (Brown 1978e) for type–variety classification of Lower Valley decorated pottery was distributed. This document was not widely circulated but proved to be quite useful to those fortunate enough to obtain copies, especially since it incorporated revisions of Phillips's (1970) scheme that would not be widely distributed until the appearance of the Lake George report (Williams and Brain 1983).

Other by-products of the Avery Island Conference included a photocopied compilation of data supplied by participants on phases in and near the Lower Valley (Williams 1978), a summary of research resources (data on collections from Lower Valley archeological sites; Williams 1979), and a comprehensive archeological and historical bibliography of the Lower Valley (Brain and Phillips 1979). The phase data were not published and were distributed only on a very limited basis but have been partially incorporated (insofar as they are relevant to this overview's study area) in Appendix A of the present overview. The research resources compilation and the bibliography have been published in limited numbers as *LMS Bulletins*. The bibliography is in the form of hundreds of index cards with an accompanying guide/index; it has been updated once with additional cards in 1984. Perhaps eventually it will be converted to a computerized form.

Two early 1980s meetings in Louisiana produced significant revisions and syntheses. In January, 1980, a symposium at the Louisiana Archaeological Society's annual meeting in Alexandria discussed the Troyville–Baytown period question, a matter of cultural taxonomy which had previously been given different solutions by Ford (1951) and Phillips (1970). The papers from that symposium were soon published as a special issue of *Louisiana Archaeology* (Gibson 1982a); they tended to favor a Fordian position of equal and/or separate status for the Troyville concept (Belmont 1982b; Gibson 1982b). In 1981, a conference on Gulf Coast archeology was held at Avery Island. The papers from that conference were also soon published (Davis 1984) and reflected a general feeling among the participants and others that Coastal archeology was significantly different from that of the Lower Valley and other inland regions.

Also in 1981, the LMS inaugurated yet another extensive research project, this time in the Boeuf Basin of northeast Louisiana. Unlike the Tensas Basin project, this one has already produced some fairly widely circulated (or at least accessible) publications, reports, and meeting papers (Belmont 1983; Fuller 1985; Fuller and William 1985; Kidder 1986a, 1986b, 1987).

Direct Historic and Protohistoric Research

Renewed interest in historic contact period and protohistoric archeology was triggered by the appearance of Brain's (1979) *Tunica Treasure* report and a series of related publications (e.g., Brain 1977, 1981). The "treasure" of European trade goods and contemporary Native American artifacts had been found a decade earlier by a relic collector at the Trudeau site on the Mississippi in West Feliciana Parish, Louisiana, and were shown convincingly by Brain to have been deposited during a Tunica occupation between 1731 and 1763. Also appearing at this time was Ian Brown's (1979, Brown University) dissertation on the Colonial French site of Fort St. Pierre near Vicksburg, Mississippi, and contemporary Tunican and other Native American remains. The 1982 Mid-South Archaeological Conference in Memphis featured a symposium on the Protohistoric period, and the papers were published four years later (Dye and Brister 1986b).

Arkansas in Review and the State Plan

Preparations began in 1979 for two noteworthy syntheses of various aspects of Arkansas archeology. Symposia observing the entrance of the Arkansas Survey into the 1980s were held in 1980 at the Caddo Conference and at the Annual Meeting of the Society for American Archeology. The collected papers, including both regional and topical summaries, were published *as Arkansas Archeology in Review* (Trubowitz and Jeter 1982) as No. 15 in the Survey's Research Series.

Meanwhile, under contract with the Heritage Conservation and Recreation Service (later incorporated into the National Park Service), Arkansas Survey archeologists summarized regional/temporal study units with appropriate research questions and provided other background documentation for *A State Plan for the Conservation of Archeological Resources in Arkansas* (Davis 1982). This document was conceived as a renewable draft and accordingly was published in loose-leaf notebook form as No. 21 in the Research Series.

New Work on the Ouachita and Red Rivers

Also in the late 1970s and early 1980s, activity (much of it under contract) intensified in the Ouachita and Red River basins

basins in the Arkansas–Louisiana borderlands. The Ouachita Valley in these regions is of particular interest in that it traverses the approximate geographic center of the present overview area, and its prehistoric remains reflect the ebb and flow of cultural influences from the Fourche Maline–Caddoan and Lower Valley traditions.

The first major synthesis to appear was the report on investigations at the Shallow Lake site in the Felsenthal region of south-central Arkansas (Rolingson and Schambach 1981). It included a completely new approach to ceramic classification (Schambach 1981), devised because of the inapplicability of the Phillips type–variety system to this region's late prehistoric grog-tempered ceramics, which often had different decorative techniques on the rim and body of the same vessel. Hemmings (1982a) reported on an extensive survey and testing project, also in the Felsenthal region. Weinstein and Kelley (1984) reported on a similar project in the upper Felsenthal region, below Camden. Also actually appearing in 1984 (despite its date) was a special issue of *Louisiana Archaeology*, on the prehistory of the Ouachita Valley in Louisiana and Arkansas (Gibson 1983a).

In the Red River Basin of Louisiana, the Corps of Engineers' New Orleans District (which then had jurisdiction over portions of the Red River drainage, later transferred to the Vicksburg District) contracted with Commonwealth Associates, Inc., for a cultural resources survey of numerous discrete loci and limited site testing along the Red River waterway between Shreveport and the Red River's mouth. The resulting two-volume report (Commonwealth Associates 1981) provides a useful overview of environmental and archeological data from this important 400 km valley segment which transects northwest to east-central Louisiana.

Meanwhile, the volume *Contributions to the Archeology of the Great Bend Region* (Schambach and Rackerby 1982) summarized the findings of several recent contract projects along the Red River in southwest Arkansas and offered a revised outline of the culture history of this region. One of these projects, at the Cedar Grove site, continued to the mitigation stage, involving work at a protohistoric to early historic (ca 1650–1750) Caddoan hamlet and cemetery (Trubowitz 1984), and an overlying late nineteenth–early twentieth century Black cemetery (Rose 1985). The Caddoan component yielded numerous ceramic vessels amenable to precise grave-lot seriation which served as the vehicle for the extension of Schambach's new ceramic classification system to Caddoan ceramics (Schambach and Miller 1984).

The Morses' Synthesis

After conducting nearly two decades of research in northeast Arkansas from the Survey's Arkansas State University (Jonesboro) station, Dan and Phyllis Morse wrote *Archeology of the Central Mississippi Valley*, published in 1983 by Academic Press and widely distributed. The Morses' Central Valley was defined as the portion of the Mississippi Valley between the mouths of the Ohio and Arkansas Rivers, a territory that is regarded here as the northern portion of the Lower Valley. This volume presented a period-by-period synthesis of research, a significant amount of it done by the Morses themselves. It represents the basic point of departure for archeological research in the northern portion of the present study area.

The Louisiana Comprehensive Plan

The same year saw the publication of *Louisiana's Comprehensive Archaeological Plan*, also known as the CAP (Smith et al. 1983). As in the case of the Arkansas State Plan, the original framework was derived from the Heritage Conservation and Recreation Service's study units format. The state was divided into six geographically defined management units which were discussed in terms of management issues. A cultural units section dealt with nine prehistoric and five historic units. The prehistoric framework paralleled that used in Neuman's book, which was in press during the writing of the CAP.

If a brief comparison may be made between the Arkansas State Plan and the Louisiana CAP, one salient difference is apparent. The Louisiana document, having been authored by the same people for the entire state, exhibits much more uniformity and consistency of approach from one region and one cultural unit to another. The Arkansas document, on the other hand, was prepared by different groups of regionally based specialists for each section and varies widely from one region to another in terms of approach and level of detail, but perhaps gains in regional expertise what it loses in consistency and uniformity.

Another point of difference of interest for future comparisons is the question of how these documents are to be revised. As noted above, the Arkansas State Plan was issued in looseleaf format to facilitate revision of specific sections; yet, after five years, no revisions have been made. The entire Louisiana CAP has been scheduled for updating and rewriting during Fiscal Year 1988–1989 (Smith et al. 1983:297ff). But due to recent financial difficulties in both states, funding for revisions is uncertain.

Neuman's Louisiana Archeology

Neuman's *An Introduction to Louisiana Archaeology* was published in 1984. It is particularly noteworthy for its detailed historical study, "The Beginnings of Archaeology in Louisiana," and its departure from the Phillips phase-based format in discussing larger scale units, archeological cultures. The historical data developed by Neuman will be called upon in the relevant regional–historical summaries below, and his cultural perspectives will be discussed at numerous points in Chapter 4.

The Lake George Report

The year 1985 saw the actual appearance of the long-awaited Lake George site report (Williams and Brain 1983). This volume was of course focused on this large and complex mound center in the southernmost Yazoo Basin, but it included a comparative synthesis of the site's relationships at various times to Lower Valley cultural dynamics (1983:393ff). It also included the formal revision of some of Phillips's ceramic types and varieties (1983:87ff), introduced the concept of ceramic sets (1983:89ff), and presented the LMS's first systematic statement on lithic typology (1983:221ff).

New Overviews from Louisiana

Both of the more recent syntheses/overviews to appear were published in Louisiana and coauthored by a veteran researcher, Hiram F. Gregory of Northwestern State University in Natchitoches. The first was another long-delayed and long-awaited volume, *The Historic Indian Tribes of Louisiana*, by Fred B. Kniffen, Gregory, and George A. Stokes (1987), published by LSU Press and widely available. Its basic message (1987:xi) was to remind "ethnocentric Europeans" of "their obligation to the land they have named Louisiana" and of the continuing presence of Native American cultural influences and peoples. The second (Gregory et al. 1987) was a report of limited distribution on the preliminary stages of a new research project in a key marginal area in which Gregory and his associates have worked for decades: the Catahoula Basin of east-central Louisiana.

EVOLUTION OF CONCEPTS OF CONSERVATION AND PROGRAMS OF MANAGEMENT

Over the years and decades of archeological research in the Lower Mississippi Valley and Trans-Mississippi South, the endangered nature of archeological resources has gradually become all too obvious. Even more gradual, at least at first, has been the development of large management programs. Some of the noteworthy points in the history of this development will be highlighted in the following historical outline.

Early Observations

It was apparent to a number of thoughtful observers in the nineteenth century that archeological sites were being destroyed by both natural and cultural processes. The pioneering Louisiana archeologist Caleb Forshey called attention to site destruction as early as 1845 (Neuman 1984a:11). Edward Palmer, working in eastern Arkansas for the Mound Exploration Division of the Smithsonian's Bureau of Ethnology in the early 1880s, noted repeated instances of sites being eroded away by stream action, cut into by road building, leveled by and eroded due to agricultural practices, dug into by local curiosity seekers, and being mined by commercial diggers working on their own or in response to advertisements promising rewards for relics (Palmer 1917; Jeter n.d.). He and other fieldworkers for this project reported their findings to the Division's director, Cyrus Thomas, who stated in his final report:

> It should not be forgotten for a moment that the mounds are fast being leveled by the encroachments of agriculture and under the stimulus of commercial enterprise. Archeologic relics of all kinds have attained a new value in recent years because of the great increase in the number of private collectors. Those who gather specimens merely for sale rarely preserve any data in connection with them, and, although relics gathered in this haphazard manner have a certain value as examples of aboriginal art or as mere curiosities, their scientific value is comparatively small. As a consequence of the leveling of the mounds by the plow and their despoiling by the relic hunter, opportunities for acquiring a clear insight into the character and methods of mound building and into the purpose of their builders, are rapidly diminishing. (Thomas 1894:20)

Such dire predictions eventually have been borne out in many cases. In April, 1983, Jeter carried out a field investigation of some of Palmer's sites with Station Archeologist Dan F. Morse and observed the last known mound of the Cherry Valley phase in northeast Arkansas (cf. Morse and Morse 1983:241ff) being destroyed by relic hunters with power equipment. There are no more Cherry Valley mounds. A number of similar cases will be noted in Chapters 7 and 8.

No real action was taken in response to Thomas's statement, however. The next major project in the present study area was the continuing expeditions of C. B. Moore, who has been condemned as little more than a relic hunter himself by some archeologists. Moore also noted various kinds of damage to sites.

Calls for State Surveys in the 1930s

The next major observer to sound an alarm about site destruction was Winslow Walker (quite understandably, after his experiences at the Fish Hatchery and Troyville sites). At the 1932 National Research Council Conference in Birmingham, Walker expressed concern over "the wanton destruction of archaeological sites" in Louisiana (Neuman 1984a:50). He recommended a state archeological survey and inventory of private collections (perhaps not surprisingly, since the meeting was held under the auspices of the NRC's Committee on State Archaeological Surveys), but unfortunately these recommendations were not published.

Following up on Walker's comments, at the conclusion of his article in the *Louisiana Conservation Review*, Ford (1935a: 11) remarked:

> It is hoped that a statewide survey to locate and study the state's aboriginal remains in a systematic and thorough manner may be undertaken soon.
>
> The conservation of Louisiana's prehistoric monuments is fast becoming a pressing question. Through cultivation, road-building, clearing with subsequent erosion and commercial "pot-hunting," the Indian remains are fast disappearing. Although most of the civilized countries have regulations concerning the preservation of antiquities, there is none in America. However, many old town sites with their accompanying monuments have been set aside

> in most states by either the Federal or state governments for preservation as parks.
>
> The research of the archaeologist is often compared with the reading of a book written in hieroglyphics. The scientific excavation of an old site is comparable to opening carefully and reading one of the musty pages. Careless or incompetent destruction of a mound or village site tears a page from the story that may never be replaced or read.

Despite the recognition of the problem by Walker, Ford, and their colleagues, their recommendations for the funding of state archeological surveys were generally not implemented for several decades. During the Depression years, the states had other, far more pressing, priorities. In the later 1930s, the energies of many archeologists (including Ford) were put into massive federal survey and/or excavation projects, such as those sponsored by the WPA in Louisiana, and to a lesser degree, in Arkansas. As has been seen, much of this work was not reported upon until after World War II, and some of it has never been reported.

Federal and State Action in the 1960s and 1970s

It was not until the 1960s that more or less concerted steps began to be taken on both the federal and state levels toward implementation and institutionalization of a conservation ethic for cultural resources. The National Historic Preservation Act (Public Law 89-665) was passed by Congress in 1966, greatly expanding the coverage of a 1935 law, and explicitly including archeology. As noted in the previous section, the Arkansas Archeological Survey was created by the state legislature in 1967 and embarked upon its state program of recording site data and conducting regional research. The National Environmental Policy Act (Public Law 91-190) was passed by Congress in 1969, requiring environmental impact statements on major federal projects. The period from then to the early 1970s saw the increasing involvement of the Survey in contract archeology (Klinger 1982:316–318).

By the middle 1960s, Lower Valley archeologists had also become alarmed by the widespread destruction of sites by landleveling and other mechanized agricultural practices. A survey and evaluation of the situation was made by McGimsey, Davis, and Griffin (1968), who labeled the Mississippi Alluvial Valley "an archeological disaster area" (1968:Figure 1). They recommended programs of intensive survey and extensive excavations at selected sites (1968:37), and the formation of a Mississippi Alluvial Valley Archeological Program (1968:41). These recommendations were not implemented due to lack of funding, but there were at least two tangible results that were direct outcomes of this effort: the passage of the Archaeological and Historic Preservation Act (Moss–Bennett Act, Public Law 93-291) in 1974 and the publication of a booklet, *Stewards of the Past*, which was distributed to some 60,000 farmers and other land managers (McGimsey, personal communication). The Survey also published studies of site destruction due to agricultural practices (Ford and Rolingson 1972; Medford 1972).

The Survey gained national and international notice in the field of cultural resource management in the early 1970s. One key event was the publication of McGimsey's (1972) book, *Public Archeology*. In this volume, the Survey's director called attention to the threatened archeological record, reviewed the status of federal and state legislation related to protecting cultural resources, and summarized the Arkansas system of cooperation among professionals and amateurs.

In 1973, the Arkansas Survey contracted with the Memphis District, Corps of Engineers, for a survey in the Cache River Basin of northeast Arkansas. The project was explicitly conceived by its director, Michael B. Schiffer, as "an experiment in contract archeology" (Schiffer and House 1975) in an attempt to demonstrate "that contract archeology can and must meet the high standards of modern archeological research." The report was widely circulated, and a related article (Schiffer and House 1977) reached an international audience.

Due primarily to federal legislation, a boom in contract archeology occurred in the 1970s, beginning with work by academic, museum, or government agency archeologists and expanding to the private sector with the rise of independent cultural resource management contracting firms. A variety of perspectives on the Survey's participation in the contract archeology of this period can be obtained from various chapters in Schiffer and House (1975), and from articles by Klinger (1982) and Rackerby (1982).

In Louisiana, the legislature created the State Historic Preservation Office in 1971 in response to the 1966 National Historic Preservation Act. After reorganizations in 1977 and 1981, there is now a Division of Archaeology and Historic Preservation, separated into a Division of Historic Preservation under the State Historic Preservation Officer, and a Division of Archaeology under the State Archaeologist. A summary of the history of these agencies and their goals is presented by Smith et al. (1983:4ff).

Unlike the Arkansas Archeological Survey, its Louisiana counterpart does not have station archeologists at institutions around the state and has not participated in contract archeology. Also unlike the Arkansas situation, the Louisiana State Archaeologist's office, since 1979, has administered grants from the U.S. Department of the Interior to various archeologists for research projects in the state.

Trends in the 1980s

A major turning point in the Arkansas Survey's contract activities was reached in the early 1980s, as a result of Congress having passed a Small Business act. A number of federal agencies, including several Corps of Engineers Districts, instituted "small business set-aside" procurement policies, and private archeological firms began to get contracts that the Survey and similar agencies in other states would have gotten under previous arrangements. This situation was discussed in an issue of the journal *Southeastem Archaeology* (McGimsey 1982a, b; Drucker 1982; Garrow 1982).

A recent trend on the part of contracting agencies, and one particularly exemplified by the Corps of Engineers' New Orleans

District, has been to contract for large overviews of cultural resource data. The study of the Red River waterway from Shreveport to the river's mouth (Commonwealth Associates 1981) has already been discussed. In another overview, the New Orleans District contracted with a Southeast/Southwest team from the National Park Service for a comprehensive cultural resources literature survey of the regions along the Lower Mississippi River from Mile 300 to Head of Passes. This document (Greene et al. 1983) includes three components: A, a thematic historical overview; B, a three-volume inventory of site forms, standing structure forms, etc.; and C, a management summary. The thematic historical overview will be called upon as a major reference in Chapter 9 of the present overview.

Despite the progress that has been made in mitigating the destruction of sites by projects involving federal and state funds and in public education, an archeological disaster of immense proportions continues on private lands. Every professional archeologist in Arkansas and Louisiana has numerous "horror stories" about the destruction of sites as a by-product of agricultural or commercial earth moving, by individual pothunters, and by commercial mining of sites leased from their owners by relic collectors. As Jeter (1982a:120) predicted some time ago, the pace of pothunting has increased as the economic hard times of the 1980s have continued in Arkansas and Louisiana.

Although as Ford (1935a, quoted above at length) noted a half-century ago, "most of the civilized countries" have regulations protecting antiquities on such lands, no such policies exist in the U.S., and there are probably no realistic prospects of instituting them, as witnessed by the failure of a recent legislative effort to protect prehistoric burials from pothunters in Arkansas (Hoffman 1987). Instead, the best hopes for protecting sites now on private lands probably lie in increased public outreach and education programs (see Smith et al. 1983:14–16 for a summary of Louisiana's activities in this field, and various Arkansas Archeological Survey *Annual Reports* for Arkansas examples), and in the actual purchase of key sites. The Archaeological Conservancy, with headquarters in New Mexico, has been organized for this purpose and has now bought several sites in Arkansas.

REGIONAL HISTORIES OF INVESTIGATIONS

In this section, the history of archeological investigations in the study area will be examined on a regional basis. The regional units used will not be the traditional archeological regions, which tend to coincide with "minor physiographic subdivisions" (Willey and Phillips 1958:19) and would be too small for the purposes at hand. Instead, macroregions on the order of quadrants of the states and comparable to the management units of the Louisiana Comprehensive Archaeological Plan (Smith et al. 1983:19ff, Figure 1) will be used. It should also be noted that although the Arkansas State Plan presented a map of 22 archeological regions in the state (Davis 1982: Figure RSU2), the actual device used as an organizing framework was to divide the state into quarters, which were called study units or sections (1982:Part II, Figure RSU1).

A similar scheme will be adopted, and adapted, here. Eight such regions will be used: Northeast Arkansas, Southeast Arkansas, Southwest Arkansas, Northeast Louisiana, Northwest Louisiana, Southeast Louisiana, Southwest Louisiana, and Coastal Louisiana. These units do not coincide exactly with the units used in the Arkansas State Plan or the Louisiana CAP but have instead been modified from those units to suit the purposes of this overview, which must attempt to compare the archeological records and histories of both states.

In particular, the Ouachita Valley, which trends from northwest to southeast across south Arkansas and into northeast Louisiana, presents something of a problem. It is dealt with here by slightly expanding the concepts of Southwest Arkansas and Northeast Louisiana. The similarly trending valleys of the Arkansas and Red rivers are less problematical. Only the lowermost Arkansas Valley is included in the present overview, and it is assigned here to Southeast Arkansas. The Red River Valley, fortunately, includes a cultural transition zone near the geographic center of Louisiana, so that Northwest Louisiana can be defined as approximately equivalent to the Caddoan area in Louisiana. A major deviation from the CAP's management units is the setting aside here of Coastal Louisiana as a region with its own unique archeological and historical situations. This is not, however, a deviation from established archeological practices (cf. McIntire 1958; Neuman 1977; Davis 1984).

A final contrast between the Arkansas State Plan and Louisiana CAP approaches must be noted. Whereas the CAP's management units were strictly bounded along parish lines (Smith et al. 1983:Figure 1), the Arkansas study units or major sections completely ignored county lines and sliced through several archeological regions as well (Davis 1982:Figures RSU2 and RSU3).

The approach taken here to such boundary problems is that, as this is a review of the history of archeological investigations, it will be most coherent if it is organized with some regard for the substantive archeological patterns that have been discerned. An attempt will therefore be made here to draw macroregional boundaries to coincide with boundaries of certain archeological regions.

Some problems remain. There is no officially defined and mapped set of archeological regions for the entire state of Louisiana (Kathleen Byrd, personal communication), although several have been produced by the LMS for their investigations in the Tensas Basin, Petite Anse, and Boeuf Basin regions. Also (and this may be to Louisiana's advantage), even if archeological regions have been defined, "at a given time, a high degree of cultural homogeneity may be expected but not counted on," as noted by Willey and Phillips (1958:20). Cultural boundaries definitely fluctuated through time, and placing too much reliance on static regional definitions can obscure this. The approach taken here is to rely on regions more in the present section on the history of archeological investigations, and to deal with the cultural boundary fluctuations in Chapters 5 through 8. To use an archeological analogy, we are setting up a grid system (though certainly not a rectilinear one!) here, and reporting on the findings in later chapters.

Within each macroregional subsection, a similar general format will be used. First, the macroregion will be defined geographically and in terms of archeological regions where relevant. Second, a brief summary of the observations made by the earliest European explorers about the aboriginal occupants of these regions will be presented. Next, some significant observations made about archeological remains by later explorers, naturalists, etc., will be noted. Finally, the great majority of each of these macroregional discussions will consist of a chronological summary of the explicitly archeological work that has taken place. Insofar as possible, this will be done in order of the year(s) of fieldwork, rather than years of publication, due to the phenomenon of publication lag that bedevils archeology.

Northeast Arkansas

This macroregion is defined as including the following archeological regions: the Eastern Lowland, Crowley's Ridge, the Western Lowland, the White River Lowland, and the Lower White River Basin. This is essentially the portion of northeast Arkansas covered in the recent book by Morse and Morse (1983), minus the Arkansas River Lowland and Grand Prairie, which are here (and in the Arkansas State Plan) included in southeast Arkansas.

The first Europeans to visit these regions were the members of De Soto's expedition, who crossed the Mississippi River into Arkansas in June, 1541. They were of course not ethnohistorians or anthropologists, let alone archeologists, but their surviving descriptions (Bourne 1904) have provided some of the key analogies for the interpretation of the remains of Mississippian chiefdoms in northeast Arkansas. The major problem with such interpretations is that the De Soto route, here and elsewhere, is uncertain and a matter of intense debate (Brain et al. 1974; Brain 1977, 1985a, 1985b; P. Morse 1981:65ff; Morse and Morse 1983:305ff; Hudson 1985; Dickinson 1980, 1986).

Some 132 years elapsed before the next visit of Europeans. Marquette and Jolliet, with five other Frenchmen, descended the Mississippi to the mouth of the Arkansas. En route, they reported a Mitchigamea village possibly near the mouth of the St. Francis River but well inland. Although this site has not been positively identified archeologically, D. Morse (1988, personal communication) has investigated a possible candidate. Later French explorers concentrated on the Lower Arkansas River and areas of Louisiana to the south.

As noted by the Morses (1983:18), these regions were occasionally visited by observant travelers and naturalists in the early 1800s; General Land Office (GLO) surveyors' maps of the 1820s and following decades often mention mounds and evidence of former habitation sites, but there was a gap in the recording of such sites from the 1840s to the 1870s.

Dr. Frank L. James, who practiced medicine briefly (1977–1978) in Osceola, Arkansas, sent a number of specimens from that general locality (probably from Mississippian Nodena phase sites) to the Smithsonian Institution and other museums (Morse and Morse 1983:18–19). This may well have provided the impetus for "the first well-documented archaeological excavations in northeast Arkansas" (1983:19), by Edwin Curtis for the Peabody Museum, Harvard, in 1879 and 1880.

Curtis worked along the St. Francis River, concentrating on the huge St. Francis-type village sites of the Parkin phase; it has recently been learned that his Stanley Mounds site was the Parkin site itself (P. Morse 1981:20). More than 900 ceramic vessels and numerous other artifacts were recovered but have never been analyzed (Putnam 1880, 1881; Morse and Morse 1983:19). Some of his vessels from various sites in this locality were illustrated by Moore (1910:333–337, Figures 57–63). Phyllis Morse (1981:50ff) has briefly summarized Curtis's work at sites such as the Rose Mound, Neeley's Ferry, and the Fortune Mound. Given the institutional goals of the day, Curtis's work was a promising beginning. However, he died in late 1880; this, coupled with the Peabody's financial problems at the time (Putnam 1881), left a void to be filled.

In 1880, Dr. Edward Palmer had just completed two seasons of highly successful collecting for the Peabody Museum in Mexico and Texas (Deter n.d.). In early 1881, he was contacted by the Smithsonian about the prospects of his working in Tennessee for the proposed Mound Exploration Division of the Bureau of Ethnology. It appears likely that Palmer, who would have been quite aware of Curtis's successes, suggested that further work in Arkansas mounds would also be appropriate. At any rate, Arkansas became one of the most intensively explored states in the entire Mound Survey project (C. Thomas 1894; Jeter 1986b:149).

As the Division's principal fieldworker in Arkansas from 1881 to 1884, Palmer visited such major northeast Arkansas sites as Bradley and Pecan Point of the Nodena phase and reconnoitered the White River Valley as far upstream as Batesville. Other Smithsonian field assistants, including Col. P. W. Norris, J. W. Middleton, and L. H. Thing, also worked in northeast Arkansas, especially in the Jonesboro vicinity. Their findings were summarized by the Division's director Cyrus Thomas (1894), but his interpretations of their notes were not always correct (Deter 1986b:149). A poorly edited publication of some of Palmer's Arkansas documents appeared posthumously (Palmer 1917); a much more complete, annotated version is in preparation (Deter n.d.).

Thousands of northeast Arkansas pots were excavated during the 1880s by Captain C. W. Riggs and "Captain" Wilfrid Hall (Brose 1980; Griffin 1981; P. Morse 1981:21; Morse and Morse 1983:19). Their collections went to major institutions in the north and east, but Riggs's notes are missing, and Hall kept few records. Many of Hall's specimens went to the Putnam Museum in Davenport, Iowa, and furnished data for W. H. Holmes (1903) in his *Aboriginal Pottery of the Eastern United States*.

Although pothunting undoubtedly continued, the next documented archeological investigations in northeast Arkansas were those of the indefatigable C. B. Moore. He had already worked in southeast Arkansas (Moore 1908, 1909); in late 1909 and early 1910, he excavated at a number of sites along the St. Francis, White, and Black rivers (Moore 1910). He ascended the St. Francis and its tributary Little River as far as the Marked Tree–Lepanto vicinity, working primarily at Parkin phase sites such as Rose Mound (207 burials, 587 pots); Parkin itself (19 burials and 25 pots in only one day); Jones–Borum (48 burials, 92 pots); Neeley's Ferry (95 burials, 175 pots); Turkey Island (42 burials and 63 pots in two days); Cummings (40 burials, 66 pots); and Miller (58 burials, 112 pots).

Moore (1910:338ff) next steamed up the White River to a point just above Newport, then ascended its tributary the Black River as far as central Randolph County near the Arkansas–Missouri state line. The northern portions of that expedition are outside this overview's territory (see Sabo et al. 1988) but will be discussed here for the sake of continuity. In point of fact, Moore was relatively unsuccessful in this drainage system, stating that

> with one exception no site of interest was found along White river, and but three vessels of earthenware were encountered along the stream. Along Black river, while some vessels were found, not one was of a character to warrant its transportation home. (Moore 1910:339)

Moore's most noteworthy site on the White River was Chandler's Landing, which had two mounds. These yielded a number of poorly preserved burials, one whole vessel, six boatstones, two long narrow stone chisels or celts, two stone pipes, an earthenware pipe, and other artifacts (Moore 1910: 341ff). These materials have been assigned by the Morses (1983:197, Figure 9.8) to the Coles Creek culture period, i.e., the Plum Bayou culture of Rolingson (1982).

On the Black River, Moore (1910:352–354) found at least 42 burials and 61 poorly made and poorly preserved pots (at least some of them shell tempered) in a mound near Lindley Landing in Jackson County. The vessels were not saved, and the site has not been relocated. He also found a flexed burial with jasper beads and an engraved shell cup at Little Turkey Hill in Independence County (1910:356, Figures 73–74). This shell has been regarded as Hopewellian (Phillips and Brown 1975:162–163), but the Morses (1983:125, Figure 6.7) suggested that it was of Late Archaic–Poverty Point affiliation instead.

In late 1910 and early 1911, Moore ascended the Mississippi River, first working in Louisiana, Mississippi, and southeast Arkansas (see below). In northeast Arkansas (Moore 1911: 401ff), he worked at sites including Avenue (probably a Quapaw phase site; Phillips 1970:943), where he found 62 burials and 75 pots; Kent (54 burials, 69 pots); Rhodes (65 burials, 123 pots); Bradley (181 burials, 28 pots); and Pecan Point, which had already been pothunted for many years but still yielded 349 burials and 535 vessels.

These figures, and the fact that numerous collectors and commercial pothunters often use power equipment to mine sites, hint of the incredible archeological richness of northeast Arkansas — and of the disastrous loss of data that has occurred there and continues unabated.

Another hiatus in semicontrolled excavation and publication of data from northeast Arkansas occurred after Moore's departure, from World War I through most of the 1920s. The reopening of these regions to scientific research was begun by Dr. James K. Hampson of Mississippi County, the owner of the late prehistoric to protohistoric Mississippian Nodena site. Hampson had excavated sporadically at the site as a young man, from 1897 to 1907, but had not reported those finds. He returned to the site in 1927 but did not resume working on it until 1932 (Morse 1973b:10). During the latter year, excavations were also conducted at Middle and Upper Nodena and several related sites by Dellinger's University of Arkansas Museum staff, who recovered hundreds of burials and pots (Morse 1973b:23ff). At Upper Nodena the Alabama Museum of Natural History found 799 burials and 718 pots (Morse 1973b:33ff). Hampson himself continued collecting, excavating, and mapping the site until 1941, also recovering hundreds of burials and vessels. All of these disparate sources were brought together in a volume edited by Morse (1973b), now out of print but currently under revision (Morse n.d.b).

In 1932 and 1933, Dellinger's staff also excavated Hazel, Neeley's Ferry, and Barton Ranch, all sites in the Parkin locality. This work led to an early *American Antiquity* article on Mississippian pottery (Dellinger and Dickinson 1940), but only the Hazel materials were thoroughly analyzed and reported upon, in a thesis by Zinke (1975).

Controlled research in northeast Arkansas languished again during the Depression. No WPA or other federal relief archeological projects took place in these regions. The next project to visit here was the Lower Mississippi Archaeological Survey in 1940–1941, and again in 1946–1947, working primarily along the Mississippi and St. Francis rivers (Phillips et al. 1951). This project and the succeeding Central Mississippi Valley Archaeological Survey (in the regions to the north) have been discussed above (see also Morse and Morse 1983:26–27).

In addition to the Central Valley Survey, several other projects in southeast Missouri during the late 1940s and 1950s provided comparative data for northeast Arkansas archeology (Morse and Morse 1983:28–29). Williams's (1954) dissertation on the southeast Missouri cultural sequence has been discussed above. Also noteworthy is the report on excavations at the terminal Mississippian to protohistoric Campbell site in the extreme southeast Missouri bootheel, only a few kilometers from the Arkansas line (Chapman and Anderson 1955). The site has yielded probable Spanish artifacts to relic collectors and may well have been visited by one of De Soto's exploratory parties (Morse and Morse 1983:312, Figure 13.2).

An amateur archeologist, John Moselage, excavated at the Middle Mississippian Lawhorn site located in Arkansas just south of the bootheel, from 1957 through 1960. His report (Moselage 1962) was "the first complete descriptive report published on any site in northeast Arkansas" (Morse and Morse

1983:28), an astounding fact given its relatively recent date and the archeological richness of these regions.

Also beginning in the late 1950s, the Gilcrease Institute of Tulsa conducted excavations in northeast Arkansas at three sites, selected to yield numerous artifacts. In 1957–1958, the Banks Village site on Bradley Ridge near Memphis was excavated and produced a number of house patterns as well as the expected late Mississippian mortuary artifacts; it is now believed to date around A.D. 1400 (Perino 1966; cf. Morse and Morse 1983:273–274). In late 1958, excavations were conducted on the west flank of Crowley's Ridge in three mounds at the Cherry Valley site, which was being ravaged by relic collectors. This work produced the basic data on mounds, structures, and artifacts of the Cherry Valley phase of middle period Mississippian culture (Perino 1967:1–71; cf. Morse and Morse 1983:241ff). In early 1960, the Gilcrease excavators returned to the Bradley locality and excavated Banks Mound 3, a separate site from the Banks Village (Perino 1966:Figure 1). This mound, which had both Baytown and early-middle period Mississippian mortuary components, was also reported upon by Perino (1967:72ff; cf. Morse and Morse 1983:239–240).

As has been discussed previously, James A. Ford (1963) salvaged two mounds at the Helena Crossing site in 1960 with funding provided by the American Museum of Natural History. In the early 1960s, Ford learned of the great potential for Dalton sites in the Western Lowlands and on Crowley's Ridge and organized a Dalton survey in 1961–1962 (Morse and Morse 1983:82ff. Numerous sites were found here and elsewhere (e.g., on Macon Ridge in northeast Louisiana), and some were tested, but only a preliminary unpublished report was written (Redfield 1971). The Lace Place, the most important site found in northeast Arkansas, was somewhat more extensively tested, and a report was published in *The Arkansas Archeologist* (Redfield and Moselage 1970).

Throughout the 1960s and into the early 1970s, James Price and others affiliated with the University of Michigan conducted research, including intensive surveys and excavations, on the middle period Mississippian Powers phase. Most of the sites involved were in southeast Missouri, but a few were in northeast Arkansas. The major reported sites are in Missouri but are relevant to Arkansas archeology for comparative purposes (Price 1978; Smith 1978b; Price and Griffin 1979; Black 1979; cf. Morse and Morse 1983:256ff).

During the middle 1960s, University of Arkansas Museum and Department of Anthropology field schools and Arkansas Archeological Society/Survey summer training programs excavated at the Hazel and Parkin sites (Davis 1966, 1973; Klinger 1977; see also P. Morse 1981). In 1965, salvage excavations were conducted by the University of Arkansas Museum at the DeRossitt site. A summary contract report was submitted (Scholtz 1965), but later a much more detailed thesis focused on feature functions and spatial relationships (Spears 1978; cf. Morse and Morse 1983:1930.

In 1967, the Arkansas Archeological Survey's station for northeast Arkansas opened at Arkansas State University near Jonesboro. This event coincided with the discovery of the Zebree site, which became a major focus of research (Morse and Morse 1983:217). Zebree had Baytown period (Dunklin phase, Barnes cultural tradition, i.e., sand-tempered pottery), Emergent Mississippian, middle period Mississippian, and Historic components; the Emergent Mississippian component was especially significant. Sponsored by the Survey, testing continued at the site in 1968; in 1969 more extensive excavations were funded by the National Park Service, resulting in a published report (Morse 1975a). After a hiatus, work was to resume at Zebree in 1975.

The Morses also conducted other Mississippian research. One line of inquiry led to a volume summarizing the decades of collecting and investigations at Nodena sites (Morse 1973). Field schools tested related sites (Morse and Morse 1983:285), and an article was published on one of these, Knappenberger (Klinger 1974).

Meanwhile, the roster of Dalton sites in northeast Arkansas was growing rapidly, and eventually one, the Brand site, was selected for extensive excavations under Morse's direction in 1970. The site report by Goodyear (1974) has become a landmark study in Dalton technology and function (cf. Morse and Morse 1983:84ff).

Sloan, a major and unique Dalton site, was excavated in 1974. It yielded caches of unused Dalton artifacts and small human bone fragments and has been interpreted as a Dalton cemetery. Several preliminary reports have been published (Morse 1975c, 1982; Morse and Morse 1983:89ff, and the final report is to be published by the Smithsonian Institution Press (Morse n.d.a).

In 1973, the Arkansas Survey began work on the Cache River project under contract with the Memphis District, Corps of Engineers. This project involved land both inside and outside of the present overview's territory but principally inside it (Schiffer and House 1975).

In 1974, the Arkansas Survey conducted a reconnaissance survey in the Village Creek Basin of northeast Arkansas for the Little Rock District, Corps of Engineers. The project area is in the Western Lowlands, barely outside of this overview's official coverage territory, but it is cited here for comparative purposes (Fehon and Viscito 1974). The initial survey was followed by a more intensive survey and testing program for the Soil Conservation Service in 1976. A report was submitted and later published essentially unchanged (Klinger 1986). Also, an article summarizing settlement pattern information from this project was published in the *Mid-Continental Journal of Archaeology* (Klinger 1978).

In 1975, the Arkansas Survey returned to the Zebree site for a major mitigation excavation directed by Dan Morse and funded by the Memphis District, Corps of Engineers. Work continued through the summer of 1976. A preliminary report was published (Morse and Morse 1976), a draft contract report (Morse and Morse 1977) and a final contract report (Morse and Morse 1980) were submitted, and a final published report is in preparation (Morse and Morse n.d.). Summaries of the prehistoric and historic components at Zebree are readily available in the Morses' book (1983:186–189, 217–233, 253–255, 327).

In late 1976, the Arkansas Survey conducted a survey in Craighead County for the Memphis District, Corps of Engineers. This work led to testing of the Mangrum site in early 1977 (Klinger and Mathis 1978) and mitigation of this site by excavation and preservation in late 1977. A report has been published (Klinger 1982).

Beginning early in 1977, and continuing intermittently over a five-year period, the Arkansas Survey conducted a variety of field investigations for the Arkansas Power and Light Company at a steam generating plant site in Independence County, and along proposed transmission line corridors running south and east from the plant. Only the eastern corridor segments are within this overview's territory, and no mitigation excavations were involved. However, two sites near Zebree were tested and found to resemble Zebree at least in the presence of principally Baytown period (Dunklin/Barnes affiliated) and Emergent Mississippian components. Also, extensive testing at three sites in the plant construction zone yielded useful comparative data on occupations of the White River Valley just below the Ozark Escarpment, especially on Late Archaic occupations (Lafferty 1987).

During 1978, the Arkansas Survey conducted three phases of investigation (survey, testing, and mitigation) on the Texas Eastern archeological project, along a pipeline right-of-way from North Little Rock northeast to the Missouri state line in Clay County. Approximately the northeastern 40% of this transect was within the present overview's territory and included eight of the 12 tested sites. One of the eight, the Burris site (a middle period Mississippian village in northwest Craighead County), was the only one at which mitigation excavations were performed. A final report on the project was submitted and revised for publication (Deter 1987, 1988).

Funded by a special appropriation from the State Legislature, in 1978 and 1979, Phyllis Morse conducted background research on, and field surveys within, a 1 km radius around the huge late Mississippian and Protohistoric Parkin site in the St. Francis Valley of eastern Cross County. Site catchment analyses were performed on related sites, and a final report was published (P. Morse 1981).

The Lower St. Francis project was also begun during 1978, and it has continued intermittently since then with John House as the principal researcher. The primary orientation of this project is toward characterization of the late Mississippian and Protohistoric Kent phase (House 1982a, c, 1987). House (1983) also conducted salvage excavations and other investigations at the Barrett Mound site in this region, encountering somewhat earlier Mississippian remains.

In 1981, the McCarty site in eastern Poinsett County was discovered during agricultural land-leveling. A salvage excavation by Dan Morse produced the first good evidence of Tchula period (Early Woodland, ca 500–100 B.C.) occupation in northeast Arkansas. A summary (Morse and Morse 1983:145ff) and a preliminary report (Morse 1986) have been published.

The Morses have been closely involved since the mid-1980s in the investigations into the De Soto route by Charles Hudson of the University of Georgia (Hudson 1985). Dan Morse (personal communication) has been investigating a site near Pocahontas, Arkansas, which may be the Mitchigamea village alluded to by Marquette and Jolliet.

During 1987, Garrow and Associates, Inc., of Atlanta, Georgia, conducted an intensive sampling survey along the L'Anguille River Valley for the Memphis District, Corps of Engineers. Numerous sites were found, and a report is in preparation (David Anderson, personal communication).

Southeast Arkansas

This smaller macroregion, used here for summarizing previous investigations, is defined as including the southern portions of the Arkansas River Lowland and Grand Prairie Ridge regions and all of the Bartholomew–Macon region. The historical summaries by Jeter (1982a; Jeter et al. 1979) and by Morse and Morse (1983:17–30ff) are the basic sources for this section.

As was the case in northeast Arkansas, the first Europeans who visited these regions and recorded data relevant to archeology were the members of the De Soto expedition. Here, their route is even more uncertain and subject to debate. Although researchers differ on the details of specific province or settlement identifications, it is generally agreed that the entrada must have proceeded up the Arkansas Valley into western Arkansas, but the return route out of Arkansas is the subject of extremely divergent opinions. The traditional view (Swanton 1939; Dickinson 1980, 1986) is that the Ouachita Valley was the exit route, and that De Soto died in northeast Louisiana. The challenging view (Hudson 1985) is that the return was via the Arkansas Valley — and that De Soto died in southeast Arkansas.

Also as was the case in northeast Arkansas, the next European observations were those of Marquette and Jolliet in 1673. They only descended the Mississippi as far as the mouth of the Arkansas. Both produced maps; that of Marquette (Phillips et al. 1951:Figure 71) showed the Akansea on the east bank of the Mississippi, apparently above the mouth of the Arkansas River. That of Jolliet (DeVorsey 1982:Figure 2) showed the Akansa in a similar location. These are believed to have been the Quapaw Indians. Both maps also showed the Akoroa or Akorua inland, along the south side of the Arkansas River. These must have been the Koroa (Coroa), apparently a Tunican group (Deter 1986). The Marquette map also showed the Tanikoa (Tunica?) near the Arkansas River mouth and six other groups, whose identity is questionable at best, along the Arkansas River. One of these groups, the Matoram, may be the same as the Malora, the only other group shown on the Jolliet map.

In 1682, LaSalle descended the Mississippi all the way to its mouth. In the vicinity under consideration here, various accounts of his expedition recorded the Kapaha (cf. Quapaw and Pacaha) or Akansas or Arkansas, this time in three or four settlements on the west side of the Mississippi, near the mouth and on the north side of the Arkansas in the only version which recorded that river's position (Galloway 1982b:Figures 1 and 2). A group called the Imaha and unidentified by modern researchers was indicated in that version as just south of the Arkansas near its mouth. (The Enansa shown in about the same position by Tonti in 1684 could conceivably be the same people.) The next group encountered to the south on the west side of the Mississippi, according to all versions, was the Taensa in northeast Louisiana. The Tonika, Koroas, and other groups are recorded as having been on the east side of the Mississippi in the Vicksburg and Natchez vicinities.

Arkansas Post was established by the French at the southern tip of the Grand Prairie in 1686 (Ford 1961c:137, Figure 1). For the remainder of the Colonial period, the French were essentially in continuous contact with the Quapaw and their neighbors, providing a modest amount of ethnohistoric information until the late 1700s (cf. Dickinson 1980, 1982). In the earlier 1800s, only a few intrepid naturalists recorded rather general information about remarkable archeological sites; e.g., in 1819, Thomas Nuttall (1821; quoted by Ford 1961c:143) very briefly described his observations at the Menard site near Arkansas Post. General Land Office surveyors' notes from the 1820s and later have also preserved some data about sites. As in many other areas, though, the first controlled archeological investigations were made by the Smithsonian's Mound Survey in the early 1880s. Specifically, in 1881 and 1882, Palmer excavated at Menard, at the Tillar site in northeastern Drew County, and at several other sites in these regions (Thomas 1894: 229ff; Palmer 1917; Jeter 1981, 1982a, 1986, 1987, n.d.)

Moore (1908, 1909, 1911) also visited a number of sites in and near southeast Arkansas. Particularly noteworthy is his (1908) work at Menard, Old River Landing, Douglas, and Greer, all Protohistoric to early Historic sites on the Lower Arkansas River. He was essentially unsuccessful in his ascent of Bayou Bartholomew (1909:168–169), only reaching east-central Ashley County. Along the Mississippi River, he only worked briefly in southeast Arkansas, excavating 18 burials and one vessel from a site in Desha County (1911:391; cf. Jeter et al. 1979:44–45).

During the 1920s, a local amateur, George P. Kelley, started excavating burial artifacts and making surface collections in the Desha–Chicot county line vicinity (Jeter 1979). His efforts eventually resulted in a 1934 field investigation along and near Bayou Macon by representatives of Judge Harry J. Lemley, then the major artifact collector in Arkansas; the published report (Lemley and Dickinson 1937) remained the major source of data from southeast Arkansas until the 1970s. The report identified a few Marksville components, a fairly strong Deasonville (Baytown) occupation, a very strong Tunican complex called the Hog Lake complex or phase after its major site, and few Coles Creek remains. The region is now believed to have been more closely aligned with the coeval Plum Bayou plainware complex than with actual Coles Creek culture (Jeter 1982a).

The Lower Mississippi Survey of the 1940s only briefly revisited some of the previously reported sites (Phillips et al. 1951:426; Phillips 1970:864). Some new collections were made, but the syntheses were essentially dependent on the earlier reports.

In 1955, the National Park Service began historical and archeological investigations of the French, Spanish, and American forts that had been built near the mouth of the Arkansas River. The preliminary archeological work centered on Arkansas Post and the Menard site; two reports were written but not published (Holder 1957a, b). In 1958, the Menard site was more extensively test trenched and was declared to have been the Quapaw village of Osotouy in a published report (Ford 1961c).

Southeast Arkansas was only minimally involved in the Dalton Project of 1961–1962 because most of the cultivated landforms were much too recent for Dalton occupation. A few sites were recorded on and near Macon Ridge in southern Chicot County (Redfield 1962).

During the late 1960s and 1970s, investigations by professionals and amateurs of the Arkansas Survey and Society began a trend toward a coherent program of investigations. McClurkan (1969) briefly summarized existing knowledge and called for the development of local and regional sequences. Rolingson (1971b) reported on initial investigations at the Lakeport mound center (Plaquemine and Mississippian) in extreme southeast Arkansas. Wesolowsky (1974) reported on finds of Baytown and Mississippi period materials at two sites along Bayou Bartholomew.

The most significant development of the 1970s, though, was the establishment, through extensive surveys and limited test excavations, of a sequence for the southern Bayou Bartholomew locality by Rolingson (1974, 1976). This work was augmented by contract surveys and tests upstream along Bayou Bartholomew in central Lincoln County by New World Research, Inc., for the U.S. Department of the Interior and the Soil Conservation Service (Giardino 1979), and by salvage excavations at, and intensive surveys around, the Boydell mound center at the northern end of Rolingson's study area (House and Jeter n.d.).

The 1978 discovery of field notes kept by George P. Kelley on his 1936 excavations at the Kelley–Grimes site, plus a study of vessels from the site at a local museum, resulted in the publication of a report on this Hog Lake phase site in southern Desha County (Jeter et al. 1979). Along with a 1980 conference at the Smithsonian and SEAC symposium commemorating the Mound Survey centennial (Jeter 1981), this may be said to have ushered in a change in research emphasis in southeast Arkansas. Research at the Survey's UAM Station now became focused on the terminal prehistoric (Mississippian) and related protohistoric remains, especially the Tillar complex or phase on Bayou Bartholomew (Jeter 1982a, 1986a). In addition to the Kent phase investigations summarized under the northeast Arkansas section, work was also done by the UAPB Station on the Quapaw phase (House and McKelway 1982), especially at the Noble Lake site in Jefferson County.

Research on earlier remains has also continued. In a 1981 Survey mitigation excavation under contract with the Arkansas Highway and Transportation Department, a portion of the Powell Canal site on Bayou Macon in extreme southeastern Arkansas was found to represent a Baytown period, Troyville culture seasonal encampment (House 1982b; Belmont 1982b). These excavations also yielded valuable data on subsistence and bioarcheology (King 1982; Carr 1982; Blaeuer and Rose 1982). Rolingson and Jeter (1986) reviewed the sparse data available on Tchula period occupations in southeast Arkansas.

However, late prehistoric and protohistoric research remains the major emphasis in these regions. During 1986, a major Tillar complex cemetery was discovered and salvaged at the Ables Creek site near Bayou Bartholomew (Jackson 1987). The largely fragmentary skeletal remains of more than 130 individuals were recovered and are being readied for analyses.

Southwest Arkansas

This macroregion used for the purpose of summarizing previous research is defined here as including the relevant (for this overview's territory) portions of the Ouachita Mountains and Little River regions, essentially all of the Great Bend, Little Missouri, and Middle Saline regions, and all of the Middle Ouachita and Felsenthal regions.

As noted previously, some researchers (Swanton 1939, Dickinson 1980, 1986) believe that De Soto's army spent a significant amount of time in or near this portion of Arkansas. These scholars have suggested that the 1541–1542 winter camp at Utiangue was near Calion or Camden in south-central Arkansas, and that they left Arkansas via the Ouachita Valley (1980: 4). No archeological remains of the winter camp have ever been identified, however, and this view has been challenged by Hudson (1985), whose alternative route would greatly diminish the amount of time De Soto's men spent in this portion of Arkansas.

The first recorded post-De Soto reappearance of Europeans in these regions was by Joutel and five other survivors of LaSalle's Texas colony in 1687. They reached a Kadohadacho village on the Red River (possibly west of Arkansas; Trubowitz 1984:32) and proceeded east-northeast to the Quapaw villages on the Lower Arkansas. En route, they spent several days with the Cahinnio Caddoans in a village alleged to have had about 100 "cabins" (Joutel in Margry 1879–1808:416; Dickinson 1980:7), almost certainly on the Ouachita River, perhaps near Arkadelphia (Hodges and Hodges 1945:99) but more likely near Camden (Dickinson 1980:6–7). Again, no archeological trace of any such village has been found. While at the village, the Frenchmen were told of a "Tonica" village only a day's journey down the (Ouachita?) river.

Other early French ventures into these regions have been summarized recently by Dickinson (1980) and Trubowitz (1984:32–35). Also of great interest is the 1691 expedition from Mexico to the Great Bend region by Don Domingo Teran da los Rios, the newly appointed Governor of Spanish Texas (Trubowitz 1984:33). He produced a rather stylized or schematic map depicting dispersed Caddoan communities, each consisting of one- or two-house farmsteads along an imprecisely identified segment of the Red River Valley. This has been used by Schambach (1982b:7, Figure 1–3) and others (Trubowitz 1984:263ff) as the basis for a model of archeological Caddoan settlement patterning.

Little in the way of observations of archeological sites in these regions seems to have been recorded by early Anglo-American settlers and travelers. As noted by Early (1983:12), the explorers George Hunter and William Dunbar in 1804 recorded the presence of aboriginal remains at the salt making site at present-day Arkadelphia. In 1806, the Freeman–Custis expedition in the Red River Valley described a historic Caddoan village site which may have been at or near the Foster site in Lafayette County (Webb 1959; Hoffman 1970:165). Featherstonhaugh (1835:65) briefly described the intensively worked aboriginal novaculite quarries near Hot Springs in Garland County, just beyond this overview's boundary.

The Smithsonian Mound Survey of the 1880s visited only a few sites in south-central Arkansas but may be said to have thereby initiated formal archeological research in these regions. In 1883, Edward Palmer briefly visited sites in Hot Spring and Clark counties for this project. At the Triggs Mounds near Arkadelphia, he excavated several vessels from burials; two of these were illustrated by Thomas (1894:Figures 152 and 153). Palmer also visited several other sites and made significant finds that were not reported by Thomas; these will be described in a forthcoming book (Jeter n.d.). In a follow-up trip, W. H. Holmes of the Smithsonian and his associate W. P. Jenney visited the novaculite quarries and published descriptive accounts (Holmes 1891, 1919; Jenney 1891).

Archeological research in these regions effectively began with Moore's work (1909, 1912) in the Ouachita and Red river valleys. On his way upstream from Louisiana in the Felsenthal region of the Ouachita River Valley, he had little success in Arkansas until he reached the Boytt's Field protohistoric cemetery in Union County. He also obtained a number of mortuary vessels from the Keller site in Calhoun County and the Kent site (not to be confused with the Kent site and phase near the mouth of the St. Francis River in northeast Arkansas) near Camden in Ouachita County. Along the Red River, Moore's (1912) major Arkansas finds were at the Haley site in southern Miller County; the protohistoric Battle Mound, Friday, and Foster sites in Lafayette County; and the McClure and Crenshaw sites in Miller County. These remain classic type sites in the Caddoan sequence.

Moore was followed by Mark Harrington (1920), who discovered the upland Caddoan mortuary complexes of southwest Arkansas at sites such as those in the Ozan vicinity, the Mineral Springs mounds in Howard County, and the Washington mounds in Hempstead County. Harrington's significant contributions will be discussed in some detail in Chapter 7. In addition to his Caddoan work, Harrington tested a deep deposit at the Lawrence site in Garland County, which extended back to Middle Archaic times (Early 1983:4).

Judge Harry Lemley of Hope in Hempstead County, southwest Arkansas, amassed a huge collection of artifacts from these regions. He and his associate S. D. Dickinson also published occasional articles which dealt with the archeology of southwest Arkansas, e.g., on pre-Caddoan cultures along the Red River Valley (Lemley 1936), at the Crenshaw site (Dickinson 1936), and in the Ouachita Valley (Dickinson and Lemley 1939), and on the novaculite quarries (Lemley 1942). Later, his collection was acquired by the Thomas Gilcrease Institute of Tulsa, where it remains as a major comparative resource.

In the late 1930s, S. D. Dellinger of the University of Arkansas Museum directed WPA excavations at several sites in the middle and upper Ouachita Valley. Neither he nor his staff members produced final site reports, although several unpublished preliminary manuscripts are cited by Early (1983: 8, 18–19). Later researchers have analyzed some of this massive data base, most notably Schambach, whose (1970) dissertation was based largely on data from the Cooper and Means sites in Hot Spring County. Philip Phillips of Harvard had surveyed and tested sites in this valley from Arkadelphia to above Hot Springs in 1939 (Early 1983:5); his experience influenced Schambach's choice of a dissertation subject. W. Raymond Wood analyzed another of these WPA sites, the Poole site in Garland County, and in 1963 produced a manuscript which was finally published nearly 20 years later (Wood 1981). The Adair site, a major site also in Garland County, has never been thoroughly analyzed, nor has data been published except in a brief summary by Early (1982:226–228).

During the 1940s and 1950s, Dr. and Mrs. T. L. Hodges of Hot Spring County systematically collected from and tested some 80 sites in the Middle Ouachita Valley between Arkadelphia and Malvern and published several articles (Hodges and Hodges 1943a, 1943b, 1945; Hodges 1957). Their collections have been acquired by the Joint Educational Consortium of Arkadelphia, and their contributions have been summarized recently by Early (1986). Other amateurs were also quite active in this region at this time (Early 1983:5), and their collections furnished a significant portion of the data base for the Texas Handbook (Suhm et al. 1954).

In 1947, Alex Krieger of the University of Texas directed test excavations at and surveys near the Battle Mound. Reports have not been published, but preliminary manuscripts are on file with the Arkansas Archeological Survey.

Only amateur excavations and other activities by amateurs and collectors were notable in the Red River Valley of Arkansas in the 1950s (Schambach 1982b:2). In the Little River region, the National Park Service funded intermittent professional work in the proposed Millwood Reservoir that began in 1954 and continued through the late 1960s. This reservoir impinged on four Arkansas counties: Howard, Sevier, Little River, and Hempstead. Only the last of these is within the present overview's territory. Few publications resulted from this work, but the numerous unpublished manuscripts submitted to the NPS have been summarized by Hoffman (1970:144) and furnished data for his (1971) dissertation. The major publication derived from these projects was of an essentially unrevised 1963 manuscript on 1962 excavations of Mounds 6 and 8 at the Mineral Springs site in Howard County (Bohannon 1973).

In 1962, the University of Arkansas Museum, sponsored by the National Science Foundation, salvaged part of Mound C at the Crenshaw site, which was under attack by pothunters. A preliminary report was published (Wood 1963a), but the descriptive report (Wood 1963b) remains unpublished. A reinterpretation of the site, based partially on these descriptions, has been published by Schambach (1982a:150ff).

In another 1962 salvage project for the Museum, Wood briefly excavated at the Denham Mound in Hot Spring County. In his published report (Wood 1963c), he redefined the Mid-Ouachita focus. It has been suggested (Early 1983:11) that another revision of this focus/phase is overdue, however.

In 1963 and 1964, the University of Arkansas made test excavations and then more extensive excavations for the National Park Service at the Powell site, a temple mound site in Clark County to be affected by impoundment of DeGray Lake. The reports were finally published more than 20 years later (Scholtz 1986; Green 1986) with updated annotations by Survey Station archeologist Ann Early.

Activities of the Arkansas Archeological Survey and Society since the late 1960s gradually built up a substantial data base. Among the sites tested or extensively excavated were Bayou Sel (the salt making station at Arkadelphia; Early 1983:12), the Paw Paw site (multiple component, from Middle Archaic to Mississippi period) in the Ouachita bottomlands of the Felsenthal region (Weber 1973); the Ferguson mound in the Little Missouri region of Hempstead County (Schambach 1972); the Standridge mound center in the Caddo Gap locality of southern Montgomery County, just beyond this overview's boundary (Early 1988), and the Martin site, an early Caddoan hamlet at Old Washington in Hempstead County. Excavated by amateurs, two sites in the Saline River Valley yielded protohistoric burials intruded into earlier middens, providing the basis for articles (White 1970, n.d.). Baker (1974) revisited the novaculite quarries for his M.A. thesis, later published in a revised form (Baker 1982).

Contract archeological projects burgeoned in these regions in the 1970s and 1980s, especially along the Ouachita and Red rivers but also in some upland locales. One major ongoing hotbed of activity was the Felsenthal National Wildlife Refuge in the Ouachita bottomlands of south-central Arkansas, mainly for the Vicksburg District, Corps of Engineers but also for the National Park Service in some instances. A preliminary reconnaissance was made in 1971 by Rolingson (1972), followed by 1972 testing by Lischka (1973) and extensive excavations at the Shallow Lake site in Union County in 1975. These investigations were synthesized in the Survey's Shallow Lake site report (Rolingson and Schambach 1981), which served as the vehicle for the introduction of Schambach's new "collegiate" ceramic classification system.

Meanwhile, a survey of relict landforms adjacent to these bottomlands was completed by Heartfield, Price and Greene, Inc. (1980). Also, a major survey and testing project was conducted by the Arkansas Survey in 1979–1980 along the Ouachita and Saline river banklines in Ashley, Union, and Bradley counties (Hemmings 1982a). Following up on the latter work, extensive excavations were performed at the Marie Saline site on the Ouachita bank in Ashley County in 1982–1983 by Historic Preservation Associates, Inc. (a report is in preparation). Upstream in the Calion–Camden vicinity, another major survey and testing project was completed by Coastal Environments, Inc. (Weinstein and Kelley 1984). Bangs Slough in Calhoun County, one of the sites investigated on a preliminary basis by the latter project, was subjected to mitigation excavations by the Survey in 1983 (Schambach n.d.).

Contract research in the uplands began with a small sample survey by the Arkansas Survey in the Ouachita National Forest (Ray et al. 1976; cf. Early 1983:15). On a more extensive and intensive scale was a series of projects by the Survey for the Radian Corporation and Shell Oil Corporation in the Sparta (formerly Hampton) mining tract in Calhoun County, south-central Arkansas (Klinger 1979; Lafferty et al. 1981; Lafferty and House 1986). The latter two phases of the project set up and tested a predictive model for prehistoric site locations. Another survey which mainly involved the uplands was performed by the Arkansas Survey for Arkansas–Louisiana Gas Company along a pipeline route between south-central Arkansas and north-central Louisiana, along the western and southwestern margins of the Felsenthal region (Waddell et al. 1984). This project documented the decreasing use of novaculite with increasing distance from the Arkansas (Ouachita Mountains) sources.

Another project mainly in an upland setting occurred in the Fancy Hill mining district of southwestern Montgomery County. In the first stage, a survey was conducted by William Martin of the Arkansas Survey for EMANCO, Inc. (Martin 1982). In the second stage, seven sites were tested by New World Research, Inc., for EMANCO, Inc. (Thomas et al. 1982). The reports on these investigations were published by the Arkansas Survey in a single volume (Early and Limp 1982), which also included Baker's (1982) revision of his 1974 thesis on novaculite quarries.

Several noteworthy syntheses and overviews involving these regions also appeared in the early 1960s. The *Arkansas Archeology in Review* volume (Trubowitz and Jeter 1982) contained an analysis of Caddoan settlement patterns in the middle and upper Ouachita Valley by Early (1982) and a major review and revision of the Fourche Maline concept by Schambach (1982a). The Arkansas State Plan (Davis 1982) included a period-by-period overview of southwest Arkansas by Schambach and Early (1982). Also, Schambach and Rackerby (1982) edited a volume of *Contributions to the Archeolosy of the Great Bend Region* (see below for summaries of some of the contents), and Early (1983) contributed a historical outline of archeological research in the Ouachita Valley of Arkansas.

Meanwhile, in the Red River Valley of southwest Arkansas, several contract projects were conducted in the late 1970s and 1980s for the Corps of Engineers, New Orleans District, which then had jurisdiction over that section of the valley. The initial study was a survey by Coastal Environments, Inc. (Pearson and DuCote 1979), which was later summarized in a published paper (Pearson 1982). Revetment construction in this vicinity resulted in the discovery of a Caddoan site, which was tested by the Arkansas Survey, and a report was published (Trubowitz et al. 1982). Another survey in this region was performed by the Arkansas Survey (Waddell and Blaylock 1982). Test excavations were also conducted by the Survey at the Spirit Lake site, a late Caddo IV farmstead (Hemmings 1982b).

The major research effort during this period, though, was concentrated on the Cedar Grove site. It was tested in 1980 after construction work exposed historic tombstones under more than a meter of Red River alluvium; the site was also found to include the remains of a very late Caddoan farmstead. A report of the testing phase was published in the Great Bend volume (Schambach et al. 1982). Subsequent work at the site revealed the presence of deep burial pits associated with the Caddoan occupation. A major mitigation excavation of the Caddoan component was conducted by the Arkansas Survey, and a report was published (Trubowitz 1984). The historic cemetery was also mitigated by excavation and reburial after analysis by the Arkansas Survey showed it to represent a Black community dating to the 1890–1927 period; a report was also published on this work (Rose 1985).

In 1980 the Arkansas Survey, with volunteers from Society members and University students, sponsored a separate project on private land to salvage the Myers Mound near the Sulphur River–Red River junction in Miller County. It proved to be primarily a Caddo II construction; a report has recently been published (Miller 1986).

Northeast Louisiana

This macroregion is defined as including the Tensas Basin, Boeuf Basin, Felsenthal (Louisiana portion), Lower Ouachita, Catahoula Basin, and Lower Red River regions. The inclusion of the latter stretches the northeast Louisiana concept southward somewhat, but the Lower Red does appear closer to the northeastern regions than to those in other directions, both in terms of prehistoric cultural affiliations and the history of archeological investigations.

This is indeed a "macro" territory insofar as the history of such investigations is concerned. Speaking of his Lower Red River region (which also included the Black River and Catahoula Basin), Phillips (1970:865–866) remarked, "This is beyond question the most important region in the entire Lower Mississippi Valley from the point of view of archaeological history." Similar views have been emphasized by Gibson (1983b) in his recent evaluatory history of Ouachita Valley (also including the Black River and Catahoula Basin) archeology.

As noted previously, it is a matter of ongoing debate whether or not De Soto's entrada involved northeast Louisiana. The view that the Spaniards left Arkansas via the Ouachita Valley, and that De Soto died in northeast Louisiana, was promulgated by the De Soto Commission (Swanton 1939) and is currently espoused by Dickinson (1980, 1986) and Brain (1985a:xli-xliv, Figure 1; cf. also Gibson 1968, 1983c:257, 263, Figure 12). In an opposing view, Hudson (1985) has proposed that the River of Cayas was the Arkansas River rather than the Ouachita, that De Soto died in southeast Arkansas, and that his survivors saw northeast Louisiana only from the Mississippi River while making their escape.

The first French explorers to see this territory were the members of LaSalle's expedition to the Mississippi's mouth in 1682. The accounts of this adventure are unanimous in reporting the presence of the Taensa (Tinsa) and only the Taensa west of the Mississippi in what is now northeast Louisiana (Galloway 1982b:Figures 1–3). The precise location is believed to have been around Lake St. Joseph (a Mississippi River cutoff) in northeastern Tensas Parish, and some of the sites have probably been located (William 1967; Phillips 1970: 945).

The next French contact with the Taensa was probably by Henri de Tonti in 1686 (Galloway 1982b:26). Tonti also traveled down the Mississippi from Arkansas Post in 1690, turning westward around or above the present Arkansas–Louisiana state line and contacting the Koroa, possibly on Bayou Bartholomew, either in southeast Arkansas or northeast Louisiana (Dickinson 1980:5; Jeter 1986:Figure 4.3). Apparently, his party proceeded southward to the Red River, which they ascended to the Great Bend region without contacting any other Native Americans in northeast Louisiana (Dickinson 1980:5).

The Taensa were contacted again by Bienville in 1700, at the beginning of an expedition westward to Natchitoches (McWilliams 1981:146–156). En route, Bienville's party was told by a Ouachita guide that a Coroas (Koroa) village was located some six leagues northward, up a stream (1981:147–148) which may have been Bayou Bartholomew and must have been in northeast Louisiana (Dickinson 1980:5; Jeter 1986: Figure 4.3).

Continuing westward, Bienville's party stopped briefly at a small settlement of the Ouachitas, probably on the Ouachita River in northeast Louisiana (Dickinson 1980:8; McWilliams 1981:148). This site has not been identified archeologically, but it is believed that the Ouachita were a Caddoan group who lived only briefly on the Ouachita, returning to the Red River and merging with the Natchitoches in the early 1700s (Webb and Gregory 1978:29).

Early Anglo-American explorers, travelers, and observers in northeast Louisiana during the first half of the nineteenth century concentrated on the Troyville mound group (Gibson 1983b:30; Neuman 1984a:6ff). A few other sites were mentioned briefly (1984a:9ff). One noteworthy exception was the work of Caleb Forshey, who in 1845 produced a well made map of the Protohistoric site now known as Jordan in Morehouse Parish (Neuman 1984a:10–13, Plate 1; Kidder 1986a: 248ff). Forshey also took notes on other sites including Troyville, Fitzhugh, and Transylvania (Neuman 1984a:17–18; see Hally 1972 for detailed discussions of the latter two, which are type sites for late phases in the Tensas Basin).

Perhaps the most noteworthy investigations of the later 1800s in northeast Louisiana were those of Samuel H. Lockett (Neuman 1984a:14–16). In particular, Lockett (1873) made the first accurate report of the earthworks at and near the Poverty Point site in a Smithsonian annual report. The Smithsonian Mound Survey of the 1880s, however, virtually ignored the whole state of Louisiana; the only three sites mentioned at all were in northeast Louisiana (Thomas 1894:250–252). One was the Pargoud Mound, another was Troyville, and the third was an unnamed and untested two-mound site, mentioned only in passing.

Just before the turn of the century, George Beyer of Tulane University became the first Louisiana archeologist officially funded by the state (Neuman 1984a:34). Beyer (1896, 1898, 1900) excavated at Troyville, Larto Lake, and elsewhere in northeast Louisiana, making a number of important observations and recording stratigraphic data (Gibson 1983b:34–40). About the same time, geologist Arthur Veatch (1902a, b) recorded data on several sites along the Ouachita River. His work may have attracted the attention of C. B. Moore to these regions (Neuman 1984a:25, 36).

Moore (1909) began his northeast Louisiana work with an ascent of the Ouachita River. After three nonproductive stops, he met with modest success at Pritchard Landing in north-central Catahoula Parish; this is a major Coles Creek period mound site with a Protohistoric mortuary component (Gibson 1983c:219–231). In a brief test of a nonmound shell midden at the nearby Booth (or Boothe) Landing site, he recovered the base of a vessel with nine encircling “feet” (Moore 1909: Figure 4); this was apparently the first published account of what has come to be known as Tchefuncte pottery (Weinstein and Rivet 1978:7). Moore's next productive stop was at Myatt's Landing in southern Ouachita Parish.

After a brief observation at Pargoud Landing, he reached the late protohistoric and historic Glendora site in northernmost Ouachita Parish; this proved to be one of his most sensational sites, yielding “some of the most beautiful vessels it has been our good fortune to obtain in our years of search” (1909:30), in addition to occasional trade goods. Moore continued up the Ouachita into Arkansas, then returned to Louisiana and ascended Bayou Bartholomew. He met with almost immediate success in western Morehouse Parish, first at Sycamore Landing, and then at Keno, the latter being similar to the nearby Glendora site and even more productive of ceramics in quantity if not quality. Moore also found productive sites at the Ward Place, Seven Pines Landing, and Bray Landing in Morehouse Parish. Continuing southward with side trips up tributaries of the Ouachita, he explored the Boeuf River and the Little River–

Catahoula Lake vicinities without much success, and none at all on the Black River.

Moore's work on the Lower Red River (1912) met only with limited success. Worthy of mention are his discoveries in Avoyelles Parish at the L'Eau Noire, Saline Point, and Mayer sites, the latter two yielding Marksville vessels. Moore ascended the Tensas River and its tributary Bayou Macon the next winter (1913). He found the sites along these streams "uninteresting" and "disappointing" (1913:34, 42) due to the scarcity and poor preservation or quality of artifacts. However, several of these sites were revisited and collected or tested by the LMS in the 1960s, and they were reinterpreted by John Belmont (personal communication; summarized in Jeter et al. 1979:39–41). These sites include Fool River, Indian Bayou, Dean Lake, Turkey Point Landing, Canebrake, Mott, and Montgomery. Moore also published what Ford and Webb (1956:13) have called "the first adequate description" of the Poverty Point site and nearby sites.

The next major exploration to impinge upon northeast Louisiana was that of Gerard Fowke in the mid-1920s (1927, 1928). He visited several sites in the Marksville vicinity (1928:410ff), produced a good map of the Marksville–Greenhouse site complex (1928:Plate 64), and excavated extensively at Marksville (see Toth 1974:16–21 and/or Neuman 1984a:137–141 for summaries). He also briefly visited some mounds in West Carroll and Richland parishes (1928:434–436), apparently interpreting the great mound at Poverty Point as a natural erosional remnant whose "appearance would easily deceive anyone who was not somewhat familiar with such deposits" (1928:435).

The early 1930s saw massive destruction at two major sites in this macroregion, Troyville (by the landowner and other local people) and Marksville (by Emergency Relief Administration laborers supervised by professional archeologists who never produced a final report or adequate records). As noted earlier, after working at the Fish Hatchery site near Natchitoches in 1931, Winslow Walker visited Marksville and Greenhouse, then learned of the ongoing destruction of the Great Mound at Troyville, and conducted brief last-ditch salvage investigations there in 1931 and 1932 (Walker 1933, 1936; cf. Gibson 1983b:49–51; Neuman 1984a:48–49).

Following up on Fowke's and Walker's leads (cf. Setzler 1933a, b), Frank Setzler of the Smithsonian, assisted by Ford, excavated intensively at Marksville with a large crew during the last half of 1933. Unfortunately, Setzler only published a very brief notice (1934) summarizing this work. (Ford also used it as the basis for his Marksville complex in various publications, and after Setzler's death intended to complete the Marksville site report but died himself before he could begin this task; Brown 1978d.) Toth (1974:21–37) has summarized the information he could salvage from this disastrous project (see also Neuman 1984a:143–148).

Also in 1933, Ford had tested the Peck site near Sicily Island in northern Catahoula Parish, obtained stratigraphic data to support his ceramic sequence, and published a brief but significant site report (Ford 1935c; cf. Gibson 1983b:51–53). Soon afterward, his first comparative magnum opus appeared (Ford 1936b; cf. Gibson 1983b:54–55).

Local amateurs also were active at significant sites in the early 1930s, especially at the Sanson site on Catahoula Lake and the Wild Hog Mound between Catahoula Lake and Larto Lake (Gibson 1983b:55–56). Neither of these sites has ever been reported upon fully, and both are still enigmatic subjects of debate and conjecture (cf. Gibson 1983b:Figure 6; Gregory et al. 1987:47–52, 89–90, 95–96).

In 1937, Ford tested the Lake Louis site near Sicily Island and found ceramics related to the Tchefuncte materials that had just emerged from coastal excavations (Ford and Quimby 1945:20–21; cf. Phillips 1970:880–881; Gibson 1983b:56).

The WPA–LSU excavations of the late 1930s involved two major sites in this macroregion: Crooks and Greenhouse. The former, a major Marksville (with minor earlier and later components) burial mound, was promptly reported upon (Ford and Willey 1940). Greenhouse, the type site for Coles Creek culture in Louisiana and a key (more so than the ravished Troyville site itself) to the definition of Troyville culture, was not reported upon until after World War II (Ford 1951), and then rather hastily, so that a reinterpretation was in order (Belmont 1967b). During a flood in 1939, the Greenhouse crew retreated to the higher Marksville site and excavated in and near one of the mounds; this work was much later summarized in a brief article (Vescelius 1957; cf. Toth 1974:38–41; Neuman 1984a: 148–149).

Also excavated under WPA–LSU auspices but never reported upon were the Baptiste site near Marksville and the Turtle Lake site in northern Concordia Parish near Ferriday. Baptiste has nevertheless been named the type site for a phase of Issaquena (late Marksville) culture (Phillips 1970:897), and a LSU student (Ann Whitmer, personal communication) is analyzing the Baptiste artifacts and notes in preparation for a thesis. Turtle Lake is an enigma, except for a hint that it may have had a Plaquemine component (Gibson 1982b:63).

The Lower Mississippi Valley Survey of the 1940s stopped short of northeast Louisiana (Phillips, Ford, and Griffin 1951). The first major field project in these regions after World War II involved excavations at Poverty Point in 1952, 1953, and 1955. A major report was soon produced (Ford and Webb 1956).

The early and middle 1950s also saw the beginnings of activities in the Catahoula Basin and Lower Ouachita Valley by two present-day leaders in Louisiana archeology, Hiram F. Gregory, now at Northwestern State University in Natchitoches, and Jon L. Gibson, now at the University of Southwestern Louisiana in Lafayette. Their early activities were summarized by Gibson (1983b:64–67), who also reported upon the late 1950s excavations and finds of untrained diggers at the Old Creek site, a Troyville ossuary in LaSalle Parish just west of Catahoula Lake (1982c).

Research by Gregory, Gibson, and their colleagues continued in these regions through the 1960s. Gregory (1965) noted the great potential of wild plant and animal resources in and near Catahoula Basin and (1969) specifically applied these concepts to Plaquemine occupation of that region. Gibson (1966) summarized the archeology of LaSalle Parish, called attention to the production of stone beads at the Cad Mound site in that parish (1968a), and completed his thesis (1968b) on the Russell Landing phase of Tchefuncte culture in northeast Louisiana, based primarily on his work at the type site in that parish. He also conducted a 1966 survey of mound sites in the Lower Ouachita Valley, producing an article on the possibilities of De Soto's passage through this valley (Gibson 1968c) and a more general manuscript which was not published until much later (Gibson 1983c).

In 1963, the LMS's surveys, test excavations, and other studies in the Tensas Basin began. As noted earlier, this project produced few detailed and widely published reports or even summaries of what was done, (cf. Gibson 1982b:42ff, 1983b: 68–70). The major publications resulting directly or indirectly from this LMS involvement in northeast Louisiana include Belmont's (1967b) brief but significant revision of the Greenhouse ceramic/phase sequence, Toth's (1974) already cited summary of Marksville site investigations and his later (1979b, 1988) summaries of Marksville and other Hopewellian manifestations in the Lower Valley, and two comparative articles by Belmont (1982a, 1982b). Less accessible but definitely important are Harvard honors theses and dissertations, especially Hally's (1972) dissertation on the late (Plaquemine and Mississippian) phases of the Tensas Basin, Toth's (1977) dissertation on early Marksville phases in the Lower Valley, and most recently, Bitgood's (1987) thesis summarizing data on Baytown period phases in the Tensas Basin, derived from the 1963–1964 LMS excavations at the Indian Bayou and Marsden sites.

In 1968–1969, the Mount Nebo Mound site on the Tensas River in northwest-central Madison Parish was excavated by Robert Neuman and George Percy of LSU under contract with the Louisiana Department of Highways. This work revealed an eight-stage mound construction sequence from Troyville through late Coles Creek times. No detailed site report has yet been published, but the site has been summarized by Neuman (1984a:204–207). Also, Giardino (1977, 1982) completed a thesis and published a journal article on the burials.

Phillips's (1970) synthesis included some data from the early 1960s LMS work in the Tensas Basin but generally deferred to the graduate student papers that were then in preparation. Also in 1970, and perhaps more relevant to northeast Louisiana, a major summary of Poverty Point-related sites appeared (Broyles and Webb 1970), including a paper on intrasite variability at Poverty Point itself (Gibson 1970), another on the nearby Terral Lewis site (Gregory et al. 1970), and one on Poverty Point sites in the Catahoula Basin (Hunter 1970). Shortly afterward, Gibson (1973) completed a dissertation on Poverty Point, arguing that the site represented the apex of the first Native North American chiefdom, and following this with summary articles (Gibson 1974a, b). As will be seen, Gibson returned to Poverty Point research in the 1980s.

Beginning in the late 1960s and continuing into the 1970s, a vast tract of lowland property between Catahoula Lake and the present Red River mouth was acquired by Louisiana Delta Plantation (LDP). In an unusual turn of events, the new management cooperated with archeologists in reporting new sites and attempting to minimize damage to them. Some of this work has resulted in publications (Hunter 1970; Gibson 1975), and other finds have been briefly summarized by Gibson (1983b: 75–76).

As noted by Gibson (1983b:79), "by far the greatest number of archaeological activities conducted [in these regions] since the mid-1970s have been cultural resources investigations." In Gibson's evaluation, the overwhelming majority of these have been "geographic inventories" (cf. Gibson 1983b:44–47) with "little or nothing new to add to local culture history" in themselves, but with the potential to make contributions if anyone ever has the time to restudy the collections comparatively and synthesize the data:

> [These inventories] are certainly not a fount of knowledge, and their simplicity will probably be decried in the future. Yet it is equally sure that these investigations will one day provide a principal (perhaps the principal) body of information for syntheses. (Gibson 1983a:47)

Gibson (1983b:46) has provided a list of dozens of such inventories, classed into four categories: overviews with little or no fieldwork, sewerage/water system surveys, highway corridor surveys, and surveys along waterways. He has also noted "a small number of contract reports that have contributed to culture historical ends." These and other such reports will be summarized in appropriate places below.

The Northeast Chapter of the Louisiana Archeological Society and other amateurs in this region have also been quite active in recent decades. For instance, the Northeast Chapter worked with Northeast Louisiana University (NLU) on the search for the Spanish Fort Miro in Monroe (Price et al. 1975; Green et al. 1975). The Northeast Chapter also revisited and tested Moore's Myatt's Landing site (Hodges 1978). Meanwhile, members of the East Central Louisiana Archaeological Society conducted emergency salvage excavations at the Atkins midden on the northeast margin of the Troyville site (Hunter and Baker 1979).

Work in the 1970s also contributed to the definition of the Pargoud Plaquemine cultural variant with a basically Plaquemine but Caddoan-influenced ceramic assemblage. NLU field schools in 1975, 1976, 1977, and 1979 at the Pargoud Landing mounds yielded a number of burials with ceramics and other grave goods, radiocarbon dated in the A.D. 1200s. No report has been published on these excavations, but photographs of the vessels have been circulated among professionals. The site was briefly summarized by Price (1980:5–6), Gibson (1983b: 78), and Jones (1983:114–115). The closely related T. E. Salsbury site was salvaged by NLU in 1977 for the Vicksburg District, Corps of Engineers, and a report describing the burials, associated ceramics, and other materials was submitted (Price and Heartfield 1977).

The Crane Lake site in nearby Morehouse Parish was tested by NLU for the Soil Conservation Service in 1975 and found to be a largely disturbed, multicomponent site with Coles Creek and Plaquemine components. A report was submitted (Heartfield and Price 1975), and an article summarizing the site was published (Price 1983).

In 1976, Gregory and Curry (1976) conducted a reconnaissance survey for the Vicksburg District, Corps of Engineers, along the lower portion of Brushley Bayou just northeast of Catahoula Lake in Catahoula and LaSalle parishes. Also in 1976, a survey along portions of Little River, Boeuf River, and Big Creek was conducted for the Vicksburg District by the Center for Archaeological Studies, University of Southwestern Louisiana. Previous work was thoroughly reviewed (Gibson 1977:8–18), and culture-historic sequences were proposed for the Lower Ouachita Valley and Catahoula Basin (1977:19ff, Figure 3; cf. Gibson 1983b:72–75, Figures 5 and 6; Gregory et al. 1978). Also in 1976, NLU produced an archeological assessment, or literature and site records overview, of the Ouachita River Basin in Arkansas and Louisiana for the Soil Conservation Service (Heartfield et al. 1976).

During the same year, Gregory et al. (1976) tested three sites near Little River, upstream from Catahoula Lake in Grant and LaSalle parishes, for El Paso Pipeline Corp. They conducted mitigation excavations at one of these sites and found evidence of Late Archaic and Plaquemine occupations, possibly mainly hunting camps in both cases.

A major event in 1977 was the publication of a new overview of the Poverty Point site and Poverty Point culture, as a special issue of the journal *Geoscience and Man* (Webb 1977). A revised second edition was published five years later (Webb 1982).

During 1977, NLU conducted a survey along the proposed alignment for four-laning of Highway 165 from Monroe to Alexandria. The corridor involved the Ouachita bottomlands from Monroe to Columbia and the uplands between Columbia and the Red River at Pineville–Alexandria. Only the Filhoil Mound complex in Ouachita Parish, south of Monroe, was considered eligible for the National Register of Historic Places. It was avoided (Heartfield et al. 1978).

In 1978, excavations by amateurs at the Gold Mine site burial mound in Richland Parish, overlooking the valley of Big Creek, encountered two remarkable human effigy vessels (Jones 1979). An emergency salvage grant was obtained from the National Science Foundation by Jerome C. Rose of the University of Arkansas–Fayetteville as principal investigator, and John Belmont of the LMS supervised intensive field investigations in 1980. More than 150 burials were recovered and are currently being analyzed in Fayetteville as a master's thesis project by Anna Harmon. A summary of the excavations has been published by Belmont (1982c:80–94).

Also in 1978, highway (bridge) mitigation excavations were performed by New World Research, Inc., for the Louisiana Department of Transportation and Development at the Whatley site on Little River, upstream from Catahoula Lake in western LaSalle Parish. This proved to be a multicomponent site, with occupations ranging from San Patrice to Plaquemine. A detailed report, including analyses by specialists, was submitted (Thomas and Campbell 1978a).

Work continued and intensified in the Catahoula Basin–Red River Mouth regions in the late 1970s and 1980s. Land clearing and drainage alteration by Louisiana Delta Plantation in the middle 1970s led to the discovery of the Cowpen Slough site south of Larto Lake in southern Catahoula Parish. The site was tested in 1977 by Southern Archaeological Research, Inc., under contract with LDP (Spencer and Perry 1978a), discovering but not excavating burials apparently in association with a Poverty Point midden. (The burials were excavated later and assigned to a Late Archaic component; see below.) Tests at the nearby Dragline site in 1978 (Spencer and Perry 1978b) yielded evidence of Late Archaic (2500 + B.C.) manufacture of the so-called Poverty Point objects or clay balls.

During 1978, New World Research, Inc., conducted an extensive survey and a series of test excavations in the vicinity of the Poverty Point site itself, under contract with Trunkline Gas Company, to avoid or mitigate the effects of a proposed complex of well sites and pipeline routes. The excavations were explicitly oriented to the recovery of subsistence data. The completed report was thorough (Thomas and Campbell 1978b) and included analyses by specialists (Byrd 1978; Shea 1978).

Coastal Environments, Inc., performed a survey of the Catahoula National Wildlife Refuge around Catahoula Lake in LaSalle Parish (Wiseman and McKloskey 1979). The same firm also surveyed five construction areas to the southeast along the Lower Red River (Whelan and Pearson 1983).

Heartfield, Price, and Greene, Inc., under contract with the Vicksburg District, Corps of Engineers, performed an extensive survey in the Jonesville and Columbia pools of the nine-foot navigation channel along the Ouachita and Black rivers in 1979 (Price 1980; see also Gibson 1983b:80–81).

Work resumed at the Poverty Point site itself in 1980 with a LSU field school directed by Sharon Goad. This work concentrated on a portion of one of the concentric ridges in a location that had been protected by a historic house. The field school also excavated at Poverty Point in 1981 and 1982, but so far only two preliminary reports have been written (Goad 1980; Exnicios 1981).

Meanwhile, H. Edwin Jackson, then a graduate student at the University of Michigan, conducted surveys and tests in the Poverty Point vicinity in 1981 and excavated extensively at the nearby J. W. Copes site in 1982. His dissertation (Jackson 1986) summarized this work and offered an alternative view of the Poverty Point site itself and the overall Poverty Point cultural system. In his view (1986:532ff), Poverty Point culture was not a chiefdom, and the Poverty Point site had a significantly smaller resident population than suggested by Gibson and others and functioned as a periodic central meeting place.

The environs of the Marksville site were subjected to cultural resources surveys and tests in the early 1980s. In 1981, New World Research, Inc. surveyed and tested a 10-acre proposed construction plot just north of the site (Thomas and Weed 1981). In 1983, surveys and tests in 28 loci along and south of the Lower Red River were conducted by Historic Preservation Associates, Inc., for the Vicksburg District, Corps of Engineers (Klinger et al. 1984).

In 1981, Archaeology, Inc., performed a survey for the Vicksburg District, District of the Sicily Island Levee Project corridor east of the Lower Ouachita River in Catahoula Parish (Gibson 1981). Also at that time, New World Research, Inc., (1981) reported on a survey in the Louisiana portion of the Felsenthal region, the Upper Ouachita National Wildlife Refuge in Union and Morehouse parishes (see Gibson 1983b:81–82 for a summary).

The Lower Mississippi Survey began an extended research project in 1981 with a reconnaissance survey in the Boeuf Basin (defined as including the Louisiana portion of Bayou Bartholomew and part of the Lower Ouachita Valley, as well as the Boeuf River drainage; see Belmont 1983:Figure 1). A report summarizing the findings of this first stage of research was published (Belmont 1983). Later stages of this project, which resumed in the field in 1983, will be summarized below.

In 1982, New World Research, Inc., tested the Clear Creek Bay site on Little River in extreme eastern Grant Parish, between Catahoula Lake and the Whatley site (see above), for the Grant Parish Police Jury, in mitigation of proposed construction. The site had been recorded by Moore (1909:104) as Nugent Landing, with “various low, circular mounds...and a quadrangular mound...about 7 feet in height.” He had tested it briefly and found burials, but was not impressed with the potential for artifacts, and left. There were still several mounds remaining in 1982, although some had been bulldozed. The 1982 testing revealed evidence of initial occupation as a Marksville hamlet, possible but uncertain occupation during the Baytown/Troyville period, and more intensive occupation and mound construction during the Coles Creek period, with no evidence of later occupation (Keller et al. 1983:37ff).

In 1983, the Cowpen Slough burial area was tested by LSU researchers supported by LDP. In 1984, more intensive excavations were conducted at this site, supported by several private and public sources of funding under the general direction of Ann Ramenofsky of LSU. A major report on the archeology and bioanthropology of the site has been submitted (Ramenofsky and Mires 1985). Also, Ramenofsky (1986a) has published an article on Late Archaic subsistence and settlement derived from this work.

Also in 1983, work once again resumed at the Poverty Point site itself. In a project administered by the Louisiana Division of Archaeology and funded by the U.S. Department of the Interior, the University of Southwestern Louisiana, and private donations, the site was more accurately mapped by a professional engineering firm using LANDSAT and other state-of-the-art technology. Test excavations were conducted at several locations and a report was submitted (Gibson 1984).

In conjunction with this work, NLU tested the so-called Deep Six locality at Poverty Point, discovering evidence of massive prehistoric basket loading to fill in a gully, and other evidence suggesting lacustrine deposition (Greene 1985). Gibson (1984:102–109) has postulated the existence of Lake Macon instead of Bayou Macon during at least some of the Poverty Point occupation. Greene (1985:48–50) considered this and other hypotheses. Roger Saucier (Greene 1985:49, personal communication) doubts the Macon Lake hypothesis on several counts, but more work is needed to definitively resolve the question.

The 1983 field season saw the resumption of the LMS research project in the Boeuf Basin with a survey of the northern portion of that study area (Williams 1983; Kidder and William 1984). In 1984, the survey was extended to the southern portion (Fuller 1985; Fuller and William 1985). The testing phase followed in 1985 (see below).

In 1984, the Arkansas Archeological Survey performed a survey in the Felsenthal region of Arkansas and Louisiana, under contract with Arkansas-Louisiana Gas Company, largely in the uplands west of the Ouachita River. The sites were avoided, but the project did provide a comparative study of decreasing use of Arkansas novaculite as distance from the source increased (Waddell et al. 1984).

During 1985, NLU tested two sites in south-central LaSalle Parish just north of Catahoula Lake, under contract with the Louisiana Department of Transportation and Development (Greene 1986). One site yielded only nondiagnostic lithic debitage. The other produced evidence of Late Archaic and/or Poverty Point, Plaquemine-related occupations and was avoided by the proposed highway work.

Also in 1985, the LMS tested eight sites in the Boeuf Basin. Five were shovel tested, and three (Stevenson, Matheny, and Jordan) were more extensively tested. A thorough report with limited distribution was issued (Kidder 1986a). Some emphasis was placed on the protohistoric Jordan site, here and in other papers (Kidder 1986b, 1987). Also, a Harvard B.A. honors thesis (Ring 1986) was completed on the Hegwood Bayou phase, a late Marksville (or Issaquena) period manifestation of the non-Issaquena plainware complex in the northern Boeuf Basin.

In May, 1986, a conference on Poverty Point archeology was held at the Poverty Point site itself. Papers summarizing a variety of viewpoints, e.g., by Ramenofsky (n.d.), Gibson (n.d.a) and Jackson (n.d.), were presented and will soon be published in a volume edited by State Archeologist Kathleen Byrd (n.d.).

In 1987, Gregory and his associates conducted a five-month survey of Catahoula Basin, funded by the U.S. Department of the Interior and administered by the Louisiana Division of Archaeology. Some 90 known sites were revisited, and 30 new ones were located. A report summarizing this work and suggesting revisions in the phase sequence has been submitted (Gregory et al. 1987). Ramenofsky (personal communication) has begun an extensive project, starting with intensive surveys and controlled surface collections, in the region between Catahoula Lake and the Lower Red River.

Northwest Louisiana

This macroregion is defined as including the Red River drainage basin of northwest Louisiana, upstream from the vicinity of Alexandria. Thus, it consists of that portion of the Great Bend region which extends into Louisiana, along with what might be called the Middle Red River region (approximately between Alexandria and Shreveport). It includes the poorly known uplands and tributary drainages on either side of the Red River, up to the divides which separate the Red River drainage from the Ouachita–Black and the Sabine drainages. The Ouachita–Black drainage includes the Felsenthal, Lower Ouachita, and Catahoula Basin regions, which were discussed above in the Northeast Louisiana section. The Sabine drainage is discussed in the Region 2 overview.

The debate over the route of the De Soto entrada once again entails a complete disagreement as to whether or not these regions were visited after De Soto's death in May, 1542. The De Soto Commission (Swanton 1939:273ff, Map No. 10), Dickinson (1980, 1986) and Brain (1985a:xlv, Figure 1, 1985b: Figure 5-3) have all proposed that the route went generally westward across the northern Louisiana uplands, crossed the Red River near present-day Shreveport, entered Texas, and returned via a similar route. However, Hudson (1985) has argued that instead, the route during this period was westward across south Arkansas, thence into the Texas–Oklahoma borderlands, southwestward into Texas, and back by a similar route. Archeological evidence in the form of Spanish artifacts from the De Soto period is totally lacking for either of the proposed routes.

The first French expeditions down the Mississippi Valley, by Marquette and Jolliet in 1673 and LaSalle in 1682, both kept to the immediate vicinity of the Mississippi River, and not even the hearsay reports about inland Native American groups that they recorded can be taken to refer to these rather distant regions. The first French venture through these portions of the Red River Valley appears to have been that of Henri de Tonti in 1690. His route, according to Dickinson (1980:5), took him down the Ouachita–Black system to the Red River, thence up the Red River Valley through northwest Louisiana into Arkansas and northeast Texas. He was guided by Taensa Indians, who regularly came to the vicinity of present-day Natchitoches to trade for salt from the Natchitoches Indians, a Caddoan group (Gregory et al. 1979:1).

On March 30, 1700, Bienville set out from a Ouachita village, probably on the Ouachita River, "with a Nadchito to lead me to his village" (McWilliams 1981:148). After traveling miserably through swamps, they arrived on April 6 at "two huts of Natchitoches" and then on the seventh at a 15-hut village of "Souchitionys" (apparently also Caddoans, possibly the same as the Doustioni, who were closely related to the Kadohadacho; McWilliams 1981:143), about a league from the Natchitoches, who were "scattered in huts along the Marne [Red] River" (1981:150).

Bienville and his lieutenant Louis Juchereau de St. Denis may have also visited the Natchitoches locality around 1701 (Swanton 1942:50; Gregory 1973:10). The Natchitoches themselves accompanied St. Denis to the New Orleans vicinity in 1702. In 1713–1714, St. Denis and the Natchitoches began a move back to Natchitoches, and by 1714, St. Denis had established Fort St. Jean Baptiste aux Nachitos there (1973:11). They attempted to set up trading relationships with the Spanish, and by 1721 the Spanish had established a mission and a presidio (military garrison) some 20 km (c. 12 mi) to the west-southwest of Natchitoches at the settlement of the Adaes (Adais), another Caddoan group. The French fort has not yet been definitively located archeologically but may have been in what is now a residential area near downtown Natchitoches (Hiram F. Gregory, personal communication). The Spanish Presidio de Nuestra Senora del Pilar de los Adaes (known coloquially as Los Adaes) has been the subject of archeological investigations since the late 1960s (Gregory 1973; Gregory et al. 1979, 1980, 1982, 1984, 1985).

According to Neuman (1970:5–6, 1984a:16), possibly the earliest publication about antiquities of the Red River Valley in these regions was a brief communication to the Smithsonian Institution by T. P. Hotchkiss (1873), who reported finds in Caddo and Bossier parishes. In the same year, C. C. Jones, Jr., reported on finds of mortuary vessels said to have come from near Shreveport (Jones 1873:457; cf. Neuman 1970:5).

The Smithsonian Mound Survey of the 1880s did not approach these regions. In the next decade, George Beyer (1896: 17ff; cf. Neuman 1970:5–6), a Tulane University geologist, described mounds (probably including both aboriginal earthworks and prairie mounds) in Natchitoches Parish. Arthur C. Veatch, a LSU geologist, reported on Caddoan burials with trade goods in Caddo Parish (Veatch 1899). These finds have been summarized more recently by Neuman (1984a:23–24).

In his ascent of the Red River, Moore (1912) dug with little success at several sites in Rapides and Grant parishes upon first entering this macroregion. Only in central Red River Parish at Briar Bend Landing and especially at the Gahagan site did he encounter burials with artifacts. The former may have been pre-Caddoan, and the latter was a major Caddo I burial mound. He also investigated several sites in Bossier and Caddo parishes and found little, but the site he called Pickett Landing (1912: 524) later became well known as the Mounds Plantation site (Webb and McKinney 1975). Moore's work at Gahagan may be said to represent the first major and reasonably well documented finds in these regions.

Harrington (1920), in his 1916–1917 follow-up to Moore's expedition, worked only in southwest Arkansas and not in the present macroregion. The next recorded explorations here were those of Gerard Fowke (1927, 1928), who briefly visited several sites in Caddo, De Soto, and Rapides parishes (cf. Neuman 1970:6–7, 1984a:41).

In 1931, Winslow Walker of the Smithsonian Institution salvaged the remains of the ravaged historic Caddoan burials at the Fish Hatchery site near Natchitoches (Walker 1934, 1935). He also conducted a reconnaissance of mounds in Rapides

Parish, looking for historically documented Caddoan settlements in Caddo and Red River parishes with only partial success and searching unsuccessfully for Los Adaes (Walker 1932a; cf. Neuman 1970:8–9). The next year, he attended the Conference on Southern Pre-History in Birmingham and made an influential presentation based in part on his experiences in these regions (Walker 1932b).

Several local amateurs became quite active in the early and middle 1930s. These included Edward Neild of Shreveport, who collected from a number of sites in that locality beginning around 1932 (Ford 1936b:1, 77), and Catherine Dormon of Chestnut in extreme northeast Natchitoches Parish (Walker 1935:1–2; Ford 1936b:2, 235). The year 1934 was the beginning of more than half a century of productive archeological research by Dr. Clarence H. Webb, a Shreveport pediatrician (Gibson 1980c:52). His first publications (Webb and Dodd 1939a, 1939b) dealt with the Gahagan Mound, which he had revisited with results comparable to Moore's. A complete Webb bibliography, with 86 entries through 1979, was compiled by Gibson (1980c). A number of these contributions will be cited and discussed below.

In his major synthesis of Lower Mississippi Valley archeology and chronology, Ford (1936b) also included data from a number of sites in these regions. He defined a Caddo complex of ceramics (1936b:72–97), based largely on Neild's collections. He also briefly summarized Caddoan ethnohistory, characterized Caddoan settlements archeologically, and described two Caddoan sites in more detail. One of these was the Wilkinson site, located in extreme northwest Natchitoches Parish several kilometers from the Red River (1936b:92–93), and the other, actually a few kilometers west of the Caddo Parish line in Texas, was the Harrison Bayou site (1936b:96). In his Marksville complex discussion, Ford (1936b:235) also mentioned the Fredricks or Fredericks site (properly, Fredrick's, if Ford's rendering of the landowner's name was correct) on the eastern margin of Clear Lake northeast of Natchitoches. That site was believed by Phillips (1970:898, footnote 26) to be related to his Baptiste phase of late Marksville culture or later; it is now regarded by Belmont (1982c:79) as having at least a component of Troyville culture. Ford's WPA–LSU projects of the late 1930s did not involve these regions.

Between 1934 and 1940, Webb and his associates excavated the early Caddoan Smithport Landing site on a Red River tributary northwest of Gahagan in eastern De Soto Parish. The site report (Webb 1963) contributed to the definition of the Alto focus (phase).

Between 1936 and 1941 (cf. Webb and Dodd 1941) and again from 1952 to 1954, Webb and his associates had conducted excavations and other investigations at the Belcher Mound site north of Shreveport in Caddo Parish. A major report on the site was published as a *Society for American Archaeology Memoir* (Webb 1959). The Belcher focus (phase) was established as a benchmark reference for protohistoric Caddoan (Caddo IV) remains.

As noted in an earlier section of this chapter, Webb and Alex Krieger began conferring on Caddoan archeology during the late 1930s. This cooperative effort resulted in the adaptation of the Midwestern (McKern) Taxonomic System of foci, aspects, etc., for Caddoan manifestations, the use of a binomial ceramic classification system, and the establishment of the Caddo Conference (cf. Gregory 1980b:22–23).

In 1944, construction work downvalley from Natchitoches exposed additional historic Caddoan burials at the Lawton site. Webb salvaged the remains and concluded that they were closely related to those from the Fish Hatchery site (Webb 1945). Also during the 1940s, Webb assembled data on a group of interrelated upland sites in northwest and north-central Louisiana and adjacent Arkansas, summarizing them as the late prehistoric (Caddo III) Bossier focus (Webb 1948a).

Also around this time, Webb began publishing on the preceramic remains of these and other regions of Louisiana (as noted by Gibson 1980b:29ff, Webb had been interested in the Poverty Point site since the mid-1930s). He called attention to the co-occurrence of San Patrice points and Albany scrapers at 10 sites on older landforms overlooking the Red River Valley (Webb 1946). He also reported on finds of fluted and unfluted lanceolate points from several sites in northwest Louisiana parishes (Webb 1948b).

In the early 1950s, Webb assisted Robert Fulton in excavations at the Bellevue Mound on Bodcau Bayou, a Red River tributary in east-central Bossier Parish. Their report (Fulton and Webb 1953) called attention to the pre-Caddoan remains at this site. Later (Webb and Gregory 1978:2; Webb 1982a), comparative data on this and other sites contributed to the definition of the Bellevue focus (phase), apparently coeval with the Marksville–Troyville manifestation of the Lower Mississippi Valley. Schambach (1982a:187–188) suggested that the Bellevue focus was essentially equivalent to one of the middle periods of his redefined Fourche Maline culture.

During the early 1960s, Hiram F. Gregory arrived at Northwestern State University in Natchitoches and started a continuing research program. His earlier interests in the Catahoula Basin and nearby portions of northeast Louisiana also continued (Gregory et al. 1987). His first studies in northwest Louisiana emphasized Paleo-Indian and other very early remains (Gregory 1963; Gagliano and Gregory 1965), but he soon developed an interest in the late prehistoric and historic cultural resources in and near Natchitoches Parish (cf. Gregory and Webb 1965) with a particular focus on Los Adaes.

In 1966, Webb and his associates began excavations at the John Pearce site, located on a terrace remnant overlooking the valley of Cypress Bayou in extreme southern Caddo Parish. Work continued through 1969, and a report was published shortly thereafter (Webb, Shiner, and Roberts 1971). The site proved to have a relatively pure San Patrice component, plus some Paleo-Indian and Archaic materials.

In 1967, Gregory began a series of excavations at Los Adaes. Six years later, he completed his Southern Methodist University dissertation (Gregory 1973) on eighteenth century Caddoan culture. Focusing on Los Adaes but also using data from 41 other sites of this period (1973:32, Figure 21) and from ethnohistorical sources, he rejected the traditional European-dominant model and suggested instead a symbiotic model with various European groups integrated into an indigenous and established Caddoan trade network.

During 1972, John House (1973) conducted surveys and brief salvage excavations for Gulf South Research Institute, under contract with Central Louisiana Electric Company, in the basin of the proposed Lake Rodemacher, at the intersection of two small streams just west of Boyce in northwestern Rapides Parish. Twenty-one sites were visited, and four of these were tested. An extensive Late Archaic occupation was recognized, and evidence was found of a microlithic industry and other traits of Poverty Point culture. A rather nondescript pre-Caddoan ceramic complex was present at some sites, with a few Tchefuncte and Marksville sherds noted. Two Caddoan hamlets produced ceramics resembling those from the Alto and Bossier foci/phases.

During 1977, New World Research, Inc., conducted mitigation excavations under contract with the New Orleans District, Corps of Engineers, at the Hanna site, an early (Alto Focus/phase) Caddoan settlement on the Red River in southern Red River Parish. The report (Thomas et al. 1980) was published as a special issue of *Louisiana Archaeology* and included several specialists' reports and a closing summary of Caddoan adaptations in these regions by Gregory (1980a).

Also during 1977, Northeast Louisiana University conducted a survey and testing project along the proposed route of the Louisiana North-South Expressway (from Opelousas to Alexandria, then parallel to and south of the Red River from Alexandria to Shreveport, exclusive of metropolitan areas), for Howard, Needles, Tammen & Bergendoff, of Baton Rouge. The project report (Heartfield 1977) included a lengthy summary of the prehistory of central and north Louisiana (Neitzel and Perry 1977).

The North-South Expressway survey produced 35 sites, 21 of which were tested (Heartfield 1977:199, 205ff). The latter included one site each in De Soto and Natchitoches parishes and 19 in Rapides Parish. Four sites were identified as eligible for the National Register. Three of these, close to each other in southeastern Rapides Parish, were apparently related to lithic (gravel) procurement and reduction. The other, the Great Totem site (16NA64), was located in the extreme northwestern corner of Natchitoches Parish, very close to Ford's (1936b:92–93) Wilkinson site (curiously, that site was not mentioned in the 1977 report, and Ford's publication was not cited). When tested, it produced a possible late Paleo-Indian point, a French Fork Incised rimsherd, and a number of Middle to Late Caddoan sherds (Heartfield 1977:205ff, 234ff, Plate 2).

In 1978, Heartfield, Price and Greene, Inc., conducted a cultural resources survey for Phillips Coal Company of Dallas, Texas, in the Oxbow Lignite Prospect, in the Red River Valley and adjacent uplands around the intersection of De Soto, Red River, and Natchitoches parishes. Eighty sites were visited. The Great Totem site was recommended for determination of National Register eligibility, and 15 other sites were recommended for testing.

During 1978, the Natchitoches Parish Police Jury and Planning Commission contracted with Gregory and his associates for production of summaries or overviews of the parish's prehistoric and historic cultural resources, with the aid of grants and support from the U.S. Department of Housing and Urban Development and the State of Louisiana. The prehistoric summary was prepared first (Gregory and Curry 1978), followed by the historic summary (Gregory, Curry and McCorkle 1979). The latter document also included a historical survey of the economic development of colonial Natchitoches (McCorkle 1979).

In the late 1970s, the site of the Presidio de Los Adaes was acquired by the Louisiana Division of Culture, Recreation and Tourism and designated as the Los Adaes Commemorative Area. Excavations resumed there in 1979 under Gregory's direction (Gregory, Matthews, et al. 1980). Work continued with mapping and more excavations in 1980, 1981, and early 1982 (Gregory, Blaine, and Morrison 1982). In 1982, the Louisiana Office of State Parks contracted with Northwestern State University for excavations in a proposed parking area at the southeast corner of the site (Gregory, Lee, et al. 1984). This work produced several interesting features, and the first substantive evidence contradicting historic documentation of Los Adaes as a "poverty-stricken" site, showing instead abundant evidence of both French and Spanish trade goods (1984:104). In 1984, a summer field school was conducted at the site to salvage a *jacal* house on the western margin, which had been disturbed by looters (Gregory, Blaine, et al. 1985).

In 1981, the Louisiana Archaeological Society published Webb's (1981) typological summary of projectile points and other stone tools found in northwest Louisiana. The author emphasized the preliminary nature of this document, but it remains a useful reference for these and nearby regions.

During 1981, Northwestern State University conducted excavations and other investigations for the St. Augustine Historical Society of Melrose, Louisiana, relating to the Badin–Roque House, a deteriorating *poteau-en-terre* structure near Melrose in southeastern Natchitoches Parish. It was found that the house was probably constructed during the 1820–1840 period (Gregory, Stokes, et al. 1982).

In early 1982, Espey, Houston & Associates, Inc., (1982a, 1982b) conducted surveys for Southwestern Electric Power Company of Shreveport along proposed railroad and highway corridors in eastern De Soto and westernmost Red River parishes and at proposed water pond and ash pond sites in eastern De Soto Parish, all related to proposed construction of the Dolet Hills Power Plant. Five recent historic sites and a historic cemetery were found; avoidance was recommended for the latter.

Later in 1982, land clearing activities associated with railroad spur construction on a small stream terrace in eastern De Soto Parish for the Dolet Hills Power Plant revealed a new site; construction was halted, and the site was partially excavated by Espey, Huston & Associates, Inc. (1983). The site was found to have had sporadic pre-Caddoan occupation, Caddo III-V components, and evidence of historic occupation which could represent the 1820s–1830s residence of Louis Procello, the son of a Spanish soldier who had been stationed at Los Adaes. Five aboriginal burials were encountered in the north-central portion of the site (1983:Figure 2) and were analyzed (1983:125–134). They were in a variety of positions and without grave goods, but probably belonged to a (late?) Caddoan component or components. A trash pit containing numerous artifacts was found in the northern part of the site (1983:Figure 2). Its contents included seven partially reconstructible aboriginal vessels (1983:96ff, Figures 26–28). They were not typed, but all were shell tempered, and their shapes closely resemble those of certain protohistoric to early historic Caddoan and Mississippian vessels. The trash pit also contained two iron tripod kettles (1983:103, 109, Figure 30), comparable to those made from the late 1600s to the early 1700s and to those found as part of the Tunica treasure at the 1731–1763 Trudeau site (Brain 1979:134–138).

From late 1982 to early 1983, Heartfield, Price and Greene, Inc., conducted highway salvage data recovery excavations for the Louisiana Department of Transportation and Development at the Montrose site near Cane River (an old Red River channel) in southeastern Natchitoches Parish (Heartfield, Price, and Greene 1985). Nearly 48,000 potsherds and more than 6,000 lithic items were recovered. Some 310 prehistoric features, including 252 pits, 54 postmolds, and four burials, were recorded (1985:7–7ff). Apparently, flotation was not performed on pit fill matrix, although 16 soil samples were examined for pollen with negative results and six unidentifiable seeds were recovered (1985:7–33). The primary component was interpreted as a transitional Issaquena–Troyville (or, late Marksville to early Baytown period) occupation, with lesser representation of later Baytown, or more likely Coles Creek and possibly Caddoan components, along with recent historic materials. With the Fredrick's site finds, this site documents the apparent western frontier of these Lower Mississippi Valley traditions.

In 1983, New World Research, Inc., conducted a background and literature review for an area including Bossier, Caddo, De Soto, and Webster parishes, and two adjacent Texas counties, for the Vicksburg District, Corps of Engineers. This project was related to proposed pipelines to supply water to the City of Shreveport with three alternatives which might involve sites in the vicinities of Bayou Bodcau Reservoir, Caddo Lake, Cross Lake, or Toledo Bend Reservoir (Campbell et al. 1983).

Also in 1983, the Kisatchie National Forest completed a cultural resources overview of the known resources and potentials of its properties (Keller 1983). This forest is subdivided into six ranger districts, mainly uplands dominated by pines, and principally within the present macroregion. The overview summarized numerous small, mostly unproductive surveys within the various districts and offered a number of problem domains and a preliminary predictive model for site locations and functions. Keller (1982) has also published an article dealing with limited activity lithic scatter sites in longleaf pine environments.

In 1984, Northwestern State University conducted a survey of Civil War military sites in and near Natchitoches Parish, funded by the U.S. Department of the Interior and administered by the Louisiana Division of Archaeology. The project concentrated on the Red River campaign of 1864, which crossed this territory from Alexandria to Mansfield (in central De Soto Parish) and back. The surveyors visited seven major sites and assembled data on numerous artifacts in private collections (Gregory, Eschenfelder, et al. 1984).

In preparation for compliance with federal regulations regarding cultural properties within Corps-controlled reservoir areas, the Vicksburg District, Corps of Engineers engaged with Coastal Environments, Inc., to plan a research design for archeological work at Bayou Bodcau Reservoir in the northeastern Bossier Parish–northwestern Webster Parish and southernmost Lafayette County, Arkansas, vicinity. The resulting document (Kelley 1986) set forth a series of problem areas and a research strategy based on a probabilistic sampling scheme.

Noncoastal Southeast Louisiana

This macroregion is defined for the present purposes as including all of noncoastal Louisiana south and east of the Red River Mouth or Lower Red River region. More specifically, it includes the noncoastal portions of the Atchafalaya Basin, the rather loosely defined Baton Rouge region (cf. Brown 1985:Figure 2), and the noncoastal portions of the Florida Parishes (south and west of the southern Mississippi state lines). Phillips (1970:866–867) defined a Delta region as including "a bit more than the actual deltaic plain," and remarked, "My subdivision of this huge sub-area is extremely tentative. One cannot say that separate sequences for these suggested regions have been set up, or even can be at this time." The present macroregion is perhaps slightly less unwieldy, thanks to the separation of the inland portions (treated here) from those along the coast (treated in a subsequent section). As suggested by Phillips's remarks, it is also one of the less intensively investigated macroregions under consideration here, for two diverse reasons: there is too much water in its western portion and not enough in its eastern portion. The major investigations therefore focus on the Mississippi River levees which wind southward between these extremes.

The Atchafalaya Basin in the west of this macroregion is one of the great wetlands of the continent. To the east, the Florida Parishes consist largely of uplands dissected by minor streams, which apparently did not attract major populations prehistorically and consequently have not attracted large populations of archeologists in more recent times. As noted by Beavers et al. (1985b:6), "the region is one of the most lightly covered portions of the state and...such work as has been accomplished is both very recent and project-specific."

These regions were in all likelihood not visited by the De Soto entrada for any significant length of time but only seen from the Mississippi River as the remnant of the Spanish army fled southward in July, 1543. Even the southern route for their exit from Arkansas down the Ouachita Valley (Brain 1985a: Figure 1) does not involve land travel south of the Red River.

The first French expedition to reach these latitudes was that of LaSalle, who reached the Mississippi's mouth in 1682. Again, the explorers essentially kept to the river and its immediate environs. The various accounts of this adventure and subsequent related trips by Henri de Tonti (Galloway 1982b: Figures 1, 2, and 3) note the presence of the Ouma or Hama (Houma) somewhat inland to the east of the river, perhaps in the vicinity of Baton Rouge; the Quinipissa (Kenipisa) on the same side (two versions have them on the west side) and a short distance downstream; and finally, the Tangibao (Tangipahoa, alternatively the Maheoula?) just south of the Quinipissa and unanimously on the east side, some three days' journey above the river's mouth.

The mouth of the Mississippi was rediscovered, this time from the Gulf, by Iberville on March 2, 1699 (McWilliams 1981:50–53). Proceeding upriver, these Frenchmen visited a Bayogoula settlement, guided by an Annocchy (Biloxi) Indian they encountered. They found their way to a Bayogoula-Mugulasha settlement, eventually contacted members of the Taensa and Houma, and proceeded upstream to the Natchez-Koroa settlement where they were told of a number of other groups including Caddoans. These accounts have been summarized by Giardino (1984a), who has also mapped the approximate locations of Native American groups in the southeast Louisiana coastal zone and the southern portion of the present macroregion, for the early French Colonial period (1984a: Figure 10.1).

It should also be noted that the Tunica, apparently refugees from the regions of northwest Mississippi and southeast Arkansas (Brain 1977; Jeter 1986), moved into the northern portion of this macroregion during the French Colonial period and inhabited sites on the Mississippi River opposite the mouth of the Red River in West Feliciana Parish just below the southwest corner of the state of Mississippi, between 1706 and 1763 (Brain 1977:3, 10–17).

An early British military engineer, Elias Durnford, produced a map of the Lower Amite and Comite rivers showing Indian settlement locations in 1771. This map was used by Weinstein (1974:26ff), who correlated some of these locations with archeological sites. William Bartram also visited the region in 1777 but did not mention Indians or their settlements (1974:31–32). These regions were virtually neglected by the major archeological projects of the late nineteenth and early twentieth centuries. The Smithsonian Mound Survey of the 1880s did not extend its coverage this far south.

Moore (1911) did not attempt excavations along the Mississippi River below Baton Rouge, remarking, "The land along the river is thoroughly cleared and comparatively thickly peopled, and has been under cultivation for so long a time that one hears but little of aboriginal remains within reach from the river" (1911:368). Above Baton Rouge, he briefly visited a relatively unproductive site in Pointe Coupee Parish (1911: 375), and "failed to come upon graves" at the Trudeau site in West Feliciana Parish (1911:376). He did note, however, that historic trade goods and a catlinite pipe had been found at Trudeau; this site was to gain fame as the historic Native American cemetery site used by the Tunica between 1731 and 1763 (Brain 1977:3, 15–17, 1979). Moore (1913:19–20) also made a brief detour along Bayou Teche, at the western margin of the Atchafalaya Basin, going as far north as Iberia Parish. However, he found little of interest, in this case possibly because there was little to find (Gibson 1975:6).

In his early synthesis, Ford (1936b:129–140) only dealt extensively with one site in this macroregion, the Angola Prison Farm site. This was another of the historic Tunica sites located near Trudeau and occupied between 1706 and 1731 (Brain 1977:3, 10–13).

Kniffen (1938) conducted a survey of mound sites in lberville Parish southwest of Baton Rouge. In this project, he extended cultural concepts he had previously (1936) defined for the coastal zone (cf. Phillips 1970:866, 921).

Large controlled excavations at last came to these regions with the WPA–LSU projects of the late 1930s and early 1940s. The Medora site, across the Mississippi from Baton Rouge in West Baton Rouge Parish, was excavated in 1939–1940 and became the type site for the Plaquemine culture when it was finally reported upon (Quimby 1951). The Bayou Goula site, on the west bank of the river below Baton Rouge in southeast Iberville Parish, was excavated in 1940–1941 and was also only reported upon after a long delay (Quimby 1957). It too had a Plaquemine component, but Quimby's interpretation of it as the site of lberville's Bayogoula–Mugulasha village has been challenged (Brown 1976; Fredlund 1982).

In the early 1960s, Sherwood Gagliano, then of the LSU Coastal Studies Institute, conducted a survey of preceramic sites in the Florida Parishes and adjacent southern Mississippi, under contract with the Geography Branch, Office of Naval Research. Gagliano's (1963) report was published by the institute in a technical series, and in the *Florida Anthropologist*, and its existence is not widely known to nonspecialists. He noted the presence and distribution of Paleo-Indian through Early Formative (Poverty Point) cultural remains, and defined four Late Archaic–Poverty Point phases. Ceramic period remains were also mentioned in passing.

Saucier's (1963) survey of the Pontchartrain Basin impinged upon the southern margin of the regions under consideration here. Gagliano and Saucier (1963) published a more widely distributed article in *American Antiquity* on Poverty Point sites in these regions, and Gagliano (1967b) also published a summary article incorporating some of these data, in the *SEAC Bulletin*.

Richard Weinstein, then a LSU graduate student, conducted a survey of the Lower Amite River Valley in 1974, locating 20 sites and testing seven of them. His (1974) thesis emphasized the Coles Creek and Plaquemine sites which were found to be relatively abundant in this valley.

Beginning in 1975, Weinstein and Phillip Rivet, who had recently completed a LSU thesis revising Tchefuncte ceramic typology (Rivet 1973), analyzed collections from 1971–1973 LSU excavations at the Beau Mire site, an inland Tchefuncte settlement on an old Mississippi River distributary in north-west-central Ascension Parish. A report (Weinstein and Rivet 1978) was published by the Louisiana Department of Culture, Recreation, and Tourism.

During 1975, Jon Gibson of the University of Southwestern Louisiana surveyed several loci under contract with the New Orleans District, Corps of Engineers. Most of this work was done in what are defined here as the Noncoastal Southwest Louisiana and Coastal macroregions, but some work was done along Bayou Teche, at the western margin of the Atchafalaya Basin, where only three sites were found (Gibson 1975:94).

In 1977, salvage excavations were conducted by the Louisiana Division of Archaeology at the St. Gabriel site on the Mississippi River levee in the east-of-the-river portion of southeastern Iberville Parish, some 25 km (c. 15 mi) below Baton Rouge. The site was found to have been occupied during late Coles Creek–early Plaquemine times. The artifacts, features (including a mound and house patterns), faunal and floral remains, and burials (including cremations) were described and interpreted in an unpublished report (Woodiel 1980a) and a LSU thesis (Woodiel 1980b). In a separate analysis, Giardino (1980) reported on the human skeletal materials.

Two general overviews of the cultural resources of the Pearl River Basin at the eastern margin of the Florida Parishes were produced during the past decade. The first was by the veteran Southeastern and Lower Valley archeologist Robert S. Neitzel (1977) for the National Park Service, and the second, a more extensive study, was done for the New Orleans District, Corps of Engineers, by Heartfield, Price and Greene, Inc. (1981). Also worthy of mention here, although it will be treated in more detail in the Coastal macroregion section, is an extensive study by Coastal Environments, Inc. for the New Orleans District, focusing on the Pearl River Mouth locality (Gagliano 1980).

A leading Louisiana amateur archeologist, Brian Duhe, conducted salvage excavations at the Bonner Creek site on a small tributary of the little known (archeologically) Bogue Chitto River in western Washington Parish. A multicomponent situation was reported (Duhe 1978), beginning in the Early Archaic and extending through the Coles Creek period.

Beginning in the late 1970s, Glen Fredlund, then a LSU graduate student, conducted field and library research on the Bayogoula–Mugulasha site recorded by the French in 1699. He completed a thesis (Fredlund 1982), concluding that Quimby's (1957) Bayou Goula site was actually the location of a slightly later French settlement, the du Vernax-du Bussoin Concession (Fredlund 1982:66; cf. Brown 1976), and that the actual Bayogoula–Mugulasha village was the nearby (about 500 m away; 1982:Figure 4) site 16IV134, found by Fredlund in a 1977 survey.

Contract archeological work increased in the Florida Parishes during the early 1980s. Espey, Houston, and Associates, Inc. (1980) conducted a pipeline route survey, cutting roughly east-west across central Washington Parish between Franklinton and Bogalusa. Some 14 prehistoric sites were found, with the principal occupations apparently during the Late and Terminal Archaic. Techstaff, Inc./Heartfield, Price and Greene, Inc., (1982) surveyed a short distance to the southwest in the triparish (Washington–St. Tammany–Tangipahoa) locality and reported a similar situation on the basis of 13 sites. During 1981, 1982, and 1983, contract investigations were conducted along Louisiana Highway 16 from Watson in northwest Livingston Parish, across southeast St. Helena Parish to Amite in west-central Tangipahoa Parish, for the Louisiana Department of Transportation and Development by Kisatchie Regional Environmental Management Group, Inc. (1984). Sites were found which apparently dated from the Middle Archaic to Later Ceramic periods, along with historic sites from the turn of the century. One of the earlier prehistoric sites and one historic complex were recommended as eligible for the National Register (1984:93–94).

Historical archeology also saw a modest increase in activity during the early 1980s. Koch (1980) reported on investigations at Port Hudson Battlefield and State Commemorative Area, conducted by the Louisiana Division of Archaeology, making recommendations for development. Shuman and Orser (1984) reported on investigations near the northern limits of the geographical distribution of sugar plantations at a nineteenth century sugar mill ruin in St. Francisville, West Feliciana Parish for the property owner, Gulf States Utilities Co. Funded by a U.S. Department of the Interior grant administered by the Louisiana Division of Archaeology, Holland and Orser (1984) surveyed the grounds around Oakley Plantation, Audubon State Commemorative Area, in southernmost West Feliciana Parish near the Mississippi River. They located 28 features and made recommendations for future research and development.

In 1982, Robert Neuman of LSU conducted coring operations at the Campus Mounds site on the LSU campus in Baton Rouge. Three radiocarbon samples from one of the mounds yielded surprisingly early dates, between about 2500 B.C. and 3400 B.C. In an as-yet-unpublished report, Neuman (1985) also summarized other data on unexpectedly early dates from mounds in these regions, e.g., 4200 + B.C. on charred bone from an apparent human cremation found in the Monte Sano Mound in Baton Rouge, and ca 3200 B.C. from the Hornsby Mound near the Amite River in western St. Helena Parish. These can be compared with a date of around 2500 B.C. from the Banana Bayou Mound at Avery Island in the coastal zone.

During the middle 1980s, the Archaeological and Cultural Research Program of the University of New Orleans undertook a series of quite informative surveys along selected stream valleys in the Florida Parishes, funded by the U.S. Department of the Interior and administered by the Louisiana Division of Archaeology. The first of these, in 1984, was a survey along the Lower West Pearl River in eastern St. Tammany Parish at the southeastern margin of the Florida Parishes (Beavers et al.

1984; M. Webb 1982). The second, in late 1984 and early 1985, was within the Lower Bogue Chitto River drainage in south-central Washington Parish and extreme northeast St. Tammany Parish near the northeastern margin of the Florida Parishes (Beavers et al. 1985a). The third, in 1985, was along the Upper Tangipahoa River in northwestern Tangipahoa Parish in the north-central portion of the Florida Parishes (Beavers et al. 1985b).

These projects involved not only field surveys using strategically placed transects but also well documented collections made by local amateurs. A model of prehistoric settlement in the Florida Parishes was developed on the basis of previous work and partially tested through these surveys. In summary (cf. Beavers et al. 1984, 1985a, 1985b:90ff), the region was apparently used most intensively in late and terminal Archaic times, with fluctuating but generally decreasing land use through the earlier ceramic phases, and virtual abandonment of the uplands by middle Coles Creek times. These uplands apparently could not compete in terms of subsistence resource productivity with the richer coastal zones to the south.

Coastal Environments, Inc., conducted a brief survey for the East Baton Rouge Parish government along Beaver Bayou, a Comite River tributary in the central part of the parish. Two sites were found and recommended for avoidance or mitigation; one was a historic cemetery and the other produced a few lithics, including bipolar flakes and scrapers which are not diagnostic but could date to the Early Archaic or Paleo-Indian periods (Bryant 1985).

Weinstein (1985) recently presented a Mid-South Conference paper (to be published later) summarizing present knowledge of Plaquemine culture in south Louisiana. At a previous Mid-South Conference, he presented a paper, later published (Weinstein 1986), summarizing Tchefuncte occupations in southern Louisiana. That paper dealt mainly with the coastal regions but had some applicability to the present macroregion in its characterizations of the Beau Mire and Lafayette phases.

Guevin (1987) has recently published an ethnohistorical and archeological summary of work at a site believed to be the Grand Houmas Village of the early to middle 1700s, on the Mississippi River in Ascension Parish.

Noncoastal Southwest Louisiana

This macroregion includes all of southwest Louisiana north of the coastal marsh zone, west of the Atchafalaya Basin, southwest of the Red River drainage, and south of the Sabine–Vernon parish line. It is probably the least investigated, least known, and possibly the least intensively occupied aboriginally of the various macroregions under consideration here. Ironically, though, it contains one of the most intensively investigated localities in the state: the Fort Polk Military Reservation (see below). However, most of the work in what is usually considered southwest Louisiana has concentrated instead on the coastal zone and its sites. Maps of the state of Louisiana showing noteworthy archeological sites tend to leave the noncoastal southwestern regions virtually blank (e.g., Haag 1971:Figure 9; Neuman 1984a:Figure 3).

These regions were almost certainly not visited by the earliest Spanish and French explorers of the 1500s and 1600s. It appears, from reports dating around 1700 and from archeological evidence, that the northern portion of this macroregion was within the southern margins of Caddoan territory, specifically that of the Adaes or Adai (Swanton 1911:Plate I, 1942; Kniffen et al. 1987:47). The extreme southeastern portion, along Bayou Teche, appears to have been the home of the western division of the Chitimacha (Swanton 1911:337–360; Gibson 1978:44), although they may have been recent arrivals and bearers of a Lower Mississippi Valley culture (Kniffen et al. 1987:53; cf. Weinstein 1985). The Opelousa(s), who also seem to have had Lower Valley ties, were observed historically on the Prairie terrace lands near the present town of Opelousas but are only known from the later 1700s when they were partially acculturated (Swanton 1911:363–364; Weinstein et al. 1979:5–21; Kniffen et al. 1987:7, 20).

The southern portion of this macroregion was exploited at least seasonally by various subdivisions of the basically coastal Attakapa (Swanton 1911:360–363; Gibson 1976a:12–19; Weinstein et al. 1979:5–19, 5–20; Kniffen et al. 1987:44–47). The Attakapa appear to have intruded eastward from the Texas coast in late prehistoric times, perhaps during the A.D. 1200–1500 time span, displacing Coles Creek–Plaquemine peoples (Weinstein 1985; cf. Kniffen et al. 1987:46–47).

The early historic settlement of the interior of this macroregion, first by the French of the early 1700s, then by Acadians and others, has been summarized by Weinstein et al. (1979:5-21ff). Little or nothing in the way of observations about archeological sites seems to have been recorded during this period.

The pioneering geologist–archeologist George Beyer (1899a) conducted what has been called “the first serious excavations in the area” (Weinstein et al. 1979:5–1), when he tested several sites on Prien Lake near Lake Charles, barely out of the coastal zone. There appears to have been a virtual dearth of noncoastal archeology in southwest Louisiana for the subsequent two-thirds of a century. Moore (1913) did explore briefly along Bayou Teche but found little of interest (cf. Gibson 1978:25).

Gibson (1970), in a brief summary of Paleo-Indian remains in Louisiana, referred to the Vatican site in St. Landry Parish and the Trappey Mastodon site in Lafayette (cf. Gibson and Miller 1973). Other mastodon fords have been reported in the Opelousas–Lawtell vicinity of western St. Landry Parish (Coastal Environments, Inc. 1977:322; Weinstein et al. 1979: 5–4), but none to date have been associated with cultural materials.

Bonnin (1972) tested several prairie mounds in the vicinity of Welsh in south-central Jefferson Davis Parish. He noted that these were high probability locations for aboriginal occupation in these regions, especially when they were located near streams.

Also in 1972, Gregory and Curry (1972) conducted the first cultural resources investigations on Fort Polk, a survey in northern Vernon Parish. Seven small prehistoric and three historic sites were found; no further work was recommended on these sites.

During 1974 and early 1975, surveys and limited excavations were conducted along the Mermentau River and bayous Nezpique and Des Cannes in Cameron, Jefferson Davis, and Acadia parishes for the New Orleans District, Corps of Engineers. The initial 1974 survey along the Mermentau River was done by Gulf South Research Institute (Saltus 1974) and was confined to the coastal zone, where nine small prehistoric shell middens were found. This was followed by a survey along all three streams by the University of Southwestern Louisiana in early 1975. Some 32 more sites were found, and the report (Gibson 1976a) called attention to the ecological and cultural differences between the Prairie Marsh region of the Coastal Marsh zone in the southern portion of this survey and the Southwest Louisiana Prairie zone in the northern portion. The Buckeye site, just southeast of Jennings in Jefferson Davis Parish, was tested and found to represent primarily an early (pre-A.D. 1000?) ceramic period occupation (1976a:76–79).

Later in 1975, the University of Southwestern Louisiana surveyed along various portions of the entire 200 km length of Bayou Teche, again for the New Orleans District. Only three sites were found, and it was suggested that either sites had been deeply buried or destroyed by stream action or this former Red River and Mississippi River meander belt may not have been a favorable environment for aboriginal settlement when those streams were active (Gibson 1976b:84–85, 1978:28).

Also during the middle 1970s, the important multicomponent Strohe site, an earth midden located on the Prairie terrace in Jefferson Davis Parish, was partially excavated. To date, though, it has only been summarized briefly (Bonnin and Weinstein 1975, 1978; Weinstein 1985, 1986:106, 118), and no detailed report has been published.

Between 1976 and 1979, the University of Southwestern Louisiana conducted a random sample survey of about 5% of the Fort Polk area (nearly 140,000 acres, mainly in east-central Vernon Parish, with outliers in the Vernon–Sabine–Natchitoches parish corner locality) with intensive testing at several sites for the Fort Worth District, Corps of Engineers, directed by Frank Servello (1983). This work is discussed in some detail in a very recent synthesis of Fort Polk archeology (Anderson et al. 1988), as are the subsequent investigations which will be briefly summarized below.

In late 1976 and early 1977, excavations were conducted by USL for the Fort Worth District at site 16VN18. The findings, reported by Fredlund (1983; cf. Anderson et al. 1987:26–31), included evidence of probably more than one Late Archaic component, plus a Caddoan component. The latter was dominated by chipping debris, and probably dated to Early to Middle Caddoan (Caddo I–III) times (cf. Webb 1981:15).

During 1977, Northeast Louisiana University conducted a survey and testing project along the proposed route of the Louisiana North-South Expressway from near Opelousas to near Alexandria, skirting the western margin of the Atchafalaya Basin, crossing upland remnants, and traversing ancient and modern Red River floodplains. Some 20 sites were found in southeastern Rapides Parish (Heartfield 1977:Figure 9). They represented Archaic, prehistoric ceramic period (especially Coles Creek), possibly Protohistoric or Contact Historic, and Historic European and African-American occupations (1977: 246ff). Three of these sites were considered potentially eligible for the National Register (1977:209).

Also in 1977, the Big Brushy site on Fort Polk was intensively excavated by USL for the Fort Worth District. Four major components were identified: San Patrice, Middle Archaic, Late Archaic, and Ceramic. These were summarized in a journal article (Guderjan and Morehead 1980) and a site report (Guderjan and Morehead 1983; cf. Anderson et al. 1988:22–26).

During 1979, Coastal Environments, Inc., under contract with the U.S. Soil Conservation Service and Interagency Archeological Services, conducted an environmentally stratified survey covering 18% of proposed ditches and channels in the Bayou Mallet watershed between Opelousas and Jennings in St. Landry and Acadia parishes. This survey located 10 sites and proposed hypotheses about Paleo-Indian and later settlement on the poorly known Prairie terrace and relict stream channels (Weinstein et al. 1979).

In 1980, Environmental and Cultural Services, Inc., surveyed the Bayou Zourie locality of Fort Polk for the Fort Worth District. This survey (Jolly and Gunn 1981) and related papers (Guy and Gunn 1983; Gunn and Kerr 1984) attempted to refine models of settlement in these uplands (cf. Anderson et al. 1988:34ff).

During the USL surveys, a series of relatively undisturbed Paleo-Indian and later occupations had been found in the Eagle Hill locality (Servello and Bianchi 1983). In 1980–1981, the University of Texas at San Antonio conducted intensive excavations at the Eagle Hill II site (Gunn and Brown 1982; Gunn and Kerr 1984; cf. Anderson et al. 1988:31–33)

In 1981, New World Research, Inc., conducted a stratified sample survey of 9% of the Fort Polk main area and the Peason Ridge locality for the Departments of the Army and Interior. More than 200 sites, plus numerous isolated finds, were documented, and again, the settlement model was refined (Thomas et al. 1982; cf. Anderson et al. 1988:35–37).

In 1982, the University of Texas at San Antonio tested 56 sites and isolated find loci in the Eagle Hill locality. Most were found to be small with few artifacts, and the larger sites had been extensively disturbed. It was concluded that this had all along been a marginal locality (Gunn and Kerr 1984).

Beginning in 1982, several small surveys and test excavations were conducted on the Vernon Ranger District of the Kisatchie National Forest in east-central Vernon Parish (and partially overlapping much of Fort Polk; cf. Anderson et al. 1987:Figure 2). This work is summarized in several brief reports (Bennett 1982; Swanda 1982; Johnson 1983; Willingham and Phillips 1987; cf. Anderson et al. 1988).

During 1983, Gregory DuCote of the Louisiana Department of Transportation and Development conducted a shovel testing investigation of the Fontenot Borrow Pit site in northeastern Evangeline Parish, on a Prairie terrace remnant overlooking a former Red River meander belt (DuCote 1983). No undisturbed deposits were found, but the testing recovered one Dalton point, a (Late?) Archaic point, plain grog-tempered sherds, and a sherd resembling Alligator Incised which could date to the Baytown–Troyville period (cf. House 1982b). Also recovered was a flake which was tentatively identified as obsidian (1983:17). It was reported (Neuman, personal communication cited by DuCote 1983:18) that several other possible obsidian artifacts have been found in Louisiana, primarily in St. Landry Parish, which is just east of this site.

In late 1983 and early 1984, Gilbert/Commonwealth Inc., tested 39 sites on Fort Polk (as recommended by Thomas et al. 1982). In the final report (Cantley and Kern 1984; cf. Anderson et al. 1988:37–39), "components spanning the range from the terminal Paleo-Indian to the later Formative [i.e., Caddoan or a coeval culture] were identified, [but] little evidence for extended use or settlement was documented" (Anderson et al. 1988:39).

During 1985, New World Research, Inc., surveyed some 17,000 acres within a proposed range complex at Fort Polk for the Department of the Army and the National Park Service. Some 339 sites were recorded, along with numerous isolated finds. This was the largest single survey project conducted on the fort and was reported thoroughly (Campbell and Weed 1986); it has been called "unquestionably the best reported [project on Fort Polk] in terms of presenting basic supporting data" (Anderson et al. 1988:41, cf.154–158).

A number of other small scale surveys and test excavations were conducted at Fort Polk between 1984 and 1987. These projects have thus far produced only minimal data, which have been summarized by Anderson et al. (1988:43–46).

In 1987–1988, Garrow & Associates, Inc., prepared a synthesis of all previous cultural resources investigations on Fort Polk for the U.S. Army and the National Park Service. The report (Anderson et al. 1988) summarizes and evaluates the previous investigations; presents historical (including military history) and architectural overviews; synthesizes the prehistoric sequences and settlement data; suggests standards for fieldwork, reporting, and curation; and recommends a set of long term research directions. Much of this is relevant to future archeological investigations in the nearby uplands of southwest Louisiana, which remain poorly known.

Coastal Louisiana

The mouth of the Mississippi and the adjacent coasts were known to Spaniards sailing in the Gulf of Mexico in the early 1500s. But, apparently the first explorers to see the inland portions of this zone were the bedraggled survivors of the De Soto entrada, who hurriedly sailed down the Mississippi and out to sea in 1543. It was not until nearly 140 years later, in 1682, that these coastal marshes were revisited by Europeans, namely LaSalle and his followers, again briefly (Galloway 1982a). French explorations over the next few decades resulted in the abortive Fort de Mississippi (1700–1707), and ultimately in the founding of New Orleans. Their interactions with a number of Native American groups have been summarized by Giardino (1984).

The history of archeological research along the Louisiana coast has been detailed by Neuman (1977, 1984a, b) who noted that interest in the antiquities of the coast can be documented as far back as the early nineteenth century. The extensive prehistoric Indian shell middens and mounds along the coast caught the attention of antiquarians and historians as well as botanists, geographers, geologists, engineers, and journalists throughout the nineteenth century. The earliest documentation of sites on the coast cited by Neuman (1977:6) was *A Map of the State Of Louisiana* published by William Darby (1816), which depicts shell banks at the mouth of the Sabine River in Cameron Parish, at Lake Charles in Calcasieu Parish, and along Little Lake in Jefferson Parish. Between 1816 and 1873, there were many other accounts of reported Indian mounds and shell middens occasionally containing artifacts and human skeletal remains along bayous and lakes in Cameron, Calcasieu, and Jefferson parishes and a number of other coastal parishes (including Iberia, St. Mary, St. Martin, and Terrebonne), along Lake Pontchartrain north of New Orleans, and along Sabine Lake in the southwest corner of the state (Pritchard et al. 1945; Drake 1850; Anonymous 1847, 1851a, b; Thomassy 1860; Humphreys and Abbot 1861; Featherman 1871; Hilgard 1873; Ripley 1876; Neuman 1977:6–7, 1984a:9–16).

In the third quarter of the nineteenth century, one of the earliest reviews of archeology of the state was published by John Wells Foster in his book *Prehistoric Races of the United States of America* (Foster 1873; Neuman 1984a:17–19). In his discussion of the antiquity of man, Foster described a human skeleton discovered beneath layers of vegetation 16 feet below the surface in New Orleans in 1844 during the excavation of a gasworks foundation. The find was reported in 1850 by physician Daniel Drake who ascribed an age of more than 57,600 years for the skeleton. Foster and other scientists challenged the reliability of Drake's method of age determination and rejected the age assessment (Foster 1873; Neuman 1984a: 17).

Another section of Foster's book cited notes submitted by Caleb Forshey to describe various prehistoric sites throughout Louisiana. This discussion (summarized by Neuman 1984a) included a description of a number of shell midden and mound sites along the coast in the vicinity of New Orleans around Lake Pontchartrain, Lake Borgne, Lake Maurepas, and Bayous Metairie, Saint John, Barataria, Perot, and Des Allemands and south to Berwick's Bay and Pointe a la Hache. Forshey (Foster 1873) remarked on the rapid destruction of shell middens in the New Orleans area as a result of the trade in shell for street grading and walkways. Forshey also noted that unique specimens of axes manufactured from hematitic iron ore and glazed pottery from the shell middens along Grand Lake (Cameron Parish) that had been donated to the Chicago Academy had been destroyed in the fire of 1871 (Foster 1873; Neuman 1984a:18).

In the middle and late nineteenth century, archeological and paleontological discoveries at the Avery Island salt dome sparked a debate over the antiquity of deeply buried prehistoric Indian artifacts and their relationship to Pleistocene fossil animal bones allegedly found above the artifact zone. The initial find was by workmen at the salt mine in 1863 when split cane matting was reported 2 feet below a zone 16 to 20 feet below surface, containing sloth, horse, and mastodon fossil bones. To complicate matters, prehistoric stone and ceramic artifacts were also found 6 to 7 feet below ground surface above the fossil bed and vegetal matting, indicating fossil deposition between episodes of Indian occupation. The Avery Island find was visited by many notable scientists and discussed in print (cf. Owen 1863; Leidey 1866, 1889; Foster 1867; Hilgard 1872; Southall 1875; Fontaine 1884; Wilson 1890; Joor 1895; Mercer 1895; Holmes 1896; Veatch 1899; Beyer 1899b; Neuman 1977:7–8, 1984a:25–34). Many researchers maintained that the fossils were secondary deposits that were washed down from the surrounding slopes, but the controversy remained unresolved throughout the nineteenth and early twentieth centuries.

In a landmark development in 1896, the Louisiana Historical society became the first professional organization within the state to officially support and fund archeological research. George Beyer of Tulane University was funded by the Society to do survey and excavations in the state. On the coast, Beyer investigated sites in Calcasieu, Iberia, St. Charles, and Orleans parishes and published his results in the Society journal (Beyer 1898, 1899). Beyer contributed much to the accumulation of information on the archeology of Louisiana. He was a staunch supporter of careful scientific research on sites. He decried the plundering of sites, opposed the removal of artifacts from the state and the thoughtless destruction of sites by road and railway construction, and set what were at that time innovative standards in site reporting (Neuman 1984a).

Though Beyer was the first archeologist carrying out studies in Louisiana sponsored by an organization within the state, the geologist Arthur C. Veatch was at the same time conducting archeological investigations in conjunction with his geological research sponsored by Louisiana State University. In the Coastal Plain, a considerable body of data concerning the archeology of Iberia and St. Mary parishes was contributed by Veatch as a result of a survey he made in 1899 at the salt domes at Belle Isle and Avery Island. At Belle Isle in St. Mary Parish, Veatch remarked on a large shell midden from which a human skeleton had been removed, and he provided one of the first descriptions of the baked clay balls that are now understood to be characteristic of the Poverty Point culture. In Iberia Parish, Veatch described the Morton Shell Mound on Weeks Island and noted that human skeletons had been found at the northern end of this site. On Avery Island, also in Iberia Parish, Veatch discussed the controversial fossil bone deposits and their association with early man (Veatch 1899). While the appointment of Beyer would foreshadow the development 52 years later of a full-time professionally trained archeologist sponsored by a state institution, the contributions of Veatch can be seen as one example of the important role that state-based geographers and geologists would play in the interim and beyond.

In western and central coastal Louisiana, the earliest archeological investigation on record was by Moore who in 1913 made a quick side trip along Bayou Teche during his survey of the Atchafalaya Basin. Moore discovered a few sites along Bayou Teche including Moro Plantation in St. Mary Parish and Bernard Mounds (161132) in Iberia Parish, but he soon abandoned his search in this area for other locales where more spectacular burial goods could be found.

The next important figure in the history of archeological research on the coast was Henry B. Collins, who in 1926 was sent by the Smithsonian Institution to conduct fieldwork in Mississippi and Louisiana. Collins visited mounds and shell middens in Plaquemines, Terrebonne, St. Mary, Iberia, and Vermilion parishes. In Plaquemines Parish, he visited a group of nine mounds near Pointe a la Hache, where the largest mound was conical with a flat top, 12 to 15 m high, and over 30 m in diameter. In Terrebonne Parish, Collins observed large numbers of sites ranging from small shell accumulations to extensive shell middens 3 m high, 90 m or more wide, and a half kilometer long. At Fairview Plantation in St. Mary Parish, he illustrated a mound containing a level of burned earth and seven firepits 2 m below the surface (Collins 1927).

It was at Pecan Island on Grand Chenier in Vermilion Parish that Collins devoted most of his excavation efforts. At the Morgan site (16VM9), four mounds revealed several building stages now assigned to the Troyville–Coles Creek period, and burials from the mound excavations exhibited fronto-occipital deformation. At the Veazey site (16VM7), the low mounds now attributed to the Marksville and Coles Creek periods contained a chipped stone knife, projectile points, celts, worked galena and hematite, red and yellow pigments, asphaltum, bone awls, teeth, jaws, penis bones, shell beads, a shell pendant, copper earspools, slate covered with copper, and textiles. Human skeletal remains had only slight frontal flattening and the long bones showed evidence of lesions. The Copell site (16VM102), a nonmound burial Tchefuncte period site, contained 34 burials (21 males and 13 females), some lying on red and yellow pigments, with no signs of cranial deformation or pathologies. The varied material assemblage from Copell included stone knives, projectile points, asphaltum, stone atlatl weights, the distal end of an atlatl, worked mammal teeth, jaws, long bones, penis bones, turtle shell, conch shell whorls, and shell beads (Collins 1927).

Based on surveys and excavations, Collins concluded that the shell middens and mounds in the Coastal Plain of Louisiana represented the farthest extension south and west of the mound cultures of the Lower Mississippi Valley. In addition, he perceived that certain distinctive pottery styles along the Gulf from Florida to western Louisiana were evidence of close prehistoric cultural relationships among the coastal populations (Collins 1941).

In the Depression years of the 1930s, Louisiana, like many other states, saw a dramatic increase in archeological research as federal relief projects to reduce the massive unemployment were established under the Federal Emergency Relief Administration, Civil Works Projects, and the Work Projects Administration (Neuman 1984a). On the coast, investigations were conducted at multicomponent shell middens (16OR1–16OR5) along the south shore of Lake Pontchartrain near the community of Little Woods and at the Big Oak Island site (16OR6) in Orleans Parish, and at the Tchefuncte site (16ST1) on the north shore of Lake Pontchartrain in St. Tammany Parish. At the Little Woods sites, excavations yielded evidence of the earliest known pottery class in the United States, the fiber-tempered ceramics of the Late Archaic period, and artifacts and human interments associated with the succeeding Tchefuncte, Marksville, and Troyville–Coles Creek periods. Work at Big Oak Island produced additional burials and archeological remains from the Techefuncte and Marksville periods, while excavations at the Tchefuncte site led to the first definition of the Tchefuncte culture (Ford and Quimby 1945).

All of the large WPA excavations on the coast took place in southeast Louisiana. In the southwestern portions of the coast, federal relief work was limited to a brief field reconnaissance for sites in Lafayette, Vermilion, Acadia, Jefferson Davis, and Calcasieu parishes (Lyon 1976; Neuman 1984a).

During the 1930s, the Louisiana Geological Survey and the School of Geology, which included the present Department of Geography and Anthropology, was established at Louisiana State University. The School of Geology had on its faculty the noted geologists Henry V. Howe, Richard J. Russell, Harold N. Fisk, geographer Fred B. Kniffen, and plant ecologist Clair A. Brown (from the Department of Botany). Together they pioneered an interdisciplinary approach incorporating geological, geographical, archeological, and biological data to interpret the state's Mississippi River Valley geomorphology and coastal physiography (Gagliano 1984). As Gibson (1984:14) notes, artifact and ecofact information bearing on the initial age and environmental context of archeological sites was often the primary information targeted. Less emphasis was placed on refining archeological sequences, examining cultural differences from one area to another, or pursuing other aspects of the archeological remains that did not directly contribute to questions related to the landscape.

The pioneer geoarcheological research efforts of Louisiana State University focused on the Mississippi River delta and adjacent coastal areas. In order to understand the complex deltaic processes on the coast, archeological data on locations, degree of subsidence, shell species content, and artifact types were collected from sites to identify the locations and relative ages of submerged levees and beach ridges (Neuman 1977). This research included analysis of 13 sites in the Grand Lake area of Cameron Parish (Howe et al. 1935) and 44 sites in Plaquemines and St. Bernard parishes (Kniffen 1936). Kniffen's study included examination of prehistoric pottery collections from shell middens and mounds, through which he discerned two distinct groups: an early complex he termed Bayou Cutler which is equivalent to the presently defined Troyville–Coles Creek culture and a later complex designated Bayou Petre which is equivalent to the presently defined Mississippi culture (Kniffen 1936; cf. Phillips 1970).

The initial coastal geological research of Howe and Kniffen was followed up in the 1950s with a large scale survey by a geomorphologist, William G. McIntire, to assign a relative chronology to present and relict stream channels by correlating them with prehistoric archeological sites on the basis of the ceramic typology defined earlier by Kniffen. McIntire (1954, 1958, 1959) visited 147 shell middens and mounds in his survey of approximately 39,000 km^2 of the Louisiana coast between the Pearl and Sabine rivers.

McIntire was assisted in his coastal geomorphological research by Saucier and Gagliano who as LSU doctoral students and later as professionals based in the state made additional contributions to the understanding of the geomorphology and archeology of the coastal zone. Saucier (1963) studied archeological deposits in the Lake Pontchartrain region to define the geomorphic history of that area, and he collaborated with Gagliano (Gagliano and Saucier 1963) concerning Poverty Point period remains in the Pontchartrain region. Some years later, Gagliano made an effort to solve the puzzle of the association of the prehistoric site deposits deeply buried with Pleistocene faunal remains at Avery Island salt dome in Iberia Parish (Gagliano 1964, 1967, 1970).

In the 1970s, Saucier, following the work of Fisk (1944), turned his attention to the Quaternary geology of the Lower Mississippi River Valley (Saucier 1974, 1981). Although primarily concerned with the portions of the Mississippi Valley north of the coastal zone, Saucier's study includes some information on the changing courses of the Mississippi and Red rivers and the formation of deltaic deposits.

Following the work of Kniffen, McIntire, and others, Saucier, Gagliano, and their associates have continued to use and develop the "man-land" focus in research on the coast. The new man-land paradigm, which has come to be known as geoarcheology (Butter 1971), is more process oriented than historical but still has as its main thrust the relationships between land or environmental systems and human cultural systems. Employing a modern sophisticated battery of data recovery and analytic methods and techniques, the geoarcheological approach has made significant contributions toward a better understanding of the intricacies of prehistoric adaptation to the complex and changing environment of coastal Louisiana. Although strict adherence to this approach has been criticized for underemphasizing cultural stimuli in favor of environmentally based explanations (New World Research, Inc.1983:40–41), perhaps this bias is warranted in light of the present lack of sociocultural data for the region (Gibson 1984:15). As Gibson noted, the geoarcheological approach is providing a solid background for integrating future cultural processual data into a cultural ecological framework. A review of the development of the geoarcheological paradigm and its contributions to an understanding of prehistoric lifeways in the Gulf region has been summarized recently by Gagliano (1984).

In the 1960s, research at Avery Island on the question of prehistoric relationships with Pleistocene fauna was taken up by Gagliano (1967, 1970). With the benefit of modern geoarcheological methods and chronometric dating techniques, he was able to reconstruct the prehistoric occupational sequence for the salt dome region. Based on results obtained from deep test borings and mechanical excavation using a backhoe and dragline, Gagliano proposed that the Avery Island locality was occupied intermittently during the Paleo-Indian, Archaic, Poverty Point, Coles Creek, and Plaquemine periods (1967:96–104). Gagliano also obtained stratigraphic and radiocarbon evidence to support the thesis of the contemporaneity of early humans and now-extinct Pleistocene animals (1967, 1970). This evidence consisted of dates of 7750 and 6440 B.C. for Pleistocene fossil bones from the island; the presence of artifacts such as San Patrice points in surface collections from the Salt Mine Valley which indirectly establishes (based on chronological evidence from excavations at sites outside the valley) that early man was in the locality at the time near or before Pleistocene megafauna became extinct; the co-occurrence of bipolar pebble tools, notched shaft scrapers, chert spalls, and cordage stratigraphically at or below beds containing the fossil bones of extinct animals; and the nineteenth century accounts of Mr. Cleu that the basketry fragment had been found below "elephant bones" (Gagliano 1967:99–100, 1970).

Neuman (1984a:64–65) challenged Gagliano's results and cautioned that Gagliano had not found a single diagnostic Paleo-Indian or pre-Clovis artifact in situ or associated with fossil mammal bone, had not proven that the bipolar specimens dated to the pre-Clovis period rather than to the more recent Archaic period, and had not documented butchering patterns on the fossil bones or other evidence of exploitation by humans. Neuman argued that the question of contemporaneity of early man and Pleistocene megafauna has not been resolved, but the data do indicate that further work should be done at the Avery Island site (1984:65).

During the period of intensive man-land research on the coast of Louisiana by the LSU School of Geology, the pottery types used for comparison were derived with reference to the Red River Mouth sequence defined by Ford and others. However, the ceramic typology was not well enough defined to permit separation of apparent differences between assemblages within the coastal zone or to discern variation between the coast and the inland areas. Gagliano (1963, 1967) began the process of segmenting the prehistory of the coast into geographically discrete phases. Based on work at Avery Island and the Pearl River mouth area, Gagliano proposed subdivisions for the Archaic and Early Woodland (Tchefuncte) manifestations in central and eastern coastal Louisiana. Later, Phillips (1970) reexamined the basis for these constructs and used the type–variety system to reorganize and redefine many of Gagliano's cultural units.

The efforts to refine the culture history of the coast of Louisiana continued in the 1970s and 1980s to build on the framework established by Kniffen, McIntire, Gagliano, Haag, and Phillips. Aten (1983; Aten and Bollich 1969), Brown (1981, 1985) and Weinstein (1985, 1986; Bonnin and Weinstein 1978; Weinstein and Gagliano 1985) built on the Gagliano and Phillips typological base to further subdivide and integrate local culture histories. Weinstein, in particular, actively compiled, refined, and synthesized the cultural chronology of the Tchefuncte (1986) and Plaquemine (1985) cultures for the coastal region. A joint paper with Gagliano presented their understanding of the local sequences for the entire coast (Weinstein and Gagliano 1985). There was some criticism of Weinstein's reliance on extraregional comparisons with Lower Mississippi Valley ceramic types in his integration of western coastal sequences (Gibson 1984:18), but Gibson noted that at least the initial ground-breaking steps had been taken.

In the central coastal region, efforts to refine the ceramic typology were carried out by Brown based on LMS work in the Vermilion Bay region and Avery Island. Syntheses by Brown (1981a, b, 1985) resulted in the demonstration of major differences between the coastal pottery assemblages and those occurring in the interior. Brown's (1981a) excavations at the Morgan site on Pecan Island provided relatively fine scale temporal subdivisions for the Coles Creek culture. He also provided refinement of the Plaquemine culture time span on Avery Island (1985).

In the western section of the coastal zone, the uniqueness of the prehistoric developments and associated pottery sequences led Aten and Bollich (1969; Aten 1983) to align much of the extreme western Louisiana complexes with sequences on the eastern Texas coast, based on sandy and grog-tempered paste categories. Subsequent work in the western area (Gibson 1976, 1984; Frank 1976; Thomas et al. 1978) documented similar departures in the ceramic patterns from the typical Lower Mississippi Valley scheme. Gibson discerned two very distinct ceramic patterns in the western coastal area. In the estuarine zone in the chenier region, the pottery sequence reflects ties to the Lower Mississippi Valley. The other pattern occurs in the western marshes along major streams from the Mermentau River westward and appears to be affiliated with Texas coast complexes. The majority of this western coastal pottery, except for a rare sherd or two, consists of crudely made wares with heavy sand and/or iron concretions, usually undecorated or with designs composed of simple incisions that form patterns without counterparts in the Mississippi Valley (Gibson 1984).

Major steps have been made in assessing the nature of settlement, subsistence, and general economic adaptations on the coast of Louisiana. In the eastern delta region, settlement studies of the late prehistoric cultures in the Barataria Basin were undertaken by Beavers (1982b) and of Plaquemine occupations by Altschul (1978). Along the central and western coastal areas, Gibson examined settlement along Bayou Teche and the Vermilion River (1975) and along the Mermentau River (1976). Other studies focused in the estuarine area of the Sabine Wildlife Refuge (Thomas et al. 1978), and in the prairie region of southwest Louisiana (Wiseman et al. 1979).

Progress on the determination of subsistence strategies has been limited by the lack of excavated sites for many areas and time periods and the bias toward the recovery and analysis of ceramic data. Byrd (1974, 1976a, b, 1978; Byrd and Neuman 1978) has been the leader in Louisiana in subsistence research. Her analysis of the Tchefuncte culture subsistence base at the Morton Shell Mound site remains one of the most complete assessments in the state. In another important study, Byrd and Neuman (1978) collaborated on a regional discussion of the data relating to subsistence in the Lower Mississippi Valley. Other good sources of subsistence data include Duhe's (1976) analysis of the Poverty Point culture seasonal fishing camp occupation at the Bayou Jasmine site. For the Coles Creek culture, the best source is Futch's (1979) analysis of faunal remains from the Morton Shell Mound site. Springer's (1979) report on the subsistence evidence at the Plaquemine culture Pierre Clement site on the Little Chenier Island is based on a relatively small sample, but it remains the only data relevant to the Plaquemine in the western coastal area.

The effort to deal with adaptation requires data on many archeological aspects, including settlement, subsistence, and cultural technology. This topic is probably the least well developed in Louisiana, but such works as Davis's (1984) edited volume, *Perspectives on Gulf Coast Prehistory*, have made encouraging inroads. This volume, the result of a conference on Gulf Coast prehistory held at Avery Island in 1981, emphasized the differences that exist in cultural adaptations between the coastal and inland areas and examined the unique nature of coastal economic patterns throughout the latter part of prehistory. One important thread carried throughout this volume and several other publications that treat the topic of coastal economies (Gagliano and Webb 1970; Gibson 1978; Shenkel n.d.) was that prehistoric coastal groups were largely outside the mainstream of cultural innovations such as horticulture or at least assimilated them in very different ways from groups in the interior; they remained in a state of balanced equilibrium with the estuarine environment, pursuing a basic Archaic hunting, gathering, and fishing tradition until quite late in prehistory. This line of research is still in its nascent stages in coastal Louisiana and is limited by the lack of attention in the past to field recovery methods adequate for producing an adequate faunal and floral data base, as well as neglect of the vast research potential of human skeletal remains for gaining insights into cultural adaptations.

University-based research has been a significant factor in the accumulation of information on the prehistory of the coast. In Louisiana, research programs at Louisiana State University (the Museum of Geoscience and the Department of Anthropology), Tulane University, the University of New Orleans, and the University of Southwestern Louisiana's Center for Archaeological Studies have provided the foundation for extended studies on coastal prehistory. Examples include Neuman's contributions (1972, 1976, 1977, 1981, 1984a, b), Shenkel's (1974a, 1980, 1984a, b), long term research at Big Oak Island, Gibson's (1976a, b, 1978, 1982c) surveys in the western delta area and central coastal region, Beavers's (1977, 1982a, b) intensive studies in the Barataria Basin and the Coquille site, and Davis's (1981,1984) excavations at the Sims site to name a few. From outside the state, the research of the Peabody Museum, Harvard University Lower Mississippi Survey Petite Anse Project on Avery Island (Brown 1978a, b; 1979a, b, 1980a, b, 1981a, b; Brown and Brown 1978a-g, 1979; Brown et al. 1979) represent an important body of information concerning prehistoric occupation in the salt dome area.

Louisiana State University and Tulane University have trained and graduated a number of individuals whose graduate theses and dissertations represent important sources relating to the prehistory, geography, and geomorphology of the Louisiana coast (McIntire 1954; Gagliano 1967; Saucier 1968; Rivet 1973; Byrd 1974; Weinstein 1974; Futch 1979; Woodiel 1980b; Shelley 1980; Fredlund 1983; Guevin 1983; Giardino 1984; Fertel 1985; and Manhein 1985). Many of these students continue, as postgraduate professionals, to make lasting contributions to the study and management of prehistoric resources on the coast of Louisiana.

The significant contributions of avocational archeologists should also be highlighted in this summary of previous archeological investigations. The test excavations carried out by members of the Delta Chapter of the Louisiana Archaeological Society at the Fleming site (16JE36) and the Isle Bonne site (16JE60) in the Barataria Basin recovered some important data concerning the late prehistoric sites in this area of the delta. The report of these excavations (Holley et al. 1977) included a contour map of the Fleming site, a detailed discussion of maize remains from Fleming (the only such evidence from coastal Louisiana), and a proposed formulation of the Barataria phase of the Plaquemine culture (Gagliano et al. 1978:3–30). In the western coastal area north of the cheniers, excavations at the Bel site by the Imperial Chapter of the Louisiana Archaeological Society (Frank 1976) provided an important example of the unique local ceramics of the indigenous prehistoric groups that were not following the pottery styles popular in the Lower Mississippi Valley. Based on Frank's analysis of the Bel site ceramics, the pottery types in this area suggest cultural connections to the Texas coast area.

The advent of legislation mandating studies to mitigate the effects of federally funded or licensed projects on cultural resources resulted in the acceleration of archeological investigations in the coastal zone over the last two decades. These studies ranged from small surveys of bridge approaches to extensive surveys and limited excavations in areas of levee construction, waterway improvements, and proposed highway routes. The majority of these investigations on the coast were sponsored by the U.S. Army Corps of Engineers, New Orleans District, and were related to construction and maintenance of the various navigational waterway and flood protection structures in the region.

Some of the major projects stemming from contract archeology include surveys by Coastal Environments, Inc. of the Gulf Intracoastal Waterway (Gagliano et al. 1975), the proposed relocation of U.S. Route 90 (Weinstein et al. 1978), the Lacassine National Wildlife Refuge in Cameron Parish (Burden et al. 1978), the Mississippi Gulf Outlet (Wiseman et al. 1979), the Pearl River Mouth (Gagliano et al. 1980), an assessment of the criteria for the identification of submerged sites on the Gulf continental shelf (Gagliano et al. 1982), investigations at the White Castle Gap revetment (Pearson and Guevin 1984), and a study of the archeological potential of areas of the continental shelf in the Sabine River Valley (Pearson et al. 1986). Other private contract archeology firms that have conducted studies in coastal Louisiana include New World Research, Inc. (Thomas 1982; Altschul 1978; Thomas et al. 1978; New World Research, Inc. 1983), Gulf South Research Institute (Saltus 1974), Heartfield, Price, and Greene, Inc. (1981), and R. Christopher Goodwin and Associates (Goodwin 1986; Goodwin et al. 1984, 1985a, b, c).

ARCHEOLOGICAL CONCEPTS: SPATIAL, TEMPORAL, AND CULTURAL DIMENSIONS

Marvin D. Jeter

The following chapters will provide an overview of the study area's culture history from the arrival of the first Native Americans more than 10,000 years ago to the beginnings of more or less continuous contacts with Europeans shortly after A.D. 1500. The only evidence of the existence, lifeways, relationships, continuities, and changes of these Native American cultures is archeological evidence.

Not only the spatial and temporal dimensions but also the cultural dimensions that are involved are immense. The prehistoric Native Americans who lived here left an extremely rich and complex archeological record, which has been assaulted by varied forces of destruction with increasing intensity.

Archeologists have studied this highly significant but dwindling record extensively for more than a century. In recent decades, research has become much more systematic, intensive, sophisticated, and cumulative. A tremendous culture–historical and to some extent, culture–processual literature has accumulated from academic, contract, and amateur research. No real synthesis of this literature has been accomplished, though.

The academic literature has provided most of the synthesizing concepts and efforts but has tended to ignore the other data sources. The work done by contract and amateur archeologists, with noteworthy exceptions, tends to be oriented toward empirical data and only local to regional perspectives, and the ensuing publications tend to have limited circulation and influence.

Given this situation, the goal of this culture–historical overview will be to present at least a preliminary integration of these varied literature sources. This will not be a new synthesis in the sense of beginning with empirical data from all sources, reanalyzing the data, and using the results to define new (or redefine old) phases, periods, cultures, etc. Instead, its basic structure will be derived from the academic–comparative–synthesizing literature, and the data from other sources will be integrated into this framework.

There is a general consensus of agreement within the academic and other literature as to the basic culture–historical sequences. However, some differences of opinion do exist here, and with the prehistoric processes which produced those sequences and the archeological record. The present overview will not attempt to resolve such differences but will call attention to them.

The overall *spatial* dimension of this overview is, of course, constrained by the boundaries of the involved Corps districts. The overview will be organized in chronological order, in terms of *time periods* demarcated by absolute (calendric) dates. The primary emphasis, though, will be on the characterization of the major *cultural units* which existed during each period, and on cultural variability, continuity, and change. Each of these basic organizing concepts deserves more extended discussion before we begin the overview.

Basic Units: Spatial

The contractually defined spatial extent of this study includes the southeastern half of Arkansas and the entire state of Louisiana, involving portions of virtually congruent physiographic provinces, biogeographic regions, and archeological areas. An attempt will be made here to treat geographic space as a dimension within which cultural variation will be observed. However, as in the case of the time dimension and culture periods, we cannot ignore the history of archeology but must note the existence of concepts which mix the spatial and cultural dimensions.

The eastern portion of the study area is, in effect, the western half of the Lower Mississippi Valley. The Lower Valley has long been established as a more or less coherent archeological area, and its eastern portion has been the base for some of the most influential pan-Valley syntheses (Phillips 1970; Williams and Brain 1983). It would be a gross error to try to view only the western half of the Lower Valley *in vacuo*, particularly since there is no adjacent Southwestern Division Overview project to the east. Therefore, as appropriate, sidelong glances and references will be made to the literature of western Tennessee, and especially, western Mississippi (particularly, the Yazoo Basin and Natchez Bluffs archeological regions).

In addition to these reasons relating to the history and literature of archeology, the citation of data from the east side of the Lower Valley is necessary on other grounds. The ethnohistoric and archeological evidence agree that historic Native American groups and their alliances or interrelations crossed the Mississippi. From north to south, examples include De Soto's observation of a Quizquiz–Aquixo alliance (Brain 1985a, 1985b), the Quapaw or Arkansas (Phillips et al. 1951: 392ff), the Tunica (Brain 1979; Jeter 1986), and the Natchez–Koroa and Natchez–Taensa alliances (Brain 1982). It is also clear that close cultural relationships often crossed the Mississippi in prehistoric times, as will be shown. The Mississippi River itself was located well to the east of its present course at times, especially during the late Pleistocene and early to middle Holocene, when it occupied various portions of the present

Yazoo Basin of west-central Mississippi (Saucier 1974:Figures 1 and 3). Finally, the study area itself includes some lands east of the Mississippi, in southeast Louisiana between the Mississippi state lines and the mouth of the Mississippi.

For similar reasons, occasional references will be made to the literature of the northern terminus of the Lower Valley and adjacent regions, although these are beyond the northeast Arkansas limits of the involved Corps jurisdictions. This will primarily involve the archeology of present-day southeast Missouri and south Illinois, and to a limited extent that of southwest Kentucky and northwest Tennessee.

The western portion of the study area constitutes the eastern half of the Trans-Mississippi South archeological area (Schambach 1970). Some references will be made to the literature of the western portion of that area, but these discussions will be relatively abbreviated, since that territory is included in another region in the Southwestern Division Overview.

Within these areas, archeological regions have been defined in some cases, generally following the guidelines stated by Willey and Phillips (1958:19–20). In particular, Phillips (1970: 861ff) listed and briefly discussed, but did not map, 16 regions for the entire Lower Valley area, including three involving portions of east Arkansas and six involving portions of east Louisiana. Arkansas Archeological Survey archeologists, in conjunction with the Arkansas State Plan, defined 22 regions covering the state (and in three cases, extending into north Louisiana) and depicted on a map (Davis 1982:Figure RSU2). No official regions have been defined for the state of Louisiana (Kathleen Byrd, personal communication), but Phillips's list has been augmented and modified to some extent by later LMS projects, e.g., on the coast (the Petite Anse region: Brown 1979a, 1980a, 1981a, b, 1984) and in northeast Louisiana (the Boeuf Basin; Belmont 1983:Figure 1), and by other workers in various regions.

In this overview, the Arkansas State Plan's regional nomenclature will be used within Arkansas, instead of Phillips's. The modified Phillips regional names will be used in Louisiana, and the Phillips terminology will be used for references to portions of the Lower Valley in other states. For comparative references to the western portion of the Trans-Mississippi South (i.e., east Texas), simple descriptive geographic terms will be used.

Although the existence of these regions in the archeological literature is thus recognized, no great reliance, let alone emphasis, will be placed upon them for several reasons. Regions tend to be the settings for archeological phases (Willey and Phillips 1958:22), and as will be seen, the major focus of this overview will be on larger units (cultures) incorporating several phases and usually covering, or including parts of, several regions. Also, the concept of archeological regions (not to mention areas) is ultimately derived from the outmoded and rather static culture area concept, and a major aim of this overview is to give some idea of the prehistoric cultural dynamics, including spatial expansion and contraction of successive related cultures, in the study area. Finally, archeological regions are not pure spatial dimensions (cf. Spaulding 1957, quoted below), but are "usually determined by the vagaries of archaeological history" (Willey and Phillips 1958:19).

Instead of focusing on archeological regions, then, this overview will attempt to deal with the geographic space of the study area (and adjacent portions of other areas, as relevant) as a discrete or pure spatial dimension (cf. Spaulding 1957:85–86) over which prehistoric cultural variations occurred and can be at least approximately mapped.

Within any given time period, discussions of the appropriate cultural entities will proceed from north to south down the Lower Valley, as did Phillips's (1970:869ff) discussions of phases within culture periods. This will provide a geographic spine of relatively well studied and correlated sequences. Since this study takes in more territory than Phillips's did and includes the area to the west of the Lower Valley in southern Arkansas and all of Louisiana, relevant additional cultural entities will be discussed in east-to-west order at each spatial increment down the Valley within a given period.

Basic Units: Time Periods

Evolution of Relative and Absolute Chronologies. Early attempts at archeological synthesis (e.g., Thomas 1894; Holmes 1903) within the present study area were severely hampered by lack of chronological control, both in the relative (sequenced) and absolute (dated) senses. It was not until the 1930s that a relative cultural sequence was developed for the Lower Mississippi Valley, largely on the basis of stratigraphic excavations and seriation studies by James A. Ford (1935a, b, 1936b; see Gibson 1983b:47–64 and Chapter 3 of the present volume for summaries of Ford's efforts).

Attempts to assign educated guess dates to the cultural units in this sequence and others in the eastern U.S. were generally unsuccessful. The chronologies that resulted are now known to have been much too short in general and too recent for individual cultural units, especially for the earlier cultures. For example, an early attempt at such a synthesis (Ford and Willey 1941) estimated a time range of about A.D. 900–1100 for the Marksville culture, which is now placed at around 100 B.C.–A.D. 200 (early Marksville culture).

It was not until the development of radiocarbon (C-14) dating during the late 1940s and its widespread application beginning in the 1950s that an absolute cultural chronology was developed. In concluding their classic volume on Lower Mississippi Valley archeology, Phillips, Ford and Griffin (1951: 455) noted:

> We stand before the threat of the atom in the form of C-14 dating. This may be our last opportunity for old-fashioned uncontrolled guessing.

Their guesses again fell short of the true magnitude of prehistoric antiquity. To use the Marksville example again, their estimate for its extent (1951:Table 17) was from A.D. 500 to 700.

In the next major synthesis of Lower Valley prehistory, Phillips (1970:955ff) was able to cite more than 60 published radiocarbon dates for this area. However, the radiocarbon record was at that time questionable due to lack of resolution of several problems in field collection of specimens, selection of specimens for analysis, difficulties of dating certain materials reliably, and laboratory procedures.

As a result, Phillips (1970:960, Figure 450) was forced to present two alternative scales of absolute dates for his cultural periods and phases. The primary difficulty was with a series of late Marksville (Issaquena culture) dates, now regarded as erroneous. Phillips's preferred scheme placed Marksville and Issaquena between about 100 B.C. and A.D. 300, which is in general agreement with the present consensus, but he was unable at that time to reject an alternative scheme which placed them between 100 B.C. and A.D. 800 and resulted in exaggerated crowding of the following periods.

Time Periods vs. Culture Periods. The evolution of chronological schemes in Lower Mississippi Valley and Trans-Mississippi South archeology can also be viewed in terms of two semicompatible, but ultimately incompatible, concepts. One is that of periods as spans of absolute time, and the other is that of periods as spans of time characterized by a certain cultural content.

The position taken here is that these concepts began in an uneasy alliance, that the culture period concept was expanded beyond its limits of usefulness, and that the wave of the future clearly belongs to an absolute time scale, especially in studies such as the present one that deal with large and culturally variable territories. Because the issue is complicated and critically important, a fairly detailed review of the history of the concepts is in order.

In a figure in Ford's original study (1935c:Figure 2; reproduced by Gibson 1983b:Figure 2), both culture periods and intervals of absolute time were represented. Two regional sequences of ceramic complexes with labels such as Marksville pottery, Coles Creek pottery, and Natchez pottery were depicted. These complexes later became the bases of phases and culture periods. Although Ford's (1935c:3) text discussion was minimal, the figure also included two cryptic series of Roman numerals (I-II-III, from early to late) and letters (X–A–B–C–D–E) which represented floating (undated but potentially datable) points in absolute time. In Ford's more comprehensive monograph (1936b:Figure 50), this figure was reproduced with minor changes, one of which was the deletion of the series of letters.

A major change of approach was presented in the Crooks site report (Ford and Willey 1940:Figure 2). On the basis of recently published data and data from recently excavated but unpublished sites ranging from southwest Arkansas (the Crenshaw site) to southeast Louisiana (the Tchefuncte culture sites), a single sequence was presented for the entire Lower Mississippi Valley. Five sequential time periods, actually culture periods, were listed: the Tchefuncte, Marksville, Troyville, Coles Creek, and Caddoan periods. Neither the Roman numerals nor the letters were included.

Alex Krieger arrived at the University of Texas in the late 1930s, and began conferring about Caddoan archeology with Dr. Clarence Webb of Shreveport (Gregory 1980:22). Outside the present study area, widely read publications by Krieger (1946; Newell and Krieger 1949) set the Trans-Mississippi South (Caddoan area) firmly upon a cultural–taxonomic course different from that of the Lower Valley, basing their syntheses instead on the Midwestern Taxonomic System (McKern 1939). The Midwestern System had already been introduced into Louisiana Caddoan archeology in a less influential paper, a preliminary report on the pottery from the Belcher Mound (Webb and Dodd 1941; cf. Webb 1959:117ff; Gregory 1980b:23). In its pure form, as noted by Spaulding (1957:86),

> the McKern system is an explicit unidimensional system, a graded classification of components with respect to formal resemblance. It has no commitment at all to time or space and operates in complete detachment from any implications of evolution, causality, or chronology.

The formal introduction of this system into Texas archeology (Story, personal communication) was in a little known paper by Kelley, Campbell and Lehmer (1940) on a west Texas subject. It was applied to Caddoan archeology in general by Krieger in another little known paper, "Archaeological Horizons in the Caddo area," given at a 1943 meeting in Chapultepec, Mexico, and published the next year (Krieger 1944) in a Mexican volume called *El Norte de Mexico y el Sur de Estados Unidos*.

The Midwestern System caught on quickly in Caddoan archeology, largely due to Krieger's and Webb's energetic application of it in synthesizing a great amount of data. There were no significant counter-efforts at this time to extend Fordian or other Lower Valley systematics into these regions (Story, personal communication). However, despite the strictures on the "detachment" of the Midwestern System, the various aspects and foci soon took on chronological and developmental, if not evolutionary, overtones (cf. Orr 1952). As Gregory (1980b:23) commented,

> By 1941...the Midwestern taxonomic system had been modified to fit the regional preoccupation with establishing time/culture units. The early "foci" of Caddoan archaeology still more nearly resemble the time/culture units, phases, than they ever fit any of the standard Midwestern taxonomy.

As will be seen, a recent trend in Arkansas and Louisiana has been to simply convert the Caddoan foci into phases and to correlate those phases with those of the Lower Valley sequence. This approach will be taken in the present overview, but it should be noted that not all Caddoan archeologists (especially not all of those in Texas and Oklahoma) have accepted this change.

Within the present study area, several field projects and reports which had been interrupted by World War II were completed in the late 1940s and early 1950s; the two most important were the Lower Mississippi Valley survey report (Phillips et al. 1951) and the Greenhouse site report (Ford 1951). Both of these used a chronological scheme which more or less reintegrated and refined Ford's original concepts and devices. The larger scheme was summarized as follows:

> a framework of seven horizons [defined in a footnote as "instants in time, with no duration involved"] designated by the letters A to G. Horizon A is arbitrarily fixed at approximately A.D. 1650. Horizon G is the unknown date of the earliest pottery so far encountered in the area. [Note that Ford's original letter sequence direction was reversed, to permit alphabetical expansion into the past.] The six time divisions marked off by these seven letters will simply be referred to hereinafter as B–A, C–B, and so on. For greater convenience, and *because names give a satisfying, if illusory, sense of reality* [emphasis added], these lettered divisions are grouped into three major divisions, Tchula, Baytown, and Mississippi, and these correspond to what is generally understood by periods in archaeological writings. That is to say, while predominantly chronological, *they do have typological implications as well* [emphasis added].... Tchula, the earliest pottery period, corresponds to G–F on the time scale; Baytown, the long middle period [which was itself divided into Early, Middle, and Late sub-periods in this report], runs from F–C; Mississippi, from C–A. (Phillips et al. 1951:68)

This statement is exemplary for its clear definition of the concepts involved and for its sense of the potential problems involved in the use of culture periods. In their concluding remarks on "Chronological Alignments, Cultural and Calendrical," Phillips et al. (1951:454–455) avoided the temptation to overextend their culture–period names, restricting them to the northern portion of the Lower Valley. They conceded different sets of period names to Ford for the southern portion of the Lower Valley and to Krieger for the east Texas or Caddoan area, and suggested a correlation of the three sequences (1951: Figure 73). The A–G horizon sequence was shown as correlated with their sequence, as discussed above, but the other sequences were indicated as partially (Ford's) or wholly (Krieger's) out of synchrony with these horizons.

A similar comparison was presented in the report on the multicomponent Jaketown site in the Yazoo Basin (Ford et al. 1955:Figure 18). Here, only the Yazoo and Red River Mouth (Ford's) sequences were presented, and they were shown as being in synchrony. The Yazoo sequence was also extended to include the Poverty Point culture period, and the letter H was added to the horizon sequence. Meanwhile, Williams (1956: Figure 2) took another tack by using hyphenated period names in an attempt to unify the northern and southern Lower Valley sequences. This device was later called "logical but cumbersome" by Phillips (1970:15).

Also during the 1950s, Phillips and Willey published two articles (Phillips and Willey 1953; Willey and Phillips 1955) which were later combined and published as *Method and Theory in American Archaeology* (Willey and Phillips 1958). This work had a significant impact on American archeology in general, especially in the Lower Valley where both authors had worked and where Phillips and his students continued working.

Willey and Phillips (1958:24–29) cautiously discussed temporal series in terms of local sequences or series of components, which they referred to as "the very stuff of archaeology," and regional sequences or series of phases, calling attention to

> another source of difficulty, to wit, the confusion that inheres in practically all archaeological sequence formulations between culture and chronology. As soon as we begin to rank cultural phases in order of time, they tend to become periods. As periods, of course, they are theoretically not spatially limited; they may be extended indefinitely.
>
> If the Marksville phase of the Lower Valley sequence is merely the interval between points E and F on a continuous time band (as in Ford's recent writings), then anything that can be established as lying within that interval, in the delta, or anywhere else for that matter, can also be called Marksville. The catch is that Marksville is and will remain more than a mere chronological period. The interval marked off by points E and F is determined by cultural criteria in the first instance; the identification of other material as belonging to that interval (*in the absence of independent calendrical dating*) [emphasis added] is determined by those same cultural criteria. (1958:28)

In their areally oriented chapter on archaeological integration (1958:44ff), they were even more cautious. They suggested two maximum units, namely the culture and the civilization (1958:47ff), but noted that

> the phase remains the manageable unit.... As a somewhat arbitrary specification, however, applicable to the New World only, we suggest that "culture" be used to denote maximum units on all stages up to and including the Formative [i.e., Mississippian; cf. 1958:163], reserving the term "civilization" for such units on the Classic and Postclassic stages. (1958:48)

Also in that chapter, they specifically addressed Southeastern and U.S. issues and held out some hope for improvement via absolute dating techniques:

> Outstanding examples of area schemes that are virtually without benefit of dating are to be found in the southeastern United States. Here, owing to the failure of independent dating techniques to develop as rapidly as in some other areas, it has become a habit to equate widely separated archaeological units on strictly formal principles, and, whether as cause or effect, there prevails a sweeping assumption of synchrony of culture change throughout the area.... The possibility that the relationship may be genetic, and therefore not necessarily synchronous, is not entertained. We are so fond of this method of reasoning in the Southeast that we tend to

> ignore the few independent (radiocarbon) dates that we have....
>
> Deliverance from...semantic ambiguity will come when current techniques of absolute dating have reached a point of such dependability that we can place a given unit within a temporal frame, on the one hand, and in a developmental sequence, on the other, without confusing the two operations.
>
> We are forced to conclude that the pure area chronology based on distributional criteria alone is, in the New World at least, a presently unattainable ideal. But, with the rapid accumulation of radiocarbon and other types of independent dating now taking place, it is a certain possibility in the future. In the meantime we must be content with the sort of hybrid area schemes now in vogue. There is no harm in them so long as we are clear about how they are made and what they mean, but, when they lead us to think that we have discovered something about how culture "works," it is time to be on guard. In any case, it will be entertaining to compare them with true area chronologies when these are available. (Willey and Phillips 1958:45–47)

In a review of the original articles, which also could be applied to the 1958 book, Spaulding (1957) severely criticized the Willey and Phillips scheme, and in particular,

> the Phillips–Willey idea that archaeological concepts [such as phases and cultures] are and must be mixtures of form, time, and space. Meaningful concepts (and their ancillary operations) either deal with form or they do not, with space or they do not, or with time or they do not.... I would conclude that certainly a large share of Phillips and Willey's classificatory difficulty is the result of not understanding the necessary dimensional basis of classification. (1957:86)

Phillips completed the fieldwork on his Lower Yazoo Basin survey in 1955. He was engaged in preparing his magnum opus on that project during the rest of the 1950s and 1960s, but one of his students, Robert Greengo, was the first to complete an application of the Willey–Phillips concepts to Lower Valley data, in an unpublished dissertation (Greengo 1957) and a *Society for American Archaeology Memoir* (Greengo 1964), both on the subject of the Issaquena phase. He explicitly characterized his work as "an attempt to apply and test the utility of these concepts" (1964:2). Greengo provided a useful summary of the development of archeological knowledge in the Lower Valley (1964:3–15), redefining Ford's periods as phases (1964:13), and presenting a table correlating two redefined regional phase sequences (Lower Yazoo Basin and Natchez–Lower Red River–Tensas Basin). He also called attention to an important continuity vs. discontinuity (Ford vs. Phillips) dichotomy in the Lower Valley literature; this will be discussed below.

Meanwhile, Williams was involved in research on the Kadohadacho and related Caddoan groups for an Indian Claims Commission case. In his report (Williams 1955) he used the term "phase" instead of "focus" and reiterated this stance in a review of Webb's Belcher site report (Williams 1960). During a discussion at the Fifth Caddoan Conference (Davis 1961b:125), Krieger and Edward Jelks of the Univer-sity of Texas reiterated their preference of "focus" in Cad-doan archeology.

Trying another path toward large scale unification in a relatively unknown but important eastern U.S. synthesis, Williams (1963) resurrected Ford's series of Roman numerals. He used a sequence from I through V that began with Early Pottery and ended with Historic Contact within the Neo-Indian Era; he employed similar Roman numeral sequences within the Paleo-Indian and Meso-Indian eras. Phillips (1970:8) later commented perceptively:

> This is a praiseworthy attempt to break away from "culture periods" by using numbered intervals of absolute time. These intervals are characterized in very broad cultural terms...which makes for somewhat greater flexibility. Application to Lower Mississippi archaeology, however, is not without its problems. For example...Coles Creek is in Period IV, which begins with the "rise of Mississippian," though Williams agrees with me that Coles Creek is emphatically not... a Mississippian culture. The catch is that, however periods are designated, however deceptively chronological, so long as we are obliged to make assignments to them by cultural criteria and not by absolute dates, they remain "culture periods" with all the difficulties incident thereto.

Phillips did not use the Williams scheme of eras and periods. It was, however, used by Stoltman (1978) in a major synthesizing article. It persisted in later Lower Mississippi Survey publications (Williams and Brain 1983:349ff, 393ff; Brown 1985:Table 1) and was adapted by others (e.g., Neuman 1984a).

As is befitting a two-volume, 999-page (plus a separate master map as the thousandth page) tome representing the culmination of a life's work, Phillips's (1970) publication has had a tremendous influence on archeology and archeologists in the Lower Valley and adjacent areas in many ways. Here, the emphasis will be on his expansion of the culture period concept, and it will be argued that he expanded it beyond its useful limits.

Phillips (1970:3) explicitly characterized his Yazoo Basin study as "an attempt to apply some of the precepts" of the Willey–Phillips volume, but added,

> My present difficulty, in a nutshell, is that most of the data I am trying to organize in this study were collected under the influence of Fordian theory [i.e., surface collections for the purpose of seriations based on the assumption of continuity]. Too much area has been covered and too little excavation done for the kind of interpretations I shall be trying to make.... It seems worthwhile, however, to make the attempt, if only to

> see whether "historical integration" as described by Willey and myself is a practicable approach to archaeological understanding.

After reviewing several schemes of cultural and chronological nomenclature (1970:5–8, Figure 2), Phillips remarked,

> So long as we are forced to operate with the mixed culture–chronological criteria inherent in our "culture periods," it is more important that these be logically intelligible than that they be capable of expansion across the board. We have a long way to travel before we can hope to make precise temporal correlations from one end to the other of the vast "Eastern" archaeological area. When we get to that point of historical fidelity we can dispense with culture periods altogether. (1970:8)

Phillips (1970:14) stated an intention to "spare no pains to distinguish clearly between 'periods'...and 'cultures'"; but like Willey and Phillips (1958), he did not provide a rigorous definition of what was meant by a "culture." He did, however, furnish a revealing discussion of his "period" concept:

> We have by no means sufficient control over calendrical dating in the Lower Mississippi to permit dispensing with the conventional sequence of archaeological periods. For the same reason, our periods are not exclusively chronological. They are the familiar "culture periods" that have so greatly discomforted archaeological theorists. There is, to be sure, a little stiffening from selected radiocarbon dates...but the periods are still mainly intelligible in terms of culture change rather than time. The problem in the Lower Mississippi is to find period names applicable to the whole area, from the mouth of the Ohio to the Gulf. Names that have proved reasonably intelligible in one part of this elongated area are not so in another. (1970:14)

Despite these misgivings, Phillips (1970:15ff) attempted to impose a scheme of period names, derived from his Lower Yazoo Basin sequence, upon the entire Lower Valley. As will be shown repeatedly in the discussions of the later (ceramic) time periods in the following chapters, the attempt was ultimately unsuccessful. It is futile to attempt to subsume the cultural variation that existed within this vast area at virtually any given time under a single culturally laden typological label. In his concluding remarks, Phillips (1970:973) conceded that he felt

> A...sense of insecurity...[which] may be summed up as a growing distrust of the principle of parallel diachrony (if I may add a phrase to the existing jargon), i.e., the notion that cultural changes, even in specific categories like ceramics, follow one another in accordance with a remarkably uniform pattern and time schedule over large geographical areas. At various points in the present work I have been forced to conclude either that the local stratigraphy was messed up or that things were not happening as expected in two juxtaposed archaeological regions. The first alternative was usually preferred but now I am inclined to think that it may have been the expectations that were in error. It would be even more futile here to attempt such blanket "culture period" labeling for the Lower Mississippi Valley plus the Trans-Mississippi South, which is the territory to be covered in this overview.

During the 1960s, 1970s and 1980s, Lower Mississippi Survey researchers carried out sustained research projects in the Tensas Basin of northeast Louisiana (Williams 1967; Hally 1972), the Natchez Bluffs (Brown and Brain 1976; Brain 1978; Brown 1982, 1985), the Petite Anse region of the south Louisiana coast (Brown 1978a, 1981a, b, 1984; Fuller and Fuller 1987), and the Boeuf Basin of northeast Louisiana (Belmont 1983; Williams 1983; Fuller and Williams 1985; Kidder 1986a, 1986b). All the projects brought the Phillips (1970) framework into these regions.

Despite Phillips's (1970:973) "distrust of...parallel diachrony," several LMS chronological charts (e.g., Belmont and Williams 1981:Table 1; Belmont 1982c:Figure 3; Brown 1984: Figure 4.2) depicted completely parallel regional sequences of phases, each precisely 150 (or 300) years long. Whether this was merely a schematic device, or a conversion by the LMS to a Fordian position of making arbitrary cuts across the continuum of time, has not been explicitly stated. One interesting innovation was Belmont's (1982c:Figure 3) placement in the Lower Yazoo Basin sequence of Baytown *culture* in the late Baytown and early Coles Creek *periods*, but not in the early Baytown period, which was assigned to Troyville culture. This can be cited as an example of moving away from culture periods, but the retention of culture-laden names for the time periods and subperiods still entailed some awkwardness.

Other Lower Valley researchers generally paralleled the Phillips–LMS framework (e.g., Weinstein and Kelley 1984: 32ff). Rolingson's (1982) definition of a new Plum Bayou culture resolved a major problem of cultural taxonomy, in effect relieving the strain on Phillips's (1970:912ff) geographically overextended Coles Creek culture concept. There also appears to be a tendency to extend such parallels into the Trans-Mississippi South, e.g., Schambach's 1982a:Table 7–1, which set up a southwest Arkansas sequence of seven Fourche Maline culture periods, paralleling the Lower Valley sequence.

There were also some noteworthy divergences from the Phillips scheme, particularly toward the northern and southern extremities of the Lower Valley. Perhaps the most striking was the Morses' (1983:200ff) characterization of the A.D. 700–1000 period, from their Central Valley (northern Lower Valley, in this overview's terms) perspective, as the Mississippian Frontier period. This contrasted sharply with Phillips's (1970: Fig. 450) labeling of precisely the same time span as the Coles Creek period, and even more so with later LMS charts (Belmont and Williams 1981:Table 1; Belmont 1982c:Figure 3), which showed a Transitional Coles Creek period lasting from about A.D. 1050 to 1200. Clearly, quite different cultural situations were coeval in various regions of the Lower Valley during these (and other) times, and Phillips's (1970:14) misgivings (quoted above) about the inappropriateness of pan-Valley culture period names were warranted.

Another divergence from the Phillips scheme was represented by Neuman's synthesis of Louisiana archeology. Neuman (1984a:2ff) used the Williams *era* scheme to subdivide the Neo-Indian Era into *cultures* arranged generally in chronological order. These were, in effect, culture periods, but Neuman's terminology only partly agreed with Phillips's. Neuman's geographic orientation, based in southern coastal Louisiana, provided some contrasts with Phillips's Yazoo Basin vantage point. Neuman did not use the Tchula period in his Louisiana Tchefuncte culture discussions, referring to it only in a passing comparison (1984a:135) to the Yazoo situation. Neuman never referred to the Baytown period or culture, but invariably used a combined Troyville–Coles Creek culture concept, derived from the traditional difficulty of separating the two in coastal Louisiana (cf. Phillips 1970:911, 921). And, in dealing with the late prehistoric situation (Phillips's Mississippi period), Neuman did not attempt to coin an overall culture period name, but discussed three more or less spatially distinct cultures — Caddo, Plaquemine, and Mississippian — which "were not successive but rather overlapped chronologically to a considerable degree" (1984a:3).

One additional grand synthesis was published in 1985, despite its earlier publication date, by Lower Mississippi Survey researchers, in the report on the 1958–1960 excavations at the Lake George mound center in the southern Lower Yazoo Basin (Williams and Brain 1983). The concluding chapter of this volume (1983:393–420) addressed cultural dynamics in the Lower Valley, again explicitly from a Yazoo Basin point of view. The authors used the Williams scheme of three eras subdivided into periods of calendric time designated by Roman numerals in their introductory chart (1983:Figure 12.1), but there was no use of these periods in their discussions. Instead, for the Neo-Indian era, the usual sequence of cultures or cultural traditions (Poverty Point, Tchefuncte, Marksville, Baytown, Coles Creek, and Mississippian) was discussed, in effect reiterating Phillips's pan-Valley culture periods. Other Lower Valley cultures such as Lake Cormorant, Troyville, and Plaquemine, coeval with the major Yazoo Basin cultures, were only mentioned in passing (1983:400, 404, 409). Two areally delimited culture spheres were illustrated on maps: Poverty Point (1983:Figure 12.5) and Coles Creek (1983:Figure 12.11).

The major point to be derived from the last three examples (Morse and Morse 1983; Neuman 1984a; William and Brain 1983) is the growing recognition of coeval cultural variation and diversity over the vast expanse of the Lower Valley and/or Trans-Mississippi South, during any given period. At any given time, especially after about 500 B.C., several large scale cultural entities could be defined by artifacts and delimited spatially, as these authors showed.

Renewed requests for what Spaulding would have called "dimensional discreteness" were being heard. One was issued by Gibson (1979a), another by this author (Deter 1982a:113ff), explicitly citing Spaulding's statements. Another came from a Lower Mississippi Survey archeologist, John Belmont (1982c:77):

> Willey and Phillips (1958:18–29) carefully distinguish between spatial, temporal and "archaeological" (I would prefer culture–historical) units. [As has been seen, Spaulding would have disagreed with this statement.] These distinctions should be preserved. *Period* is a temporal unit and should be defined not in cultural or spatial terms, but *simply as an interval between two absolute dates*. Phillips' periods are an improvement on Ford's in that he has eliminated pairs of period names that are temporal equivalents for different areas (Troyville and Baytown, Plaquemine and Mississippi), reducing the spatial elements in their definition. [Actually, Phillips eliminated Ford's Louisiana period names and expanded the coverage of his own.] The cultural element remains strong, however, perhaps warranting the use of the hybrid term *culture period* for his formulations. [Emphasis in original]

This overview will indeed be presented in terms of *time periods*, defined as intervals bracketed by absolute dates. Before such dates can be defined, though, some discussion of criteria used previously for defining culture periods, and more recently for defining time periods, is in order.

Continuity vs. Discontinuity. It was noted above that Greengo (1964) called attention to a fundamental difference of opinion between Ford and Phillips over the issue of cultural (especially ceramic) continuity vs. discontinuity. Ford was responsible for the seriation analysis in the 1951 report, whereas Phillips dealt with stratigraphy (Phillips et al. 1951:vi). The assumption of continuity was explicitly stated at the beginning of the seriation chapter (1951:220), and the alternative possibility of significant discontinuities was brought up at the conclusion of the stratigraphy chapter (1951:292). The issue was briefly discussed, but not resolved, in the concluding chapter (1951:427–428), with Griffin and Phillips voting for the likelihood of at least small discontinuities, and Ford holding out for a general continuity.

Greengo (e.g., 1964:8–9, 11, 94, 122) repeatedly criticized Ford's general assumption of continuity throughout virtually all of the Lower Valley sequence. Phillips was to return to the subject often in his 1970 synthesis, and remarked in summary that:

> the author has constantly sought for cultural discontinuities with an assiduity bordering on fanaticism...my rule seem to have been: when in doubt, separate. (Phillips 1970:973)

At issue here was the question of how (and where) to draw the lines separating a given sequence into culture periods. Ford (e.g., 1951:13, 1952:323) believed that the ceramic typological operations underlying the definition of culture periods involved "drawing arbitrary lines between related materials," and that similarly, the time scale could be divided by "arbitrary points ...marked A, B, etc." (1952:324) into culture periods. Ford

(1952:323, Footnote 5) remarked that he had gone through a "slow and painful process of crystallization" with regard to his views on these subjects. Phillips (1970:908–909) commented from his own perspective on Ford's development:

> It is important to remember that [Ford's Troyville period as defined by Ford and Willey 1940 and elaborated by Ford 1951] was a departure in *theory from Ford's earlier unit concepts such as Marksville and Coles Creek* ....
>
> By 1940 Ford's theory of archaeological culture as a unity (a continuum in time and geographical space arbitrarily sliced up by the investigator) freed him from the necessity of defining his periods in cultural terms; hence there is no more talk of "marker" types. The classic archaeological method of coincidence of period beginnings with significant cultural changes is abandoned because there are no significant cultural changes. In Ford's view change itself is continuous and proceeds at a more or less unvarying rate which can be measured in terms of slowly shifting popularity of long established styles of pottery decoration.
>
> ...in setting up Marksville and Coles Creek in 1936, Ford was following the classic method of starting new periods with the appearance of new forms.... If Troyville had continued to be simply a division corresponding to early Coles Creek...there would have been no difficulty. The "natural" (a word Ford would not allow me to use) line of separation between the old Marksville and Coles Creek would have remained in place. But Ford's description of 1951, in failing to accent the new forms that belong specifically to Troyville, makes it appear to straddle this line. Actually, he is using a new criterion in marking off chronological divisions. Instead of coinciding with the appearance of new features and the disappearance of old, lines of separation are determined by their maximum occurrence.... If Ford were desirous of demonstrating his break with classic archaeological method he could do no better than to point to these examples.

The position taken here is that both Ford and Phillips (especially Ford; cf. Spaulding 1953:591) were operating with inadequate samples, and perhaps more importantly, with inadequate access to reliable absolute dating methods. It is now possible to set up at least an approximate calendrical chronological scale, based primarily on independent noncultural methods such as radiocarbon and archeomagnetic dating (Wolfman 1982, 1984) and perhaps dendrochronology (Stahle et al. 1985). And, it is possible to at least overview the apparent continuities, discontinuities, and spatial variations of coeval prehistoric cultures during specific intervals on this scale.

Such an approach was taken in an overview of southeastern U.S. prehistory by Smith (1986). Smith's point of view, by the way, was overwhelmingly (but not explicitly) on the Fordian side, in that the words "continuum" and "continuity(-ies)" were repeatedly used. In setting up his chronological framework, Smith (1986:6, Figure 1.3) noted the general lack of agreement on the chronological placement of culture–period boundaries across the Southeast. As an alternative, he proposed,

> Rather than add to the already confusing list of competing "cultural" chronologies, a combination of the "arbitrary" and "natural" approaches...[is] employed to establish a chronological framework for the Southeast. The "natural" approach involves adopting much of the Quaternary chronostratigraphic framework that has been established for the Midwest...and informally extended to the Southeast.... The temporal boundaries of the three Holocene time units (early Holocene, 12,500–8000 B.P.; middle Holocene, 8000–5000 B.P.; late Holocene, 5000 to the present) are tied to three major climatic trends... Within this natural tripartition of the Holocene, smaller time units have been established arbitrarily as needed. The resultant "culture-free" regional chronology, while not competing with various previously proposed culturally defined temporal frameworks, does facilitate easy comparison with environmental trends and studies, and provides a neutral background for the temporal placement and comparative analysis of the culturally defined local chronologies that have been established for the Southeast. (Smith 1986:6)

It could be argued that Smith's natural chronological breaks were somewhat arbitrary and culturally significant, while his arbitrary breaks were not wholly noncultural. The Midwestern climatic breaks were not necessarily the most relevant for the Southeast, Lower Valley, or Trans-Mississippi South. Smith's middle Holocene (8000–5000 B.P.), which converts to about 6001–3000 B.C., is equivalent to the Middle Archaic period of many archeologists (Stoltman 1978:714–715; Goodyear et al. 1979; Jeter 1982a:90) but not completely equivalent to Morse and Morse's (1983:99ff) Hypsithermal Archaic which was also defined on a climatic basis. Smith's major arbitrary breaks within the late Holocene showed some tendency to coincide with major cultural breaks; i.e., his 2500 B.P. break approximated the general Southeastern ArchaicWoodland transition at around 500 B.C., and his 1000 B.P. break was close to the Woodland–Mississippian transition at around A.D. 1000 in portions of the Southeast. What was most different about his approach was his general avoidance of using cultural names to label his time intervals.

An approach generally similar to Smith's will be taken here. For the preceramic time intervals, his general framework will be used, with the breaks adjusted slightly in some cases. However, for the ceramic periods, more cultural influence will be admitted, as a concession to established practice in these areas and regions, and to the Phillips position that there may have been actual discontinuities; this cannot offend the Fordian position that, because the breaks are arbitrary, one place is as good as another. There is now something approaching a consen-sus on some of the major periods, and on the absolute dating of the breaks between them. An attempt will be made to place the time period breaks approximately at these culture period breaks and to avoid placing time period breaks in the middle of established culture periods.

Within any given time period, some emphasis will be placed on characterizing the cultural variation that existed within and adjacent to the study area. The cultural concepts that will be employed in these characterizations are discussed in the following section.

Basic Units: Cultural

> It is difficult to imagine anything more intangible than a dead and forgotten culture. The concepts which a cultural student must make in attempting to study a past culture are just as intangible as any used in atomic physics. (Ford 1954:110)

History of Cultural Unit Concepts and Maps. Most of the cultural unit definitions in the Lower Mississippi Valley and Trans-Mississippi South have been based primarily on distinctive artifact assemblages. Due at least in part to the nature of the archeological record in the Lower Valley, and to the history of archeological investigations in that area, tremendous emphasis, if not overemphasis, has been placed on ceramics. In the following historical discussion, particular attention will be given to studies which mapped cultural/artifact distributions over broad geographic areas, since that approach will be used in this overview.

The first effective attempt to characterize prehistoric ceramic variability which included the present study area was made by William Henry Holmes (1903) in his classic monograph on *Aboriginal Pottery of the Eastern United States*. Holmes (1903:80ff) defined five major pottery groups in this enormous territory and mapped their distribution (1903:Plate IV). He remarked,

> it seems advisable to begin with that group most fully represented in our collections.... By far the most complete in every essential is the great group of utensils representing the middle Mississippi valley region....
>
> The geographic distribution of the ware of this group naturally receives first consideration. Apparently its greatest and most striking development centers about the contiguous portions of Arkansas, Missouri, Illinois, Kentucky, and Tennessee. The area covered is much greater, however, than would thus be indicated; its borders are extremely irregular, and are not as yet at all clearly defined. Typical specimens are found as far north as Chicago, as far northeast as Pittsburgh, and as far southeast as Augusta, Georgia. Closely related forms are found also along the Gulf of Mexico, from Tampa bay to the Rio Brazos. As a result of the segregation of the peoples of this vast province into social divisions — each more or less isolated and independent and all essentially sedentary — there are well-marked distinctions in the pottery found, and several subgroups may be recognized. The most pronounced of these are found, one in eastern Arkansas and western Tennessee, one in southeastern Missouri, one in the Cumberland valley, Tennessee, and a fourth in the lower Mississippi region. (Holmes 1903:80–81)

Holmes was dealing predominantly with late prehistoric pottery (although the chronology was not understood at the time) obtained from burials by the Smithsonian Institution, Bureau of (American) Ethnology, Mound Exploration Division in the 1880s and 1890s (Thomas 1894), and by other institutions such as the Davenport (Iowa) Academy of Sciences. His middle Mississippi group of ceramics became the basis of Middle Mississippi culture, which became shortened to the Mississippi or Mississippian culture and culture period (cf. Phillips et al. 1951:39ff, 445ff; Phillips 1970; Morse and Morse 1983: 201ff).

Of the subgroups mentioned by Holmes (but not differentiated on his map), two are most relevant for the present study: the one centering on eastern Arkansas and the one in the lower Mississippi region. As will be seen, a roughly similar cultural distinction persisted through most of the ceramic periods of prehistory, with the approximate boundary fluctuating between the vicinities of the Arkansas–Louisiana state line and the present lower course of the Arkansas River.

Moore's (1908a, b, c, 1909, 1910, 1911, 1912, 1913, 1916) explorations along the Mississippi, Arkansas, St. Francis, White, Black, Ouachita, and Red rivers in Arkansas, Louisiana, and Mississippi, added immensely to the ceramic data base. He did suggest the Arkansas River mouth as a ceramic boundary marker between the Lower and Middle Mississippi Valley regions (1911:370–371). Moore was generally content with descriptions and illustrations of outstanding specimens, though, and produced no real synthesis; that task was taken up by Ford. In one remarkable illustration in his Peck Village site report, Ford (1935c:Figure 1) mapped the overlapping geographic distributions of seven pottery decoration complexes divided among three chronological horizons. For the first time, the temporal dimension had been controlled. Ford's map, which curiously was not included or revised in his more comprehensive (1936b) monograph, covered northeastern Louisiana and southwestern Mississippi.

Ford's Horizon I included only the Marksville complex, shown as occurring in both states along the Mississippi and continuing into the Yazoo Basin. Horizon II included both the Deasonville complex in the Big Black and Yazoo drainages, barely extending into extreme northeast Louisiana, and the Coles Creek complex, roughly congruent with Marksville but stopping below Vicksburg. Horizon III included four complexes: Caddo in extreme northeast Louisiana, centering on Monroe; Choctaw in south-central Mississippi; Tunica in the extreme Lower Yazoo and Lower Big Black drainages; and Natchez along the bluffs from present-day Natchez to just below Vicksburg.

All of these complexes are still accepted as archeological phases and/or cultures or ethnohistoric groups. It is worth noting, though, that Ford's Caddo complex was based on his acceptance of Moore's 1908 illustrations of artifacts from the

Keno and Glendora sites near Monroe as representative. Phillips (1970:861) also accepted this region as Caddoan on the same basis, but other research (Belmont 1983:280–281; Williams 1983; Fuller and Williams 1985) showed that Moore's illustrations were not representative. The two sites were at least as much Mississippian as Caddoan, and the surrounding region was solidly Mississippian in Protohistoric times; the Caddoan ceramics apparently represent only a brief Historic intrusion or refugee situation. Also, Ford's Tunican complex was based on the presence of Protohistoric to Historic Tunicans, who may have been refugees, near Vicksburg from the late 1600s to 1706 (Brain 1981:45; Galloway 1982b:Figures 1 and 3; Jeter 1986:42, Figure 4.4).

The 1951 synthesis by Phillips, Ford and Griffin did not include maps of ceramic complexes or cultural entities, but did present one intriguing mapping innovation. A series of eight maps (1951:Figures 7 through 14), each covering the same territory (eastern Arkansas and adjacent western Mississippi and Tennessee), illustrated by means of contour lines what was in effect clinal variation in the geographic frequency of eight pottery types. Their maps show the distribution of the types Mulberry Creek Cord Marked (1951:Figure 7) and Parkin Punctated (1951:Figure 10). Unfortunately, this approach has not been expanded or elaborated upon since, not even in these latter days of computerized data bases and mapping programs.

The 1951 volume also included a series of six maps of the same territory (Phillips et al. 1951, Figures 64–69), showing the distribution of occupation patterns (site types) during the six ceramic periods. However, no cultural differentiation was made on any of the maps, and their primary effect was to show the landscape gradually becoming more populated, with trends toward more sites and/or larger sites.

Another interesting study in this volume (Phillips et al. 1951: 295–306) attempted a correlation of archeological sequences with geological data on the sequence of Mississippi River meanders. Although it was limited in scope and suffered from dependence on Fisk's (1944) "short" chronology (cf. Saucier 1974: 1), this was the precursor of modern paleogeographic studies in Lower Valley archeology. It should be noted, though, that the major purpose of the 1951 study was as a means of dating archeological sites, rather than paleogeographic reconstruction.

The concluding summary discussion (Phillips et al. 1951: 429ff) was in terms of culture periods. Variation within periods was generally characterized as a contrast between north (northeast Arkansas and adjacent regions) and south (the Yazoo Basin and adjacent regions), sometimes with reference to ceramic complexes and sometimes to cultures. No attempt was made to define phases, although the term was then coming into common use (Kidder et al. 1946:9).

Contemporary workers in the Trans-Mississippi South began to use large scale maps to display cultural distributions in various ways. In the Davis site report (Newell and Krieger 1949:Figure 62), a map of the entire Caddoan area showed the locations of "sites related to Davis and the Alto Focus" and other sites; a lengthy caption differentiated the various foci and cultural affiliations. In the Belcher site report, Webb (1959:Figure 1) mapped the major (primarily Caddoan) sites in northwest Louisiana and southwest Arkansas, and adjacent regions. Symbols differentiated mound sites from village sites, but there was no chronological differentiation.

Taking another tack, the Fifth Caddoan Conference, held in 1958, produced two maps which sacrificed the details of site locations and concentrated instead on the geographic distributions of foci. The first (Davis 1961b:Figure 1) mapped foci of the Gibson aspect (Alto and Gahagan) and such early foci as the pre-Alto Bellevue focus, the post-Alto Haley focus, and others as far north as the Grove focus of the Arkansas–Oklahoma–Missouri–Kansas borderlands. The second (Davis 1961b:Figure 2) mapped foci of the Fulton aspect that included Bossier, Belcher, and Texarkana, and other late foci that included the late prehistoric Mid-Ouachita focus and the Contact Historic Glendora focus. Although these maps were palimpsests, they did (and do) provide a clear visual overview of Caddoan cultural distributions. The maps were all superimposed on modern drainage maps. In fact, paleogeographic maps are more relevant for the Lower Valley than they are for this relatively stable area, especially at large scales and when dealing with relatively recent cultures.

Quite another approach was taken in the most dynamic environment of all, by LSU geomorphologist William G. McIntyre (1958) in his *Prehistoric Indian Settlements of the Changing Mississippi River Delta*. Working with LSU artifact collections and making some new collections, he analyzed data from more than 500 sites along the coast, from the Sabine River to the Pearl River, and inland to about 30 degrees north latitude. He emphasized data on the initial periods of site occupations to reconstruct the sequences of stream courses, delta lobes, and cheniers on a series of maps (1958:Plates 1–12), some of which included paleogeographic data.

Willey and Phillips (1958) followed A. V. Kidder and others who had by then made the *phase* the "prevailing usage in a preponderance of New World areas." They presented a redefinition of the phase as

> *an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time.* (1958:22) [emphasis in original]

They also clearly saw the focus of the Midwestern System as close to their concept of the phase, and perhaps foresaw the eventual conversion of Caddoan units, such as the Alto focus, to their system:

> In theory the basic [Midwestern] unit of classification is the focus, comprising a number of components, and the same may be said of what we designate as a "phase".... Like Kidder, we prefer "phase" to the approximately equivalent "focus" because of its stronger temporal implication. (1958:21–22)

> The native cultures of the Caddoan area of eastern Texas and northwestern Louisiana were strong enough to resist the inroads of Mississippian culture. Whether this is because the Alto and other *phases* that make up the Gibson aspect were too early to receive Mississippi influences...depends on the outcome of the dating controversy. (1958:167–168) [emphasis added]

Willey and Phillips (1958:47–48) regarded the culture as a maximum unit for all pre-Classic stages of cultural organization, but were rather vague about its definition. They saw it as having "tremendous variability"and as therefore being poorly suited for comparative studies (1958:51–53). Instead, they saw the phase as "in our opinion, the practicable and intelligible unit of archaeological study" (1958:22).

As noted above, the Willey–Phillips scheme was published in two articles earlier in the 1950s, and the phase concept was first applied to a Lower Valley subject in Greengo's (1957) dissertation, which was revised and published in 1964. Others then applied the concept in their regions of interest. Gagliano and Saucier (1963) defined the Bayou Jasmine phase of Poverty Point culture in the Pontchartrain Basin of southeast Louisiana. Also that year, Gagliano (1963) published a report on preceramic occupations of southeast Louisiana and adjacent Mississippi, describing four phases (including Bayou Jasmine).

Gagliano's report, though not widely circulated, was noteworthy for its mapping of paleogeographical and archeological data on a regional scale. In one map (1963:Figure 1), he coded the distributions of sites of different ages and phases, in a fashion somewhat reminiscent of Ford's (1935c:Figure 1) pioneering effort, and added both the modern major landforms and three sequent Mississippi River deltas. The correlations between site and landform ages were clear.

In a widely read *American Antiquity* article, Webb (1968) summarized the extent and content of Poverty Point culture. On a large-scaled map of the Lower Valley and adjacent areas (1968:Figure 1), he plotted the distribution of 34 Poverty Point sites in Louisiana, Mississippi, and Arkansas, plus other possible Poverty Point sites and related sites. Reference was made to Gagliano's phases, but no new phases were defined.

Phillips (1970) put the Willey–Phillips theoretical stance, methodology, and terminology into practice on a grand scale. He culminated his Lower Valley synthesis with a discussion of more than 80 phases (1970:869–954) divided among six culture periods, each accompanied by a map (1970:Figures 442 through 447). The maps showed the locations of sites with components of a given period and coded the site symbols (squares, triangles, circles, etc.) to indicate phase affiliations. Each map's geographic base was the same, i.e., the modern stream courses rather than the paleogeographic situation.

Although Phillips was primarily responsible for the analysis of site correlations with old meanders in the Lower Valley survey report (Phillips et al. 1951:vi, 295ff), he declined to repeat the attempt in his Yazoo Basin volume. There (Phillips 1970:961) he noted that "our own relative dating is now just as good if not better."

No large scale, period-by-period series of phase or culture maps covering the entire Lower Valley has been published since Phillips's effort. However, several reports, articles, and monographs include maps of phase or cultural sequences on the local to regional scale, or of single period (or limited sequence) cultural distributions on a large scale. These studies provided valuable data for our overview and will be reviewed briefly below.

It should also be noted that pure paleogeographic maps, without archeological data, have been published. Saucier's (1974:Figure 1) large-scaled, color-coded map of the Quaternary geology of the Lower Valley displays the discontinuous remnants of a series of old meander belts of the Mississippi and other large rivers. An even larger and more detailed map is in preparation (Saucier, personal communication). Saucier (1981:Figure 3) also published a series of five-stage maps of the Lower Valley, connecting the appropriate Mississippi River meander belt remnants to show inferred meander belt courses, terminating in variously located subdeltas. The first four of these maps represent the equivalent of the Paleo-Indian and three Archaic periods.

Webb (1977:Figure 1) presented a large-scaled map showing the distribution of six clusters of Poverty Point sites, plus related Southeastern cultural complexes and individual related sites outside the clusters. A series of regional maps (1977:Figures 2 through 6) showed the locations of important sites within the Poverty Point clusters. Again, modern stream courses, rather than paleogeographic situations, were depicted.

The State of Louisiana's Comprehensive Archaeological Plan or CAP (Smith et al. 1983) included a series of eight cultural unit maps (1983:Figures 9 through 17) for the prehistoric periods. Areas of cultural concentrations were shown against a background of modern parish outlines. Streams were not indicated except as parish or state boundaries. The general scheme paralleled that used in Neuman's (1984a:2ff) volume on Louisiana archeology, in that the maps represented the Paleo-Indian culture/period, an undifferentiated Archaic (cf. Neuman's Meso-Indian period), and the Louisiana names for the Neo-Indian culture periods. It also paralleled Neuman's usage in that a combined Troyville–Coles Creek culture period was mapped, and separate maps were presented for the partially contemporaneous Plaquemine, Caddo, and Mississippian cultures.

Except for the latter example, these maps were mainly undifferentiated culturally and might be better characterized as simply representing site densities during any given period. Also, as will be seen, in some cases the concentrations do not completely agree with site component data tabulated by parishes elsewhere in the CAP (Smith et al. 1983:Tables 1 through 5). However, there is general agreement, and these maps provide a useful first-approximation overview device.

Morse and Morse (1983) used a series of maps at the beginnings of the "period" chapters in their Central Mississippi

Valley synthesis. The base map for each showed the modern stream patterns and major landforms in northeast Arkansas and adjacent regions of other states. The cultural entities that were mapped and the mapping techniques varied from period to period. For the Paleo-Indian period (1983:Figure 3.1), "major regions of fluted point discoveries" were stippled. For the Dalton period, three major sites were indicated, along with known or reported concentrations, and eight schematic "apparent band territories." No map was given for the Hypsithermal Archaic disruption of ca 7000–3000 B.C. The Late Archaic–Poverty Point period map (1983:Figure 6.1) showed a general occupation zone, plus major sites and localities of exotic artifact concentration.

For the early ceramic Tchula and Marksville periods, the Morses' maps (1983:Figures 7.1 and 8.1) included both phases and major sites. A similar map for the Baytown period (1983: Figure 9.1) showed ceramic traditions (Baytown and Barnes) rather than phases, and major sites. The early and late Mississippian maps (1983:Figures 10.1 and 12.1) again showed phases and major sites, but the Middle period Mississippian map (1983:Figure 11.1) indicated only sites.

Smith (1986), in his recent article summarizing Southeastern prehistory, presented eight maps (1986:Figures 1.4, 1.6, 1.8, 1.10–1.14) showing locations of sites in his successive time periods. All used a standard base map of modern streams, shorelines, and state boundaries, although two separate maps (1986:Figure 1.2 A–B) showed early and mid/late Holocene vegetation zones and shorelines. Only two of the time period maps showed site clusters or other cultural units above the site level. The first, for the 5000–2500 B.P. period (1986:Figure 1.8) mapped 10 Poverty Point regional clusters (derived from Gibson 1980d:Figure 1) which were basically reduced scale or split versions of Webb's (1977) six.

Smith's map for the 2500–2000 B.P. period (1986:Figure 1.10), unlike all of his other maps, showed the distributions of eight cultural–ceramic regions, two of which (Tchefuncte and Lake Cormorant) impinged upon the present study area. Also unlike his other maps, it did not show individual site locations. However, in the caption, he listed the phases or ceramic complexes included in each region.

Overview Units for Ceramic Periods. A review of the post-Phillips literature reveals that many new phases were defined in the Lower Mississippi Valley. However, his synthesis did not include phases (or foci) already defined in the Trans-Mississippi South, and a number of new phases have been defined in that area since 1970. Even without counting Phillips's (and later defined) phases in the Lower Valley *east* of the Mississippi (and therefore out of the present study area), the total number of phases named (if not adequately defined) within the study area exceeds 200.

Given the requirements of this project for an overview of the study area, it is clear that the phases are too numerous and fine grained to serve as the basic units. The phase level of resolution is too detailed, as we would be dealing with tens to scores of units for most time periods, especially the later ones. Nevertheless, the phases (and indeed, at least the major sites — or rather, components at sites — that make up the phases) must be dealt with. For this purpose, a summary of phases in (or adjacent and relevant to) the study area is presented in Appendix A.

There remains the problem of what kind of basic unit would be best suited for the aims of this overview. Faced with a similar situation, Belmont (1982c:77–78) suggested a more precise and useful redefinition of the archeological culture concept, specifically with reference to the Lower Mississippi Valley situation:

> As archaeological knowledge has increased in the Lower Valley, local sequences have multiplied and phases have become more and more limited in extent. This admirable trend has increased the need for an "intermediate unit" between the phase and such broad concepts as the Mississippian tradition. Rather than introduce a new term, I somewhat reluctantly propose the overworked term *culture* for this unit. A *culture* in this sense may be defined as *a set of phases, contiguous in space and time, sharing substantial similarities in artifact content, settlement pattern and adaptational systems, and differing in the same criteria from surroundingphases or cultures*. [Emphasis in original]

The scale and concept of this unit seem ideal for the purposes of this overview. During any given time period, only a few (usually about four or five, up to a maximum of seven) distinctive cultures can be identified. As will be seen in Chapter 5 through 8, maps showing their approximate locations provide an excellent overview for any one time, and comparisons of consecutive maps give at least a hint of the large scale dynamics of cultures (as defined primarily by artifacts) through time.

As Belmont noted, the culture concept has indeed been overworked. Possibly a more fitting term would be "variant," originally defined by Lehmer (1971:32), working in the Missouri Valley. The variant was redefined by Jenkins and Krause (1986) as a multiphase unit (analogous to Belmont's culture). They applied the variant concept to the prehistory of the Tombigbee watershed in western Alabama and adjacent Mississippi in a series of discussions and maps (1986:30ff, Figures 4, 8, 10, 12, 24).

The word "variant" certainly implies the idea of cultural variation better than "culture," which has certain static connotations. But "variant" has no history of usage in the Lower Valley or Trans-Mississippi South, and its redefinition by Jenkins and Krause (1986:16) was horrendously jargon-laden ("multiphase but not suprainstitutional system–state trajectories"). "Culture" at least has the precedents of previous use in both areas, Belmont's clear and explicit redefinition, and Phillips's (1970:862ff) undefined but repeated usage to assign cultural affiliations to his phases, essentially in the same way and on the same geographic scale as implied by Belmont.

Overview Units for Preceramic Periods. So, at least for the ceramic periods, cultures in Belmont's sense will be defined, mapped, and discussed. For the preceramic periods, the data are scarcer, dating is less secure, periods are significantly longer, artifact assemblages in general contain fewer distinctive types, and diagnostic artifacts generally are found over a much wider geographic range. (There are a few exceptions for which lithic-based cultures can be defined.) Wrestlingwith a similar problem three decades ago, Willey and Phillips (1958:52) stated:

> On the lowest stage, the Lithic, the term “culture” usually refers to single technologies or “assemblages” reflecting a similar economic adjustment shared by a large number of social groups. The content of such a “culture” is seldom sufficiently complete...to suggest that a single homogeneous society is responsible.... It would perhaps be preferable to organize these incomplete data...in terms of phases and traditions, eschewing the term “culture” altogether. We do not really expect this wholesome suggestion to be followed, but, if we could at least eliminate “cultures” represented by a single type of projectile point, it would be progress in the right direction.

Progress has been made in other directions since Willey and Phillips wrote. In some cases, lithic tool kits or at least, consistent assemblages, have been defined, e.g., in the cases of Dalton (Goodyear 1974; Morse and Morse 1983:72ff) and San Patrice (Webb et al. 1971). Also, much more has been learned about preceramic settlement patterns, and some data (mainly comparative, from other regions) are available on preceramic subsistence (cf. Smith 1986).

Still, the data are for the most part inadequate for the definition of cultures analogous to those of the ceramic periods, and this difference should be reflected in the terminology used. Instead of preceramic cultures, a series of lithic horizons will be identified and discussed (in Chapter 5). These horizons will be named after projectile point types or type clusters, and are thus equivalent to the point horizon styles of Morse and Morse (1983:101ff). Our use of the term horizon is adapted from Willey and Phillips (1958:33):

> *a primarily spatial continuity represented by cultural traits and assemblages whose nature and mode of occurrence permit the assumption of a broad and rapid spread*. The archaeological units linked by a horizon are thus assumed to be *approximately* contemporaneous. [emphasis in original]

Willey and Phillips (1958:29–34) primarily had in mind certain very distinctive artifacts, motifs, and cultural practices related to the later prehistoric periods, and marking extremely brief instants of time. They also noted, though, that:

> It is conceivable, however, that other kinds of cultural data might serve equally well to mark horizons.... We have in mind items such as highly specialized artifact types, widely traded objects, new technologies...any kind of archaeological evidence that indicates a rapid spread of ideas over a wide geographic space. (1958:32)

This approaches what is intended here, but it must be emphasized that the lithic horizons of this overview stretch the concept even more. The instants in time that are implied here probably lasted for hundreds of years. It is only in terms of their relative antiquity, on the order of thousands of years before the present, that they can be considered to be brief.

Otherwise, some of the elements of the Willey and Phillips definition fit rather well: the continuity that is recognized here is indeed primarily spatial and the units thus linked can be assumed to be approximately contemporaneous. For example, a Dalton horizon linking northeast Arkansas to southwest Arkansas and portions of Louisiana is assumed to represent contemporaneous peoples with some degree of interaction. However, less is assumed about the temporal continuity and relatedness of successive lithic horizons. In many cases, apparently successive point styles in a given region do not resemble each other closely and have significantly different overall distributions. Sampling error may be a factor, but we are far from controlling this and other sources of variation.

It should also be emphasized at the outset that these horizons or cultures are not considered to be monolithic (or monoceramic!) entities, rather invariant within their own geographic space and temporal span. Instead, they should be considered as polythetic sets or clusters of artifact assemblages (phases, in the case of the cultures), similar in many or most, but not all, attributes, through their allotted time and within their space. Instead of their being invariant, it is suggested that the artifact differences and other variations *within* a given horizon or culture is less than that *between* it and any of its geographic neighbors, and that these characteristics have generally been recognized by archeologists familiar with the regions in question.

Relationship to Adaptation Types. The final chapter of this overview will synthesize the cultural variation of the study area in terms of adaptation types, summarizing both the archeological and physical anthropological (bioarcheological) data. The lithic horizons and archeological cultures discussed below are the initial steps in the definition of adaptation types. As implied in Belmont’s (1982c:77–78) redefinition (quoted above) of the culture concept, the primary criteria used to define both horizons and cultures are artifacts and styles. The secondary and tertiary archeological criteria are settlement pattern data (on a variety of spatial scales) and subsistence data. (Belmont’s phrase for the third criterion, “adaptational systems,” is more inclusive and anticipates the final synthesis of the present study.)

The preceramic periods will not contribute substantially to the definition of adaptation types. Too often, the lithic horizons are only that, with inadequate settlement pattern data and little or no subsistence data. Even more telling is the relative scarcity of bioanthropological data from these periods (see Chapters 10 and 11).

Particularly in the cases of the archeological cultures, suggestions can be made as to the degree of relatedness or continuity between units, both in time and geographic space. For example, an essential continuity is generally believed to have obtained through time in eastern Louisiana and adjacent regions, from Troyville culture though Coles Creek, Plaquemine, and Natchezan culture (Neuman 1984a), but a major, rapid transition apparently occurred between the Baytown and Emergent Mississippian cultures in northeast Arkansas (Morse and Morse 1983:202), and significant demographic disruptions occurred in the Lower Valley in late prehistoric and Protohistoric times (Brain 1978:350; Dye 1986). Or, during the A.D. 700–1000 period, the Plum Bayou culture of eastern Arkansas was probably much more closely related to Coles Creek culture of adjacent Louisiana and Mississippi than to the Emergent Mississippian culture in northeast Arkansas.

Special attention should be called to an innovation in cultural classification in this overview. Throughout the time periods, the coastal zone of Louisiana, including both the Deltaic Plains and the Chenier Plains, is tentatively set apart culturally. For any given period, a coastal variant of the predominant inland culture that has traditionally included the coast will be defined, e.g., a Coastal Coles Creek culture.

This is based on a perception that a significantly different adaptation type —a coastal adaptation — prevailed in this zone throughout much, if not all, of prehistory. This adaptation is reflected in the clearly different site types (e.g., *Rangia* shell middens), the existence of a coastal literature (e.g., McIntire 1958; Gagliano and Saucier 1963; Neuman 1977; papers in Davis 1984), unusual burial practices and bioanthropological findings (Robbins 1976; Neuman 1984a:198ff; Rose, personal communication), sometimes distinctive artifact assemblages or types (e.g., lack of cord-marked and presence of check-stamped pottery; Phillips 1970:911, 921; Brown 1981b), and the general consensus among Louisiana archeologists (e.g., Robert Neuman, Jon Gibson, Dave Davis, Richard Weinstein, personal communications) that the coastal zone is indeed different in many ways.

Such a cultural distinction has in fact been hinted at in the literature on several occasions. Phillips (1970:923) remarked that “we may not be able to extend Coles Creek [culture] so far south as previously supposed.” Belmont (1982c:79) stated that “To the west, east, and south, the cultures coeval with Troyville are essentially unknown.” And Shenkel (1984:65) has suggested that a basic adaptive pattern was developed by coastal Tchefuncte peoples and maintained by all subsequent coastal populations.

Here, we take the logical next step of a trial formulation. If this tentative distinction is rejected, our use of the traditional culture names after the coastal qualifier will have done little harm. If it is accepted for any or all periods, perhaps new culture names will emerge from the marshes.

As seen here, the horizons and (especially) cultures defined by archeological criteria (stylistics, settlement, subsistence) represent hypotheses about cultural continuity, similarities and differences, with the potential to be tested independently by the bioanthropological data. The latter summarize the ultimate results of adaptations, in terms of demographics, health, and disease. The resulting adaptation types may be said to represent an elaboration of the stage concept used as the basic unit in the synthesis of New World prehistory by Willey and Phillips (1958:64ff). The major differences here are the addition of bioanthropological data and additional archeological subsistence and settlement data.

It is expected that, on the one hand (and like the stages), the adaptation types will often transcend the primarily stylistic cultural boundaries. Peoples who made significantly different types of pottery and other artifacts (and, who may have lived at significantly different times, in distant places) may well have had quite similar adaptation types. On the other hand, some of the cultural boundaries may well coincide with significant adaptational transitions, and it is at least possible that significant bioanthropological variation may be found within an archeologically defined culture.

The task of this overview is to provide the first overall comparison of these independent lines of evidence for this study area, and at least a preliminary evaluation of cases of congruence and noncongruence between the distinctions made by archeological and physical anthropological means. With this in mind, we begin the culture–historical review.

LITHIC HORIZONS AND EARLY CULTURES

Marvin D. Jeter and G. Ishmael Williams, Jr.

This chapter will present definitions and discussions, with maps when appropriate, of the lithic horizons and early (largely if not totally lithic-based) cultures of the study area. It will begin with a summary of the controversial and at least partly hypothetical concepts of Pre-Fluted Point occupations. Next, the generally accepted Paleo-Indian through Archaic sequences will be discussed. The chapter concludes with summaries of Poverty Point and coeval Terminal Archaic manifestations.

THE PRE-10,500 B.C. PERIOD

The transition from the Pleistocene "Ice Age" to the Holocene was a complex process rather than a brief event (Porter 1983; Wright 1983; Meltzer and Mead 1983:130), but it does appear to have been a relatively rapid process from the perspective of geological time. In the Central and Lower Mississippi Valley and contiguous southeastern U.S., at least, a really significant climatic amelioration, accompanied by related changes in vegetation, animal distributions, and other aspects of ecology and biogeography, seems to have begun by around 12,500 years ago, or about 10,500 B.C. (Delcourt et al. 1980:112).

This chronological datum was used by Smith (1986), in his review of Southeastern prehistory, as a starting point for a "natural" series of Holocene time periods, in an effort to get away from the difficulties of dealing with cultural periods. In light of the statistical uncertainties associated with radiocarbon dating and the lack of tree-ring calibration of radiocarbon years vs. calendrical years this far back into the past, it could be argued that a more obviously round figure, such as 10,000 B.C., should be used (cf. Porter 1983). As will be seen, though, the extra 500 years in the 10,500 B.C. figure conveniently allows us a little more time, which is apparently necessary, to include the earliest generally accepted arrivals in the Southeast in the Holocene rather than the Pleistocene.

Paleoenvironmental Data. Delcourt and Delcourt (1981: 141ff; Figures 3, 4, 5, and 6) produced detailed paleovegetation maps for eastern North America as of about 40,000 B.P. (ca 38,000 B.C.), 25,000 B.P. (ca 23,000 B.C.), 18,000 B.P. (ca 16,000 B.C.), 14,000 B.P. (ca 12,000 B.C.), and 10,000 B.P. (ca 8000 B.C.) which are relevant to the present discussion. They indicate the general environmental situations that would have been encountered by any truly early arrivals to this area.

The earliest of these maps shows the Laurentide continental ice sheet at around 38,000 B.C., extending southward into the present Great Lakes region. The Lower Mississippi Valley is mapped as Cypress–Gum Forest (the cypress being baldcypress), with the immediately flanking uplands and Crowley's Ridge mapped as Mixed Hardwoods and the Trans–Mississippi South mapped as Oak–Hickory–Southern Pine Forest flanked by Oak Savannah on the north and west. The second map shows the ice sheet at around 23,000 B.C., having retreated slightly in the Great Lakes region but moved farther southward in the New England region, with similar vegetation in and near the present study area.

The third map shows the maximum Late Wisconsinan continental glaciation, about 16,000 B.C., with the ice sheet extending southward beyond the Great Lakes, well into east-central Illinois and adjacent Indiana. Sea level was depressed at least 100 m below the present level due to the great volume of water locked up in the glaciers, resulting in approximately a doubling of the subaerially exposed area of the Florida peninsula (with virtually all of the increase on the Gulf side), and a significant expansion of subaerially exposed terrain which is now under water off the Gulf coasts of Louisiana and adjacent states.

It may have been about or shortly before this time that the braided Mississippi River, perhaps in response to increased volume of glacial outwash, abandoned the Western Lowlands to occupy the Eastern Lowlands (Saucier 1974:19). In a major (and possibly related?) vegetation change, the cypress-gum association of the Lower Mississippi Valley was replaced by an unusual ecotype of Spruce Forest extending all the way to the Gulf. White spruce and larch were apparently isolated on "extensive sand flats of braided streams" in the southern part of the Valley. The flanking Mixed Hardwoods remained more or less in place. The Oak–Hickory–Southern Pine Forest shifted its northern border slightly southward, and extended its southern extent onto the newly exposed coastwise terrain. The Oak Savannah, however, was also dramatically replaced, by a Spruce–Jack Pine Forest covering the Great Plains, the unglaciated Midwest, and the Ozark and Ouachita mountains (Delcourt and Delcourt 1981:145).

The fourth map shows the results, around 12,000 B.C., of a minor climatic warming that had begun around 14,500 B.C. The ice sheet had retreated about to the present Great Lakes, but remained continuous across Canada and the northern U.S. The Gulf coastlines had receded almost to their present locations. The vegetation patterns in and near the present study area remained about the same as at 16,000 B.C.

The fifth map, though depicting a time (ca 8000 B.C.) later than the span considered in the present subsection, is relevant, as it indicates the trends of the changes which took place after 12,000 B.C. As already noted, a major climatic amelioration began around 10,500 B.C.; the Lower Valley Spruce Forest began to be replaced by Cypress–Gum Forest (Delcourt and

Delcourt 1981:147). Also about this time, an ice-free corridor was opening between the continental ice sheets (Haynes 1987: 83–84; see below). The Spruce–Jack Pine Forest of the Plains and northern portions of the present study area was replaced by several different vegetation communities. In northern and western Arkansas and the southern Midwest, an Oak–Chestnut Forest developed. To the west of the present study area, along the eastern margin of the Plains, a narrow north-south front of Oak Savannah reappeared, this time with Prairie to the west. The Oak–Hickory–Southern Pine Forest remained in place on the Coastal Plain, and expanded its northern border somewhat northward.

The Earliest Arrivals Controversy. American archeologists have been investigating and debating the early man or earliest peopling of the New World question for many decades (cf. Willey and Phillips 1958:79ff; Krieger 1964), but the question remains controversial and unresolved. Claims have been made for late Pleistocene pre-Clovis or pre-Paleo-Indian sites in both North and South America (Bryan 1978; Ericson et al. 1982), but none are universally accepted.

In 1977, intensive claims for a really early North American site were made on behalf of the Meadowcroft Rockshelter in southwestern Pennsylvania (e.g., Adovasio et al. 1977), where radiocarbon dates well in excess of 15,000 B.C. were obtained on materials apparently associated with cultural remains. However, the Meadowcroft dates and interpretations were challenged on the basis of possible contamination by coal particles, absence of the expected extinct Pleistocene fauna, presence of hardwood forest macrofossils rather than the expected periglacial species, and on other counts (Haynes 1980, 1987:87; Dincauze 1981).

The conservative position, that there is no convincing evidence of a human presence in the New World before about 10,500 B.C., has been advocated most effectively in recent years by C. Vance Haynes of the University of Arizona and Frederick H. West, editor of the *Quarterly Review of Archaeology*. Reference is made to their publications (e.g., Haynes 1980, 1987; West 1986, 1987) and those of their associates (e.g., Colinvaux and West 1984; Turner 1985) for a general perspective on this position.

No serious claims have been made for any putative pre-Clovis sites in Arkansas. Schambach and Early (1982:SW26ff) reviewed the most likely possibilities for landforms where such sites might be found in southwest Arkansas. Morse and Morse (1983:50ff) summarized finds of late Pleistocene megafauna (not associated with artifacts) in and near northeast Arkansas, and Hemmings (1982c) summarized finds of megafauna in the Great Bend region of the Red River Valley in southwest Arkansas.

In Louisiana, a series of studies of possible early remains, including extinct fauna, at Avery Island was made by Gagliano (1964, 1967, 1970), who also reported finding *Rangia* clamshells in a sandy-ashy matrix suggesting a possible hearth, with an estimated date around 10,000 B.C. However, after reviewing this evidence, Neuman (1984:64) concluded that neither the presence of a Paleo-Indian component, nor a pre-Clovis component, nor association of people with extinct animals, had been convincingly demonstrated. Gibson and Miller (1973) reported on a mastodon find at Lafayette, but Neuman (1984: 65–66) also expressed doubt about this as a pre-Clovis, or even a Paleo-Indian, find, noting that no definite association had been documented. Other finds of extinct animal remains, not associated with cultural materials, in south-central and southeast Louisiana, were summarized by Coastal Environments, Inc. (1977:320–323).

Any assessment of the possibility of pre-Paleo remains (or indeed, of Paleo-Indian and Archaic remains) in the coastal zone of Louisiana must take into consideration the dynamic role of environmental factors with regard to preservation and discovery potentials. As discussed in Chapter 2, the coastal zone has undergone major changes during the late Quaternary, which may have buried, drowned, altered, or destroyed such evidence (cf. Gagliano 1984).

Also worthy of note is the nineteenth-century Natchez pelvis find. Although the location is not within the present overview area, it is quite close to it, and quite intriguing. In 1846, the antiquarian Dr. Montroeville W. Dickeson reported an alleged find of a human pelvis fragment beneath extinct faunal materials and beneath the loess deposits near Natchez. The pelvis and animal remains were tested for fluorine content in 1895, and found to have approximately equal proportions of this element (Neuman 1984:59–61). A review of the geological evidence of the age of the loess suggested that the alleged find-spot was in a stratigraphic position that should date between 20,000 and 16,000 B.C. (Coastal Environments, Inc. 1977:214–218). No further finds of human skeletal material or artifacts have been made in similar contexts in the intervening decades, however.

Here, the pre-10,500 B.C. period has been given rather short shrift because of the lack of conclusive evidence for any occupation in or near the present study area dating before 10,500 B.C. For the moment, at least, the conservative position has been taken.

THE 10,500–7000 B.C. PERIOD

The beginning of this period coincides with that of Smith's (1986) Early Holocene period, which he placed at 12,500–8000 years before the present, or ca 10,500–6000 B.C. However, the ending date used here has been set at 7000 B.C. This span of time begins with the terminal Pleistocene–initial Holocene climatic transition, which resulted in highly significant vegetation changes (probably beginning as early as 10,500 B.C.; Delcourt et al. 1980:112; Delcourt and Delcourt 1981) and may well have been the major factor in the extinction of the Pleistocene megafauna. The contributions of Paleo-Indian hunters to these extinctions are still debated and still unresolved (Meltzer and Mead 1983; Martin and Klein 1984). In any event, it appears likely that some, perhaps most, of the major species extinctions occurred during or slightly before this period; none are unequivocally dated after 8000 B.C. (Meltzer and Mead 1983).

This period is divided here into a series of lithic horizons which are broadly defined and almost certainly overlap chronologically and geographically to some extent. They will be discussed below in chronological order of estimated beginning dates.

Pre-Fluted Point Horizon(s) 10,500–9500 B.C.

Although no sites in or near the present study area have been attributed to this hypothetical horizon, it must be included as a logical possibility. It does appear likely that there was some occupation of these and nearby regions shortly before 9500 B.C., or even 10,000 B.C., on the basis of comparative evidence from Alaska, the Plains, and Florida. The ice-free corridor leading southward from Beringia (the unglaciated refuge extending from Siberia through central Alaska) between the retreating continental glaciers toward the High Plains probably opened between about 11,000 and 10,000 B.C. This lengthy passageway was probably truly habitable by around 10,000 B.C. (Haynes 1987:83–84).

The general environmental trends in and near the present study area between about 12,000 and 8000 B.C. have been summarized above. Again, attention should be called to the major climatic amelioration and its results, beginning around 10,500 B.C.

During all of the period under consideration here, the Mississippi River flowed through the Eastern Lowlands in a braided-stream configuration. About 10,000 B.C., though, it appears that the river changed abruptly to a meandering regime below present-day Baton Rouge and started forming extensive backswamps in the Atchafalaya Basin, possibly in response to a sharp increase in the rate of sea level rise. The average floodplain level south of Baton Rouge was probably some 25 m (75–80 ft) lower than at present, and only north of Memphis was it higher than at present (Saucier 1974:19–20).

It was recently believed that the Arkansas River had also changed from a braided to a meandering regime about 10,000 B.C. (Saucier 1974:20), but it is now open to question whether that river ever was in a braided mode in the late Pleistocene (Autin n.d.; Saucier, personal communication). The floodplains of both the Arkansas and Red rivers at this time were probably 3 to 5 m (ca 10–15 ft) lower than at present (Saucier 1974:20), and they have been slowly aggrading ever since.

Haynes (1987:83) has recently emphasized the critical importance of the period ca 10,000–9500 B.C. as “the half millennium immediately preceding the earliest known Clovis sites.” He notes that the Nenana lithic complex of central Alaska, which dates to this period, includes unfluted projectile points and other tools with close similarities to those found in Paleo-Indian assemblages on the High Plains with fluted Clovis points. He also notes that some evidence exists on the Plains for nonfluted points dating around 9340 B.C., approximately coeval with or slightly earlier than early Clovis points (1987:85, Figure 1), and for a nondiagnostic and culturally unidentified pre-Folsom component at the Agate Basin site on the Plains with good dates averaging about 9650 B.C., slightly earlier than any yet obtained for Clovis points, though they may well represent a Clovis component (1987:88, Figure 1; cf., Frison and Stanford 1982:178, Table 2.2). He concludes that fluted points were probably invented after the Paleo-Indian hunters had passed beyond the remains of the ice barrier.

Also, a radiocarbon date of about 10,080 B.C. has been obtained on a wooden spear in association with extinct fauna at Little Salt Spring, an apparent Paleo-Indian hunting camp (now submerged) in southern Florida (Clausen et al. 1979; Steponaitis 1986:367–369). No fluted points were found in association.

The Fluted Point Horizons ca 9500–8000 B.C.

Lanceolate projectile points with longitudinal flake scars (flutes) on one or both faces are generally recognized as the earliest truly diagnostic artifacts in the New World. They are most reliably radiocarbon dated to the period between about 9500 and 8000 B.C. (Haynes 1987:Figure 1), and were quite probably invented south of the ice-free passage and the waning continental glaciers (1987:83, 85, 90–91). They have been found over most of the U.S., quite commonly in the Plains and Southwest, and especially near the major rivers of the East and Southeast (Mason 1962; Williams and Stoltman 1965; Goodyear et al. 1979). Goodyear (1982:389) has remarked, “Given the often-cited abundance of fluted points in the Southeast, and the earlier chronological estimation of Dalton [which he suggested to be as early as 8500 B.C.; see below], fluted points may turn out to be surprisingly early in the Southeast.”

The two prototypical fluted point types are Clovis and Folsom, both named for type sites in eastern New Mexico. Clovis points are generally large lanceolate points and are most reliably dated to the period between 9500 and 9000 B.C., with a few earlier and later outliers (Haynes 1987:Figure 1). Folsom points tend to be smaller and more delicately made and have been dated most reliably between about 9000 and 8000 B.C. (1987:Figure 1).

Although a number of sites in the western U.S. have produced evidence of Clovis and Folsom points directly associated with extinct megafauna, it was not until 1979–80 that such a site was excavated in the eastern U.S. At the Kimmswick salt springs south of St. Louis, Clovis-like fluted points were found in stratigraphic association with a bone deposit which included mastodon remains (Graham et al. 1981).

According to Saucier’s (1974:19–20) reconstruction, which is unchanged in the revised version (Autin n.d.), the Mississippi River would have been in a braided configuration in the Eastern Lowlands during the fluted-point horizon times, with the transition zone between braided and meandering regimes gradually trending upriver from the present Baton Rouge vicinity. During at least some of this time, the main flow of the river was probably as far east as the eastern margin of the Yazoo Basin in west-central Mississippi (Saucier 1974:Figure 1). The Arkansas River may have been in its earliest meander belt (No. 1 in the 1974 version; No. 7 in the revised version), at its northeasternmost location along the southwest margin of the Grand Prairie in east-central Arkansas. The Red River’s course is unknown at this time.

By around 10,500 B.C., or well before the time of fluted point use, the vegetation of the study area, especially in the Lower Mississippi Valley, had begun to respond to the climatic amelioration. During the period of Paleo-Indian occupation, the Lower Valley was probably undergoing a transition from Spruce Forest to Cypress–Gum Forest with the general trend probably being from south to north (quite possibly correlated with the south-north extension of the meandering regime, which would have produced oxbow lakes which are favored habitats for baldcypress trees today).

The Arkansas site file data base (AMASDA) includes listings of 121 Paleo-Indian components in Arkansas. It should be noted that this category includes both fluted and nonfluted point finds and may also include some misclassifications. These are scattered across the state, with concentrations in northeast Arkansas, northwest Arkansas, south-central Arkansas, and southwest Arkansas.

According to Morse and Morse (1983:60), about 100 fluted points are known to have been found in northeast Arkansas. Most of these are a Clovis-like form, regionally known as the Crowley's Ridge point (1983:61–63, Figure 3.7a–c). Also present is a Folsom-like form, regionally known as the Sedgwick point (1983:63, Figure 3.7e–h), and a number of other variants are known. The two major concentrations of fluted point finds in these regions are along the eastern margin of Crowley's Ridge, and along the escarpments overlooking the Cache River in the Western Lowlands. All of these are surface finds.

No fluted point finds have been documented in southeast Arkansas, south of the Arkansas River and east of the Ouachita River (Jeter 1982a:87). In south-central and southwest Arkansas, Schambach and Early (1982:SW31ff) noted that fluted point finds have been primarily made on formerly cleared uplands and terraces. Again, only surface finds are known; no excavated sites in Arkansas have produced in situ Paleo-Indian deposits.

In Louisiana, the known Paleo-Indian components are definitely concentrated in the northern part of the state. Figures based on site file data from the early 1980s, as tabulated in the Louisiana CAP (Smith et al. 1983:Tables 1-5), show concentrations in northwest and northeast Louisiana. This may reflect the actual situation to some extent, but an element of chance is also definitely present.

The northwest Louisiana concentration in Caddo and Bossier parishes is at least partly a function of more than a half-century of persistent investigations by Webb (e.g., Webb 1948) and additional investigations for more than 20 years by Gregory (1963; Gagliano and Gregory 1965), based nearby. The major surface finds of lanceolate points in northwest Louisiana have occurred on terraces along the larger streams (Webb 1981:3). Gregory and Curry (1978:22) also reported finds of Clovis points along the Kisatchie Wold uplands which trend across southern Natchitoches Parish. The lesser concentration in northeast Louisiana derives at least in part from the work of the Dalton survey on Macon Ridge (Redfield 1962).

A few rare and scattered Clovis-like points have been found in the uplands and on the Prairie terrace in the Florida Parishes of southeast Louisiana (Gagliano 1963:112, Figure 4a–c). Paleo-Indian points have also been found along old beach ridges north of Lake Pontchartrain and within the old delta area of the Tangipahoa River, which flows into the Pontchartrain Basin (Coastal Environments, Inc. 1977:322–323).

At present, knowledge of the earlier prehistory of Louisiana comes almost exclusively from sites landward from the presently active shore zone, which dates to the time of sea level stabilization, about 2000 to 1500 B.C. Terminal Archaic and Poverty Point sites are generally the earliest that can be detected at or near the surface of present-day coastal landforms. This scarcity of data on early prehistoric use of what was then the coastal zone means that predictive models will have to draw on studies from outside the present overview area, and from underwater research in Louisiana and the general Gulf Coast region (e.g., Coastal Environments, Inc. 1977).

Although sites are situated in or near the present shore zone, with only a few exceptions their locations were well inland from the actual shoreline when they were occupied. They owe their present coastal character to landward retreat of the shoreline as a result of rising sea level. One of the apparent exceptions is the Garcia site in Orleans Parish, where unfluted Clovis and Dalton points have been reported (Gagliano and Saucier 1963).

Paleo-Indian points have not been found in the geologically recent Chenier Plain of southwest Louisiana. However, scattered Paleo-Indian points (types unspecified) have been reported from Pecan Island in Vermilion Parish; this is a relict chenier that appears to be in one of the oldest beach-ridge complexes in this region (Coastal Environments, Inc. 1977: 249).

Unlike the Arkansas situation, in Louisiana a few Paleo-Indian materials have been recovered in situ by controlled excavations. The first such finds were made in extreme southern Caddo Parish at the John Pearce site (Webb et al. 1971), best known for its San Patrice component or components. However, it also produced two fluted lanceolate points found together in a possible pit feature (1971:7, 17–19, Figure 7d–e). Both were Clovis-like, although one was somewhat variant in shape and the other was relatively very small. No animal or vegetal remains attributable to this component were found.

At the Eagle Hill site in extreme southeastern Sabine Parish, on Peason Ridge just south of the Kisatchie Wold, excavations again revealed a San Patrice occupation, but there was also some evidence for a Folsom-like component (Gunn and Brown 1982:233, Plate 8; Servello 1983). Campbell and Weed (1986: 9–10) concurred that the Eagle Hill specimens are morphologically like Folsom points from the western U.S.

In the general absence of preserved animal or vegetal remains, little can be said about specific environments of Paleo-

Indian fluted point hunters in the study area, or about their exploitation of those environments. Most archeologists who have considered the matter of Paleo-Indian subsistence, though, doubt that these people, especially in the Southeast, depended primarily on the megafaunal species (Morse and Morse 1983: 67; Steponaitis 1986:369). Gregory and Curry (1978:22) suggested that a tendency for fluted point finds to be made in ecotonal locations in northwest Louisiana might indicate a broadly based subsistence pattern.

Settlement pattern data are unsystematic, based largely on surface finds with a large element of chance involved (especially, preservation of landforms of the proper age, and some land clearance, erosion, or disturbance to expose the cultural materials). Morse and Morse (1983:68) suggested that two band territories might be involved in northeast Arkansas, along either side of Crowley's Ridge. In a more wide ranging and speculative reconstruction, Anderson et al. (1988:60, Figure 22) hypothesized five Paleo-Indian macroband territories covering portions of Louisiana and adjacent states, but noted that typological refinements and comparative analyses would be necessary to test this conjecture.

Similarly, little in the way of systematic work has been done on evidence for Paleo-Indian lithic procurement and/or exchange in these regions. Schambach and Early (1982:SE35) noted that most of the fluted points found in southwest Arkansas were made of novaculite from the Ouachita Mountains. Neuman (1984:68) stated that the vast majority of lanceolate points found in Louisiana are made either of flints which are probably from Texas or from Arkansas novaculite. Further study of the distribution and recycling of such artifacts, with reference to Goodyear's (1979) hypothesis of use of high-quality lithic materials by mobile Paleo-Indian groups, would be useful. In Mississippi, McGahey (1987) compiled a brief but useful summary of the distribution of fluted points and other early types made of exotic and local materials, and similar summaries should be compiled for Arkansas and Louisiana. McGahey's distribution maps suggest that the distribution of certain exotic raw materials may be related to the then-extant course(s) of the Mississippi River.

Paleo-Indian Unfluted Lanceolate Point Horizons (ca 9000–7000 B.C.?)

In both Arkansas and Louisiana, a number of unfluted lanceolate points, resembling specimens found and typed elsewhere in Paleo-Indian contexts, have been found. None of these point types has been dated in or near the present study area, but it is a reasonable guess that they have at least some overlap with the fluted point tradition. Possibly, some of them date as early as 9000 B.C., and some date as late as 7000 B.C. Some of them could, of course, be unfluted points made by the makers of Clovis-like fluted points; some could even be pre-Clovis.

The name "Coldwater" was imported from the earlier Mississippi literature (Brown 1926) by the Morses (1983:65) as a generic name for unfluted lanceolate points in and near northeast Arkansas. These points have not been dated, but the Morses suggested that they may have some temporal and cultural overlap with the Dalton complex, or may bridge the fluted point–Dalton transition. Neither the Coldwater type nor similar points have been documented in southeast Arkansas.

The Plainview unfluted lanceolate point type, which at least superficially resembles the Coldwater type, has been found in the Texas Panhandle and elsewhere on the Plains in association with extinct bison. Plainview-like points have been found occasionally in northwest Louisiana (Webb 1981:4). Although Webb gave an estimate of about 7000–6000 B.C. for these points, the Plainview prototype is dated significantly earlier than that on the Plains. Wheat (1972:156–158) indicated that Plainview points dated between 8500 and 7500 B.C. Later research in the Texas Panhandle resulted in an estimated date of about 10,000 B.P., i.e., 8000 B.C. (Johnson and Holliday 1980; Holliday and Johnson 1981; Holliday 1985:396). Gagliano (1963:112, Figures 3 and 5B) typed an unfluted lanceolate point found in East Baton Rouge Parish as a Plainview. Similar points found in west-central Louisiana during the Fort Polk surveys were redefined as Coastview points by Gunn and Kerr (1984) to differentiate them as a possible Louisiana variant. Campbell and Weed (1986:9–7, 9–8) also argued against applying Western names to Louisiana point types (cf. Anderson et al. 1988:60).

There may well have been eastward movements or range expansions of Plains-based peoples during late Paleo-Indian and/or Early Archaic times. Wyckoff (1985) suggested that such expansions were correlated with an eastward spread of prairie and savannah habitats beginning about 8000 B.C.

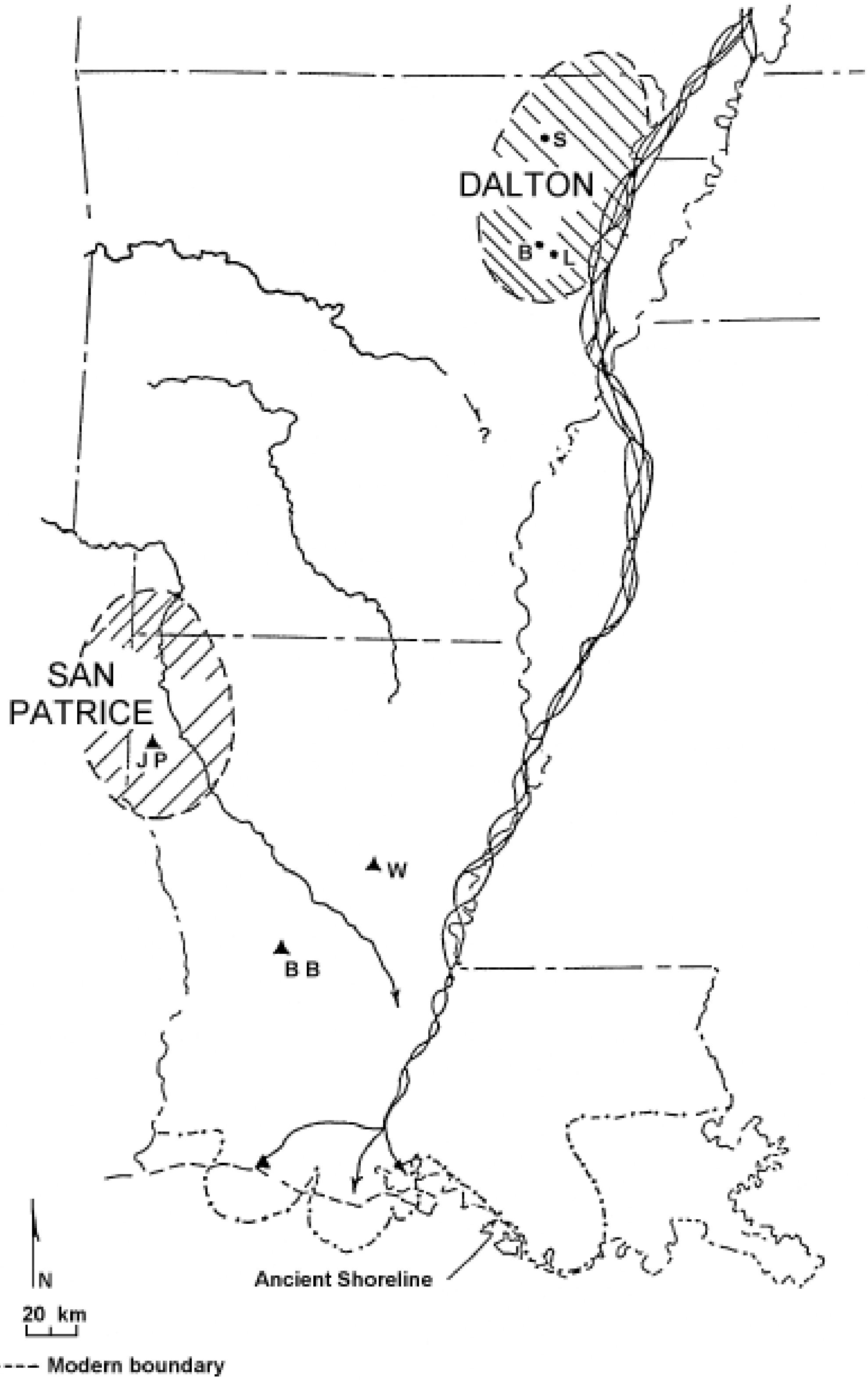
The Agate Basin-like Horizon (ca 8500–8000 B.C.?)

The Morses noted (1983:64) the presence in northeast Arkansas of a few points resembling the Agate Basin type of the northern Plains, but they cautioned against the assumption that such Plains type names (and the associated chronological implications) can be extended into Arkansas. (This caution has been reiterated by Dan Morse and Marvin Kay; personal communications).

On the Plains, the prototypical Agate Basin points are variable in workmanship and form, but often quite long and beautifully pressure-flaked at a right angle to the long axis (Frison 1978: 156–161; Bradley 1982; Frison and Stanford 1982:80–107). They have been radiocarbon dated to around 8500–8000 B.C. (Frison 1978:31; Frison and Stanford 1982:366), and there is some evidence for technological and cultural continuity between Folsom and Agate Basin points and assemblages (Bradley 1982; Frison and Stanford 1982:366–367; Shelley and Agogino 1983).

The Dalton Horizon ca 8500–7500 B.C. (Figure 6)

Largely due to continuing investigations over the past two decades by D. Morse (e.g., 1969, 1971a, 1971b, 1973a) and his associates (e.g., Morse and Goodyear 1973; Goodyear 1974;



Key: **Dalton sites:** B = Brand; L = Lace; S = Sloan.
San Patrice site: JP = John Pearce.
Other sites with Dalton and/or San Patrice components: BB = Brushley Bayou; W = Whatley.

Figure 6. Map of cultural concentrations and key sites in the study area ca 8000–7500 B.C. In addition, Dalton and San Patrice sites are found in most parts of the study area where landforms are sufficiently ancient.

Morse and Morse 1983:70ff) in northeast Arkansas (and, of course, due also to the relative abundance of Dalton sites in that macroregion), much more is known about Dalton culture than about any other early lithic horizon. For this reason, the present discussion will be more formalized than those of most of the other early lithic horizons, and will be cast into the framework of subheadings used for the later cultures of the ceramic periods.

Definition and Location. Dalton culture was originally defined on the basis of Missouri finds in the 1930s and 1940s by an amateur, Judge S. P. Dalton of Jefferson City (C. Chapman 1948:138; Dalton 1960). Although the original collections and assemblage descriptions included some extraneous and unrelated materials, subsequent research has resulted in a well defined Dalton tool kit.

The concept of Dalton points as distinctive indicators of a widespread early type was soon enhanced by reports of major postwar excavations which found them in stratigraphically early contexts, e.g., at Graham Cave in Missouri (Logan 1952; Klippel 1971), the Modoc Rock Shelter in southwestern Illinois (Fowler 1959), the Stanfield–Worley bluff shelter in northwest Alabama (DeJarnette et al. 1962), and the Hardaway site in the North Carolina Piedmont (Coe 1964:63ff, 120).

Later excavations, analyses, and experimental replications, particularly those related to Rodgers Shelter in Missouri (Ahler 1971, 1976; Ahler and McMillan 1976; McMillan 1976), the Brand and Sloan sites in northeast Arkansas (Goodyear 1974; Morse 1975c, 1982; Morse and Morse 1983:84ff, 89ff), and deeply stratified sites in the Little Tennessee River Valley (J. Chapman 1977), clarified the stratigraphic and chronological position of Dalton remains, the nature of Dalton technology, and the adaptations of Dalton peoples to the evolving environment. As noted by Goodyear (1982:382), Dalton has been variously classified as late Paleo-Indian, Early Archaic, or transitional between the two. Probably little in the way of understanding can been gained through such taxonomic pigeonholing, though.

On the basis of radiocarbon dates from clearly stratified open sites, Goodyear (1982) argued that the Dalton horizon dates between about 8500 and 7900 B.C. rather than the previous estimates of about 8000 to 6000 B.C. that were based largely on dates from caves and shelters, which are inherently more susceptible to mixing. The Morses (1983:70ff) allowed a slightly longer time span with their estimate of 8500 to 7500 B.C., which is used here.

The general acceptance of this early beginning date for the Dalton tradition suggests some overlap and continuity with the fluted point tradition. The early stage Dalton points are indeed lanceolate in outline, with concave bases and basal thinning (Morse and Morse 1983:72ff, Figures 4.2b, 4.5). Analyses and replications of Sloan site Dalton points by Bruce Bradley indicated that many Dalton points were fluted early in the manufacturing process, but that the flute-like scars were virtually obliterated by subsequent flaking (Dan Morse, 1987 personal communication). The possible continuity of Clovis-like fluted points, Coldwater unfluted lanceolates, and Dalton points was noted above. Viewing Dalton evolution and distribution in their entirety, Myers and Lambert (1983:112–113) suggested a possible transition from Eastern Clovis forms to Dalton forms.

On the basis of data from a northeast Oklahoma site salvaged before flooding in the early 1960s, Wyckoff (1985) argued that at least some Dalton components date after about 7400 B.C., and that the inferred persistence of the Dalton style for more than a millennium invalidates the concept of a Dalton horizon (1985:21). However, there is a possibility of reversed stratigraphy at the key site, which is no longer accessible (Marvin Kay, 1987 personal communication). The Morses (1983: 104ff) noted that although they believed classic Dalton points ceased being made between 8000 and 7500 B.C., a possibly late or transitional "eared" form was known, along with another possibly late variant resembling the San Patrice point type, so "the change from Dalton to the next period was not necessarily sudden."

The Dalton tool kit was thoroughly described by Goodyear (1974:19–76) and summarized by Morse and Morse (1983:71–79). The most distinctive element in this assemblage is the Dalton point itself, which actually functioned primarily as a hafted knife. Properly, these artifacts should be called Dalton points/knives and the point/knife appellation should also be applied to many if not most of the subsequent Archaic and post-Archaic dart points which also probably functioned mainly or partly as hafted knives. In the following descriptions, however, the term "Dalton point(s)" will be used for the sake of convenience.

This multiple-use point/knife concept was emphasized as an important techno-functional innovation, e.g., by Goodyear et al. (1979:99), who noted that it represents an important change from the earlier fluted point tradition which emphasized retipping but not lateral edge resharpening. The sequential stages of resharpening change the shape of an unbroken Dalton point from lanceolate to the familiar steeple-shaped outline, and ultimately to a drill or perforator form (1974:Figures 11 and 12; 1983:Figures 4.2 and 4.3). Broken or exhausted Dalton points were often recycled as scrapers and other tools.

The remaining items in the tool kit include the Dalton adz, a series of unifacial tools, *pieces esquilles* (probably wedges for splitting bone and/or antler) and other items produced by bipolar percussion, cobble tools, and abraders. The adz is of particular interest, as it was probably used in a variety of woodworking tasks, from making dugout canoes to preparing small utensils, and may signal an adaptation to exploiting resources of the expanding hardwood forests (Morse and Goodyear 1973; Morse and Morse 1983:75, 78, Figure 4.2i–j).

The Arkansas site files data base (AMASDA) counts of Dalton components by Arkansas counties, predictably, show the major concentration in northeast Arkansas, with relatively high counts in Clay, Craighead, and Lawrence counties. However, these counts of recorded components fall far short of the Morses' (1983:71, 80) statements that almost 1,000 Dalton components are known in their Central Mississippi Valley area, and that most of these are in northeast Arkansas. Also, the AMASDA data do not necessarily represent the true major concentrations of intensive Dalton occupations.

According to Dan Morse (personal communication), the major Dalton concentrations are in Poinsett, Craighead and Lawrence counties, with secondary concentrations in Jackson and Cross counties. All of these counties contain significant portions of the Western Lowlands, which consist largely of Late Pleistocene Mississippi River braided-stream deposits, now (and in Dalton times) traversed by the L'Anguille and/or Cache river valleys. These deposits have been largely cleared during the twentieth century and eroded (and/or leveled) by agricultural practices, exposing large areas of Dalton-age surfaces, a very unusual situation.

The AMASDA files also indicate a Dalton concentration in Pulaski County, but this is at least partially due to sampling bias; an amateur from the Little Rock vicinity who specialized in Dalton sites reported a number of them to John House (Morse, personal communication). AMASDA also shows an apparent Dalton concentration in northwest Arkansas. Southeast Arkansas, which contains mainly later Holocene farmlands and timbered uplands, does not show Dalton concentrations on the AMASDA map. The Dalton Survey's only work in this macroregion was on Macon Ridge in Chicot County (Redfield 1962). Dalton components in Jefferson and Lincoln counties are at least partially accounted for by extended research by John House. Although southwest Arkansas does not appear from this map to include a high Dalton concentration, Schambach and Early (1982:SW42) have remarked that "Dalton culture is well represented.... It seems possible that if conditions for surface collecting were as good here as they are in northeast Arkansas...the density of Dalton sites might prove to be as high."

Even assuming the possibility of a significant decline in Dalton population density southward into present-day Louisiana and/or a gradation into more or less coeval San Patrice territory, and noting the continuation of the pattern of too-young Delta farmlands and low-visibility timbered uplands, there appears to be a disjunction in the Dalton literature as one crosses from Arkansas into Louisiana. Dalton points were not included in Webb's (1981) northwest Louisiana point typology. Dalton was not mentioned as a culture in the Louisiana CAP, nor was it even mentioned comparatively in the Paleo-Indian culture discussion which included this time period (Smith et al.1983:131–134), and it was only mentioned in passing in a tabulation of selected Paleo-Indian site components (1983:137). Neuman's volume on Louisiana archeology only mentioned Dalton culture twice in passing, with no reference to Louisiana sites (1984:69, 308). Gagliano (1963:Figure 413; cf. Gagliano and Saucier 1963) reported only one Dalton-like point in a survey of early sites in southeast Louisiana and adjacent Mississippi. Dalton-like points were not commonly found in the Fort Polk surveys in west-central Louisiana (Campbell and Weed 1986:9–12), but a few were apparently associated with a San Patrice component at the Big Brushy site on the Fort (Guderjan and Morehead 1983).

As noted above, Dalton points have a widespread distribution beyond the present study area. Although Goodyear (1982: 382–383) remarked that the similar Meserve point type seemed to have died away as a viable concept on the Plains, and probably represented only occasional reworking of lanceolate points, another view has also been propounded. Myers and Lambert (1983) proposed that Meserve points should be regarded as a Dalton–Meserve type or variant, produced by the same resharpening technology and representing "the westernmost extension of the Dalton horizon," as far west as southwestern Nebraska. D. Morse and Kay (personal communications) agree that at least some Meserve points might be considered Dalton variants.

Meserve points were originally found and defined in Nebraska and northern Texas (Meserve and Barbour 1932; Bell and Hall 1953; Davis 1953; Myers and Lambert 1983:109–110). They were subsequently identified elsewhere on the Eastern Plains, into central and eastern Texas, and western Louisiana, Arkansas, and Missouri (Suhm and Jelks 1962:217). They are apparently not well dated on the Plains, but at one Nebraska site, they have been found stratigraphically below cultural zones which yielded dates around 6000 and 6900 B.C. (Myers and Lambert 1983:111–112). Therefore, a date before 7000 B.C. appears likely for Meserve points on the Plains, and this does not rule out the possibility of at least some overlap with the Dalton time span, especially if the Morses' view of the terminal Dalton date is correct. Meserve points have been found, or at least identified, in apparent association with the San Patrice complex in northwest Louisiana, and more will be said about them in the San Patrice discussions, below.

Paleoenvironmental Data. Goodyear (1982:389–391) summarized the implications of Dalton chronology for the study of post-Pleistocene adaptations, noting that throughout the eastern U.S., the period from about 9000 to 8000 B.C. was a time of transition from boreal or near-boreal forests to forests containing or dominated by deciduous species. It therefore seems likely that Dalton peoples lived in environments that were "significantly different from [those] of previous fluted point groups and subsequent Archaic societies, the latter of which were adapted to a fully modern biota and climate" (1982:390).

As noted, a major climatic amelioration began around 10,500 B.C. (Delcourt et al. 1980; Delcourt and Delcourt 1981). This process must have resulted in significant vegetation (and faunal?) changes in the relevant portions of the present study area by Dalton times, as indicated by the Delcourts' paleovegetation map for ca 8000 B.C. In their terms, the Lower Mississippi Valley would have reverted from Spruce Forest back to Cypress–Gum Forest with Mixed Hardwoods along the valley margins and much of the rest of Arkansas would have been covered by Oak–Chestnut Forest.

As a conjecture, perhaps the ecotonal zones between the oak-chestnut forests of the Ozarks and Crowley's Ridge and the bottomland hardwoods of the Lower Valley made northeast Arkansas truly a "Land of Opportunity" (cf. Morse 1975c) for Dalton peoples. According to the Delcourts' map, this particular ecotonal zone would not have existed in other parts of the present study area: in southeast Arkansas the Lower Valley would have been flanked by an Oak–Hickory–Southern Pine Forest; and in southwest Arkansas and northwest Louisiana, the Lower Valley would have been far away, and the forests perhaps less productive and more drought-prone, though the Red River Valley would have afforded a somewhat similar but significantly smaller floodplain environment.

Morse and Goodyear (1973) suggested that the common occurrence of the Dalton adz in northeast Arkansas may reflect an adaptation to the use of deciduous forest hardwoods. Interestingly, Schambach and Early (1982:SW42) noted that the Dalton adz does not seem to be present in southwest Arkansas; perhaps the environment(s) and adaptation(s) there were significantly different. As Smith (1986:9) remarked,

> The early Holocene forests of the Southeast were neither temporally nor spatially homogeneous...one might reasonably expect the documented, if often overemphasized, geographic variation that does exist within early Holocene projectile point type categories to be paralleled by regional diversity in tool kits and subsistence patterns.

No extinct Pleistocene animal species has ever been identified in association with Dalton materials (Goodyear 1982:391). However, at least a few such species appear to have survived into the 9000–8000 B.C. period (Meltzer and Mead 1983), so Dalton peoples may have been involved in their demise. The diverse modern fauna exploited by Dalton peoples were summarized by Goodyear (1982:391). The Mississippi River abandoned its Braided-Stream Terrace 1 (the Western Lowlands) long before Dalton times but probably remained within Braided-Stream Terrace 2 (the Eastern Lowlands) until some time between 8000 and 7000 B.C. (Saucier 1974:19–20, Figures 1 and 3; Autin n.d.). Some of the relict Mississippi River braided stream channels of the Western Lowlands were probably sloughs and lakes during Dalton times, and others were reoccupied or reworked by streams such as the Cache and L'Anguille rivers (Smith and Saucier 1971; Fehon 1975; Morse and Morse 1983:83). The active, braided Mississippi channels themselves would probably have been nearby in the Eastern Lowlands for most if not all of Dalton times. According to Roger Saucier (cited by Goodyear 1974:10; cf. Morse and Morse 1983:86, Figure 4.7), some windblown silt (i.e., loess) deposition continued after Dalton times, based on stratigraphic data from the Brand site.

The succeeding earliest Mississippi River meander belt (No. 1 in the 1974 terminology; No. 5 in the new system) may have begun before 7000 B.C. (Saucier 1974:Figure 3; Autin n.d.:Table 2), but has been obliterated by later meander belts in these latitudes (1974:Figure 1). Its inferred position (Saucier 1981:Figure 3) is against the eastern bluffline north and south of present-day Memphis. Given the current uncertainties about dating of these meander belts (Autin n.d.; Saucier, personal communication), a speculation that the change in Mississippi River regime and location may have been related to the decline of Dalton culture in northeast Arkansas, ca 8000–7500 B.C., is perhaps worthy of investigation.

Phases. The northeast Arkansas Dalton phenomenon is one of this study area's relatively few preceramic situations and certainly the oldest, in which evidence has been sufficient to permit an adequate definition of a phase. Although the term "Dalton phase" is sometimes seen in print, this is an informal, loose usage. The L'Anguille phase has been designated to include "all known Dalton period sites in northeast Arkansas and most of southern Missouri" (Morse and Morse 1983:83).

This definition obviously takes in a much larger territory than is usual for ceramic-based phases. To some extent, this may ultimately be warranted, due to the much more mobile lifeway of Dalton peoples. However, if the Dalton settlement pattern question is ever resolved conclusively, some geographical subdivision into subphases or multiple phases may be appropriate. Also, the lengthy time span of the Dalton tradition, especially if the Morses' 1000-year span is approximately correct (cf. also Wyckoff 1985:21), suggests that some temporal subdivision(s) may eventually be feasible.

Key Sites. Due to the James Ford-inspired Dalton Survey in northeast Arkansas and along Macon Ridge (Redfield 1962), and subsequent research by the Morses and others, numerous Dalton sites and isolated find spots are now known, especially in northeast Arkansas. According to Morse and Morse (1983: 80), almost 1,000 Dalton components are known in their Central Mississippi Valley area, most of them in northeast Arkansas. However, only three of these sites have been intensively investigated: Lace, Brand, and Sloan. These sites were discussed by Morse and Morse (1983:82ff), and will only be briefly summarized here.

The Lace Place (3PO17) was located in south-southwest Poinsett County, on a knoll on the braided stream terrace about 3 km west of the L'Anguille River. It was discovered in 1950 when the land was cleared and "basketfuls" of points were found, then extensively surface collected and briefly tested by the Dalton Survey in 1961–62. The land was planed repeatedly in the next two decades, during which the site was intensively harvested by collectors. It was also surface collected and briefly tested by the Arkansas Survey in 1970, during the Brand site excavations. Also at that time, a report summarizing the 1961–62 investigations was published (Redfield and Moselage 1970). This site and all known nearby Dalton sites were finally destroyed by leveling for rice cultivation in 1980. The Lace site apparently had a Dalton midden covering about 30 x 9 m, and yielded hundreds of Dalton points, plus numerous other associated tools, before its demise. It is interpreted as having been a base camp, perhaps occupied by as many as 25 people over an extended period or periods (Morse and Morse 1983:82–84).

The Brand site (3PO139) was carefully chosen to test hypotheses about Dalton subsistence and settlement, was extensively excavated in 1970 under Morse's direction, and was reported in a major monograph by Goodyear (1974). It was also located in the L'Anguille drainage, in western Poinsett County near the Lace Place. Again, the location was a natural knoll on the braided stream surface. The major finding at Brand was a series of five artifact clusters interpreted as floors or activity areas, each occupied by individual males exclusively involved in butchering white-tailed deer and working deer bone and antler (Goodyear 1974:xiii, 77ff; Morse and Morse 1983:86–89). The artifact analyses (1974:19ff) made a major contribution to the Dalton tool kit concept. Some 305 Dalton points and point fragments (including only 41 complete specimens), representing all stages of attrition and resharpening, were found, as were many other tools related to butchering, scraping, and bone/antler working. However, evidence of point manufacture was lacking, as were woodworking tools, and the site is interpreted as a limited-activity deer-processing locale rather than a base camp (Morse and Morse 1983:86–89; cf. Schiffer 1975a, 1975b for an alternative interpretation, and Morse 1975b, 1977 for responses).

The Sloan site (3GE94), in southwest Greene County on the margin of the Cache River Valley, was discovered in the early 1970s and completely excavated by Morse in 1974. It was located on a low sand dune, probably at least 18,000 years old, into which the Dalton materials had intruded. They tended to occur in clusters or definite caches, within an 11 x 12 m area. Various types of tools were present, but in different proportions from the assemblages at Lace and Brand (see Morse 1982:155–159, Table 7.2; Morse and Morse 1983:92–94, Table 4.2, for discussion and tabulation). The Dalton points, 144 of which were found, were mainly whole and tended to be larger than usual. Due to these characteristics, the site was suspected of being a cemetery. Subsequent analyses have supported this hypothesis, and the site is now regarded as the earliest known cemetery in the New World.

The Sloan site has so far been described only in brief summaries (Morse 1975c, 1982; Morse and Morse 1983:89–95). However, a complete report is in preparation, to be published by the Smithsonian Institution (Morse n.d.a).

Settlement Data. Speaking of settlement patterning on a large scale, Goodyear et al. (1979:99) noted that "it is obvious that Dalton groups were the first people to make an intensive utilization of the upland or hinterland environments in the Southeast and Midwest." They (following Morse 1973; cf. also Goodyear 1982:391) called attention to the contrast in northeast Arkansas between Dalton peoples and the previous fluted point makers, whose remains were closely associated with major streams. Also, they noted that Dalton groups seem to have been the first to make use of cave and bluff shelter sites in the Southeast and Midwest.

The intriguing questions of Dalton settlement patterns in relation to seasonality, resource procurement, and social organization have been extensively discussed in the northeast Arkansas case, especially by Morse (1971b, 1973a; Morse and Morse 1983:80ff) and Goodyear (1974), and in a series of exchanges between Schiffer (1975a, 1975b; cf. also House et al. 1975) and Morse (1975b, 1977).

This literature was discussed by Morse and Morse (1983: 80ff, Figure 4.1) and will only be briefly summarized here. Morse's original model was from ethnographic analogy and the concept of central-based wandering, with bands focused on individual watersheds. Schiffer's alternative model suggested territories extending across watersheds to diversify resource (especially lithic) procurement, without permanent base camps. Morse's refined model (1983:80–82, Figures 4.1 and 4.6) involved banana-shaped band territories along watersheds, with site concentrations indicating zones of base settlements and resource procurement accomplished through "trade and intervisitation" (1983).

The Morses' model involved several site types: base settlements (e.g., Lace), hunting and butchering camps (e.g., Brand), cemeteries (e.g., Sloan), quarries, and food collecting and processing camps. The latter are logically probable, as are kill sites, but no sites of these types have been definitely identified and excavated.

Dalton sites found in portions of the study area other than northeast Arkansas so far seem to have been restricted to the hunting/butchering (and kill?) types. In particular, no sites analogous to Lace or Sloan have been reported.

Subsistence Data. As noted above, no extinct fauna have been found in association with Dalton remains. Indeed, no faunal or floral remains at all have been found preserved and definitely associated with Dalton materials in northeast Arkansas excavations, and investigations of Dalton sites elsewhere in the present study area have thus far produced no subsistence data. However, functional analyses of Dalton tools, and experiments with replicated tools, have indicated that they quite probably were used for the various killing, butchering, scraping, and bone/antler working functions ascribed to them (Goodyear 1974; Morse and Morse 1983:72ff).

In particular, an emphasis on exploitation of white-tailed deer was inferred from the analyses of the Brand site materials and data (Goodyear 1974; Morse and Morse 1983:84–89). This inference was supported by findings of animal bones with Dalton artifacts at two Missouri sites (summarized by Goodyear 1982:391), although a number of other terrestrial and aquatic animals were also represented. The Missouri sites also yielded hickory nuts, black walnuts, and acorns (Smith 1986: Table 1.1). However, Goodyear (1974:67) cautiously avoided attribution of nutting stone functions to cobbles with concavities found at the Brand site. The Morses (1983:79) noted that modification of Dalton cobble tools was generally minimal, so it appears that no formalized (lithic, at least) nut/seed processing industry was developed by these peoples. Smith (1986: Table 1.1) also noted finds of a hackberry seed and a persimmon seed in Dalton contexts in Missouri and Alabama, respectively.

Mortuary Data. Only one Dalton site, Sloan, has been interpreted as a cemetery. It has been described in three preliminary summaries (Morse 1975c, 1982; Morse and Morse 1983:89–95), and the artifacts were summarized above in the description of the site.

The major factors leading to the interpretation of the Sloan site as a Dalton cemetery were the frequent occurrence of whole, unused artifacts, often in caches or clusters, the scarcity of manufacturing debris and worn or broken artifacts, the lack of midden deposits, soil chemical analyses, and the presence of definite human bone fragments.

The soil chemical data (Morse 1982:155, Table 7.1; Morse and Morse 1983:90, 92, Table 4.1) showed relatively high proportions of calcium, believed due to disintegration of bone (and comparable to proportions in a Late Archaic grave), in and beneath a suspected Sloan site grave, and relatively low percentages elsewhere on the site. Rose analyzed 141 small fragments of bone from the Sloan site. Of these, 91 were definitely human, 26 were probably human, 11 were of uncertain status, and 13 were probably nonhuman. None, however, were definitely nonhuman, and the analysis supports the interpretation of the site as a cemetery.

The Sloan site is thus regarded as unique. Although probable Clovis burials of one or two individuals are known from Montana and Idaho (Morse and Morse 1983:89–90), the Sloan site is presently interpreted as the earliest recognized cemetery in the New World, probably representing at the the very least 12 burials, and perhaps as many as 36 (1983:94–95).

Exchange and External Relationships. The mainly pan-Southeastern distribution of the basic Dalton point/knife form and technology constitutes strong evidence of information exchange across this huge area. Morse and Morse (1983:71) remarked on the evidence for widespread trade including exotic artifacts. For example, some of the points from the Sloan site were made on cherts from as far away as the St. Louis vicinity (1983:92).

However, Dalton peoples in general seem to have placed less emphasis on obtaining excellent exotic lithic materials than did the preceding fluted point hunters (Coe 1964:64ff; Goodyear 1979; Goodyear et al. 1979:94ff). As in several other aspects of Dalton culture, northeast Arkansas may have been somewhat exceptional. The Morses (1983:82) noted that Ozark cherts are more abundant on Dalton sites in the lowlands than at any other time until the emergence of Mississippian chiefdoms some 9000 years later. They concluded, “It appears that social mechanisms strong enough to transport lithic resources in quantity throughout the lowlands were involved.” These mechanisms, however, may simply have been trade and intervisitation among “patrilocal exogamous bands tied together by marriage.”

Given the scarcity of nonlithic artifacts at Dalton sites, it will probablybe difficult to expand upon the present emphasis on raw material sources and lithic artifact stylistics and technology in the study of external relationships.

The San Patrice Horizon ca 8000–7000 B.C.? (Figure 6)

Especially in northwest Louisiana and adjacent portions of Arkansas and Texas, a San Patrice complex of points and other lithic tools has been defined. It appears to have been at least partly coeval with, and related to, the Dalton horizon or tradition, but the nature of these relationships is vague. Certainly the San Patrice complex is widespread and distinctive enough to warrant separate treatment here.

As will be seen, the San Patrice assemblage includes a fair amount of variation in point morphology and technology, from a form of basal thinning that approaches (and may well have been derived from) fluting to rather crude corner-notched and side-notched forms that usually lack basal thinning. Although radiocarbon dates are lacking, typological comparisons suggest that the earliest members of this assemblage may well be virtually as old as the Dalton tradition, and the latest may well postdate Dalton. Consequently, the San Patrice horizon is here estimated to cover most, if not all, of the period ca 8000–7000 B.C.

San Patrice points and other elements of the associated tool kit have been often found on numerous sites, and several San Patrice components have been excavated. Although the resultant data base is not nearly as detailed as that for the Dalton horizon and some kinds of data are completely missing, enough exists to warrant organizing the following discussion in terms of our standard subheadings, as was done in the case of Dalton.

Definition and Location. San Patrice points, and the Albany scrapers which are often found in association with them, were defined four decades ago by Webb (1946) on the basis of finds in the northwest Louisiana parishes. The name was derived from San Patricio Creek (or Bayou San Patricio), a stream which drains southward into the Sabine River; numerous examples were found along this stream’s valley near the town of Pelican in southern De Soto Parish. The definition was refined and expanded, and the associated tool kit was explicated, as a result of excavations of the Wolfshead site in east Texas (Duffield 1963) and the John Pearce site in southern Caddo Parish (Webb et al. 1971). At Wolfshead, San Patrice-like and concave-based lanceolate points were both interpreted as preceding corner-notched and side-notched forms (Duffield 1963; Gunn and Brown 1982:221), but there was mixing at that site (Webb et al. 1971:44; Thomas and Campbell 1978:195).

Webb (1981:4–6) published concise descriptions of San Patrice points and associated tools. He divided the San Patrice type into two varieties, *Hope* and *St. Johns*, following the lower-case designations *hope* and *st. johns* made by Duffield (1963) in a northeast Texas site report and also used in the John Pearce site report (Webb et al. 1971). Duffield also defined a *goodwin* variety, which apparently has not been identified in the present study area.

San Patrice points are usually relatively small, often due to the use of small locally available pebble raw material and to resharpening, since they were often used as knives (Webb 1981:4; cf. Morse and Morse 1983:104). Webb noted that the *Hope* and *St. Johns* varieties are often, if not always, basally thinned or even fluted, sometimes only on one face, especially in the case of the *St. Johns* variety (Webb 1981:4–5; cf. Webb et al. 1971:11, 27). The *Hope* variety has been compared to, and found in apparent associations with, Meserve-like points (Thomas and Campbell 1978:201, 204, Plate XXII; Gunn and Brown 1982:220–221). Webb (1981:4) described the *St. Johns* variety as having "short notches at the lower edges;" Webb et al. (1971:13–14) described *St. Johns* as having side or corner notching and "in this respect...intermediate between variety *Hope*and the side-notched points in this assemblage." The Morses (1983:104, 106), however, consider San Patrice notching to be corner notching in free variation with side notching.

Two other point types, Keithville and Pelican, are apparently associated with the San Patrice complex. In the John Pearce site report, two varieties (A and B) of side notched points which did "not fit any named type" were described (Webb et al. 1971:15ff, 28–29, Figures 5 and 6). In his point typology, Webb (1981:5) designated these as the Keithville, *var. A* and Keithville, *var. B* point types/varieties. He noted again that they were found with San Patrice points but were "thicker and cruder than San Patrice, and lack the basal thinning by long flutes." Keithville points are sometimes rather crudely side notched, and the side notches of *var. A* apparently often approach corner notching (cf. Webb et al. 1971:Figure 5; Webb 1981:5).

The Pelican point type was originally defined on the basis of finds near the town of Pelican in southeast De Soto Parish, where they appeared to be associated with San Patrice points (Gagliano and Gregory 1965; Webb 1981:5). Four were found at the John Pearce site (Webb et al. 1971:40, Figure 7a–b), which produced numerous San Patrice points. Pelican points have an odd stubby shape that sometimes approaches a pentagonal form with a hint of a stem; the base is sometimes thinned. Gunn and Brown (1982:220) regarded them as "reminiscent of the fluted pentagonal points...of the Northeast." The overall shape of Pelican points is close to that of some San Patrice, *var. Hope* points (cf. Webb et al. 1971:Figure 3). Webb (1981: 5) and Gunn and Brown (1982:224, Table 27) noted that they were usually made on local cherts, as were San Patrice points; the latter authors (1962:224–227, Figure 60; cf. Campbell and Weed 1986:9–10) suggested that they were chronologically between Scottsbluff and San Patrice, but they were of the opinion that Scottsbluff might be earlier than San Patrice. Here, following the example of Webb (1981), Pelican will be regarded as part of the San Patrice assemblage. Since they are described as "usually rough" (Webb 1981:5), the possibility that they were preforms for *Hope* points should be explored by technofunctional analyses.

It seems likely from the comparative data cited above that a fairly long time span may be represented by the various point types and varieties in the San Patrice assemblage, no doubt with some chronological overlap between certain pairs of types/varieties, but possibly not with total overlap among all of them. If a provisional sequence may be hazarded on the basis of comparative data, it might begin with Pelican and/or San Patrice, *var. Hope* points as the earliest, followed by San Patrice, *var. St. Johns*, then Keithville, *var. A*, and finally Keithville, *var. B*.

Special mention should also be given to the Albany scraper or Albany spokeshave (Webb 1946:10, Plate 1; Duffield 1963: 113; Webb et al. 1971:20, 30, 33, Figure 10D; Webb 1981:5). It was named after Albany Landing, overlooking the Red River north of Shreveport, where many scrapers were found. They have been found repeatedly in association with, or on the same sites as, San Patrice points. Most were made on flat local tan chert pebbles, and were shaped to a distinctive form resembling side-notched points in plan view but with an asymmetrical blade featuring a unifacially retouched concave spokeshave edge. With regard to side notching, at least, they appear more closely related to the Keithville points. Also, the relationship, if any, of Albany scrapers to the Cody knives found with Scottsbluff-like points should be explored.

The remainder of the San Patrice tool kit (Webb et al. 1971: 20ff, 30ff, 40ff; Thomas and Campbell 1978:195ff; Webb 1981:5–6) includes a variety of unifacial and bifacial artifacts with several resemblances to the Dalton kit cited above.

The geographical distribution of the San Patrice complex, especially the points, extends well beyond the northwest Louisiana region (cf. Neuman 1984:71). Schambach and Early (1982:SW45) noted that San Patrice points and Albany scrapers were commonly found in the Great Bend and Felsenthal regions, and that they had been identified in collections from sites as far north as DeQueen (near the Oklahoma line in Sevier County, southwest Arkansas) and Little Rock. Similar points and scrapers have been found occasionally in northeast Arkansas (Morse and Morse 1983:104–106, Figure 5.2b–c). The Morses noted that a morphological and perhaps chronological gradation exists between (probably late) Dalton variants and San Patrice points.

A point called Dalton, *var. San Patrice* was identified in a private collection from a site in the Natchez Bluffs region of southwest Mississippi (Brown 1985:15). A San Patrice component was also found at the Whatley site in east-central Louisiana, along a stream dissecting the uplands west of Catahoula Lake (Thomas and Campbell 1978:195ff). The points were found at several sites during the Fort Polk surveys (Gunn and Brown 1982; Servello 1983; Cantley and Kern 1984; Campbell and Weed 1986:9–11ff) and at two excavated sites in the Fort locality, Eagle Hill (Gunn and Brown 1982) and Big Brushy (Guderjan and Morehead 1983). San Patrice points were said to be "widespread and manufactured from local gravel" in the Florida Parishes of southeast Louisiana and adjacent southern Mississippi (Gagliano 1963:112, Figure 4E–H), and have also been found at the Cedarland site at the Pearl River mouth in Mississippi (Gagliano and Webb 1970; Duhe 1978:Table 3).

Paleoenvironmental Data. The general environmental context of San Patrice peoples must have involved regional variants of that described for the Dalton peoples: transition from Pleistocene to early Holocene conditions (cf. Goodyear 1982:390; Smith 1986:9). According to the Delcourts' (1981: Figures 6 and 7) maps, the San Patrice heartland of northwest Louisiana and adjacent regions would have been near an ecotone between the southwestern portion of the newly established Oak–Chestnut Forest (which would have recently replaced the Spruce–Jack Pine Forest) and the northwestern flank of the (then) more stable Oak–Hickory–Southern Pine Forest of the Coastal Plain. A short distance to the west would have been the eastward-advancing front of the newly established Oak Savannah vegetation community.

The major stream transecting the San Patrice territory would have been the Red River. Its geological history is not well known, and the meander belt sequence has not been projected back beyond about 3500 B.C. (Saucier 1974:23, Figure 3; Autin n.d.:Table 2). The Deweyville terrace has been identified along the Red River Valley in these regions (Smith and Russ 1974), but estimates of its dates vary widely (Gagliano and Thom 1967; Saucier 1974:19; Pearson 1982:18). It is certain that many San Patrice sites have been destroyed or buried by Red River meandering and alluviation, which have affected much more recent sites (cf. Pearson 1982:21ff).

Phases. No phases of the San Patrice culture or horizon have been formally defined.

Key Sites. The one major San Patrice site excavation in the present study area was at the John Pearce site (16CD56) in extreme southern Caddo Parish, just south of the town of Keithville and about 15 km (ca 10 mi) west of the Red River Valley (Webb et al. 1971; Neuman 1984:70–74). The site was on a spur or terrace remnant overlooking the floodplain of a small tributary stream.

Two areas of the John Pearce site were excavated and analyzed separately, but both appear to have had similar San Patrice occupations (Webb et al. 1971:4ff, 10ff, 26ff, 37). Area A, about 10 m across, yielded 355 artifacts including 19 San Patrice points; Area B, a short distance to the north, was about 20 m across and yielded 566 artifacts including 20 San Patrice points. The site report (Webb et al. 1971) is thebasic documentation on the San Patrice horizon.

Two other excavated and reported sites in Louisiana have yielded evidence of minor San Patrice components. At the Whatley site (16LA37) on the Little River west of Catahoula Lake in western LaSalle Parish, a San Patrice component was found beneath Early Archaic deposits and was analyzed separately and comparatively, with particular attention to comparisons with the John Pearce site (Thomas and Campbell 1978: 193ff). Although there was a general similarity, the Whatley site yielded a few ground stone items and relatively more bifaces (as compared to unifaces) than did John Pearce (1978:205).

The Big Brushy site (16VN24) on Fort Polk in southwest Vernon Parish was excavated in 1977 (Guderjan and Morehead 1980, 1983). A generally consistent sequence of projectile point types was found in a series of six arbitrary levels; although there was some evidence of mixing of other point types, the only two San Patrice, *var. Hope* points were found in the fifth and sixth levels (1983:900-901, Table 184, Figure 221a–b). A San Patrice, *var. St. Johns* point was also found on the surface, as was a Dalton point (1983:901, 914, Figure 221c–d). The excavated San Patrice assemblage was small, consisting mainly of flakes, four of which were unifacially worked (1983: 914, Figure 226).

Settlement Data. According to Gregory and Curry (1978: 21) San Patrice sites are more numerous than those of any other northwest Louisiana lithic horizon in the pre-6000 B.C. period and “may well mark the beginnings of sedentary or semi-sedentary life in the Louisiana uplands.” This is reminiscent of the statement made about Dalton land use by Goodyear et al. (1979:99), and reinforces the impression of Dalton–San Patrice relatedness.

Webb et al. (1971:44) noted that San Patrice sites were known from two basic settings: the margins of upland terraces overlooking stream valleys or lakes and along small streams dissecting the uplands, well away from major water sources. Data were not adequate to address the question of tool kit variability from one type of location to the other.

Gregory and Curry (1978:25–26, Figure 3) mapped the distribution of known San Patrice sites in Natchitoches Parish and concluded that “the preferred microenvironment...was in an ecotonal situation between the swamps and the lower terrace...at the interface between mixed hardwood uplands and the wet-backswamps or old lacustrine areas.” They noted that the beachlines around what appear to have been old raft lakes in the Red River Valley often yielded San Patrice materials. A comparison of their map with the *Geologic Map of Louisiana* (Snead and McColloh 1984) indicates that none of their San Patrice sites are in the Red River floodplain. It should be emphasized again that San Patrice sites certainly have been destroyed or buried by river action in the Red River Valley, and this potentially important type of setting remains unknown.

The John Pearce site assemblages appear at least somewhat similar functionally to the Dalton assemblages from the Brand site (Goodyear 1974; Morse and Morse 1983:84–89). The possibility should be considered that the John Pearce site, which lacked evidence of hearths, also represented multiple uses for butchering and related activities. The San Patrice component at the Whatley site appears to include a similar flaked stone assemblage. However, it also included a few items of ground stone, and it was suggested that this site may have also functioned as a seasonally revisited camp for processing wild plant foods (Thomas and Campbell 1978:205).

Subsistence Data. No preserved floral or faunal remains directly related to questions about San Patrice subsistence have been reported. The points and related artifacts indicate that hunting was a major activity, so by analogy with Dalton, some emphasis on deer can at least be hypothesized.

As in the case of Dalton, no formalized grinding stones have been assigned to the San Patrice complex. No ground stone at all was found at the John Pearce site (Webb et al. 1971:42). However, three pieces of ground stone were found in San Patrice context at the Whatley site, which is near a sandstone outcrop, and these were interpreted as having been used in wild plant food processing (Thomas and Campbell 1978:205). The question of San Patrice use of plant foods remains extremely problematical, however.

Mortuary Data. No San Patrice burials have been reported, either in publications or by personal communications.

Exchange and External Relationships. The most obvious questions about the external relationships of the San Patrice horizon concern its relationship to the Dalton horizon, which surely must have been at least partly contemporaneous. There are a number of similarities in point/knife manufacture, morphology, and use, and some overlaps in other aspects of the associated tool kits. These questions cannot be resolved until the San Patrice horizon is definitively dated by radiocarbon (or any other means that may be applicable). New excavations at well preserved San Patrice sites are clearly needed. It would be highly desirable to excavate a stratified site or sites with both Dalton and San Patrice components; perhaps such sites exist in southwest Arkansas, which seems to be the major overlap zone for the two horizons.

Dalton-like points have been identified at a few San Patrice sites in Louisiana (Smith et al. 1983:137; Guderjan and Morehead 1983). The latter authors discussed possible trade of Dalton points for San Patrice points, but this has been criticized by Campbell and Weed (1986:9–12).

Again much more like Dalton peoples than their Paleo-Indian predecessors, and to a greater extent than Dalton peoples, the San Patrice peoples emphasized locally available lithic raw materials (Webb et al. 1971:42; Thomas and Campbell 1978: 205). However, some imported materials, especially Arkansas novaculites, were used (Webb 1981:46; Neuman 1984:71).

The Angostura-like Horizon (ca 8000–7000 B.C.?)

Schambach (1979:24, Figure 3.2; cf. Schambach and Early 1982:SW38) discussed the "Snow Hill" complex of alleged finds in south-central Arkansas of points resembling the Angostura type found on the Plains. Schambach explicitly doubted the claims of the Snow Hill finds by a collector, and they are still not verified. However, a survey in the upper Felsenthal region of south-central Arkansas recovered two basal fragments resembling the Snow Hill specimens (Weinstein and Kelley 1984:34). Webb (1981:3) also noted infrequent finds of Angostura-like points in the northwest Louisiana uplands.

The prototypical Angostura points of the High Plains are characterized by parallel-oblique flaking (Frison 1978:34–37), and neither the illustrated Snow Hill specimens nor the one illustrated by Webb exemplify this technique. There appears to be only one good radiocarbon date (7430 B.C. ± 500) on the Angostura type, from a site in western South Dakota (Wheat 1972:157; Frison 1978:37, Table 2.2); the standard deviation is large, and only an estimate of some time in the 8000–7000 B.C. interval is warranted. If this is correct, and if the Snow Hill or Louisiana specimens are truly related to the Angostura points, Webb's (1981:3) suggested range of 7000–6000 B.C. in Louisiana appear to be slightly too late.

Wyckoff (1985) reported on the Packard complex of eastern Oklahoma, including points he compared to both the Snow Hill specimens of Arkansas and the Agate Basin type of the Plains. He obtained a radiocarbon date of about 7400 B.C. from a hearth associated with Packard complex materials. As noted, Wyckoff suggested that peoples with Western assemblages spread or expanded their hunting range eastward in response to early Holocene climate–vegetation–faunal distribution changes.

These comparisons of the Snow Hill and Packard materials to the Plains type Agate Basin and/or Angostura have resulted in an eastward expansion of a somewhat confused Western literature. According to Shelley and Agogino (1983:115):

> Typologically, there has been confusion as to what constitutes an Agate Basin point, particularly in the states of Texas and Oklahoma. Early identifications of Agate Basin and Angostura point types clearly indicated a lack of perception as to which point was being identified. Early editions of books showing these two point types mislabeled them more often than not in print, resulting in frequent confusion which has persisted to some degree to the present. This is unfortunate, since the Angostura point is a late Paleo-point type and is chronologically separated by more than a millennium in time from the Agate Basin point type. [Note: this estimated interval appears somewhat exaggerated in view of the scanty radiocarbon evidence cited above.]

The different pressure flaking patterns of classic Agate Basin and Angostura points have been described above. Here, it remains to note that Wyckoff's date for the Packard complex was definitely later (on the order of 500 years) than the generally accepted terminal date (ca 8000 B.C) for Agate Basin points on the Plains, but almost exactly coincident with the one good date on Angostura points.

The Early Corner-Notched Point Horizon (ca 7500–7000 B.C.)

This horizon was defined by the Morses (1983:104–106) to include several kinds of points, possibly interrelated in a trend toward corner-notched forms which appears to have occurred around 7500 B.C. Possibly late corner-notched variants of Dalton points and certain varieties of San Patrice (and Keithville) points have already been mentioned.

Also important here is a trend toward more definitely stemmed, corner-notched points, which took place mainly east of the Mississippi, with the development of Palmer Corner-Notched and Kirk Corner-Notched points (Coe 1964:67ff, Figures 59 and 60). The Kirk cluster of related point types has been securely dated to this time span (and possibly slightly later) at deeply stratified sites in east Tennessee (Chapman 1977; Morse and Morse 1983:106). Similar points, including untyped specimens and points resembling the St. Charles type of the Midwest, have been found in and near northeast Arkansas (Morse and Morse 1983:Figure 5.2d–g).

Artifacts of this form are unknown in southeast Arkansas (Jeter 1982a:89) and southwest Arkansas (Schambach and Early 1982:SW46–SW48). This may be due to low population densities at this time and/or to forest cover on uplands and other land surfaces of sufficient age, with alluvial erosion and deposition destroying or covering such remains on the floodplains.

However, Gregory and Curry (1978:25) suggested that in and near Natchitoches Parish in northwest Louisiana, there was “a high probability that the San Patrice points evolved into small serrated and corner-notched points similar to the Palmer Corner Notched points.” Palmer-like and Kirk-like corner-notched points have also been found during the Fort Polk investigations, but are “comparatively rare” there (Anderson et al. 1988:63).

THE 7000–3000 B.C. PERIOD

Chronology: Natural and Cultural Criteria. This period coincides with the Morses’ (1983:99ff) Hypsithermal Archaic Disruption period. It includes but begins a millennium earlier than Smith’s (1986:6, 18ff) Middle Holocene period (ca 6000–3000 B.C.). Smith’s dates, although intended to reflect natural climatic and related environmental changes rather than cultural changes, were equivalent to those of the Middle Archaic period of many eastern U.S. archeologists (Stoltman 1978:714; Goodyear et al. 1979:106ff; Schambach and Early 1982:SW48; but cf. Neuman 1984:75, whose Meso-Indian Era is placed at 6000–2000 B.C, and Steponaitis 1986:370, who placed the Middle Archaic at 6000 to 4000 B.C).

However, the pollen data from southeast Missouri (King and Allen 1977) suggest that the driest period in that region lasted from about 6700 B.C. to 4500 B.C. (they also note that relatively dry conditions lasted until about 3000 B.C. in that region). The Morses’ beginning date of 7000 B.C seems much more appropriate and natural than does 6000 B.C., as it includes all of this driest period, and a few centuries before it. Even though the Hypsithermal or Altithermal is regarded by climatologists as a time-transgressive phenomenon which was not an invariant entity but manifested different symptoms in different regions (Kam-Biu Liu, Louisiana State University, personal communication), Neuman’s (1984:75) estimated dates of 5000 to 2000 B.C appear to be significantly too late.

The 7000 B.C. beginning date is also not at variance with cultural (artifactual) criteria for marking a significant change. Although, as Goodyear et al. (1979:106) noted, “the distinction between the beginning of the Middle Archaic and the close of the somewhat similar late Early Archaic, while somewhat arbitrary, is based primarily on the appearance of stemmed rather than notched points,” there is good evidence that, at least in the present study area, stemmed points appeared by around 7000 B.C. The first two (apparently approximately coeval, but geographically separate) horizons discussed in the present section, the Early Stemmed Point horizon (in the eastern portions of the study area) and the Scottsbluff/Eden/Cody-like horizon (in the western portions) both feature stemmed points which are reasonably well dated to about the interval between 7000 and 6000 B.C.

In addition to stemmed points, a number of other artifact diagnostics appeared during this time span. Perhaps most distinctive are ground and often polished bannerstones or weights used on the atlatl (the throwing stick or board for spears or darts), which appeared by around 6000 B.C (Chapman 1977: 90–92; Stoltman 1978:714; Goodyear et al. 1979:106; Morse and Morse 1983:108). Bannerstones are much more commonly found in the Midwest and northern Southeast, and are comparatively rare in the present study area. They underwent a long sequence of stylistic/morphological evolution, and a basic chronology has been proposed (Kwas 1981).

Various other ground (and sometimes polished) stone tools came into use in various regions at various times during this period. These items included grooved axes, notched pebble netsinkers and a series of food grinding implements (Goodyear et al. 1979:106; Schambach and Early 1982:SW51; Morse and Morse 1983:99ff; Neuman 1984:77–79).

Paleoenvironmental Summary. The paleovegetation maps published by the Delcourts (1981:Figures 7 and 8; cf. also Smith 1986:Figure 1.2A–B) for 8000 B.C. and 3000 B.C. clearly indicate the eastward trend of the Oak Savannah belt, into northwest Arkansas and east Texas. Following immediately west of the oak savannah, an enormous Prairie zone, which covered the Plains, made its easternmost penetration through the Prairie Peninsula of Illinois into western Indiana, and approached western Arkansas. It should be noted that the driest period of ca 6700–4500 B.C. (King and Allen 1977) is not represented in the Delcourts’ maps; a map as of ca 5000 B.C., for instance, might well have indicated even farther eastward penetrations by xeric plant species and vegetation associations.

The Delcourts’ maps also indicate a significant northward shift, between 8000 and 3000 B.C., of the Oak–Hickory–Southern Pine Forest vegetation type, virtually completely out of the Coastal Plain, and only surviving as an isolated remnant in northern Arkansas. On the Coastal Plain itself, a significant expansion of Southern pines appears to have occurred around 4000 B.C. (Wright 1976:586); this is reflected in the Delcourts’ map for 3000 B.C., which shows the Coastal Plain, both east and west of the Mississippi, covered by a Southern Pine Forest type. Once again, attention should be given to the warning by Colinvaux (1987), that vegetation associations or communities are ephemeral accidents of an “every species for itself’ sort of response to environmental changes, rather than having any essential existence in their own right.

The Mississippi River may have become a meandering stream as far north as Memphis by about 7000 B.C. (Saucier 1974:20, Figure 3; Autin n.d., Table 2). Its course probably hugged the eastern bluffs north and south of Memphis for the earlier portion of this period, until about 4000 B.C., when it shifted to Meander Belt 3 (the same number, coincidentally, in both the 1974 and revised systems), which swung westward in the region west of Memphis, abutting the eastern margin of Crowley’s Ridge. In the latitudes opposite southeast Arkansas, the Mississippi flowed through what is now the Yazoo Basin of western Mississippi during all of this period, with successive meander belts trending westward toward the present one. In northeast Louisiana, it flowed near or through the present Tensas Basin during much of this period (Meander Belt 2, revised to No. 4, from about 5500 to 4000

B.C.), but was otherwise near the present river course. Below about the latitude of Natchez, it swung west of the present course and flowed through the Atchafalaya Basin for all of this period (Saucier 1974:21–22, Figures 1 and 3; Saucier 1981:Figure 3; Autin n.d.:Table 2).

Around 7000 B.C. (according to the revised chronology; 6000 B.C. in the 1974 version), the Arkansas River in southeast Arkansas may have shifted its course slightly from the Bayou Macon meander belt to one a short distance to the west (No. 5 in the revised system; No. 3 in the 1974 version), occupying approximately the modern Boeuf River course. Before 5000 B.C. (revised date estimate; 4000 B.C. in the 1974 version), it made a major change to a meander belt (No. 4 in both systems) which ran from just south of the river's present mouth toward the Mississippi at a locality east of the present city of Greenville, Mississippi. This course flowed southward from the Greenville vicinity, east of Macon Ridge in northeast Louisiana, paralleling the Mississippi in yazoo stream fashion before finally joining it in the vicinity of present-day Natchez. Around 4000 B.C. (revised estimate; 3000 B.C. in the 1974 version), it may have shifted again, to a meander belt (No. 3 in the revised system; No. 5 in the 1974 version) just east of the Bayou Bartholomew belt in southeast Arkansas and approximating the course of the present Boeuf River (Saucier 1974:21, 23, Figures 1 and 3; Autin n.d.:Table 2).

The Red River's meander belts remain uncharted for all of this period, though it must logically have joined the Mississippi in some portion of the Atchafalaya Basin. Its first charted meander belt (No. 1 in the 1974 system; No. 5 in the revised version) was near the southern margin of its valley, and may have been occupied before 3000 B.C. (Saucier 1974:Figures 1 and 3; Autin n.d.:Table 2).

Cultural Adaptations. Smith (1986:18ff) characterized his Middle Holocene for the southeastern U.S. in general as a time of increasing sedentism and dependence on localized riverine resources. Cultural adaptations to these generally warmer and drier conditions in many portions of the Southeast included increased use of aquatic resources, most noticeably (but probably not most significantly for subsistence) shellfish. Huge Middle (and Late) Archaic shell middens are known especially along the Tennessee and Green rivers in Alabama, Tennessee, and Kentucky, and on other Southeastern streams (Smith 1986:22; Steponaitis 1986:372).

Some mention must also be made of evidence from the Midwest and Southeast for very early use of possible Mesoamerican cultigens. The earliest such evidence consists of direct accelerator radiocarbon dates of ca 5000 B.C. for Cucurbita rind fragments from the Koster and Napoleon Hollow sites in the Lower Illinois Valley of west-central Illinois and ca 3750 B.C. from western Kentucky (Conard et al. 1984; Smith 1987:8). *Lagenaria* or bottle gourd remains directly dated to about 5300 B.P. have also been reported from Florida (1987:21). However, Smith (1987:18ff) has argued on several grounds (including Hypsithermal eastward expansion of xeric habitats) that the cucurbits may have been wild buffalo gourds from the western U.S. or another indigenous species, instead of a Mesoamerican cultigen, and that the Florida gourd may have been brought in by ocean currents (1987:21). Smith (1987:23ff) argued that these plants were not really important and that the beginnings of significant eastern U.S. plant cultivation could only be traced back as far as the earliest evidence of domestication of native Eastern plants, around 2000 B.C.

Whether or not cultigens were important—and the preponderance of the present evidence suggests that they were not—increasing sedentism later in the Middle Archaic in various parts of the eastern U.S. is suggested by several lines of evidence. These include larger sites, midden development, use of storage pits, increased use of inferior local lithic raw materials, and increased numbers of burials (Stoltman 1978:714; Goodyear et al. 1979:111; cf. Smith 1986:25ff for a somewhat skeptical discussion of this evidence). As will be noted at the end of this section on the 7000–3000 B.C. period, there is even some evidence for late Middle Archaic mound building in Louisiana.

By and large, though, evidence for Middle Archaic population concentration, sedentism, and concentration on riverine resources is scarce in Arkansas and Louisiana. Morse (1975d:190–191) noted the possibility of depopulation and a hiatus in northeast Arkansas during these times, but later (1978), as an alternative, suggested that artifacts belonging to this period might not have been recognized by archeologists.

In their recent book, the Morses (1983:103) hypothesized that "valley inhabitants shifted permanent site locations to the Ozark uplands and used the lowlands as a hinterland during the Hypsithermal" but emphasized that "a complete hiatus is not being hypothesized." They suggested that "potential subsistence variety" in the lowlands may have decreased due to development of grasslands, and that in other ways the lowlands may have become significantly hotter, drier, and "more miserable." Lowland exploitation could have become "minimized and specialized, not terminated," and "east-west travel was easier at this time than at any other time during prehistoric human occupation." They also noted that

> although Dalton artifacts are plentiful, artifacts dated to between 7500 and 3000 B.C. are rare. Those dated to 6000–4000 B.C. are very rare. Those dated to 4000–3000 B.C. are more prevalent than earlier ones, which correlates positively with a lessening of the severe conditions of the Hypsithermal and population increase in the lowlands... The population in the Central Valley was small ...at the beginning of the period.... After the end of the Hypsithermal period the valley population increased significantly.... Much of this increase may have taken place at the end of the Hypsithermal, since reforestation of the lowlands introduced a new ecological habitat into which to expand for permanent residency. (Morse and Morse 1983:111–112)

Very little evidence of occupations dating to this period is known in southeast Arkansas east of the Ouachita Valley. The little that is known is based on scattered surface finds (Jeter 1982a:91).

In southwest Arkansas, though, the overall population profile and cultural sequence seem rather different from those in eastern Arkansas. Scottsbluff-like points have been found in moderate abundance and probably date between 7000 and 6000 B.C. In general, knowledge of the post-Scottsbluff period usually called Middle Archaic is rudimentary at best in southwest Arkansas (Schambach and Early 1982:SW49), but there is an exception. The Tom's Brook culture (Schambach 1970; Schambach and Early 1982:SW50ff), centering on the Ouachita Valley, appears to represent this study area's only real example of a "typical" Southeastern Middle Archaic riverine adaptation; it appears to date between about 5000 and 4000 B.C.

In northwest Louisiana, the Scottsbluff situation more or less parallels that noted in southwest Arkansas. However, post-Scottsbluff (or, post–6000 B.C.) materials appear to be either extremely scarce or poorly documented in much of Louisiana until the end of the period under consideration here. Summarizing the Louisiana situation, Neuman (1984:82) stated:

> Much is known about cultural developments during the Meso-Indian Era in some parts of the southeastern region, but in Louisiana the specifics of such phenomena for the most part remain to be determined. Not a single Louisiana site with a discrete archaeological deposit unequivocally attributable to this era has been systematically excavated, analyzed, and comprehensively reported. Furthermore, most of the data we do have applies to the very end of the Meso-Indian Era. [Recall that for Neuman, this time span extended to 2000 B.C. rather than ending at 3000 B.C.]

Moving beyond these general summary statements, we will now examine the specific lithic horizons (and one lithic culture, namely Tom's Brook). Again, the discussions will proceed in chronological order of beginning dates.

The Early Stemmed Point Horizon (ca 7000–6000 B.C.) (Figure 7)

This horizon has been generalized from the Morses' (1983:106–108) Hardin and Early Stemmed period. Addressing their Central Mississippi Valley from their northeast Arkansas base, they naturally emphasized the Hardin stemmed points of the Midwest. Similar points (often used as knives and resharpened; 1983:107) are also found sparingly in the Central (here, northern Lower) Mississippi Valley, and in northeast Arkansas (1983:Figure 5.2i–l).

The Morses suggested that Hardin and similar stemmed points were indicative of an "influx of Plains-like styles at the very time the Midwestern prairies [were] expanding" (1983:106; cf. also comments on Scottsbluff points, below). They also (1983:107–108) contrasted these stemmed forms with a contemporary tradition of points with bifurcated bases which prevailed in portions of the eastern U.S. The distribution of the latter was summarized as "from Alabama to New York" by Goodyear et al. (1979:103); it would appear likely that they are more or less restricted to the northern portion of Alabama (observations by Jeter) and the northeastern part of Mississippi (Samuel O. Brookes, personal communication). Stemmed forms, however, appear to have a continuous distribution across the Coastal Plain, at least into the Carolinas.

Stemmed, serrated points, somewhat resembling the type later formally defined in North Carolina by Coe (1964:70, Figure 61) as Kirk Serrated, were reported by Gagliano (1963:112, 114, Figures 4I–K, 5C–E) to be "widespread in occurrence, invariably of local gravel, and usually found in sites whose locations suggest considerable antiquity" in the uplands and Prairie Terrace localities of the Florida Parishes in southeast Louisiana. It should be emphasized that Coe (1964:70) reported that Kirk Serrated points tended to be stratigraphically later than Kirk Corner-Notched points, and that the points illustrated by Gagliano do not appear to be corner notched. According to Brookes (personal communication) these points are now known as Kirk Stemmed, *var. St. Tammany*, and are regarded as dating in the late Early Archaic to early Middle Archaic interval. Gagliano (1967c; Gagliano and Thom 1967) also suggested that these Kirk Serrated points could be used to date the Deweyville terrace. However, Saucier (1974:19, 1987 personal communication) suggested that the Deweyville terrace might be considerably older than even the Paleo-Indian fluted point remains.

The Scottsbluff/Eden/Cody-like Horizon (ca 7000–6000 B.C.?) (Figure 7)

The Scottsbluff point type, a well made lanceolate form with a rectangular, straight base stem, was defined originally in the Plains area. Similar points, at least some of which may be typologically true examples of the type, have been found quite frequently in southwest Arkansas (Schambach and Early 1982:SW38ff) and in moderate numbers in northwest Louisiana, along with specimens resembling the similar but even better made and much rarer Eden point type and stemmed bifaces with asymmetrical blade forms resembling the Cody knives of the Plains (Webb 1981:7). Gregory and Curry (1978:23) suggested that Natchitoches Parish was about at the southeastern margin of a Scottsbluff–Eden intrusion from the Plains into these regions, noting that these types had been found only in the northern part of that parish and were more common in De Soto and Bienville parishes.

The prototypical Scottsbluff and Eden points and Cody knives of the Plains are included in the Cody complex (Frison 1978:33–34, 180–188). This complex was reviewed extensively by Wheat (1972), who added instructive discussions of point typology (1972:140–142) and distribution (1972:142, 152). He noted that the Eastern variants found in sites from Wisconsin to northwest Louisiana and northeast Texas tended to be significantly larger than the Plains prototypes. He suggested calling these points Renier variants after the Renier site in Wisconsin and calling the Eastern assemblage the Renier complex (1972:142). His suggestion has not been heeded; it is doubtful that archeologists in the Trans-Mississippi South would readily accept the Wisconsin term as an improvement. Perhaps an Arkansas or Louisiana (or northeast Texas) type

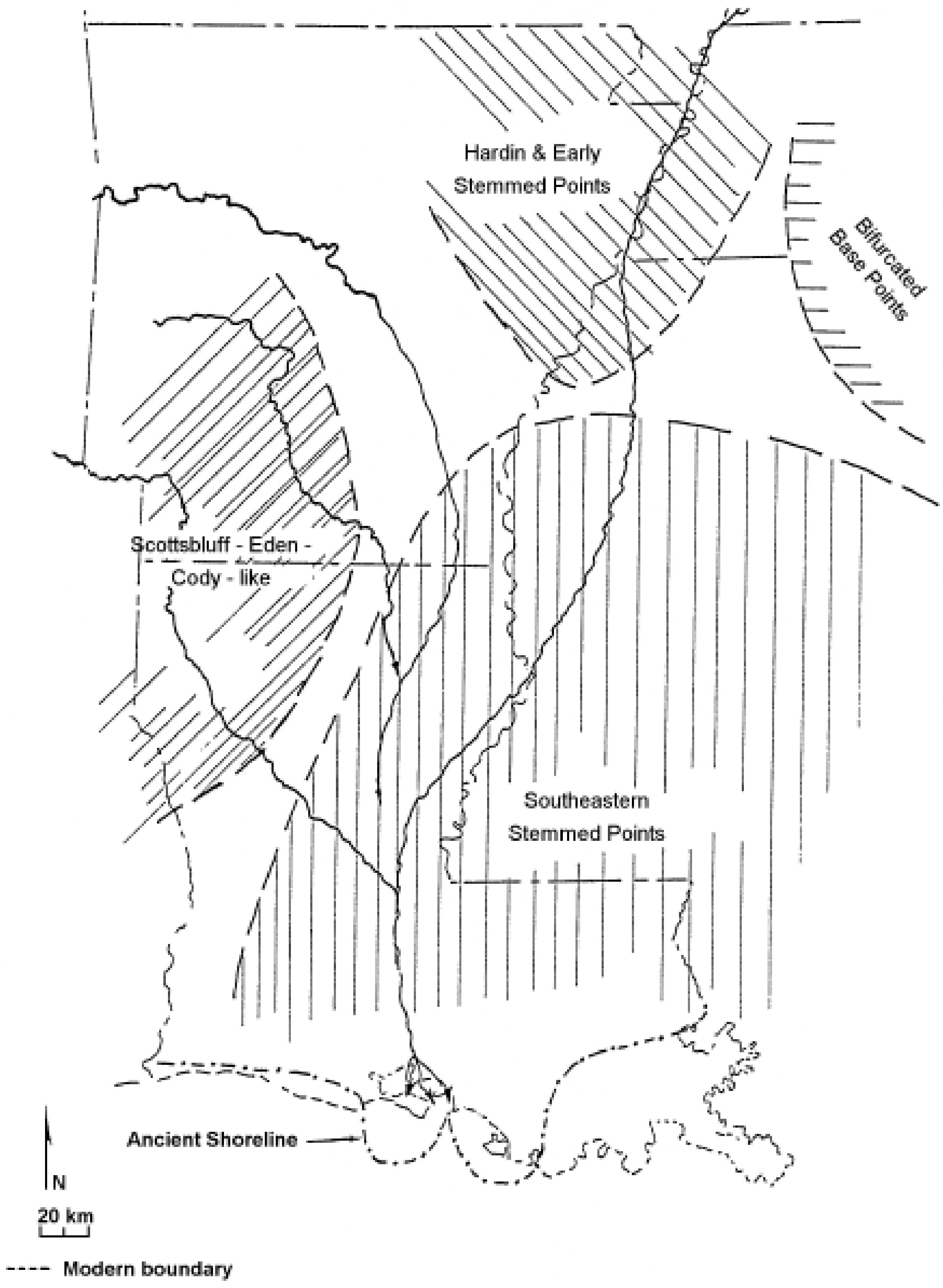


Figure 7. Map of lithic horizon distributions in and near the study area ca 7000–6000 B.C.

site will eventually be excavated and will provide an appropriate name.

The archeological literature of southwest Arkansas and northeast Louisiana includes some widely divergent and partially contradictory interpretations or implications about the culture–historical sequence placement and absolute chronology of the Scottsbluff- and Eden-like remains. However, this literature is based on little or no hard data from these regions, and contains no references to the recent literature of the Plains, where the Scottsbluff–Eden–Cody complex was defined and is best known.

Gregory and Curry (1978:19, Figure 2) suggested a "not well established" sequence of Clovis–Scottsbluff–San Patrice–Dalton/Meserve, implying a date around or before 8000 B.C. for the Scottsbluff–Eden–Cody assemblage. Webb (1981:7) suggested a long time range of about 7500–5000 B.C. for the Scottsbluff- and Eden-like points in Louisiana, a span which starts earlier and ends later than his suggested dates (7000–6000 B.C.) for the San Patrice complex (1981:4). He noted that the two were "possibly contemporaneous" (1981:7). Gunn and Brown (1982:224–227, Table 27, Figure 60), and Campbell and Weed (1986:9–10) suggested that these Scottsbluff-like points were earlier than San Patrice points. Schambach and Early, in their general sequence for southwest Arkansas (1982:Figure SW3), and in their Dalton discussion (1982: SW43) implied that Scottsbluff preceded Dalton, which would in turn imply a date before 8000 B.C.

However, if comparative data from the Plains are at all appropriate, Webb's estimated dates would appear more likely. Wheat (1972:156) suggested that the Cody complex dated between 7000 and 6000 B.C. Frison (1978:33–34, Tables 2.2 and 2.3) cited six radiocarbon dates which rather securely placed the Cody complex from possibly just before 7000 B.C. to around 6600 B.C., with the central dates clustering in the 7000–6800 B.C. range. Greiser (1985:19) defined a Boreal climatic episode for the Plains as occurring between about 7700 and 6500 B.C., and placed the Scottsbluff–Eden–Cody complex in "late Boreal times" (1985:70–78, 122).

It should also be noted that Morse and Morse (1983:107) stated that the Cody complex is very similar to the Hardin complex of the Midwest and Central Mississippi Valley, and that both complexes probably dated between about 7000 and 6000 B.C. However, they emphasized that "unlike Scottsbluff, which was designed for penetrating, Hardin was designed for cutting" (1983:111). Many or most of the Arkansas Scottsbluff-like specimens are made of a fine light tan chert that weathers white and is believed to derive from a source to the west (Schambach and Early 1982:SW39). The Louisiana specimens are also mostly made of foreign materials, including cherts which may be from Oklahoma or central Texas (Webb 1981:7). Gregory (1963) suggested that these points were left in these regions by hunters ranging eastward from a Texas base area. Schambach and Early (1982:SW39) acknowledged such a possibility, but considered trade or occasional travel to western lithic sources by Scottsbluff-affiliated peoples residing in the Arkansas–Louisiana regions as at least equally likely.

Once again, due to the scarcity or absence of real occupation sites (as opposed to scattered, isolated finds), much less excavated sites, little can be said about the subsistence practices (except for the obvious fact that hunting was important) or the settlement patterns of the people(s) who made and/or used any of these point types.

The Rice Horizon (ca 6000–5000 B.C.?) (Figure 8)

As noted above, the data base is extremely weak over virtually all of the present study area for the period between 6000 and 5000 B.C. This may not be coincidental, given the palynological evidence for the driest part of the Hypsithermal, at least in the northern portion of this study area, from about 6700 to 4500 B.C. (King and Allen 1977).

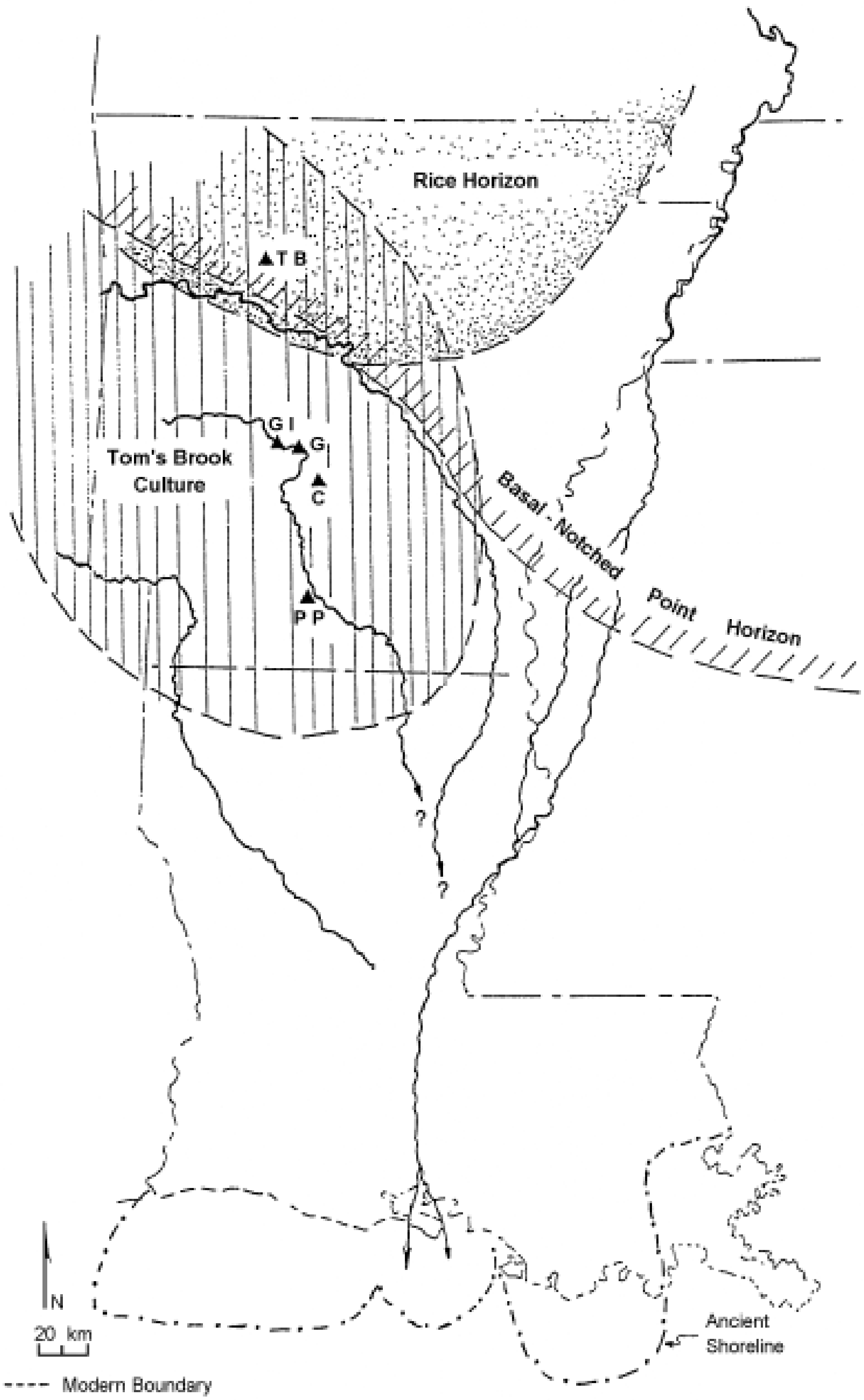
The Morses (1983:108, Figure 5.3a) have tentatively defined the Rice period for this approximate time span, based on very rare occurrences of points resembling the Rice Lobed type. This type was defined in southwest Missouri (Bray 1956; C. Chapman 1975:129), where it was called both Early and Middle Archaic, and is found "across the Ozarks but not in the Plains" (Morse and Morse 1983:106; cf. Sabo and Early 1988); good examples are not known from the northeast Arkansas lowlands. This distribution is the basis of the Morses' hypothesis of decreased use of the lowlands.

The Morses also suggested that the Rice Lobed point type, which is stemmed with a single concavity or notch in the base, might be related to the Stanly type found east of the Mississippi and dated to about this time period (Coe 1964:35; Chapman 1977:90ff; Goodyear et al. 1979:106–107), and that both types may have been late developments out of the bifurcated-base point tradition. A few crescent-shaped bannerstones, believed to be the earliest type and coeval with Rice Lobed points, have also been found in and near northeast Arkansas (Morse and Morse 1983:Figure 5.3b).

Otherwise, the 6000–5000 B.C. interval remains mysterious, both in northeast Arkansas and elsewhere in this study area, as attested by Jeter (1982a:90–91) for southeast Arkansas, and by Schambach and Early (1982:SW48–SW49) for southwest Arkansas. Webb's (1981) northwest Louisiana point typology did not include any types known to date to this period (assuming that his 7500–5000 B.C. range for Scottsbluff-like points extends too late, as discussed above). Neuman's (1984:82) statement about the scarcity of Meso-Indian Era sites in Louisiana has already been quoted. The Louisiana CAP did not even mention the Middle Archaic in its discussion of the Archaic period; it merely referred to contemporary developments in other areas (Smith et al.1983:141–150).

The Basal-Notched Point Horizon (ca 5000–4000 B.C.?) (Figure 8)

In the western portions of the Southeast, various point types characterized by basal notches between the stem and the shoulders were in use between 5000 and 4000 B.C. These include the Eva type, defined at the Eva site on the Tennessee River in west-central Tennessee (Lewis and Lewis 1961), and



Key: Tom's Brook culture sites: C = Cooper; G = Gulpha; GI = Goat Island; PP = Paw Paw, TB = Tom's Brook

Figure 8. Map of cultural and lithic horizon distributions and key sites in and near the study area ca 5500–4500 B.C.

the Calf Creek type, most commonly found in the southwest Missouri and northwest Arkansas Ozarks (see the Region 1 overview).

The northeast Arkansas situation during this millennium appears to have been similar to that described for the Rice horizon; Morse and Morse (1983:108,110, Figure 5.3e–f) note that basal-notched points are “rare in the lowlands” but “more common in the Ozark Highlands” overlooking the Western Lowlands. No sites representing this horizon have been studied in detail.

Basal-notched points resembling Eva and Calf Creek types have been reported by House (1980:7) from sites on old Arkansas River natural levees, apparently associated with Arkansas Meander Belt No. 4 (in both the 1974 and revised terminology). This belt was previously believed to have been occupied beginning around 4000 B.C. (Saucier 1974:21, Figure 3) but is now estimated to have been occupied by around 5000 B.C. (Autin n.d.:Table 2; Saucier, 1987 personal communication).

Basal-notched points are extremely rare in southeast Arkansas collections (observations by Jeter) and were not mentioned in the southwest Arkansas Middle Archaic discussions by Schambach and Early (1982:SW48ff), nor were they mentioned in the Archaic discussion for northwest Louisiana by Gregory and Curry (1978). Webb’s (1981:11) northwest Louisiana point type descriptions included the Marshall type with barbed shoulders produced by basal notching, but it appears to be a Late Archaic–Poverty Point type. No true Middle Archaic points of any form seem to have been found during the extensive investigations at Fort Polk in west-central Louisiana (summarized by Campbell and Weed 1986:9–14ff who noted the “really inadequate” nature of the data base, and by Anderson et al. 1988:67–69). Basal-notched points were not noted by Gagliano (1963) in his survey of preceramic evidence from southeast Louisiana and adjacent Mississippi. However, Duhe (1978:Table 3) reported that Eva-like points occurred, but were not common, at the Bonner Creek site in Washington Parish, the northeasternmost of the Florida Parishes of southeast Louisiana. Such points do not seem to occur elsewhere in southern Louisiana.

The Tom’s Brook Culture (Johnson Horizon) (ca 5000–4000 B.C.) (Figure 8)

A decidedly different situation seems to have prevailed in and near southwest Arkansas. Here, a well defined and relatively well known archeological culture was in existence between about 5000 and 4000 B.C., and a formal discussion is in order.

Definition and Location. Schambach (1970:384–385) defined the Tom’s Brook phase in the Middle Ouachita region on the basis of materials found at the Cooper site in southern Ouachita County, and by extension from finds at the Tom’s Brook site in northwest Arkansas. Subsequently, Tom’s Brook was upgraded to the status of a culture (Schambach 1979:27–27; Schambach and Rolingson 1981:178; Schambach and Early 1982:50–53).

The principal diagnostic artifact for Tom’s Brook culture is the Johnson point. This is a distinctive point of medium to large size, with a very broad stem and a concave base. Both the base and sides of the stem are usually dulled by grinding. This type was originally, and rather tentatively, defined by Bartlett (1963:28–29) as Type B (Johnson) on the basis of his finds at the Tom’s Brook shelter in eastern Johnson County, Arkansas. This location is well out of the present study area, some 15 km north of the Arkansas River Valley, and on the southern margin of the Boston Mountains (southern Ozarks) in northwest Arkansas. Even farther out of the present study area, Wyckoff (1984:136–140) defined an eastern Oklahoma Tom’s Brook complex comparable to Bartlett’s finds. He estimated it to date to about 4000–3000 B.C. (1984:136), but noted that “In several ways, Tom’s Brook assemblages manifest ties to early Archaic manufacturing ideas” (1984:138).

Schambach (1970:131–134, Plates 8 and 9) formalized the definition of the Johnson point type. He also noted (1970:133, 384) that they were common in the southern foothills of the Ozarks and in and around the Ouachita Mountains. Subsequent research revealed that these points and other diagnostics of this culture were “abundant throughout the Ouachita Valley in Arkansas” (Schambach 1979:26). This distribution includes not only the Middle Ouachita region, but also both upland and lowland components in the Felsenthal region (Weber 1973; Schambach 1979:26–27). They were not found by Hemmings (1982a:230ff) in his survey and testing project in the lower Felsenthal region, quite probably because work was restricted to the immediate banklines, and deposits of this age would have been below the water levels of the Ouachita and Saline rivers (cf. 1982a:208–212, Figure 56).

The distribution of Johnson points does not appear to extend into northeast Arkansas and extends only sporadically into east-central and southeast Arkansas. They were not mentioned in the Morses’ (1983) summary of the former area, and only rare finds were noted by House (1980) for the Lower Arkansas Valley and by Rolingson (1974; cf. Jeter 1982a:91) in the southeastern Delta lands. Schambach (1982b:4; Schambach and Early 1982:SW50) noted their scarcity in the uplands of the Great Bend region in southwest Arkansas and their absence from the Red River Valley in that region, possibly due to destruction by river meandering and/or burial by alluvial deposition.

Neither Tom’s Brook culture nor Johnson points were mentioned in a recent review of Ouachita Valley (and adjacent northeast Louisiana) prehistory (Gibson 1983a). Johnson points were not included in Webb’s (1981) northwest Louisiana point typology, and are very rare finds in northwest Louisiana (Webb and Jeane, personal communications), with one known exception.

It thus appears that the present study area includes only the southeastern portion of the distribution of these points and this culture. However, despite the fact that the type site is outside this study area, it is likely that the heartland—or much of it—was within the present overview’s coverage zone.

In addition to Johnson points, Tom's Brook culture assemblages are characterized by notched pebbles and stemmed (probably for hafting) end scrapers with "a strong morphological resemblance to Johnson points" (Schambach 1970:381, 384, Table 23). The notched pebbles are believed to have functioned as netsinkers, and Schambach (1979:27) noted that, "as one would expect," they were missing from a "good upland component" at a Felsenthal region site, where instead grinding stones and scrapers were common. Notched cobble netsinkers have been reported from east Tennessee contexts dating between 6000 and 5000 B.C. (Chapman 1976:7–8, 1977; Goodyear et al.1979:106–107).

Only one good radiocarbon date has been obtained on a Tom's Brook component. This date, about 4700 B.C., was from the Paw Paw site in the upper Felsenthal region (Weber 1973; Schambach 1979:26; Schambach and Early 1982:SW50).

Paleoenvironmental Data. The general paleoenvironmental situation has been discussed above. Here, it remains to call attention to a preliminary paleogeographical reconstruction of the Ouachita Valley in the upper Felsenthal region by Weinstein and Kelley (1984:488–493, Figure 9–3). They suggested that the Ouachita River channel adjacent to the Paw Paw site had been abandoned by Middle Archaic times, and possibly by Early Archaic times, and attempted to reconstruct the course of the active channel(s) during those times.

Phases. As mentioned above, Schambach (1970:384–385) originally defined a Tom's Brook phase in the Middle Ouachita region, but the Tom's Brook concept has since been expanded to the culture level. Schambach and Early (1982:SW50–51) referred informally to the Tom's Brook phase/culture in this and adjacent regions. Possibly a new phase name will eventually be coined for the Middle Ouachita region. This has already been done in the case of the Felsenthal region, where Schambach (1979:Figure 3.1; Schambach and Early 1982:SW50) named, but did not thoroughly describe, the Spoon Bend phase primarily on the basis of the findings at the Paw Paw site.

Key Sites. The type site, Tom's Brook bluff shelter (3JO1), is out of the present study area (cf. Bartlett 1963). Type B (Johnson) points and associated materials were concentrated near the lowermost levels (especially levels 12 and 13 in a 14-level trench) at that site (1963:28, Table 2).

The site which inspired the original phase (and ultimately, culture) designation, however, was Cooper (3HS1), located on the east side of the Ouachita River, just south of Friendship in southern Hot Spring County and the Middle Ouachita region. It was excavated during one of Dellinger's WPA projects, in 1939 (Schambach 1970:32ff), but the materials remained unanalyzed until Schambach began working with them in the 1960s and discussed them in his dissertation (1970:78ff).

The nature of the midden deposits at Cooper was not well documented in the field notes, but they (and a later test by Philip Phillips) do indicate that the midden was "homogeneous black dirt freely interspersed with shell" (Schambach 1970:43). Due to the poor documentation of vertical stratigraphy by the WPA excavators, Schambach depended to some extent on horizontal stratigraphy for assemblage assignments. Thus, he originally placed the notched netsinkers in the succeeding Crystal Mountain phase, while noting that they might also be part of the Tom's Brook assemblage (1970:385), which was later confirmed (Weber 1973:54).

Schambach (1970:133) also noted that six Johnson points had been found by Harrington (1920:Plates cxiv–b, cxv–k, and cxvi–c–h) from the "deep deposit" at the Gulpha site (3GA20) on the Ouachita River in extreme southeast Garland County, and that others had been reported by an amateur, Forest Sargent (1966:3a), at a deep site destroyed by construction of the dam that created Lake Ouachita in central Garland County. Also, Sargent collected more than 120 Johnson points and more than 800 notched pebbles from the Goat Island site (3GA9), now in Lake Hamilton south of Hot Springs in southeast Garland County (Schambach 1970:133–134, 252, 384).

The Paw Paw site (3OU22), located on an old Ouachita River cutoff in southeast Ouachita County in the upper Felsenthal region, was tested in 1971 by Schambach and J. Cynthia Weber, who divided it into four areas, three of which were tested; a preliminary report on one of these (Area 4) has been prepared but not published (Weber 1973). It was found to have deeply buried Tom's Brook midden deposits consisting primarily of a gray clay matrix containing abundant fire-cracked rock and charcoal flecks (1973:10, 13, 53). This deposit was well below the site's first shell midden deposits, which were attributed to a Coles Creek component (1973:10–13). In the lower Felsenthal region, another deeply buried Tom's Brook midden is known from the Short Brake site (3BR20) in southern Bradley County (Schambach 1979:26; Schambach and Early 1982:SW50), and an upland component is known at the Oscar Smith site (3UN36) in eastern Union County (Weber 1973:54; Schambach 1979:27).

A unique find to date in northwest Louisiana was made at the Conly (or Bill Conly) site (16BI19), on Loggy Bayou near Lake Bistineau in western Bienville Parish. There, under about 3 m (10 ft) of overburden, broad stemmed points similar to Johnson points were found in apparent association with a number of storage/trash pits (Webb and Jeane, 1987 personal communications).

Settlement Data. No detailed studies of Tom's Brook settlement patterns have yet been attempted, but from the above evidence it seems clear that a seasonal round between lowland and upland (and at least in some localities, bluff shelter) sites must have been in effect. In particular, it is of interest due to Schambach's (1979:26) characterization of this as "our earliest example of a strong riverine adaptation by Archaic peoples" and possibly one of the earliest such adaptations in the Southeast.

Subsistence Data. The Johnson points, netsinkers and grinding stones suggest indirectly that hunting, fishing, and wild plant food processing were important to these peoples. Although Schambach and Early (1982:SW50) indicated that "carbonized plant remains" and "tolerably good refuse bone preservation" were encountered in the Tom's Brook midden at the Paw Paw site, the preliminary report (Weber 1973:39ff) referred only to the materials from the upper (Coles Creek) strata. Schambach and Early (1982:SW50–SW51) also indicated that the potential for recovery of subsistence-related remains was good at several of the other sites mentioned above, and that new excavations at Paw Paw and other Tom's Brook sites should be high priority projects.

Mortuary Data. No mortuary data have been published from any of these sites. Schambach and Early (1982:SW50) stated that the Paw Paw site had yielded "the earliest human burials now known for Arkansas," but no burials were described in the preliminary report (Weber 1973). (The earliest burials now recognized for Arkansas are those from the Dalton horizon Sloan site.)

Exchange and External Relationships. Nothing directly addressing these questions for Tom's Brook culture has been published. However, the widespread distribution of Johnson or Johnson-like points, from southeast Arkansas to eastern Oklahoma, and from the southern Ozarks into northern Louisiana, suggests some degree of interaction among regional groups. The even more widespread distribution of notched pebble/cobble netsinkers should also be noted. However, from the meager evidence now at hand, there do not appear to be any indications of interregional, let alone interareal, exchange in raw materials. In the only available summary of raw materials, all 53 Johnson points described by Schambach (1970:133) from the Cooper site were made of locally/regionally available materials (39 of novaculite, 14 of other Ouachita stone).

The Side-Notched Point Horizon (ca 4000–3000 B.C.)

Although some side-notched point types have been associated in the Eastern literature with Dalton and/or Early Archaic materials (Goodyear 1982:385ff; Morse and Morse 1983:106), and although some Dalton, San Patrice, and Keithville variants are more or less side notched (sometimes merging with corner notching; Webb 1981:4–5; Morse and Morse 1983:104, 106), there does appear to have been a later and more distinctive recurrence of side-notched points.

This has been called the Side-Notched horizon by the Morses (1983:110–111). They suggested that in northeast Arkansas, the possibly earlier (perhaps as early as 7500–6500 B.C.) but rare Cache River side-notched point type (1983:110, Figure 5.3k–n), and especially the more abundant Hickory Ridge side-notched type (1983:110, Figure 5.3g–j) both dated to about 4000–3000 B.C. They explicitly compared the latter type to the Big Sandy type of Tennessee and northern Alabama (Lewis and Lewis 1961) and to Midwestern types (cf. Jefferies and Lynch 1983:305, 307; O'Brien and Warren 1983:95–96; and other papers in Phillips and Brown 1983) dating to this period.

The Morses (1983:110) reported that such points were "fairly abundant in the lowlands, in contrast to what has been recovered representative of the period 7500–4000 B.C." but that they were "not as abundant as points dated to the post–3000 B.C. Late Archaic." It is worth noting again that the driest Hypsithermal interval in this general region apparently ended around 4500 B.C., although relatively dry conditions prevailed until about 3000 B.C. (King and Allen 1977). It should also be reiterated that the Mississippi River is believed to have shifted to its No. 3 (in both the 1974 and revised terminologies) meander belt, which swung west from the Memphis vicinity to the eastern flank of Crowley's Ridge, around 4000 B.C., and to have remained in this belt until after 3000 B.C. (Saucier 1974: 21, Figure 3, 1981:Figure 3; Autin n.d.:Table 2).

Aside from the above inferences based on point abundance and distributions, little is known about this horizon in northeast Arkansas. No sites have been intensively investigated. Even less is known about this period in southeast Arkansas, where such points are extremely scarce in collections (observations by Jeter).

In south-central Arkansas, though, side-notched Big Sandy-like points have been found at a number of sites, generally those that also produced Tom's Brook materials, and have been assigned to the Crystal Mountain phase (Schambach 1970:385–387; Schambach and Early 1982:SW53–SW55). However, they are rare outside the Middle Ouachita region (Schambach and Early 1982:SW53).

No similar side-notched point horizon has been identified in the Louisiana literature. Neuman (1984:77) mentioned side-notched points only in passing in his Meso-Indian Era discussion. Jeane (1981) summarized some rare Cache River-like points found in northwest Louisiana, but attributed them to a San Patrice or Early Archaic association, and indeed, at least some of his illustrated specimens may be within the range of variation of Webb's (1981:5) Keithville type, believed to be associated with (late?) San Patrice materials.

Middle Archaic Mounds?

Several investigations have produced surprisingly early radiocarbon dates for mounds in southern Louisiana. Some of these fall into the time range generally regarded as the Late Archaic culture period, and will be discussed in the "3000–500 B.C. period" section, but three have produced dates earlier than 3000 B.C. and will be summarized here.

The Monte Sano Mound (16EBR17), in the Baton Rouge vicinity, was tested by LSU researchers during the 1960s (Webb 1977:6). It yielded a date of 4270 B.C. on charred bone, which may have been cremated human bone (Webb 1982; Neuman 1985:32). However, as Neuman cautioned, "the archaeological deposition at the Monte Sano Mound is most complex, and until we are provided with a report detailing the results of the investigations there, the evaluation of this early date would be presumptuous" (1985:32). The Hornsby Mound (16SH21), in St. Helena Parish (one of the Florida Parishes), was tested in 1979 by Louisiana Archaeological Society members. A fire pit located near the base of the mound contained amorphous fired clay objects and yielded a radiocarbon date of about 3200 B.C. (Manuel 1979). Again, as

Neuman (1984:32) noted, no final report on the excavations has been published.

In 1982, the Campus Mounds (16EBR6), on the LSU campus in Baton Rouge, were cored for soil samples by Neuman (1985). One of the two mounds yielded samples which have produced three radiocarbon dates. The earliest of these dates was about 3400 B.C. (Neuman 1985:27). The other two dates were about 2890 B.C. and 2560 B.C., and the site will be discussed again later. Neuman (1985:28) emphasized that no artifacts have ever been found in or near these mounds.

In summary, these and the slightly later Late Archaic dates from mounds in Louisiana are indeed provocative, but little more can be said at present. Clearly, these sites must be rigorously excavated and reported upon if these surprising dates are to be accepted (or rejected) rather than regarded as interesting curiosities.

THE 3000–600 B.C. PERIOD

This time interval is virtually the same as that characterized by the Morses (1983:115ff) as the (Late) Archaic Expansion period, and approximately coincides with the first subdivision (5000–2500 B.P.) of Smith's (1986:6, 28) Late Holocene time unit. The beginning date also coincides with that usually given by Eastern and Southeastern archeologists for the beginning of the Late Archaic or an equivalent culture period (Stoltman 1978:715; Goodyear et al. 1979:111; but not Neuman 1984: 86ff, whose Neo-Indian Era begins at 2000 B.C.). The ending date has been adjusted slightly from the usual 500 B.C. estimate for the end of the Late Archaic and/or Poverty Point culture periods because of increasing evidence that these cultures were succeeded by Tchefuncte and related early ceramic cultures around 600 B.C., if not earlier (Shenkel 1984:44; Jenkins et al. 1986:551–552).

In the following subsections, a series of more or less distinctive non-Poverty Point lithic horizons and cultures will be summarized following discussions of chronology, general paleoenvironmental data for the entire 3000–500 B.C. period, and general trends in eastern U.S. cultural adaptations over the same period. After these summaries, remarks will be made about the poorly known Late Archaic, non-Poverty Point, mortuary practices, possible mound building, and subsistence–settlement in the study area. The section will close with summaries of the Poverty Point culture itself, of the first recognizable manifestations of Fourche Maline culture in southwest Arkansas and adjacent regions, and of the possibility of a pre-500 B.C. beginning for Tchefuncte and related cultures.

Chronology. The ending dates given for Late Archaic culture periods vary widely from area to area, depending on the varying dates for the first introduction of pottery. Although there is evidence for fiber-tempered pottery in Poverty Point (if not Late Archaic) contexts dating before 1000 B.C. (Webb 1977:31; Jackson 1986:50; Jenkins et al. 1986), this is traditionally ignored by Lower Valley archeologists as a basis for making any kind of culture–period distinctions, probably because the dating is so uncertain and the quantities involved are minimal (as Webb noted) in comparisonwith other Poverty Point artifacts. Instead, the "first ceramic making/using culture" distinction is usually bestowed on the Tchefuncte culture and related cultures of the Tchula culture period. The traditionally estimated date for the beginning of this period and the end of the Archaic is 500 B.C. (cf. Morse and Morse 1983:137ff; Neuman 1984:135–136); however, it now appears that 600 B.C., if not earlier, would be a better estimate.

Within the 3000–600 B.C. time span or Late Archaic culture period, a separate chronological and spatial status is usually allotted to the Poverty Point culture. Chronologically, this culture is generally estimated to have existed between about 1700 and 600 B.C., with this span subdivided into incipient (or nascent), florescent and decline stages (Webb 1977:60–61). Spatially, this culture seems to have been concentrated in, if not restricted to, the Lower Mississippi Valley (1977:Figure 1), with its major external connections (usually extractive) to the north, east and south (Eastern Gulf Coast), rather than to the west (Trans–Mississippi South and Western Gulf Coast). The major exceptions to this generalization appear to have been for extraction of lithic resources from the upper Ouachita and Arkansas valleys (1977:Figure 28).

The Morses (1983:115–116) treated the Poverty Point period as equivalent to Late Archaic or 3000–500 B.C., on the basis of evidence for early existence of some of the diagnostic Poverty Point artifacts, but this is an unusual usage. Here, the traditional restriction of Poverty Point culture to about 1700–500 B.C. (Webb 1977, 1982; Morse and Morse 1983:116), coeval with non-Poverty Point, late Late Archaic cultures, will be followed.

Paleoenvironmental Summary. The Delcourts' (1981: Figure 8) paleovegetation map for ca 3000 B.C. shows the Lower Valley dominated by the Cypress–Gum bottomland hardwood forest type. The Oak–Hickory–Southern Pine Forest type which formerly dominated the Coastal Plain, i.e., most of the (southern) Trans–Mississippi South, had been displaced in those regions by the Southern Pine Forest type, which blanketed Louisiana and southern Arkansas, west of the Lower Valley. This was the result of the major expansion of southern pines which occurred around 4000 B.C. (Wright 1976:586). A similar pine forest dominated the East Gulf Coastal Plain as well, and Larson (1980) has argued cogently that it had little to offer hunter–gatherers. A remnant Oak–Hickory–Southern Pine Forest type now survived well to the north of its former habitat, in northern and eastern portions of Arkansas. The Oak Savannah may have impinged on northwest Arkansas, and approached southwest Arkansas and western Louisiana.

During most of the Late Archaic, the Mississippi River was in meander belts which carried its flow from the edge of the bluffs above present-day Memphis, southwestward through the Eastern Lowlands to the southeast margin of Crowley's Ridge, then through various portions of the Yazoo Basin to the present Vicksburg vicinity, and finally through or near the Tensas Basin in northeast Louisiana. Below the present Red River mouth locality, though, it made a major change around 2800 B.C. from the Atchafalaya Basin to a course hugging the extreme eastern margin of the Lower Valley, terminating in the St. Bernard subdelta east of present-day New Orleans (Saucier 1974:21–22, Figures 1 and 3, 1981:Figure 3; Autin n.d.:Table 2).

A major problem, not directly relevant to the present study area, is the apparent development of separate but simultaneous partial flow channels by the Mississippi River in the Yazoo Basin of western Mississippi for an extended time span during this period (Saucier 1974:21–22). This was once interpreted as representing both the Mississippi River and the Ohio River (Fisk 1944; Ford et al. 1955:18–24; Brain 1971:36), but Saucier (1974:22, 1987 personal communication) felt that this could not have happened after about 4000 B.C. The problem is indirectly related to this overview, in that Poverty Point trade routes to the Midwest, and the environments of affiliated sites in the Yazoo Basin, like Jaketown (Ford et al. 1955) and Teoc Creek (Connaway et al. 1977) cannot be definitively reconstructed until this puzzle is solved.

One other major change appears to have occurred toward the end of this period. The Mississippi probably changed from its next-to-last (No. 4 in the 1974 terminology; No. 2 in the revised version) meander belt to its present one (No. 5 in 1974; No. 1 now) at some time between 1000 and 500 B.C. (Saucier 1974:22, Figures 1 and 3, 1981:Figure 3; Autin n.d.:Table 2). Saucier (1974:22) emphasized that this modern meander belt reoccupied regions formerly occupied by several earlier meander belts but did not completely obliterate remnant earlier deposits, so that some archeological sites predating 1000 B.C. may be preserved within the generally modern meander belt.

The interpretation of the Arkansas River's more recent meander belt chronologies has changed significantly; although the 3000–500 B.C. time period is not affected as much as some later periods, the changes should be noted. Formerly (Saucier 1974), it was believed that the meander belt which ran south of the present one toward present-day Greenville, MS, was abandoned about 3000 B.C. for one which ran along the eastern margin of the Bayou Bartholomew meander belt and passed west of Macon Ridge, and that the latter belt was in turn abandoned for the Plum Bayou–Bayou Bartholomew meander belt, following a similar course, around 1000 B.C. In the new interpretation (Autin n.d.:Table 2; Saucier, 1987 personal communication), the dates of these two changes were pushed back to about 4000 B.C. and 2000 B.C., respectively.

The major implication of these changed interpretations, as far as the 3000–500 B.C. period is concerned, is that the Arkansas River probably occupied the Plum Bayou–Bayou Bartholomew meander belt by 2000 B.C. instead of a millennium later. As in the previous interpretation, the river stayed in this belt until well after 500 B.C., the end of Late Archaic and Poverty Point times. So, during the entire 3000–500 B.C. period, the Arkansas River would have flowed southward in courses that were to the west of Macon Ridge, and the Ouachita River would have been its tributary, joining it at various places in northeast Louisiana. The Arkansas River, in turn, would have joined the Mississippi far to the south of their present juncture at various localities between the south end of Macon Ridge and the present Red River mouth (Saucier 1974:Figure 1). The location of the Poverty Point site itself would have been between the Mississippi and Arkansas rivers during this entire period.

The Arkansas River's change to the Bartholomew meander belt around 2000 B.C. appears to have involved only a slight westward movement in southeast Arkansas, but a fairly major shift to the west in northeast Louisiana, isolating the Bastrop Hills from Monticello Ridge which extends southward from Arkansas. The change in the estimated date of this shift from about 1000 B.C. (Saucier 1974) to about 2000 B.C. (Autin n.d.; Saucier, 1987 personal communication) would imply that it occurred before Poverty Point culture became established instead of in the midst of Poverty Point's florescent stage.

The Red River's lower course chronologies for this time span remain conjectural—in fact, more so than previously. Saucier (1974:23, Figures 1 and 3), noting his unfamiliarity with this valley, proposed a tentatively dated meander belt sequence beginning with No. 1, dating ca 3400–1800 B.C., followed by No. 2, dating ca 2000–300 B.C. In the revised summary, though, these were renamed Nos. 5 and 4, respectively, and the dates will be indicated as uncertain (Autin n.d.:Table 2; Saucier, personal communication).

Both of these earliest (as recognized so far) Red River meander belts flowed through the Atchafalaya Basin to the Gulf rather than joining the Mississippi, which probably flowed in a course hugging the eastern margin of the Lower Valley below the present Red River mouth during most of this period. It seems likely that such a situation existed during much if not most of this 3000–500 B.C. period, whatever the precise dates of these belts may be.

It should also be noted that according to Saucier (1978:35–36), the controversial prairie mounds, which occur by the hundreds of thousands in Arkansas and Louisiana west of the Mississippi River, may have been formed during a relatively brief interval between about 3000 and 2000 B.C. These features are usually 0.3 to 1.0 m high and 10 to 30 m in diameter, and are often reputed to be Indian mounds. Prehistoric artifacts have been found on some of them, especially on those near streams, but they are almost certainly of noncultural origin.

Cultural Developments. As implied by the Morses' (1983:115) Archaic Expansion characterization, this appears to have been a time of population and settlement expansion over much if not all of the present overview area. Populations appear to have settled in to regional or local settings to varying degrees, ranging from regular seasonal rounds to year-round base camp sedentism (Jackson 1986:77ff). Brose (1979) suggested that this settling-in process was accomplished with the establishment of modern (pre-European) ecological conditions, by about 2500 B.C., and was accompanied to varying degrees across the eastern U.S. by the establishment of exchange relationships between groups. Such exchange, and the links it fostered, may have served to develop and maintain social–ceremonial integration and to act as a form of primitive insurance against hard times. The Poverty Point exchange system

(Webb 1977; Gibson 1980) may be seen as a culmination of this basic Late Archaic trend.

Another development of this period, also undoubtedly related to social integration and ceremonialism, was increased investment in the construction of mounds and earthworks. For some time, it was believed that the large and smaller mounds and the large concentric earthworks at Poverty Point might represent the earliest such efforts in the eastern U.S. However, as noted before, two sites in Louisiana have now yielded evidence of possible Middle Archaic mound building. As will be seen below, there is also some evidence for Late Archaic, pre-Poverty Point mounds.

As already discussed, possible Mesoamerican cultigens have been found in the Midwest and northern Southeast in contexts dating to and before the Late Archaic time span being considered here. However, Smith (1986) discounted their role. Smith (1986:31ff) suggested instead that a long term and gradual process involving relatively stress free or minimalist selective pressures over the period ca 4500–1500 B.C. led to the independent domestication of native North American plants between about 2000 and 1000 B.C. He hypothesized that two basic kinds of human activities were involved: creation and maintenance of disturbed ground "domestilocalities," and the purposeful or accidental transportation of harvested wild plant seeds from their natural habitats to these "anthropogenic" habitats.

Evidence in the form of remains of domesticated or domesticable food plants is almost totally lacking in the entire present study area for this crucial period. Instead, we must turn for analogies and sources of hypotheses to the Midwest and Central Mississippi Valley, where massive flotation programs have been conducted, largely in Illinois in conjunction with highway contract archeology (Johannessen 1984; Asch and Asch 1985). Summing up this and much other evidence from the eastern U.S., Smith (1986:23ff) concluded that the span of time from about 2000 to 1000 B.C. "brackets the earliest evidence of morphological changes reflecting domesticated status" in all three native North American annual seed crops (sunflower, sumpweed, and chenopodium) which were domesticated before the first well documented appearance of maize in the East.

Late Archaic Lithic Horizons and Cultures

A wide variety of more or less diagnostic artifacts, including numerous stemmed projectile point/knife types and other chipped and ground stone artifacts, characterized various regions within the study area during this period. These will be reviewed under the relevant horizon and culture headings below, again listed in order of beginning dates.

The Williams Point–Big Creek Point Horizon (ca 3000–2000 B.C.?) (Figure 9)

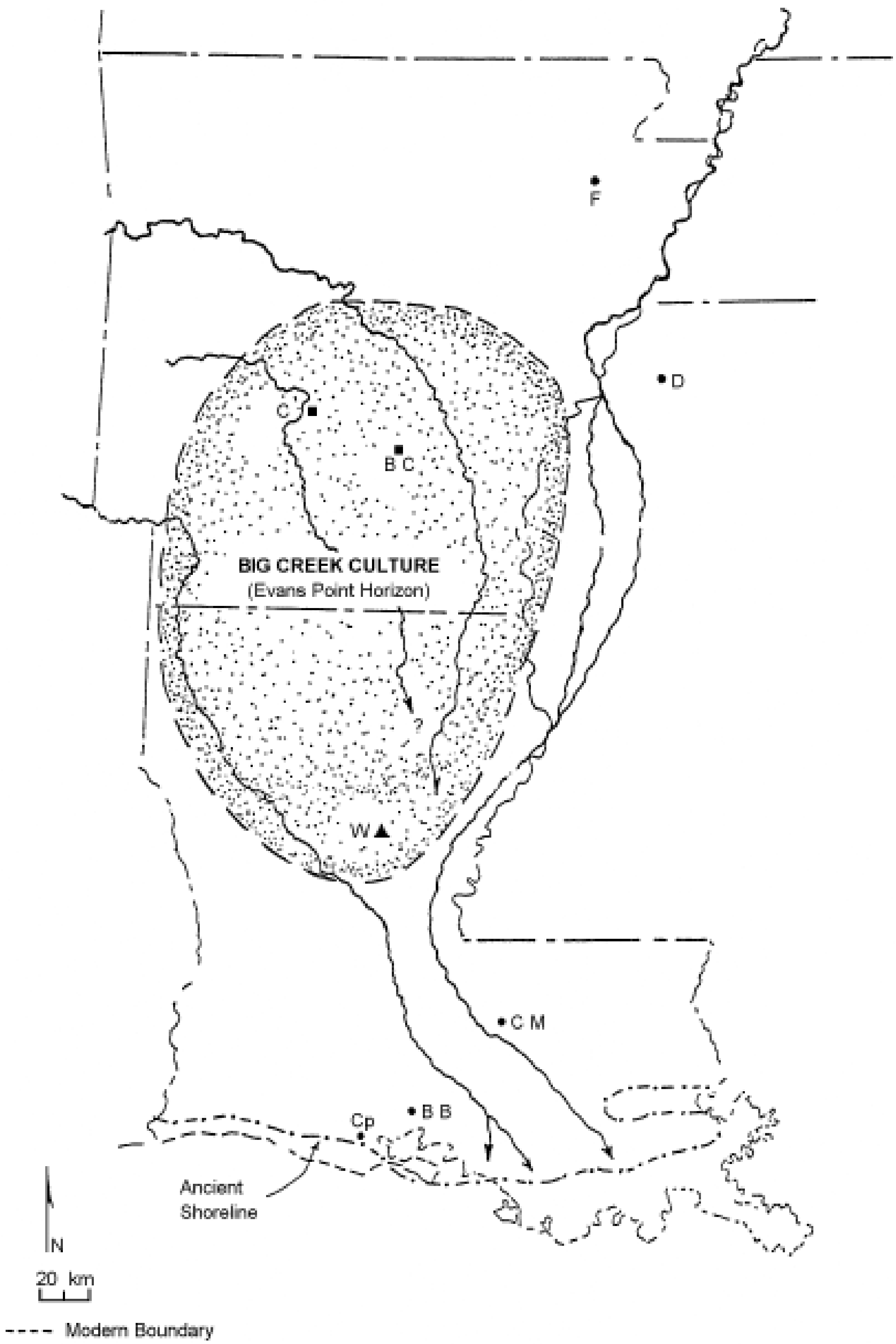
Williams points were originally defined in south-central Texas but have been found over large areas in eastern Texas and Oklahoma and well into western and central Arkansas and northwest Louisiana (Suhm and Jelks 1962:259; Schambach 1970:152ff; Webb 1981:11). Schambach (1970:159) suggested that "the weightier portion of the Williams distribution now appears to be in the valleys of the Ozark and Ouachita highlands and foothills south of the Springfield Plateau." They are points of medium size with generally pronounced and barbed shoulders, produced by corner notching. They have expanding, bulbous stems with distinctly convex bases (1981:11).

The Big Creek point type should be distinguished from the Big Creek culture, which was probably slightly later. Big Creek points are bulbous base bifaces of medium size with wide corner notches, expanding stems, convex bases, and often prominent shoulder barbs (Morse and Morse 1983:116, Figure 6.2a–b). They were named after a stream near Jonesboro in northeast Arkansas, are very prevalent in and near that macroregion, and despite some evidence for slightly earlier dates are believed to date primarily to the 3000–2000 B.C. period; the Morses noted that they belong to the Williams point cluster (1983:118). Given the precedence of the Williams point type and the existence of the nearby (in space and time) Big Creek culture in south-central Arkansas, perhaps the Big Creek point type should be taxonomically "sunk" to avoid confusion.

In a change from the pattern for presumably earlier point types, Williams-like points are fairly abundant in east-central and southeast Arkansas collections (House 1980; Jeter 1982a: 93; Jeter et al. 1982:SE9). As usual, though, none have been recovered from controlled excavations.

Schambach and Early (1982:SW56) briefly summarized the minimally defined White Oak phase (originally defined by Schambach 1970:388) as "an amorphous entity marked by the presence of diagnostic Williams projectile points" and placed it in the Middle Archaic period. However, Sabo and Early (1988) included Williams points in Late Archaic cultures dating after 3000 B.C.

Five Williams points were found during the excavations at the multicomponent Whatley site in northeast-central Louisiana, but their stratigraphic and chronological positions were not clear (Thomas and Campbell 1978:Tables 14–17). However, at the Cowpen Slough site near Larto Lake in east-central Louisiana, a single Williams-like point was found; radiocarbon dating placed the earliest occupation of that site at ca 2500 B.C. (Ramenofsky and Mires 1985:110, 164). Summarizing the archeological sequence of the Catahoula Basin, Gregory et al. (1987:26) suggested that Williams and other point types (all generally considered somewhat later) all belonged to the Middle Archaic to Late Archaic. Williams points were not mentioned in Gregory and Curry's (1978) review of Natchitoches Parish prehistory. A few were found during excavations of the Big Brushy site on Fort Polk in west-central Louisiana, but their placement could not be discerned clearly due to somewhat mixed deposits (Guderjan and Morehead 1983:902; Anderson et al. 1987:67–68). A Williams point from the Jones Creek site east of Baton Rouge was illustrated by Gagliano (1963:Figure 5R), but appears to be flat based and lacks distinct barbs. Neuman (1984:83–84) summarized scattered surface finds of Williams points around



Key: **Big Creek culture sites:** BC = Big Creek; C = Cooper.
Other sites: BB = Banana Bayou; CM = Campus Mounds; Cp = Copell; D = Denton; F = Frierson; W = Whatley.

Figure 9. Map of cultural and lithic horizon distributions and key sites in and near the study area ca 2500–2000 B.C.

Louisiana, and included them in the discussion of his Meso-Indian Era, which he dated from 6000 to 2000 B.C.

The dating of Williams points is obviously questionable. Schambach (1970:159) noted that their assignment to the nebulous Edwards Plateau aspect of Texas "means practically nothing" due to the catchall nature of that concept. Webb (1981: 11), following the Texas and Oklahoma type descriptions, placed them in "some part of the span 4000 B.C. to A.D. 1000" but expressed some doubt about the latter date.

Given the absurdly long time span assigned by the Texas literature to Williams points, the apparent trend toward guess dates after 3000 B.C. for them and the presumably related Big Creek points, and the 2500 B.C radiocarbon date from the Cowpen Slough site, both types are here very tentatively placed in the ca 3000–2000 B.C.? pigeonhole. A series of good radiocarbon dates from sites in different regions would be most welcome, though.

Due to the lack of intensive or extensive excavations of well defined components and preserved features, nothing is known about tool kits, settlement patterns, subsistence, and mortuary practices of the peoples who made Williams and Big Creek points.

The Evans Point Horizon and Big Creek Culture (ca 2500–1500 B.C.?) (Figure 9)

The unusual blade-notched Evans points, often with slightly expanding stems if not distinct corner notching, were defined by Ford and Webb (1956:64, Figure 22d–e) in their original Poverty Point site report, although they were rare there and are believed to be earlier than the Poverty Point period. They were named for Mr. and Mrs. U. B. Evans of Alexandria, Louisiana, pioneering amateur archeologists of the Catahoula Basin region (Ford 1936b:2; Webb 1981:10; Gregory et al. 1987:vi). A probably closely related Sinner point type, which has two blade notches, was also named (Webb 1981:10) on the basis of northwest Louisiana finds and probably has a similar distribution.

Evans points were not mentioned in the later books by the Morses (1983) and Neuman (1984). Their main area of occurrence appears to be in southern Arkansas, outside the Morses' Central Mississippi Valley coverage, and in northern Louisiana, which was somewhat deemphasized in Neuman's book. Schambach (1970:392) summarized the Evans distribution as "rarely found in Texas [Webb, personal communication, agrees], its frequency increases in southwest Arkansas and central and northwest Louisiana and reaches a peak...at or near the eastern border of the Trans–Mississippi South." He added that the type might be important in the Lower Mississippi Valley. Samuel O. Brookes (1987 personal communication) reports that similar points are occasionally found in western Mississippi.

House (1980:7) stated that Evans points were found in small numbers at numerous sites along the Arkansas River's Meander Belt No. 4 (in both the Saucier 1974 and revised terminologies; now estimated to have been occupied ca 5200–3800 B.C.; Autin n.d.:Table 2) in east-central Arkansas. He estimated the points' age at around 2000 B.C They are also found occasionally along the more recent meander belts near Bayou Bartholomew, probably associated with the older of these two belts (Rolingson 1974; Jeter, personal observations).

However, it is in the uplands at the northeastern margins of the Felsenthal region and the Saline River drainage, in northeast Cleveland County, southeast Arkansas, that the major Evans point site known to date was found. The Big Creek site (3CV18) was discovered by the late Frank Chowning, a leading amateur who collected well over 500 Evans points from this site (Schambach 1970:392; Schambach and Early 1982: SW57). It has been tested briefly on several occasions, but never investigated intensively.

Schambach (1970:175–182) described some 88 Evans point variants from the Cooper site in the Middle Ouachita region. He defined the Dorcheat phase (1970:389ff) to include these and Bulverde points, a straight-stemmed type with a westerly distribution (Suhm and Jelks 1962:169, Plate 85; Schambach 1970:390–392), found with Evans points at Cooper but absent at the Big Creek site.

The Dorcheat phase concept was expanded beyond the Middle Ouachita region to include at least parts of the Felsenthal, Middle Saline, and Ouachita Mountains regions (Schambach and Early 1982:SW57–SW59). The assemblage probably also includes small ground and polished stone tools and ornaments made of red slate, at least at the Cooper site. For the eastern Felsenthal region, a Rison phase named after the Cleveland County seat has not been thoroughly described, but it has been designated to include the Big Creek site and related sites (Schambach and Rolingson 1981:179). Schambach also designated the Big Creek culture and is defining it to include at least the major Arkansas Evans point sites (Schambach and Rolingson 1981:179; Schambach and Early 1982:SW57ff). It should be reiterated here that the Big Creek point type was named in northeast Arkansas and is only coincidentally close to the Big Creek culture in space and time.

The Big Creek culture has been characterized as late Middle Archaic to Late Archaic (Schambach and Early 1982:SW57), but it is regarded as possible that it was Late Archaic and not late Middle Archaic (1982:SW60). If it indeed dates ca 2500–1500 B.C., as suggested here, it would be well within what is usually regarded as the Late Archaic time span. As noted by Schambach and Early (1982:SW57), a prerequisite for adequate definition of Big Creek culture will be extensive controlled excavations at sites like Big Creek, followed by thorough analyses and publications.

The Late Archaic Stemmed Point Horizons (ca 2000 B.C.–??)

A number of poorly dated, probably relatively long lived and morphologically rather variable point types have been found in various parts of this study area and generally assigned to a Late Archaic cultural affiliation. Many if not most of them probably first appeared, or at least flourished, after 2000 B.C., and some of these general styles apparently endured (though perhaps trending to smaller sizes) well into the first millennium A.D. In most of these cases, type names from other areas (especially Texas and Oklahoma, for which point type books were published relatively early) have been invoked, not always justifiably. Here, some of the major types of the post-2000 B.C. Late Archaic will be reviewed briefly. A number of other point types of this general period are specifically associated with the Poverty Point culture, and will be reviewed in that section.

The Burkett point type was defined by Chapman (1980: 306), on the basis of finds in the Cairo Lowland of southeast Missouri. Similar points have been found in northeast Arkansas and assigned to the period ca 2000–1000 B.C. (Morse and Morse 1983:116, 118, Figure 6.2c). These are medium to large points with prominent shoulders. The stems are usually straight, but sometimes contract and tend to merge with the ubiquitous Gary type (see below).

In the report on the Jaketown site, a Heavy Blade point category was described (Ford et al. 1955:131, Figure 52 l–p). In the Poverty Point site report, this category was redefined as the Hale point type (Ford and Webb 1956:64–66, Figure 22f–j). As in the case of Burkett points, variation in size and shape was apparent, and resemblances to certain Gary point variants was noted (1955:131, 1956:66). Webb (1977:39, 1981:12) noted that Hale-like points also occur on Late Archaic sites. He also stated that most specimens found in northwest Louisiana were made on nonlocal cherts (1981:12). It is probable that there is a great deal of morphological, typological, and chronological overlap between the Hale and Burkett types.

The Gary type was formally defined by Alex Krieger in the report on the Caddoan Davis site in east Texas (Newell and Krieger 1949:164, 166, Figure 57A–P) as "tremendously widespread...in virtually the entire woodlands of the eastern United States" and including "many variations in size, workmanship, and stem and blade form, but in general...a heavy point with the stem contracting to a sharp or rounded tip." He noted that it was common in both Archaic and early pottery associations. In his Greenhouse site report, Ford (1951:115, Figure 45) brought the type name into the Lower Mississippi Valley literature.

Ford, Phillips, and Haag (1955:127–129, Figure 51) attempted to refine the typology by naming several Gary variants on the basis of size and shape. A similar approach was taken by Ford and Webb (1956:52–54, Figure 17) in their report on the Poverty Point site; they also suggested that "with the passage of time there may have been a tendency for Gary points to decrease in size" (1956:53), illustrating this trend graphically (1956:Figure 18).

Schambach (1970:188ff) formally introduced the type–variety system in his analysis of Gary points from the Cooper site collections in his dissertation. In the ensuing decade, he refined these concepts further on the basis of comparisons with collections from many other sites in and near southwest Arkansas. In his recent review of the Fourche Maline culture concept (see below), he suggested that the *Gary* variety was "the ancestral Archaic variety" (Schambach 1982a:174), and that it may have been introduced to the Trans–Mississippi South by interaction with the Poverty Point culture. However, in view of the extremely widespread distribution of large and small Gary-like points in Archaic, non-Poverty Point contexts, they are not discussed here with the distinctive Poverty Point complex, although they are certainly associated with that complex.

Morse and Morse (1983:118) stated that Gary points "probably are essentially contemporaneous with Burkett but are so nebulous in definition and temporality at the present time that they are not very useful in keying specific complexes." Schambach (1982a:174) stated that the early *Gary* variety was not documented in post-Fourche Maline 2 contexts. Based on these and other perspectives, it appears likely that the *Gary* variety was in use by about 1500 B.C. and continued in use until about 100 B.C. (cf. Schambach 1982a:Table 7-1).

The Weems point type was named in southeast Missouri, and extended into northeast Arkansas by the Morses (1983:116, 118, Figure 6.2e). It is a barbed point with an expanded stem, estimated to date 1000 B.C. through the Tchula period, ca A.D. 1(1983:118).

A number of other Late Archaic point types, many of them imported from the Oklahoma or (especially) Texas literature, have been identified in Arkansas and Louisiana. These include the Carrollton, Elam, Ellis, Kent, Marcos, Marshall, Yarbrough, and Wells types. Most of these are described in the Poverty Point culture literature, and summarized conveniently in Webb's (1981) northwest Louisiana type guide.

Late Archaic Subsistence and Settlement

Data on both Late Archaic and Poverty Point subsistence are extremely scarce in the study area. However, some progress has recently been made on both fronts. Largely on the basis of analyses of materials and data from the Cowpen Slough site (Ramenofsky and Mires 1985), Ramenofsky (1986) proposed a distinction between Late Archaic and Poverty Point subsistence–settlement systems. Following Gibson (1973) and Usner (1983), both of whom emphasized the richness of the Lower Valley's floodplain resources, she suggested that both systems were involved in a diffuse resource exploitation strategy.

However, after reviewing the Cowpen Slough floral and faunal data and artifact assemblage, Ramenofsky suggested that the Late Archaic occupation there was "perhaps quite permanent" (1986:299), and that the basic Late Archaic exploitation strategy was not only diffuse, but also "redundant" (1986: 300). That is, in Late Archaic society, "within age and sex distinctions, any individual could perform the same task as any other individual" (1986:294), and "the archeological record preserved at one location should look quite similar to that at another location" (1986:295). In contrast, the Poverty Point strategy was characterized as diffuse and "nonredundant" (1986:303), i.e., "residential locations should vary functionally" (1986:295).

Ramenofsky (1986:303) noted that this position was in agreement with previous suggestions that Poverty Point society was stratified (Ford and Webb 1956) or even a chiefdom (Gibson 1973). As will be seen, Jackson (1986) argued that a relatively small Poverty Point outlier, the Copes site, was occupied year-round by more or less sedentary people. Although he downplayed the possibility that Poverty Point was a chiefdom, his and other data offered some support for the hypothesis of non-redundant functional variability. It should also be noted that Ramenofsky (1986:306) hypothesized "the persistence of the more generalized [Late Archaic] strategy after the development of the specialization that has become known as Poverty Point."

An alternative hypothesis, certainly worth equal consideration, and suggesting a closer interrelationship between Poverty Point and the contemporary Late Archaic culture(s), was stated by John House (in Jeter et al. 1982:SE10): "whether the Poverty Point complex represents a distinct sociocultural unit in the normative sense, or is rather the ceremonial–integrative structural pose of a widespread grouping of Late Archaic societies within this portion of the Southeast." This might explain the rather curiously discontinuous distribution of clusters of Poverty Point-related sites, which when mapped (cf. Webb 1977: 7ff, Figures 1–5; Gibson 1980d:322, Figure 1) have the appearance of islands in a Late Archaic sea.

The situations may have been rather different in portions of the study area farther from the Poverty Point center, both before and during the times that center flourished. The Morses (1983:130–132) suggested that Late Archaic midden sites in northeast Arkansas may represent late fall–winter villages of peoples who exploited seasonal lowland resources such as waterfowl, fish, and deer. The populations may have fragmented from early spring to early fall, with some emphasis on the upland resources. They also suggested (1983:132–134) that this may have been the time of development of tribal level, possibly "big man" societies.

Although it has been suggested (Shenkel 1984:65) that a rather specialized coastal subsistence adaptation started with the Tchefuncte culture, some earlier evidence for a coastal adaptation has been obtained from Late Archaic and Poverty Point sites. These older sites are rather rare in the coastal zone, and it may well be that most coastal sites of this age have been covered by subsidence and deposition, or destroyed. Therefore, we are here beginning our practice of differentiating coastal variants from the inland variants of archeological cultures. In most cases, the inland variant was the first defined and described, and is better known than the coastal variant. But, in one case (Tchefuncte), the cultural definition was made in the coastal zone, which is still better known.

Late Archaic Mounds?

The possibility of Middle Archaic mound building has been mentioned above. There is also some evidence from Louisiana for Late Archaic, non-Poverty Point mound building. Neuman (1985) cored the Campus Mounds on the LSU campus at Baton Rouge, and in addition to the Middle Archaic date of ca 3400 B.C., obtained dates of ca 2500 B.C. and ca 2900 B.C. on two other core samples from the same mound (1985:27). Neuman (1985:28) emphasized, however, that not a single artifact has been documented as having come from this site, or near it. Additionally, the Banana Bayou Mound on Avery Island in the coastal zone of Iberia Parish yielded a radiocarbon date of ca 2400 B.C. (Gagliano 1964; Neuman 1984:83–84, 1985:31). Again, no diagnostic artifacts were associated.

The same remarks that were made in discussion of the possible Middle Archaic mounds are applicable here. Both meticulous excavations at these sites to produce cultural materials associated with carefully dated samples and thorough reports on those excavations will be required before these provocative findings are generally accepted.

Late Archaic Mortuary Data

Despite the abundant and widespread finds of Late Archaic points, data on Late Archaic mortuary practices are extremely scarce. The only site with any real data in the entire Arkansas portion of the present study area is Frierson (3CG54), near Jonesboro in northeast Arkansas. There, a test excavation of a Late Archaic midden mound yielded seven flexed burials (Morse and Morse 1983:128, Figure 6.8). The Morses (1983: 128, Figure 6.7a) also suggested that similar burials found by Moore (1910:355–356) at Little Turkey Hill in Independence County, slightly outside the present overview's territory, were of this period.

In Louisiana, only one site has yielded good Late Archaic mortuary data. That site is Cowpen Slough (16CT147), located near Larto Lake in southern Catahoula Parish. It was originally thought to be of Poverty Point affiliation (Spencer and Perry 1978), but excavation indicated that the 28 burials (minimum number of individuals) were of a Late Archaic, non-Poverty Point, context, dating ca 2500–2000 B.C. (Ramenofsky and Mires 1985:113). A wide range of interment types, including primary and secondary unburned burials and primary and secondarily deposited cremations, was identified. These burials will be discussed further in Chapters 10 and 11.

Late Archaic Exchange

It was noted above that Brose (1979) suggested a general increase in the intensity of interregional exchange during the Late Archaic. No thorough studies of this phenomenon have been published for the present study area, but such research would be worthwhile if the necessary chronological controls could be achieved. The Morses (1983:116) summarized several examples indicative of a trend toward increasing intensity in such exchange throughout the Late Archaic, in and near northeast Arkansas. From a Louisiana perspective, Gibson (1980d:326) remarked that the Poverty Point network "had been preceded in the same area by a Late Archaic trade network which trafficked in some of the same materials" but "does not appear to have been as intensive or as extensive as Poverty Point commerce during its zenith." He also noted some indications of source area shifts, and changes of emphasis in kinds of materials being circulated.

Late Archaic–Poverty Point Transition in the Pontchartrain Region

Archeological research by Gagliano and Webb (1970) on the Cedarland Plantation site (22HC30) and the Claiborne site (22HC35) located in Hancock County, Mississippi, has provided an example of two possibly closely related occupations that fall on either side of the transition between the Late Archaic and Poverty Point. The authors proposed that the close physical proximity, similarities between the layout and artifact content, and the close sequential temporal relationship of the two sites indicated that they represent sequential occupations of the same population type (Gagliano and Webb 1970:69–70).

The two sites, which are separated by a narrow swampy depression, are remarkably similar in layout, consisting of horseshoe-shaped shell middens with the open ends toward the Pearl River estuary. The Cedarland site (Late Archaic) midden, which is 165 to 90 m in diameter, is made up of predominantly *Crassostrea* (oyster) while the Claiborne midden, which measures 200 to 140 m in diameter, is dominated by *Rangia* or clam (Gagliano and Webb 1970:47–49). This shift in the midden from oyster at Cedarland to clam at Claiborne is interpreted as a function of the river delta shifts which brought an influx of freshwater (and the brackish water clam) into the area and pushed the saline zone (where oysters thrive) seaward (Coastal Environments, Inc. 1977:264–265). The large and diverse nature of the archeological deposits from the two sites suggests that they represent semipermanent village type occupations, and the varied exotic materials at the sites suggests that each occupied an important position with respect to the regional distribution of materials during their respective periods of use (Gagliano and Webb 1970:69). This continuity in the location of the seat of regional trade over the Late Archaic–Poverty Point occupation span of the two sites underscores the fact that regional trade networks of the Poverty Point Period have foundations extending back at least as far as the Late Archaic (cf. Gibson 1968; Webb 1970; Smith 1976; Brose 1979).

While there are differences in the artifact content between the two sites, which Gagliano and Webb attributed to the timing of the shift during the transition between Late Archaic and Poverty Point, there is little difference between the sites in terms of lithic technology, projectile point styles, or bone antler tools. The material differences between Cedarland and Claiborne include the introduction at Claiborne of clay ball cooking, fiber-tempered and untempered pottery, clay figurines, Motley projectile points, a shift from bannerstones to two-hole gorgets, and a shift in the method of microflint manufacture from bipolar reduction to core blade production. A radiocarbon date from the upper (presumably terminal) level of Cedarland yielded a date of 1240 B.C. and a sample from the basal (presumably earliest) level of Claiborne produced a date of 1150 B.C. which suggested to Gagliano and Webb that the shift in occupation from Cedarland to Claiborne occurred around 1200 B.C. (Gagliano and Webb 1970:69).

Though it can be argued that Gagliano and Webb (1970) have not convincingly demonstrated a derivative relationship between the actual populations of the two sites, the evidence seems to clearly support the notion of a sequential developmental relationship between the cultures at Cedarland and Claiborne. In addition, it might also be appropriate to consider the possibility that the intrasite structural similarities between the two sites may be a factor of culturally independent functional considerations rather than an indication of population continuity. In any event, the importance of the study by Gagliano and Webb (1970) in contributing insights into this transitional time between coastal Late Archaic and Poverty Point is not diminished if the sequential occupations at Cedarland and Claiborne were not by the same population group.

The Poverty Point Culture (ca 1700–500 B.C.?)

We now turn to a truly unique cultural manifestation, the Poverty Point site in northeast Louisiana and related sites which functioned in the Poverty Point cultural system. Poverty Point has challenged archeologists' efforts at explanation and understanding for more than a century and will probably be equally challenging, perhaps in different ways, a century from now.

Definition and Location. The first widespread published description of the Poverty Point site itself seems to have been a summary of an 1872 visit by Samuel H. Lockett, whose brief notes about mounds on the Jackson, Mabin, and Motley properties (the name "Poverty Point" was not used) were published in a Smithsonian Institution Annual Report (Lockett 1873; quoted in Neuman 1984:15–16). However, the Smithsonian's Mound Survey of the 1880s paid little attention to the site; it was only mentioned in passing (again with reference to the landowners rather than Poverty Point) in the preliminary report (Thomas 1891), and not at all in the final report (Thomas 1894).

Moore (1913) made the first relatively thorough preliminary investigation and followed local usage in using the name "Poverty Point." He accurately mapped the great Poverty Point Mound A (which is about 21 m or 70 ft high) and the Motley Mound to the north, and described and illustrated several kinds of artifacts which have become regarded as Poverty Point diagnostics, including clay balls (Poverty Point objects, probably used as a substitute for stones in hot rock cooking), hematite plummets, celts, stone beads, and a clay figurine. He also remarked on the curious absence of ceramics (1913:70).

Fowke visited Poverty Point during the middle 1920s, and arrived at the erroneous conclusion that the mounds were natural (1928:434–436). He did summarize finds by local people, including a plummet cache and a steatite vessel. Work at the site languished during the 1930s, due to other priorities such as working out a ceramic chronology (Ford 1935c, 1936b; cf. Ford and Webb 1956:14; Jackson 1986:15).

Webb (1944, 1948) was the first to describe the Poverty Point artifact complex adequately and compare it to other eastern U.S. complexes in national articles. Gibson (1980b) summarized Webb's long involvement with and contributions to Poverty Point research.

Meanwhile, the related Jaketown site in west-central Mississippi, which had been rediscovered by James B. Griffin in 1941 (after having been described as "Mounds near Wasp Lake" by Moore 1908:581–582), was tested by the Lower Mississippi Survey in 1946 and discussed in the survey report (Phillips, Ford and Griffin 1951:273–281, 429–431). Speaking of Jaketown, the authors concluded, "It goes without saying that further excavations ought to be carried out on this extremely interesting and important site" (1951:281).

Almost as soon as possible thereafter, in 1950 and 1951, excavations were conducted at Jaketown, and Poverty Point was tested in 1952 and 1953. Also, while examining aerial photos of the Poverty Point site, Ford noticed the concentric earthworks for the first time, and published a note about them in *American Antiquity* (Ford 1954), which was followed by major 1955 excavations at Poverty Point. The twin reports (Ford, Phillips and Haag 1955; Ford and Webb 1956) published by the American Museum of Natural History on these two sites marked a quantum leap ahead in the documentation of basic facts about Poverty Point culture. However, a number of questionable interpretations about chronology, geoarcheology, and cultural relationships were also made (see Jackson 1986: 17ff for a critique).

During the next two decades, data about Poverty Point-related sites accumulated rapidly, through work in southeast Louisiana and the Gulf Coast (Gagliano 1963, 1967; Gagliano and Saucier 1963; Saucier 1963; Gagliano and Webb 1970), east-central Louisiana (Gibson 1968; Hunter 1970); and northeast Louisiana (Gregory et al. 1970). Much of this work was summarized in an *American Antiquity* article by Webb (1968) on "The Extent and Content of Poverty Point Culture," and in more detail on a site-by-site basis in a special issue of the *Southeastern Archaeological Conference Bulletin* (Broyles and Webb 1970). Also in 1970, Phillips' major synthesis of Lower Valley archeology was published and included a section defining phases of Poverty Point culture (Phillips 1970:869–876).

Another aspect of the Poverty Point site itself, social organization as evidenced by intrasite variability of artifact distributions, was made possible by a local amateur, Carl Alexander, whose abundant collections (more than 18,000 artifacts) were provenienced by sectors and rows within the grid of prehistoric earthworks. Preliminary analyses were presented by Webb (1970b) and Gibson (1970), but the major studies and interpretations were presented in Gibson's (1973) dissertation. Briefly, Gibson suggested that Poverty Point had been a chiefdom with ranked social organization, maintaining a large resident population at the Poverty Point site and integrated economically through redistribution of both exotic trade goods and locally produced subsistence goods. With regard to the latter, he suggested that the Lower Valley environment was productive enough to maintain this system despite the lack of maize agriculture.

During the 1970s and 1980s, several generally limited excavations took place at and near Poverty Point. Kuttruff (1975) reported on tests in the site's north sector. In the Yazoo Basin, the Teoc Creek site was reported upon, after having been tested by Ford and others (Connaway et al. 1977). Construction of a gas pipeline near the Poverty Point site led to extensive surveys and test excavations, producing some subsistence data (Thomas and Campbell 1978b; Byrd 1978; Shea 1978). Test excavations were conducted in the central plaza at Poverty Point (Woodiel 1981). An LSU field school worked at Poverty Point in 1980, 1981, and 1982, concentrating on one of the concentric ridges; thus far, only two preliminary reports have been written (Goad 1980; Exnicios 1981). Much of this work was summarized in a special Webb *festschrift* issue of *Louisiana Archaeology* (Gibson 1980a, b, c, d).

Meanwhile, H. Edwin Jackson, then a graduate student at the University of Michigan, conducted surveys and tests in the Poverty Point vicinity in 1981, and excavated extensively at the nearby J. W. Copes site in 1982. His dissertation (Jackson 1986) summarized this work and offered an alternative view of the Poverty Point site itself and the overall Poverty Point cultural system. In his view (1986:532ff), this was not a chiefdom; Poverty Point itself had a significantly smaller resident population than suggested by Gibson and others and functioned as a periodic central meeting place.

In 1983, work once again resumed at the Poverty Point site itself. In a project funded by the U.S. Department of the Interior (administered by the Louisiana Division of Archaeology), the University of Southwestern Louisiana, and private donations, the site was more accurately mapped (by a professional engineering firm using LANDSAT and other state-of-the-art technology), and test excavations were conducted at several locations. A report was submitted (Gibson 1984).

In conjunction with this work, NLU tested the so-called Deep Six locality at Poverty Point, discovering evidence of massive prehistoric basket loading to fill in a gully, and other evidence suggesting lacustrine deposition (Greene 1985). Gibson (1984:102-109) postulated the existence of Lake Macon instead of Bayou Macon during at least some of the Poverty Point occupation. Greene (1985:48–50) considered this and other hypotheses. Roger Saucier (personal communications to Greene 1985:49 and to Jeter in 1987) expressed doubts about the Lake Macon hypothesis on several counts, but more work is needed to definitively resolve the question.

In May, 1986, a conference on Poverty Point archeology was held at the Poverty Point site itself. Papers summarizing a variety of viewpoints, e.g., by Ramenofsky (n.d.), Gibson (n.d.a), and Jackson (n.d.), were presented, and will soon be published, along with another paper by Gibson (n.d.b) in a volume to be edited by State Archeologist Kathleen Byrd (n.d.).

The artifacts of the Poverty Point culture were summarized in the major site reports cited above and in several widely distributed overviews by Webb (1968, 1977, 1982). In these and other works, Webb listed a series of primary, secondary, and tertiary diagnostic traits of the Poverty Point complex The primary traits include Poverty Point objects (baked clay balls molded into a wide variety of shapes (1977:Figure 15), tubular pipes, clay figurines, stone (steatite or soapstone and sandstone) vessels, a microflint industry, rough greenstone hoes and celts, hematite and magnetite plummets, and a lapidary industry featuring polished beads and other ornaments made from jasper.

The secondary diagnostics include several projectile point types (see below) and other chipped stone tools, adzes, two-hole gorgets, polished stone pendants, boatstones, and bannerstones (especially the butterfly shape, often made of quartz). Tertiary traits include galena (lead ore), quartz crystals, and fiber-tempered pottery. This pottery is believed to date before 1000 B.C., and possibly as early as 1200 B.C., at two Poverty Point sites in Mississippi (Jenkins et al. 1986:548), but it has not yet been dated at Poverty Point itself or at related sites in the present study area.

The abundance of certain artifact classes at the Poverty Point site itself is sufficient to make even veteran archeologists pause and wonder. Almost 12,000 projectile points have been recovered from the Poverty Point site (Webb 1977:Table 4), and Webb (1977:36) estimated that thousands of steatite vessels (which must have been imported from no closer than eastern Alabama) must have been used there. Based on the densities of Poverty Point objects in the excavations reported by Ford and Webb (1956), Gibson (1973:132–133) estimated that there might be 12,000,000 Poverty Point objects at the entire site.

There are at least 12 projectile point types clearly associated with Poverty Point culture, according to Webb (1977:37ff). The most common, but not truly a diagnostic, is the Gary type (see above). More distinctive is the Pontchartrain type, slender and often well made. The Kent type resembles Pontchartrain, but is less slender and poorly made; both often retain pebble cortex at the base of the stem.

The Motley point is the most distinctive and diagnostic type, and is regarded as virtually restricted to the Poverty Point culture (Webb 1977:37–38). It has definite corner notches which produce barbed shoulders and narrow, expanding stems which might also be said to be barbed at the base in some cases. At Poverty Point itself, Motley points are second only to Garys in abundance, but they are less common at other sites. They are generally more common on the larger sites, are often made of exotic materials, and sometimes are found in caches, all of which has been taken to suggest that they may have been associated with an elite class (Gibson 1973; Webb 1977:38).

Other point types found at Poverty Point and related sites include Hale (see above); three types named for places near Poverty Point (Delhi, Macon, and Epps); and three imported from the Texas literature (Ellis, Carrollton, and Marshall).

Webb (1977:60–61, 1982) proposed three developmental stages of Poverty Point culture. The incipient or nascent stage, from about 1700 to 1200 B.C., involved sites from small camps on the coast to Jaketown and Teoc Creek in the Yazoo Basin (which, it will be recalled, was probably occupied by the Mississippi River during these times). Poverty Point itself was also occupied, but the massive earthworks had not yet been started.

In the florescent stage (ca 1200–800 B.C.), regional interaction was fully developed. It was probably during these centuries that the monumental earthworks at Poverty Point were constructed. Gibson (1973:127–139, 1980d:342–343) suggested that this stage was even briefer, on the order of 1200–1000 B.C.; he used this to conceptualize the site as a large town with 4,000 to 5,000 residents, organized as a complex chiefdom and led by an elite warrior group. Jackson criticized his concept (1986:42ff), arguing instead for a significantly longer period of construction.

The decline stage, according to Webb (1977:61) lasted from about 800 to 600 B.C., "by which time Tchefuncte culture replaced Poverty Point." (As will be seen, there are some indications that Tchefuncte culture was in existence in some parts of the Lower Valley by 700 B.C.) During these centuries, the massive construction at Poverty Point ceased, occupation there shrank to the edge of Bayou Macon, and the trade network declined.

Paleoenvironmental Data. The general paleoenvironmental situation has already been reviewed. Here, it should be reiterated that the locations of various river courses and deltas may have been crucially important for the wider Poverty Point interaction network. And, in particular, the Poverty Point site's location on Macon Ridge appears to have been between the more or less parallel Mississippi and Arkansas rivers for the entire time of its existence. This location, "at the base of the raw material collection funnel and at the head of the southern commodity distribution funnel," has been credited by Gibson (1980d:338) as "the primary reason for the prominence of the Poverty Point site."

As noted in the above summary of recent work at Poverty Point, there have been some suggestions that there may have been a lake in front of the site during its florescence, formed by downstream alluvial deposition which in effect dammed and ponded Bayou Macon (or, even, that the Arkansas River was diverted east of Macon Ridge during these times). However, the leading Lower Valley geologist, Roger Saucier (personal communications) strongly doubts these hypotheses. As concluded by Gibson (n.d.a), "Lest we be completely swept away by the imaginary waters of hypothetical 'Lake Macon,' let us leave this subject for future consideration."

The apparent split flow of the Mississippi through the Yazoo Basin during this period (Saucier 1974, 1981:Figure 3; Autin n.d.) may have some relationship to the flourishing of the Jaketown site.

The lowermost Mississippi River was discharging into the St. Bernard subdelta east of New Orleans during much of this time, and also began building the Lafourche subdelta (Saucier

1974, 1981:Figure 3; Autin n.d.). These patterns may relate to a cluster of Poverty Point sites in the eastern Lake Pontchartrain–Pearl River mouth area and another along Bayou Lafourche.

As will be seen in the discussions of the Tchefuncte and Marksville cultures, the positions of the Red River's meander belts before about A.D. 1500 are completely conjectural and somewhat controversial. Here, it will suffice to note that two of the regional clusters of Poverty Point sites are located along Bayou Teche and the Vermilion River in south-central Louisiana (Gibson 1980d:Figure 1). The relationships of these clusters to the ancient Red River's situation should be investigated.

Phases. Phillips (1970:869ff) defined seven phases within his Poverty Point period. The two northernmost phases, O'Bryan Ridge (southeast Missouri) and Hugo (a single site in easternmost-central Arkansas), though, were not included in Poverty Point culture. His northernmost Poverty Point culture phase was the Jaketown phase in the Yazoo Basin (1977:871). Continuing southward, he defined the Poverty Point phase (1970:872), to include sites in and near the delta country of northeast Louisiana and southeast Arkansas, but did not deal with the Ouachita Valley (see below). He also defined the Catahoula phase (1970:872–874) for the Catahoula Basin–Red River mouth regions, and the Bayou Jasmine–Garcia and Rabbit Island phases (1970:874–875).

West of Phillips's area of coverage, additional phases have been defined. Schambach (1979:Figure 3.1; Schambach and Rolingson 1981:Table 19) named the Calion phase and noted the strong concentration of Poverty Point sites (see below) in the Felsenthal region (1981:179; Schambach and Early 1982: SW62–SW63), but has not yet published a thorough description of the phase. The Catahoula phase—or rather, another Catahoula phase, somewhat different from Phillips's conception—was defined by Hunter (1970) and was amplified by Gibson (n.d.b), who had previously (1977:Figure 6, 1983b: Figure 6) substituted a Caney phase for the Catahoula concepts) in this region.

In the vicinity of Lafayette, a short distance inland from the true coastal zone, Gibson (1974, 1975a, b) documented a number of Poverty Point-related sites, including Beau Rivage (16LY5), Black Bayou Ridge (16LY6), Airport Runway East (16LY13), Beau Rivage (16LY5), Ruth Canal (16SM9), and Olivier (16SL2) and placed them into the Beau Rivage phase which he used to designate Poverty Point sites possibly affiliated with a chiefdom that flourished from 1500 B.C. to around 700 to 600 B.C. Gibson defined the Beau Rivage phase as a cluster of sites along the Vermilion River including, with the one exception being the Ruth Canal site, a geographically different set of sites from those grouped by Phillips (1970) under the Rabbit Island phase. He did not discuss the relationship between the Beau Rivage phase and the Rabbit Island phases.

The only indication of a chronological relationship between the two phases in the literature occurred in a table of the cultural sequence of coastal Louisiana in an article by Weinstein and Gagliano (1985:Table 2); it illustrated the relative chronological position of the two phases but did not suggest a temporal breakpoint between the Rabbit Island and Beau Rivage. Since the typological and chronological distinctions between Rabbit Island and Beau Rivage are not well understood, it might be best to follow Gibson (1980:Figure 1) in keeping the two phases distinct geographically, and Weinstein and Gagliano (1985) in keeping the chronological relationship between the two open, until additional research can be focused on this problem.

The Beau Rivage phase includes, with few exceptions, the expected range of Poverty Point ceramic and lithic items. The assemblage of Poverty Point objects included the typical cylindrical grooved, biconal, cross-grooved, nearly speroid, trapezoidal, triangular, finger squeezed, and amorphous as well as forms not duplicated in the more inland sites such as subrectangular or disc-shaped objects often decorated with finger grooves and slashes. The lithic complex was based on pebble reduction and included debitage, bifaces, expanded base drills, microlithics made on flakes, and diagnostic projectile points including Gary, Wells, Evans, Sinner, Elam, Ellis, Delhi, Marshall, Palmillas, Morhiss, and several unclassified types. Though these types are well represented at the northeastern Poverty Point site, the Beau Rivage specimens were shorter, narrower, and thicker than similar types from Poverty Point (Gibson 1979:98–104).

Key Sites. The Poverty Point site itself has already been summarized. As implied above, the second most important site, both in terms of the Poverty Point culture and the history of Poverty Point-related archeology, is probably, Jaketown. That site is in the Yazoo Basin, well out of the present overview area. In addition to the classic Jaketown testing and excavation reports cited above, reference should also be made to a recent report on surface collections from the site (Lehmann 1982).

Also in the Yazoo Basin, the Teoc Creek site (Connaway et al. 1977) was definitely affiliated with the Poverty Point culture. Somewhat more problematical is the Slate site (Lauro and Lehmann 1982), which yielded abundant evidence of the manufacture of beads and other items from Arkansas slate, plus Gary and Pontchartrain points. However, the Slate site has not yet been closely linked to the nearby Jaketown site (Lauro and Lehmann 1982:61; Samuel O. Brookes, personal communication). Complicating the Yazoo Basin picture further is the Denton site (Connaway 1977), where an extensive lapidary industry has been dated well back into the early Late Archaic and even into the pre-3000 B.C. late Middle Archaic (cf. also Morse and Morse 1983:116).

Despite the Morses' use of the term "Poverty Point period" in and near northeast Arkansas, and the inclusion of the Hyneman, Walnut Mound, Frierson and Hugo sites of northeast Arkansas as Poverty Point-related by Webb (1977:10, Figure 1), this is not generally regarded as Poverty Point territory. In the lowlands of southeast Arkansas, two sites, Deep Bayou and Lloyd's Bayou (or Grampus), on old Arkansas River floodplains, are also isolated Poverty Point-affiliated sites (1977:8).

The northernmost real cluster of Poverty Point sites known in the present study area is that along the Ouachita River upstream and downstream from the Arkansas–Louisiana border (Webb 1977:Figures 1 and 4). It should be reiterated that the Ouachita River was most probably a tributary of the Arkansas River at this time, and that its valley leads up into the Ouachita Mountains, the source of novaculite, which was definitely used in abundance at Poverty Point (Ford and Webb 1956:51; Conn 1976; Webb 1977:37ff), and of slate, magnetite, and other such exotic and widely (re?)distributed materials.

The major center in this region was probably the Calion site (3UN51) in northeast Union County, but there are several other major components in the Felsenthal region (Schambach 1979:27–28; Schambach and Rolingson 1981:179; Schambach and Early 1982:62; Weinstein and Kelley 1984:493–497). None of these have been extensively excavated and reported upon as yet. However, in 1982–1983, an extensive excavation was conducted at the Marie Saline site (3AS329; see Hemmings 1982a:159ff for preliminary test data) on the Ouachita River in western Ashley County, by Historic Preservation Associates, Inc., for the Vicksburg District, Corps of Engineers. A definite Poverty Point component (almost certainly seasonal, since the locality is subject to heavy flooding and the deposits were buried by alluvium) was encountered (Timothy C. Klinger, personal communication), and a report is in preparation.

In the immediate vicinity of Poverty Point, there is another cluster of related sites (Webb 1977:7–8, Figure 2). Two of these have been excavated and reported upon. The first is the Terral Lewis site on Joe's Bayou (a Bayou Macon tributary), about 20 km south-southeast of Poverty Point (Gregory et al. 1970). It was a single component midden, up to 1 m thick, about 20 m in diameter, which yielded abundant clay balls but few points. Stone hoes with wear polish were also found, and the site was interpreted as a spring–summer agricultural camp (1970:43). However, no direct evidence of cultigens was reported (cf. Jackson 1986:27–28).

The other excavated site near Poverty Point is the J. W. Copes site, located on Joe's Bayou a short distance upstream from Terral Lewis and about 13 km from Poverty Point. It was excavated intensively during 1982 by H. Edwin Jackson, with funding from the National Science Foundation, University of Michigan, American Museum of Natural History, and the Louisiana Division of Archeology. The Copes site was chosen primarily because of its potential for yielding information on subsistence, and this topic (see below) was emphasized in Jackson's (1986) dissertation.

Some 31 sites with Poverty Point components are known in the Catahoula Basin cluster (Webb 1977:9, Figure 5; Gregory et al. 1987:70), but none of them have been intensively excavated. It appears that a number of Webb's primary traits are missing from these sites (1987:93), but there is "a desperate need for testing" (1987:99). The major site here appears to be the Caney Mounds site (Gibson 1980d:Figure 1), which may have one or more Poverty Point mounds, but it has not been tested (1987:70). The Cowpen Slough site in this vicinity was originally thought to represent a Poverty Point burial component (Spencer and Perry 1978), but upon investigation was judged to be a non-Poverty Point, Late Archaic cultural manifestation, as noted above (Ramenofsky 1986; Ramenofsky and Mires 1985).

The Beau Rivage site (16LY5) is the type site for the Beau Rivage phase located along the Vermilion River in the town of Lafayette in Lafayette Parish. Though much of the site was destroyed by urban growth, some limited observations and surface collections were made by students of Jon Gibson before the site was completely razed in 1972. The Beau Rivage site was characterized by a thick, greasy, black midden containing earth ovens, fragments of Poverty Point objects, clay tubular pipes, cane cores, fired daub, fragments of clay figurines, an incised clay tablet, lithics, and other artifacts (Gibson 1979:96–98).

Settlement Data. The major focus of Poverty Point settlement pattern research has been upon the earthworks and intrasite artifact distributions at Poverty Point itself. The most accessible summary description of the Poverty Point site is that given by Webb (1977:16–18, 1982). The major features there are the huge Mound A, sometimes interpreted as having been a bird effigy, and the conical Mound B, both outside the perimeter of a series of six concentric ridges in a sort of partial octagonal arrangement. It was formerly believed that there had been a complete octagon which had been eroded away by Bayou Macon, but it is now thought that only minor erosion has occurred. More recently, the Poverty Point site has been accurately mapped and reinterpreted by Gibson (1984; n.d.a). Short distances north and south of Poverty Point are related mound sites, Motley and Jackson (Webb 1977:Figure 8) which may well have once functioned as part of the same complex.

The great controversy over the Poverty Point site's own internal settlement pattern, as noted above, is what it means in terms of population and social organization. After analyzing the artifact class and type distributions at the site, Gibson (1973) concluded that it had been a town of 4,000 to 5,000 people at the apex of a complex chiefdom led by a warrior elite. This may be seen as an elaboration on the earlier conclusion of Ford and Webb (1956:129), who wrongly hypothesized an invasion by Midwestern Hopewellian peoples who (we now know) actually lived about a millennium later.

However, Jackson (1986:52ff, 532ff) argued that Gibson assumed a shorter florescence than warranted, and that the differential artifact distributions did not necessarily represent differential access due to social ranking. He suggested instead that Poverty Point was a periodic "central meeting ground" (1986:535) and that the surrounding environment could not have sustained a town with the population hypothesized by Gibson. Jackson (1986:539–540) emphasized that he, too, "overextended the available data base" and did not provide "answers" but suggested that "a range of alternative hypotheses" need to be rigorously evaluated. Gibson (n.d.a) concluded that "we have sought [Poverty Point's] essence without really doing all the needed baseline descriptive work."

Much more such work, in the service of evaluating hypotheses, will be needed at Poverty Point itself and at Copes-like (and different) surrounding sites, before the answers can be confidently stated.

Other foci of Poverty Point settlement analysis have included more distant sites, and the nature of site clusters. The well investigated individual distant sites are either outside the present study area in the Yazoo Basin (see Webb 1977:19–22) or in coastal settings (see below).

Webb (1977:7) noted that by 1960, only five Poverty Point-related sites were known, but that hundreds had been identified since then. The first major summary of the overall distribution was given by Webb in his 1968 *American Antiquity* article. This was elaborated upon in his summary of clusters of Poverty Point sites (Webb 1977:7–10, Figures 1–6). These were somewhat refined and reduced in size by Gibson (1980d:322ff, Figure 1). Gibson noted that "the recent rash of cultural resources surveys has not succeeded in closing the gaps among clusters" (1980d:322), so it appears that they may be real rather than products of unequal survey coverage. Within the clusters, he did note a "recurrent pattern" of site distribution: a "dual linear arrangement" with one line of sites following a bluff line separating well drained alluvium from frequently flooded lowlands, and the other line of sites paralleling the first but running along a wetland water course (1980d:323). He also noted that "it is possible to identify a single paramount site in practically every locality as well as second order and, sometimes, third order components" (1980d:325). These site distribution data constitute a major portion of Gibson's argument for Poverty Point as a complex chiefdom.

Subsistence Data. One of the major stumbling blocks in the study of Poverty Point culture has all along been the frustratingly poor preservation of subsistence-related remains, especially at Poverty Point itself. Only within the past decade has real progress been made in investigating this question.

Jackson (1986:65–74) thoroughly reviewed the development of ideas and data sets related to Poverty Point subsistence. In brief outline, Ford and Webb (1956) assumed a large permanently resident population at the type site, implying a productive agricultural base probably based on maize. Gregory et al. (1970:45) suggested instead that Poverty Point agriculture was based on semidomesticated native North American seed plants. Gibson (1973:314ff) suggested instead that the natural wild foods of the vicinity would have sufficed, perhaps supplemented by domestications.

The first real subsistence data were obtained at Teoc Creek (Connaway et al. 1977), where nut remains and persimmon seeds were found. In the "peripheries of Poverty Point" investigations (Thomas and Campbell 1978), Shea (1978) identified four nut species and 10 of fruits and seeds (including wild beans). Only one specimen each of potential domesticates (knotweed and chenopodium) was recovered, suggesting that they "played a minor role at best" (Jackson 1986:68, Table 3). Byrd (1978) identified some 141 animal bones from peripheral Poverty Point contexts; this small sample was dominated by fish species (Jackson 1986:70–73, Table 4). Woodiel (1981) reported similar floral and faunal finds from the Poverty Point plaza area (Jackson 1986:74).

At the Copes site, which had much better than usual preservation for a Poverty Point-related site, an intensive effort was made to recover subsistence-related remains. Jackson's dissertation summarized the nearly 4,000 plant remains (1986: 378–385) and especially the more than 30,000 identifiable animal remains (1986:385–517) from that site. He concluded (1986:517–519) that the Copes site, at least, represented a year-round, floodplain-oriented subsistence system, "dominated by fishing [especially for catfish], deer hunting, and mature forest plant foods [especially pecans], but also involving the hunting of small terrestrial and semiaquatic vertebrates and the cultivation of squash." Further, he hypothesized that fish were "a localized resource with an impact on other components of the meat procurement system that was structurally equivalent to the impact of intensified horticulture on prehistoric Southwestern Puebloan communities" (1986:528).

In the terms used by Gibson (n.d.a) and cited above, Jackson's research provided the first real baseline of descriptive data. It also went well beyond the descriptive level, using various lines of evidence to provide a new interpretive baseline which must be considered as a point of departure and source of comparisons for all future research on Poverty Point subsistence.

Mortuary Data. Despite the extensive excavations at a number of Poverty Point sites and fairly intensive work at Poverty Point itself, no burials have been found, with one exception. Even at the Copes site, which had relatively good (though variable) preservation of animal bones (more than 50,000 fragments, including bones of birds and fish), no human bone was recovered (Jackson 1986).

The single exception occurred at the Poverty Point site itself. At the base of Mound B, two trenches encountered an ash bed which may extend beneath the entire mound. It contained small, scattered fragments of charred bone, one of which was identified as the proximal end of a human femur. This may have been the remains of a large and very hot crematory fire (Ford and Webb 1956:35, 38; Webb 1977:14).

As noted previously, the burials at Cowpen Slough were originally believed to have been Poverty Point-affiliated (Spencer and Perry 1978) but were later determined to belong to a Late Archaic, non-Poverty Point component (Ramenofsky and Mires 1985). Nevertheless, they certainly furnish yet another baseline for comparisons, both with other Late Archaic burials and with Poverty Point burials if and when they are recovered.

Exchange and External Relationships. Poverty Point exchange in exotic lithic raw materials and other items has long been noted (Ford and Webb 1956:125–127, Figure 45). The data base has been updated and summarized periodically, e.g., by Webb (1968, 1977, 1982) and Gibson (1973, 1980d). Materials found at Poverty Point and related sites include copper from the Great Lakes vicinity, galena from the Potosi region of southeast Missouri and the Upper Mississippi Valley (Walthall et al. 1982), steatite (soapstone) from east-central Alabama and adjacent northwest Georgia (Smith 1976; Webb 1977:35), novaculite and magnetite from southcentral Arkansas, Midwestern and Ozark cherts, and various other items. In two LSU theses, Conn (1976) has summarized the exotic lithics at Poverty Point, and Bass (1981) has examined local to regional lithic sources available for Poverty Point's occupants.

The most elaborate and developed model of Poverty Point exchange is that developed by Gibson (1973, 1980d). He saw the Poverty Point site itself as a "gateway community" at the center of "a catchment area shaped like a gigantic hourglass" (1980d:322), with a northern "raw material collection funnel" and a southern "commodity distribution funnel" (1980d:338). As already noted, he suggested that the location of Poverty Point itself, between the then active channels of the Mississippi and Arkansas rivers, was critical to its prominence (1980d: 338).

Gibson has consistently interpreted Poverty Point as a complex chiefdom with circulation of materials to related sites accomplished through chiefly redistribution. Jackson (1986: 535ff) offered an alternative hypothesis of Poverty Point itself as "a central meeting ground to facilitate intertribal interactions and transactions." Resolution of this question may be long in coming, but it does appear that the alternatives are becoming better defined.

Some of the lithic raw materials from the Beau Rivage site (16LY5) such as pebble cherts, ochre, limonite, and ferruginous sandstone were probably obtained from the Tertiary hills 95 km north of the site or in the Avery Island area 38 km south. Other materials are regarded as long distance trade items obtained from throughout the Mid-South through the Poverty Point trade network and include Catahoula sandstone, orthoquartzite, gray Midwestern flint, Ozark chert, slate, galena, and steatite (Gibson 1979:108).

On an even larger scale, Webb (1968, 1977:5–6, 61) suggested connections between Poverty Point and Mesoamerican Formative cultures, especially the approximately contemporary Olmec of the Veracruz Gulf Coast. Although there are some artifact similarities, e.g., in certain attributes of figurines (1977: 33–34), no definite Mesoamerican raw materials or artifacts have been identified from any Poverty Point site, and no Poverty Point artifacts have been identified at Olmec or other Mesoamerican sites. Smith (1986:35) dismissed the Olmec connection as "whimsy at best."

On the other hand, the East Gulf Coast may have served as the route for steatite, possibly greenstone from the same general region of east-central Alabama, fiber-tempered pottery, and Tallahatta quartzite from southwest Alabama, to enter the Poverty Point network through sites such as Claiborne at the mouth of the Pearl River. This southerly source is something of a contradiction or exception to Gibson's northern collection funnel generalization. Another model, suggested by Williams and Brain (1983:398, Figure 12.5), may be more appropriate. It shows raw materials coming in to Poverty Point from all directions, and being redistributed within a smaller zone around Poverty Point itself. They emphasized the role of Poverty Point's agents as extractors rather than traders (1983:399).

Exchange or extraction was clearly important to the members of Poverty Point culture(s), and understanding it is clearly a high priority item to archeologists. Once again, the inadequate chronological controls that exist at present must be improved so that trends and changes in this exchange system can be documented. Gibson (1980d:344) remarked,

> Change...in raw material inflow or outflow through the gateway community could have been very upsetting to the functioning of the interaction system. These changes must be detected and explained...if we are to gain much headway in understanding the real essence of Poverty Point culture, its development, its maintenance, and its transformation.

Fourche Maline 1 Culture in the Trans-Mississippi South

Definition and Location. Fourche Maline culture was originally defined on the basis of 1930s WPA excavations along Fourche Maline Creek in eastern Oklahoma. They yielded pre-Caddoan "Woodland" ceramics mixed with some Late Archaic remains. Bell (1980:84ff) provided an excellent summary of the development of this concept, and concluded that the generalized Fourche Maline concept that had resulted "extends over much too long a time span" (1980:112).

Frank Schambach, whose (1970) dissertation on pre-Caddoan cultures in the Trans–Mississippi South had focused on the Archaic and early ceramic components at the Cooper and Means sites in south-central Arkansas, gathered data on similar sites for more than a decade, and published a major revision of the Fourche Maline concept in the *Arkansas Archeology in Review* volume (Schambach 1982a). This revision was also summarized in the Arkansas State Plan (Schambach and Early 1982:SW67–SW87).

Fourche Maline is now conceived as a cultural continuum covering some 1500 years between Late Archaic and initial Caddoan times. It was subdivided by Schambach (1982a:Table 7-1) into three eras (Early, Middle, and Late) and seven subperiods (Fourche Maline 1 through Fourche Maline 7). Schambach correlated the subperiods in this sequence with Lower Mississippi Valley periods and subperiods. Here, these subperiods will be considered one or two at a time, within the relevant time period. The present section will consider only the preceramic Fourche Maline 1 subperiod.

Little is known about this subperiod, which equates temporally with terminal Late Archaic (or terminal Poverty Point) and perhaps early Tchefuncte culture of the Lower Valley. Schambach (1982a:Table 7-1) estimated dates of ca 800 B.C. to 400 B.C. (which may be slightly too late, given the Poverty Point connection), and noted only one component, the preceramic level at the Johnny Ford site in Lafayette County (1982a: 145–146). The major artifact diagnostic is the *Gary* variety of the Gary dart point type (1982a:174, Figure 7-6). Also probably associated are various Poverty Point-associated items, such as Delhi points, steatite vessels, hematite plummets, and various beads, but clayballs or Poverty Point objects are absent (Schambach 1982a:145; Schambach and Early 1982:SW74).

Paleoenvironmental Data. No paleoenvironmental reconstructions have been specifically applied to this cultural subperiod. It does appear that any sites that may survive in the Red River Valley would have to be along the valley walls (Pearson 1982:24–25, Figures 2-9 and 2-10).

Phases. No phases of Fourche Maline 1 culture have been defined.

Key Sites. The only well investigated site in the literature is Johnny Ford (3LA5) on the margins of the Red River floodplain in northwest Lafayette County. Collections from and intensive testing at this extensive midden site were summarized by Schambach (1982a:145–146). The main component appears to have been the result of a slightly later, Fourche Maline 2 occupation.

Settlement Data. The Johnny Ford site data indicate a riverine or at least a bottomland orientation.

Subsistence Data. The numerous points found at Johnny Ford indicate that hunting was obviously important. No food remains were recovered.

Mortuary Data. No mortuary data are available for Fourche Maline 1. A cremation cemetery found at Johnny Ford was attributed to the successor, Fourche Maline 2, component (Schambach 1982a:146; Schambach and Early 1982:SW74).

Exchange and External Relationships. Some connection with the far-flung Poverty Point exchange system is evident, as noted above. However, Schambach (1982a:145) emphasized the lack of the full Poverty Point cultural assemblage. Some mention should also be made of a find of a fragmentary but reconstructable and remarkable engraved steatite bowl from a small site in south-central Columbia County (Schambach 1974). This material has been chemically analyzed and traced to an east-central Alabama source (Smith 1976).

Coastal Poverty Point Culture

Definition and Location. The Poverty Point culture was originally defined as a result of research by Webb (1944) and Ford and Webb (1956) at the Poverty Point site in northern Louisiana. The presence of related sites in coastal Louisiana was not established until much later. Diagnostic Poverty Point objects had been uncovered at coastal Tchefuncte culture sites including the Little Woods Middens (16OR1-5), Big Oak Island (16OR6) in Orleans Parish, and the Tchefuncte site (16ST1) in St. Tammany Parish (Ford and Quimby 1945). However, since at this time, Tchefuncte was the earliest well established component on the coast, these Poverty Point items were interpreted as holdovers absorbed into the succeeding Tchefuncte culture (Coastal Environments, Inc. 1977:256).

Recognition of Poverty Point culture on the coast came with the discovery of three new Poverty Point sites in the Lake Pontchartrain region: Linsley (16OR40) and Garcia (16OR34) in Orleans Parish and Bayou Jasmine (16SJB2) in St. John the Baptist Parish (Gagliano and Saucier 1963). Later, the Claiborne site (22HC35), an important Poverty Point network regional trading and ceremonial center for the central coastal Gulf, located near the mouth of the Pearl River in Mississippi, was added (Gagliano and Webb 1970). Poverty Point culture apparently did not reach into coastal southwestern Louisiana or southeastern Texas, though these areas do share much in the way of general Archaic material precursors to Poverty Point such as clay balls and certain projectile points such as Gary, Ellis, Kent, and Carrollton. The western coastal area is lacking tubular pipes, clay figurines, stone vessels, greenstone celts, hematite plummets, fancy lapidary work, and the microblade technology, particularly the Jaketown perforator (Patterson 1975).

Examination of the frequency of Poverty Point culture components by parish, compiled from data published in the Comprehensive Archaeological Plan (Smith et al. 1983:Tables 3 and 5), illustrates the distributional pattern of site clusters, as noted above. The eastern delta cluster is comprised of eight components located predominantly on the north side of Lake Pontchartrain. The absence of sites in the western section of the coastal zone reflects the central coastal boundary of Poverty Point influence noted above. In general, the relatively low frequency of components in the eastern delta area, particularly within the old Metairie subdelta lobe south of Lake Pontchartrain, suggests that Poverty Point sites are underreported in this section of the state.

Paleoenvironmental Data. During the interval between the transition from Late Archaic and Poverty Point, several important geomorphological developments occurred in the central coastal areas and eastern delta region. Some time during the Archaic, the Maringouin Delta complex which developed between 7000 and 4500 B.C. from the Bayou Tortue Meander Belt of the Mississippi River in central coastal Louisiana became drowned by the most recent rise in sea level during the period from about 4000 to 2000 B.C. (Figure 5). As sea level approached its present level, the Mississippi River extended another lobe to the east of the Maringouin delta, known as the Teche delta, which was active between approximately 3800 and 1900 B.C. (Coastal Environments, Inc. 1977; Weinstein and Gagliano 1985).

Sea level stabilization near the modern day stand was accompanied by a shift of the course of the Mississippi upriver and a shift in the course of major deltaic development from the central to the eastern part of the delta. Some flow continued down the old Teche course of the river, contributing to additional deltaic formation on the Teche delta complex in the central coastal region. This deltaic complex, termed the Sale-Cypremort subdelta, still continued to build slowly from sediments associated with the Red River drainage along the Teche course of the Mississippi. Some Poverty Point occupations associated with this deltaic complex include Rabbit Island, Belle Isle, and Negro Hammock (Coastal Environments, Inc. 1977:326–327). Farther northwest, the Beau Rivage sites represent occupations along the

Coteau Ridge area of the old Prairie terrace edge, overlooking the more active alluvial valley (Gibson 1980d).

However, by Poverty Point times, the major area of subdeltaic growth was in the eastern region where a new delta in the vicinity of present-day New Orleans, known as the Metairie Lobe, created a marginal deltaic basin in the Lake Maurepas–Lake Pontchartrain area. The Metairie Lobe was utilized during Poverty Point times for specialized fishing, hunting, and gathering camps, but the major settlement at Claiborne was located across the marginal basin on the east side of the Pearl River estuary.

Phases. In the Pontchartrain region an early phase, termed the Bayou Jasmine phase, and a late phase, the Garcia phase, have been defined (Gagliano and Saucier 1963). There are no phases of the Poverty Point culture defined for western coastal Louisiana.

The Bayou Jasmine phase has been defined for the early Poverty Point occupations in the Lake Pontchartrain region and includes the Linsley site, the Bayou Jasmine site (16SJB2) and the Claiborne site (22HC35). The Garcia phase has been defined for the later manifestation of Poverty Point, based on the Garcia site (16OR34) (Gagliano and Saucier 1963). Bayou Jasmine phase sites are typed by the presence of Poverty Point baked clay objects, bone artifacts, and a lithic complex that does not include the classic Poverty Point microlithic assemblage. In contrast, the Garcia site has the exact reverse: a lack of Poverty point clay objects but a typical Poverty Point lithic complex consisting of polished stone plummets, boatstones, and celts, and a well developed microlithic assemblage. Gagliano and Saucier (1963) pointed out that the absence of the Poverty Point objects at Garcia may be due to factors relating to the severe erosion at the site and the great potential for disintegration of such low fired clay artifacts.

Phillips, in his discussion of regional cultural sequences for the Poverty Point period (1970:874), combined the two phases and noted that the typology and chronology of the Bayou Jasmine and Garcia phases cannot be final until more sites are assessed and dated. Phillips also added three additional components to the combined Bayou Jasmine–Garcia phase: the Tchefuncte site (16ST1), Big Oak Island (16OR6), and Little Woods Middens (16OR1-5). Phillips later went on to support the chronological separation of these phases for methodological reasons and suggested that subdivision of other "monolithic units" of Poverty Point might be the right way to proceed for areas outside the coast as well. Phillips' (1970) recommendations for chronological separation were supported by other researchers (cf. Gibson 1973; Jackson 1986) as a means of gaining a better perspective of the processes involved in the development of Poverty Point culture.

The Bayou Jasmine phase has been radiocarbon dated from 1740 B.C. (based on an average of three charcoal dates from Linsley) to 1150 B.C. (Gagliano et al. 1980). Phillips noted that this 1740 B.C. date for Poverty Point falls about 1000 years earlier than the average dates for the Poverty Point site and 1200 years before dates from the Jaketown site. In considering the stylistic similarities between the baked clay Poverty Point objects at Bayou Jasmine phase sites and those at the classic sites in northern Louisiana, Phillips (1970) found it incredible that these types would have remained stable for so long if the Bayou Jasmine phase sites actually dated 1000 to 1200 years earlier. A thermoluminescence date from another Bayou Jasmine phase site, the Claiborne site, yielded a more acceptable date of 650 B.C. ± 240 years for this phase and casts some additional doubt on the accuracy of the early radiocarbon dates for the Bayou Jasmine phase Linsley site. Some uncertainty about the validity of this chronological scheme is also due to the lack of any dates from the one Garcia phase component, the Garcia site (Phillips 1970:874). In fact, the assignment of Garcia to the post-Bayou Jasmine phase, late Poverty Point period is based on the similarities between the lithic assemblage at the Garcia site and the northern Louisiana Poverty Point sites (Gagliano and Saucier 1963).

Phillips (1970:874–875) formulated the Rabbit Island phase as a catchall for Poverty Point sites in the Teche–Mississippi region of central coastal Louisiana. He includes in this phase the Rabbit Island site which Gagliano (1963:119) reported was similar to Garcia in containing exotic stone, a microlithic assemblage, and only "a few baked clay objects" (Gagliano 1967:13). Other sites assigned to the Rabbit Island phase include Lafayette (16SM10), Ruth Canal (16SM9), Bayou Sorrel (16IV4), the Schwing site (16IV13), and Miller (16SM6) (Phillips 1970).

Key Sites. The Claiborne site (22HC35) is a large stratified semicircular shell and earth midden and associated conical sand mound located near the Louisiana state line in Mississippi at the mouth of the Pearl River. It has an outside diameter of about 200 m and an inside diameter of approximately 140 m. The mound was about 22 m in diameter and 1.2 m high but was destroyed before test excavations could be made. The site was discovered in 1967 and extensive surface collections were made. Formal studies were made by Webb, who classified more than 12,000 Poverty Point objects from the site (Gagliano and Webb 1970; Webb, Ford, and Gagliano n.d.).

Artifact analysis by Gagliano and Webb (1970) revealed that virtually the entire Poverty Point assemblage was present and led to the conclusion that Claiborne was probably a regional node in the Poverty Point trading network. The recovery of a cache of steatite vessels at the site is an important indicator of the role that the site played in the Poverty Point network. Steatite was the most frequent trade item across the coastal plain. Trace element analysis (Smith 1981) indicates that steatite originated from the Piedmont region of western Georgia and eastern Alabama where it was probably procured by groups who may have transported it down the river arteries to the Gulf coast. There it may have found its way to redistribution sites like Claiborne (Jenkins et al. 1986:548–550). Another significant aspect of this site was the recovery of 200 fiber-tempered sherds of the Wheeler Plain and Punctated series, which makes this the most productive site for fiber-tempered pottery in the central Gulf area. The study by Gagliano and Webb (1970) discussed the importance of the Claiborne site and the Cedarland Plantation site (22HC30) for understanding Late Archaic-Poverty Point transition on the coast.

The Bayou Jasmine site (16SBJ2) is a Bayou Jasmine phase shell midden fishing station situated in the marsh along the north and south banks of Bayou Jasmine near Lake Pontchartrain. The midden measures about 30 m long by 7 m wide and extends to a depth of over 2 meters. The Bayou Jasmine site was briefly reported on by Gagliano and Saucier (1963), Gagliano (1963), and Duhe (1976). Previous research on the site also included a discussion of the methodological problems of shell midden excavations and in particular the constraints of data recovery below water table (Neuman 1976). The research by Dube (1976) represents the most complete information concerning coastal subsistence at a coastal Poverty Point site.

Settlement Data. Gibson's (1980d) summary of settlement patterns was reviewed above. An exception exists in the Lafourche Deltaic Plain of Coastal Louisiana where the low swamps and marshes do not provide such clear upland and lowland divides.

Another important pattern within Poverty Point site clusters is the ranked hierarchy of sites based on site size, presence–absence and mass of earthworks, quantity and diversity of exotic trade materials, and general artifact complexity (Gibson 1980d:324–325). The relationship among the Bayou Jasmine–Garcia phase sites in southeastern coastal Louisiana may fit this pattern, with Claiborne the regional and ceremonial center and the Garcia, Linsley, and the Bayou Jasmine sites the locations of surrounding satellite occupations (Coastal Environments, Inc. 1977:259).

Subsistence Data. The most distinguishing feature of Bayou Jasmine phase is an abundance of Poverty Point baked clay objects and extensive *Rangia cuneata* clamshell middens containing numerous firepits, abundant faunal remains, and bone artifacts. The extensive investigations at the Bayou Jasmine site (Gagliano and Saucier 1963; Neuman 1970; Duhe 1976) make this the best documented Poverty Point sites in terms of coastal subsistence data. Analysis by Dube of subsistence remains and food procurement equipment at Bayou Jasmine revealed evidence of seasonal occupation oriented toward fishing, gathering, and hunting with major emphasis on specialized fishing and hunting semiaquatic species (Dupe 1976: 37). He found the most important food resources to be, in order of importance: fish, turtle, alligator, small mammals, and shellfish. The large and varied inventory of hunting and fishing equipment included a complete fishing tool kit consisting of bone fish hooks and gorgets, bone harpoons and gigs, cordage, fishline weights, a wooden spool thought to have been used for holding cordage, and a possible wooden paddle (Duke 1976:47-65). Gagliano (1963) also illustrated what appears to be net impressions on baked clay, suggesting that netting and/or seining may have also played a part in the aquatic subsistence strategy at Bayou Jasmine.

Duhe (1976) proposed that Bayou Jasmine was a seasonally inhabited fishing station occupied temporarily during the summer months, and that as a basic extractive camp, it lacked many of the material traits usually associated with Poverty Point sites. For instance, diagnostic trade and ceremonial artifacts such as clay effigies and red jasper ornaments were absent, and microtools, exotic raw materials, and steatite were not found in abundance. The paucity of human burials or evidence for substantial shelters also suggests temporary use, while the linear configuration of the site is also typical of seasonal camps, based along streams as opposed to the oval or semicircular pattern of larger semisedentary base camps and villages (Duhe 1976).

Mortuary Data. There are no mortuary data for the coastal Poverty Point culture.

Exchange and External Relationships. The Claiborne and Garcia sites contain a diverse range of exotic materials including red jasper, ferruginous sandstone, limonite, steatite, orthoquartzite, (including the distinctive Tallahatta quartzite from southwest Alabama and/or immediately adjacent Mississippi) crystal quartz, magnetite, and hematite (Coastal Environments, Inc. 1977:257). Many of these materials were also imported into the coastal area during the Late Archaic (cf. Gibson 1980d). Gibson (1979a, 1980d) explored the question of Poverty Point trade and exchange networks and the position of the central and eastern coastal Poverty Point sites. According to Gibson's hourglass-shaped catchment model of Poverty Point trade interaction, the Poverty Point site was positioned at the neck of the hourglass "at the base of the raw material collection funnel and at the head of the southern commodity distribution funnel." (Gibson 1980d:338). The southern V-shaped catchment terminated at the coast and was confined by the western escarpment of the Mississippi alluvial valley and the Pearl River estuary (1980d:332–333). The coastal area does not appear to have functioned in the acquisition of raw materials, but in the consumption of finished trade commodities. As illustration, Gibson cited evidence from the Beau Rivage site where exotic materials comprised 36% of the chipped stone assemblage. The residue from chipped stone manufacture included only advanced stage by-products such as tertiary and bifacial thinning flakes which implies that exotic rocks arrived at the Beau Rivage site as blanks or preforms, not as quarried blocks or cobbles (Gibson 1980d:340).

CERAMIC-USING CULTURES, 600 B.C.–A.D. 700

Marvin D. Jeter and G. Ishmael Williams, Jr.

As noted above, there is a fair amount of evidence for at least the occasional use of fiber-tempered ceramics by some Poverty Point peoples as early as 1000 B.C. or even 1200 B.C. (Jenkins et al. 1986:548). However, the use of ceramics does not appear to have become widespread throughout the present study area until about 600 B.C.

In this chapter, we will begin with the earliest archeological cultures which consistently used ceramics, beginning at about 600 B.C. The chapter's first section continues until 100 B.C., roughly coeval with the Early Woodland period of the eastern U.S. The following sections cover the periods from 100 B.C. to A.D. 400, from A.D. 400 to 700, and from 700 to 1000. The latter period saw a number of critical important cultural and behavioral changes in both the Lower Mississippi Valley and the Trans-Mississippi South.

THE 600–100 B.C. PERIOD

Tchula has gradually gained widespread, if not complete, acceptance as the first culture period in which ceramics were commonly in use in the Lower Mississippi Valley. Tchula is the name of a small town in the Yazoo Basin of western Mississippi. It was chosen as the period name by Phillips, Ford and Griffin (1951:68ff, 431ff) because its association with the name of the Tchefuncte culture would be "alliterative and easily remembered" (Griffin 1986:40).

A traditional beginning date of around 500 B.C. (or even later; cf. Phillips 1977:Figures 2 and 450) for the Tchula period and its constituent cultures such as Tchefuncte and Lake Cormorant has become more or less established in much of the literature of the Lower Valley (Webb 1977:61; Morse and Morse 1983:137ff; Williams and Brain 1983:Figure 11.4; Neuman 1984:135–136). The year 500 B.C. is a nice round figure, but it may not be an accurate one. Jenkins et al. (1986:551–552) suggested on the basis of comparative cross dating with similar materials from the Coastal Plain of Alabama and Florida that Tchefuncte culture may have begun as early as 700 B.C., or even 800 B.C. Within the Lower Valley itself, Shenkel (1984:44) suggested a beginning date of around 600 B.C. for Tchefuncte, and that date is tentatively used here. His ending date of 100 B.C. is also accepted here, as it seems to be in line with other recent estimates.

Tchefuncte was in fact the first cultural manifestation of this period to be analyzed and defined, on the basis of 1930s and 1940s investigations in southern Louisiana (Ford and Quimby 1945). References to the Tchefuncte period have therefore occurred in the literature (Phillips et al. 1951:433). But, especially since the major synthesis by Phillips (1970:15–16, 876ff), Tchefuncte has been generally relegated to the status of a culture covering the southern portion of the Lower Valley during the Tchula period.

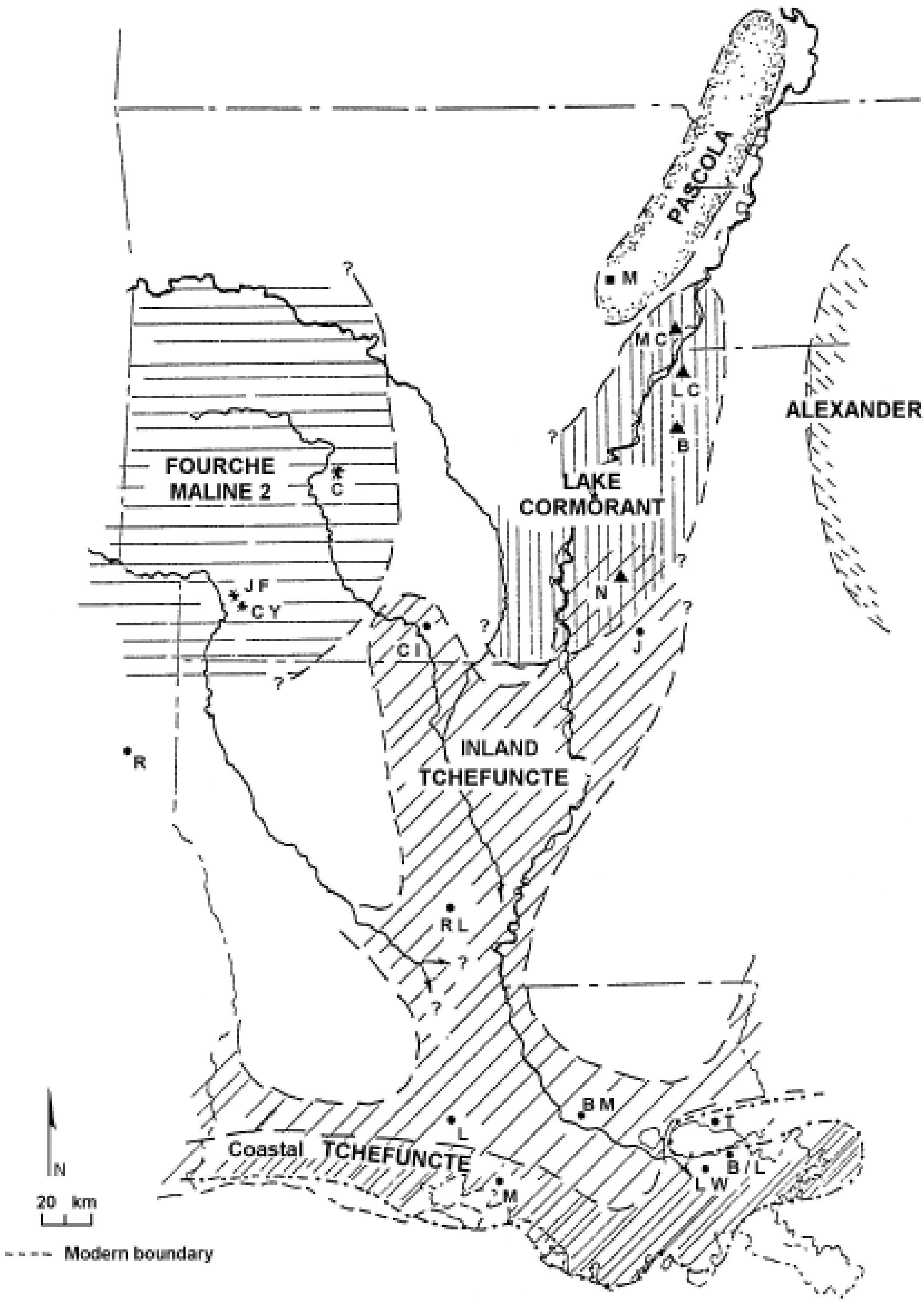
With regard to the Woodland terminology used in the Midwest and Southeast, the Tchula period is more or less coeval with the Early Woodland period. In their discussions of this period in the northern Lower Valley (their Central Mississippi Valley), the Morses (1983:136ff) used these period terms interchangeably. Shenkel (1984a) used Early Woodland as the period name (instead of Tchula) in his summary of coastal Tchefuncte culture. Aten (1984) extended the Woodland terminology to the Texas–Louisiana Gulf Coast but emphasized that this was a rather loose usage that did not connote sharing of the general Eastern Woodland adaptive patterns (1984:74).

This section will begin with discussions of two nonTchefuncte (but related) cultures which occupied the northern portions of the study area during this period. The first is here tentatively labeled Pascola culture, thus promoting a phase defined in southeast Missouri by Williams (1954), and extended into northeast Arkansas by the Morses (1983; see below). Most of the northern portion of the study area, though, was assigned by Phillips (1970:16, 885–886) to a rather vaguely defined Lake Cormorant culture.

Schambach (1982a:133ff, 1982b:67ff) advocated the concept of a long-lived Fourche Maline culture, adapted to the Trans-Mississippi South in southwest Arkansas, northwest Louisiana, and adjacent regions, and suggested a Fourche Maline 2 period as coeval with Tchula/Tchefuncte in those regions (1982a:139–141, Table 7-1).

Despite its chronological priority in the history of archeological concepts, and its status as the best-known culture of this period in the study area, Tchefuncte will be discussed in the latter portions of this section rather than at the beginning, due to its southerly location and our established practice of proceeding from north to south in these summaries. Also, Tchefuncte culture will be conceptually and heuristically split into two subdivisions which will be discussed separately: Inland Tchefuncte and Coastal Tchefuncte cultures. Whether or not this is actually warranted by the artifacts, it is being done in anticipation of defining a separate Coastal Adaptation Type (or types).

Figure 10 displays the apparent cultural boundaries during this period. It also includes a schematic rendering of the paleogeographic situation.



Key: **Pascola culture sites:** M = McCarty. Lake Cormorant culture sites: B = Boyd; LC = Lake Cormorant; MC = Mound City; N = Norman (cultural status questionable).
Fourche Maline 2 culture sites: C = Cooper; CY = Cicero Young Mound; JF = Johnny Ford.
Tchefuncte culture sites (inland): BM = Beau Mire; Cl = Coon Island; J = Jaketown; L = Lafayette; N = Norman (cultural status questionable); RL = Russell Landing.
Tchefuncte culture sites (coastal): B/L = Big Oak and Little Oak Islands; LW = Little Woods; M = Morton Shell Mound; T = Tchefuncte.
Other sites: R = Resch (in Texas).

Figure 10. Map of cultural distributions and key sites in and near the study area ca 300 B.C.

Pascola Culture

Definition and Location. The Pascola phase was defined by Williams (1954) for the Little River Lowland region of the southeast Missouri bootheel. Phillips (1970:877–878, Figure 443) added several other southeast Missouri sites to the phase; although he did not include any Arkansas sites, he did divide the Little River Lowland region into adjacent north (i.e., Missouri) and south (i.e., Arkansas) portions. Morse and Morse (1983:145; cf. also Morse 1986:79) assigned the recently discovered McCarty site in eastern Poinsett County, northeast Arkansas, to this phase as well. Price and Price (1981:473–480; cf. also Morse and Morse 1983:145; Morse 1986:72, 79) noted that similar ceramics also characterized Tchula period Grimes phase sites west of the bootheel and adjacent to the Ozark Escarpment, in Ripley County, Missouri and the adjoining Randolph County, Arkansas.

For the present purposes, this already expanded phase (or artifact complex) is tentatively designated as Pascola culture to emphasize its spatial extent and its distinctiveness from Lake Cormorant and Tchefuncte.

The primary diagnostic of the Pascola culture/phase is an assemblage of sand-tempered ceramics, decorated by pinching, punctating, and incising (Williams 1954; Phillips 1970:877; Morse and Morse 1983:147ff). This phase, by the way, marked the beginning of a long-lived tradition of sand-tempered Woodland ceramics in the western portions of southeastern Missouri and northeastern Arkansas (Morse 1986:79). There has been an apparent reluctance on the part of these archeologists to assign new type/variety names to these ceramics; instead, they have been dealt with mainly in terms of general descriptive categories and comparisons with types from other regions or areas (Phillips 1970:877–878; Morse and Morse 1983:147ff; Morse 1986:79ff, Tables 7.2 and 7.3).

Phillips (1970) did not discuss the remainder of the Pascola phase artifact assemblage. However, comprehensive summaries were provided by the Morses (1983:153ff; Morse 1986: 84–89, Table 7.4) for the McCarty site. The principal point type found there was the expanded-stemmed and barbed Weems type (1983:153, Figure 7.8a, 1986:84, Plate 7.3a–d). A Weems-like variant with squared notches was also found and has been called the McCarty point (1983:153, 156, Figure 7.8b, 1986:84, Plate 7.3e–f). Gary-like contracting-stemmed points were also present (1983:156). Other artifacts included a variety of stone and bone tools, and biconical baked clay Poverty Point objects; all of these materials are summarized in the Morses' publications.

Paleoenvironmental Data. The Mississippi River apparently shifted to its modern meander belt system around 800 B.C. (Saucier 1974:Figure 3; Autin n.d.:Table 2). This would not have been a major change in these latitudes, where this meander belt has virtually obliterated traces of earlier meander belts (1974:Figure 1). The other major environment in this region is the terminal Pleistocene/early Holocene Braided Stream Terrace 2 (1974:Figure 1; Morse and Morse 1983:143). Although no detailed environmental reconstructions have been attempted, the Morses (1983:143) suggested that this was generally a period of increased warmth and moisture, by extension of the concept of the contemporary Sub-Atlantic climatic episode.

Key Sites. The Pascola phase was originally based on finds at the Pascola site in southeast Missouri (Williams 1954). Phillips (1970:878–879) listed eight other sites in that state. As noted above, the Morses added the McCarty site to the roster; they stated (1983:145) that no connecting sites had yet been identified between McCarty and the Missouri sites.

McCarty (3PO467) is clearly the most important and best-known site of this culture, even though it has not yet been fully reported upon. The site was located on a low ridge in a relict Mississippi River backswamp between the present Tyronza River and Left Hand Chute of Little River. It was discovered by the landowner during land-leveling for rice cultivation in 1981, and brought to the attention of Dan Morse, who conducted salvage excavations (Morse and Morse 1983: 145ff; Morse 1986:72ff). The site was found to have had a Tchula period occupation covering about 2500 square meters, with a cluster of 20 Tchula period features (plus nine Mississippian features), including 10 Tchula burials. These, and "the first good assemblage of Tchula period artifacts found to date in northeast Arkansas" (1986:90) are described in the Morse publications cited.

Settlement Data. The Morses (1983:143) suggested that this period was characterized by a pattern of permanent lowland orientation which may have begun in Poverty Point times and continued throughout the Woodland periods in these regions. They noted (1983:144) that the central portion of the braided stream surface apparently was not occupied permanently until the Baytown period, and that the uplands were probably a little-used hinterland (1983:143). They suggested that population was probably "concentrated in small dispersed villages" (1983: 144), but added that sites are difficult to identify, due to the scarcity of diagnostic artifacts.

Although it is not necessarily typical, the McCarty site "is part of a pattern of Tchula villages located near the junction of the braided surface and the meander belt" (Morse and Morse 1983:146). Its general setting was within a backswamp, but the site was on a slightly more elevated and sandier knoll, perhaps near a stream or lake. No Tchula period structural remains were found, but some hints of spatial organization can be derived from the clustering of pit features and burials (1983: 146–147; Morse 1986:72–76, Figure 7.2). The storage pits might have sufficed to permit year-round residence, but the evidence is insufficient to disprove a seasonal interpretation (1983:147).

Subsistence Data. Only the McCarty site has produced evidence of Pascola culture subsistence, and these data have not been analyzed. The Morses (1983:146) noted that fish bones and mussel shells were relatively common; although no floral remains have been identified, the pit features imply some storage of vegetal materials. Some maize agriculture is barely conceivable for this phase, but isotopic analysis of one of the burials indicated a basic nonmaize subsistence (Morse 1986:74). The Morses (1983:143–144) suggested that horticulture involving native North American cultigens such as marsh elder and sunflower, plus squash, may have been important during this period. This is certainly likely, given the general eastern North American prevalence of such plants by this time (Smith 1986).

Mortuary Data. Again, the only data are from the McCarty site, where eight disturbed Tchula period burials were salvaged (Morse and Morse 1983:147; Morse 1986:74–76). There was no definite evidence of a burial mound. Oval pits contained tightly flexed individual burials, usually oriented east-west with the skull toward the east. Grave goods were present with several burials and included some exotic materials.

Exchange and External Relationships. Evidence is scanty for exotic raw materials, but there appears to have been a tendency for association with burials (cf. Morse and Morse 1983:147). At the McCarty site, Morse (1986:84–89) found a McCarty point made of Burlington chert (probably from Missouri), a basalt adz and nine copper beads (probably from the Ste. Francois Mountains of southeast Missouri), and a greenstone celt (possibly from eastern Alabama).

The Pascola culture territory is geographically intermediate between Lower Valley Tchefuncte and Midwestern Early Woodland traditions, but so far, the latter do not appear to have been influential. Pascola phase ceramics from Missouri have been compared to the sand-tempered and similarly decorated types of the Alexander complex of northwestern Alabama and adjacent regions (Phillips 1970:877–878) but Morse and Morse (1983:149) noted the infrequency of Alexander-like (or Illinois Black Sand-like) incising in the McCarty assemblage. The McCarty ceramics emphasized instead several Tchefuncte-like decorations on sandy wares (Morse and Morse 1983:149–153; Morse 1986:81–82).

Lake Cormorant Culture

Definition and Location. This very inadequately defined concept had its genesis in 1941 testing by the original Lower Mississippi Survey at the Lake Cormorant site in extreme northwest Mississippi (Phillips, Ford, and Griffin 1951:248ff). The major finding was an indication of a very early time in the Lower Valley ceramic sequence, "when Withers Fabric-impressed was an important type" (1951:252). At that time, this type was thought to be earlier than the Marksville ceramic complex and possibly coeval with the types Indian Bay Stamped and Cormorant Cord Impressed. Now, Withers is regarded as possibly straddling the Tchula-Marksville transition (Phillips 1970:174–175, 877–878; Williams and Brain 1983:210; Rolingson and Jeter 1986:95–96); Cormorant is regarded as totally in the Tchula period, and Indian Bay as totally within the Marksville period (Phillips 1970; Brown 1978).

In summarizing their overall survey findings, Phillips, Ford, and Griffin (1951:432) distinguished between a "northern Tchula Period [ceramic] complex" and an apparently coeval southern complex. The former was said to feature "heavy proportions of sand-tempered types" and "the fabric-impressed surface...concentrated in an area from Hannibal, Missouri, south to about Greenville, Mississippi, and east to the Appalachians." The southern complex, in contrast, was primarily characterized by "an absence of fabric- and Cord-impressed surfaces."

Phillips (1970:16) named "Lake Cormorant 'culture' [as] a stopgap in the hope that a more intelligible concept will emerge as the data accumulate." He summarized it as "a ceramic complex of general Early Woodland cast." He (1970: 876ff) later noted that he had renamed the former northern and southern Tchula complexes as Lake Cormorant culture and Tchefuncte culture respectively and had "pushed the distribution of Tchefuncte culture a little farther north into territory formerly given to 'northern Tchula'" (1970:885). He defined the Turkey Ridge phase (1970:878–879) for extreme northwest Mississippi and confined the Lake Cormorant culture to it. Immediately to the south, he defined the Norman phase (1970:879–880), based largely on materials from the Norman site in the north-central Yazoo, just above the latitude of the present Arkansas River mouth, and classified it as Tchefuncte culture rather than Lake Cormorant (1970:885).

Williams and Brain (1983:329) found only a "bare shadow" of a Tchula period (Tchefuncte culture) component at their Lake George site in the southernmost Yazoo Basin. In their more general discussion (1983:400–401), they only remarked parenthetically that "minor ceramic differences are used to distinguish the Lake Cormorant 'culture' in the northern part of the Lower Valley, but until other than ceramic data are available we see little point in bringing it into the discussion here."

As noted by Brookes and Taylor (1986:26) the northern Tchula or Lake Cormorant culture has not been actively investigated since Phillips's summary, and a complete reappraisal is still needed (1986:23). This evaluation is reinforced by the fact that two recently published and widely circulated culture–ceramic distribution maps have seemingly misrepresented the situation.

Smith (1986:Figure 1.10) mapped Lake Cormorant as including virtually all of southeasternmost Missouri, easternmost Arkansas, westernmost Tennessee, and the northern half of the Yazoo Basin. He explicitly included the northwest Mississippi Turkey Ridge and Norman phases and the Pascola phase, although the former two were regarded as culturally/ceramically distinct by Phillips (1970:878–879), who included only Turkey Ridge in his Lake Cormorant culture concept, and Pascola was distinguished from Cormorant/Tchula by the Morses (1983:145). Also, Smith's map inexplicably shows a separate zone in southwest Mississippi as Lake Cormorant culture.

Jenkins et al. (1986) made no mention of Lake Cormorant. Much more strangely, their map (1986:Figure 21.6) showed Tchefuncte within a bounded zone which included westernmost Tennessee, the northern two-thirds of Mississippi, easternmost Arkansas, and the northeasternmost portion of Louisiana, completely excluding Tchefuncte from the Tchefuncte type regions of southern Louisiana.

As indicated in Figure 10, Lake Cormorant culture is basically confined to northwest Mississippi. Its southern extent may be somewhat farther south than Phillips suggested, according to Brookes and Taylor (1986), who briefly tested the Norman site in 1981 and reexamined the other evidence. They characterized the Cormorant group of ceramics as including Cormorant Cord Impressed as a major type, but emphasized that they were speaking primarily of "a paste group rather than a decorative treatment. Paste is soft and very chalky, similar to Tchefuncte, but the appearance of lamination is not present" (1986:23). They noted that Cormorant, Tchefuncte, and sand-tempered ware like the Alexander series of northern Alabama were all present at Norman (1986:24). They also reanalyzed Tchula period ceramics from the Boyd site (Connaway and McGahey 1971), about halfway between Lake Cormorant and Norman, and affirmed the relative abundance of Cormorant group ceramics there (1986:25–26). They added that a radiocarbon date of about 220 B.C. from Boyd was apparently a valid date for the Tchula period in the northern Yazoo (1986:26).

At least two tenuous lines of evidence suggest some extension of Lake Cormorant culture (or ceramics, practically the same thing) into the present study area, in northeast and southeast Arkansas. Morse and Morse (1983:145) stated that grog/clay-tempered, Tchula-like ceramics from the Mound City site complex just west of Memphis were "not assignable to the Pascola phase" (which features sand-tempered pottery, see above), and that the closest relationships were to the Turkey Ridge phase, which is Phillips's type phase for Lake Cormorant culture. They also noted that similar materials had been found along the Mississippi River meander belt "to Missouri and westward almost to Parkin [on the St. Francis River]" (1983: 145). They stressed, however, that the Tchula identification was tentative, and these materials might relate to the Marksville culture period. Elsewhere (1983:142), they remarked that in general, Tchula period pottery in and near northeast Arkansas was wedged and tempered during manufacture, and was "technologically superior to Tchefuncte pottery" made in more southerly regions (cf. Gertjejansen et al. 1983).

In southeast Arkansas, Rolingson and Jeter (1986:95–96) noted the presence of Withers Fabric Impressed and Tchefuncte Plain ceramics (with a very chalky soft paste) from the Loggy Bayou site near Bayou Bartholomew. The site, which was a single pit, also produced clay balls dated by thermoluminescence to a surprisingly late period (Marksville or later). However, they were said by Williams (personal communication) to resemble materials from his (1954) Burkett phase (coeval with Pascola in southeast Missouri; cf. Phillips 1970: 876–877). Rolingson and Jeter (1986:Figure 8.1, Table 8.1) also reviewed the distribution of the sparse Tchula period ceramic types found so far in southeast Arkansas and noted that a more Tchefuncte-like complex appeared to be present in the Felsenthal region, whereas the northerly types Alexander Incised and Withers Fabric Marked were so far only known to be present in the Delta regions.

The upshot of these data would appear to be that Lake Cormorant culture (or ceramics) may well have been in existence relatively late in the Tchula period (and/or early in the Marksville period), and its/their distribution may have extended at least as far south as the present Arkansas River Valley, with some Tchefuncte interaction south of there.

Paleoenvironmental Data. As noted above, the Mississippi River would probably have been in its present meander belt well before this time. The interpretation of the Arkansas River's situation has recently changed significantly for this period, though. Previously (Saucier 1974:23, Figure 3), it was estimated that the Arkansas had occupied its modern meander belt only since about A.D. 1000. In the revised chronology, though, it is estimated that this major change from the Bartholomew meander belt may have taken place about A.D. 1, which is very close to the time under consideration here, especially given the likelihood that Lake Cormorant was a late Tchula (if not early Marksville) culture.

Phases. As noted above, the Turkey Ridge phase of northwesternmost Mississippi is the type phase for this culture (Phillips 1970:878–879), and similar materials have been found to the north in adjacent northeast Arkansas (Morse and Morse 1983:145), although no phase designation has been made. And, although Phillips (1970:879) defined the Norman phase as not of this culture, the Norman site was originally regarded as northern Tchula (Phillips, Ford and Griffin (1951: 432) and is still regarded as having some Lake Cormorant representation (Brookes and Taylor 1986:25). No phase designation has been made, or indeed is warranted on the basis of present knowledge, for the tenuous extension of Lake Cormorant-like materials into east-central and southeast Arkansas.

Key Sites. The only site in the present project area that appears likely to have been a really important representative of Lake Cormorant culture is Mound City (Morse and Morse 1983:145, 172, Figure 7.1). This is actually a site complex represented by three different site numbers (3CT3, 4, and 5) on the Mississippi River floodplain in Crittenden County, Arkansas, just across from Memphis and threatened by urban expansion. Only surface-collected materials have been studied. There is definitely some Tchula period representation which appears closer to Lake Cormorant than to any other culture yet defined, but there is also a major Marksville component.

In Mississippi, the Lake Cormorant site itself had the remains of a mound but was a multicomponent site with much evidence of disturbance (Phillips, Ford, and Griffin 1951: 248ff). The Norman site has produced much interesting pottery (Phillips 1970:879–880; Brookes and Taylor 1986:25) and is certainly critical for defining the southern extension of Lake Cormorant culture, but recent limited testing indicated that the midden deposits were plow-disturbed and that only the lower portions of pits remained (1986:25). The Boyd site (Conoway and McGahey 1971) had a Tchula period component, which upon reanalysis (Brookes and Taylor 1986:25–26) proved to be of the Lake Cormorant complex.

Settlement Data. No really systematic work has been done on Lake Cormorant culture settlement patterns in the northwest Mississippi homeland. Phillips (1970:978) remarked that his Turkey Ridge phase included “a tight cluster of sites...all on the natural levees of the same cut-off channel...on both sides of the channel, which probably means that the occupation was subsequent to the cut-off when the former channel was an open lake.” But, as he went on to note, no other sites were known, and it was “highly unlikely that these five sites represent the full range of distribution.”

In general, according to the Morses (1983:144), Tchula period populations in and near northeast Arkansas were concentrated in small dispersed villages. A pattern of “permanent lowland orientation may have been characteristic of most groups” (1983:143).

Subsistence Data. Direct evidence of subsistence is lacking. As noted above, the Morses (1983:143–144) suggested by analogy with other regions (cf. Smith 1986) that horticulture was probably important by this time, but it did not emphasize maize and may not have even included it.

The biconical clay balls and a possible (disturbed) earth oven found at the McCarty site (Morse and Morse 1983:153; Morse 1986:84) and the find of similar clay balls in a pit at Loggy Bayou in southeast Arkansas (Jeter 1982a:95; Rolingson and Jeter 1986:95–96) suggest the continuation, with stylistic simplification, of the Poverty Point method of cookery. Similar finds have been made at Tchefuncte sites to the south.

Mortuary Data. No mortuary data are available for Lake Cormorant culture. The presence of Lake Cormorant ceramics at the Mound City center suggests the possibility that some form of mound burial may have been practiced, but this is only a possibility.

Exchange and External Relationships. No evidence has been presented on Lake Cormorant exchange or exotic lithic materials. In general, the Tchula period seems to have been a time of deteriorated external connections after the demise of the Poverty Point system (Williams and Brain 1983:389). The major discussions of external relationships have been in terms of ceramics, as indicated above. However, the lack of exotic materials may reflect the lack of data from burials (cf. the Pascola mortuary and exchange data, above).

Fourche Maline 2 Culture in the Trans-Mississippi South (Figure 10)

Definition and Location. The general definition and revision of the Fourche Maline culture concept were summarized above. Fourche Maline 2 was defined by Schambach (1982a) and correlated with the Tchula/Tchefuncte culture period. It is characterized by Gary, *var. LeFlore* points, crude bone-tempered Cooper Boneware pottery, Williams Plain grog-tempered pottery, double bitted stone axes, and other items (1982a:139; Schambach and Early 1982:SW74, SW79).

Schambach’s definition was restricted to southwest Arkansas. However, Gregory et al. (1987:39) noted the presence in the Catahoula Basin of east-central Louisiana of ceramics that were thick, bone-tempered, and “more ‘Fourche Maline’ in technology,” with Tchefuncte-like decorations; this may signal a southeastward extension of this culture or trade of its wares during the (late?) Fourche Maline 2 period. Or, as suggested by Gibson (personal communication), this may merely be a case of independent invention resulting from the use of bone-laden midden soils in the ceramic paste.

Paleoenvironmental Data. As in the case of Fourche Maline 1, specific data are not available, but it is likely that sites have been buried or destroyed by river action.

Phases. Two phases, Field Bayou and Lost Bayou, were ascribed to the Fourche Maline 2 period by Schambach (1982a: 139, Table 7-1). The former was identified at the Johnny Ford site, in the Great Bend region, and the latter at the Cooper site in the Middle Ouachita region.

The Field Bayou phase may be somewhat earlier and/or mixed with earlier, Poverty Point-related, Fourche Maline 1 materials (1982a:139–140; Schambach and Early 1982: SW74). According to Early (Schambach and Early 1982:79), the Lost Bayou phase may be associated with small amounts of Marksville ceramics. Given the length of the Tchula/ Tchefuncte culture period, these two phases could be separated by several hundred years.

Gregory et al. (1987:39) tentatively named the Bodcaw phase for the Fourche Maline-like manifestation in the Catahoula Basin. However, it is here reported as more likely an inland Tchefuncte phase, on the basis of its locational context.

Key Sites. Once again, the Johnny Ford site (3LA5) is the major data source (Schambach 1982a:145–146). Also probably associated with the Field Bayou phase is the nearby Cicero Young Mound site (3LA7; 1982a:146).

The Lost Bayou phase is based on Schambach’s (1970) study of the Cooper site (3HS1) in southern Hot Spring County (Schambach 1982a:142). There is also a buried (2 m deep) component known to be from a creek floodplain in Clark County at site 3CL201 (Schambach and Early 1982:SW79).

Settlement Data. Schambach and Early (1982:SW74) suggested that the Field Bayou phase was characterized by “compact villages of 2 to 3 acres.” However, data on internal settlement patterning, and the question of contemporaneity vs. repeated sequential revisits to one site, are not available.

The Cicero Young Mound was found to contain the remains of a lightweight circular structure about 5.6 m in diameter, interpreted as a charnel house (Schambach 1982a:146).

The Lost Bayou phase “is represented by...substantial midden deposits in riverine alluvial bottomland settings” (Schambach and Early 1982:SW79). Again, the question of how these middens were formed is unresolved. The little that is known about these settlements is certainly reminiscent of the presumably coeval Lower Valley Tchefuncte pattern.

Subsistence Data. No remains directly related to subsistence have been recovered from Fourche Maline 2 sites. The apparent emphasis on bottomland settings suggests that exploitation of aquatic and floodplain resources was of major importance.

Mortuary Data. The major find at the Johnny Ford site was a cremation cemetery which contained "15 small interments each containing the cremated remains of human bodies and associated heat-shattered ornaments or offerings" (Schambach 1982a:146). The artifacts have not yet been described, and the bone preservation was extremely poor. Schambach also noted that the nearby Cicero Young Mound, which was excavated by knowledgeable amateurs and found to include a structure and a large fire pit containing cremated human bone, may have been a charnel house and crematory associated with the Johnny Ford site.

No mortuary data are available on the Lost Bayou phase (Schambach and Early 1982:SW79).

Exchange and External Relationships. Aside from possible late Poverty Point and (early?) Marksville connections and the widespread point types, there are no obvious connections with other cultures. In particular, the cremation burials are not paralleled by Tchefuncte or Lake Cormorant mortuary practices.

Inland Tchefuncte Culture

Definition and Location. As noted above, the basic definition of Tchefuncte culture was derived primarily from work at sites in the Louisiana coastal zone (Ford and Quimby 1945). That work will be summarized in the Coastal Tchefuncte Culture section. Tchefuncte culture has also been identified up the Lower Mississippi Valley through Louisiana and immediately adjacent Mississippi as far north as southeast Arkansas and as far northwest as Natchitoches Parish, with an outlier in northeast Texas. These Inland Tchefuncte manifestations (cf. Ford and Quimby 1945:87; Gibson 1968b:1) are the subject matter of the present section.

Although Tchefuncte culture was formally defined largely on the basis of coastal data, the first actual widely circulated archeological publication describing a Tchefuncte artifact was based on an inland find. Moore (1909:21, Figure 4) found most of the base of a vessel with nine podal projections or "feet" at the Booth Landing site in extreme northwest Catahoula Parish, in "a small area composed of black soil and fragments of mussel-shells." Moore, of course, had no idea of the actual or relative antiquity of this specimen; such realizations did not arrive until the 1930s.

Ford's (1936b) landmark monograph, which established the basic Lower Valley cultural sequence, began with the Marksville ceramic complex and did not include Tchefuncte. However, as noted by Gibson (1983b:56), the significance of the coastal Tchefuncte materials was becoming apparent as early as 1934, and Ford soon set out to find an inland equivalent. In 1937, Ford trenched the Lake Louis Mound in northeast Catahoula Parish and found Tchefuncte-like materials which were used as supplementary data in the original Tchefuncte monograph (Ford and Quimby 1945:20).

Ford and Quimby (1945:21–23) also summarized the Lafayette Mounds site, east of Lafayette and in St. Martin Parish, on the western margin of the Atchafalaya Basin, near the coastal zone but not within it. They also mentioned in passing the Bayou Rouge mound site in northern St. Landry Parish, in the Atchafalaya Basin (1945:24). In their concluding summary, they differentiated the Lafayette and Lake Louis sites from the coastal shell middens (1945:87).

A major contribution of the report by Ford and Quimby was the thorough documentation of the Tchefuncte artifact complex (1945:29–73). The most distinctive artifacts are a set of pottery types (1945:52ff), made on a paste that is "poorly wedged" with a "laminated and contorted appearance" in cross section. Recent experimentation by University of New Orleans artist–potter Doyle Gertjejansen, in consultation with archeologist Richard Shenkel and geologist Jesse Snowden, has resulted in the conclusion that classic Tchefuncte pottery clay was indeed poorly wedged or not wedged and worked at all, but "was pulled from the ground and, without further preparation, formed into vessels" (Gertjejansen et al. 1983:45). As noted above, this differs from the manufacturing techniques used in apparently contemporary Tchula period (Lake Cormorant culture) ceramics made in and near northeast Arkansas (Morse and Morse 1983:142).

Tchefuncte ceramics (Ford and Quimby 1945:52ff; Phillips 1970) include a rather wide assortment of plain, incised, punctated (zoned and unzoned), pinched, rocker-stamped, and red-slipped types. Frequently, vessel bases have tetrapodal, multipodal, or various annular arrangements of feet or supports (1945:Figures 17 and 18, 1970:162–163). The manufacturing techniques involved have been replicated (Gertjejansen et al. 1983:46ff, Figures 5 and 6).

Tchefuncte and related ceramic assemblages at sites in both the northern and southern portions of the study area have also often produced sand-tempered sherds of (or resembling) the Alexander series, first defined in northern Alabama (Ford and Quimby 1945:64–66, Plate 7; Phillips 1970:876ff). Phillips remarked that as far as he was concerned, "the role of Alexander pottery...is completely enigmatic" (1970:876), and added, "Assuming that Alexander is 'northern' and therefore more closely akin to Lake Cormorant than Tchefuncte, we have to explain why it is more often associated with Tchefuncte complexes, even in the far south" (1970:885). Alexander pottery is now estimated to be rather early, on the order of before 500 B.C. to perhaps 100 B.C., by Jenkins et al. (1986:552), but the same authors also propose even earlier dates for Tchefuncte (1986:551–552, 559). They noted that Alexander ceramics have also been found abundantly during recent research in the upper and central Tombigbee drainage (1986:552) and suggested "trade or some other interaction [along the Gulf Coastal Plain] which continued from Poverty point times" (1986:559) to account for the Alexander–Tchefuncte connection. However, as noted above, their presentation is flawed by the erroneous and misleading placement of Tchefuncte on their map (1986: Figure 21.6).

As noted above, Phillips et al. (1951) documented Tchefuncte-like materials from sites well to the north, in the Yazoo Basin, most notably at Lake Cormorant (1951:248ff) and Jaketown (1951:273ff). Along with the previous work in Louisiana, this was the basis of their formulation of the Tchula period concept for the northern Lower Valley, their Survey Area (1951:431–433, Figure 73), though they also used a separate but coeval Tchefuncte period concept for the Lower Mississippi (Ford's Louisiana coastal and inland) materials (1951: 436, Figure 73).

The excavation of the multicomponent Jaketown site (Ford et al. 1955) resulted in an expanded discussion of Tchula period pottery types and their relations (1955:63–76), including a brief discussion of "Jaketown Tchula" and "Louisiana Tchefuncte" (1955:75–76) which focused mainly on the problem of their relative chronology, and in effect considered them as possibly separate but definitely related cultures.

Gibson's (1968b) thesis defined the Russell Landing phase, consisting of "inland Tchefuncte stations more than one hundred miles from the coast" (1968b:1) in and near the Catahoula Basin of east-central Louisiana. He interpreted this phase as "an inland migration of people or diffusion of ideas northward... from the coastal areas" (1968b:ix). This strengthened the link between coastal and inland Tchefuncte, even though Gibson elsewhere (1968b:23, 29, 36, 40, 44, 46, 100ff) explicitly noted close resemblances of critical Russell Landing ceramic types/varieties to Yazoo Basin Tchula types/varieties and contrasts to classic Tchefuncte types/varieties from the Pontchartrain Basin. Gibson (1968b:109) suggested that Russell Landing might be later than the coastal sites and earlier than the Tchula sites, but noted (1968b:111) that Phillips, Ford, and Haag (1955:63–76) had inferred Tchula to be earlier than Tchefuncte. In any event, this thesis appeared too late for inclusion in Phillips's (1970) synthesis; instead, Gibson's (1966) preliminary data were incorporated by Phillips (1970:881) into his slightly expanded (e.g., by adding a Crooks site component) version of the Russell Landing phase, which he assigned to his significantly expanded version of Tchefuncte culture.

The Harvard–LMS expansion into the Tensas Basin of northeast Louisiana in the 1960s eventually resulted in the definition of the Panther Lake phase (Phillips 1970:880). Phillips noted in passing that this region "is a long and difficult way from Lake Pontchartrain and in a markedly different ecological setting," but included this phase also within Tchefuncte culture.

Phillips (1970:15–16) formally extended the Tchula period name to cover the entire Lower Valley as a period name only. In the Tchula home region, the Yazoo Basin, he did not use Tchula as a cultural name, but substituted the Lake Cormorant–Tchefuncte cultural dichotomy. It was clear, though, that he saw this as a rather one-sided dichotomy; he not only included his newly named Tuscola phase in the Lower Yazoo in Tchefuncte culture but also included the Upper Yazoo Norman phase in Tchefuncte, extending its territory northward at Lake Cormorant's expense. His overall impression of Tchefuncte culture was stated as "a Gulf Coastal orientation with limited northward penetration up the Mississippi and other rivers of the coastal plain, where it gets involved with more Woodland-like groups of the interior" (1970:16, cf.1970:885).

Phillips (1970:885) stated that he had merely substituted the Lake Cormorant–Tchefuncte dichotomy for the northern vs. southern Tchula dichotomy. That is true in terms of the 1951 report's actual survey coverage area, but it ignores and obscures a major effect of his change in terminology, which was to override the coastal–inland and/or Yazoo Basin–southern Lower Valley dichotomies which had been stated, at least as minor distinctions, under Ford's influence (Ford and Quimby 1945:87; Ford, Phillips, and Haag 1955:75–76). It must be noted, though, that Phillips's dichotomy between Tchefuncte culture from the Gulf to the northern Yazoo Basin and Lake Cormorant culture beginning in northwesternmost Mississippi is in approximate agreement with an assessment made by Griffin (1986:41): "The southern area, roughly south of Memphis, is quite distinct from the north in its early pottery while at the same time sharing some of the techniques."

Phillips's revised version has held sway since 1970 and has not really been subjected to a critical examination on a large scale. Even though two conference volumes dealing with this period in the eastern U.S. have very recently appeared (Dye and Brister 1986; Farnsworth and Emerson 1986), neither contained an article dealing adequately with the critical middle ground of northern Louisiana and adjacent Mississippi. Gibson's (1983d) summary of Ouachita prehistory skipped from the Poverty Point period to later ceramic periods without examining the Tchula period in northeast Louisiana.

The coastal–inland distinction used as a general principle in the present overview restores, in effect, the dichotomy made by Ford and Quimby. This is not the place to attempt a major rethinking of the old Tchula–Tchefuncte cultural dichotomy, but we are at least calling attention to it and suggesting that such a reanalysis might be useful, especially in light of Gibson's statements about the close resemblances of Russell Landing pottery to that from the Yazoo Basin, and its contrasts with Tchefuncte pottery from the coastal regions.

Following Phillips's expansion of the Tchefuncte culture concept, it has also been expanded into the Felsenthal region of south-central Arkansas (Schambach 1979). It seems to be strongly represented only in the lower Felsenthal region, though (Schambach and Early 1982:SW87–SW88; Weinstein and Kelley 1984:498).

The major post-Phillips Inland Tchefuncte documentation was provided by the appearance of Gibson's (1974) study of Lafayette phase sites and settlement patterns, and the Beau Mire site report (Weinstein and Rivet 1978). The Beau Mire and Lafayette phases were also summarized (along with Coastal Tchefuncte phases) in an article by Weinstein (1986).

West of the Lower Valley, Tchefuncte-like ceramic complexes extend up the Red River Valley at least as far as the southern part of Natchitoches Parish (Gregory and Curry 1978: 43). According to Clarence Webb and David Jeane (personal communications), no typical Tchefuncte ceramics are known from the Red River in northwest Louisiana. Some crude, plain, thick pottery that could be Tchefuncte-related is known from Bossier Parish. It should be noted that this is the general vicinity of Webb's (1982; Webb and Gregory 1978:2) Bellevue focus of the succeeding Marksville period, and that Schambach (1982a:187–188) argued that this should be subsumed under the Fourche Maline culture rubric. It is quite possible that the Tchefuncte-coeval materials of this region should also be included under Fourche Maline.

Ironically, the only whole (actually, restored) Tchefuncte vessel yet found came from the northwesternmost known outlier of (or related to) the Tchefuncte culture, the Resch site in northeast Texas (Webb et al. 1969; cf. Neuman 1984:122, 126, Plate 19a).

In extreme south-central Louisiana, the natural levees of the upper Vermilion River, which follows the course of the old Teche–Mississippi channel, contains one of the most intensive Tchefuncte occupation found anywhere. This pattern of occupation of old river levees is duplicated across southwestern Louisiana and eastern Texas where the prairies represent deltaic remnants of the Pleistocene course of the Mississippi, Red, Sabine, and Trinity rivers.

Paleoenvironmental Data. The remarks made above in the Lake Cormorant culture section about the middle Lower Mississippi and Arkansas rivers and their meander belts also are relevant here. In addition, the situations of the "lower" Lower Mississippi and the lower Red River are worthy of some consideration here.

Probably between about 1000 B.C. and 500 B.C., the Mississippi moved eastward in northeast Louisiana, from a meander belt along the Tensas Basin to its present meander belt. Below the vicinity of Marksville, little change is apparent from the next-to-last to the present meander belt (Saucier 1974; Autin n.d.).

Saucier (1974) previously estimated that around 400 or 300 B.C., there was a major change by the Red River from a meander belt (No. 3 in both the 1974 and revised terminologies) trending eastward and passing just south of Marksville to join the Mississippi just below the present Red River mouth, to the next-to-last one (No. 2 in the revised system; No. 4 in the 1974 system) trending southward along the western margin of the Atchafalaya Basin. However, in the revised version, the Red River's chronology before about 1000 A.D. is left open to question (Autin n.d.; Saucier, personal communication).

It should also be noted that Pearson (1986) suggested that the Red River's modern meander belt, passing north of Marksville, has been in existence since no later than A.D. 200 and probably before A.D. 1(1986:41–42). Thus, major diversions of the lower Red River during or near Tchefuncte times are postulated in two recent reconstructions, but there is total disagreement as to which meander belt change was involved and, consequently, as to whether it was a change from or a change to the western Atchafalaya Basin course.

In extreme south-central Louisiana, the natural levees of the upper Vermilion River, which follows the course of the old Teche–Mississippi channel, contain one of the most intensive Tchefuncte occupations found anywhere. This pattern of occupation of old river levees is duplicated across southwestern Louisiana and eastern Texas where the prairies represent deltaic remnants of the Pleistocene courses of the Mississippi, Red, Sabine, and Trinity rivers.

Phases. The northernmost formally designated phase of Tchefuncte culture is Phillips's (1970:879–880) Norman phase, in the northern Yazoo Basin and out of the present overview's study area. As discussed above, there is some question as to whether this is a pure Tchefuncte culture phase, or a Tchefuncte culture phase at all; the question of its relationship to Lake Cormorant culture remains to be resolved.

West of the Mississippi in these latitudes, no phase of Tchefuncte culture has been designated. The Morses (1983:142–145) described the remains found north of the Arkansas River as more similar to those of the Turkey Ridge phase of Lake Cormorant culture than to those of "lower" Lower Valley Tchefuncte culture.

Rolingson (1974) named a Grampus phase for this period in the southern Bartholomew locality of southeast Arkansas, but noted that the evidence for it was extremely tenuous (cf. Jeter 1982a:95). The cultural affiliation of these delta regions during this period remains uncertain. Rolingson and Jeter (1986:99, Figure 8.1, Table 8.1) noted that in southeast Arkansas, "Tchefuncte culture [pottery] types make a better showing in the Felsenthal region, and the more northerly types...have only been found in the other [Delta or Mississippi Valley] regions."

The Felsenthal region, though, is regarded as having had a strong representation of "full fledged–real" Tchefuncte pottery in the Coon Island phase (Schambach 1979:29, Figure 3.1; cf. Schambach and Rolingson 1981:181, Table 19; Schambach and Early 1982:SW87–SW88). This is reinforced by the findings of Hemmings (1982a:252–254, Figure 65) along the Ouachita bottomlands in the lower Felsenthal region, but in the upper Felsenthal region, the Tchefuncte-like materials apparently are rare in comparison to contemporary Fourche Maline 2 materials (Weinstein and Kelley 1984:498).

In the Lower Yazoo Basin, Phillips's (1970:532–534, 880) Tuscola phase represents Tchefuncte culture but is well represented only at the Jaketown site. The Lake George site produced only a "vague manifestation" of this phase (Williams and Brain 1983:329).

In the Tensas Basin, another very tentative and poorly documented phase, Panther Lake, has been designated (Phillips 1970:880). In the Boeuf Basin, virtually no Tchefuncte material was found in a survey of the northern part of the basin, and only a limited representation was found in the southern portion (Fuller and Williams 1985:7–8).

The Panther Lake phase is adjoined to the southwest (and somewhat intermingled, in Phillips's discussions) by Gibson's (1968) Russell Landing phase in the Catahoula Basin (cf. also

Phillips 1970:881). Gregory et al. (1987:37–40) suggested that two phases, Russell Landing and Bodcaw, should be designated for the Catahoula Basin during this period, with Russell Landing as the earlier of the two. They also noted possible Fourche Maline influence in the presence of thick, bone-tempered plain pottery in these assemblages (1987:38). Jon Gibson (personal communication) has suggested that the bone may derive from midden soils used in making this pottery.

To the west of the Catahoula Basin, Gregory and Curry (1978:43, Table 3) tentatively designated the "premature" Lena phase to represent a "thin sprinkle" of Tchefuncte-related sites in southernmost Natchitoches Parish. They noted that these sites may merely represent temporary camps of Russell Landing phase hunter–gatherers. This appears to mark the effective northwestern limits of Tchefuncte culture despite the presence of the Resch site outlier in northeast Texas (Webb et al. 1969). Tchefuncte-like materials are quite rare in northwest Louisiana (Clarence Webb and David Jeane, 1987 personal communications).

Phillips's (1970:881–882, Figure 443) north-south discussion of Tchula period phases in the Lower Valley took a rather long jump over the lower Red River Valley, from the Russell Landing phase to the Pontchartrain phase, considered here to be a Coastal Tchefuncte manifestation, and the Lafayette phase, considered here as Inland Tchefuncte. The Beau Mire phase has subsequently been defined by Weinstein and Rivet (1978: 117ff) and summarized by Weinstein (1986:115); they regarded it as a relatively late Tchula period phase, perhaps postdating the coastal Pontchartrain phase. Although Weinstein (1986: 115) characterized Beau Mire as a coastal Tchula manifestation, it is here regarded as Inland Tchefuncte because, as he noted (cf. also 1978:117ff), all of the known Beau Mire sites are earth middens rather than shell middens, and they are clearly focused on the Mississippi River floodplain (1986:Figure 9.2).

Phillips's (1970:882–884) Lafayette phase was based largely on the original definition by Ford and Quimby (1945) and includes the best evidence for Tchefuncte mound building (1970:882–883). Gibson (1974:70) suggested that Phillips's definition had been "areally too broad," incorporating "too many non-Tchefuncte components to be of much utility"; he redefined the phase (1974:70ff). Again, although Weinstein (1986:115) characterized the Lafayette site as coastal, it and the other sites of this phase are not coastal shell middens. They are located along the Prairie terrace margins overlooking the Atchafalaya Basin and along the Teche–Mississippi natural levees within the basin (cf. Gibson 1974:68–70, 76ff, Figure 1). For our purposes, this is regarded as another Inland Tchefuncte phase.

Key Sites. Again, the Norman site in the Upper Yazoo Basin of northwest Mississippi is a crucial site; this time, for determination of the northern range of Tchefuncte (or Tchula) culture (Phillips 1970:878; Brookes and Taylor 1986:25). In the Lower Yazoo Basin, Jaketown remains the major known site (Phillips 1970:878–879).

Within the present overview's study area, there are as yet no key sites of Tchefuncte culture in the delta regions of southeast Arkansas. Any major site of this culture found in these regions will automatically become important. In the Felsenthal region, in southern Bradley County, the major site is Coon Island (3BR10), the type site for the Coon Island phase (Schambach 1979:29; Schambach and Rolingson 1981:181; Schambach and Early 1982:SW87–SW88). It has been tested fairly extensively, and has yielded the most complete Tchefuncte-like assemblage of any Arkansas site; however, these artifacts have not been rigorously analyzed, and no site report is available (Rolingson and Jeter 1986:96–97, Table 8.1).

In the Tensas Basin of northeast Louisiana, the Panther Lake phase's type site (Phillips 1970:880, Figure 443) is presumably the most important site, but no report has been published on it. Nothing more has been published on the Lake Louis site since Ford and Quimby's (1945:20) brief summary.

At the Gold Mine mound site in the Boeuf Basin, a Tchefuncte component was found in submound strata (Belmont 1982c:81). However, emphasis was on the Troyville burials in the mound, and the Tchefuncte occupation remains undocumented.

Gibson's (1968b) Russell Landing site thus remains the best-described Tchefuncte site in northeast Louisiana, but this description is poorly known, as it is in his unpublished thesis, which was not available before Phillips's (1970) synthesis went to press. Very briefly, the site is in southern La Salle Parish, on Little River a short distance upstream from its junction with Catahoula Lake. It has two mounds which may belong to a later component. Gibson repeatedly revisited the site in the late 1950s and 1960s, making surface collections and conducting limited testing. His thesis (1968b:19ff) described a number of varieties of classic Tchefuncte types and compared them to Tchula materials from the Yazoo Basin (especially Jaketown) and the coastal Tchefuncte sites. In almost all cases (1968b:23, 29, 36, 40, 44, 46, 100ff), he found that the Russell Landing materials' resemblances were much closer to the Tchula materials, but this distinction seems to have been swamped by Phillips's (1970) expansion of the Tchefuncte culture concept. Russell Landing would certainly be a key site in any reexamination of the cultural situation for the Tchula period.

The Beau Mire site (16AN17) was excavated by LSU researchers in the early 1970s and analyzed by Weinstein and Rivet, whose (1978) report represents the first widely available and thoroughly researched report on a Tchefuncte culture site since the Jaketown report. The site was an earth midden on the banks of New River, an old Mississippi River crevasse distributary (Weinstein 1986:115). This site report is also noteworthy for its publication of descriptions of a number of new ceramic varieties based on Rivet's (1973) thesis.

Other critically important Inland Tchefuncte sites include those of the Lafayette phase, especially the Lafayette Mounds and the Bayou Rouge Mound site (Ford and Quimby 1945:21–24, 87; Phillips 1970:882–884, Figure 443; Gibson 1974). As indicated on Phillips's map, these sites are somewhat detached by the intervening Red River Valley from the other Inland Tchefuncte sites but are not Coastal Tchefuncte shell middens. They are certainly critically important in the resolution of the question of Tchefuncte mounds.

The Lafayette Mounds site (16SM17) excavated by Ford and Quimby (1945) is the major type site for the Lafayette phase. This site consisted of three low, circular earth mounds measuring about 0.3 to 1.5 m high and 12 to 18 m in diameter, located on a natural levee of the Teche–Mississippi river course. The one mound that was excavated, the largest one, had a premound cultural level comprised of the postmold remains of several structures that had been erected within a low depression dug out of the levee. A total of 30 burials had been placed either on the premound surface or within the two earthen levels on top of the low depression. This was followed by a thick mantle of soil to a height of approximately 1.5 m (Weinstein 1986:115).

Settlement Data. This subject has not been studied systematically for Inland Tchefuncte culture(s) in most regions of this study area and certainly not from the southeast Arkansas Delta regions, where only sporadic site finds have been recorded (Rolingson and Jeter 1986). In the Felsenthal region, a start has been made, with Hemmings's (1982a:252–254, 275–277) summaries of seasonal (summer–fall) extractive campsites along the Ouachita and Saline rivers. Still missing are data from upland, cold weather sites, and no Inland Tchefuncte mounds are documented from Arkansas.

Gibson (1968b:118) characterized Russell Landing phase settlements as "small riverine middens, usually with single mounds or groups of two [mounds]." In the Catahoula Basin, Tchefuncte sites appear to have been clustered on older (Arkansas River) alluvium, rather than around Catahoula lake or in the uplands (Gregory et al. 1987:75). A few mounds in this region may be attributable to Tchefuncte culture.

All eight Beau Mire phase components known at present are earth middens (Weinstein and Rivet 1978:117ff; Weinstein 1986:115). They tend to be associated with ancient Mississippi River meanders or distributaries. No mounds are known.

In the most detailed and rigorous study so far made of Inland Tchefuncte settlement patterns, Gibson (1974, 1975; cf. also 1976b) summarized data on 11 sites in his redefined version of the Lafayette phase, with regard to site types, soil types, and physiographic and ecological settings. He suggested that this phase represented the breakdown of the previous Beau Rivage phase of Poverty Point culture in this region, i.e., a devolution from the chiefdom to the tribal level of social organization. He also suggested that the Lafayette phase system was "oriented to several divergent ecosystems along upland bluffs and down in the floodplain, while those of the Beau Rivage phase were limited to escarpment edges" (1974:90).

Lafayette phase sites are found along the terrace edge, on natural levees and accretional ridges of the middle reaches of the old Teche–Mississippi River course. The lower reaches of this river course, closer to the coast, were apparently avoided during Tchefuncte times (Gibson 1975:81). According to Gibson (1975:84), one overriding factor is that site locations were chosen to place Tchefuncte settlements above all but the most extreme floods. It is possible that the lower reaches of the Teche–Mississippi, which by this time had a flow augmented by the diversion of the Red River from the Mississippi, were so subject to flooding that it was avoided during the Tchefuncte period.

In terms of site functional variability, Gibson (1975:85) found that "most Lafayette phase components reported from the Vermilion River appear to have been small, seasonal base camps or semipermanent villages, occupied by small groups... (numbering between 30-90 people)." The residential groups were apparently economically self-sufficient, leaving little archaeological evidence of formal intervillage ties. One possible focus of intervillage significance may have been the communal maintenance and sharing of the conical burial mound sites documented at the Lafayette Mound site, Bayou Tortue, and Bayou Capucin (Gibson 1975:85). However, it should be emphasized that the assignment of these conical mound sites to the Lafayette phase is a source of debate (cf. Griffin 1979).

Almost nothing is known about Tchefuncte structures. However, as noted by Neuman (1984:133–134), an arc of postmolds, which might have represented part of the outline of a circular structure about 10 m in diameter, was found at the Lafayette site in the premound surface (Ford and Quimby 1945: 21–22, Figure 6).

Subsistence Data. No directly relevant data at all are available on Inland Tchefuncte subsistence from sites in the Delta regions of southeast Arkansas (Rolingson and Jeter 1986:99). In the Felsenthal region, Hemmings (1982a:275–277) logically hypothesized a summer–fall fishing emphasis for his bankline sites.

Gibson (1968b:118) noted that fish bones and mussel shells at Russell Landing phase sites indicated that "at least a portion of the subsistence was obtained from fishing." Biconical and other shapes of clay balls were found (1968:54–57). Moore's (1909:21) Tchefuncte vessel base from Booth Landing was found in a concentration of mussel shells. Although no direct subsistence data are available from the Catahoula Basin, Gregory et al. (1987:70, 75) also noted the presence of Poverty Point objects (clay balls) at most of the Tchefuncte-related sites in that region.

At the Beau Mire site, some 374 poorly preserved fragments of burned bone were recovered from the surface. Although their association is thus dubious, some were identified by Kathleen Byrd (in Weinstein and Rivet 1978:115) as representing several fish species, plus turtle, duck, raccoon, and deer. Several soil samples from the site were floated, but no plant remains were recovered. Clay balls were apparently not found.

Detailed subsistence data were not presented for the Lafayette Mounds site, although 15 refuse pits were excavated and yielded ash and bone fragments, in addition to Tchefuncte sherds (Ford and Quimby 1945:22, Figure 6).

Gibson (1974) did not add detailed subsistence information from other sites of this phase but did suggest that, based on settlement locational data, a rather diverse subsistence pattern was in effect.

Mortuary Data. As noted by Rolingson and Jeter (1986: 99), nothing is known about Tchefuncte burial customs in Arkansas. In northeast Louisiana, very sketchy data from Lake Louis and other sites suggest that mounds were built in stages, and flexed and bundle burials were placed on consecutive building surfaces without grave goods (Ford and Quimby 1945: 20; Gibson 1968b:118). One of the sites contributing to this impression is Booth Landing, where Moore (1909:21) found burials in a mound and a Tchefuncte vessel base (1909:Figure 4) in another location; the association is rather uncertain at best.

No data are available on Catahoula Basin or Beau Mire phase mortuary practices. At the Lafayette Mounds, burials were placed on a premound surface, and the primary mantle, of midden materials, was heaped over them. Some slightly later burials were apparently placed on this new surface and covered in the same manner. No grave goods were found (Ford and Quimby 1945:21–22).

Exchange and External Relationships. Very little is known about these topics in the northern range (south Arkansas) of Inland Tchefuncte culture. The presence of northern ceramics with Tchefuncte-like materials at sites such as Norman (Brookes and Taylor 1986:25) and those in the southeast Arkansas Delta regions (Rolingson and Jeter 1986:Table 8.1), and of Fourche Maline-like materials in the upper Felsenthal region (Weinstein and Kelley 1984:498) would appear to mark poorly defined or fluctuating cultural boundaries or boundary zones. Exotic lithics have not been noted from Tchefuncte sites in these regions, but the data base is weak in general, and burials, the most likely association for exotic materials, are unknown so far.

In northeast Louisiana, as just noted, Tchefuncte burials are known, but no grave goods, exotic or otherwise, have been found with them. As noted above, Gibson (1968b) found ceramic relationships of the Russell Landing site and phase to be closer to Tchula materials from Jaketown and the Yazoo Basin than to Tchefuncte materials from the coastal region, but nevertheless interpreted his materials as primarily reflecting diffusion northward from the coast. Gregory et al. (1987:39, 92) suggested that the Bodcaw phase of Tchefuncte-like culture followed the Russell Landing phase in the Catahoula Basin and reflects increasing contacts to the north and west, exemplified by lithic materials from the Ouachita Mountains and Fourche Maline-like ceramics.

Data from the Beau Mire site suggest a rather modest level of exotic raw material procurement. One hematite fragment, possibly from the Ouachitas of Arkansas, was found (Weinstein and Rivet 1978:106), along with six pieces of steatite (soapstone), possibly from east-central Alabama (1978:111), and a biface of orthoquartzite (Tallahatta quartzite?), possibly from southwest Alabama (1978:112). All of these materials are known to have circulated in the preceding Poverty Point system, and some Wheeler Plain fiber-tempered pottery, generally associated with Poverty Point components (Jenkins et al. 1986:548–551), was found at Beau Mire (1978:80–82), so there is some reason for doubting the Tchefuncte association of these materials (1978:81–82).

In his review of Lafayette phase data, Gibson (1974:90) concluded that it was "quite evident, judging by the paucity of exotic materials on Lafayette sites, that during the Poverty Point–Tchefuncte transformation, the procuration and redistribution of foreign raw materials in general rapidly slowed and eventually stopped altogether."

Coastal Tchefuncte Culture

Definition and Location. The Tchefuncte culture was the dominant manifestation along the central Gulf Coast and adjacent Lower Valley during this period. Coming between the socially integrated and materially elaborate Poverty Point and Marksville cultures, Tchefuncte culture has been characterized as a drab, lackluster, conservative development during which social complexity, trade, and interaction declined (Ford and Quimby 1945; Gibson 1974). To some, a closer affinity is seen between Tchefuncte and the Late Archaic, particularly on the coast where the artifact assemblage, settlement system, and subsistence strategies are similar, and the addition of a rather complete ceramic complex is seen as the major difference between the two (Wiseman et al. 1979:3–4; Weinstein and Gagliano 1985:137). In a broader sense, Tchefuncte stands as an important stage in the efficient adaptation to floodplain and coastal environments, which was achieved through optimum positioning of settlements and increased sedentism (Gibson 1975:14). From a research point of view, Tchefuncte is the earliest culture for which we have good chronometric control over phases, widespread collections of human physical remains, and well preserved subsistence data (Neuman 1984:113).

The first report of coastal Tchefuncte period sites was a paper by Czajkowski (1934) on the salvage excavations at the Little Woods Middens (16OR1-5) in the Lake Pontchartrain Basin. However, it was not until Ford and Quimby's (1945) classic study that Tchefuncte was fully described and recognized as a major widespread cultural phenomenon. That study detailed the results of the WPA-sponsored excavations at the Tchefuncte site (16ST1), Big Oak Island (16OR6), Czajkowski's previous work at the Little Woods Middens, the Lafayette Mounds (16SM17), Lake Louis (16CT24), Bayou Rouge (16SL3), and Copell (16VM102).

Examination of the distribution of Tchefuncte culture components by parish, based on data published in the Comprehensive Archaeological Plan (Smith et al. 1983:Tables 3 and 5), shows a broad but uneven scatter of occupations across the coastal zone. Only about 50 of these components are situated in coastal parishes; the remaining 49 components are located inland. The coastal parishes with the highest densities of Tchefuncte components are Orleans and St. Charles parishes in the eastern delta, and Cameron Parish in southwestern Louisiana. The absence of components in the southernmost delta parishes (St. Bernard, Plaquemines, and Terrebonne parishes) reflects the recent age of the Lafourche and Plaquemines subdeltaic landforms. Elsewhere, the patterns of high and low density possibly may reflect the intensity of coverage in these areas.

Paleoenvironmental Data. Sites of the Tchefuncte culture on the Louisiana coast tend to cluster in the Pontchartrain Basin in the eastern Mississippi delta and around Grand Lake in southwestern coastal Louisiana (Ford and Quimby 1945; Weinstein and Gagliano 1985). During the time span of the Tchefuncte culture, a number of deltaic landforms were already in existence or were active in the Mississippi River delta. The Bayou Teche lobe, which had begun formation 3800 to 1900 years B.C. (during the Middle and Late Archaic–Poverty Point times), was utilized during initial Tchefuncte times. Sometime after about 1400 B.C., the Metairie deltaic system expanded into two lobes, known collectively as the La Loutre lobe or St. Bernard deltaic complex, which began development during the latter part of this period south of the Pontchartrain Basin. These two lobes formed most of what are now St. Bernard and Lafourche parishes (Weinstein and Gagliano 1985; Gagliano 1984).

In addition to the above-mentioned deltaic features in the eastern region, several older marine landforms already in existence before the development of the surrounding alluvial deltas also became important in the Tchefuncte settlement system. Relict beach ridges such as the Pine Island Beach Trend in the eastern delta region became productive locations for Tchefuncte settlements such as Big Oak Island, once the eastward shift of the Mississippi River brought freshwater flow into the area and formed fresh and brackish water swamps and marshes. Similar barrier islands just off the mainland in the estuary east of the delta around the Pearl River mouth were also settled during this period (Weinstein 1986). Along the immediate coastline of southwest Louisiana, the old beach ridges in the chenier region were also favored landforms for Tchefuncte occupation.

Phases. Although discrete clusters of Tchefuncte sites had been recognized by Ford and Quimby (1945) and McIntire (1958), Gagliano (1967a, 1967b) was the first to attempt formulation of specific phases. This was followed by Phillips's (1970) synthesis in which Gagliano's three original Tchefuncte culture phases were reformulated using the type–variety system. Work throughout the 1970s and 1980s resulted in several new phase determinations (Weinstein and Rivet 1978; Aten 1983; Weinstein 1986; and others) and significantly refined our understanding of Tchefuncte chronology (Figure 11), settlement, subsistence, and material culture.

The Pontchartrain phase formulated by Gagliano (1967b) and later refined by Phillips (1970) takes in the margins around Lakes Maurepas and Pontchartrain, encompassing the Pearl River mouth and New Orleans vicinity in southeastern Louisiana (Figure 3). Sites of this phase are generally large to moderately sized, sometimes deeply stratified shell middens composed almost exclusively of the clam *Rangia*. This phase has received more attention than any other Tchefuncte culture phase in coastal Louisiana, with research including Czajkowski's excavations at the Little Woods Middens (16OR1-5), Bayou Jasmine (16SJB2) by Neuman, and extensive work at the Tchefuncte site (16ST1), Little Oak Island (16OR7), and Big Oak Island (16OR6) in the New Orleans vicinity (Ford and Quimby 1945; Shenkel 1974, 1979, 1980, 1984; Shenkel and Holley 1975). Radiocarbon dates from the Tchefuncte site, Bayou Liberty, Big Oak Island, and Little Oak Island indicate a time range for the Pontchartrain phase of about 300 B.C. to A.D. 50 (Weinstein 1986:112), but the latter date appears too late for Tchefuncte culture (cf. Shenkel 1984:44).

The Pontchartrain phase is distinguished by poorly wedged, sandy or sand-tempered laminated paste ceramics. Examples include a linear dentate stamped pottery termed Mandeville Stamped, *var. Mandeville*; Tchefuncte Plain, *var. Mandeville*; Tammany Punctated, *var. Cane Bayou*; Lake Borgne Incised, *var. Ponchitolawa*; Tchefuncte Stamped, *var. Lewisburg*; and Tchefuncte Incised, *var. Abita Springs* (Ford and Quimby 1945; Weinstein and Rivet 1978; Weinstein 1986). Also associated with these wares are a number of varieties of the original Tchefuncte pottery series which are described in detail by Weinstein and Rivet (1978) and Shenkel (1980). Other common Pontchartrain phase artifacts include clay tubular pipes, bone points, occasional Poverty Point-like baked clay objects, Pontchartrain dart projectile points, and Kent dart points (Weinstein 1986: 112). The Beau Mire phase (Weinstein and Rivet 1978) and the Lafayette phase (Gibson 1975) have been regarded as coastal for some purposes (Weinstein 1986). However, they are regarded as Inland Tchefuncte culture manifestations here.

A cluster of Tchefuncte period sites in the Barataria Basin south of New Orleans has not been assigned to the Pontchartrain phase. Due to the isolated nature of these components, Gagliano et al. (1978) suggested that these sites would in all probability require formulation of a separate phase. However, there is presently not enough of a sample of the ceramics to formulate a phase, nor is there adequate data to enable an assessment of any possible ties to other nearby Tchefuncte phases (Gagliano et al. 1978:4–5).

The Grand Lake phase was formulated by Gagliano (1967b) for a number of sites originally recorded during the coastal survey by McIntire (1958). Geographically, the Grand Lake phase encompasses a broad area from Vermilion Bay in the central coast of Louisiana west to Grand Lake in Cameron Parish and extending north up the reaches of the Mermentau and Vermilion rivers (Weinstein 1986:Figure 9.2). Excavations at Morton Shell Mound (16IB3) by Neuman, at Veazey (16VM7) by Brown, and the Strohe site (16JD10) by Bonnin and Weinstein (1975, 1978) have yielded a wealth of information concerning the geographic range of Grand Lake ceramics, subsistence strategies, and chronology (Weinstein 1986:118). Radiocarbon dates from Neuman's excavations on Morton Shell Mound (16IB3) reported by Byrd (1974) generally fall within the range from 200 B.C. to AD. 200 (Weinstein 1986: 118); the latter date appears much too late for Tchefuncte (cf. Shenkel 1984:44). The extensive floral and faunal analyses by Byrd (1974, 1976a, b, c) at Morton Shell Mound have provided the basis for what is known about Tchefuncte subsistence for the coastal Louisiana region.

A lack of conformity of certain aspects of Grand Lake phase pottery types, compared to the eastern Tchefuncte ceramic traditions, has been a problem since the inception of the phase. Many researchers have noted that, because the ceramic tradition exhibited by Grand Lake phase sites differs so markedly from the other classic Tchefuncte wares (Gagliano 1967b), there is some question whether Grand Lake ceramics should even be considered a variety of Tchefuncte pottery (Phillips 1970:884; Weinstein 1986:117). Gagliano (1967b), writing about Grand Lake phase pottery, noted that it differed from Pontchartrain phase types in having a high incidence of sand tempering, in being thicker and more poorly made, in appearing to be molded rather than coiled, and in having decoration resembling Jaketown and Deptford-like stamped pottery. Other unusual decorative elements include folded lips, multiple incised lines parallel to the rim, cane stamping, and angular incised lines (Gagliano 1967b: 15). In a 1966 paper, Gagliano observed that some of the Grand Lake phase pottery conforms to northern ceramic types from the Jaketown and Russell Landing sites in the Mississippi River valley while other Deptford-like and Alexander-like type Grand

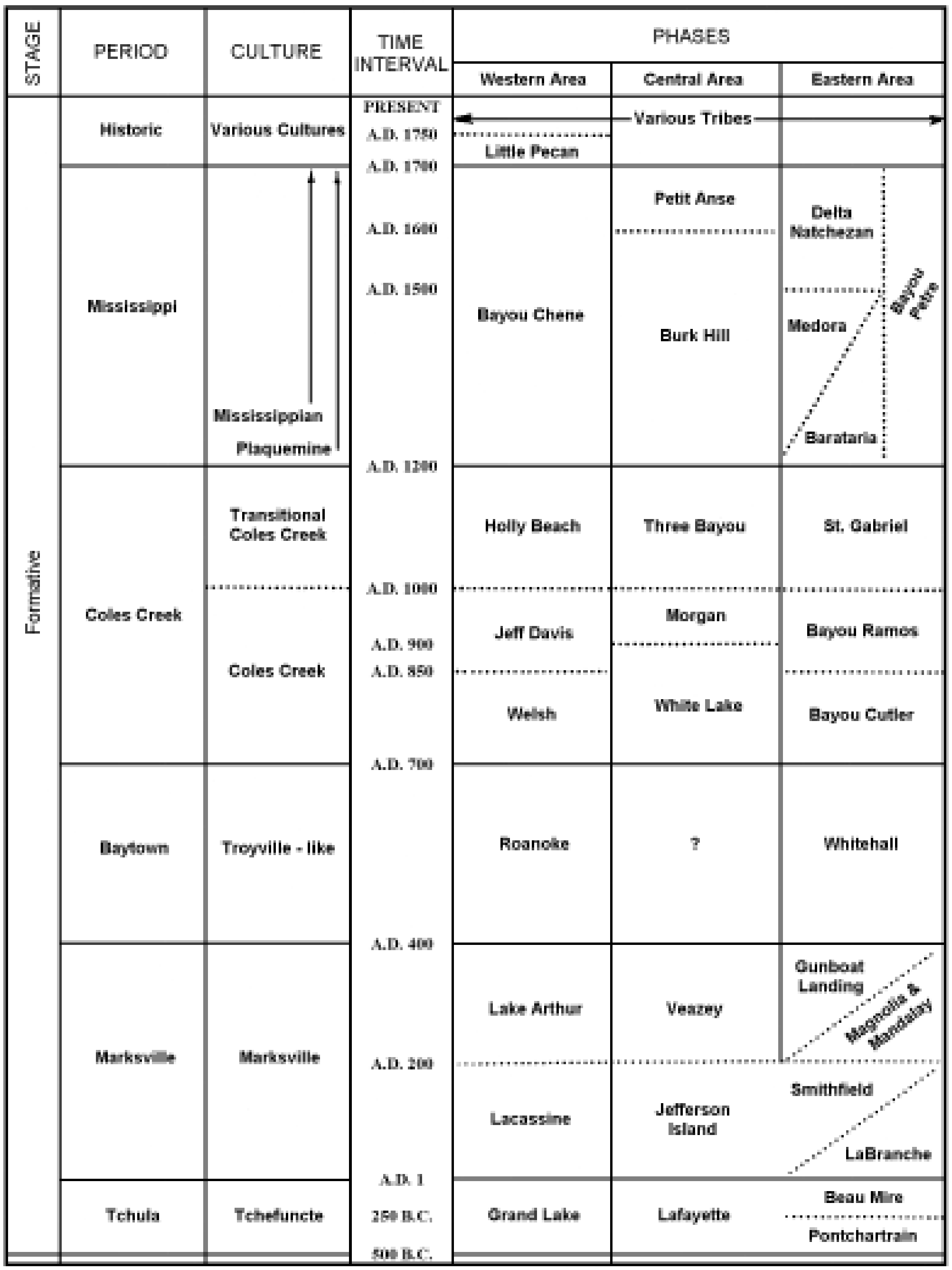


Figure 11. Coastal Louisiana culture sequence and chronology (after Weinstein and Gagliano 1985). Note: Some of the phases listed here represent near-coastal "inland" cultures; see the text for further discussions.

Lake wares suggest affinities with traditional Gulf Coast ceramics (Phillips 1970:884).

The Sabine Lake phase was formulated by Weinstein (1986) to separate coastal Tchefuncte sites in extreme southwestern Louisiana and southeastern Texas that were either formerly considered Grand Lake phase components or had been left unclassified. The distinguishing ceramic criterion for this phase is the presence of O'Neal Plain *var. Conway* pottery (Aten 1983; Weinstein 1986:119). Other pottery types documented on Sabine Lake phase sites are Tchefuncte Plain, Goose Creek Plain, Mandeville Plain (which is equivalent to Tchefuncte Plain, *var. Mandeville*),as well as dart projectile points, sandstone abraders, and Jaketown-like microflints. The geographical range of this phase takes in an area extending from a point midway between Calcasieu and Sabine lakes in Louisiana west to a point midway between Sabine Lake and Galveston Bay in Texas (Weinstein 1986:Figure 9.2). The best example of a Sabine Lake phase site in Louisiana is the Conway D site (16CU108) in Calcasieu Parish, a shell midden where Tchefuncte ceramics have been found in association with a radiocarbon sample obtained by Aten (1983) dated to about 70 B.C. (Weinstein 1986:119).

Key Sites. The classic sites described by Ford and Quimby (1945) have been listed above. The key sites of the Pontchartrain phase are Big Oak Island (16OR6) and Little Oak Island (16OR7), located on the south shore of Lake Pontchartrain in Orleans Parish. Shenkel's extensive excavations there (1974, 1980, 1984a, 1984b) have provided a large body of information concerning the material culture, cultural–historical relationships with other cultures, settlement and subsistence patterns, and mortuary behavior for this phase. Three Tchefuncte components are present at the two sites: two earth middens with dense artifact concentrations representing possible multifunction villages and a large shell midden extending more than 4 m below surface, contemporaneous with the earth middens, but with lower artifact densities (Shenkel 1984b:45–47).

A diverse artifact assemblage was documented at the Big and Little Oak Island sites through these excavations. It included typical Pontchartrain phase ceramics; lithics including Macon-like projectile points, Kent or Pontchartrain points, and other tools and points; a few ground stone tools; and bone and shell tools (Shenkel 1984a:47–59). Also present at the Big Oak Island site was a late Tchefuncte–early Marksville ossuary containing the remains of 50 bundled individuals (Shenkel 1984a). Faunal remains recovered at the sites are dominated by *Rangia* (clam), mammals, fish, and reptiles. Shenkel notes that, based on evidence from these two sites, the Tchefuncte culture achieved a basic adaptation to river delta and coastal environments that was maintained largely unchanged until historic contact (Shenkel 1984b:65). Shenkel also hypothesized an egalitarian patrilocal band level of social organization for the Pontchartrain phase cultures (1984b:67–71).

The Morton Shell Mound (16IB3) excavated by Neuman constitutes one of the most extensive shell middens in the entire Gulf region. This important Grand Lake phase site yielded stratified deposits spanning the Poverty Point, Tchefuncte, Marksville, Troyville–Coles Creek, and Plaquemine periods (Neuman 1977:12). The excavations at the site by Neuman have not been fully published yet, but have been summarized by Neuman (1984a:119ff). The research by Byrd (1974, 1976a, b, c) on the faunal and floral remains from the Morton Shell Mound is an important contribution to our understanding of Tchefuncte subsistence.

Settlement Data. Most of the Tchefuncte sites reported in Louisiana are situated in the coastal zone. Tchefuncte settlements in this region are located on cheniers, terrace remnants, salt domes, and along lake shores and natural levees (Neuman 1984:133). Several models of coastal settlement and adaptation have been proposed for the coastal Tchefuncte (Gibson 1974, 1983; Shenkel 1984a).

In the eastern Mississippi delta region, research at the Big and Little Oak Island sites of the Pontchartrain phase by Shenkel (1984a) revealed a possible functional dichotomy in terms of site size, location, subsistence remains, and artifact composition. Shenkel hypothesized a village type base camp characterized by expansive but relatively thin, circular earth middens containing dense artifact and faunal concentrations, and postholes. The second site type is typified by massive *Rangia* shell remains, a much lower artifact density, faunal remains associated with primary processing, and an absence of postholes. The Little Oak Island earth midden is an example of this village site type, while the massive shell midden at Big Oak Island was probably a special fishing and hunting station functioning as an extractive base for the associated village at Little Oak Island (Shenkel 1984a:46). It is also the fishing and hunting stations that are seen by Shenkel as tied directly to the *Rangia* bed habitat as a primary food extractive base for the less tethered village site (Shenkel 1984a:66–67).

Shenkel perceived the differences in artifacts and faunal remains between the two site types as a function of the different roles of the sites in terms of the overall Tchefuncte economic adaptation and the resulting different activities carried out at each site. At the Little Oak Island village, ceramics were generally larger vessels, frequently having decorations and slab-shaped podal supports which are interpreted to be more permanent pots for cooking and storage. At the Big Oak Island fishing station, pottery vessels are generally smaller and plain having teat-shaped podal supports presumed to have a more utilitarian function as a vessel for the transport of processed goods back to the village (1984a:50–51). Other artifact variation between the two sites can be seen in the more varied lithic assemblage at the Little Oak village site, and the presence of shell gouges and celts at the Big Oak fishing station. A comparison of faunal remains shows the presence of only drumfish postcranial bones in the village, whereas at the fishing station postcranial parts are absent and drum heads (based on identification of pharyngeal grinding mills) are found mixed in the shell midden. The inference is that freshwater drum were procured and processed at the station and were transported back to the village where the postcranial bones found their way into the earth midden after consumption (Shenkel 1984a: 50–61).

Subsistence Data. Extensive data relating to the subsistence base of coastal Tchefuncte culture are available from

Big Oak Island (16OR6), Little Oak Island (16OR7), and Morton Shell Mound (16IB3). Perhaps the most complete analysis was accomplished for Morton Shell Mound by Byrd (1974, 1976a, b, c) who computed the relative importance and nutritional value of faunal and floral remains recovered from a well preserved peat deposit at the site.

Byrd (1974) found that, in terms of actual meat weights, mammals (particularly deer, raccoon, and muskrat, together constituting 57%) were the most important, followed by reptiles (alligator and turtle) making up 20.6%; then birds, namely geese and cranes at 12.4%; with fishes such as bowfin, catfish, and bass representing only 9.8% (1974:180, Figure 10). Of particular interest is the finding by Byrd (1974, 1976a) that while *Rangia* (clam) shell made up a large volume of the midden, this source actually contributed very little to the overall Tchefuncte diet as measured by meat weight and nutritional value.

The analysis by Byrd (1974) showed that floral resources were also an important food source at Morton Shell Mound. These plant remains included squash, bottle gourd, greenbriers, grapes, haws, knotweed, wild plum, persimmon, hickory, and oak. The recovery of squash seeds *(Cucurbita pepo, var. ovifera*) and bottle gourd *(Lagenaria siceraria*) are of particular importance, as this is the first documented evidence of horticulture during the Tchefuncte period. The presence of squash at Morton Shell Mound also represents the earliest date for *Cucurbita* horticulture on the Gulf Coast (Byrd 1974:180).

Shenkel's (1984a) faunal analysis at the Big and Little Oak Island sites produced results divergent in many respects from those found by Byrd at Morton Shell Mound. Shenkel also figured the relative importance of food resources by computing the meat weights of the various animal species recovered from the midden. He found that freshwater drumfish, representing 40% of the total faunal weight, was the most important element of the diet, followed by *Rangia* at 37%. Deer at 8% was third, with other fishes (8%), other mammals (5%), and alligator (2%) providing the bulk of the remainder (Shenkel 1984a:60–61). No floral remains were recovered from the Oak Island sites.

The heavy reliance on estuarine resources such as fish and clam, and the relatively low proportions of terrestrial mammals at the Oak Island sites compared to Morton Shell Mound, would seem to confirm Shenkel's hypothesis that the Big Oak Island site midden was a specialized processing station focusing predominantly on estuarine resources in the vicinity of the site (1984a:65–66). The heavy reliance on *Rangia* at the Oak Island sites compared to Morton Shell Mound might also be a function of the specialized nature of the Big Oak Island site compared to the more generalized subsistence base at Morton Shell Mound, where estuarine resources were balanced by terrestrial mammal resources.

Basing his hypothesis on the fact that animal resources recovered at the Oak Island sites were dominated by either *Rangia* or predators of the *Rangia* clam, Shenkel (1984a:66–67) went on to propose that the coastal adaptation of the Tchefuncte culture, and other succeeding prehistoric groups, consisted of a settlement system tied specifically to the *Rangia* bed ecozone. In this sense then, the *Rangia* beds are a kind of microcatchment area for coastal Tchefuncte groups who exploited the varied food sources associated with the clam bed habitat, with emphasis on drumfish and other species which prey upon the *Rangia* clam. According to Shenkel (1984a:67), these clam beds were such optimal habitats for exploitation that site occupation and abandonment was directly related to shifts in the locations of these habitats as a function of the continually shifting Mississippi River delta.

Mortuary Data. The data relating to human burials during the Tchefuncte period do not show any special treatment of the dead, such as high status grave goods, that might indicate the presence of a nonegalitarian or stratified society. With the possible exception of the mounds of the Lafayette phase along the Vermilion River area, most burials occurred in nonmound areas, often in the midden deposits, and without the accompaniment of grave goods (cf. Ford and Quimby 1945; Shenkel 1984b). Since the Lafayette phase is not considered a coastal adaptation, it can be stated that there is no evidence of mound building for coastal Tchefuncte (cf. Shenkel 1984b:65).

At the Little Woods Middens in Orleans Parish, Czajkowski uncovered six adult human burials, including one with two quartz crystals (Ford and Quimby 1945). Excavations by Doran at the Tchefuncte site and at the Big Oak Island site (Ford and Quimby 1945) recovered 43 burials, including 21 primary flexed interments and 22 secondary bundle burials. None of these had funerary associations (Neuman 1984:116). Shenkel's (1984b) investigations at the Big and Little Oak Island sites in Orleans Parish also duplicated the pattern of unadorned primary flexed or secondary bundle burials for the Tchefuncte period (Shenkel 1984b:116).

Exchange and External Relationships. There is little evidence to suggest that the coastal Tchefuncte groups were participating in the sort of geographically widespread trade and exchange network that was common during the preceding Late Archaic and Poverty Point cultures or the succeeding Marksville culture. There is a lack of exotic materials on Pontchartrain phase Tchefuncte sites. At Big Oak Island, Shenkel (1984a:58–59) noted that most of the lithic raw materials were available from streams within 30 to 40 km of the Pontchartrain Basin, except for a few quartz crystals and several pieces of orthoquartzite, which Gibson (1974a) suggests were scavenged from nearby Poverty Point sites.

Researchers look to antecedent and contemporary cultures in the southeast outside the geographic range of Tchefuncte for the origins of the local ceramics. As Shenkel (1984a) noted, the Tchefuncte pottery tradition did not originate in the Tchefuncte culture area; rather it was derived as a polythetic set of cultural attributes that had developed out of the wide-flung networks of the Late Archaic and Poverty Point periods. The eclectic Tchefuncte ceramic traditions that came out of this broad time–spatial network can be seen as a blend of Mississippi River Valley, east Gulf Coast, and other neighboring Southeastern pottery traditions (Shenkel 1984a:62).

For instance, the temperless paste of Tchefuncte pottery and rim bosses may have connections with the St. Johns ware group in Florida. Certain design elements, such as finger and tool punctations, drag-and-jab incisings, and simple stamping, were duplicated in the earliest fiber-tempered Stallings Island tradition and the Toms Creek–Awendaw complex in the Savannah River locality of Georgia and South Carolina. Other design techniques such as incised and zoned incised motifs occur on late fiber-tempered Orange ceramics from Florida, while rocker stamping, scallop shell impressing, and the use of podal supports may derive from the Bayou La Batre tradition of the Alabama coast. Other decorative styles may have connections with the Alexander ceramic series of northwestern Alabama, which may have ultimately derived from a synthesis of sand tempering that developed in west Georgia and Florida and the Wheeler fiber-tempered complex of northern Alabama (Shenkel 1984a:62–63; Jenkins et al. 1986:551).

The origins of and processes whereby these diverse ceramic styles were melded into the Tchefuncte tradition are only beginning to be understood (cf. Jenkins et al. 1986). Further research on regional pottery development has the potential to contribute significantly to the broader goals of establishing the cultural–historical relationships of the various Southeastern Native American groups as well as gaining a better understanding of the complex cultural processes that were involved in this development.

THE 100 B.C.–A.D. 400 PERIOD

This time span is the same as that designated by Phillips (1970:Figures 2 and 450) and Pearson (1986:41) as the Marksville culture period. The Morses (1983:161ff) set their equivalent Hopewellian or Middle Woodland period at 0–A.D. 400, but the general consensus of a rather contradictory and inconsistent literature seems to be that the Early Woodland–Middle Woodland transition occurred around 100 B.C. In the American Bottom, opposite St. Louis, this transition is dated around 150 B.C. (Bareis and Porter 1984:Figure 3). According to Shenkel (1984:44), the equivalent Tchefuncte–Marksville transition had occurred by about 100 B.C. in coastal Louisiana.

In many if not most portions of the eastern U.S., the earlier portion of this time span was characterized by the appearance of Hopewellian ceramics, burial mounds, and exotic artifacts from distant sources. The name "Hopewell" derives from an Ohio site and culture, first reported upon by Squier and Davis in 1848 (Morse and Morse 1983:161; Neuman 1984:142). Similar materials are also known from the Illinois River Valley (Illinois Hopewell), and the Lower Mississippi Valley (Marksville culture); a general summary may be found in a volume edited by Brose and Greber (1979).

The unfortunate history of investigations at the Marksville site itself, near the Red River mouth in east-central Louisiana, has been summarized in Chapter 3 and discussed in detail by Toth (1974). Very briefly, the site was extensively excavated by several archeologists, including James A. Ford as Frank Setzler's assistant, in the 1920s and 1930s. Their brief preliminary reports, plus Ford's (1935c, 1936b) classic definition of Lower Valley ceramic complexes, got the name "Marksville" firmly entrenched in the Lower Valley literature, but no final site report was ever completed on the Marksville site itself. About two decades ago, Greengo (1964:14) had to say in summary, "[Marksville] is about the best-known name in Lower Mississippi archaeology. It is rather surprising to find how few data it represents, even in the type locality."

The situation has improved significantly since then, due in no small part to the work of Greengo (1964), Phillips (1970), Toth (1974, 1979) and other Lower Mississippi Survey archeologists. Greengo's work defined the Issaquena phase as a late Marksville manifestation, and Phillips (1970:573–858) expanded upon the concept greatly. Although there has been a problem with bad radiocarbon dates (1970:959–960), Issaquena is now generally regarded as dating in the A.D. 200–400 interval, and as being distinct from the earlier Hopewellian (or Hopewell-influenced) Marksville culture. Here, therefore, Issaquena will be considered as a culture in its own right.

For the later portion of this period, Belmont (1983:274, 276, Figure 2) made a useful geographic distinction between the plainware complexes which prevailed in the northern portions of the Lower Valley (as far south as northeasternmost Louisiana), and the Issaquena-related complexes with abundant decorated ceramics which prevailed to the south. As will be seen, a similar plain vs. decorated geographic contrast continued through the Baytown and Coles Creek culture periods, dating about A.D. 400–700 and A.D. 700–1000, respectively.

Although the late Marksville or Issaquena culture subperiod is apparently the earliest in which this plain vs. decorated ceramic contrast can be made, a similar boundary can be tentatively hypothesized on another ceramic basis as early as the Hopewellian or classic Marksville subperiod. Toth (1979:Table 25.3) presented a tabular summary of the frequency of Early (classic) Marksville ceramics by phases. The phases were listed in north-south order in his table, but the ceramic types/varieties were listed in alphabetical order. As a result, geographic patterning was not readily discernible in Toth's table.

However, for the purposes of the present overview, Toth's table was recast with both the phases and the ceramic types/varieties in geographic order. Also, the frequency scores assigned by Toth were filtered to maximize contrasts. Toth had scored the frequency of each variety in each phase on an ordinal scale: 1 = missing; 2 = trace; 3 = minority; 4 = important; and 5 = prevailing. For the purposes of this display, the lower values were masked or suppressed.

Table 1 displays a revised version of Toth's table, with both rows and columns in north-south order, and with only the "5" values displayed. Here, it is clear that the northern surface-roughened types/varieties (Withers Fabric Marked and Mulberry Creek Cord Marked), plus the unzoned stamped type Indian Bay Stamped, are prevailing only in the northern phases (with one exception).

In contrast, the classic Marksville incised and zone-stamped types/varieties, are prevailing only in the southern phases, with no exceptions. All of these latter types have in common the presence of U-shaped incised lines, either to zone the stamping, or as decorations in their own right.

It must be emphasized that the apparent clarity of this table was obtained only by discarding values lower than "5" from Toth's original table. In fact, as his table shows, classic Marksville ceramics are found in some abundance ("4" scores) in some of the northern phase assemblages, and the northern surface-roughened ceramics are at least present in a few of the southern phase assemblages. Also, it should be emphasized that even in the northern phases, the southern or Marksville ceramics apparently predominate as grave goods (see the discussion of Helena Crossing mortuary data, below).

It would be of interest to attempt a similar kind of filtered analysis of ceramics from phase assemblages of the preceding Tchula period. As will be recalled, Phillips's (1970:876ff) expansion of the Tchefuncte culture concept appears to have obscured the Tchula vs. Tchefuncte (northern vs. southern) distinction made by others (Ford et al. 1955; Gibson 1968). However, although there are a few hints (e.g., Rolingson and Jeter 1986:Table 8.1, cited above), in general the data are much scarcer for the Tchula period.

Figure 12 maps the approximate boundary (based on Table 1) between the northern and southern phases of the early or classic Marksville period. The northern phases will be discussed below under the rubric of Hopewellian culture, following the Morses' (1983:161ff) usage of Hopewellian as a period name in their summary of what is here called the northern Lower Valley. The southern phases will be discussed under the general heading of Marksville culture, which is not to say that Marksville is unrelated to Hopewell.

This terminology also effects a compromise of sorts between the positions taken by Phillips (1970:16–17) and by Williams and Brain (1983:401). Reversing the position he had taken earlier (in Willey and Phillips 1958:160), Phillips argued for the ascendancy of Hopewellian culture throughout the Lower Valley. Williams and Brain preferred instead to treat Marksville (and Issaquena) as indigenous Lower Valley phenomena. Given Belmont's (1983) separation of Issaquena from its northern contemporaries, and the support offered this concept by Ring (1986:91ff), it would appear worthwhile to suggest a similar approach to the earlier subperiod.

Figure 13 maps the approximate boundary between northern plainware complexes and southern, Issaquena-related complexes characterized by abundant decorated ceramics, following Belmont's (1983:Figure 2) distinction. It will be noted that the boundaries between northern and southern Lower Valley cultures or complexes shown in Figures 12 and 13 are quite similar, despite the fact that they were based on different criteria. It will also be seen in later sections that they are similar to the lines drawn to separate northern plainware Baytown from southern Troyville, and northern plainware Plum Bayou from southern Coles Creek ceramic complexes or cultures.

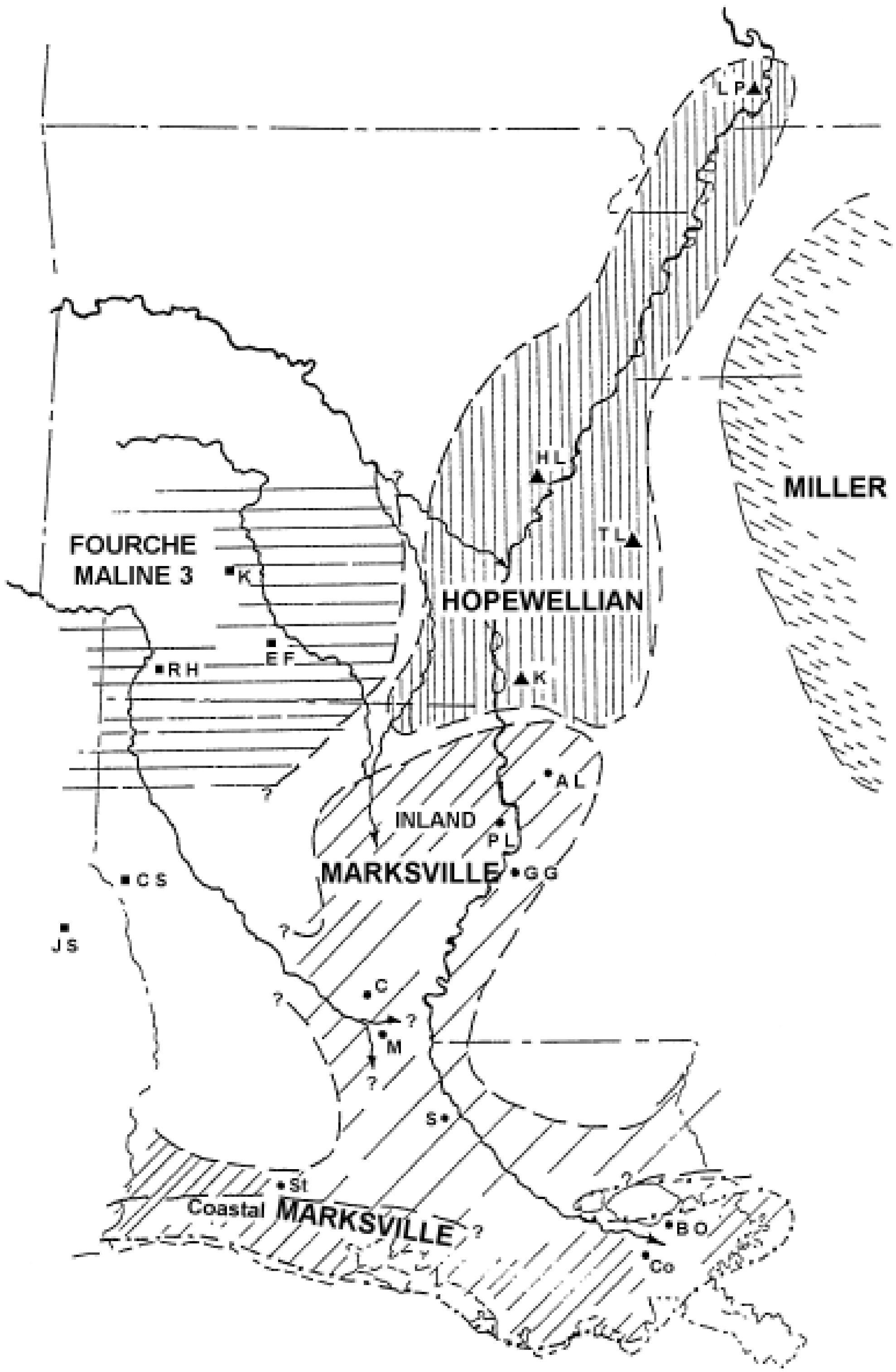
In the following discussions, the culture summaries proceed in the usual geographic order. We will begin with summaries of the two sequent cultures that occupied the northern Lower Valley during this period, here labeled the Hopewellian and Plainware cultures. We will then examine the Fourche Maline 3 and 4 cultures of southwest Arkansas and adjacent Louisiana. Next, the classic (early) Marksville and (later) Issaquena cultures of the southern Lower Valley will be summarized.

TABLE 1

GEOGRAPHIC DISTRIBUTION OF CERAMIC TYPES AND VARIETIES IN THE PHASES OF THE EARLY MARKSVILLE PERIOD IN THE LOW MISSISSIPPI VALLEY

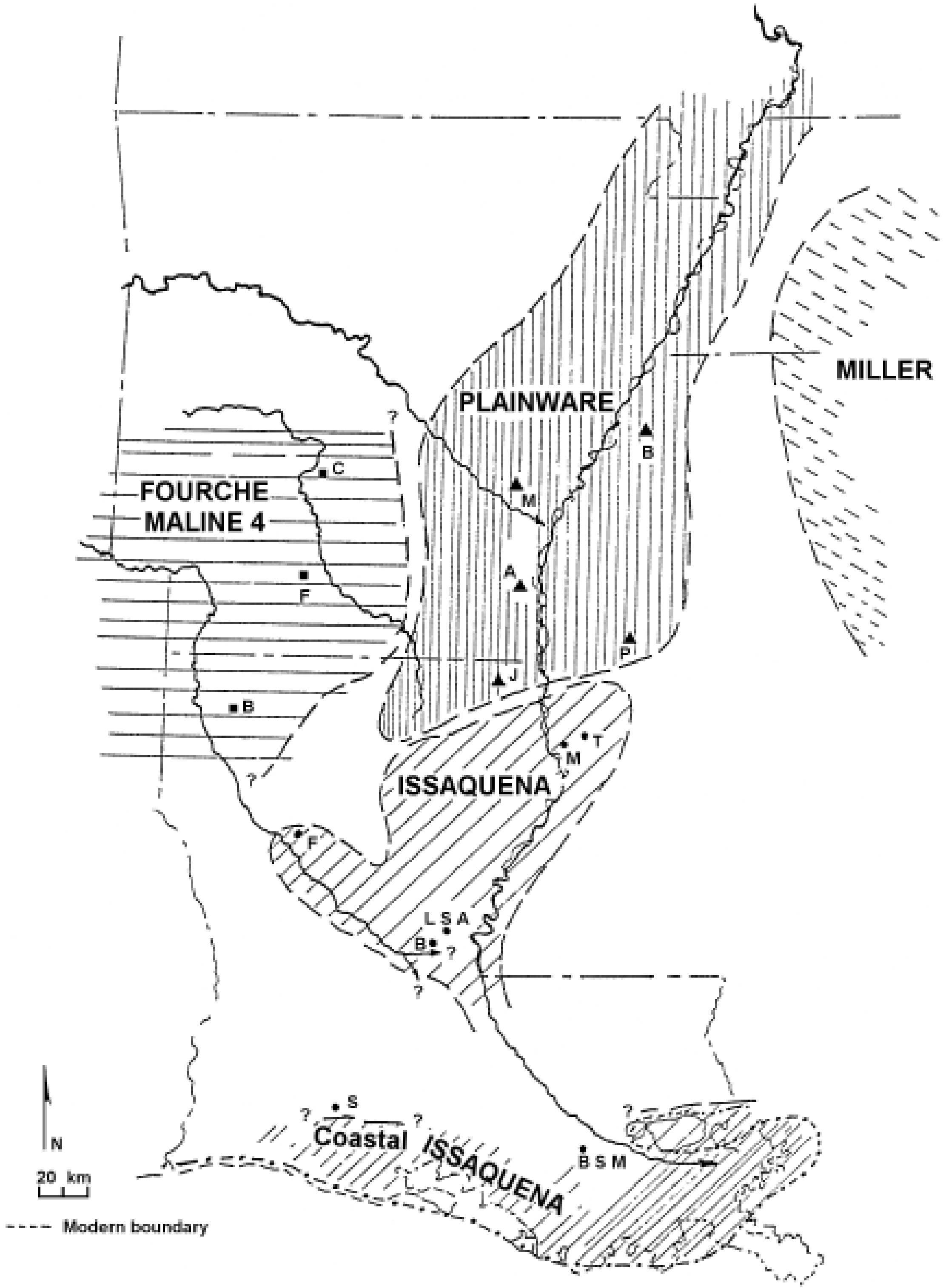
Types/					Phases					
Varieties	LaPlant	Helena	Dorr	Twin Lakes	Kirk	Anderson	Point Lake	Grand Gulf	Marksville	Smithfield
Withers Fabric Marked										
Withers	-	5	5	5	5	-	-	-	-	-
Twin Lakes	-	-	-	-	5	-	-	-	-	-
Indian Bay Stamped										
Indian Bay	-	-	5	5	-	-	-	-	-	-
Mulberry Creek Cord Marked										
Blue Lake	-	-	-	-	5	-	-	-	-	-
Porter Bayou	-	-		5	5	5	-	-	-	-
Sevier	-	5	-	5	-	5	-	5	-	-
Marksville Stamped										
Marksville	-	-	-	-	-	-	5	-	5	-
Mabin	-	-	-	-	-	-	-	5	-	-
Old River	-	-	-	-	-	-	-	-	-	5
Point Lake	-	-	-	-	-	-	-	5	-	-
Marksville Incised										
Marksville	-	-	-	-	-	-	-	-	5	5
Sunflower	-	-	-	-	-	-	5	-	-	-

(Note: "5" designates prevalency; after Toth 1979:Table 25.3)



Key: **Hopewellian culture sites:** HL = Helena Landing; K = Kirk; LP = La Plant; TL = Twin Lake.
Fourche Maline 3 culture sites: EF = Ecore Fabre; K = Kirkham; RH = Red Hill Mound.
Marksville culture sites (inland): AL = Anderson Landing; C = Crooks; GG = Grand Gulf; M = Marksville; PL = Panther Lake; S = Smithfield.
Marksville culture sites (coastal): BO = Big Oak Island; Co = Coquille.
Other sites: CS = Coral Snake; JS = Jonas Short (in Texas); St = Strohe.

Figure 12. Map of cultural distributions and key sites in and near the study area ca A.D. 100.



Key: **Plainware culture sites:** A = Alma Brown; B = Boyd; J = Johnson; M = Massey; P = Paxton.
Fourche Maline 4 culture sites: B = Bellevue; C = Cooper; F = Ferguson.
Issaquena culture sites (inland): B = Baptiste; F = Fredericks; LSA = Lake St. Agnes; M = Manny; T = Thornton.
Other sites: BSM = Bruly St. Martin; S = Strohe.

Figure 13. Map of cultural distributions and key sites in and near the study area ca A.D. 250.

Finally, the Marksville-like, Issaquena-like, and other cultures of the coastal zone will be discussed. Whenever possible, an attempt will be made to differentiate the Hopewellian (or classic Marksvillian) cultures of the earlier portion of this period from the later (non-Hopewellian) ones. It appears that this distinction is more readily made in and near the central portions of the Lower Valley.

Hopewellian and Plainware Cultures in the Northern Lower Valley

Definition and Location. These concepts have been defined for the purposes of this overview on ceramic criteria and the geographic distributions of certain ceramic decorative (or undecorative) treatments. The earlier Hopewellian phases are characterized by the prevalence of northern surface-roughened ceramics over southern classic Marksville types. The later northern plainware phases are, obviously, characterized by the predominance of plainwares over Issaquena decorated types.

A hint of a possible continuity between these two northern ceramic complexes of the early and late Marksville culture period is provided by a recent analysis by Ring (1986). She found the ceramic assemblage of the northern plainware Hegwood Bayou phase of northeast Louisiana to be dominated by Baytown Plain, *var. Johnson*, which has a rough and bumpy surface (1986:56–58), and defined a new decorated type, Macon Textured, made on *Johnson* paste with a very rough, coarse surface (1986:55ff). Perhaps these ceramics indicate some connection with the northern surface-roughening tradition.

Paleoenvironmental Data. According to the Delcourts' (1981) reconstruction, modern vegetation patterns had been established by this time. By both the Saucier (1974) and revised (Autin n.d.) Lower Valley meander belt reconstructions, the Mississippi River had moved to its modern meander belt several hundred years B.C.

However, there is a noteworthy difference between the two reconstructions with regard to the Arkansas River. Saucier's (1974:23, Figure 3) version had the Arkansas River making the major change from the Bayou Bartholomew meander belt to its modern meander belt around A.D.1000, so that it would have been in the Bartholomew belt during all of the period under consideration here. But the revised version (Autin n.d.: Table 2; Saucier, 1987 personal communication) pushes the time of this change back to the period from about A.D. 1 (or slightly earlier) to about A.D. 200. In this version, the change would have been going on during the early portion of this period.

Phases. The phases included here under early Hopewellian culture have been defined by Phillips (1970:886–895) and elaborated upon by Toth (1979). In north-south order, they are: La Plant (in southeast Missouri and out of the Overview area); Helena (in east-central Arkansas); Dorr, Twin Lakes, and Kirk (all in the Yazoo Basin and outside the overview area).

Thus, the only definitely relevant early Marksville subperiod phase for this overview in the northern group is Helena. It has been summarized briefly by the Morses (1983:172, 175). They included the Mound City complex near Memphis and a number of other sites in northeast Arkansas, as well as the Helena site. However, none but Helena itself have been excavated.

Other early Marksville period Hopewellian sites (and/or later northern plainware complex sites) might be included in Rolingson's (1974) Alligator Point phase in southeast Arkansas (cf. Jeter 1982a:96). No phases of this early Marksville subperiod have been defined in northeast Louisiana.

In summarizing the late Marksville subperiod phases of the northern plainware complexes, we will begin at the southern end of that territory, since that is where they were first recognized, and will proceed northward from there. Belmont (1983: 274, Figure 2) included six Late Marksville plainware complexes, which could be regarded as protophases, in his initial formulation of a cultural boundary between these complexes and coeval regional variants of Issaquena. These were: Felsenthal Marksville and Sumner Lane in southeast Arkansas; Hegwood and Johnson in northeast Louisiana, and Porter Bayou and Paxton in the Yazoo Basin.

Although Phillips (1970:895) described Paxton as "hardly worthy to be called a phase," it was the first of these to be described (1970:545–546, Figures 162–163,166–168, 170–173) and might eventually give its name to a culture incorporating these phases or complexes. Alternatively, a Harvard senior honors thesis (Ring 1986) has been completed on the Hegwood complex, rechristened the Hegwood Bayou phase. It now has become by far the best described phase in this culture, and perhaps its name should be promoted.

The presence of Marksville culture in the Felsenthal region is quite dubious, given the overwhelming predominance of plain ceramics there (Schambach 1979:29). No phases have been defined, and Belmont's catchall Felsenthal Marksville must suffice for both early and late plainware complexes of that region. In the southeast Arkansas Delta regions, Belmont's Sumner Lane complex is merely a catchall for collections from several poorly known components (Jeter 1982a:96–97). Actually, Phillips's (1970:892–893) tentative Alma Brown phase probably should also be included here (Jeter 1982a:96). In the White River Valley of northeast Arkansas, the Morses (1986:175) tentatively defined the Cow Mound phase, probably of late Marksville date and with predominantly plain pottery, which may also eventually be included in a plainware culture concept.

Key Sites. By far the most important site of the early Hopewellian unit is the Helena Crossing or Helena Landing mound site (3PH11) at the southeastern edge of Crowley's Ridge, overlooking the Mississippi Valley from a point just south of Helena in northeast Phillips County. It was discovered during the Lower Valley survey in 1940 by Phillips, Ford, and Griffin (1951); local residents were unaware of its existence, as the five mounds resembled erosional remnants. The site began to be destroyed by construction work in 1958.

By late 1960, only two mounds remained; they were salvaged by Ford (1963), who found them to have been constructed over classic Hopewellian log-covered tombs with Hopewell–Marksville vessels and exotic items including Gulf Coast shells, copper panpipes and earspools, and other items. Four radiocarbon dates (all with 150-year plus/minus factors) placed Mound B (one date) at A.D. 220, and Mound C (three dates) at 140 B.C. to 335 A.D. (Ford 1963:46, Table 2). Ford's report is out of print but available in most academic libraries; a summary was included in the Morses' book (1983:166–171).

Mound City might become an important Hopewellian data source if it could be excavated properly (Morse and Morse 1983:172). No really important early Marksville subperiod sites have yet been definitely identified in southeast Arkansas and northeast Louisiana; any such sites would become key sites by default if and when identified.

Turning to the late plainware complexes, the Cow Mound site already appears to be an important center (Morse and Morse 1983:175) but has not really been intensively investigated. The same is true in southeast Arkansas for Alma Brown, Sumner Lane (3AS213), Taylor (3DR2), and Possum Trap (3DE37) in the delta and for Coon Island (3BR10) in the Felsenthal region (Jeter 1982a:96–97).

In northeast Louisiana, thanks to Ring's (1986) analysis of data from 1985 LMS test excavations, the Stevenson site in the Oak Ridge locality of the upper Boeuf Basin has become the type site of the Hegwood Bayou phase. Two radiocarbon dates were obtained, permitting an estimated time span of A.D. 250–400 for this component at this site (1986:91).

Settlement Data. For the early subperiod, a riverine orientation is indicated by what is presently known about site distributions in the Helena phase. Habitation sites probably related to Helena, a specialized burial mound site, are known along the Mississippi River and St. Francis River meander belts (Morse and Morse 1983:173, 175). The scarce data from southeast Arkansas also indicate associations with streams, such as bayous Bartholomew and Macon and the Ouachita River; mounds are known but, like the other sites, have not really been studied enough to make early vs. late distinctions (Jeter 1982a:96–97).

For the late subperiod, the Cow Mound phase sites known so far are associated with the alluvial plain of the White River (Morse and Morse 1983:175); at least some mound building is associated. Again, southeast Arkansas sites are in alluvial situations, possibly with mounds associated (Jeter 1982a:96–97). According to Ring (1986:91), little can yet be said about Hegwood Bayou phase settlement patterns, but it is clear that low accretionary mounds were affiliated with sites of this phase, and the data that do exist suggest possible orientation to the Boeuf River.

Subsistence Data. This is the time when the evidence for domestication of indigenous North American seed plants becomes really unmistakable and abundant in the Midwest and northern Southeast (Smith 1986:Figure 1-2; Gayle J. Fritz, personal communication). Those areas have been the scenes of intensive flotation to recover such evidence, but no such effort has been made on sites of this period in the Lower Valley and Trans-Mississippi South. This holds true for both the early and late subperiods under consideration here.

The only intensively excavated early subperiod site in this study area, Helena, was a specialized burial mound. About 80 fragments of animal bone were recovered, all from the fill of Mound C, and all were identified as deer (Ford 1963:40).

Only one late site has yet yielded any such data, and they are rather minimal, so far at least. At the Stevenson site, the late Hegwood Bayou phase component was associated with a shell midden. Faunal materials were preserved, but have not yet been analyzed; however, "a wide range of [faunal] resources including both aquatic and terrestrial species" were exploited, and included fish, shellfish, small mammals, birds, reptiles, amphibians, and deer (Ring 1986:90). Soil samples for flotation were not mentioned.

Mortuary Data. The Helena Crossing mound site is one of the major classic prehistoric burial sites of any period in the Lower Valley. Ford salvaged Mounds B and C in 1960. Mound B was oval, about 30 x 20 m; it covered one log tomb containing two burials, both adult males in the extended-supine position. Grave goods were relatively scanty but included a large marine shell drinking cup, a number of marine shell beads, and a cache of eight lamellar Hopewellian blades made of Harrison County flint from southern Indiana (Ford 1963:41–45, Figures 35–38).

Mound C at Helena (Ford 1963:9–45, Figures 2 through 38) was a larger oval containing five log tombs along with several nonlog burial groups and pottery deposits. Tomb A included an adolescent with a marine shell dipper, freshwater pearl bracelets, wolf teeth, two copper earspools (both were found in the hands, and had their axes wound with string, prompting the conjecture that they were actually yo-yos; Ford 1963:17, Footnote 1), and a copper panpipe with silver trim, possibly from the Lake Superior region (1963:16–17).

Tomb B in Mound C contained an adolescent and a child, both extended-supine, and an adult male bundle burial. They were accompanied by two large marine shell cups and a variety of freshwater and marine shell bead bracelets and other ornaments (Ford 1963:17–21). Tomb C contained only the disarticulated bones of an infant, a plain vessel, and a mussel shell "spoon" (1963:21–22).

Tomb D, the largest and one of the stratigraphically earliest (Ford 1963:11) in Helena Mound C, had been burned after the logs were in place, then covered. It included the extended burials of an adult and a young child, and a few scattered fragments of at least one other adult. Grave goods included only a marine shell cup and a pearl bead.

Tomb E, the deepest of the log tombs, contained remains of four individuals (Ford 1963:24–27, Figures 20–21). The apparent principal interment was a bundle burial of an adult female, with some of the vertebrae still articulated. A cylindrical copper cutout (1963:26–27, Figure 21) accompanying this burial was interpreted as a ferrule for a wooden staff. Also in this tomb were the extended skeleton of an infant accompanied by bead bracelets and anklets, an extended skeleton of a child with a piece of mica (probably from the Blue Ridge Mountains; a recurrent Hopewellian find) and a number of beads, and an isolated skull of an adult male with marine shell drinking cups.

Burials or burial groups lacking log enclosures were found at various places in the mound fill. They generally consisted of one to a few extended adult skeletons with a few grave goods. One included two Marksville Stamped vessels (Ford 1963:27–30, Figures 22–25).

In addition to the burials, Helena Mound C contained six pottery deposits and various potsherds (Ford 1963:31–40, Figures 29–34). Marksville Stamped was predominant, but other types included Tchefuncte Stamped, Withers Fabric Impressed, Marksville Plain (including two with crosshatched incised Hopewell rims), Indian Bay Stamped, and Mulberry Creek Cord Marked.

Mortuary data are not available from other sites of either the early or late subperiods under consideration in this discussion. However, it is worth noting that Toth (1979:195, 196), in comparing Helena to the approximately contemporary burial mounds (Marksville and Crooks, see below) in the southern Lower Valley, remarked on the emphasis on individual status at Helena and added that only Helena duplicated “a total mortuary configuration that might be found in the Illinois Valley.” This reinforces the Hopewellian vs. Marksville distinction being used here.

Exchange and External Relationships. Clearly, the mortuary complex at Helena reflects contacts with Ohio and/or Illinois Hopewellian groups. This is reflected in the log tombs, the presence of copper, mica, panpipes, and Gulf Coast shell. Yet, no similar sites have been documented in either the northern or southern Lower Valley; Helena stands alone. It is of interest that Schambach (in Schambach and Early 1982:SW69) suggested that the Helena Hopewellians were more closely connected to the Fourche Maline 3 peoples of southwest Arkansas than either was connected to southern Lower Valley Marksville culture, in terms of burial modes (see the Fourche Maline 3 discussions, below).

Whatever its exact nature, the Hopewellian system probably was at its peak around A.D. 1 to 100 (Williams and Brain 1983:401). The subsequent centuries, at least in the northern portion of the study area where plain ceramics were predominant, appears to have seen the beginnings of the “general provincialism that pervaded the Baytown culture” (1983:404).

Fourche Maline 3 and 4 Cultures in the Trans-Mississippi South

Definition and Location. The Fourche Maline 3 and 4 periods of Fourche Maline culture were defined by Schambach (1982a:Table 7-1) as correlated with Lower Mississippi Valley Early (or Hopewellian) Marksville and Late Marksville (or non-Hopewellian Issaquena and northern plainware), respectively.

Finds in the Middle Ouachita, Little Missouri, and (especially) the Great Bend regions established the Fourche Maline 3 subperiod. Fourche Maline 4 sites are also known in these regions, plus the Ouachita Mountains region.

In northwest Louisiana, Webb (1982a) defined the Bellevue focus as a Marksville–Troyville manifestation. Schambach (1982a:187- 188) argued that this complex should be included in the Fourche Maline culture concept, and Webb (1982b:364) responded that he was “almost persuaded.” Here, Bellevue will be tentatively included in the Fourche Maline 3, 4, and 5 distributions, since Webb (1982a:268–272) compared the various Bellevue sites to Hopewellian Marksville, Issaquena–Marksville, and Troyville.

Paleoenvironmental Data. None of the sites examined so far have yielded substantive evidence of former environments. On the basis of Marksville period site distributions and siteless stretches of the Red River valley in northwest Louisiana, Schambach (1982a:189) speculated that something like the Great Raft of early historic times may have formed along the Red River in Marksville times.

Phases. No phases have been defined for the Fourche Maline 3 subperiod. Schambach (1970a, 1982a:141, Table 7-1; cf. Schambach and Early 1982:SW83–SW85) defined one regional phase of the Fourche Maline 4 subperiod, the Oak Grove phase of the Middle Ouachita region. It is characterized by Williams Plain and Ouachita Ironware pottery, with occasional Marksville-like designs on locally made pottery, Gary, *var. Camden* narrow dart points, and Poole pipes (1982a: 141, 176, Figure 7-6).

Key Sites. For Fourche Maline 3, the key sites are Ecore Fabre #1 and #2 in the Middle Ouachita region, the Red Hill Mound in the Great Bend region, and Kirkham in the Little Missouri region. The Ecore Fabre sites (3OU166 and 167), are located just north of Camden and the Lower Valley–Trans-Mississippi South boundary. They were destroyed by land-leveling, but yielded good Fourche Maline 3 surface collections (1982a:143). The Red Hill Mound (3LA21) was potted in 1965 by an untrained digger, who found a classic Marksville Stamped pot (made on local paste) with a raptorial bird design, containing 13 copper beads (1982a:147, Figure 7-3). The Kirkham site (3CL29) was first reported upon by Dickinson and Lemley (1939) but was virtually destroyed by bulldozing later. It had Marksville-like (and Coles Creek-like) pottery.

For Fourche Maline 4, key sites include Cooper in the Middle Ouachita region, Canfield in the Great Bend region, Ferguson in the Little Missouri region, and Poole in the Ouachita Mountains region. The Cooper site (3HS1) was one of the major sources for Schambach’s (1970) dissertation, and is summarized in his recent (1982a:142) article. Canfield (3LA24) was a site on the Field Bayou bottomlands which had a rich and exceptionally pure Fourche Maline component. Unfortunately, it was destroyed by agricultural land-leveling (1982a: 147–148). Ferguson (3HE63) was a Caddoan mound site with a rich Fourche Maline midden. It was excavated intensively by the Arkansas Survey/Society summer digs in 1972, 1973, and 1974 (Schambach 1972, 1982a:158–159), and a report is in preparation. The Poole site (3GA3) was excavated in 1939–1940 by the University of Arkansas WPA project. It was a large multicomponent site, with a small Fourche Maline 4 component. No report has been published, though the materials and notes were analyzed by W. Raymond Wood (summarized by Schambach 1982a:144).

Settlement Data. In a recent summary of Fourche Maline settlements in general, Schambach (in Schambach and Early 1982:SW68) stated that the sites of this culture "are evenly distributed throughout southwest Arkansas.... They range in size from tiny hill country components to small and medium sized lowland villages of 2 to 20 acres." It should be reemphasized here that virtually nothing is known about whether these larger sites represent seasonal or year-round occupations, or whether anything like their entire extent was occupied at any one time. However, given the likelihood that their subsistence base was wild foods, it seems probable that these sites are palimpsests formed by repeated reoccupations.

The only defined phase of the period under consideration here is the Fourche Maline 4 Oak Grove phase of the Middle Ouachita region. According to Early (in Schambach and Early 1982:SW83), this phase's settlement pattern is not well defined, but "Most known components are midden deposits in alluvial valleys...no structural features have yet been defined." She also noted scattered finds of Gary, *var. Camden* points in other environmental zones.

Subsistence Data. "We know almost nothing about Fourche Maline subsistence, especially about plant foods" (Schambach and Early 1982:SW71). Schambach (1982a:159) noted that despite extensive use of flotation, plant food remains in general were scarce in the Fourche Maline 4 midden at the Ferguson site, and cultigens were not found. He also stated that storage pits apparently were not in general use at this time. Another important indirect clue to Fourche Maline subsistence is that "Fourche Maline components almost invariably have tremendous quantities of stone grinding equipment...but these things are lacking on Caddo sites...as if stone grinding equipment correlates with wild plant foods" (Schambach and Early 1982:SW71).

Mortuary Data. According to Schambach (1982a:133; Schambach and Early 1982:SW68–SW69), the general mode of Fourche Maline burial was flexed or extended in shallow graves in village middens, with few or no offerings. But, there was also apparently a concept of honored dead, perhaps derived from northern sources. The first Fourche Maline burial mounds are from the Fourche Maline 3 subperiod and usually include a single cremation (or flesh burial) with offerings, in a central tomb under the mound. This appears to be "a northern or Hopewell burial pattern and is not at all like the southern burial pattern of Marksville, Troyville, and Coles Creek cultures" (1982:SW69).

Fourche Maline 4 graves were found at the Poole site (Schambach 1982a:144) but have not been described in detail. Two of them did contain grave goods. According to Early (in Schambach and Early 1982:SW83–SW84), scattered burials at the Ferguson site were attributed to the Oak Grove phase component, and consisted of "extended inhumations with few accompanying grave offerings."

Exchange and External Relationships. Aside from the rather scattered finds mentioned above, Schambach (1982a: 189) noted "reason to suspect that there was very little, if any, contact and interaction between Marksville people and Fourche Maline people." He suggested this was true not only in the Red River Valley (possibly due to a raft blockage, as noted above), but also in the Ouachita Valley. Similarly, Webb (1982a:272) summarized the Bellevue focus as "an unspectacular culture, apparently using local materials and with little evidence of widespread contacts or trade materials."

The differences in burial modes between these Fourche Maline peoples and those of the southern Lower Valley have been noted. However, Schambach (in Schambach and Early 1982:SW69) suggested that there might have been "some connection between Fourche Maline in southwest Arkansas and the Helena phase of Hopewell culture in east-central Arkansas," and that unlike Marksville peoples, Fourche Maline peoples were "able to accept the Hopewellian concept of mound burial for a few 'honored' individuals. This indicates that Fourche Maline society was fundamentally different from Marksville society in which everyone seems to have been given a mound burial, regardless of their station in life."

Marksville and Issaquena Cultures in the Southern Lower Valley

Definition and Location. Among others, Fowke (1927, 1928) and Setzler (1933a, 1933b, 1934) worked at the Marksville site in east-central Louisiana and briefly summarized their findings, but it was Ford (1935c, 1936b:219ff) who formally defined Marksville as a ceramic complex and placed it in a sequence. The Marksville concept was further refined in the Crooks site report (Ford and Willey 1940).

Ford's initial concept of the distribution of Marksville sites (1935c:30) was in eastern and southern Louisiana and adjacent western Mississippi, but like Collins (1932:19) and Setzler before him, he called attention to the resemblances to Ohio Hopewell remains and suggested that similar intervening sites would be found. The major breakthrough in that regard was the Helena Crossing site.

The next major review of the Marksville situation was by Phillips (1970:16–17, 886–901). As already noted, he regarded the culture as Hopewellian and retained Marksville only as the period name and the name of a phase (cf. Williams and Brain 1983:401). For the present purposes, Marksville culture will be restricted to the southern Lower Valley, as indicated in Figure 13, on the basis of the prevailing ceramic types (varieties of Marksville Incised and Marksville Stamped; see Table 1).

Toth (1974) published a major reanalysis of the archeology and ceramics at the Marksville site itself. His Harvard dissertation

(Toth 1977) thoroughly revised the phases of the early Marksville period for the entire Lower Valley. Until recently, it was virtually inaccessible due to Harvard policy against microfilm reproduction. However, it has just been published, with minor revisions, by the Mississippi Department of Archives and History (Toth 1988).

Moving to the later subperiod, the Issaquena phase was defined by Greengo (1957, 1964), on the basis of 1954–1955 excavations at two sites in the Lower Yazoo Basin. Phillips (1970:573–753) published a more detailed description and discussion of these excavations, and (1970:37ff, 539ff, 755–858) a thorough reclassification of the Issaquena ceramic complex in terms of the type–variety system.

Phillips (1970:538–545, 893–894) also expanded the spatial extent of this phase, noting that the Lower Yazoo Basin was probably not the geographic center of distribution of Issaquena-like sites and stating that the "center appears more likely to have been farther south and probably west of the Mississippi" (1970:893). Belmont (1983:274–276, Figure 2) briefly but more specifically summarized this situation, mapping six Issaquena regional variants (phases or ceramic complexes) in northeast Louisiana and adjacent western Mississippi, and contrasting them with the late Marksville plainware complexes discussed above (see also Figure 14).

The characteristic ceramics of the Issaquena regional phases and complexes were thoroughly reviewed by Phillips. Both he (1970:893–894) and Belmont (1983:274) remarked on the essential unity of these assemblages, with emphasis on the abundance of elaborately decorated varieties of Marksville Stamped, Marksville Incised, and other types. Also present, at least in the Yazoo Basin, were ceramic pipe fragments "decorated in characteristic Issaquena style," possibly representing a form intermediate between the Hopewellian "flat-based monitor" and the Mississippian "elbow" types (Phillips 1970:542, Figure 379d–g).

Phillips (1970:542) regarded any efforts to define an Issaquena lithic complex as premature, but did note that two point types were definitely part of Issaquena assemblages. One, the Anthony's Fork type (1970:384, 542, Figure 157) has flaring barbed shoulders and is a relatively thin dart point with a straight to contracting stem. The other, called the Mabin type by Greengo (1964:Figure 37e–g) and Phillips (1970:542, Figures 107f–g, 217e, 380a–d), has been renamed Gary Stemmed, *var. Maybon (sic)* by Williams and Brain (1983:233, Figure 7.10). It is also a thin, contracting-stemmed dart point, including a wide range of variation. Other artifacts include boatstones and stone plummets, plus various bone implements (Greengo 1964:Figures 41–42; Phillips 1970:544, Figures 107, 381).

Paleoenvironmental Data. As noted in the Hopewellian culture discussion, the Mississippi River was in its present meander belt by this time, and modern (presettlement) vegetation patterns were in existence. A major unresolved question in these latitudes, though, is the situation of the Red River.

Saucier (1974:23, Figure 3) very tentatively suggested that the Red River may have been in a meander belt that passed just south of Marksville, to join the Mississippi southeast of Marksville, from about 400 to 700, thus including all of the period under consideration here. However, the revised reconstruction (Autin n.d.:Table 2; Saucier, 1987 personal communication) will leave the dates of this meander belt (No. 3 in both terminologies) open to question.

In a radical departure from Saucier's (1974) chronology, Pearson (1986) suggested that the Red River's modern meander belt (No. 5 in the 1974 sequence; No. 1 in the revised version) was occupied "by approximately A.D. 1 and certainly no later than A.D. 200" (1986:42). This meander belt passes north of Marksville, and marks a radical change from the previous belt (No. 4 in the 1974 terminology; No. 2 in the revised version), which traversed the Atchafalaya Basin to the Gulf. Pearson's suggestion is based on the presence of Marksville period sites, buried by Red River alluvium, along the modern meander belt. Saucier (personal communication) set forth as an alternative the possibility that this meander belt represents a reoccupation of an earlier meander belt.

Clearly, much more geoarcheological and stratigraphic research remains to be done before we can be even reasonably certain where the Red River was during the Marksville period in general and specifically while the Marksville site itself was flourishing. It could have been north of Marksville, as Pearson suggested, south of Marksville as Saucier suggested, or perhaps even in the Atchafalaya Basin course. This uncertainty is reflected in Figure 13.

Phases. In and near the territory under consideration here, Phillips (1970:893–897) defined the Anderson Landing phase in the Lower Yazoo Basin (and out of this Overview's territory), the Point Lake phase in the Tensas Basin, and the Marksville phase in the Catahoula Basin and Red River regions. Toth (1977, 1988) added the Grand Gulf phase in the Natchez Bluffs (again, out of this Overview's territory), on the basis of salvage excavations at the Grand Gulf Mound by Brookes (1976), and a tentative Smithfield phase in the Baton Rouge region. His recently published dissertation (Toth 1988) is the basic source for early Marksville phases.

Gibson (1977, 1983b:Figure 6) named a King phase in the Lower Ouachita Valley and a Crooks phase in the Catahoula Basin. Phillips (1970:896) included the Crooks site in his Marksville phase. Gregory et al. (1987:41, 75–79) included both the Crooks and Marksville phases in the Catahoula Basin and suggested that the Crooks phase was earlier.

As for the Issaquena-related late Marksville phases, Issaquena itself was defined by Greengo (1957, 1964), primarily on the basis of Lower Yazoo Basin data, and revised by Phillips (1970) and Belmont (1983), as noted above.

Belmont's (1983:274, 276, Figure 2) Issaquena regional variants in the present study area are ceramic complexes rather than well defined phases. They include the Upper Tensas, Lower Tensas, Boeuf, and Lower Red variants or complexes. Phillips (1970:897) also defined the poorly documented but "unmistakably late Marksville" Baptiste phase, which includes a territory approximately equivalent to that of Belmont's Lower Red complex plus the Catahoula Basin.

Gibson (1977, 1983b:Figure 6) designated a Strickland phase in the Lower Ouachita region and a Rhinehart phase (plus the early portion of a Marmon phase) in the Catahoula Basin as Issaquena-related. Gregory et al. (1987:41) merely noted that there maybe "something equivalent to the Baptiste phase" in this region.

North of the Pontchartrain Basin, noncoastal late Marksville sites in the lower Amite River and Bayou Manchac region have been assigned to the Gunboat Landing phase (Weinstein n.d.). However, this phase is based on very limited data from mound sites along the Prairie Terrace edge, and its chronological relationships and geographic range have not yet been worked out (Weinstein 1974:295; Gagliano et al. 1978:4–19).

Key Sites. The primary key site for the early subperiod is, obviously, the Marksville site (16AV1), "or rather the report of [Setzler's] 1933 excavations, a missing key" (Phillips 1970: 965). Although that key remains missing, the door has been pried open, as it were, by Toth's (1974) summary of "Archaeology and Ceramics at the Marksville Site." Marksville was mapped very well by Fowke (1928; reproduced by Toth 1974: Figure 5, and in Figure 11). The main part of the site is enclosed by a semicircular embankment some 1000 m long and 1 to 2 m high, on the edge of Marksville Prairie, overlooking Old River. Five mounds of varying sizes and shapes are within this enclosure. Smaller embankments are to the north and south, and scattered in the vicinity are several other mounds (including those of the Greenhouse site). Although there are multiple components present at Marksville, the main component there appears attributable to an early Marksville period occupation.

Fowke excavated parts of two burial mounds of the classic Marksville phase (Toth 1974:16ff). Setzler, assisted by Ford, excavated the remainder of one of these mounds, and tested two others and two village areas (1974:21ff). In addition to Toth's discussions, Neuman (1984:137–150) summarized these and later excavations at Marksville.

Marksville and Crooks remain the only extensively or intensively excavated sites of the early Marksville subperiod in the study area. The Crooks site (16LA3), located just east of Catahoula Lake, was excavated by the WPA–LSU project in 1938–1939 and promptly reported upon (Ford and Willey 1940). It had two burial mounds, which were completely excavated. Mound A yielded the astounding total of 1,159 burials, and Mound B contained 13 more (1940:Figure 13). The site is particularly noteworthy for the excellent examples of Marksville Stamped and Marksville Incised vessels that were found (1940:65ff, Figures 28–39). Again, Neuman (1984:150–163) summarized the Crooks site in a readily available publication.

Two small Marksville hamlet components, both of which were parts of multicomponent sites, have been tested by contract projects west of Catahoula Lake. These are the Clear Creek Bay site (Keller et al. 1983) and the Whatley site (Thomas and Campbell 1978a). The chronological position of Clear Creek Bay is uncertain since funding was insufficient for detailed analyses. Ceramics were only identified at the type level and as "present" rather than quantified (1983:32, 35). At Whatley, the Marksville occupation was dated "clearly...to the later portion of the period" (1978:226). Other sites with presumably larger Marksville components, such as Wiley (Gregory et al. 1987:40–41), have not been excavated and reported upon.

The two primary data sources for the Issaquena phase were the Thornton and Manny sites in the Yazoo Basin (Greengo 1957, 1964; Phillips 1970:573ff). Phillips (1970:894, Figure 444) added Issaquena components as far south as Troyville and Baptiste. Phillips (1970:898) and Belmont (1983:274–276, Figure 2) also implied that the Fredericks site, on the Red River near Natchitoches, belonged to the Issaquena ceramic group, as its westernmost outlier, or a "site unit intrusion." However, Gregory et al. (1987:43) suggested that this may be reinterpreted as a more widespread cultural development, spreading up the Red and Little rivers from the Catahoula Basin and/or the Marksville Prairie. The Whatley component may be related.

The Lake St. Agnes mound site (16AV26), in the Red River floodplain northeast of Marksville, was tested by LSU in 1972, and reported upon in a semipopular report series (Toth 1979a; see also a summary by Neuman 1984:164–165). It was found to be a multicomponent situation, with the first use and mound building attributed to late Marksville, Issaquena-related peoples, about A.D. 200–400 (1979:35).

Perhaps the most important of these unreported or underreported sites is Baptiste, which was excavated in the late 1930s by the WPA–LSU project under Ford's direction, and holds "the key to the late Marksville period" (Phillips 1970:896). Although it has never been reported upon, an LSU graduate student, Ann Whitmer (personal communication), is analyzing these materials for a thesis.

Settlement Data. Toth (1979b:194ff) summarized three main types of Marksville sites in the Lower Valley: conical burial mounds, villages, and villages with conical burial mounds. The conical mounds apparently decreased in number toward the later portion of this period. His hypothetical Marksville settlement model (1979b:197) included "unspecialized, self-sufficient" small nucleated villages on the tribal level of social organization. Nothing is known, though, about what kind(s) of settlements these village sites represent in terms of permanence vs. seasonality.

Williams and Brain (1983:403) noted that Issaquena sites were "numerous, although not very large," perhaps reflecting a shifting, slash-and-burn or milpa-oriented settlement pattern which could give an impression of "a larger population than actually existed." Although mounds were constructed, they "would not now ascribe to [Issaquena] great mound building projects, nor the high levels of social organization that sometimes may be inferred from such projects"

The Issaquena-related mound at Lake St. Agnes was a low platform of clayey silt containing a burial pit (Toth 1979a:24–

28, 31, 35), rather than a Marksville-like conical burial mound.

Subsistence Data. Williams and Brain (1983:403) speculated that maize might have been part of the Hopewell intrusion into the Lower Valley, but reports of Hopewellian maize have been debunked in the Midwest by direct (accelerator) radiocarbon dating (Conard et al. 1984), and it is not known at this time level in these presumed donor regions, despite very intensive flotation (Johannesen 1984; Asch and Asch 1985). Also, isotopic analyses of human skeletal samples from the northern Lower Valley show no evidence of significant maize consumption until Mississippian times, ca A.D. 1000–1200 (Lynott et al. 1986).

In short, the question of Hopewellian (or Marksvillian) corn seems to be a dead issue. Instead, this has emerged as the period when domesticated native North American starchy seeded annuals became truly important in those portions of the eastern U.S. that have been intensively investigated for such evidence (Johannesen 1984; Asch and Asch 1985; Smith 1986:44, 1987; Gayle Fritz, personal communication).

The classic burial mound excavations at Marksville and Crooks, of course, produced no really rigorously documented evidence of subsistence remains, and none are known from other definitely early Marksville sites in the study area. Fowke (1928:420–421) stated that he had found corn and squash in a small vessel from Mound 4 at Marksville, but this has not been verified (Toth 1979b:197; Neuman 1984a:139). The Crooks site yielded only a few fragmentary animal bones (turkey and opossum) from Marksville context, with evidence of historic (cow and pig) intrusions (Ford and Willey 1940:129–130). No food plant remains were reported.

The Clear Creek Bay site (Keller et al. 1983), of uncertain Marksville period age, yielded only a few mammal, fish, bird, and turtle bones, not identified by cultural proveniences (1983: 35). A minor flotation effort produced fragments of wood charcoal, but no subsistence remains.

The late Marksville, Issaquena-related component at the Whatley site could not be isolated from other components in terms of faunal remains (Byrd 1978:184) or floral remains (Shea 1978). However, the general picture derived from poorly preserved faunal remains showed an emphasis on mammals and aquatic resources at this riverine site, and little evidence of birds (Byrd 1978:184). Preservation of plant remains was poor (Shea 1978:185ff); hickory nut and acorn fragments were dominant, but fragments of knotweed (an indigenous North American cultigen in other regions) and a seed of amaranth (a cultigen in other areas) were recovered, along with a fragment of squash or pumpkin (Mesoamerican cultigens). However, these materials could all be derived from later components. No maize was recovered.

Mortuary Data. At Marksville, Fowke (1928:420–421) found burials at 17 locations in Mound 4 (Toth 1974:18). Most of these were multiple secondary burials in pits lined and covered with wood or bark. He found 20 vessels and three pipes (Neuman 1984:139). Seven other burials were found in Mound 8 (1928:423; Toth 1974:19; Neuman 1984:140). One contained an extended skeleton of a child, and some of the others contained secondary and/or burned remains.

The Setzler–Ford excavation at Marksville encountered a large burial pit, barely touched by Fowke, which had been dug into the first clay platform of Mound 4. It had had log walls and cane roofing, and contained traces of at least 12 burials (Toth 1974:22–25; Neuman 1984:144).

At Crooks, Mound A yielded 1,159 burials from a variety of stratigraphic contexts, and Mound B, 13 more (Ford and Willey 1940:35ff). The most common type was flexed (more than 35%), but isolated skulls and bundle burials were also common, as was the semiflexed type. Extended burials were extremely rare (1940:Figure 13), also in contrast to the Helena situation. Age and sex determinations were attempted in the field, due to very poor preservation. Most were adults, but poor preservation of younger individuals could have distorted the data (1940:40). Grave goods of some kind were found with 169 burials and included 36 restorable vessels (1940:44–45). The Crooks site is clearly unique, in the enormous number of burials found in Mound A. Toth (1979b:195) contrasted this rather egalitarian situation with the “great concern with individual status” at Helena.

The late Marksville (or Issaquena) initial low mound at Lake St. Agnes contained a large burial pit about a foot deep. Human burials were placed in it in seven locations. All were secondary, and it was not possible to determine the number of individuals, but at least five persons were represented (Toth 1979b:25). The first burial was an adult cranium without a mandible, and a pile of charred, defleshed bones, including ribs apparently from an infant. The next was an adult mandible and unarticulated bones. Next were two poorly preserved skulls, of an adult and an infant. Then, in a burned area, a charred, partial pelvis and some charred leg bones were found. Near this were a tightly bundled pile of bones and two crania. None of these burials were accompanied by grave goods (1979b:25–28).

Although several burials were excavated at the Thornton and Manny sites, their associations tended to be questionable, and all were regarded as post-Issaquena (Phillips 1970:591–592, 654, 689).

Exchange and External Relationships. Hopewellian cultures in general are, of course, famous for exchange of materials and ideas, but in the case of Marksville culture as conceived here, there is less than might be expected in the way of hard evidence. Interaction is best exemplified in these southern sites by ceramic decorative motifs, especially those on Marksville Stamped vessels, rather than by the metal artifacts and marine shells that were so common at Helena. As Neuman (1984:167) pointed out, the idea of mound burial itself may have been a Hopewellian import.

Summaries of exotic artifacts and widespread motifs may be found in Toth (1979b:194, 199, Table 25.4, 1988:65–70) and Neuman (1984:167). However, as Toth (1979b:199) stated, “it seems that imported goods and raw materials are very rare in the Lower Valley.” He noted that standard Hopewellian materials such as copper cutouts, mica effigies, and obsidian had not been found in Marksville sites, and concluded that there was "little evidence to indicate that the Lower Valley participated in any consequential interareal exchange system." As Willey (1949:564) and Greengo (1964:114) noted, copper in general is more abundant in Florida Hopewellian sites than in Marksville sites, and the main Hopewellian route to the Gulf may well have been through the east Alabama–west Georgia regions rather than the Lower Valley.

Williams and Brain (1983:390, 401–403) suggested that the "Hopewellian interaction sphere" connection with cultures in the Lower Valley was a brief episode in the early Marksville (and/or late Tchefuncte) period. The Hopewellian and Marksville systems appear to have been interrelated at a level emphasizing "direct interregional contact between primary centers" (1983:401, Figure 12.8). Despite their emphasis on Marksville as an indigenous phenomenon, Williams and Brain suggested "the actual intrusion of new [Hopewellian] peoples who preferred to remain separate [from the Tchefuncte natives] in all or part of their activities" (1983:401–402). Issaquena, in contrast, was "in no way Hopewellian" in spite of continuities in ceramics and settlement pattern.

In the absence of detailed analyses of exotic materials and extraregional stylistic similarities, a tentative hypothesis must be that the Issaquena complexes represent a well integrated and cohesive (Williams and Brain 1983:403) cultural system, which covered several regions on both sides of the Mississippi, but was self-sufficient. Williams and Brain suggested that there may have been "multiple exchanges at the most local level between contiguous groups who, constantly shifting, rapidly dispersed basic concepts and so continually reinforced the cultural solidarity." However, in late Issaquena times, there appears to have been an opening of contacts with groups to the east, both along the Gulf Coast and in the uplands, signaled by the appearance of certain painted and incised pottery types (Belmont and Williams 1981:23, 34, Table 2). This east-west interaction intensified in the southern Lower Valley during the succeeding period.

Coastal Marksville and Issaquena Cultures

Definition and Location. The existence of Marksville culture in coastal Louisiana is based on the recovery of pottery bearing distinctive Marksville designs and the presence of burials accompanied by diagnostic Marksville artifacts (Weinstein and Gagliano 1986:137). Many elements of the Marksville culture are present as the terminal occupations of the coastal sites previously discussed for the Tchefuncte culture, including the Tchefuncte site (16ST1), Big Oak Island (16OR6), and the Little Woods Middens (16OR1-5). The sequential relationship between the two components (where radiocarbon dates are available) and the overlap of many other material and economic elements of the two cultures suggests that the Coastal Marksville culture was derived from an assimilation of pan-Southeastern Middle Woodland traditions by the resident late Tchefuncte period population (cf. Shenkel 1984b:107; Brose and Greber 1979; Gibson 1975).

Archaeologists are divided as to whether the appearance of Marksville represented the development of a true and separate culture or whether it simply reflects the adoption of a burial cult tradition, social system, or exchange network by the indigenous Tchefuncte people (Gibson 1975). Many researchers in coastal Louisiana hold the former view that this transition was not just an intrusion of Marksville elements in late Tchefuncte contexts but represents an independent and complete cultural occupation in the region (Phillips 1970:898; Gibson 1975:17; Shenkel 1984b:117). However, the manner of this transition from late Tchefuncte to Marksville on the coast and the full extent of this cultural change beyond the obvious shifts in ceramic and burial traditions is unknown. This uncertainty is, at least partly, due to the fact that our data for coastal Marksville are limited primarily to burial mound contexts (Gibson 1975:15).

Coastal Marksville is characterized by ceramic decorative elements that include cross-hatched cambered rims, zoned rocker stamping, an improved (compared to Tchefuncte) fabric-impressed treatment, and curvilinear motifs including the raptorial bird design. Common items of the trade network include mica, galena, and copper artifacts (particularly earspools), and platform pipes. One of the most diagnostic features of Marksville is the burial practice change from simple individual unadorned burials in Tchefuncte times to ossuaries containing mass burials and grave offerings (Gibson 1975; Shenkel 1984b).

Examination of the distribution of Marksville components, based on data published in the Comprehensive Archaeological Plan (Smith et al. 1983:Tables 3 and 5), reveals that only about 40 of the total 181 components in the state are situated in parishes along the coastal zone (Appendix B). The frequencies of components along the coast range between 1 to 8 components per parish and are low compared to the inland areas. The low density of recorded Marksville components along Lake Pontchartrain probably reflects the abandonment of this region after the Tchefuncte culture period, while the low densities in Lafourche and Plaquemines parishes reflect the predominately post-Marksville age of the landforms.

Paleoenvironmental Data. Geomorphological developments on the coast of Louisiana during the Marksville period followed the trends previously established in the Tchefuncte period. By this time, the Mississippi River and its distributaries, namely bayous Lafourche and Terre aux Bouefs, had built the deltaic land mass that stretched north of New Orleans, and the Bayou Terrebonne lobe had defined the western margin of future deltaic development (Gagliano et al. 1978:4–5).

The La Loutre lobe, or St. Bernard deltaic complex, continued to develop during late Tchefuncte/early Marksville times eastward and just south of the Pontchartrain Basin (Weinstein and Gagliano 1985:141). The discovery of early Marksville ceramics on the Chandeleur Islands, which are remnants from the old St. Bernard delta lobe (McIntire 1958), indicates that this deltaic complex prograded very rapidly during the time when the system was receiving the full flow from the Mississippi River. A major decrease in river sediment flow through the St. Bernard delta occurred during the Marksville period as the Mississippi River became dispersed through several other distributaries and crevasse channels. As the sediment flow decreased, the delta lobes entered a transgressive phase and began to deteriorate, resulting in the development of lakes, barrier islands, and brackish marsh in the outermost parts of the delta. As a result of the environmental change, vast areas of the central portion of the delta became rich, diverse habitats for settlement, and this previously avoided region was colonized by the late Marksville people of the Magnolia phase between A.D. 200 to A.D. 400 (Wiseman et al. 1979:6-16, 6-17).

The distributaries created at this time established much of the pattern of bayou drainages and deltaic landforms that would shape the process of prehistoric and historic settlement to come. In addition to the land features being formed along the distributaries of the eastern valley, deltaic development continued in the central part of the coastal plain at the Teche lobe where the old Teche–Mississippi course was still occupied by the Red River (Gagliano et al. 1975).

The environmental adjustments that accompanied deltaic development in the Mississippi Valley are hypothesized to have affected the stability and distribution of *Rangia* and the prehistoric fishing and shellfish collecting stations that were so dependent on these habitats. By the end of the Tchefuncte period, the gradual seaward buildup of these delta lobes and influx of fresh water had begun to lower the salinity levels of estuarine areas such as the Pontchartrain Basin and undoubtedly created fluctuations in the distribution of *Rangia* (Saucier 1963). By the early Marksville period, the decreased productivity of the Pontchartrain Basin may have resulted in a shift in prehistoric settlement south along portions of the St. Bernard delta to relocate to the optimum zone of the *Rangia* bed habitat. The overall low density of Marksville occupations in the Pontchartrain Basin area may be a reflection of this settlement adjustment (Shenkel 1984b).

Phases. The formulation of coastal phases for the Marksville period has been hampered by the aforementioned bias in previous excavations towards burial mounds and the lack of good data from residential site contexts. With the exception of the Big Oak Island ossuary, most of the Marksville data consist of either small surface collections or light components that represent a minority of recovered remains in excavated sites of the Tchefuncte period. The phase determinations are based on diagnostic ceramic traits, but the primary criterion used by Phillips (1970:898–900) appears to be geographic distribution. A summary of the cultural chronology of the coast including the regional extent of the defined Marksville culture phases is shown in Figure 11.

These early attempts at the definition of phases (cf. Phillips 1970) struggled with the apparent change toward late Marksville times (around A.D. 200) away from the elaborate mortuary ceremonialism of the early Marksville period and apparent disintegration of the complex Hopewellian network. This late Marksville development on the coast appears to be roughly equivalent to and contemporaneous with the Issaquena phase defined for the middle part of the lower Mississippi Valley (cf. Phillips 1970). Issaquena is now being recognized by some as a separate culture in its own right (cf. Gibson 1975), but the concept is still not fully developed. The following discussion of phases will focus on the early classic coastal Marksville and will note the occurrence of late Marksville Issaquena elements. Any further detailed treatment of Issaquena on the coast of Louisiana will have to await additional research.

The LaBranche phase was defined for a number of Tchefuncte culture sites containing a minority of early Marksville wares in the Pontchartrain Basin region. Phillips (1970:898) included in this phase the three original Tchefuncte middens reported by Ford and Quimby (1945): the Tchefuncte site (16ST1), Big Oak Island (16OR6), and the Little Woods Middens (16OR1-5). Phillips also added four additional sites in the Basin to the LaBranche phase, two of which contain evidence of early Marksville without Tchefuncte components. Over time, the geographic range of the phase has been extended to cover most of southeastern Louisiana, but this practice has overextended the definition of the phase and will eventually necessitate subdivision of LaBranche (Gagliano et al. 1978:4–14). The early Marksville LaBranche phase is distinguished from Issaquena by the predominance of the ceramic type Marksville Stamped, *var. Crooks* while late Marksville is marked by the absence of *Crooks* and the presence of Issaquena ceramic traits such as Marksville Stamped, *var. Troyville*, Yokena Incised, and Churupa Punctated (Phillips 1970).

Sites in the basin that are characterized by Issaquena ceramics and other associated artifact elements are generally assigned to the Magnolia phase (Gagliano et al. 1980:3–12). The phase is made up of sites situated along the St. Bernard deltaic complex, particularly along Bayou La Loutre. The primary site for this phase is the Magnolia Mound site (16SB49), an earth mound built on top of a shell midden (Phillips 1970). This site and several other smaller mound sites of the Magnolia phase have also produced later Coles Creek and Plaquemine pottery from the mound levels. Thus, the association of the mound components with the late Marksville ceramics has not been demonstrated beyond a doubt (Phillips 1970:899).

The nature and extent of Marksville culture in the St. Bernard delta south of the Pontchartrain Basin was delineated by Beavers (1977, 1982a, b) as a result of surveys and site excavations in the Barataria Basin in Jefferson Parish. Based on this work, the Coquille phase was defined after the Coquille site (16JE37) excavated by Beavers (1977; Giardino 1984b). A second Coquille phase component in the Barataria Basin, the Boudreaux site (16JE53) is the only excavated Marksville burial mound in the deltaic plain (Lamb 1982). The ceramic characteristics of the Coquille phase include the predominance of Marksville Incised, *var. Sunflower* with minority types including Marksville Incised, *var. Marksville*, Marksville Stamped, *var. Old River*, Pontchartrain Check Stamped, *var. Canefield*, Churupa Punctated, *vars. Boyd* and *Hill Bayou*, Mabin Stamped, *var. Crooks*, Marksville Incised, *var. Prairie*, and Marksville Stamped, *var. Marksville*. Beavers (1982b) proposed that Coquille is an early Marksville occupation and suggested a date range for the Coquille phase between A.D. 0 to 300.

However, based on his reanalysis of the ceramics from the Coquille site, Giardino (1984b:49) believed that in the absence of clear stratigraphy or absolute chronometric information there were not enough comparative data to conclude that the site dates to the early Marksville period. Giardino also disagreed that only one component is present at Coquille. He interpreted differences at the Coquille site between the ceramics in the upper levels versus those recovered from the lower levels as an indication of two occupation components, but was unable to determine whether these differences reflected early versus late Marksville influences or some other factor (1984b:50).

Elsewhere in the coastal zone of Louisiana, the delineation of Middle Woodland phases in general and the presence of early Marksville in particular is less certain, though late Marksville Issaquena-like elements are present. For the central coastal region, the early Marksville phase is termed Jefferson Island and late Marksville/Issaquena is known as the Mandalay phase (Weinstein and Gagliano 1985:Table 2). The Jefferson Island phase was formulated by Toth (1977) for sites along the old Teche–Mississippi River channel and the Jefferson Island salt dome region. The late Marksville Mandalay phase is also restricted geographically to the Teche–Mississippi channel and salt dome region in south central Louisiana (Toth 1977).

The Veazey phase is defined on the basis of the presence of Issaquena-like ceramic characteristics suggesting a late Marksville age; the Marksville components are very weak, sometimes limited to one or two sherds recovered from sites predominantly of the Grand Lake phase of the Tchefuncte period. Phillips (1970:900) noted that Marksville occupation was probably present throughout the period and that the Veazey phase would probably have to be subdivided as evidence of early Marksville is uncovered in this region.

Research by Bonnin and Weinstein at the Strohe site (16JD10) in Jefferson Davis Parish prompted the formulation of the Lacassine phase to separate early Marksville from the broadly defined Veazey phase in southwestern Louisiana. The corresponding late Marksville phase for southwestern Louisiana is the Lake Arthur phase (Bonnin and Weinstein 1978). These phases are only tentatively defined from very limited data and will require more refinement before they can be placed into proper perspective.

Key Sites. There are no pure Marksville period excavated sites in coastal Louisiana, and the limited data available from multicomponent sites generally have Marksville as a minority in combination with earlier Tchefuncte or later Coles Creek occupations. Of the sites noted in the phase descriptions above, only Big Oak Island (16OR6), Magnolia Mound (16SB49), Coquille (16JE37), and Boudreaux (16JE53) have major Marksville period components that have also been well sampled through excavation. However, these sites are primarily limited to mortuary data and do not come close to uncovering the range of probable activity areas and material culture that characterize Coastal Marksville. As previously noted, many of the Coastal Marksville phases are predicated on limited subsurface work or surface collections. Further research on Marksville sites is obviously imperative if we are to clarify the temporal–spatial relationships among the sites and progress beyond basic mortuary and ceramic information.

Settlement Data. Coastal Marksville settlement patterns in the Mississippi River delta are constrained by the naturally occurring levee ridge systems that formed along the various distributary channels. Beavers (1982b:102–106) recognized a linear north-south pattern of site location corresponding to the configuration of the natural levees. In general, the major residential site complexes, such as the Coquille site, are strategically situated at the confluence of tributary/distributary streams and trunk channels where avenues of water communication and access to a broad array of environmental zones could be exploited.

A similar pattern has been seen for the northern end of the basin at such sites as the Temple site (16LF4) and Sims Place (16SC2) in Lafourche and St. Charles parishes (Gagliano et al. 1978:4–7). This pattern has also been noted for late Marksville Magnolia phase sites along a crevasse distributary off of the LaLoutre channel. There, the major residential center at the Magnolia Mound site was surrounded by sites such as Southwest of Cut-off Lagoon, Northwest of Cut-off Lagoon, and Bayou Biloxi I, all of which probably represented small temporary seasonal camps tied to Magnolia Mound (Wiseman et al. 1979:6–19).

These stream confluence residential sites tended to be the location of multimound complexes while smaller residential sites on the levee ridge between the stream junctions contained single mounds that were probably related to the larger sites in a hierarchically ranked fashion. Around each residential site complex were scattered a series of smaller apparently related special function sites. The basic economic strategy appears to be one of optimizing access to a full spectrum of the rich and varied zones perpendicular to the orientation of the distributary channel (Beavers 1982b:103–106).

Subsistence Data. There are unfortunately not sufficient floral and faunal data from Marksville sites to permit a comparison with the relatively well documented subsistence strategies of the Poverty Point and Tchefuncte period sites on the coast. As Toth (1979:197) noted, the probability that horticulture was practiced during the Marksville period is great, considering the documentation of squash and gourd in earlier Tchefuncte contexts at Morton Shell Mound (16IB3) by Byrd (1974). Indications are that if horticulture was known, it probably was of secondary importance during the Marksville period and primary reliance probably rested on the traditional hunting and gathering strategies that focused on the *Rangia* bed habitat.

Shenkel's (1984a, b) faunal analysis of the Big Oak Island site, where both Tchefuncte and early Marksville remains are present, showed little change in the subsistence strategy between the two periods. The faunal analysis by deFrance (1983) of the Marksville levels duplicated the findings of Shenkel (1980) for the Tchefuncte component at the site. For both periods, a basic economic focus on the *Rangia* habitat is indicated, consisting of clam, fish, and mammals and other vertebrates.

Analysis of the faunal remains from the Coquille site indicates a hunting and gathering subsistence strategy very similar to the *Rangia* bed habitat focused economy of the Tchefuncte period. Beavers (1982b) reported numerous shell remains of the clam *Rangia* but did not quantify its importance relative to the other food sources exploited. In addition, Beavers documented, in order of frequency, deer, fish, small mammals, turtles, oysters, and birds. There is no conclusive evidence for the practice of corn agriculture during the Marksville period in the Barataria Basin (1982b:122).

Mortuary Data. Marksville period mortuary data are available from the Big Oak Island ossuary in the Pontchartrain Basin. The ossuary contained the remains of over 50 individuals in prepared bundles of bones interred in a collective mass burial. Included with the bundle burials were a few special grave offerings such as pottery (sometimes broken at interment); shell cups or dippers; beads of shell, copper, quartz, and chert; and other shell and bone tools. Shenkel interpreted this mass burial to have been the final episode of the site occupation in which the stored remains (presumably from a charnel house) were emptied into the ossuary (1984b:117). Though the Marksville period mortuary practices at Big Oak Island show significant changes from the simple individual unadorned burials of the Tchefuncte period, Shenkel (1984b: 117–119) considered the material remains to be impoverished compared to Hopewellian status objects in burial contexts elsewhere in the Southeast. Shenkel (1984b:118) viewed the Big Oak Island Marksville elements as Tchefuncte culture recast into a regional expression of Marksville but lacking any conclusive tie to Havana (Illinois) Hopewell.

Exchange and External Relationships. There are currently three theories concerning the spread and development of Marksville culture and the relationship between classic northern Hopewellian Marksville and southern groups such as the Coastal Marksville culture. One of the earliest views held that the fundamental elements of Middle Woodland Hopewellian cultures were already in the Lower Mississippi River Valley and diffused from south to north (Ford and Willey 1940). Another theory posits the development of Hopewell ceramic traditions in the Ogden and Utica phases of the Illinois Havana Hopewell and the subsequent intrusion of these pottery elements southward during the first century A.D. (Toth 1977, 1979). Jon Gibson (Shenkel 1984b), in rejecting the hypothesis of a single primary origin for Hopewell, instead suggested that Marksville and other Middle Woodland cultures were the products of a pan-Eastern development of ideas and materials from a number of locations. The cultural makeup of specific regional manifestations of Hopewell or Marksville is related to both the quality and quantity of external contacts as well as the strength of the local traditions that assimilated these outside contacts (Shenkel 1984b:107).

The synthetic nature of regional Marksville developments and the strong historical connections with indigenous Tchefuncte traditions can be seen in the expression of Coastal Marksville. The influence of the Tchefuncte ceramic tradition on subsequent local Marksville forms has been noted by various researchers in the Lower Mississippi Valley (cf. Ford and Quimby 1945; Toth 1977; Shenkel 1980). Marksville period pottery construction techniques, vessel shapes, rim forms, and decorative elements are presaged in earlier Tchefuncte culture contexts. Other traditions such as the use of raptorial birds, lamellar blades, lapidary items, clay figurines, and galena were present during the Poverty Point period before Tchefuncte. Even the aspect of burial ceremonialism and the use of burial mounds may have roots in the Tchefuncte Lafayette phase along the Vermilion River in south central Louisiana (Shenkel 1984a: 64). However, the association of Tchefuncte and conical burial mound construction has not been confirmed through radiocarbon dates.

In contrast to the local regional historical roots of certain aspects of Marksville culture discussed above, evidence of other classic Middle Woodland Hopewell traditions is lacking on the coast of Louisiana. For instance, Shenkel (1984b) noted that the coastal Marksville expression at Big Oak Island was "impoverished" compared to a list of classic northern Marksville traits. The Big Oak Island Marksville ossuary produced only a handful of materials that could be considered truly Hopewellian including one copper bead, three shell cups, and two vessels with the raptorial bird design. Missing from the site are status objects such as copper panpipes, copper earspools, copper bracelets, copper beads, platform pipes, clay figurines, cut mica, galena, marine shells, freshwater pearls, carnivore canines, and greenstone celts (Shenkel 1984b:117–118). Shenkel did ascribe the ossuary at Big Oak Island to Marksville, but he saw no evidence to suggest Havana Hopewell influence. He concluded that, at least for the early Marksville phases, the data supported the notion of a general pan-Eastern Middle Woodland origin (1984b:119).

THE A.D. 400–700 PERIOD

This time span is approximately equivalent to that of the Baytown culture period as defined by Phillips (1970:17–18, Figures 2 and 450; cf. William and Brain 1983:Figure 11.4), and is the same as the Morses' (1983:181ff) "Woodland Conflict" or Late Woodland period.

Baytown was originally defined by Phillips, Ford and Griffin (1951:68, 436ff) as a sort of superperiod, with Early, Middle, and Late subdivisions corresponding respectively to what are now called the Marksville, Baytown, and Coles Creek (or Emergent Mississippian) culture periods. That super-Baytown concept was the Mississippi Valley's "equivalent of that other overextended term, 'Woodland'" (Williams and Brain 1983:404). A Woodland-like pottery type, Mulberry Creek Cord Marked, was seen as appearing around the beginning of the Early Baytown period, reaching its peak of popularity at the time of transition from Early to Middle

Baytown, declining slowly throughout Middle and Late Baytown times, and disappearing about the end of the Late Baytown period (1951:440–443).

The multimound Baytown site in east-central Arkansas was selected as the type site but was not excavated or tested, and was only mentioned briefly in the first Lower Mississippi Survey report (Phillips et al. 1951:51, Table 1, Figures 2 and 18). Although this project had been intended to cover the Lower Valley as far south as Vicksburg, due to World War II and other factors it only reached the latitude of the Arkansas–Louisiana state line (1951:5, 40, Figure 2).

Ford (1935:12ff, Figure 2; 1936:141ff, Figure 50) had already defined a Deasonville complex emphasizing cordmarked and red-filmed pottery, based on work by himself and others (Collins 1932) in and near the Yazoo Basin. Ford and his associates had also developed the concept of a Troyville period, based in part on Walker's (1936) report on the Troyville site in east-central Louisiana. The Troyville period was first mentioned in print in a chronological chart at the beginning of the report on the (Marksville period) Crooks site (Ford and Willey 1940:Fignre 2), and gained wider exposure in a major synthesis by the same authors (Ford and Willey 1941). Its cultural content was not itemized and described, though, until the appearance of Ford's (1951) report on the Greenhouse site (subtitled "a Troyville–Coles Creek period site..."). At Greenhouse, Mulberry Creek Cord Marked was a distinct minority type (1951: 55), with several contemporary incised and stamped types generally more common (1951:Figures 35–40).

These period and culture concepts, and their relationships with each other, have undergone a complicated series of revisions over the ensuing decades. The best guides through this tortuous terminological morass are probably a pair of related articles by Gibson (1982b) and Belmont (1982a). As Gibson (1982b:35–36) noted, the differing geographical perspectives of the proponents are crucial to understanding these problems. Here, it will suffice to cite a few landmark studies.

In their report on the multicomponent Jaketown site in west-central Mississippi, Ford, Phillips, and Haag (1955:61–62, Figure 18) accomplished a terminological truce by presenting parallel charts for the Lower Yazoo and Red River Mouth sequences, showing Middle Baytown as coeval with Troyville. Greengo (1957, 1964; summarized by Gibson 1982b:37–40), also working in the Yazoo Basin, ignored Baytown and expanded the Troyville concept. In contrast, Lower Mississippi Survey researchers in the Tensas Basin of northeast Louisiana in the 1960s (Williams 1964; summarized by Gibson 1982b: 42–46) proposed to replace Early Baytown by Marksville, and Late Baytown by Coles Creek, but did not mention Troyville at all, instead substituting Baytown/Deasonville for Middle Baytown, and for the first time, applied the term "Baytown" to the Troyville type site.

This presaged the major revision by Phillips (1970:17–18, 901ff), who formally changed the Early–Middle–Late Baytown period sequence to Marksville–Baytown–Coles Creek, expanded the Baytown culture concept significantly, and demoted both Deasonville and Troyville to regional phases of Baytown culture. He admitted that in the northern Lower Valley, the (ceramic typological) data were then inadequate for terminating the Baytown period, but stated that "in the south [sic] the end of Baytown is clearly marked by the appearance of Coles Creek types" (1970:902). A few pages later, though, he noted that researchers (mainly geoscientists) working in southeastern Louisiana had been unable to separate Troyville and Coles Creek components, primarily because "the most useful Baytown period indicator, Mulberry Creek Cord Marked, is practically nonexistent in the Delta" (1970:910; cf. Ford 1951:55).

This impasse (from the coastal Louisiana perspective) is reflected in Neuman's (1984:169ff) use of the phrase "Troyville–Coles Creek Culture." The position taken in this overview, however, is that the Baytown (Troyville) and Coles Creek periods, viewed as spans of time, are at least potentially separable in coastal Louisiana sites by both absolute dating methods and more refined artifact (especially ceramic) analyses, if well preserved deposits are excavated extensively. This is exemplified by LMS work on the coast, placing the Coles Creek period at between A.D. 700 and 1000 (Brown 1984:97).

During the 1970s, research in Louisiana by both professional and amateur archeologists significantly increased the data base for this period, and placed increasing stress on Phillips's period/culture scheme. This trend culminated in a Louisiana Archaeological Society meeting symposium on the Troyville–Baytown period in January, 1980. The papers from that symposium were published (Gibson 1982a), including the two major and basically compatible historical reviews by Gibson (1982b) and Belmont (1982a).

The concepts as redefined by Gibson and Belmont have been used as the basis for the present overview. Baytown is retained as the name of an archeological culture (in the sense of Belmont 1982a:77–78, quoted in Chapter 3), and the name of a phase in east-central Arkansas. (This overuse of the name is systematically untidy, but probably irrevocably ingrained in the literature.)

Again following Belmont (1982a:78ff), Troyville is promoted to culture status and deleted as a phase name, replaced on that level by Belmont's (1967, 1982a:78–79, Figure 3) Black River and Fort Adams phases.

The two cultures are distinguished ceramically by the dominance in Baytown culture of "the coarse *Reed* variety of Baytown Plain and by the high proportion of cord marking to other decorative techniques" (1982a:79). Belmont also remarked that:

> The rarity of significant mound sites and the large number of shell middens in the Deasonville phase [of Baytown culture in the Yazoo Basin], at least, suggest an adaptational and sociocultural distinction between the two cultures as well. Finally, the geographical distribution of Troyville sites and the strong ceramic continuities indicate that Troyville evolves directly out of Issaquena proper...whereas Baytown is apparently intrusive into

> the northeastern fringe of Issaquena territory and is presumably derived from Paxton, Porter Bayou, and other northerly [Yazoo Basin] non-Issaquena phases.... Moreover, Troyville, not Baytown, is the direct antecedent to Coles Creek. (1982a:79)

Two other archeological cultures can be distinguished in the study area during this period, on the basis of ceramics and other criteria. Another portion is culturally undefined.

One distinctive manifestation, here tentatively labeled Barnes culture, is an expansion of the Dunklin phase, defined in southeast Missouri by Williams (1954) and commented upon briefly by Phillips (1970:903). In the ensuing years, work at the Zebree site and elsewhere in northeast Arkansas by the Morses (e.g., 1977, 1980, 1983:182ff), and by others in southeast Missouri (1983:184, Figure 9.2) has resulted in a much-expanded concept of the Dunklin phase and the Barnes tradition (1983:183, Figure 9.1) of sandy paste pottery.

The other coeval but distinctive cultural entity is Fourche Maline culture in and near southwest Arkansas (Schambach 1982a). Specifically, the Fourche Maline 5 and Fourche Maline 6 periods, estimated at A.D. 400–500 and A.D. 500–700, respectively (1982a:Table 7-1), are relevant here.

Figure 14 maps the apparent archeological culture boundaries during this period. The Troyville culture boundary follows that defined by Belmont (1982a:Figure 2); it should be emphasized that it includes a portion of extreme southeast Arkansas (cf. also Belmont 1982b), and its southern limit stops short of the Deltaic and Chenier plains. Belmont (1982a:79) stated that the cultures coeval with Troyville to the south, west and east are unknown. Gibson (1982b:58–59) has concurred:

> Troyville...may also have typological merit further down the then active Mississippi meander belt to the head of the delta. But east and west of the meander belt, particularly along the flanking marshy coasts, another cultural designation is warranted. Here, a Coastal Troyville cultural variant is tentatively designated.

Barnes Culture in Northeast Arkansas

Definition and Location. As noted above, this is an expansion of the Dunklin phase concept originally defined by Williams (1954). Phillips (1970:903) suggested that the sandy ceramics might be a function of the relatively sandy environment, but he noted that some nonsandy environments were occupied by Dunklin phase peoples who made very sandy pottery, and the Morses (1983:183) pointed out that some very sandy environments, including Barnes Ridge itself, were occupied earlier and later by peoples who made grog-tempered pottery.

A minor Barnes component was found at the Lawhorn site in northeast Arkansas, just south of the Missouri bootheel (Moselage 1962:20–24). Excavations at the Zebree site in extreme northeast Arkansas have furnished the best assemblage data, however (Morse and Morse 1977, 1980, 1983:186, 189).

Cord-marked, sand-tempered jars and plain sand-tempered bowls were typical of Barnes culture at Zebree (Morse and Morse 1983:186, Figure 9.3a–c). Small to medium Steuben expanded-stemmed dart points, rather than arrow points, appear to have been the basic weapons used by these people (1983: 189, Figure 9.4a–c). This contrasts with the apparently contemporary use of the bow and arrow to the north (1983:189), and to the south in Troyville culture.

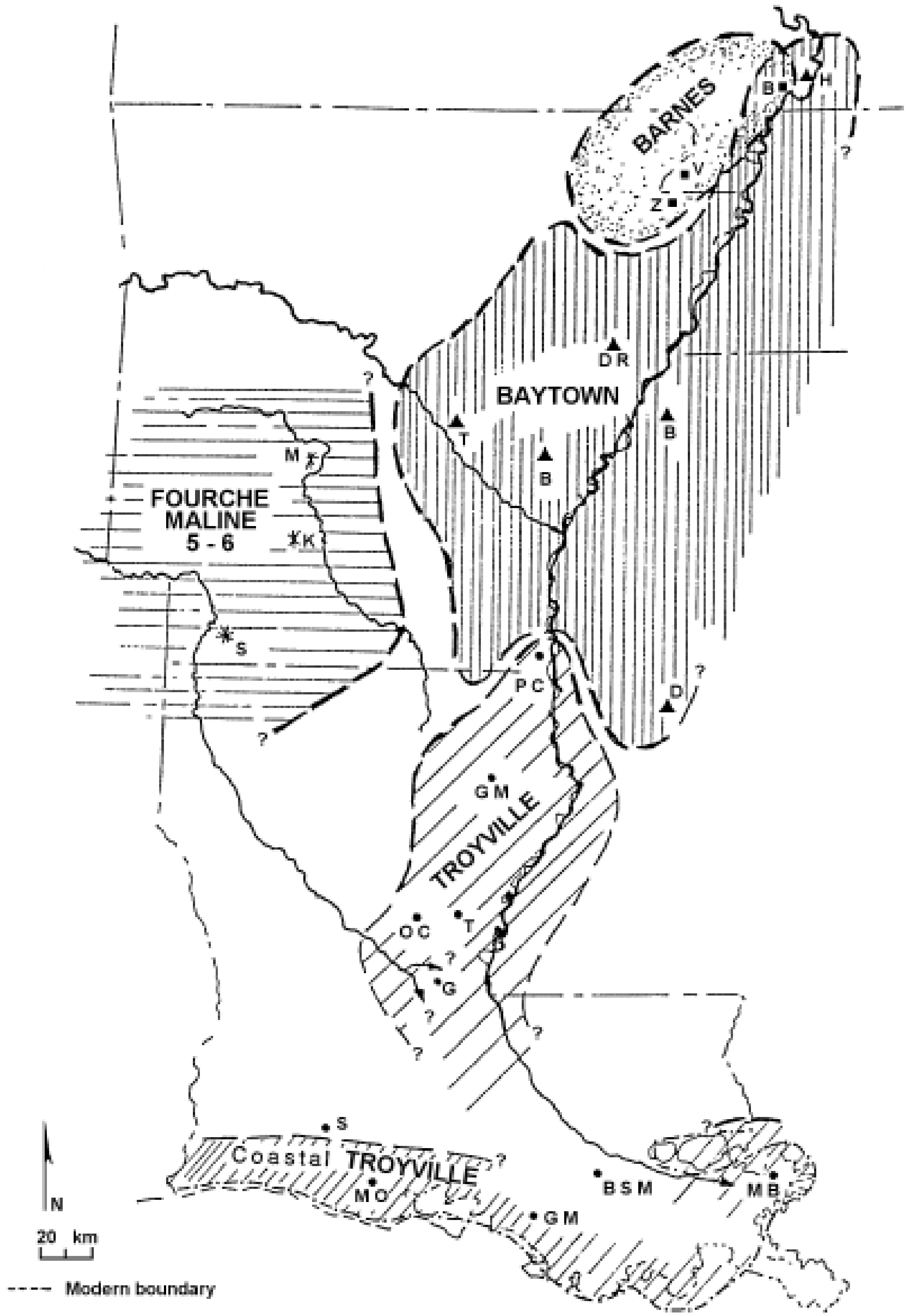
One intensive survey transect, ca 24 km long (east-west) by ca 0.4 km wide, was made in northeast Arkansas and furnished basic data on Barnes/Dunklin site distribution (Morse and Morse 1983:183). The maximum distribution of Barnes culture is mapped as overlapping that of the Baytown grog-tempered pottery tradition or culture (Figure 14; cf. Morse and Morse 1983:Figure 9.1).

It should be noted that Williams (1954) thought the nearby Hoecake phase in southeast Missouri belonged to what was then called the Early Baytown (i.e., Marksville or Middle Woodland) period, and was earlier than Dunklin/Barnes. The Dunklin/Barnes component at the Lawhorn site, however, was called Early Woodland by the excavator (Moselage 1962:24). Phillips (1970:902–903) suggested that Hoecake and Dunklin were at least roughly contemporaneous and that both belonged to his Baytown period (Middle Baytown in the old LMV terminology, or early Late Woodland in general Eastern terminology). The Morses (1983:192) suggested that the Dunklin and Hoecake phases represent the remains of opposing Baytown period peoples and that the Hoecake phase peoples expanded at the expense of Dunklin, but they noted the uncertainty of the chronology.

The radiocarbon dates for Dunklin and Hoecake components seem somewhat at variance with their presumed calendric dates (Morse and Morse 1983:182). There is also a lack of arrow points in Dunklin assemblages. Finally, there is an apparent lack of continuity between the sand-tempered Pascola (Tchula period or Early Woodland) and sand-tempered Dunklin/Barnes ceramics, unless continuity may be exemplified by the rare Barnes Fabric Marked type (Moselage 1962:20, 24, Figures 6 and 7, Table 1; Phillips 1970:903). It therefore seems obvious that more chronometric studies are badly needed.

Paleoenvironmental Data. Modern vegetation patterns were in existence by this time, and the Mississippi River was long since in its modern meander belt. However, an abortive attempt by the Mississippi to move westward apparently created the so-called St. Francis sunk lands and Big Lake (next to the Zebree site) shortly after this time, if not during this period (Saucier 1970; Morse and Morse 1983:9). The Morses (1983:182) noted the coincidence of this period with the Scandic climatic episode defined in Europe, but no relevant data are at hand in the study area.

Phases. So far, only the expanded concept of the Dunklin phase has been used as coextensive with the Barnes ceramic tradition, as noted above.



Key: **Barnes culture sites:** B = Barnes; V = Varney-, Z = Zebree.
Baytown culture sites: B (Arkansas) = Baytown (Indian Bay); B (Mississippi) = Boyd; D = Deasonville; DR = De Rossitt; H = Hoecake; T = Toltec.
Fourche Maline 5-6 culture sites: K = Kirkham; M = Means; S = Shane's Mound.
Troyville culture sites: G = Greenhouse; GM = Gold Mine; OC = Old Creek; PC = Powell Canal; T = Troyville.
Other sites: BSM = Bruly St. Martin; S = Strohe.

Figure 14. Map of cultural distributions and key sites in and near the study area ca A.D. 500.

Key Sites. The original sites used in the Dunklin phase definition are in southeast Missouri (Williams 1954) and out of the present overview area. The Lawhorn site (Moselage 1962) may be critical to solving the chronological difficulties, as indicated above.

However, clearly the major site for this culture in the present study area is Zebree (3MS20), adjacent to Big Lake in northwest Mississippi County, Arkansas. Zebree was worked on by the Morses at various times from 1967 through 1976 and is best known for its Emergent Mississippian component (Morse and Morse 1983:217ff), though it also had an extensive Dunklin/Barnes component (1983:186, 189). No other sites of this complex have been extensively investigated, but a number have been discovered through a variety of survey techniques (1983: 183).

Settlement Data. "The Dunklin phase is mostly characterized by seasonally dispersed household units in minor watersheds" (Morse and Morse 1983:192). The Morses suggested that maximum units consisted of about two to five households, and no evidence of mounds is known. Houses were circular, and made of poles placed in postholes and probably covered with some sort of flexible, perishable materials (1983: 189).

Subsistence Data. Thanks to the Zebree site investigations, something is known of Barnes/Dunklin subsistence (Morse and Morse 1983:186). Despite the use of flotation, no maize was recovered from Barnes features. The indigenous potential cultigen, sunflower, was recovered, and pollen of chenopodium, another possible cultigen, were present. Other identified plant foods included hickory nuts, acorns, black walnuts, persimmons, wild beans, and grapes. Animal bones indicated that deer was the main meat source, but raccoon, rabbit, ducks, passenger pigeon, turtle, and fish were also exploited.

The Morses (1983:186) interpreted the survey data as indicating that Dunklin phase sites were not necessarily associated with the best agricultural soils. They concluded that plant cultivation was either absent or relatively unimportant.

Mortuary Data. No burials related to this complex were found at Zebree. So far, at least, burial mounds (or any mounds) are unknown for this culture/phase (Morse and Morse 1983:192).

Exchange and External Relationships. The Morses (1983:186) noted little evidence for trade by Dunklin phase peoples. They also suggested (1983:182, 192) that the possibly agricultural Hoecake phase peoples of easternmost southeast Missouri, makers of grog-tempered pottery, expanded at the expense of the Barnes tradition peoples, and that conflict was involved.

Baytown Culture in East Arkansas and Northwest Mississippi

Definition and Location. In the northern Lower Valley, Baytown was originally conceived (Phillips, Ford, and Griffin 1951) as including what are now generally called the Marksville, Baytown, and Coles Creek culture periods. Phillips (1970:903) noted that Baytown had "ballooned into a major 'cultural period' of extraordinary dimensions." He proceeded to reduce it greatly in the temporal dimension but to make it even larger areally as a culture, especially at the expense of Ford's Troyville concept. The Baytown culture in the present overview is again restricted by the expansion of the Morses' Dunklin phase into something tentatively called Barnes culture on the north and by acceptance of Belmont's (1982a) Troyville culture on the south (Figure 14).

Baytown culture is characterized by a ceramic assemblage dominated by grog-tempered (though often called clay-tempered) varieties, Baytown Plain and Mulberry Creek Cord Marked pottery types, plus Larto Red, Alligator Incised, and other types (Phillips 1970:903–904; Williams and Brain 1983: 314, 316, Figure 9.4; Morse and Morse 1983:193).

Mulberry Creek Cord Marked pottery is generally more common to the east, in and near the Yazoo Basin of western Mississippi, where it is associated with the poorly understood Deasonville complex. (It also occurs in Troyville sites to the south.) It is generally rare in northeast Arkansas (Morse and Morse 1983:193) except around the mouth of the St. Francis River (Phillips 1970:904). It is moderately common in the Delta of southeast Arkansas (Jeter 1982:98–99) but was unknown in the Felsenthal region of south-central Arkansas, despite fairly intensive research over the past two decades (Frank Schambach, personal communication), until two sherds were found in a private collection from Calhoun County (Weinstein and Kelley 1984:501).

Also present, at least in the Yazoo Basin, are both stemmed dart points and Collins Side Notched arrow points. Williams and Brain (1983:222–225, Figures 7.2–7.5) described the Collins points as representing the introduction of the bow and arrow in and near that region. The points are consistently associated with Baytown period sites, not only in the southern Yazoo Basin (Lake George), but also at sites such as Oliver, which is just above the latitude of the Arkansas River mouth. However, the Morses (1983:193) reported only a few crude stemmed dart points from Baytown contexts in northeast Arkansas, and provenience data are uncertain in southeast Arkansas except that both dart points and arrow points were found at the contemporary, Troyville culture, Powell Canal site (House 1982b:55, Figure 36a–f).

Paleoenvironmental Data. As noted above, the Mississippi River was in its modern meander belt during these times. The Arkansas River's situation, though, has been totally reinterpreted recently. Saucier (1974:23, Figure 3) had estimated that the Arkansas River was in its Bayou Bartholomew meander belt throughout this period, only abandoning that course after A.D. 1000. However, the revised meander belt chronology (Autin n.d.:Table 2; Saucier, 1987 personal communication) estimates that this belt was abandoned for the modern one around A.D. 1 to A.D. 200. If so, the Arkansas River would have been in its modern meander belt during all of this period.

Phases. In the present study area, Phillips (1970:902ff) defined only one phase that is here included in the Baytown culture concept. This was the Baytown phase itself, which included sites from well north of Memphis to east-central Desha County, well south of the present Arkansas River (1970:Figure 445). The Morses (1983:192) stated that "very little is known about the Baytown phase" but that it extended over "the lower portions of the St. Francis and White River drainages and the lowland portion of the Arkansas River" (1983:193).

In the southern Bayou Bartholomew locality of southeast Arkansas, Rolingson (1974) defined a "tenuous" Dry Bayou phase for this period, based solely on the presence of Mulberry Creek Cord Marked sherds at several sites. Several other sites with this pottery and/or other probable Baytown markers are known along Bayou Macon and northern Bayou Bartholomew (Jeter 1982a:99), but no phases have been defined. The Powell Canal site in extreme southeast Arkansas is regarded as more closely related to Troyville culture (House 1982b; Belmont 1982b, 1982c; see below).

Key Sites. The Baytown (or Indian Bay) site in extreme southern Monroe County, east-central Arkansas, was designated as the type site for this culture by Phillips, Ford, and Griffin (1951), but it has not been excavated under controlled conditions. It is a multimound site (Phillips 1970:903) with a later component (Morse and Morse 1983:192–193), and the cultural affiliation of the mounds is uncertain.

As noted by the Morses (1983:193), only one adequate written account exists for a Baytown culture site in northeast Arkansas. The DeRossitt site (3SF49), in north-central St. Francis County, was salvaged in 1965. Some 164 pits and more than 500 postmolds were identified. Carol Spears (1978) used the data from this site as the basis of a thesis, which emphasized analyses of the features.

The Hyneman site in eastern Poinsett County was salvaged in 1967, but no report has been published. Morse and Morse (1983:193) stated that a Baytown phase component there yielded two radiocarbon dates in the A.D. 600s and 700s and that both Steuben expanded base and crude stemmed dart points were found (1983:Figure 9.4c–e).

Banks Mound 3, on the Mississippi River floodplain in northeast Crittenden County, was excavated in 1960 by the Gilcrease Institute and reported upon by Perino (1967). The report emphasized the Mississippian pottery from later portions of the mound but also mentioned in passing a component of Baytown burials beneath the first mound stage (1967:72, 75, Figures 45 and 46).

Settlement Data. As noted, the Baytown type site itself is a mound and village site, but the affiliation of the mounds is uncertain. Apparently, a low Baytown mound was built over Baytown burials at Banks Mound 3 (Perino 1967). Phillips (1970:904) noted that although assigning cultural affiliations to unexcavated mounds was hazardous, "a good many of our Baytown components are on sites that have small conical mounds."

In a brief summary of surface survey data, House (1982a:42) reported that Baytown phase sites were "extremely frequent and widespread" in east-central Arkansas, "occurring in the full range of landforms" and including "small middens and small or large low-density sherd scatters." He suggested that the larger sites probably represented "overlapping outputs of multiple temporally discrete occupations" and that none of these sites were true villages or long-occupied locations.

At the one extensively excavated site, DeRossitt, four areas of Baytown feature concentrations were noted, but it is uncertain whether they represented contemporaneous or successive occupations. At least a summer–fall–winter occupation was indicated by food plant remains (Spears 1978; Morse and Morse 1983:193).

Subsistence Data. Despite intensive flotation, no maize or other definite cultigens were found at DeRossitt (Spears 1978; Morse and Morse 1983:193). Instead, the Baytown features there yielded persimmon, grape, hickory nuts, acorns, and chenopodium. A small quantity of bone indicated the usual exploitation of deer, rabbit, raccoon, aquatic resources and birds. Although the coeval Deasonville phase sites in the Lower Yazoo Basin are well known for the abundance of freshwater mussel shells in their middens (Phillips 1970:549–550; Williams and Brain 1983:391, 404), no such situations have been reported from Baytown sites in Arkansas.

Mortuary Data. Only Banks Mound 3 has yielded a moderately well described Baytown mortuary component from the study area. According to Perino (1967:72, 75, Figures 45 and 46), a low Baytown mound was erected over pits containing two types of burials: articulated extended-supine, and bundles of disarticulated bones. No grave goods were found, but the low mound contained Baytown Plain sherds and a few Mulberry Creek Cord marked sherds.

Exchange and External Relationships. Williams's (1963:297) characterization of Baytown as a "good gray culture" between the Hopewellian and Mississippian high points of interaction certainly seems to hold true. Twenty years after that statement, Williams and Brain (1983:404) remarked on the "general provincialism that pervaded the Baytown culture, so that extraregional interactions were minimized or maintained only on a secondary level."

Fourche Maline 5 and 6 Cultures in the Trans-Mississippi South

Definition and Location. Fourche Maline 5 and 6 were defined by Schambach (1982a:Table 7-1) as coeval with portions of the Baytown–Troyville culture period of the Lower Mississippi Valley. Schambach used an unusual concept of those two cultures, with Troyville indicated as earlier, ca A.D. 400–500, and Baytown as later, ca A.D. 500–700. Here, Baytown and Troyville are considered as geographically separate but coeval cultures, both having existed ca A.D. 400–700. However, Schambach's temporal distinction between Fourche Maline 4 and 5 will of course be preserved.

Also, it should be noted that Schambach defined Fourche Maline 5 as the last period of his Middle Fourche Maline era and Fourche Maline 6 as the first period of the Late Fourche Maline era (1982a:Table 7-1). Here, the "era" distinction will be overridden in favor of the standard Lower Valley Baytown (and Troyville) time frame, which considers the ca A.D. 400–700 period as a unit.

Fourche Maline 5 culture is best known in the Middle Ouachita and Great Bend regions. Fourche Maline 6 is more widely known, in the Middle Ouachita, Ouachita Mountains, Little Missouri, and Little River regions, but not well known in the Great Bend. The Bellevue focus of northwest Louisiana (Webb 1982a) was defined as including not only Marksville and Issaquena-coeval components, but also as being at least partially coeval with Troyville. It is included here as at least a Fourche Maline 5-affiliated culture (cf. Schambach 1982a: 187–188).

Fourche Maline 5 artifacts include Williams Plain ceramics, and Scallorn-like arrow points in addition to late varieties of Gary dart points (Schambach 1982a:149, 173). The Fourche Maline 6 assemblage is similar and includes Larto Red pottery (1982a:141).

Paleoenvironmental Data. Again, no research specifically relating these culture units to former environmental conditions has been done. Pearson's (1982:25, Figure 2-10) general study of the Great Bend region indicated that surviving sites of this period in the Red River Valley would probably be restricted to the valley margins.

Phases. No phases of Fourche Maline 5 culture have been defined. In the Middle Ouachita region, Schambach (1970, 1982a:Table 7-1) defined the Dutchman's Garden phase of Fourche Maline 6 culture. This phase is based principally on his (1970) analysis of the Means site. Early (Schambach and Early 1982:SW85) noted the presence of Coles Creek-like ceramics in components of this phase, which would appear to place it very late in the period under consideration here, if not in the subsequent A.D. 700–1000 period (and, presumably, Fourche Maline 7).

Key Sites. Schambach (1982a:Table 7-1) listed three key sites for Fourche Maline 5 culture: Condray in the Middle Ouachita region, and Shane's Mound and Shane's Village in the Great Bend region. The Condray site (3OU171) was surface collected and yielded an excellent Fourche Maline 5 assemblage (1982a:143). It has suffered from agricultural impacts (a possible mound was leveled) but might have preserved subsurface remains. Shane's Mound (3LA6) was excavated by knowledgeable amateurs in 1959 and summarized by Hoffman (1970a:152–153) and Schambach (1982a:149). The nearby Shane's Village site was also extensively excavated by the amateurs and appeared to be a single component Fourche Maline 5 midden (1982a:149).

For Fourche Maline 6, the key sites are Means in the Middle Ouachita region, Kelly Creek in the Ouachita Mountains, Allen's Field and Kirkham in the Little Missouri region, and Hutt in the Little River region. Means (3HS3) was thoroughly analyzed in Schambach's (1970) dissertation (cf. also Schambach 1982a:142–143). It was a single component Fourche Maline 6 midden (with a later Caddo house and associated features intrusive) on Watermelon Island in the Ouachita River in central Hot Spring County, intensively excavated by the WPA.

Allen's Field (3CL97) has only been surface collected; it appears to be late Fourche Maline 6 or perhaps Fourche Maline 7 and may have been a small farmstead (Schambach 1982a: 159). Kirkham (Dickinson and Lemley 1939) yielded Coles Creek-like sherds, and may also have a Fourche Maline 7 component; Schambach (1982a:158) remarked that it showed evidence of occupations "during the Fourche Maline 3 and Fourche Maline 6 periods and probably most of the time in between." The Hutt site (3HE3) was relatively unproductive (Hoffman 1970a, 1971:231–278; Schambach 1982a:160), but it was extensively excavated by the University of Arkansas and appears to have a Fourche Maline 6 component.

Settlement Data. The general characterization of Fourche Maline settlement (Schambach and Early 1982:SW68; see the Fourche Maline 3 and 4 summary, above) still holds. Schambach (1982a:143) estimated that the Condray site had been "a small village of perhaps three or four houses" on the basis of surface data. Shane's Mound was about 200 m north of Shane's Village, and apparently related (1982a:149).

Early (in Schambach and Early 1982:SW85) stated that the "well defined settlement type of the Dutchman's Garden phase is an intense midden deposit located in alluvial bottomland settings." Other components of that settlement system have not been defined, but Early suggested that the overall system might not have been significantly different from that of the earlier (Fourche Maline 4, see above) Walnut Bend phase (1982:SW86).

Subsistence Data. Again, directly relevant data are nonexistent. Schambach (in Schambach and Early 1982:SW79) speculated that "intensification of horticulture to something beyond the incipient level" may have occurred in late Fourche Maline times, and elsewhere (1982a:159) suggested that the late Fourche Maline 6 (or 7) Allen's Field site might have been a small farmstead.

Mortuary Data. Shane's Mound was erected over a pit which contained cremated human bones, Gary points, a boatstone and ornaments made from animal and human bone (Schambach 1982a:149). Shane's Village, located nearby, also had midden burials.

Exchange and External Relationships. Paralleling the general provincialism of the Baytown culture in the Lower Valley, these Fourche Maline societies appear to have been self-sufficient and self-contained, with no noteworthy exchange or regular interaction with outsiders reported as yet.

Troyville Culture in the Southern Lower Mississippi Valley

Definition and Location. The concept of a Troyville culture period was devised by Ford (1951) in his Greenhouse site report, modified significantly by Belmont (1967) and reduced to the status of a phase within the Baytown culture period by Phillips (1970:908–910). Here, we follow Belmont's (1982c:75ff) redefinition of Troyville as a culture in its own right (but not as a culture period; cf. 1982c:77–79). The geographical extent of Troyville culture (1982c:Figure 2) is mainly within the Lower Valley, from the Lower Yazoo Basin and extreme southeast Arkansas in the north to just below Baton Rouge in the south.

Belmont (1967, 1982b, 1982c:92) also provided overviews of Troyville ceramics, which are as usual the primary artifact diagnostics. In early Troyville assemblages, there is a strong continuity from Issaquena pottery, with late varieties of Marksville Incised, Marksville Stamped, *var. Troyville* (formerly Troyville Stamped; characterized by plain or pseudodentate rather than true dentate rocker stamping, within Marksville-like (but narrower) U-shaped (in cross section) incised zoning lines; cf. Phillips 1970:125–127; Brown 1978c: 29, 31), and Churupa Punctated (also within zoning incisions). Cord marking appears, use of red slips increases, and painting with red, black, and white pigments occurs, most sensationally in the two figurines recently discovered at the Gold Mine site (Jones 1979). In later Troyville assemblages, the incised lines change from U-shaped to sharp lines, a punctated line decoration is introduced, and decorations are increasingly restricted to the neck area (all of these are trends that culminate in Coles Creek pottery).

Another important Troyville innovation (apparently) was the first widespread use of the bow and arrow in these portions of the Lower Valley. Small stemmed (dart?) points (e.g., Mabin, or Gary, cf. *var. Camden*) persist, but definite stemmed arrow point types (e.g., Alba and Catahoula) also occur consistently (Ford 1951:114–117; House 1982b:55, Figure 36; Belmont 1982c:91–94).

Perhaps the best descriptions and illustrations of Troyville assemblages using the modern type–variety terminology are to be found in an article by Hunter and Baker (1979) on salvage excavations at the Troyville site itself, and in a report by House (1982b) on salvage excavations at Powell Canal, a site at the northern end of the Troyville territory, in extreme southeast Arkansas. Neuman (1984:169–214) presented a fairly detailed discussion of Troyville–Coles Creek culture in Louisiana, but it was somewhat weakened by his lumping of the two cultures together—something which has traditionally been done in coastal Louisiana, but not in the heartland shared by the classic inland manifestations of these cultures.

Paleoenvironmental Data. The Mississippi River was in its present meander belt during the entire Troyville time span. This seems certain, but clearly, much more interdisciplinary research needs to be done on both the Arkansas and Red River courses during this period.

It was formerly believed (Saucier 1974) that the Arkansas River had been in its Bartholomew meander belt during all of this span, but it has more recently been proposed (Autin n.d.; Saucier, personal communication) that it had completed its shift to the modern meander belt by about A.D. 200. If so, the actual Arkansas River would have been well to the north of Troyville territory as construed here, and the relatively new underfit stream, Bayou Bartholomew, would have been tributary to the Ouachita River, also flowing in a former Arkansas River meander belt, in the northwestern portion of the Troyville territory.

According to Saucier (1974), the Red River had for several centuries been in its No. 3 meander belt (coincidentally, this same number applies to this meander belt in both the 1974 and in-press terminologies) when Troyville culture began, and abandoned it around A.D. 700 (e.g., around the Troyville–Coles Creek transition), for the No. 4 (No. 2 in the new terminology)

TABLE 2

PHASES OF TROYVILLE CULTURE IN THE HEARTLAND REGIONS

Date	Lower Red River	Tensas Basin	Lower Yazoo
A.D. 600			
	Fort Adams	Marsden	(not Troyville)
A.D. 450			
	Black River	Indian Bayou	Little Sunflower
A.D. 300			

TABLE 3

PHASES OF TROYVILLE CULTURE IN OUTLYING AREAS

Date	Catahoula	Lower Ouachita	Natchez Bluffs
A.D. 600			
	Old Creek	Atkins	Hamilton Ridge
A.D. 450			
	Mannon	Harrelson Landing	Indian Bayou
A.D. 300			

belt. This would have been a change from a meander belt flowing into the Mississippi just south of Marksville Prairie (and the modern meander belt) to one that flowed southeasterly from the Alexandria vicinity, through the Atchafalaya Basin, to the Gulf. The geological revision (Autin n.d.; Saucier, personal communication), though, will express uncertainty about the dates of these belts. Meanwhile, Pearson (1986) suggested on the basis of archeological site distributions that the Red River has been in its modern meander belt since Marksville times. If so, the Lower Red River course would have flowed through the south-central portion of the Troyville territory.

Phases. Belmont (1982c:Figure 3) defined five phases in three regions in his concept of Troyville culture in its heartland, as shown in Table 2. He incorporated the Deasonville phase (cf. Phillips 1970:546ff, 907) of the Lower Yazoo Basin into his chart, but not as a phase of Troyville culture; he assigned it to Baytown culture instead. Nevertheless, he did include the Western Deasonville complex along the east bank of the Mississippi River (Phillips 1970:907–908) in Troyville culture (1982c:78). Later (1982c:94), he referred in passing to the "upriver...neighboring Deasonville culture," implying that he would restrict Deasonville, whether it be phase or culture, to the regions east of the Mississippi River. In contrast, Gregory et al. (1987:43–46, 79, 90–91) brought the Deasonville concept as far southwest as the Catahoula Basin. Clearly, the Deasonville question has not yet been satisfactorily resolved; although it refers primarily to sites in Mississippi and out of the present study area, its unresolved status contributes to the conceptual muddling of several cultures, especially Troyville.

Belmont (1982c:78) brings several phases and isolated components in outlying regions into his discussion. The phases are summarized in Table 3. The Harrelson Landing and Atkins phases were assigned to the Troyville culture period by Gibson (1977, 1983b:Figure 6). Harrelson Landing is included here, although it was not mentioned by Belmont. The Indian Bayou phase was primarily defined in the Tensas Basin but extended to the Natchez Bluffs in some LMS publications. Belmont's (1982c:Figure 3) chart also included the Marsden phase (from the Tensas) in the Natchez Bluffs, but his text discussion referred to the Hamilton Ridge phase in the latter region, so it is substituted for Marsden in Table 3.

The isolated components of Troyville culture cited by Belmont (1982c:78–79) are listed here in north-south order. The northernmost is the one at the Powell Canal site (House 1982b; Belmont 1982b) on Bayou Macon in southeasternmost Arkansas. The Gold Mine burial mound site in the Boeuf Basin is still relatively isolated, with its regional context poorly understood, despite recent surveys in the vicinity (Fuller and Williams 1985:15). The Fredericks site, near Natchitoches, has been known for some time (Ford 1936b:235–237), and marks the farthest extent of Troyville culture up the Red River Valley (Gregory and Curry 1978). To the south, in the "Atchafalaya region," Belmont included a component at the Bruly St. Martin site (Springer 1976; cf. Neuman 1984:194–196), and another at the (unpublished) Miller site.

Key Sites. The (as usual, atypical) type site is the Troyville site itself (Figure 14), located just below the confluence of the Ouachita and Tensas rivers, which forms the Black River, where the latter is joined by Little River (which drains Catahoula Lake). It may have had as many as 13 mounds, including the "Great Mound," enclosed by an L-shaped embankment (Walker 1936; Neuman 1984:169ff). The last remnants of the "Great Mound" were partially salvaged in 1931 (Walker 1936). In 1974, brief emergency salvage excavations were conducted by the East Central Louisiana Archaeological Society when it was learned that stabilization efforts by the Vicksburg Corps of Engineers would affect a portion of the remaining midden (Hunter and Baker 1979).

The second type site is Greenhouse (16AV2), which had seven mounds arranged around a plaza, located just below the Prairie terrace (Avoyelles Prairie) edge and just north of the Marksville site. It was mapped by Fowke (1928:Plate 64), excavated extensively by the WPA–LSU project in 1938, and reported upon by Ford (1951), providing the original definition of the Troyville culture period. Belmont (1967) revised Ford's interpretation of the Greenhouse situation, suggesting that only the early midden ridges, arranged in an oval around a plaza, belonged to the Troyville occupation, and that the mounds were Coles Creek constructions.

Ford's (1935c) Peck site also had what would now be considered a Troyville component (Belmont 1982c:66-68). However, no modern reanalysis of the Peck materials has been published.

The most recent type site (Belmont 1982c:80) is Gold Mine (16RI13), in southern Richland Parish on an extension of Macon Ridge overlooking an old channel of Big Creek, a Boeuf River tributary. A low burial mound there was partly excavated by amateurs in 1978, resulting in the recovery of two remarkable human effigy vessels assignable to the Quafalorma Red and White type (Jones 1979). In 1980, excavations were expanded, with partial funding from a National Science Foundation grant, with physical anthropologist Jerome C. Rose of the University of Arkansas–Fayetteville as principal investigator and Belmont supervising in the field. Belmont's (1982c) article included a preliminary summary of the findings.

The Mount Nebo site (16MA18), on a natural levee of the Tensas River west of Tallulah, northeast Louisiana, had an eight-stage flat-topped mound which was threatened by Interstate 20 highway construction, and was excavated by George Percy in 1968–1969, in a project directed by Neuman for LSU and the Louisiana Department of Highways. No site report has yet been published, but the findings, which included almost 100 burials, were summarized by Giardino (1982) and Neuman (1984:204–207). It appears that the earliest two stages may be attributable to the Troyville and/or Coles Creek culture(s).

A short distance to the south of Mount Nebo along the Tensas are two sites with burial mounds, Indian Bayou (16MA9) and Fool River, both investigated by Moore (1913: 39–42). Both sets of burials were probably mainly attributable to Troyville peoples (Jeter et al. 1979:39).

Another interesting mortuary site is Old Creek, on the tip of a ridge overlooking the western margin of Catahoula Lake. It was excavated by untrained diggers in the late 1950s, but some information has been salvaged by Gibson (1982c).

Lake St. Agnes (16AV26), a mound site with a habitation midden on the Lower Red River floodplain about 18 km northeast of Greenhouse, was tested and partially excavated in 1972 by Toth, with private funding (Neuman 1984:265) and the support of Neuman and LSU. It was a multicomponent site (Issaquena–Troyville–Coles Creek–Plaquemine), as summarized in a brief report by Toth (1979).

In addition to Troyville and Greenhouse, Phillips (1970: 910, Figure 445) listed and mapped five other sites in this general region with "Troyville phase" components. These included Marksville and the nearby Baptiste site (16AV25), both of which were excavated in the 1930s and are known to also have Marksville components, but have never been reported upon in detail. The Baptiste materials and field notes are currently being analyzed by Ann Whitmer (personal communication), for a thesis in the LSU Department of Geography and Anthropology.

Phillips (1970:907–908) only used Western Deasonville as an interim phase to include a few sites along the Mississippi, and did not discuss them. Belmont (1982b:105) noted the "unfortunate" connotations of the name of this phase and suggested that an eventual change would clarify matters; he also stated that his reexamination of ceramics from the important Manny site indicated that it should be included in the Troyville-affiliated Western Deasonville phase, rather than in Deasonville proper as Phillips had done. However, Belmont did not provide any evidence for this judgment in that brief review. Phillips (1970:616–753) published an extensive and well illustrated description of his (and Greengo's)1954–1955 excavations at Manny and the artifacts recovered there, and although his presentation emphasizes the earlier Issaquena component, his Deasonville materials are worthy of reexamination.

The Bruly St. Martin site (16IV6) in Iberville Parish is a Troyville–Coles Creek site in the northern margin of the coastal zone in the Mississippi River delta.

Settlement Data. As noted by Belmont (1982c:88), Troyville-related research has emphasized excavations at mound sites and burial sites. The most remarkable of all, of course, is (or rather, was) the Troyville site itself (Walker 1936; Hunter and Baker 1979). As summarized by Neuman (1984:170ff), this was a group of at least 13 mounds, in a 400-acre enclosure demarcated by an L-shaped embankment and the juncture of the Black and Little rivers. The site was dominated by the Great Mound, which consisted of two stepped terraces, surmounted (if early nineteenth century reports are to be believed) by a unique cone-shaped earthen tower giving it a total height of about 80 feet. The site has been severely damaged by Civil War earth moving, floods, and the growth of the town of Jonesville (formerly Troyville), but during its florescence, may well have been the major site in the Lower Valley (Belmont 1982c: 89–90; Gibson 1983d:323–324). However, the truly tragic destruction of the Great Mound, and of much of the rest of this site, makes it unlikely that we will ever know with much certainty how much of the Troyville site actually flourished during Troyville times, and how much really was added during the Coles Creek period, if not later.

Beyond the type site itself, Belmont (1982c:88–89) has suggested that a hierarchy of site types existed. The second rank (after Troyville) included several multimound centers in the Upper Tensas region. These tended to have oval plazas, ringed with relatively low and small mounds.

The third rank would include sites with one to a few small mounds, used for mortuary functions. The single mound at Gold Mine and perhaps the earliest stages of the mound at Mt. Nebo might fit this category. It is also noteworthy that these sites have provided evidence for very early flat-topped platform mound construction (Belmont 1982c:83). Some of these sites, such as Gold Mine, may not have had permanent inhabitants but perhaps simply served as mortuary centers for surrounding populations.

The final tiers in the hierarchy would consist of habitation sites and extractive sites, with at least some sites fulfilling both functions. Although Belmont (1982c:88) stated that all tested or excavated Troyville sites had been "mound sites with nonlogistic functions," this is not quite correct. Belmont himself (1982b) included the Powell Canal site in the Troyville culture; although this site had a small mound near its southern margin, the mound's cultural affiliation has not been determined, and the excavations, conducted some 130 m north of the mound, produced ample evidence of seasonal subsistence functions (House 1982b). Also, according to Belmont's own reanalysis, the Greenhouse site, despite the presence of Coles Creek mounds, had only midden ridges rather than true mounds, during its Troyville occupation (Belmont 1967, 1982c:83). It seems clear already that these nonmound sites could be further subdivided into several types.

Despite the evidence for some kind of site type hierarchy (or at least, differentiation), Belmont (1982c:88–90) stated that there is "no present unequivocal evidence for social stratification in Troyville culture" on the basis of mortuary data (see below). Elsewhere (1982c:94), he suggested that there was apparently a "more egalitarian social structure than in preceding or succeeding periods."

One intriguing Troyville feature type, with possible implications for social structure, is the bathtub-shaped pit. Nine of these were found at Greenhouse in a late Troyville context (Ford 1951:104–105; Belmont 1967). One more was found at Gold Mine, in an early Troyville context (Belmont 1982c:86–88). Both Ford and Belmont have suggested that they were large cooking or barbecue pits, and the presence of charred deer bone in the ashy pit fill at Gold Mine supports this inference. Belmont (1982c:88) suggested that such pits, "especially the long row of them at Greenhouse, imply large scale feasting activity," perhaps in ritual contexts.

Subsistence Data. As was noted in the Baytown culture discussion, Williams and Brain (1983:404, in a section written during the 1970s) speculated about the "continuing development of a maize agriculture subsistence base" during the Baytown culture period. Although data are scarce from Troyville sites, those that do exist fail to support this suggestion at all. In addition, comparative data from coeval cultures in other regions, especially to the north, tend to make such a speculation highly unlikely.

The most intensively researched Troyville site with regard to the question of maize subsistence is one of the northernmost, Powell Canal (House 1982b). Flotation of samples from nine features (King 1982b) produced no maize, nor any other cultigen remains, but did yield evidence for a primary early summer occupation, with some late summer to fall and early winter occupation. Furthermore, bioarcheological analysis of dentition (Blaeuer and Rose 1982:78–84) indicated that agriculturally derived carbohydrates such as maize were not consumed in significant amounts. The subsistence evidence instead suggested that this site functioned primarily as a seasonal fishing camp (Carr 1982; House 1982b:88–92).

Although the faunal remains from the Gold Mine site have not been analyzed, Belmont (1982c:90–91) noted that preservation was generally excellent there, and that although deer bones were "overwhelmingly predominant," there was "a strong emphasis on aquatic resources," with "oddly few or no waterfowl remains." He also stated that, although shellfish remains here and at other northeast Louisiana Troyville sites were not comparable to those in the contemporary Deasonville shell middens of the Yazoo Basin and did not represent a primary food resource here, they were nevertheless utilized "far more in Troyville than in any other culture [in northeast Louisiana] for which subsistence data [are] available." The only vegetal remains noted in the field were charred (hickory?) nuts.

In the "fire level" at the base of the Great Mound at Troyville, Walker (1936:38–39) recovered "along with the bones and pottery fragments...many traces of seeds, leaves, stems, etc., of a great variety of vegetable substances." He sent these to specialists in Washington, who identified 38 plant species; Walker commented:

> only the grapes, berries, gourd, and possibly the Nightshade and Passion flower are considered edible. The most striking omission, of course, is any mention of maize, but as the cache pits of the village were not located, nor the fields belonging to it, this does not necessarily prove that maize was not grown here. (1936:39)

This relatively early effort to identify plant remains must be credited to Walker as another of his pioneering achievements. He also noted (1936:38) that despite the quantity of animal bones, a "surprisingly small" number of species was identified. Deer dominated; small mammals, birds, and fish were present, along with a few mussels. Walker called attention to the absence of dog and bison bones. The 1974 tests in the Atkins midden at Troyville yielded only a few bones, mainly deer (Hunter and Baker 1979:45); apparently, no plant remains were recovered.

At the Bruly St. Martin site (16IV6) in Iberville Parish, Springer (1975,1980) found that large fish such as catfish and gar were the most important component of the diet, followed by mammals including deer, bear, muskrat, and raccoon, with birds (coots, ducks, geese, and cormorants) and reptiles making up the balance. Also, he recovered the following plants: persimmon, grape, wild bean, and chokeberry.

Mortuary Data. Documentation on burials is fairly abundant, if of variable quality, for Troyville sites. At the northernmost, Powell Canal, four burials were recovered (House 1982b: 29–31) and analyzed (Blaeuer and Rose 1982). All were extended with heads to the east, and had little in the way of grave goods. Two were supine, but the other two were prone. As noted by Phillips (1970:591), prone burials were fairly common during this time period (but probably not diagnostic of it; cf. Morse 1973:2; House 1982b:30–31).

The 40 burials in Stage F, near the base of the Mt. Nebo mound, were somewhat ambiguously attributed to Early Coles Creek/Troyville or Early Coles Creek peoples by Giardino (1982:99, 102, 122), but he compared the ceramics associated with this stage to assemblages dated elsewhere in the A.D. 400s to 600s (1982:102). These burials contrasted with a late Coles Creek group in the same mound, in that they exhibited "a marked tendency" toward the extended-prone position, with the head to the south (1982:116–118). Bundle burials were also found (1982:Table 2).

At Indian Bayou, Moore (1913:40–42) found at least 44 individuals buried, mostly extended, in a low mound. He only recovered two vessels, which were not illustrated. Belmont (personal communication; cf. Jeter et al. 1979:39) suggested that these burials were assignable to the Indian Bayou phase (early Troyville), for which this is the type site.

At the Fool River site, Moore (1913:39–40) excavated the remains of at least 66 individuals. Most had apparently been extended supine, but many were disturbed. No artifacts were found, but Belmont (1979 personal communication; cf. Jeter et al. 1979:39) suggested that these burials be assigned to the Marsden phase (late Troyville).

The Gold Mine site mound, less than 50% excavated, has yielded at least 150 burials attributed to Troyville culture (Belmont 1982c:83–85). Many were secondary, or partially disarticulated, perhaps representing periodic emptying of a charnel repository; others were extended and "usually supine" (the prone position was not explicitly mentioned). Dog burials were present, as well. Only a few grave goods, as usual for Troyville sites, were found, but they included the remarkable Quafalorma Red and White ceramic figurine vessels (Jones 1979; Belmont and Williams 1981:29–31, Figures 8 and 9), plus two other vessels and a conch shell cup. They were not associated with any one burial, and may have been "general offerings" (Belmont 1982c:85).

At the Troyville site itself, Walker (1936:32–35) excavated in a nonmound cemetery area and found three burials. One was a single young female extended supine; a second included two adults extended on the back and side; and the third included nine individuals of varying ages and both sexes, extended and parallel but otherwise indiscriminately arranged. Unfortunately, Walker had to stop these excavations due to intensive vandalism. No burials were found during the 1974 salvage work at Troyville (Hunter and Baker 1979). Belmont (1982c:90) emphasized the paucity of mortuary data from this great site and noted that data from Troyville itself "might radically alter the picture" of generally egalitarian burials that now exists for the culture.

A unique situation was encountered at the Old Creek site (Gibson 1982c). An ossuary, which may have been a small mound, was excavated by untrained diggers, who found at least 41 burials and 26 ceramic vessels. These finds contrast with the usual scarcity of grave goods at Troyville sites and emphasize "the hazards of generalizing about Troyville" (Belmont 1982c:85). The Old Creek burial program was dominated by bundles and isolated skulls (Gibson 1982c:137–148, Figure 3). The vessels were mainly Baytown Plain, but included several variants of other Troyville types, including one unique deep bowl with a Churupa Punctated decoration encircling the rim, and a Mulberry Creek Cord Marked body (Gibson 1982c:158–159, Figure 9). In his concluding remarks, Gibson (1982c:196) emphasized the "lack of uniformity in Troyvillian burial practices."

At Greenhouse, although the basic burial descriptions were provided by Ford (1951:36–37,41–45, Tables 1 and 2, Figure 11, Plates 5a–b), the ceramic reanalysis by Belmont (1967) refined the contexts. According to Belmont, during the Black River phase (early Troyville), the site consisted of a long oval plaza, defined by low midden ridges which contained secondary or bundle burials without grave goods. During the Fort Adams phase (late Troyville), one of these midden areas appears to have been set aside as a cemetery. There, burials were extended or semifexed, often accompanied by dog burials (11 in all), but not by artifacts.

The Baptiste site yielded seven Troyville burials (Rose, personal communication).

Exchange and External Relationships. According to Belmont (1982c:92; cf. also Williams and Brain 1983:404, Figure 12.10), a "shift in external relations" occurred in late Marksville (i.e., Issaquena) or early Troyville times:

> While Marksville culture has abundant ties to Midwestern Hopewell, in Troyville the important relationship is with cultures on the Gulf Coast of Florida. The first tangible evidence of trade was found in 1980 [at Gold Mine]: the conch shell cup. The ceramic parallels with early Weeden Island are manifold—the human effigy vessels, an animal rim effigy, the red slipping and red and white painting (Belmont and Williams 1981).... Weeden Island-like vessels are found not only at Gold Mine, but north as far as Greenville and Greenwood in the Upper Yazoo Basin. Troyville is a participant in a widespread exchange network centering on northwest Florida. The Floridian parallels diminish in late Troyville and disappear thereafter. (Belmont 1982c:92–93)

This interaction network is also evident in the reverse direction, in the common occurrence of cord-marked ceramics in Troyville assemblages. Mulberry Creek Cord Marked overwhelmingly dominates the more or less contemporary Deasonville assemblages in the Yazoo Basin, although it appears to be more a surface-roughening technique than a decoration there (Belmont 1982b:105). It drops off in popularity, apparently in a clinal pattern (cf. the contour map of its frequency published by Phillips et al. 1951:Figure 7), but increases in decorativeness, going down the Lower Valley, and it is absent in the coastal zone (Phillips 1970:911).

Coastal Troyville-Coles Creek Culture

Definition and Location. The nature of prehistoric developments in the coastal zone during the time span between late Marksville (Issaquena) and Plaquemine cultures is not well defined. This transitional period was first termed the Troyville period after the cultural unit derived from the Red River mouth sequence (Ford 1951), but the concept was discontinued by Phillips (1970), and Baytown was substituted as a catchall name for this period (cf. Gibson 1978:34). However, as previous researchers have noted, because of the similarities and overlap in ceramics and other characteristics, there is little basis for separating Troyville from Coles Creek geographically or temporally on the coast in terms of cultural criteria (McIntire 1958; Saucier 1963; Phillips 1970; and Gibson 1978). Because of the difficulty in separating the two units in this period, Coastal Troyville–Coles Creek will be used (cf. Neuman 1984a:169) to designate this broad period intervening between Marksville and later Plaquemine and Mississippian cultures from approximately A.D. 400 to 1000.

The Troyville culture subdivision marks a poorly defined stylistic transition from the late Marksville to Coles Creek between about A.D. 400 to 700. Rather than a clear association of a unique artifact assemblage, Troyville is based on the presence of pottery types previously identified as late Marksville (Issaquena) and Coles Creek. Gibson (1975:17) notes that the pottery styles carried over from Marksville–Issaquena are mainly in the everyday utilitarian ware category, and that stylistically these ceramics were modified somewhat. These Baytown pottery types consist of coarse, utilitarian wares with limited decorative treatment that are difficult to distinguish from later Coles Creek ceramics (Gibson 1978:34; Williams and Brain 1983:404).

Phillips (1970:908, 910), however, suggested that several innovations in ceramics were made at this time. Pottery development during this period continued to show the influence of both the upper Mississippi River valley as well as the eastern Gulf Coast. A greater diversity and durability in ceramics is indicated by clay tempering used in the manufacture of specialized rounded and barrel-shaped jars, and both shallow and deep utilitarian bowls (Pearson and Guevin 1984:27). Other new ceramic types that emerged during this period are red painted, banded red painted, and zoned cursive incised types (Gibson 1975:17).

Other innovations include the use of smaller stone projectile points or bone, antler, and wood points which appears to signal the advent of the bow and arrow. At the late Coles Creek period Morgan site in the Petite Anse region, excavations by Fuller and Fuller (1987) yielded socketed bone points, a flaked bone point, bone awls, and cut deer tines and antler flakers. They also reported a limited number of lithic tools, including a biface and five Alba Stemmed type arrow points. The increased accuracy achieved with the bow and arrow during the Troyville–Coles Creek period undoubtedly had a positive impact on the procurement efficiency of the coastal focused economy and probably contributed to greater village sedentism and autonomy (Gibson 1978:36).

Much more information on the material culture, religion, subsistence, and settlement patterns is available for the subsequent Coles Creek period subdivision of the Coastal Troyville–Coles Creek culture, dating from about A.D. 700 to 1000 (cf. Brown 1984). The Coles Creek period was apparently a time of general population increase, sedentary small village life, the development of large socioreligious ceremonial temple mound centers, and heavier reliance on horticulture, possibly including corn agriculture in some areas (Weinstein and Gagliano 1985:138). Gibson (1978:34–40) equated the ceremonial and social elaboration of Coles Creek with the emergence of chiefdoms after the apparent collapse and reversion back to simple tribal levels of organization during Troyville times. Despite this, the lack of evidence of large political and ceremonial centers and the continued dominance of the small shell midden site type suggests that the basic Archaic pattern of estuarine *Rangia* bed habitat exploitation and simple political organization still continued during Coles Creek times on the coast (Gagliano et al. 1978).

A review of the distribution of Troyville–Coles Creek components across the state, compiled from data published in the Comprehensive Archaeological Plan (Smith et al. 1983:Tables 1 and 5), appears to reflect the general population increase reported for this period. Approximately 192 components out of 595 are situated in parishes along the coast. A large number are situated in Jefferson Parish (36) and in the western part of the coast (46), while the area around Lake Pontchartrain has a low number of components, particularly north of the lake where only four are reported (Appendix B). As with previous culture periods discussed above, the portion of the Mississippi River between Baton Rouge and the western edge of Lake Pontchartrain is marked by generally low frequencies of sites.

Paleoenvironmental Data. During this interval, delta formation continued in the eastern part of the valley, adding to the overall southeastward trend of the Mississippi delta. During this period, the foundations of the present-day trunk channel of the lower Mississippi River below New Orleans were created, and Lake Borgne, which was forming between the Pine Island Beach Trend and the St. Bernard Delta, nearly reached its present size (Gagliano et al. 1978:4–31). With the establishment of the Mississippi trunk channel, there was a reduction of freshwater flow through the des Familles–Barataria courses, resulting in some subsidence and erosion of the distal ends of these deltaic systems. Other major distributaries such as the Lafourche and Terrebonne bayous continued to contribute flow and build subdelta lobes seaward (Weinstein and Gagliano 1985:143).

Phases. There are currently two phases defined for this period on the coast of Louisiana: Whitehall and Roanoke. The Whitehall phase was formulated by Phillips (1970:911) for Baytown period sites along the eastern half of the coast recorded during the survey by McIntire (1958). The Roanoke phase was later defined for coeval sites in the western half of the coast on the basis of excavations at the Strohe site in Jefferson Parish by Bonnin and Weinstein (1978). The relationship between the Whitehall and Roanoke phases is unknown, and beyond the gross geographic boundaries, the criteria for separating these two phases have not been worked out.

The temporal separation of Troyville and Coles Creek is also unclear. Phillips (1970:911), for instance, noted that the most reliable ceramic indicator of his Baytown period, Mulberry Creek Cord Marked, is practically nonexistent in the delta, and other useful pottery types such as Larto Red and Woodville Zoned Red are present only in low frequencies. For the most part, Phillips was only able to separate Whitehall phase sites in the Mississippi delta from earlier Marksville and later Coles Creek components on the basis of negative information. The Whitehall phase is distinguished from Marksville on the basis of the presence of Troyville Stamped, Yokena Incised, or Churupa Punctated and the absence of Marksville Stamped or Marksville Incised. Whitehall was differentiated from later Coles Creek by Phillips on the basis of the presence of the pottery types Mazique Incised, French Fork Incised, Chevalier Stamped, or Chase Stamped and the absence of Coles Creek Incised or Pontchartrain Check Stamped. Phillips explained that: “The theory is that in the first case occupation is not early enough to be in the Marksville period, in the second not late enough to be Coles Creek.” (1970:911).

Although only one coastal phase of Coles Creek culture, the Bayou Cutler phase, had been defined at the time of Phillips’s synthesis of the Lower Mississippi Valley (1970:920–922), extensive research since 1970 on the Coles Creek period sites has resulted in the formulation and refinement of six phases (Figure 11). These include Bayou Cutler, Bayou Ramos, Welsh, Jeff Davis, White Lake, and Morgan (Brown 1984:97). In the eastern region of the coast, the Bayou Cutler phase represents early Coles Creek and the Bayou Ramos phase late Coles Creek. In the central portion of the coast, the sequence defined in the Petite Anse region includes the White Lake phase for early to middle Coles Creek (ca A.D. 700 to 900) and the Morgan phase for late Coles Creek (ca A.D. 900 to 1000). In the western coastal area, the Welsh phase is temporally equivalent to Bayou Cutler, and the Jeff Davis phase represents later Coles Creek components. Brown (1984) provided a discussion of the ceramic criteria for the separation of the early and late phases.

It should be noted that the study of prehistoric pottery in southwestern Louisiana has long labored to place the local stylistic trends within the context of ceramic complexes worked out for better known regions such as the Red River mouth and the central Texas Coast (Goodwin 1986:20). However, the inability of either sequence to fully account for the ceramic variability in the chenier region has been noted by many previous researchers (cf. Gibson 1975; Burden et al. 1978; Weinstein et al. 1979; Springer 1979; Aten 1983; Goodwin 1986). The heart of the problem may be the fact that the chenier region functioned on the margin or boundary between cultural centers on the Texas coast and the Lower Mississippi Valley and assimilated influences variously from both centers (Burden et al. 1978; Weinstein et al. 1979; Aten 1983). Gibson (1978) noted a similar lack of fit of the Red River Mouth-derived ceramic sequence with the Atchafalaya Basin region.

This classificatory problem is most evident for plainware pottery, which often constitutes 90% of the ceramic types on Coles Creek period sites in the chenier region. Aten (1983) proposed that all grog-tempered plainware should be classified as Baytown Plain and all sandy paste plainwares should be typed as Goose Creek Plain. However, this results in the creation of a polymodal ceramic popularity curve for the Goose Creek type over the almost two millennia of its existence with the type Baytown Plain interrupting the popularity of the sandy paste variety during Coles Creek times. Goodwin (1986:31) argued that the bimodality of Goose Creek ceramics may be a real indication of the initial acceptance of new ceramic modes from the Coles Creek culture followed by the failure of the Coles Creek agricultural economy in the southwestern area and rejection of the diffused ceramic complex in favor of the readoption of the traditional Goose Creek ceramic style.

Key Sites. Undifferentiated or poorly differentiated Troyville–Coles Creek sites are known throughout the coastal zone of Louisiana. Research at a number of these sites has contributed much to our understanding of the Troyville–Coles Creek culture history and lifeways (Brown 1984). Some of the important sites from this period include the Mulatto Bayou site (16SB12) in St. Bernard Parish investigated by Wiseman et al. (1979), and the Gibson Mound Complex (16TR5) in Terrebonne Parish (Weinstein et al. 1978). The Veazey site (16VM7) situated on Pecan Island in Vermilion Parish is a Marksville mound site containing a veneer of Coles Creek artifacts (Brown 1984:100).

The Morgan site, located on the Pecan Island chenier in Iberia Parish, is the only Coles Creek mound complex in the central Louisiana coastal Petite Anse region (Brown 1984; Fuller and Fuller 1987). Other Troyville–Coles Creek period sites in the Petite Anse salt dome region include Morton Shell Mound (16IB3) in Iberia Parish (Neuman 1972; Robbins 1976; Futch 1979) where analysis of human and faunal remains has provided one of the best studies of subsistence patterns and human ecology. In the western portion of the coast of Louisiana, excavated Troyville–Coles Creek sites include the Strohe site (16JD10) in Jefferson Davis Parish (Bonnin and Weinstein 1975, 1978), the Pierre Clement site (16CM47) in Cameron Parish (Springer 1979), and site 16CM61, also located in Cameron Parish (Goodwin 1986).

Settlement Data. Partly owing to the broad time frame of the Troyville–Coles Creek period and the lack of regionally based studies, our understanding of coastal settlement patterns for this period is limited. In general, the high frequencies of sites recorded indicate a population zenith in most areas of the coast. Sites ranging in size from small collecting stations to moderate camps or hamlets, to large village and mound sites have been documented in the eastern river delta, central salt dome region, and western chenier zone during this period (Gagliano et al. 1978; Wiseman et al. 1979; Brown 1984).

In the inland areas north of the coastal zone, the later Coles Creek period subdivision is marked by the emergence of large sedentary villages and ceremonial complexes containing flat-topped pyramidal mounds associated with intensive horticulture. However, the coastal adaptation of Troyville–Coles Creek culture, particularly the Troyville period subdivision, appears to have focused on the wetland estuarine environment in a manner similar to that seen in previous coastal Archaic and Woodland coastal traditions. In fact, Gibson (1975, 1978) views Troyville as the culmination of the basic coastal wetland focus that had its roots in the Archaic period.

The settlement system of the later Coles Creek groups apparently focused on a much broader range of environments suggesting that Coles Creek was more adaptable to varied environmental conditions than the preceding Troyville. The intensification of horticulture mainly in the inland areas during the Coles Creek period may have resulted in an increased use of the fertile natural river levees of the upper delta where slash-and-burn agriculture would have been feasible. The mound complexes on these natural levees may have served as ceremonial centers for surrounding horticulturally based villages analogous to the hierarchical central town arrangement documented for later Southeastern chiefdoms (Gagliano et al. 1975; Gibson 1978). Under this model, the central town or ceremonial center where political managerial power resided controlled the timing of the planting and harvesting cycle of the smaller villages and hamlets nearby (Gibson 1978:39).

However, in the estuarine areas on the coast where the conditions for horticulture were not favorable, the Coles Creek inhabitants probably remained impervious to the changes occurring further inland and continued the basic coastal hunting, fishing, and gathering pattern as practiced since the Archaic (Gibson 1978:38). The *Rangia* shell and earth midden sites of the Coles Creek period are, with the exception of different pottery types, very similar to coastal sites of the preceding Troyville period (Gibson 1978:40). Although the natural cyclical deltaic geomorphological and environmental changes necessitated shifts to new landforms, the range of microenvironmental zones chosen for settlement remained basically unchanged from the Archaic economic tradition. As Gibson noted, in the coastal estuarine zone, the result of the emergence of Coles Creek in the latter end of the Troyville–Coles Creek period was "a perpetuation of an Archaic lifeway onto which was grafted a ceramic complex indicative of widespread style sharing during the interval from A.D. 900 to 1200." (1978:42).

Subsistence Data. Brown (1984) reviewed the subsistence evidence for the Coles Creek period on the coast of Louisiana. Analyses of floral and faunal remains from sites of this period reveal many similarities with the subsistence patterns of earlier prehistoric coastal cultures. In addition to the ubiquitous *Rangia* remains found on shell midden sites, researchers have documented fish, mammals, reptiles, and birds in Baytown and Coles Creek period sites. At the Pierre Clement site in Cameron Parish in the western coastal zone, Springer (1979) found that mammals including muskrat, white-tailed deer, raccoon, weasel, and otter dominated with birds, turtles, and fish such as gar, bowfin, sucker, and freshwater drum also present.

Faunal analysis from site 16CM61, in Cameron Parish, showed fish to be the dominant vertebrate species taken with alligator, mink, muskrat, as well as *Rangia* clam also documented (Goodwin 1986:60). Analysis of seasonality using four fish otoliths and a sample of *Rangia* shell indicated deposition during the months of May to June, suggesting that the site was a fishing camp utilized from spring to early summer. Goodwin (1986:69) proposed that this evidence gives support to the notion that the models of seasonal transhumance for the historic Attakapas Indians (cf. Gibson 1975; Aten 1983) might also be relevant for the prehistoric precursors of the Attakapas as far back as the late Coles Creek period.

In the Petite Anse region of central coastal Louisiana, Futch's (1979) analysis at the Weeks Island site (16IB3) in Iberia Parish revealed fish to be the most common resource, followed by mammals, reptiles, and birds. The most common fish taken were bowfin, gar, freshwater catfish, buffalo fish, and bass. The primary mammals procured at the Weeks Island site were white-tailed deer, muskrat, and raccoon, with secondary species including opossum, swamp rabbit, eastern cottontail, and bobcat. A wide variety of reptiles were taken, including box turtles, pondsliders, mud turtles, common snapping turtles, and alligator snapping turtles. Bird species consumed included geese and turkeys. At the Morgan site (3462) on Pecan Island, faunal remains were also dominated by muskrat, deer, raccoon, mud and snapping turtles, and the bowfin fish. Secondary species included opossum, rabbit, gray wolf, otter, mink, bobcat, alligator, and various turtle, fish, and bird species (Brown 1984:107; Fuller and Fuller 1987:29).

Floral data for the coastal Troyville–Coles Creek period are limited. The floral analysis from the investigations at the Morgan site have not been fully reported, but the remains of various wild species including *Chenopodium* have been reported so far (Fuller and Fuller 1987). Although cultigens such as squash and corn have been recovered at Coles Creek sites further inland (Byrd 1978:16), only at Morgan have they been documented on coastal sites. This may merely reflect a sampling or preservation bias. Brown (1984) argued that horticulture probably did not play a major role in coastal subsistence strategies in the Petite Anse region until the Plaquemine period, although it is possible that some cultigens such as maize were attaining some importance as early as the Coles Creek period. Neuman (1984) also noted the lack of recovered corn, beans, or squash remains from sites of this period. He cautioned that few excavations have focused on the midden and habitation areas where such remains may be found and suggested that the early Troyville–Coles Creek culture probably had an incipient horticultural base.

Gibson (1978:38–42) argued that the Atchafalaya Basin served as a barrier to the westward spread of horticulture during this period and noted that the cheniers were first utilized intensively during this time; however, the Coles Creek groups in this area were apparently following a traditional hunting, gathering, and fishing existence rather than plant horticulture. The chenier area would not have been well suited to horticulture due to low soil fertility and the problem of salt water incursion resulting from storms and tidal surges (Gibson, personal communication, 1987).

Mortuary Data. Mortuary data for the coastal Troyville–Coles Creek period include investigations by Neuman (1984: 199–204) and Robbins (1976) at the Morton Shell Mound (16IB3) in Iberia Parish, and some limited work by Weinstein (1974) along the Lower Amite River. At the Bayou Chene Blanc midden, Weinstein excavated a flexed adult interred in the shell midden with no evidence of a burial pit and a secondary interment with cutmarks or incisions suggesting postmortem defleshing of the body. Two more flexed burials were recovered at the Diversion Canal site. No associated burial offerings were found at either of the two sites (Weinstein 1974), and other researchers noted the lack of grave accompaniments in either Troyville or later Coles Creek site contexts (cf. Pearson and Guevin 1984:27).

The only evidence of material offerings in Troyville–Coles Creek burial contexts comes from the Morgan site located in Iberia Parish. The recovery at this site of a carved antler human effigy possibly associated with a human burial is the only slim evidence so far of status burial offerings during the Coles Creek period. The effigy is socketed as if for mounting on a staff or baton and has been interpreted as a representation of the deceased or death in general. Since the provenience of the artifact and its relation to human burial remains at the site is uncertain due to the fact that it was recovered by a local resident from fill transported from Mound 2, its temporal and cultural affiliation is suspect (Fuller and Fuller 1987:31–32).

The largest and most detailed recovery and analysis of burial data comes from Robbins's (1976) work at the Morton Shell Mound where the remains of 275 individuals were excavated from the extensive shell midden deposits. The most common burial pattern found at this site consisted of secondary interment of one or more individuals with the bones found either loosely scattered or concentrated as in a bundle burial. In no case were all of the skeletal remains present, indicating that the bodies were probably exposed to the elements for a time, perhaps on a scaffold or other special shelter, until the flesh was decomposed. One unusual mortuary ritual documented at the site was the breaking of bones (both long bones and others) before final interment. The clean, unsplintered breaks in the bones indicate that they were broken after they had been defleshed and become dry. These bundles were then buried in the shell midden on a prepared surface of fine gray silt without funerary accompaniments (Neuman 1984:199–200).

Exchange and External Relationships. The earlier part of the Coastal Troyville–Coles Creek culture, the Troyville or Baytown period, would appear to be characterized by much less regional exchange and interaction than the later Coles Creek subdivision. Gibson (1978) maintained that Troyville represented the final conclusion of the conservative simple nonagricultural hunting and foraging Archaic lifeway. This continuity of the Archaic tradition, Gibson noted, survived throughout the region in populations isolated from the social and political developments achieved in certain restricted environments during the Poverty Point and Marksville periods (1978:34–35).

According to Gibson, Troyville groups were probably even more isolated, independent, and autonomous than the conservative Tchefuncte culture. For instance, in contrast to the Tchefuncte culture, the Troyville culture even lacked a means of acquiring lithic raw material and instead manufactured their tools out of wood, bone, and antler that could be obtained locally. Gibson (1978:34–37) saw the intensification of wetland zone specialization during Troyville times as a reflection of the interrelated effects of increased population, the diminution of intercommunity social and political ties, and increased sedentism and autonomy achieved by the efficiency resulting from the advent of the bow and arrow.

The growing importance of horticulture and the attendant development of a more complicated, chiefdom-level social/political management apparatus marks the emergence of the Coles Creek culture in the inland areas. However, this development may have bypassed the coastal marsh area where conservative groups participating in the Archaic hunting, fishing, and foraging lifestyle were insulated from such change (Gibson 1978:38–42). Whether for reasons of efficiency or isolation, the basic coastal Archaic lifestyle appears to have been maintained by the succeeding coastal Coles Creek culture despite the cultural and social changes taking place further inland. With the exception of shifts in pottery styles, Gibson (1978) saw little difference between coastal Troyville groups and coastal Coles Creek people in areas such as the Atchafalaya Basin. However, these new developments in pottery suggest that some degree of extraregional exchange was taking place involving coastal Coles Creek groups residing in the marsh zone of the coast.

One important exception to this general lack of evidence of the participation of coastal Coles Creek populations in the wider Coles Creek socioreligious network occurs at the Morgan site. This evidence consists of a human effigy carved from a deer antler that was recovered by a local resident from a load of fill obtained from the leveled Mound 2 (Fuller and Fuller 1987:31–32). Human bone was also reported from the fill, suggesting that the artifact may have accompanied the burial of a high ranking individual. Fuller and Fuller (1987:32) noted that the effigy shared some similarities with a ceramic human effigy from the Weeden Island culture Buck Mound site in Fort Walton Beach, Florida.

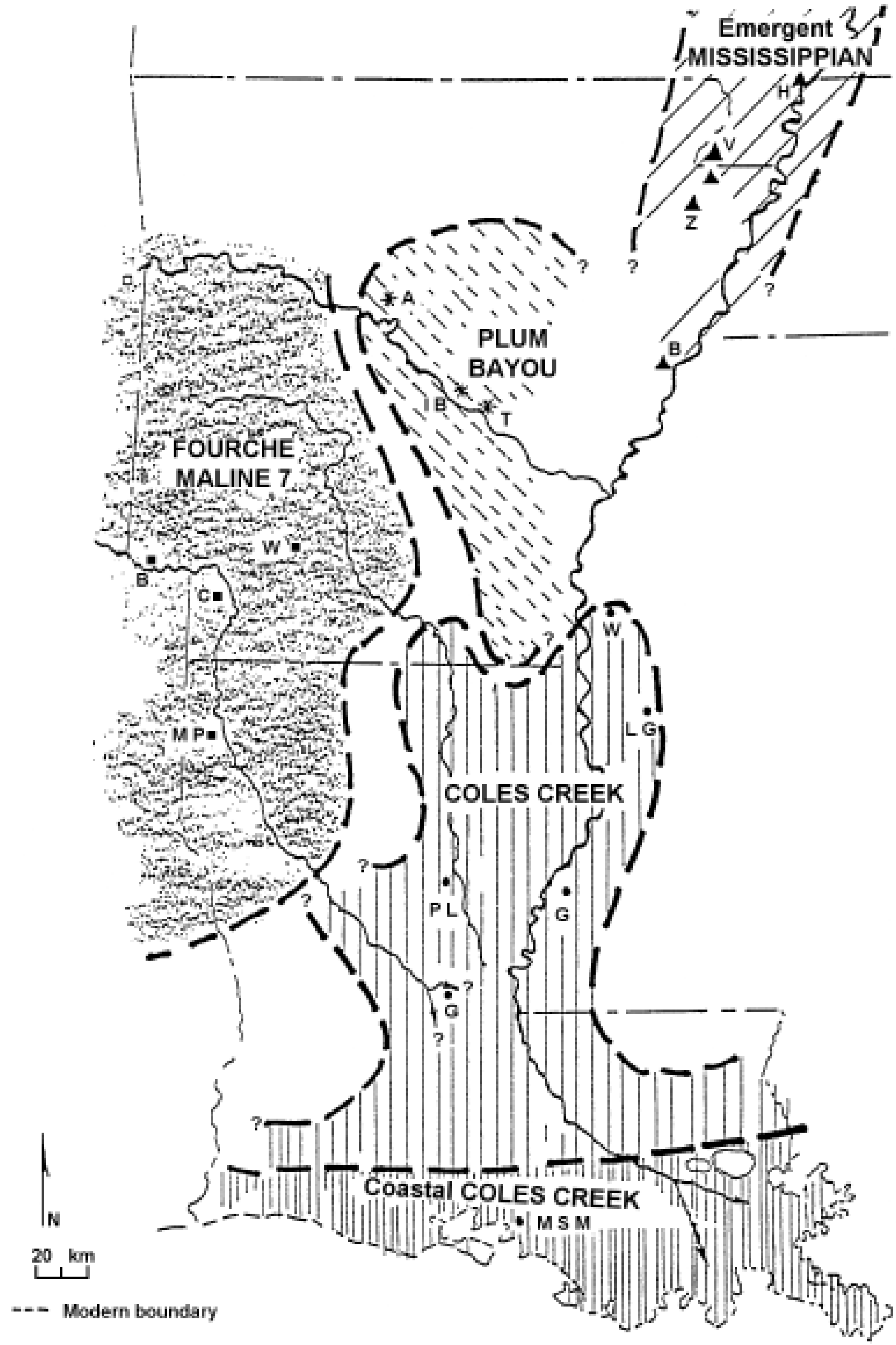
Ceramic data provide the clearest indications of long range relations and regional interaction between coastal Coles Creek culture groups with people to the interior north and other coastal populations to the east and west. Brown (1984), for instance, noted close similarities between Coles Creek Incised, *vars. Athanasio* and *Dozier* and the late Weeden Island type St. Petersburg Incised found on the Florida Gulf Coast. Another pottery type that occurs in high frequencies in Troyville–Coles Creek sites in coastal Louisiana is Larto Red, *var. Vaughn*, which is comparable to Pasco Red of central Florida and the central Gulf Coast. Varieties of complicated stamped pottery on the Louisiana coast such as complicated stamping, check stamping, the bulls-eye motif of concentric circles, the nested rectangles motif, and certain rim modes also share many similarities with types in the Florida Gulf region, Georgia, and Alabama (Neuman 1981; Brown 1984:107–122).

By far the designs most similar to the Louisiana types are associated with Weeden Island cultures in the Tampa Bay–Manatee regions of Florida (Brown 1984:122–123). The nature of the contacts between these two regions is unknown. Researchers in Florida equate the influence of Weeden Island related cultures with the spread of new ideas concerning maize agriculture (Milanich and Fairbanks 1980). Brown (1984), however, believed that the similarities could also have reflected contacts in other aspects of life such as ceremonialism, though he noted that the question was still unresolved.

THE A.D. 700–1000 PERIOD

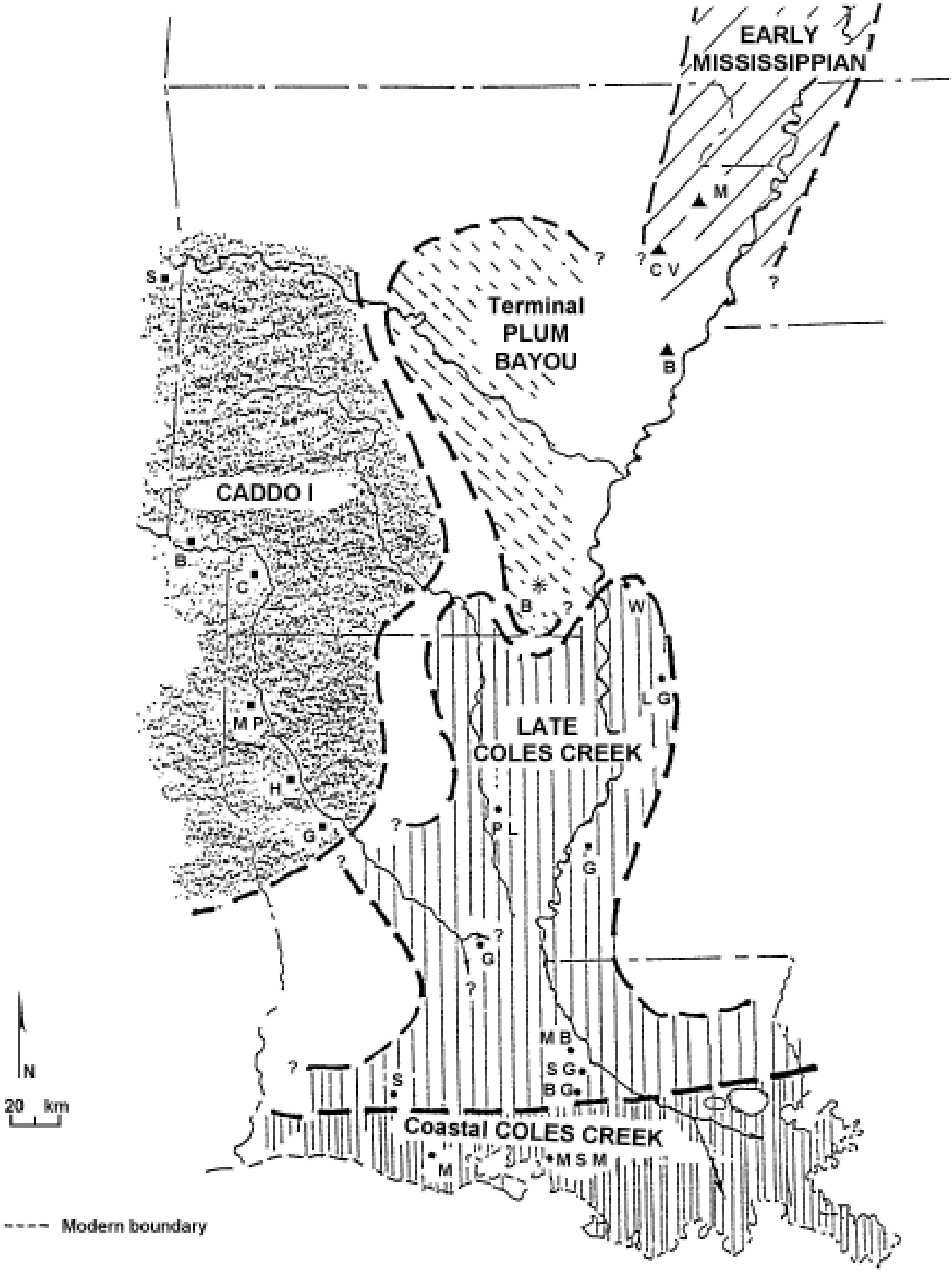
There would probably be general agreement that several crucially important changes took place during these centuries in prehistoric societies virtually throughout the present study area. In northeast Arkansas, the Emergent Mississippian culture replaced Baytown culture and began an evolution toward much more complex social organization. In central and much of eastern Arkansas, Plum Bayou culture continued its evolution, flourished, and devolved. In southwest Arkansas, northwest Louisiana, and adjacent portions of other states, the culmination of Fourche Maline culture and transition to Caddoan culture occurred. Over most of eastern Louisiana and adjacent Mississippi, Coles Creek culture expanded and consolidated. And, on the coast, a distinctive Coles Creek-like variant emerged. The geographical distributions of these cultures at the middle and end of this period, ca A.D. 850 and A.D. 1000, are mapped in Figures 15 and 16.

Although Holmes (1903) had in effect named the Middle Mississippi culture long ago, he was primarily referring to later Mississippian manifestations. The Emergent Mississippian concept relevant to this period has only developed in recent years (cf. Kelly et al. 1984). During the 1930s, Coles Creek culture was defined by Ford (1935c, 1936b). Phillips, Ford and Griffin (1951) did not use the Coles Creek terminology for their study area, which extended southward only to about



Key: **Emergent Mississippian culture sites:** H = Hoecake; V = Varney, Z = Zebree.
Plum Bayou culture sites: A = Alexander; IB = Ink Bayou; T = Toltec.
Fourche Maline 7 culture sites: B = Bowman; C = Crenshaw, MP = Mounds Plantation; W = Washington.
Coles Creek culture sites (inland): G (Mississippi) = Gordon (probably the original Coles Creek site); G (Louisiana) = Greenhouse; LG = Lake George; PL = Pritchard Landing; W = Winterville.
Coles Creek culture sites (coastal): MSM = Morton Shell Mound.
Other sites: B = Barrett (Walnut Bend phase, culture undefined); MP = Mounds Plantation (cultural status in question for this period).

Figure 15. Map of cultural distributions and key sites in and near the study area ca A.D. 850.



Key: **Early Mississippian culture sites:** B = Barrett; CV = Cherry Valley; M = Mangrum.
Terminal Plum Bayou culture site: B = Boydell.
Caddo I culture sites: B = Bowman; C = Crenshaw; G = Gahagan; H = Hanna; MP = Mounds Planation; S = Spiro.
Late Coles Creek culture sites (inland): G (Mississippi) = Gordon; G (Louisiana) = Greenhouse; LG = Lake George; PL = Pritchard Landing; S = Strohe; SG = St. Gabriel; W = Winterville.
Late Coles Creek culture sites (coastal): M = Morgan; MSM = Morton Shell Mound.

Figure 16. Map of cultural distributions and key sites in and near the study area ca A.D. 1000.

the Arkansas–Louisiana line. They did, however, suggest a correlation of Ford's Red River-based Coles Creek period with their Late Baytown period (see the Baytown culture discussion, above) and the early portion of their Early Mississippi period (1951:Figure 73). In a review of the Greenhouse report, Krieger (1952:179) also alluded to the Phillips et al. (1951) synthesis and complained about the "jumble" of cultural and period names that Lower Valley archeologists were using in discussions of this and later periods.

Phillips (1970:912ff) attempted to include the entire Lower Valley under the Coles Creek period rubric for essentially this same time span, excluding Mississippian cultures. But there is now a clear consensus that societies with significant differences in their artifact assemblages and other cultural attributes coexisted in the Lower Valley (not to mention adjacent areas) during this period, and a single culture period name is clearly inappropriate. The Morses (1983:200ff) labeled this the Mississippian Frontier period in northeast Arkansas, where Coles Creek culture is essentially absent. In intermediate regions, this situation has resulted in hybrid culture period names, such as House's (1982:Figure 4-2) designation of an Early Mississippi/Coles Creek period from about A.D. 800 to 1000 in east-central Arkansas, and Schambach's (1987) definition of the Cypress Swamp phase of the Late Coles Creek–Early Mississippi period from about A.D. 900 to 1000 in the Ouachita Valley of south-central Arkansas.

Syntheses by Smith (1986:50ff) and Steponaitis (1986:385–387) called attention to the significance of these changes, with different emphases perhaps reflecting their own field research backgrounds. Smith concentrated on a broadly defined Mississippian emergence and virtually ignored Coles Creek, whereas Steponaitis emphasized Coles Creek culture somewhat more than Emergent Mississippian. Here, an attempt at a more balanced treatment will be made by eschewing any attempt to give this time span a culture period name and examining each of these more or less coeval archeological cultures in its turn.

The following summaries of present-day concepts of the cultures of this period will proceed from north to south down the Lower Valley, with sidelong glances to the east and west as appropriate.

Emergent Mississippian Culture

Definition and Location. The background of the concepts of the Mississippi period and Mississippian culture will be discussed in detail in the next chapter. Here, it will suffice to note that in recent decades, research in regions from the American Bottom (the Mississippi floodplain opposite St. Louis) to northeast Arkansas has resulted in the recognition that Emergent Mississippian (Kelly et al. 1984) or Mississippian Frontier (Morse and Morse 1983:200ff) societies existed between about A.D. 700 and 1000.

In the Cairo Lowland of southeast Missouri, opposite the Ohio–Mississippi river junction, and in northeast Arkansas adjacent to the Missouri bootheel, Mississippian lifeways probably began around A.D. 700 or shortly thereafter (Morse and Morse 1983:201–202). These regions are therefore depicted in Figure 15 as occupied by Emergent Mississippian culture. The Cairo Lowland may well have seen the earliest development of truly hierarchical Mississippian societies (1983:214ff). In the American Bottom, which eventually was the scene of the greatest Mississippian developments, this emergence apparently did not begin until about A.D. 800 (Bareis and Porter 1984:Figure 3; Kelly et al. 1984).

Artifactually, the emergence of Mississippian cultures in northeast Arkansas and adjacent regions is primarily characterized by what the Morses (1983:208) called a revolution in ceramic technology. The new manufacturing step was the addition of previously burned and crushed mussel shell fragments to the plastic clay as a tempering agent. The resulting pottery was lighter but stronger, permitting new and more efficient vessel shapes for cooking, storage, and artistic expression. Also, the calcium carbonate in the shell may have released the B vitamin, niacin, from maize cooked in such vessels (1983: 210).

Archeologically, the result of this technological change is the appearance of easily recognized shell-tempered potsherds. The principal pottery types found on Emergent Mississippian sites in and near northeast Arkansas (Morse and Morse 1983: 218ff) are all shell tempered: Mississippi Plain, Varney Red Filmed, and Wickliffe Thick, which is a salt pan ware. Varney Red Filmed was also used frequently for the purpose of evaporating saline solutions to produce salt.

A number of distinctive lithic artifact types also became abundant in sites of this culture (Morse and Morse 1983:210ff, 222ff, Figures 10.4, 10.6, 10.8). The stemmed, unserrated Scallorn and its serrated variant, the Sequoyah type, were true arrow points. There was a microlithic core and blade industry similar to that at Cahokia. Mill Creek chert from southern Illinois was made into large bifaces such as hoes, which exhibit a mirror-like sheen on their bit edges from digging in silty soils, most likely during planting, cultivating, and weeding. Also, the discoidal or chunky stone appeared at this time; from ethnographic and prehistoric artistic evidence, it appears to have been used in a ritualized game.

Paleoenvironmental Data. The Mississippi River had long since been in its modern meander belt by this time. Zebree, the only excavated site representing this culture in the study area, was some 50 km west of the Mississippi, near the Right Hand Chute of Little River and the present Big Lake Wildlife Refuge. Big Lake itself may have been formed about the time the Emergent Mississippian society settled at Zebree (Saucier 1970; Morse and Morse 1983:9).

Because much of the Zebree site's catchment area had been cleared for agribusiness, an effort was made to reconstruct the past environment (Morse and Morse 1983:226–228), and several microhabitats were defined. The site was adjacent to excellent agricultural land, and a rich variety of plant and animal resources (including many aquatic species and waterfowl) was readily available. In 1881, the general locality was said by Smithsonian Mound Survey archeologist Edward Palmer to be "a hunters' haven" (Jeter n.d.), and the presence of both federal and state wildlife refuges presently attests to this.

Phases. Two Emergent Mississippian phases have been defined within the bounds of the present study area (Morse and Morse 1983:Figure 10.1). One is the Big Lake phase, primarily based on findings at Zebree (1983:217ff) and on surveys. This phase extends from the juncture of the St. Francis and Little rivers northward beyond the Arkansas–Missouri state line into the western Missouri bootheel. No contemporary Mississippian sites have been reported to the south and west of the Big Lake phase territory (1983:232).

The other is the Hayti phase, named after a town in the eastern margin of the bootheel and best known from work by Marshall (1965) at the Kersey site near Hayti. The ceramic assemblage resembles that at Zebree, but Varney Red Filmed is even more common than Mississippi Plain (Morse and Morse 1983:217). Sites of this phase are found down the courses of Little River and Pemiscot Bayou in the southeastern portion of the bootheel and into adjacent extreme northeast Arkansas (1983:Figure 10.1).

Key Sites. The Zebree site (3MS20) has already been mentioned. It was located immediately south of the Arkansas–Missouri line, and was the subject of investigations by the Morses from the inception of the Arkansas Archeological Survey in 1967. It was tested in 1968 by the Survey. In 1969 the National Park Service funded a major excavation there; subsequently, the site was placed on the National Register, and two reports were published (Morse 1975; Morse and Morse 1976).

In the mid-1970s, the Corps of Engineers, Memphis District, planned a drainage ditch that would destroy the Zebree site. Major mitigation excavations were conducted in 1975, with a final salvage effort during the destruction of the site in 1976. Lengthy and detailed reports (Morse and Morse 1977, 1980) were submitted to the Corps but have seen only very limited distribution. Several efforts to obtain funding for a major publication were unsuccessful, and at present a report is being prepared for publication in the Survey's Research Series (Morse and Morse n.d.). In the meantime, the major widely available source of data is the extensive discussion of Zebree in the Morses' book (1983:217–233).

Settlement Data. The Zebree site during the Big Lake phase was a planned village, apparently made up of rows of small rectangular wall-trench houses with cane matting walls rather than wattle-and-daub, oriented just east of north in the Mississippian manner (Morse and Morse 1983:228ff). The village itself was rectangular, with a ditch and perhaps a stockade around much of it, and sloughs adjacent to the rest of the perimeter. Large pits were probably used for storage of maize and other grains. It appears that the households may not have been completely egalitarian, as one zone seems to have had more access to venison and other choice meats (1983:231).

In the vicinity near Zebree, various other small and presumably contemporary habitation sites are known to have existed, but they have not been investigated. Ceremonial (mound) centers are not known here (1983:232–233). However, in the Cairo Lowlands, the Hoecake site, a multicomponent, multi-mound center, may well have been such a central place in Emergent Mississippian times (1983:215).

Subsistence Data. Again, the only data are from Zebree (Morse and Morse 1983:226–228). Deer, as usual, represented by far the predominant meat source. Fish and waterfowl were also well represented. The only identified cultigen was maize (both 12- and 14-row varieties). Hickory nuts, acorns, and walnuts were present. The major finding, however, comes from analyses of skeletal materials. Trace element analysis of human bone samples from Zebree and other sites indicates that despite the presence of maize, it did not represent a really significant contribution to the Emergent Mississippian diet (Lynott et al. 1986).

Mortuary Data. At Zebree, 27 definite burials and 26 isolated human bones were found, without artifacts. (Morse and Morse 1983:231). Most were in the midden areas near houses, usually as individuals extended supine. Four males and four females were found in one grave. Dog burials, rare in Mississippian sites, were also found.

Exchange and External Relationships. Much evidence of exchange and interaction with groups to the north has been found (Morse and Morse 1983:205ff). Mill Creek chert has already been mentioned. Crescent Quarry chert, from the St. Louis vicinity, was also common at Zebree and provided the basic raw material for the microlithic industry, which paralleled that at Cahokia (Morse and Morse 1983:205, 222). The most common evidence, though, is the ubiquitous shell-tempered pottery, which from this time onward gradually spread southward. Whether this spread represented slow technological diffusion or actual population movements or both is an unresolved question.

Walnut Bend: A Phase In Search Of A Cultural Affiliation

The cultural situation in the regions just south of extreme northeast Arkansas is poorly known during this period. Phillips (1970:914–916) defined the Walnut Bend phase, with a grog-tempered ceramic assemblage, for his Coles Creek period in the regions on both sides of the Mississippi River immediately south of Memphis, but cautioned of "the hazards of differentiating Coles Creek from Baytown period complexes" here. Wheeler Check Stamped was thought to be the only useful marker of the phase (Phillips 1970:914). However, it was outnumbered roughly three to one by Mulberry Creek Cord Marked, which is more characteristic of the Baytown period. Phillips was uncertain as to whether check-stamped pottery (and therefore, the phase) was really characteristic only of the Coles Creek period (1970:916). It should be noted that the distribution of check-stamped pottery is not continuous from the Memphis vicinity to the Gulf. Wheeler Check Stamped is not found south of the Arkansas River, and Pontchartrain Check Stamped becomes quite rare north of Baton Rouge. During five years as Survey Station archeologist for southeast

Arkansas, Jeter saw no check-stamped pottery whatever from that territory.

In a preliminary report on recent salvage excavations at the Barrett site (3LE3) in northeastern Lee County, Arkansas (just southwest of Memphis), House (1983:5, 9) noted the presence of a Walnut Bend phase component in an extensive surface scatter and a submound midden and suggested a very general time range of about A.D. 500–1000. He emphasized that this "overwhelmingly grog-tempered" assemblage, "though probably contemporary with Plum Bayou culture...is quite distinct from that of Plum Bayou" (1983:5).

Clearly, much more investigation is needed before this orphan phase can be integrated into a coherent picture of Lower Valley prehistory in these regions. Quite possibly, some critical research remains to be done outside of the present study area, in northwesternmost Mississippi, as both cord-marked and check-stamped pottery are ultimately derived from Woodland traditions centered east of the Mississippi Valley.

Plum Bayou Culture

Definition and Location. This culture's type site is the Toltec Mounds site, located on an old Arkansas River cutoff some 25 km (ca 15 miles) southeast of North Little Rock. Toltec and many if not most of the related sites are located outside of the present overview's boundary. They were discussed in the Region 1 overview. Here, brief summaries of the relevant data from Toltec and other sites in the central Arkansas heartland of this culture will serve as background for discussions of the relatively scarce data available on Plum Bayou culture in east-central and southeast Arkansas.

Toltec had always been considered an enigmatic site, with mounds which appeared Mississippian but with an essentially non-Mississippian ceramic assemblage featuring grog-tempered plainwares and occasional variants of Coles Creek types (Phillips 1970:916–917). Phillips predicted that Toltec "will inevitably become the type site for a phase of Coles Creek (or earlier?) date" (1970:916). Beginning in 1976, a concerted research program was initiated by the Arkansas Archeological Survey at Toltec (Rolingson 1982:1–2). This research resulted in the definition of a new Plum Bayou culture regarded as beginning around A.D. 500 (late Baytown period in Phillips's terminology, and indeed earlier than his Coles Creek period) and lasting until around A.D. 900 at the Toltec site (Rolingson 1982:87ff).

The basic Toltec/Plum Bayou ceramic assemblage was described by Stewart-Abernathy (1982) and discussed by Rolingson (1982:87–88) and Belmont (1982a:66–68). The ceramics are often more than 90% Baytown Plain. Of the rare decorated types, Larto Red is often the most common. Several varieties of Coles Creek Incised are present, the most common being *var. Keo*, which does not have the traditional Coles Creek encircling lines below the rim, but does have one or more lines incised in the lip. Other varieties have various combinations of rim lines and lip lines. Officer Punctated, a new type, has several varieties with different punctated decorations in or near the lip. Also found are varieties of other standard Coles Creek types and a few bone-tempered ceramics which perhaps reflect interaction with peoples of the Fourche Maline–Caddoan tradition. A very rare but consistent minority ware in large collections is shell-tempered Mississippi Plain (Stewart-Abernathy 1982:50, Table 2).

Plum Bayou sites have produced both small stemmed dart points, including the Gary and Means Stemmed types, and true arrow points, such as the Scallorn and Rockwall types (T. Hoffman 1982; Hemmings 1985:27ff; Waddell n.d.). Quartz crystals are found commonly in Plum Bayou contexts and were used for production of arrow points, as tools themselves (T. Hoffman 1982; Rolingson 1982:89), and perhaps as scrying crystals. They were obtained in the Ouachita Mountains, probably especially in the vicinity northwest and southwest of Little Rock. The Ink Bayou site, a hamlet located between the source area and Toltec, yielded evidence of a quartz crystal workshop (Waddell n.d.). Plum Bayou assemblages also often include ground stone tools made of igneous rocks available near Little Rock (Rolingson 1982:89).

Research at other sites and localities in central and eastern Arkansas expanded the Plum Bayou concept both temporally and spatially. It is clear that this cultural tradition continued at least well into the A.D. 900s, if not beyond A.D. 1000 (Waddell 1987a), and covered a large area. As indicated in Figure 15, assemblages more or less characteristic of Plum Bayou culture have been found from north-central Arkansas (Hemmings and House 1985; Waddell 1987b). Northeast of the Toltec site, the Plum Bayou range includes the White River Lowland and at least the lower Cache River Valley and western portion of the Western Lowlands (House 1975:158–159; Sabo et al. 1982: 193). However, House (1983:5) has emphasized that the artifact complex of the Walnut Bend phase (see above) is "quite distinct from that of Plum Bayou."

In southeast Arkansas, Plum Bayou-like assemblages dominated by plainwares, and therefore unlike true Coles Creek assemblages, have been found along present-day Bayou Bartholomew near the Louisiana state line (Rolingson 1974, 1976: 114–117; House and Jeter n.d.) and along Bayou Macon in the Desha–Chicot county borderlands (Lemley and Dickinson 1937:44). It is not clear at present just where the boundary should be drawn between the Plum Bayou and Coles Creek cultures along Bayou Bartholomew; perhaps somewhere between the Arkansas–Louisiana state line and the Bayou Bartholomew–Ouachita River confluence.

In south-central Arkansas, however, the Coles Creek period assemblages along the Ouachita Valley in the Felsenthal region, as far north as the Calion–Camden vicinity, appear more closely related to classic Coles Creek materials from northeastern Louisiana than to the Plum Bayou complex (Weinstein and Kelley 1984:41). (North of Calion–Camden, the Fourche Maline–Caddoan traditions, rather than Plum Bayou culture, occupied the Ouachita Valley.) With regard to Louisiana, Belmont (1983:279) stated, "Through Coles Creek times, all evidence attests to the close relationship, ceramically at least, of the Boeuf to the Lower

Mississippi Valley." His Boeuf region includes the Ouachita Valley below the Felsenthal region.

Tentatively, the picture that emerges, at least for the time around AD. 850 (Figure 15), is one in which Plum Bayou-related assemblages extend down the Bartholomew–Macon region into northeasternmost Louisiana. This produces an indentation in the Coles Creek culture distribution, which extends north of the state line into the Felsenthal region, and northward as far as the Winterville site in the Yazoo Basin.

Paleoenvironmental Data. Extensive paleoenvironmental studies have been made or begun at the Toltec site itself. Geoarcheological analyses (Kaczor 1982) suggested that Mound Lake (the oxbow adjacent to the site) had been abandoned by the Arkansas River before the Plum Bayou occupation. A preliminary study of GLO records on presettlement vegetation in the site's vicinity was made by McCartney (1982). Archeobotanical materials recovered by flotation have the potential for contributions to knowledge of the paleoenvironment and are being analyzed and reported upon by Gayle J. Fritz at the Smithsonian Institution and University of Michigan. Animal bones have been analyzed in a thesis by Robert Hoffman (1980). Similar studies have been made at the related Alexander site (Hemmings and House 1982) and Ink Bayou site (Waddell n.d.); both are upstream from Toltec and outside the present overview area.

The really crucial paleoenvironmental question, especially from the point of view of the present overview, is the status of the Arkansas River's meander belts while Plum Bayou culture was flourishing. According to an interpretation used as a guideline for interpretations for more than a decade (Saucier 1974: 23, Figures 1 and 3), the Arkansas River abandoned its Plum Bayou–Bayou Bartholomew meander belt (No. 6 in that reconstruction) around A.D. 1000, i.e., about the time of the apparent end of Plum Bayou culture. However, a later interpretation, based in part on archeological evidence, suggested that this abandonment occurred around A.D. 1–200 (Autin n.d.; Saucier, personal communication). This would have been several centuries before the inception of Plum Bayou culture.

This reinterpretation would place the Arkansas River only a few kilometers farther from Mound Lake and the Toltec Mounds than in the previous reconstruction. But in east-central and southeast Arkansas, below Pine Bluff, the differences in these versions' locations of the river during Plum Bayou times are on the order of dozens of kilometers and are highly significant for culture–ecological and other interpretations. Clearly, much interdisciplinary work will be needed to resolve this question.

Phases. Three phases were tentatively defined (ceramically) by Stewart-Abernathy (1982) at the Toltec site: Dooley Bend (early), Dortch Bend (middle) and Steele Bend (late). These have not been formally defined, though, and in any event are outside of the present overview area.

On the basis of surveys along southernmost Bayou Bartholomew in Arkansas, Rolingson (1974, 1976:114–117) defined the DeYampert phase for the Coles Creek period and noted the scarcity of decorated ceramics. This work was done before her (1982a) definition of Plum Bayou culture, but this description seems to fit the Plum Bayou pattern. Subsequent excavations at, and surveys around, the Boydell mound site (House and Jeter n.d.) and surveys elsewhere in the Bartholomew–Macon region (unpublished Arkansas Survey site forms) have produced additional evidence of related sites. Much more work, probably including excavations, would be needed for clear definition (and probably, subdivision) of the DeYampert phase.

No other phases of Plum Bayou culture have been defined. Likely regions or subregions for such definitions would include the White River Lowland, Grand Prairie and lowermost Arkansas River Valley, and the eastern (Bayou Macon) portion of the Bartholomew–Macon region.

Key Sites. The three best known Plum Bayou sites at present are all outside this project's study area: Toltec, Alexander (Hemmings and House 1985), and Ink Bayou (Waddell n.d.). Two mound sites within a tertiary ring around Toltec are within this study area: Jones (3JE107) and Greer (3JE50). Another Jefferson County site, Walt (3JE46) was tested by an amateur (Robinson 1964) and found to have a thick midden which may be coeval with or slightly earlier than Plum Bayou culture (Rolingson 1982a:92).

In the Bartholomew–Macon region, salvage excavations were conducted in 1977 and 1978 at the Boydell Mound site (3AS58). The later portions of the mound represented the Plaquemine-affiliated Bartholomew phase, but an earlier component related to Plum Bayou culture, with Keo and other Toltec-like ceramics and quartz crystals present. A survey within a 2 km radius of the mound located several small habitation sites apparently related to the Plum Bayou component. The report has not been completed (House and Jeter n.d.)

Rolingson, in the Arkansas State Plan (Jeter et al. 1982:20), listed several other sites in the Grand Prairie, White River Lowland, and Bartholomew–Macon regions which have produced evidence of Plum Bayou-related occupation. None of these have been excavated or otherwise intensively investigated and reported upon, though.

Settlement Data. Rolingson (1982a:92) noted the presence of four smaller and apparently related mound sites within 14 km of Toltec and a partial tertiary ring of seven similar mound sites approximately 20 km from Toltec. All of the inner group, and five of the 20-km ring sites, are outside the present project area, but two of the latter group, Jones and Greer, are in Jefferson County.

Elsewhere, Rolingson (in Jeter et al. 1982:19–20) summarized a range of site types, from large multimound ceremonial centers to single mound sites, and "midden sites ranging in size from those that may be interpreted as small villages, to hamlets, and small farmsteads or camp sites." She stated that this "suggests a hierarchical political structure," although no real test of this hypothesis had been conducted.

The Alexander site was interpreted as a sedentary habitation, but the excavated portion did not yield evidence of structures or community planning (Hemmings and House 1985:103–104). The Ink Bayou site (Waddell n.d.) did produce evidence of one structure in the excavated portion.

A number of mound centers exist along Bayou Bartholomew but are primarily attributed to the later Bartholomew phase (Rolingson 1976). However, as already noted, when Mound A at Boydell, the northernmost of these centers mapped by Rolingson (1976:Figure 6.2), was actually excavated, evidence of Plum Bayou involvement in its construction was found (House and Jeter n.d.). The Boydell survey produced evidence of small hamlets related to Plum Bayou culture within 2 km of the mound but did not sample the cutoff lakes along this old Arkansas River meander belt. Some larger surface scatters, which may represent either larger sites or repeated occupations, are known from such environments for the Bartholomew phase (Rolingson 1974, 1976:Figure 6.2) and might mask Plum Bayou occupations with relatively few diagnostics.

Subsistence Data. Again, the analyzed and published data are from sites outside this study area. Robert Hoffman (1982) found a wide variety of animal remains from Mound D at Toltec. Deer was as usual the principal meat source, but numerous species of fish, and various birds, were also present. A similar situation was found at Alexander (Styles et al. 1985). Faunal remains were sparse at Boydell but included a small Plum Bayou-related shell midden beneath the mound.

A sample of plant remains from Toltec was analyzed by Gayle J. Fritz (personal communication) at the Smithsonian Institution. Maize was present, but rare; details are not yet available. At Alexander, maize was found in Mississippian features but not in the Plum Bayou features (King 1985:54–55). Instead, such elements of the native North American starchy seed complex (cf. Asch and Asch 1985) as maygrass, knotweed, and chenopodium were found, along with hickory and other nut shells. Bottle gourd, a Mesoamerican cultigen, was also tentatively identified (King 1985:54).

Analyses of dentition of human burials attributed to the Plum Bayou component at Alexander (Rose and Marks 1985: 89, 96, 98) revealed microwear patterns indicative of consumption of coarse foods and nuts prepared with stone grinding implements. Caries rates were relatively high but could have resulted from increased dependence on native North American cultigens rather than maize. One of the burials was examined for enamel hypoplasias; these were found to have occurred frequently, indicating a high childhood stress level possibly due to inadequate nutrition.

At Ink Bayou, where a Plum Bayou component dating into the A.D. 900s was identified, maize has been found in several features and tentatively attributed to this component (Waddell n.d.). However, the site also had a Mississippian component, and detailed analyses of its possible relationship to the maize remains have not yet been completed, nor has the maize been directly radiocarbon dated. No cultigens were found in the sparse plant remains at Boydell.

Mortuary Data. A brief 1966 test in Mound C at Toltec encountered two burials, a female extended supine and a semi-flexed male (Miller 1982:30g). At Alexander, a cluster of seven fragmentary and incomplete burials was found and regarded as probably assignable to the Coles Creek period (Hemmings and House 1985:23), i.e., Plum Bayou culture. They had apparently been originally extended but were oriented in widely variable directions.

Several burials were found in Boydell Mound A, but they could only be assigned to the later Bartholomew phase. One site (3DR184) to the north of Boydell, in eastern Drew County on Bayou Bartholomew, was found during a survey to have human bone fragments and teeth scattered on the surface in a very restricted area which also produced plain grog-tempered sherds, one sherd with a Keo-like lip line, and a quartz crystal fragment. It has not been tested, however.

Exchange and External Relationships. The primary exchange and other cultural relationships of the Emergent Mississippian peoples to the northeast of the Plum Bayou regions seem to have been with peoples even farther to the north. The Coles Creek culture to the southeast seems to have been “relatively unbuffered by external influences” (Williams and Brain 1983:408). Belmont (1982a:64–66) emphasized the relative isolation of Toltec and its satellites from intensive Mississippian and Coles Creek influences. As noted in the Definition discussion, shell-tempered and bone-tempered ceramics do occur in Plum Bayou assemblages but could hardly be said to represent significant Mississippian or Fourche Maline (or Caddoan) influence. It should be noted, though, that Schambach (1982a:169) suggested relationships between Toltec–Plum Bayou and Fourche Maline 7 culture, especially as exemplified at the Crenshaw site.

To the east of Toltec and across the Mississippi, in the upper Yazoo Basin, Phillips (1970:917) defined a makeshift Peabody phase, which he regarded as “particularly open to question.” He noted the “preponderance of Baytown Plain”and the presence of “Baytown Plain with one or more incised lines on a broad insloping lip;” which would be equivalent to Coles Creek Incised, *var. Keo* (see above). Phillips (1970:905) regarded the Peabody phase as “a later part of Baytown culture...occupying the fore part if not all of the Coles Creek period” but it might well be classed as a regional variant similar to Plum Bayou culture. Indeed, Belmont (1982a:67) noted the presence of *Keo* even farther to the southeast, in the Bayland and Aden phases of the Lower Yazoo Basin, and suggested that these phases might eventually be seen as Plum Bayou outliers (1982a:70).

It is also of interest that Sherrod and Rolingson (1987) found resemblances in celestial alignments and the use of a Toltec “module” unit of measurement between Toltec and a number of mound sites in the Lower Yazoo Basin. Similarities were also noted with Caddoan mound sites and with the Cahokia mound center near St. Louis. Clearly, such evidence of interaction on the conceptual level is worthy of much additional intensive investigation.

Fourche Maline 7 Culture in the Trans-Mississippi South

Definition and Location. The Fourche Maline 7 culture period was defined as the final manifestation of Fourche Maline culture by Schambach (1982a:Table 7-1). Ceramic assemblages are dominated by clay- or grog-tempered Williams Plain and grit-tempered LeFlore Plain (1982a:162–163). According to Schambach (1982a:173) Gary dart points are absent from unmixed Fourche Maline 7 assemblages, whereas arrow points are common. Burials and other ceremonial contexts have produced the long stemmed Crenshaw variety of the Red River pipe (1982a:172). Sites of this subperiod are primarily known in the Great Bend, Little Missouri, and Little River regions of southwest Arkansas, and perhaps into northwest Louisiana (Schambach 1982a:166–172, 190; but, cf. Webb 1982b:364–365).

Paleoenvironmental Data. Once again, no site-specific, detailed studies of paleoenvironmental data have been done. Pearson's (1982) general study of Red River Valley paleogeography in the Great Bend region showed that significant meandering and site destruction must have taken place since the time of Fourche Maline 7 (1982:Figures 2-7 and 2-10).

Phases. Two phases of Fourche Maline 7 culture have been defined (Schambach 1982a:Table 7-1): the Crenshaw phase in the Great Bend region, and the Old Martin phase in the Little River region (out of the present Overview area).

The Crenshaw phase was originally defined as belonging to Coles Creek culture (Wood 1963; Hoffman 1970a), but Schambach (1982a:166–172, 190) argued extensively and convincingly that the assemblages (especially the ceramics) in question were not part of classic Lower Valley Coles Creek culture, but were regional Fourche Maline adaptations and reinterpretations.

The Old Martin phase was defined by Hoffman (1971:149–183), again as a phase of Coles Creek culture. Schambach (1982a; Schambach and Early 1982:SW78) suggested that it should instead be classed as a Fourche Maline culture phase and should be redefined, as it probably included unrelated traits from earlier and later components.

Key Sites. The most important Fourche Maline 7 site is unquestionably the Crenshaw site (3MI6), in the Red River Valley in northeast Miller County. Crenshaw was first described by Moore (1912), then by Lemley (1936) and Dickinson (1936), and has been revisited on numerous occasions, as summarized by Schambach (1982a:150–158).

Other important sites of this subperiod include the Washington site in the Little Missouri region, and the Old Martin site in the Little River region. Washington (3HE35) was an early Caddoan center, first excavated by Harrington (1920), with a Fourche Maline 7 midden component and possibly a burial mound lying under and between the mounds. It was extensively tested in 1981 by the Arkansas Survey/Society summer dig (Schambach 1982a:159). Old Martin (3LR49) is outside this Overview's study area, but worthy of mention (cf. Hoffman 1971:149–183; Schambach 1982a:160).

Settlement Data. The major research on Fourche Maline 7 settlement has been at the Crenshaw site itself. During this subperiod, as summarized by Schambach (1982a:150), it was "a major Fourche Maline village covering perhaps as much as 8 ha and containing at least three mounds and four cemeteries... the largest, most complex Fourche Maline site in southwest Arkansas."

Subsistence Data. This is one of the major data gaps in Fourche Maline archeology in general (Schambach and Early 1982:SW71), and the lack of data is particularly acute here. Schambach (in Schambach and Early 1982:72) suggested that intensification of horticulture had occurred in late Fourche Maline or very early Caddo times, and the bioarcheological data suggest that the former was the case. Data on plant remains from good Fourche Maline 7 contexts are completely lacking, however.

Mortuary Data. The Crenshaw site has both mound and midden burials, which have been described in some detail by Schambach (1982a:152–158). According to him, most of the midden graves are Fourche Maline 7, and most but not all of the mound burials are Caddoan; a cemetery near Mound B included large group interments and may represent a high status Fourche Maline precinct (1982a:152). Less formal burials occur in profusion in and beneath the village refuse on other parts of the site. Grave offerings generally consist of one or two pots placed near the head, with the types LeFlore Plain, Williams Plain, Coles Creek Incised, French Fork Incised, and Crockett Curvilinear Incised, occurring in that order of frequency.

As noted above, there may have been a Fourche Maline 7 burial mound at the Washington site. The Old Martin Place had "a large Fourche Maline 7 through Caddo I cemetery with over 67 graves" (Schambach 1982a:160) but was essentially destroyed by relic hunters.

Exchange and External Relationships. A critical question for Fourche Maline 7 culture is the nature of its relationship with Coles Creek culture of the Lower Mississippi Valley and with Plum Bayou culture of the Arkansas River Valley. As noted above, until quite recently, southwest Arkansas sites and phases of this period were generally regarded as belonging to Coles Creek culture. Webb (personal communication) still regards coeval components in northwest Louisiana, such as the one at Mounds Plantation, as Coles Creek. Schambach (1982a: 166ff) suggested that the "so-called Coles Creek pottery of southwest Arkansas" is a "mixed bag" consisting of misclassified "bogus" Coles Creek Incised, or non-Lower Valley varieties of Coles Creek types, and that none of it is real Coles Creek pottery made by real Coles Creek culture potters in southwest Arkansas.

On the other hand, Schambach (1982a:169) suggested, largely on the basis of ceramic comparisons, that "by Fourche Maline 7 times, the main Lower Mississippi Valley [*sensu lato*] ties of southwest Arkansas Fourche Maline were to the east [actually, northeast], with the cultures of the Arkansas River Lowland such as...Plum Bayou culture." For instance, the Crenshaw site ceramic assemblages contain varieties of Coles Creek Incised and French Fork Incised ceramics, including

Coles Creek Incised, *vars. Keo and Lonoke* (Schambach 1982a: 150, 152), both of which were defined on the basis of investigations at the Toltec site, type site for Plum Bayou culture (Rolingson 1982).

The Fourche Maline-Caddoan Transition

In concluding this review of Fourche Maline culture, it should be noted that Schambach (1982a:182) emphasized the "seamless and rapid" transition from Fourche Maline to Caddoan culture. He suggested that this transition took place over a broad front and that evidence of this could be observed at sites such as Crenshaw, Mounds Plantation, Gahagan, Spiro, Harlan, and Davis (1982a:182–183).

Despite this quite probable and plausible continuity and the likelihood that the transition took place around A.D. 900, the discussion of Caddo I culture will be deferred until the next section, that dealing with the A.D.1000–1500 period, in the interest of a larger continuity, that of Caddoan culture itself. The Caddo I period is generally estimated at ca A.D. 900–1200, so most of it indeed does fall within our arbitrary A.D. 1000–1500 segment. The present note is merely an acknowledgment that Caddoan culture did begin before A.D. 1000, and that it did have significant continuities with Fourche Maline culture.

Coles Creek Culture

Definition and Location. The Coles Creek complex of distinctive ceramics from village and mound sites in northeastern Louisiana and adjacent Mississippi was first defined and described by Ford (1935c, 1936b, 1951). The most characteristic diagnostic always has been the common occurrence of ceramics decorated with encircling incised lines parallel to the lip (Ford 1935c:14ff, 1936b:174ff, 191); this was eventually defined as Coles Creek Incised (Ford 1951:74–76). Especially in the Coles Creek heartland and in classic (or Middle) Coles Creek assemblages, these lines were often incised with the tool held at an angle to produce an overhanging or "clapboard" effect.

Numerous varieties of this and such associated types as Mazique Incised have now been defined (Phillips 1970; Williams and Brain 1983). For details on these types/varieties and their associations with various phases, reference is made to these publications and the relevant phase definitions. Ford's original typology (1935c) was a simple alphanumerical scheme, but he soon changed it to a very complex numerical system (1936b), which was abandoned with the advent of binomial type names (Ford and Willey 1940). Johnson and Sparks (1982: Figure 4) provided a typological key correlating Ford's (1936b) numerical code with the modern varieties of one type, Coles Creek Incised.

The Coles Creek ceramic complex was first based on collections from the Coles Creek site itself and from the Mazique site, both near Natchez (Ford 1936b:172, Figure 2). Ford noted that neither site was actually quite typical of the complex as later defined on the basis of more extensive collections; Phillips (1970:920, Figure 446) made the nearby Truly site the type site for his Truly phase of Coles Creek culture in that region.

Coles Creek itself is a stream flowing westward into the Mississippi River a short distance above Natchez (cf. Johnson and Sparks 1982:Figure 1; Brown 1985:Figure 3). The identity of Ford's original Coles Creek site is something of an enigma. Although Cottier (1952) and Phillips (1970:552, 919–920, citing communications from Ford) believed it to be the site now known as Gordon (now the type site for the Gordon phase of Plaquemine culture in Mississippi; Phillips 1970:947–948), there are some minor inconsistencies in the sources for this identification (Johnson and Sparks 1982:105–111).

Ford (1935c:30) originally saw the distribution of Coles Creek sites as extending only as far north as "a line...through Jackson and Vicksburg, Mississippi, and Monroe, Louisiana"; to the east, it extended not more than 50 miles from the bluffs overlooking the Mississippi, "widely spread over the flood plain area west of the river" and up the Red River as far as Shreveport; south, it extended only as far as near Baton Rouge. In his more detailed discussion (Ford 1936b:173), he remarked that "a few sites are found up the course of Bayou Macon in Louisiana, almost to the Arkansas border" and added that "southward they occur all through the Mississippi Valley and along the tributary streams all the way to the Gulf Coast." Lemley and Dickinson (1937:44) found very little evidence of Coles Creek occupation along Bayou Macon in southeast Arkansas.

Ford supervised the excavations at the Greenhouse site in 1938–1939 and incorporated the preliminary findings in an influential synthesis (Ford and Willey 1941). The Greenhouse site report appeared a decade later. In it, Ford (1951:70ff) defined and described a group of "Coles Creek period [pottery] types," but his work was subsequently revised significantly (Belmont 1967, 1982a:70–72; Phillips 1970).

Phillips (1970:918) reinforced Ford's original statements about the Coles Creek heartland, noting that the Tensas Basin "really is Coles Creek country." However, his discussions of this period in the northern Lower Valley were severely handicapped by two factors: the rarity of diagnostic types in the largely plain grog-tempered ceramic assemblages of both his Baytown and Coles Creek periods in those regions, and his refusal to include shell-tempered Mississippian ceramic assemblages of those regions in this period. He relegated the latter to his Mississippi period, which he construed as totally post-A.D. 1000; he thus perhaps exaggerated the appearance of a Mississippian population explosion (Phillips 1970:923). Summing up his discussions of Coles Creek period phases, he admitted that his "references to the Coles Creek culture have been more than usually evasive" (1970:923), concluding that:

> No matter how the culture is defined...its northern limits can be definitely located about the latitude of Greenville, Miss.... Toltec, Peabody, and all other phases from there on [northward] cannot be called Coles Creek [culture].

Lower Mississippi Survey research in the Tensas Basin began in the early 1960s. Phillips (1970:918–919) did not present detailed discussions of the Coles Creek heartland phases in this region and the adjacent Lower Red River region, deferring to the publication of results of Belmont's then-ongoing analyses. Belmont, however, only published a short preliminary paper on the Greenhouse sequence (1967) and contributed some brief redefinitions or summaries of comparative data (Belmont 1982a:74–77, Figure 3, 1982b:105–106, 1982c, 1983:276–279, Figure 3; Belmont and Williams 1981). His long-awaited dissertation was never completed, a major loss to Lower Valley archeology in general, and Coles Creek studies in particular.

Belmont (1983:276–278, Figure 3) did call attention to the relative density of Coles Creek period mounds in the Lower Yazoo Basin, Tensas Basin, Natchez Bluffs, and Lower Red River regions. This is essentially the core of the Coles Creek culture sphere illustrated by Williams and Brain (1983:Figure 12.11), and is reflected in Figure 16. Williams and Brain (1983: 369) reasserted that "The core development seems to have occurred along an axis including the lower Red River, Tensas, and lower Yazoo regions, with the center somewhere in the Tensas." In the nearby Catahoula Basin of east-central Louisiana, Coles Creek sites are also common (Gregory et al. 1987: 46, 79ff).

To the west and slightly north of the Tensas Basin, recent LMS surveys and test excavations in the Boeuf Basin have produced ample evidence of Coles Creek culture (Belmont 1983; Williams 1983; Kidder and Williams 1984; Fuller and Williams 1985:10), albeit with fewer mounds than in the heartland (Belmont 1983:276–278, Figure 3).

In the Felsenthal region of south-central Arkansas and adjacent Louisiana, Schambach (1979:29–30) noted the presence of abundant Coles Creek culture sites. Weinstein and Kelley (1984:502) suggested that Coles Creek culture sites extended into the northern part of the Felsenthal region, up the Ouachita Valley to the locality between Calion and Camden.

In northwestern Louisiana, according to Gregory (1980: 353), pure Coles Creek assemblages are not found farther up the Red River Valley than Natchitoches. Gregory also noted that plain ceramics related to the Fourche Maline culture were found at Mounds Plantation (Webb and McKinney 1975:90–91), on the Red River above Shreveport. It should be noted that Webb (1982b:364–365; personal communication) interpreted the pre-Caddoan remains at sites such as Mounds Plantation and Crenshaw as reflecting real Coles Creek culture.

Research in southern Louisiana, summarized by Brown (1984), has greatly clarified the subjects of coastal Coles Creek culture and phases (which are treated in a separate section, below). Compared with the heartland, these phases are characterized by a relative abundance of check-stamped pottery (Brown 1982:29ff, 1984:115–122), and a relative scarcity of mounds (Belmont 1983:276, Figure 3).

Phillips (1970:923) stated that, although he had "stressed the importance of Gulf Coastal elements in the formation of Coles Creek culture," this view had "not gained strength...from a closer look at the archaeology." He concluded by suggesting that "we may not be able to extend Coles Creek so far south as previously supposed" (1970:923). It is also worth noting that Belmont (1982a:Figure 2) mapped the boundaries of the preceding Troyville culture as stopping short of the Deltaic/Chenier plains, and remarked that Troyville was "the direct antecedent to Coles Creek" (1982a:79); and that Williams and Brain (1983:Figure 12.11) mapped the southern boundary of the Coles Creek culture sphere at about the mouth of the Red River. Quite possibly, another culture will eventually be defined for these coastal regions, following the precedent set by the designation of Plum Bayou culture to the north.

Paleoenvironmental Data. It appears highly likely that the Mississippi River occupied its present meander belt throughout this period. However, riverine processes within this meander belt may have had much significance for Coles Creek peoples. Brown and Brain (1984) suggested that the use and abandonment of Coles Creek ceremonial centers overlooking the River along the Natchez Bluffs was correlated with the development and cutting-off of meander loops.

As was the case for Plum Bayou culture, the status of the Arkansas River during this period is a critical problem for students of Coles Creek culture. To reiterate, according to Saucier's (1974:Figures 1 and 3) chronology, the Arkansas River would have been its Bartholomew meander belt (No. 6 of that publication) throughout this period, until about A.D. 1000 or 1100. However, according to the revised chronology (Autin n.d.:Table 2; Saucier, personal communication), the Arkansas would have abandoned that belt (No. 2 in the new terminology) and occupied its present meander belt around A.D. 1 to 200. In the new reconstruction, then, Bayou Bartholomew would have joined the Ouachita River, about as it presently does, near the northwestern margin of the Coles Creek culture's distribution, and the Arkansas River would have been well to the north of the Coles Creek culture.

Similarly, the concept of the situation of the Red River has recently changed. In Saucier's 1974 reconstruction, the Red was in a meander belt flowing to the Gulf through the Atchafalaya Basin from about A.D. 700 to 1500. However, this was challenged by Pearson (1986), who suggested that the change to the present meander belt had occurred by Marksville times, about A.D. 1. The new geological synthesis (Autin n.d.) places this change on the order of A.D. 500 to 800, but this is only a rough estimate, definitely open to question (Saucier, personal communication).

Clearly, at this point there are more questions than answers with regard to the nature of the major streams that traversed the Coles Creek culture area. Future work at Coles Creek sites on these meander belts should emphasize interdisciplinary efforts to resolve these questions.

Phases. The definitions and dating of both the temporal subdivisions (Early, Middle, etc.) and phases of the Coles Creek culture period have been in a state of flux recently, and there is small likelihood of a real resolution in the immediate future. For the present overview's purposes, two summary tables may suffice as guides to the regional phase sequences

TABLE 4
PHASES OF COLES CREEK CULTURE IN THE "HEARTLAND" REGION

Date	Coles-Creek Period	Lower Red	Tensas	Natchez	Lower Yazoo
A.D. 1200					
	Transitional	Spring Bayou	Preston	Gordon	Crippen Point
A.D. 1050					
	Late	Greenhouse	Balmoral	Balmoral	Kings Crossing
A.D. 900					
	Middle	Bordelon	Ballina	Ballina	Aden
A.D. 750					
	Early	Grand Cote	Sundown	Sundown	(Bayland?)

TABLE 5
PHASES OF COLES CREEK CULTURE IN MARGINAL REGIONS

Period	Catahoula	Lower Ouachita	Felsenthal
Transitional	Wild Hog	(undefined)	Cypress Swamp
Late	Open Brake	Routon	Small Slough
Middle	Wiley/Old River	Pritchard Landing	(undefined)
Early	Pete Green/Gorum–Chevalier	Crawford	(undefined)

of waxing and waning Coles Creek culture. The first (Table 4) displays the sequences in four heartland regions investigated by Ford and/or the Lower Mississippi Survey: the Lower Red River (Red River Mouth), the Tensas Basin, the Natchez Bluffs, and the Lower Yazoo Basin. The second (Table 5) presents the more or less parallel sequences in three marginal westerly regions: the Catahoula Basin, the Lower Ouachita Valley, and the Felsenthal region.

A number of comments and qualifications are relevant to these tabulations. The dates given in Table 4 are derived from the 150-year phase scheme recently promulgated by the LMS, and should be regarded as only approximations, probably with a plus-or-minus range of 50 to 100 years. No dates are given in Table 5, though the period subdivisions therein should be approximately coeval with the equivalent subdivisions in Table 4. It should be emphasized that both Gibson (1983b:Figure 6) and, by implication, Gregory et al. (1987:90) use a chronological framework significantly later than that used by the LMS. Gibson's chronology started the Coles Creek period at A.D. 900; he commented:

> wariness should be uniformly extended to other phase chronologies (e.g., Belmont's, Phillips's, etc.) where documentation (for the region in question) is also weak, assertive, or argumentative. Forthright acceptance of one chronology and rejection of another is simply an act of faith and not a sure-fire procedure for discerning classificatory appropriateness. (Gibson 1983b:75)

With this caveat in mind, the LMS chronology is nevertheless used here—not on faith but as a heuristic device. The Transitional Coles Creek subperiod adopted by the LMS (e.g., Belmont and Williams 1981) is also adopted here and shown in these tables. Clearly, it extends the Coles Creek concept well beyond the endpoint of the A.D. 700–1000 period under discussion here but is included to show the full span of Coles Creek culture.

The rather flexible and arbitrary status of these phases and their cultural assignments may be illustrated by several examples. Gibson (1983b:Figure 6) and Gregory et al. (1987: 89ff) used different names for the Early and Middle Coles Creek phases in the Catahoula Basin, and none of their phases were really thoroughly described. Although Phillips (1970: 919) proposed a Truly phase of Coles Creek culture in the Natchez Bluffs region, it appears to have been dropped by the LMS in favor of extension of the phase names from the Tensas Basin, across the Mississippi River. Belmont (1982c:Figure 3) placed the Bayland phase in the Early Coles

Creek subperiod but assigned it to Baytown culture. And Williams and Brain (1983:366), in discussing the Bayland phase, stated that it "is certainly not Coles Creek (except, perhaps, in ceramic terms)" which approaches the status of self-contradiction (cf. also 1983:334).

Key Sites. Within the apparent heart of the Coles Creek heartland, the Tensas Basin (cf. Phillips 1970:918), there are unfortunately no intensively excavated and thoroughly reported sites. Belmont's never-completed dissertation would presumably have included much data from the Sundown, Ballina, and Balmoral type sites. The Mount Nebo mound site (16MA18) was excavated in 1968–1969 by LSU, but has thus far only been briefly described archeologically (Giardino 1982: 101–103; Neuman 1984:204–207). It was a seven-stage mound, spanning the (late?) Troyville to Late (or Transitional) Coles Creek sequence.

Ford's (1935c) Peck site, a shallow midden in the borderlands between the Tensas and Catahoula basins and the Lower Ouachita–Lower Red regions, furnished some of the original Coles Creek data. Gibson (1983b:51) called attention to the limited albeit significant nature of Ford's work here, but a reanalysis in terms of modern typologies and knowledge is long overdue.

The major multimound site in the Lower Ouachita Valley, Pritchard Landing, was tested by Gibson (1983c:219ff) and found to have reached its zenith during the Coles Creek period, possibly early in the period (1983c:229, 1983d:323; cf. also Belmont 1983:276–278, who placed it in the Lower Red region).

The Greenhouse site (16AV2) in the Lower Red River region provided the first really detailed definition of Coles Creek culture (Ford 1951). A preliminary reanalysis, and definition of phases, was done by Belmont (1967), but never brought to completion.

In the Catahoula Basin, the major site of this period appears to have been Wiley (Gregory et al. 1987:79, 91), but again, no intensive excavation has taken place. Just upstream to the northwest of Catahoula Lake, on Little River, contract mitigation excavations at the Whatley site produced evidence of minor early and late Coles Creek occupations (Thomas and Campbell 1978).

In the Felsenthal region, excavations at the Shallow Lake site (3UN9/52) produced weak concentrations of (early?) Coles Creek materials in several areas (Schambach and Rolingson 1981:182ff). More recently, excavations at the Bangs Slough site (3CA3) have yielded substantial evidence of a (late) Coles Creek occupation, sufficient for the definition of the Cypress Swamp phase (Schambach n.d.).

Although out of the present study area, two partially excavated major sites in the Yazoo Basin have provided critical comparative data for Coles Creek studies. Of these sites, the closer to the heartland, and more recently reported in a much more widely available report, is the Lake George site (Williams and Brain 1983). It was intensively occupied by Coles Creek peoples, especially during the Crippen Point phase (1983:334–337).

Near the northeastern margin of Coles Creek distribution (cf. Williams and Brain 1983:Figures 11.13–11.16) is the Winterville site. It was tested by Brain, and reported upon in his (1969) dissertation. That report is not widely available, but it is presently being revised for publication by the Mississippi Department of Archives and History (Patricia Galloway, personal communication).

The Natchez Bluffs region includes at least a few Coles Creek sites, but none have been thoroughly excavated. The best site summary is that of Johnson and Sparks (1982) for the Gordon site, as noted above.

Near the southern margin of what is here considered the true or inland Coles Creek culture distribution is the St. Gabriel site (16IV128), a mound site near Baton Rouge which was partially salvaged and has been described in a thesis (Woodiel 1980). It produced some evidence of (primarily late?) Coles Creek occupation, plus floral and faunal remains. Pontchartrain Check Stamped, regarded here as a coastal Coles Creek marker, was present but not abundant, and *Rangia* shells (omnipresent in true coastal sites) were apparently absent. Some mention should also be made of the Bruly St. Martin site (16IV6), which is also near the northern margin of the coastal zone. It was excavated and reported upon by Springer (1975, 1980) and included a Coles Creek component.

Settlement Data. Most of the research into Coles Creek settlement patterns has dealt with the more obvious mound sites, presumably representing the upper and/or ceremonial aspect of a moderately complex system of social organization. All six of the village sites upon which Ford (1936b:191ff) based his original Coles Creek definition were mound sites, as was Greenhouse (Ford 1951). Such sites have now been studied both from the viewpoints of internal organization and of their relationships to other sites.

Williams and Brain (1983:405) stated that the Coles Creek culture provided "the first certain evidence of substructural pyramidal mounds in the eastern United States," and that this is a "distinctively Mesoamerican trait." They added that "this connection becomes even more apparent" when the arrangement of mounds around a central plaza, with mound ramps facing inward, is considered. As noted in the Plum Bayou culture discussion, Sherrod and Rolingson (1987:81–84) suggested that astronomical alignments of mounds, and the use of a modular unit of measurement (about 47.5 m) began during the Coles Creek period.

Furthermore, Williams and Brain (1983:369ff, Figure 11.12) suggested that the placement of the principal mound in a group around a plaza changed consistently during and after the Coles Creek period in the Lower Yazoo Basin, rotating clockwise from the Bayland–Aden east side location, to the south side in the Kings Crossing phase, the southwest in the Crippen Point phase, the west in the Winterville phase, and the north in the Lake George phase. Following Belmont's (1967) reanalysis of ceramics and provenience units from the Greenhouse site, which clarified its mound construction sequence, they extended these comparisons to sites in the Tensas Basin and Lower Red regions (1983:Figures 12.12 and 12.13) with positive results, and concluded:

> there appears to have been a dynamic progression in site plan, as determined by orientation and position of the focal mound, during the course of the Coles Creek culture. The schedule is so consistent that it is now possible to predict closely a site's principal occupation, or period of construction, on the basis of site plan alone. However, there are apparent exceptions... It may be that only the principal sites...adhered closely to the orientations described. (1983:407)

Williams and Brain emphasized that these were modest sites, usually with only a few small to medium mounds each, and that they tended to be vacant ceremonial centers occupied by members of a nascent elite class—religious specialists and/or privileged persons. There were "multiple centers in any region at any given time," representing "the nuclei of relatively equal and autonomous social units" (1983:407), and the rest of the population was apparently dispersed in small hamlets along the natural levees.

Belmont (1983:276, Figure 3) examined data on numbers of mounds and mound sites during the Coles Creek period and found that mound densities were high only in the core area of the Lower Red–Tensas–Natchez–Lower Yazoo regions. With regard to the marginal Boeuf Basin (and Lower Ouachita) region, he reached a somewhat different hypothesis than the relatively equal stance of Williams and Brain:

> Thus, we may frame a hypothesis that in Coles Creek times there is a concentric settlement pattern, with a major center flanked by a belt of minor centers, and beyond that a belt of dense habitation sites and a final belt of sparser occupation. This pattern suggests a more centralized and hierarchical social system than has usually been attributed to Coles Creek. (Belmont 1983: 278)

Gregory et al. (1987:79ff), commenting on their survey in the Catahoula Basin, noted that Belmont had mapped it in his high density area but that there were only three true multimound centers there during the Coles Creek period. Coles Creek habitation sites occupied the higher and better soils throughout the basin but apparently avoided the lower elevations and poor terrace soils; again, a "clear preference for arable lands" was suggested (1987:82).

In the heart of the Felsenthal region are a number of mound groups on the terrace edges overlooking the often flooded Ouachita River Valley, or on sandy pine islands within the lowlands. Most of these were occupied well into Plaquemine (Mississippi period) times, as illustrated in a map by Hemmings (1982:Figure 34), but many or most of them were probably initially occupied during Coles Creek times (Schambach 1979: 29–30; cf. the Shallow Lake site, reported on by Rolingson and Schambach 1981). Here, there would have been a forced seasonal (winter–spring) abandonment of sites on the floodplain, although fishing in the flooded areas would have been feasible (Hemmings 1982:275–277, Figure 70). Several sites up the Saline River Valley from the Felsenthal floodplain, in Ashley and Bradley counties, have midden deposits suggesting intensive occupation (or seasonal reoccupations) during Coles Creek times and later (Jeter 1982a:102; White 1987).

Subsistence Data. Williams and Brain, who wrote the comparative sections of the Lake George site report during the 1970s in the absence of remains of cultigens (or of much in the way of serious attempts to recover such remains), suggested that the ubiquity of Coles Creek sites on sandy loam soils along the natural levees "testifies to the importance of agriculture in their subsistence base" (Williams and Brain 1983:408). They further suggested that the Coles Creek culture's geographic distribution indicated that these peoples "had adopted a subtropical variety of maize."

These speculations at least furnish a significant basis for testable hypotheses. Some flotation has now been attempted, and indeed some evidence for the presence of maize in Coles Creek contexts has been recovered, but the evidence is by no means overwhelming, or even unquestionable. Most of the evidence has come from sites on the margins, rather than the heartland of the Coles Creek territory. In the Lake George site report itself, appendices presented analyses of the faunal remains (Belmont 1983) and mollusks (Barber 1983), but no vegetal remains were recovered. Belmont (1983:468–469) noted evidence of a shift from the Bayland phase to the Coles Creek phases:

> The Bayland data suggest a general utilization of all wild faunal resources, especially aquatic ones, while in later times shellfish and various woodland animals were neglected in favor of deer and rabbit, which could be efficiently hunted in communal drives... [but] it is impossible to assess the hypothesis that immediately comes to mind: the shift in hunting patterns between Bayland and late Coles Creek times is an aspect of a general shift toward a primary dependence on agriculture, with hunting becoming a specialized secondary activity.

The St. Gabriel site, on a Mississippi River levee near the southern margin of the Coles Creek territory, did indeed produce one maize kernel (from a 12-row cob), the only domesticate found at the site (Woodiel 1980:84). It was interpreted as indicating "the definite presence of maize by A.D. 1000" (1980:85). A few persimmon and honey locust seeds were also found. The faunal remains were dominated by fish bones, although deer probably represented the most important animal food (1980:91ff).

Faunal remains from the Whatley site, in a western marginal location, could not be precisely correlated with the numerous prehistoric components, but did include remains of a wide variety of aquatic and terrestrial animals (Byrd 1978:184). Plant remains (Shea 1978) also were not specifically assigned to components, but included hickory nut and acorn fragments, along with seeds of honey locust, persimmon, and cherry or plum. One fruit fragment of a *Cucurbita* species (squash or pumpkin, Mesoamerican cultigens) was found (Shea 1978:188).

Also, and perhaps significantly, a few remains of *Polygonum sp.* (knotweed) and *Amaranthus* were found at Whatley (Shea 1978:186). Knotweed is one of the most important members of a three- to four-species complex of starchy seed-producing plants that has been documented by intensive flotation and archeobotanical research in the American Bottom and Lower Illinois Valley as native cultigens which rose in importance from Middle Woodland through Late Woodland and into Emergent Mississippian times (Johannessen 1984: 201ff; Asch and Asch 1985:356–363). *Amaranthus*, cultivated prehistorically in Mesoamerica and the Southwest, has been found archeologically in the Midwest but not documented as a cultigen there.

The Bangs Slough site (Colburn and Styles n.d.) yielded a depauperate faunal assemblage, dominated by deer and smaller woodland resources, from late Coles Creek contexts. Aquatic resources were sparsely represented, despite the site's proximity to water, and compared to later occupations, the scarcity of mussels was notable. Most of the Bangs Slough plant remains were from a later Mississippian component, but even so, no cultigens were identified (King n.d.).

Mortuary Data. The primary source on Coles Creek burials, of course, is the Greenhouse site (Ford 1951). Belmont's (1967) reanalysis of Greenhouse data permitted a more accurate placement of the various burials found there. The early Coles Creek burials were made in the top of a low platform mound, and the Troyville practice of midden burials was discontinued. The trait of mound-top burial continued in the middle Coles Creek component, but in late Coles Creek times was discontinued. A special cemetery area was then set aside, and the burials in it were all extended-supine, without grave goods. Belmont (1967:32) noted that this "unrelieved lack of grave goods" in Coles Creek culture "sets it off sharply from both Marksville–Hopewell, and Caddoan–Mississippian traditions."

Marco Giardino wrote a thesis (1977) and an article (1982) on the Mount Nebo mound burials, most if not all of which are assignable to Coles Creek culture. The early burials, which may have been either late Troyville or early Coles Creek, were both extended-prone and supine; the later burials (late Coles Creek) were supine or extended-supine, but not extended-prone. Both components had isolated skull burials. Grave goods were very scarce and did not include pottery (Neuman 1984:206).

Mound C at Lake George is a large pyramidal structure and therefore an unlikely burial mound by the traditional categorization, but it contained the only burials found by the LMS excavations there (Williams and Brain 1983:38–56). They were analyzed by Egnatz (1983), who distinguished some 77 interments, many of them multiple, for a total of 185 individuals. Williams and Brain (1983:56) suggested that these burials were restricted to "one—or possibly two—phases"; elsewhere (1983:334–335) they stated that some of these burials were deposited in Mound C during the Aden phase, and others during the Kings Crossing phase.

Four burials from the Shallow Lake site most probably belong to the Coles Creek component there (Schambach and Rolingson 1981:189).

Exchange and External Relationships. Despite their suggestion of an ultimate Mesoamerican inspiration for Coles Creek mound site layouts, Williams and Brain (1983:408) saw little in the way of outside influence after the cultural patterns had consolidated:

> The Coles Creek culture exudes self-confidence and comfort. These are curious attributions for an archaeological culture and, of course, are meaningless beyond expressing the remarkable homogeneity and conservatism of the culture...continuities were overwhelming, change was minimal. Whether the lack of change more accurately represented conscious resistance to any alteration of the satisfactory status quo, or whether it was due to the fact that after the initial flurry, the Lower Valley was relatively unbuffered by external influences during this period, remains a moot point.

The quartz crystals so commonly found in Plum Bayou culture sites to the north are uncommon in Louisiana Coles Creek sites (Jon Gibson, Hiram F. Gregory, and Clarence H. Webb, personal communications), despite the obvious ceramic relationships between these cultures and the fact that quartz crystals, probably from Arkansas, are found in earlier Louisiana sites. Again, it should be noted that relationships may have been closer between Plum Bayou and Fourche Maline 7 cultures than between either of them and Coles Creek culture (Schambach 1982a:169).

Coastal Coles Creek Culture

To reflect the historical difficulties faced by archeologists in coastal Louisiana in their attempts to differentiate Troyville (Baytown period) remains from Coles Creek remains, we have "lumped" the two in our Coastal Troyville–Coles Creek Culture section. Here we will merely note that the wave of the future appears to be definitely in favor of differentiating at least the larger sites. This trend is especially noteworthy in the Lower Mississippi Survey's work in the Petite Anse region (Brown 1981, 1984; Brown and Brown 1978a, b; Brown et al. 1979; Fuller and Fuller 1987).

An important marker for Coles Creek and perhaps early Plaquemine components in and near the coastal zone is Pontchartrain Check Stamped pottery. This type is generally abundant on sites of this period but not in Troyville contexts. It has been subdivided into a number of chronologically sensitive varieties and has also been subjected to modal analyses (Brown 1982, 1984; Fuller and Fuller 1987). The increasing use of radiocarbon dating also holds promise for distinguishing Troyville from Coles Creek components.

LATE PREHISTORIC CULTURES, A.D. 1000–1500

Marvin D. Jeter and G. Ishmael Williams, Jr.

This chapter summarizes the last five centuries of prehistory in the study area. During this period, the three major Native American cultural traditions represented in the study area at the time of European contact — Mississippian, Caddoan, and Plaquemine — became firmly established and developed into distinctive complex societies.

Because our discussions of these cultural traditions are quite extensive, they are preceded by brief summaries (in the next three sections), for the reader's convenience.

Mississippian Summary

Mississippian culture reached its zenith at the Cahokia site and elsewhere in the American Bottom–St. Louis vicinity during the A.D. 1100s and 1200s, and "devolved" in those regions during the 1300s (Bareis and Porter 1984:244). In the Cairo Lowland, immediately north of the present study area, Mississippian developments are inadequately documented, but appear to have culminated at the Towosahgy site (Beckwith's Fort) and its satellites such as Crosno, Sandy Woods, and Lilbourne, during the Cairo Lowland phase, ca A.D. 1150–1350 (Morse and Morse 1983:262–267). But during the period ca A.D. 1350–1400, this region became virtually uninhabited (1983:271).

Meanwhile, within the northeast Arkansas portion of the study area, Early and Middle Period Mississippian cultures experienced an apparently steady growth from A.D. 1000 through the 1300s. This growth was expressed in terms of numbers of sites, sizes of sites, and geographic expansions both southward in the Eastern Lowlands, and westward onto Crowley's Ridge and the Western Lowlands, in phases such as Cherry Valley, Lawhorn, Wilson, and Powers.

Essentially simultaneously with the depopulation of the Cairo Lowland, ca A.D. 1350–1400, related Mississippian cultures in the Eastern Lowlands of northeast Arkansas experienced "significant population increases" and "an extraordinary population nucleation" (Morse and Morse 1983:271). The ancient Mississippi River's braided stream surfaces in the Western Lowlands were also abandoned as permanent settlement locations, as Mississippian peoples congregrated on the alluvial soils along the meander belts of the Eastern Lowlands.

The Late Mississippian phases of those regions, such as Nodena, Parkin, Walls, Kent, Old Town, and Greeenbrier, began in the late 1300s or early 1400s and persisted until the time of historic contact and epidemic diseases in the 1500s. Mississippian culture also spread to the south of the Arkansas River during the 1400s, as seen in phases such as Hog Lake, Tillar, and Wilmot in southeast Arkansas, and the "Mississippianization" of the Yazoo Basin. It was to spread even farther south and west by the 1500s, into northeast Louisiana and south-central Arkansas. The probably ancestral relationships of prehistoric Mississippian cultures to Protohistoric and Historic Native American groups such as the Quapaw (Arkansas), Tunica, and Koroa are the subjects of intensive ongoing research, as discussed in the next chapter.

Caddoan Summary

Caddoan culture is sometimes regarded simply as an outlier within the Mississippian tradition and has been suggested to be in some ways ancestral to Mississippian culture. However, the two can be differentiated easily enough in most instances on artifactual (especially ceramic) grounds and, in historic times, on a linguistic basis. Here, they will be treated separately.

Unlike Mississippian culture, which continues to produce impressions and interpretations of expansionism and intrusion (if not invasion), Caddoan culture seems to have been solidly rooted in its homeland, the adjacent portions of Arkansas, Louisiana, Texas, and Oklahoma, and to have more or less remained in these regions (though not unchangingly) during the period under consideration here. At least in some portions of the study area, there appears to have been a "virtually seamless" transition from the preceding Fourche Maline tradition (Schambach 1982a:191), suggesting that the Caddoan (or Fourche Maline–Caddoan) tradition may have had a really great time depth, back to Archaic times.

The Caddo I period is generally regarded as having started around A.D. 900, if not earlier, in these regions, and to have continued until about A.D. 1200. It includes the early and relatively well known Alto and Gahagan foci (treated as phases here) in Texas and northwest Louisiana, and less publicized phases such as Lost Prairie and Miller's Crossing in southwest Arkansas, and Hanna in northwest Louisiana.

The Caddo II period, from about A.D. 1200 to 1400, is primarily known from sites of the Haley phase of the Great Bend region in Arkansas, Louisiana, and Texas, and the Mineral Springs site and phase of the Little Missouri region in Arkansas. Spectacular "baroque" ceramics from burials at mound sites such as Haley and Mineral Springs have overshadowed other aspects of Caddo II culture. Many other sites of this period are known in southwest Arkansas, and some of them have been extensively excavated or at least tested, but the data are as yet unpublished. This was also the time of the florescent Spiro phase at the Spiro site itself, in the Arkansas

Valley of extreme eastern Oklahoma, as summarized in the Region 1 overview.

The Caddo III period, from about A.D. 1400 to 1500, is primarily known from sites of the Bossier focus (phase) in northwest Louisiana. Related and probably related sites are known in southwest Arkansas but are inadequately reported. This may have been a time of significant shifts, with a decline in mound building and mortuary ceremonialism and a change to more dispersed settlement patterns.

The Caddo IV (Protohistoric, ca A.D. 1500–1700) and Caddo V (Historic, after A.D. 1700) periods will be summarized in Chapter 8. Here, it will suffice to note that within an overall context of cultural continuity, Caddo IV was marked by a revival of mortuary ceremonialism and increasing contact with Mississippian culture, and that Caddo V involved contacts with both Europeans and historic Native American groups such as the Quapaw and Natchez, and at least temporary movements of some Caddoan groups to the east, toward the Mississippi Valley.

Plaquemine Summary

In at least one sense of the broad geographical and cultural perspective taken here, Plaquemine culture appears more analogous to Caddoan than to Mississippian culture. Like the Fourche Maline–Caddoan tradition, the Coles Creek–Plaquemine regional sequences seem to represent a deeply rooted continuum, in this case centered in and near eastern Louisiana. Unlike the Caddoan culture, though, Plaquemine culture was greatly influenced and perhaps even inspired by Mississippian culture, quite possibly reflecting their more direct upstream-downstream connections in the Mississippi Valley itself.

Although Plaquemine culture was originally defined on the basis of archeological research in the Baton Rouge region (Ford and Willey 1941; Ford 1951:13, 85ff; Quimby 1951; cf. Phillips 1970:950), the origins of Plaquemine culture are possibly to be found primarily in the Transitional Coles Creek phases of ca A.D. 1000–1200 in the old Troyville–Coles Creek heartland: the Tensas Basin–Natchez Bluffs, Lower Red, and Lower Yazoo Basin regions. Another view of Plaquemine origins (Brain 1969, 1971, 1978; Williams and Brain 1983:375–376, 409–414) emphasized the importance of Mississippian influences, specifically from Cahokia itself, during the (late?) A.D. 1100s, especially at large sites in the Lower Yazoo Basin.

Whatever its ultimate origin(s), Plaquemine culture flourished in the old heartland from about A.D. 1200 throughout the rest of prehistory. It also developed what is referred to here as a coastal Plaquemine variant (cf. Weinstein 1985), which was eventually encroached upon by Late Mississippian culture(s) from the east (and north) and by late prehistoric and Protohistoric Attakapa culture from the west.

Plaquemine culture also expanded into (or at least appeared in variant forms in) marginal regions such as the Catahoula Basin, Lower Ouachita, Felsenthal, and Bartholomew–Macon regions. Due largely to the methodological history of archeological investigations, numerous phases have been defined in both the heartland and marginal regions. The western marginal phases variously show evidence of interaction with Caddoan groups. The northern marginal phase assemblages evince a gradual process of Mississippianization around the A.D. 1300s, with southeast Arkansas essentially in the Mississippian camp, as it were, by the 1400s, and the northern portions of the heartland, in northeast Louisiana, becoming Mississippian (e.g., the Transylvania phase; Hally 1972) by the 1500s. In the rest of the heartland, Plaquemine culture persisted through the Protohistoric period of A.D. 1500–1700, and into Historic times with the Natchez and other groups, as discussed in Chapter 8.

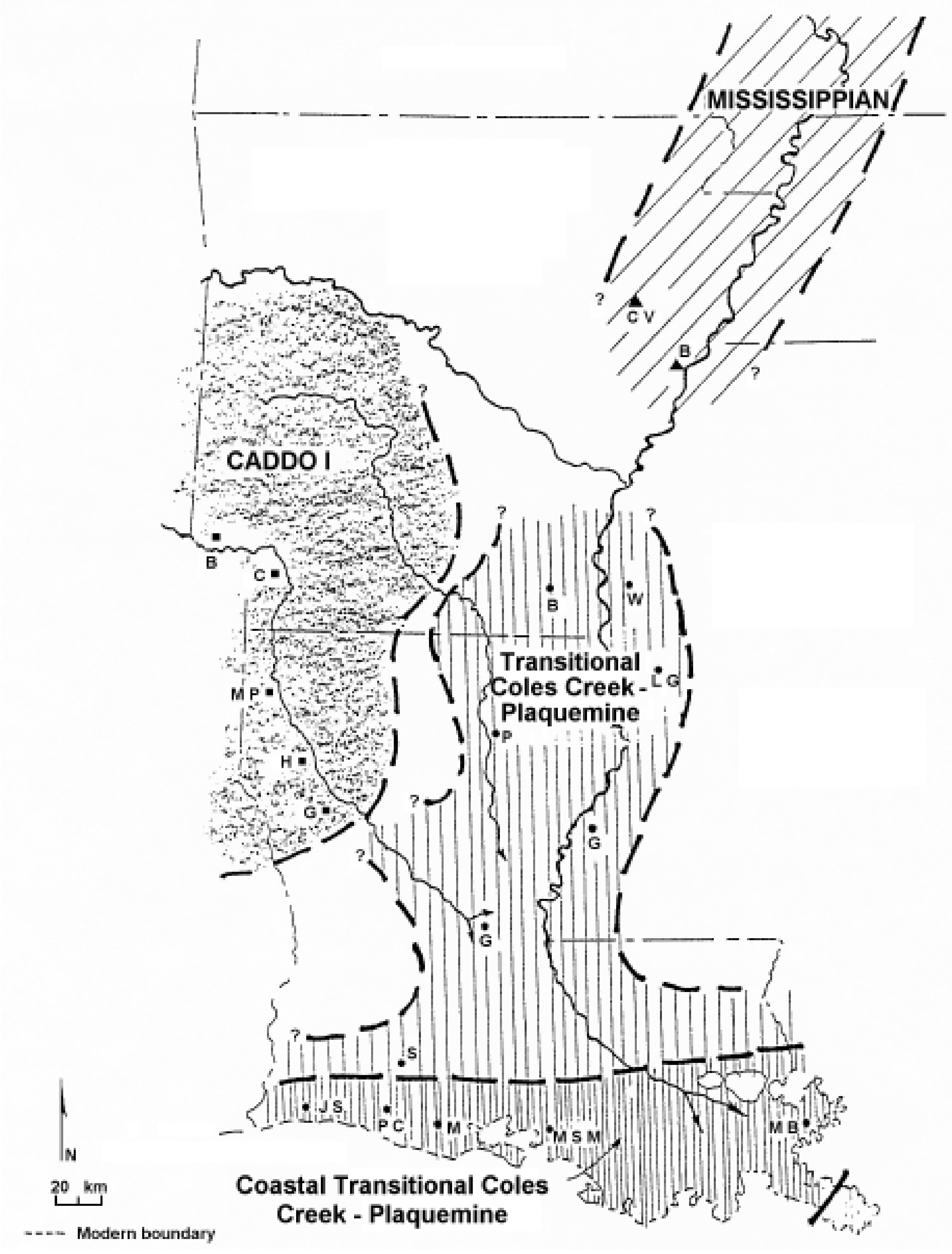
Mississippian Culture (Figures 17–21)

Definition and Location. It was Holmes (1903:80ff) who in effect first named Mississippian culture, defined it in terms of characteristic ceramics, and mapped its distribution. Holmes's middle Mississippi group was said to be distributed in and around the contiguous portions of Arkansas, Missouri, Illinois, Kentucky, and Tennessee. He distinguished several subgroups, including eastern Arkansas and lower Mississippi, mapped the distribution of the latter almost as far south as Baton Rouge, and furnished illustrations and descriptions of numerous shell-tempered vessels, of various forms and decorative treatments.

Thomas (1894:586) had previously defined an "Arkansas district of earthworks," including "the southeastern counties of Missouri, the state of Arkansas, and the northern part of Louisiana," especially "the eastern part of the area included in these bounds," distinguished particularly by "large, oblong, terraced, pyramidal mounds." He also noted close resemblances in terms of both "groups of works and types of pottery" between southeast Missouri and "southern Illinois and the Cumberland Valley." He therefore more or less defined the Mississippian heartland and some of the major outlying regions, but he segmented its distribution, and the names he chose did not catch on.

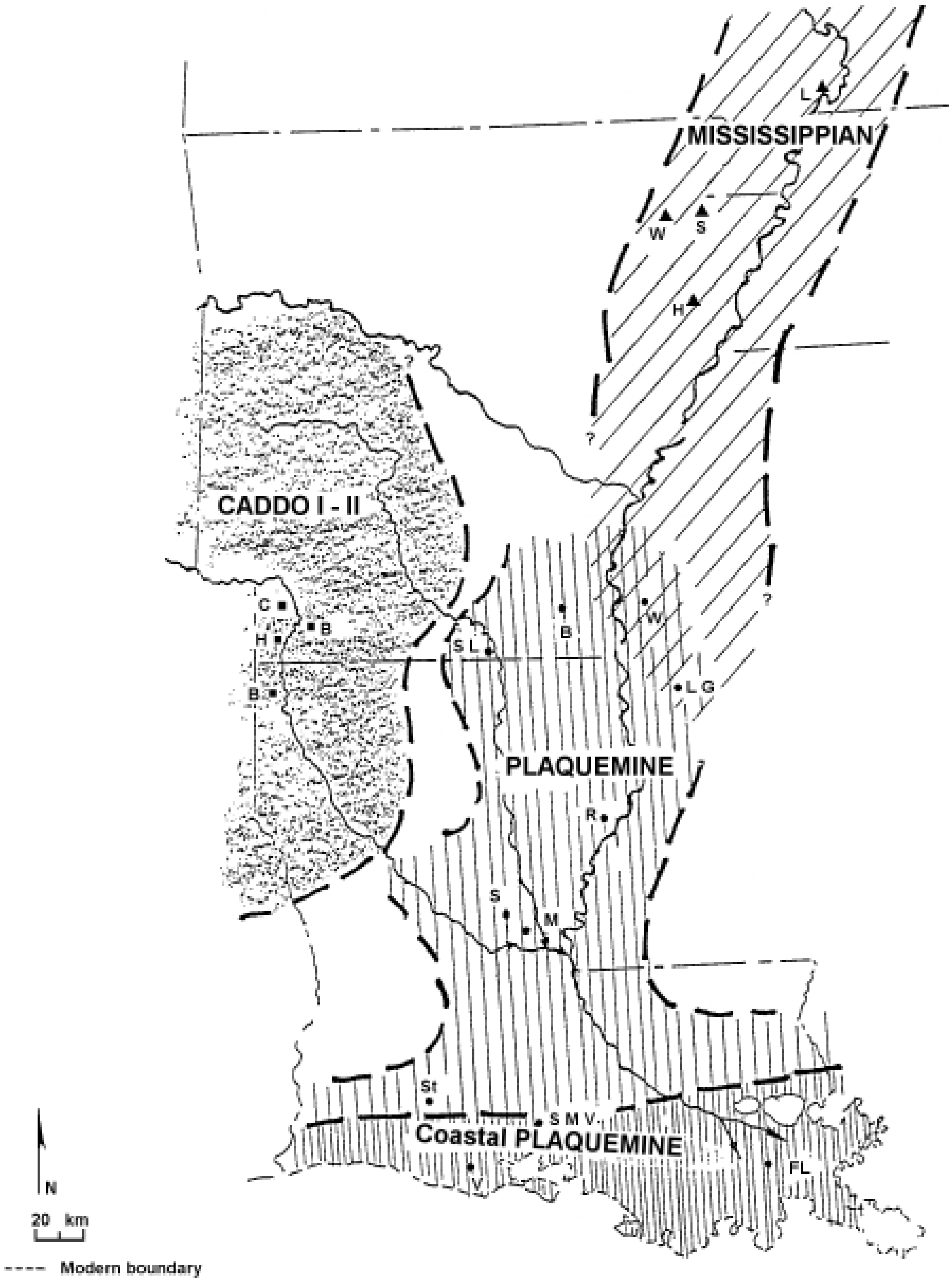
Both turn-of-the-century works called attention to the largely overlapping geographic distributions of what were to become the primary criteria for defining Mississippian culture: shell-tempered pottery and pyramidal mounds, often arranged in groups around a central plaza. However, they lacked chronological controls, except for the knowledge that many of these remains were relatively recent, having historic trade goods associated. Also completely lacking was any control over the time(s) of origin of the culture(s) that had produced these pots and mounds, or knowledge of the sequences of development that had been involved.

Moore's explorations added a great deal of distributional data; especially with regard to ceramics. He (1911:370) cited Holmes's definition and suggested that a boundary could be drawn between the Middle and Lower Mississippi Valley regions at about the mouth of the Arkansas River, on the basis of decorative techniques. North of the Arkansas, plain pottery was common, as were painted decorations, but well done



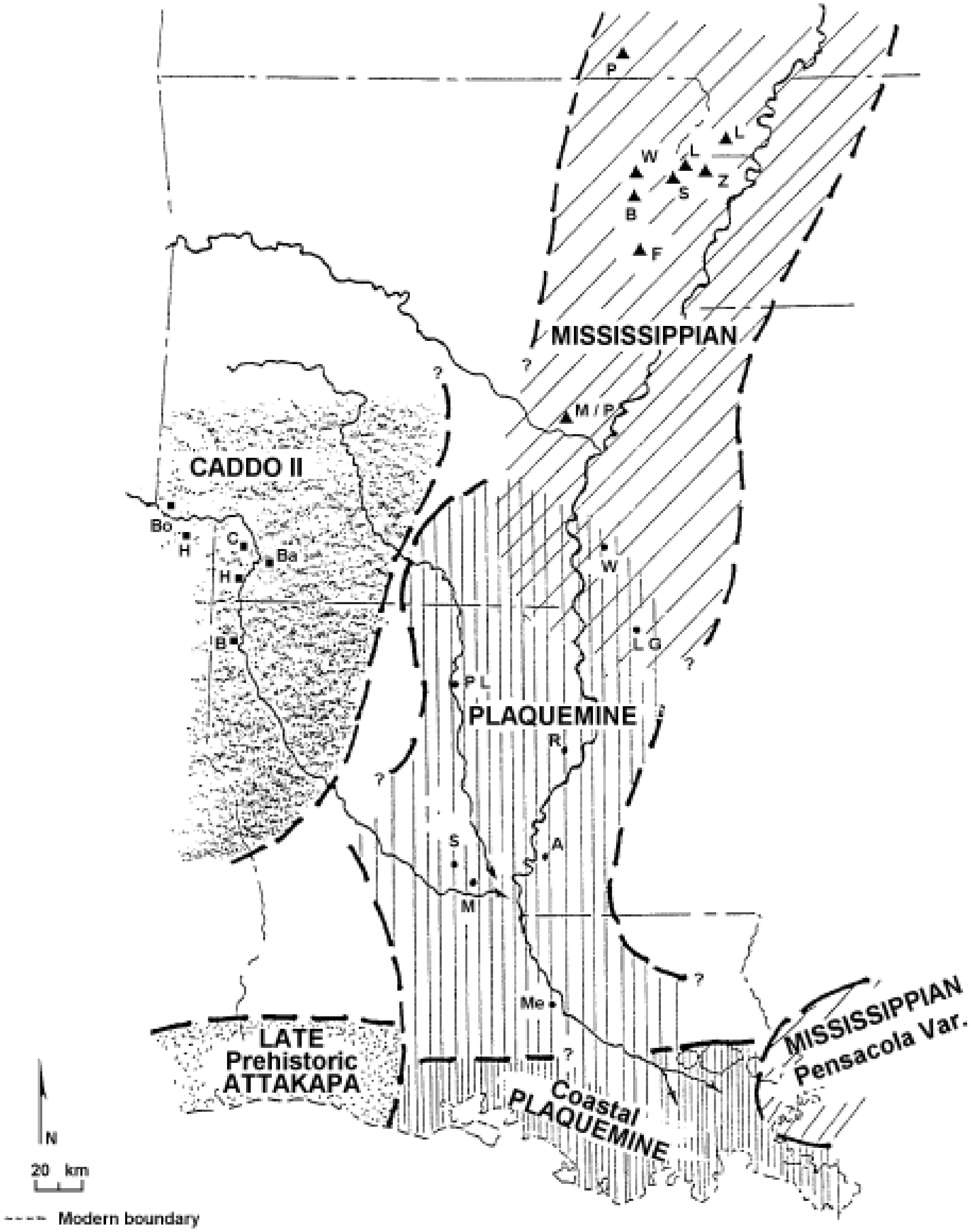
Key: **Mississippian culture sites:** B = Barrett; CV = Cherry Valley.
Caddo I culture sites: B = Bowman; C = Crenshaw; G = Gahagan; H = Hanna; MP = Mounds Plantation.
Transitional Coles Creek–Plaquemine culture sites: B = Boydell; G (Mississippi) = Gordon; G (Louisiana) = Greenhouse; LG = Lake George; P = Pargoud Landing; S = Strohe; W = Winterville.
Coastal Transitional Coles Creek–Plaquemine: JS = Jeff Simmons; M = Morgan; MB = Mulatto Bayou; MSM = Morton Shell Mound; PC = Pierre Clement.

Figure 17. Map of cultural distributions and key sites in and near the study area ca A.D. 1100.



Key: **Middle Mississippian culture sites:** H = Hazel; L = Lilbourn; S = Schugtown; W = Wilson.
Caddo I culture sites: B (Arkansas) = Battle; B (Louisiana) = Belcher; C = Crenshaw; H = Haley.
Transitional Coles Creek–Plaquemine sites: B = Boydell; LG = Lake George; M = Mayes; S = Sanson; SL = Shallow Lake; W = Winterville.
Coastal Plaquemine sites: FL = Fleming; SMV = Salt Mine Valley; V = Veazey.
Other sites: St = Strohe

Figure 18. Map of cultural distributions and key sites in and near the study area ca A.D. 1200.

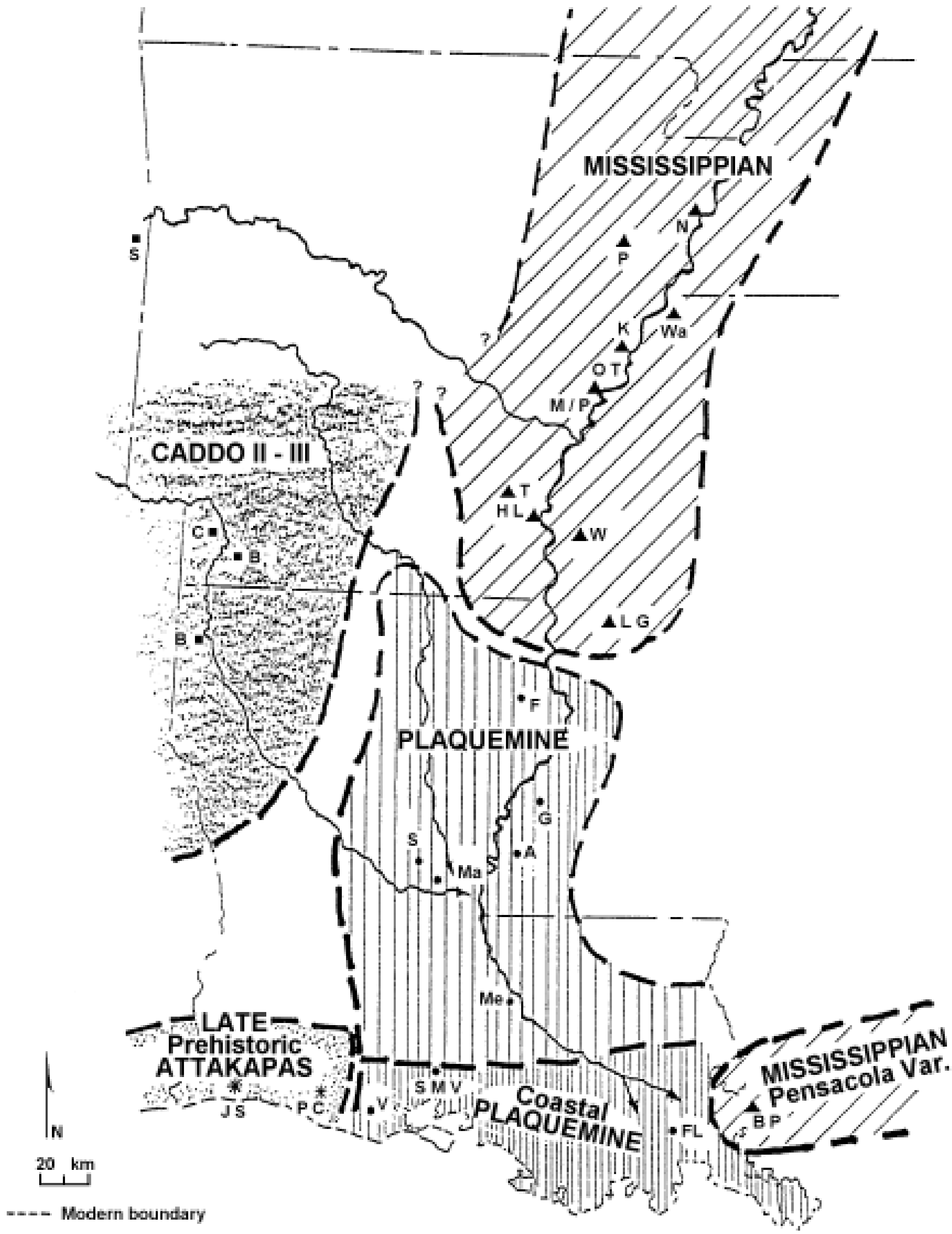


Key: **Middle Mississippian culture sites:** B = Burris; F = Floodway; L (Arkansas) = Lawhorn; L (Missouri) = Langdom; M/P = Massey and Poor; P = Powers Fort; S = Schugtown; Z = Zebree.

Caddo II culture sites: B = Belcher; Ba = Battle; Bo = Bowman; C = Crenshaw; H (Texas) = Hatchel; H (Arkansas) = Haley.

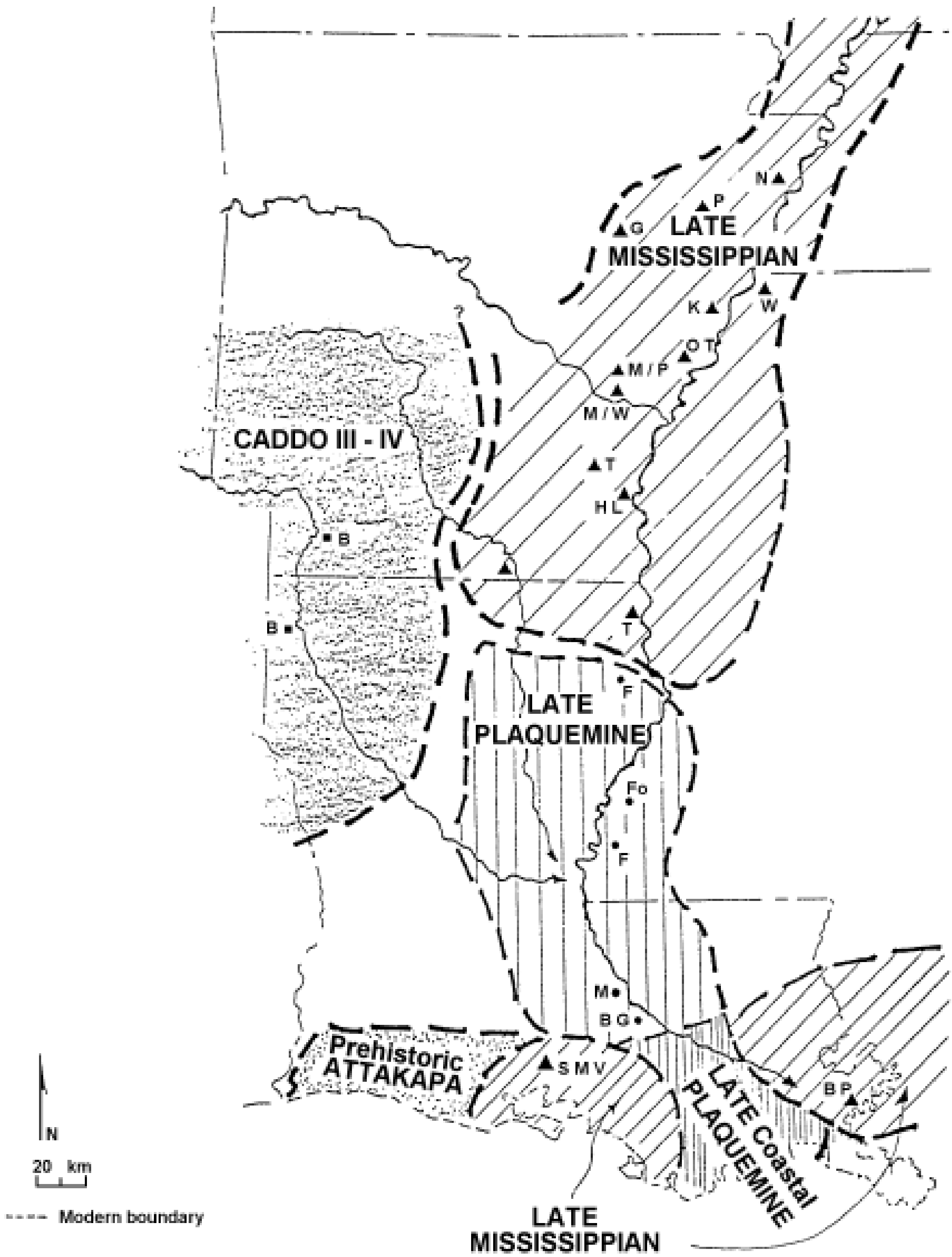
Plaquemine culture sites: A = Anna; LG = Lake George; M = Mayes; Me = Medora; PL = Pargoud Landing; R = Routh; S = Sanson; W = Winterville.

Figure 19. Map or cultural distributions and key sites in and near the study area ca A.D. 1300.



Key: **Late Mississippian culture sites:** HL = Hog Lake; K = Kent; LG = Lake George; M/W = Menard and Wallace; M/P = Massey and Poor; N = Nodena; OT = Old Town; P = Parkin; T = Tillar; Wa = Walls; W = Winterville.
Caddo II–III culture sites: B (Arkansas) = Battle; B (Louisiana) = Belcher; C = Crenshaw; S = Spiro.
Plaquemine culture sites: A = Anna; F = Fitzhugh; G = Gordon; Ma = Mayes; Me = Medora; S = Sanson.
Coastal Plaquemine culture sites: FL = Fleming; JS = Jeff Simmons; PC = Pierre Clement; SMV = Salt Mine Valley; V = Veazey.
Coastal Mississippian culture site: BP = Bayou Petre.

Figure 20. Map of cultural distributions and key sites in and near the study area ca A.D. 1400.



Key: **Late Mississippian culture (inland) sites:** G = Greenbrier; HL = Hog Lake; K = Kent; M/W = Menard and Wallace; M/P = Massey and Poor; N = Nodena; OT = Old Town; P = Parkin; SL = Shallow Lake; T (Arkansas) = Tillar; T (Louisiana) = Transylvania; W = Walls.

Caddo III–IV culture sites: B (Arkansas) = Battle; B (Louisiana) = Belcher.

Late Plaquemine culture sites: BG = Bayou Goula; F (Mississippi) = Fatherland; F (Louisiana) = Fitzhugh; Fo = Foster; M = Medora.

Late Mississippian culture (coastal) sites: BP = Bayou Petre; SMV = Salt Mine Valley.

Figure 21. Map of cultural distributions and key sites in and near the study area ca A.D. 1500.

incising was rare. South of the Arkansas, though, "engraved, incised, and trailed decoration is the rule rather than the exception, and vessels marked by beautifully incised decoration are not infrequently found." Moore's observation is generally true, but again, he lacked chronological controls, and he further confused the picture by ignoring temper. To be sure, much of the pottery he was dealing with belonged to the Mississippi culture period, but some did not.

As noted in Chapter 3, extensive excavations were conducted at Mississippian sites in northeast Arkansas by Dr. Hampson and by the University of Arkansas Museum and others, and in the Arkansas Valley by the Museum, beginning in the early 1930s. However, the findings of these projects were generally not published until much later, if at all (Morse 1973; Zinke 1975; Hoffman 1977). Exceptions to this statement were two journal articles: one, on the "historic [aboriginal] earthenware" of the Lower Arkansas Valley, appeared in the Texas *Bulletin* (Dickinson and Dellinger 1940); the other dealt with "possible antecedents of the middle Mississippi ceramic complex in northeastern Arkansas" (Dellinger and Dickinson 1940), and was widely circulated in *American Antiquity*.

Ford (1935c, 1936b:103–110) described a Tunica complex of ceramics from sites (including mound sites) on or near the Mississippi River in southwestern Mississippi and eastern Louisiana, but he only mentioned shell tempering along with other tempering materials, in passing. He did not offer any comparisons with the Middle Mississippi group or cite Holmes's work in any way. The actual Tunica are now generally believed to have been solidly in the Mississippian ceramic tradition (Brain 1979:224ff). They probably only moved into these regions (especially the southerly ones) in the late 1600s and early 1700s, possibly from an original homeland which had extended north and south of the Arkansas River mouth on both sides of the Mississippi (Brain 1977, 1979, 1981, n.d.; Jeter 1986). Immediately after Ford's work, Lemley and Dickinson (1937) reported finding shell-tempered Tunica ware at several sites along Bayou Macon in southeast Arkansas, but again did not cite Holmes nor make the Mississippian connection.

However, in the first major temporal–spatial synthesis of eastern U.S. prehistory, Ford and Willey (1941:348–349, Figure 2) did attempt to refine Holmes's terminology, placing an early Middle Mississippi trait complex in their Temple Mound I stage, and estimating its date around A.D. 1400–1600. Avoiding the terminological redundancy of a middle Middle Mississippi unit, they placed late Middle Mississippi complexes, including those of the St. Francis Valley in northeast Arkansas, in the Temple Mound II stage, from about A.D. 1600 to 1700. Their scheme was greatly oversimplified and their estimated dates (especially those for the earlier cultures) "ridiculously late" (Willey and Sabloff 1974:122). But the scheme nevertheless brought new attention to bear on the Mississippian phenomenon.

In designing the Lower Mississippi Valley Archaeological Survey, Phillips, Ford, and Griffin focused on a set of unanswered questions about Mississippian culture:

> By 1939, when the present Survey was first discussed, an immense amount of data on Middle Mississippi had accumulated, but the problem of its origins and development appeared to be as far from resolution as ever. There was a general impression, shared by many students of Southeastern culture, that this was because the "central" Mississippi Valley, the assumed center of distribution of the culture, had not been sufficiently investigated. It was primarily to make good this lack that the present Survey was undertaken....
>
> It is important to remember that as used by Holmes, [Middle Mississippi] was a broad typological concept applied to pottery alone. So far as our particular area is concerned, it has remained just that. The large-scale excavations and comparative studies necessary to convert that concept into a culture context have not been started....
>
> It so happens that in the Lower Mississippi Valley, profusion of burial offerings is a late development characteristic of the Mississippian cultures, but not of the earlier cultures that preceded them. In planning the Survey, we had to accept the melancholy conclusion that accumulated materials were mostly late and therefore of little use in solving the questions we were interested in. (Phillips et al. 1951:39–40)

In their concluding summary for the northern portion of the Lower Valley, Phillips, Ford and Griffin (1951:445ff, Table 17, Figure 73) defined an early Mississippi period which they saw as beginning around A.D. 1000 and ending around 1400, overlapping with the latter portion of Ford's Coles Creek period and most of his Plaquemine period. Their late Mississippi period began around A.D. 1400 and lasted into the 1600s, overlapping the latter portion of the Plaquemine period and the earlier portions of the Natchez period. It should be noted, though, that it was in their late Baytown period, equivalent to the earlier two-thirds of the southern Coles Creek period and estimated at around A.D. 850–1000, that they saw shell tempering as beginning to become prominent (Phillips et al 1951:443).

With regard to the "origins" question, they doubted the idea of a single center, suggesting instead "a number of centers in which this culture was developing more or less simultaneously along parallel lines with continuing interaction between them" (Phillips et al. 1951:451). They saw five major elements in this process: (1) continuity from the previous Baytown culture; (2) influences from regions north of the Lower Valley (e.g., the American Bottom and Cairo Lowland); (3) influences transmitted indirectly (possibly through the Caddoan area) from Mesoamerica; (4) influences from the Southwest; and (5) an "X-factor" which was in effect the synergistic "contributions made by the culture to its own development" by integrating local and introduced traits into the new cultural configuration. As has been seen in the Emergent Mississippian discussions above, the second and fifth factors have been emphasized in recent interpretations of

Mississippian origins in the present study area (Morse and Morse 1983:202ff). The multicenter interaction model of overall Mississippian origins, largely attributable to Griffin (Smith 1984:19–20, 30), has become predominant, if not uncontested.

Phillips et al. (1951:445ff) discussed numerous ceramic and other artifact traits of their early and late Mississippi periods. However, these discussions mixed several types and contexts (cf. Phillips 1970:924, who called their distinctions “a complete though unintentional swindle”) that have since become somewhat clarified. They did note that in the early period, “the population started clustering into larger groups and true towns were established” (1951:447), and that in the late period, “the most important single characteristic [of sites] is the trend toward larger and more concentrated villages.... This is particularly the case in the St. Francis area” (1951:449–450). These population increases and concentrations were ultimately believed to be related to improved varieties of maize and more efficient agricultural practices (1951:453). They also remarked that “it is probably safe to say that De Soto [in northeast Arkansas in 1541] saw the Mississippian culture in full bloom” and that subsequently a severe depopulation must have ensued, judging from French accounts of the late 1600s (1951:451).

Phillips (1970:912ff) excluded the possibility of pre-A.D. 1000 (Coles Creek period) Mississippian phases. He also was unable, from his Yazoo Basin perspective, to correct the “swindle” perpetrated in northeast Arkansas and adjacent regions in the 1951 report, settling instead for lumping the early and late phases into an undifferentiated, lengthy Mississippi period which exaggerated even the “population explosion” that almost certainly did take place (1970:923ff). Subsequent research refined the Mississippian sequences in these regions and greatly clarified our perceptions of trends in population, subsistence, land use, geographic distributions, and settlement patterns (Morse and Morse 1983:200–303).

Some later comparative studies, influenced by the New Archeology movement of the 1960s and 1970s, shifted away from the old emphasis on diagnostic artifacts and mound types. Smith (1978c:486) suggested a redefinition of Mississippian cultures as:

> those prehistoric human populations existing in the eastern deciduous woodlands during the time period A.D. 800–1500 that had a ranked form of social organization, and had developed a specific complex adaptation to linear, environmentally circumscribed floodplain habitat zones.

This adaptation was believed to focus on maize horticulture on alluvial soils renewed by more or less annual flooding. However, this definition might include some of the prehistoric cultures usually regarded as non-Mississippian (e.g., certain Caddoan or Plaquemine groups; Brown et al. 1978; Brain 1978) and exclude some traditionally (or more recently) regarded as Mississippian (e.g., Emergent Mississippian groups who did not depend heavily on maize; Lynott et al. 1986; or Mississippian generalists living along minor streams, such as the Summerville phase of western Alabama or perhaps the Powers phase of southeast Missouri; Peebles 1987:18–19; Smith 1978a; Price 1978). After examining the situation in east-central Arkansas, House (1982a:45) concluded:

> the archeological record from east-central Arkansas underlines the disparity between the prevailing artifact–typological definition of “Mississippian” and Smith’s ecological definition. Site distribution data indicate that the users of shell-tempered pottery during the A.D. 1000–1400 interval did not possess a specific adaptation to floodplain habitat zones; the evidence rather suggests continuities with the more wide-ranging settlement patterning of the preceding Plum Bayou culture.... After ca. A.D. 1400, however, there are indications of a simultaneous and abrupt shift in both community patterns and site distributions. Indeed, the dense populations, very large settlements, and complex political organizations of the 1541 ethnohistoric dateline do appear to have been based on a highly efficient adaptation to large river floodplains.

After further investigations of the late Mississippian Kent phase in this region, House (1987:55–57) emphasized variability within this period as well.

Late prehistoric to protohistoric peoples with predominantly shell-tempered Mississippian ceramics in southeast Arkansas seem to have had a relatively simple social organization with a community focus on mortuary ceremonialism, a dispersed settlement pattern based on small sites, and perhaps a generalized rather than specialized subsistence system (cf. Rolingson 1976:117; Jeter et al. 1979:47–48; Jeter 1986:55).

Smith’s definition would exclude this regional variability in Mississippian societies and might tend to mask dynamic oscillations in adaptation and social organization within those societies that did appear to fit his criteria (cf. House 1987:57). Instead of adopting his definition, this overview will use the traditional artifact-based definition and seek to characterize the variability among and within the Mississippian culture(s) in the study area.

No attempt is made in this broad overview to label subdivisions of the Mississippi period (Phillips 1970) or Mississippian period (Morse and Morse 1983) as early, middle, or late. At least for heuristic purposes, the Morses replaced the old early-late dichotomy with a tripartite Mississippian Frontier (A.D. 700–1000), Consolidation (A.D. 1000–1350) and Nucleation (A.D. 1350–1650) division for their central Mississippi Valley synthesis. In their Consolidation discussions (1983:237ff and elsewhere), they also referred to Middle *period* Mississippian in order to avoid confusion with Holmes’s temporally undifferentiated Middle Mississippi geographically derived phrase which gave the overall culture its name.

In regions to the south, though, the Phillips (1970) restriction of Mississippian phases to the post-A.D. 1000 period more or less holds true, producing hybrids like an Early Mississippi/Coles Creek period in east-central Arkansas (House

TABLE 6
MISSISSIPPIAN PHASES IN AND NEAR NORTHEAST ARKANSAS

Dates	Western Lowland	Crowley's Ridge	Central St. Francis	Eastern Lowland	Cairo Lowland
A.D. 1700					
			(abandoned)	(abandoned)	
A.D. 1600					
			Parkin	Nodena	
A.D. 1500					
A.D. 1400	(abandoned)	(abandoned)			(abandoned)
	Powers				
A.D. 1300	Wilson			Lawhorn	Cairo Lowland
A.D. 1200			Hazel, etc.		
A.D. 1100		Cherry Valley	Mangrum, etc		
A.D. 1000		?	?		
A.D. 900	Scatters			Big Lake	Hayti

1982a:42, Figure 4.2), or a Late Coles Creek–Early Mississippi period in south-central Arkansas (Schambach 1985:224), neither of which include actual Mississippian phases. Other approaches have included designating a post-A.D. 1000 Early Mississippi subperiod which includes Plaquemine-related, rather than Mississippian, phases (Jeter 1982a:103ff; cf. Schambach and Rolingson 1981:189–193, Table 19; House 1982a:68ff, Table 4).

The position taken in this overview is that little other than confusion will be gained by attempting to impose such labels over the huge area covered here. Instead, each region will be examined in its own terms for evidence of the appearance, nonappearance, or disappearance of phases which are generally regarded as Mississippian. Such evidence is clearly time-transgressive from north to south and, to a lesser degree, from east to west. It is appropriate, though, to repeat here a caution expressed by Phillips (1970:940),

> against the too easy assumption that Mississippian culture — or the bearers thereof if you prefer to put it that way — marched down the River in so regular a procession that individual phases can be dated by reference to degrees of latitude.

It will suffice here to reiterate a few general points (see also Phillips 1970; Williams and Brain 1983; Morse and Morse 1983) on the ceramic types and varieties characteristic of the various Mississippian phases. A basic distinction has historically been made between relatively coarsely shell-tempered Mississippi Plain paste and relatively finely shell-tempered Bell Plain paste, especially in northeast Arkansas and nearby regions; this simple dichotomy, though, has undoubtedly masked a great deal of variation. In more southerly regions, the shift to these more or less exclusively shell-tempered pastes from the heterogeneous grog-and-organic-tempered Addis ware pastes of Plaquemine ceramics seems to have been gradual, involving intermediate pastes such as Greenville ware (Brain 1969; Williams and Brain 1983) or Addis/shell paste (Hally 1972). And, as noted by Moore and other early observers, there is a general tendency for painted types to be more common north of the Arkansas River and for incised types to be more common south of that latitude. Also, decorated types in general appear to be more common in later Mississippian phases.

The major nonceramic diagnostic artifacts are projectile points. Emergent and other relatively early Mississippian phases, perhaps as late as the A.D. 1300s, are characterized by Scallorn-like (including Sequoyah, or serrated Scallorn) corner-notched arrow points. Madison triangular arrow points occur in some northeast Arkansas Mississippian contexts around A.D. 1000–1200. Some Middle period Mississippian phases in the A.D. 1200s and 1300s, especially in and near the Western Lowlands, are characterized by broadly side-notched Schugtown arrow points. Finally (as far as the A.D. 1000–1500 period is concerned), after about A.D. 1400 (and into Protohistoric times), the willow-leaf Nodena point became common. This sequence and the sequences of many other artifact types are best summarized in various discussions by Morse and Morse (1983).

Paleoenvironmental Data. The Mississippi River flowed within its modern meander belt in these latitudes throughout this period. Similarly, the courses of its major tributaries such as the White and Arkansas rivers, and of the creeks, bayous, and minor streams, would have been quite similar to those observed in early historic times.

Rolingson (1976:109) called attention to evidence of very broad climatic variability during this period: climates in general appear to have been relatively warm and moist between A.D. 1000 and 1200, warm and dry between 1200 and the early 1400s, and relatively cold from then until the 1850s. However, such characterizations are much too general to be of much use in explaining prehistoric local to regional adaptations (Dean et al. 1985). Perhaps the best hope at present for region-specific paleoenvironmental data from this period is research in bald-cypress dendrochronology and dendroclimatology (Stahle et al. 1985).

Phases. Numerous Mississippian phases have been defined in and near this study area, principally in its northern portions. In the following pages, a chronologically sequent examination of their distributions provides an overview. These maps and tables are to some extent influenced by the history of archeological investigations, but they at least appear to display the major geographic shifts in population, and hint at changes in land use patterns. They tell us nothing about the prehistoric processes which produced this archeological record, but a number of hypotheses have been proposed, and some have been tested by excavations at several key sites.

The phase tables are presented in north-to-south order, beginning in northeast Arkansas and proceeding discontinuously to the Gulf (there is a gap in Mississippian phase distribution between northeast Louisiana and the coastal zone). A few regions outside the present study area are included for comparative purposes when relevant.

Table 6 displays the spatial–temporal relationships of phases in northeast Arkansas and the nearby Cairo Lowland, a critical region of Mississippian developments (Morse and Morse 1983:214–217, 262–266). The regions involved are arrayed in a generally west-to-east order, from left to right, with the Cairo Lowland, actually to the north of the study area, added at the extreme right.

A clear pattern is apparent (keeping in mind Phillips's caution cited above): from beginnings before A.D. 1000 in the Cairo Lowland, Eastern Lowlands of Missouri and extreme northeast Arkansas, and Western Lowlands of Missouri and possibly extreme northeast Arkansas, the distribution of Mississippian culture (seen here as a polythetic cluster of variables, rather than a constant, monothetic entity) spread generally southward into the Arkansas portions of the Mississippi floodplain, St. Francis Valley, Crowley's Ridge, and Western Lowlands by the 1100s and 1200s. During the period A.D. 1350–1400, the Cairo Lowland and the westerly regions were effectively abandoned (Morse and Morse 1983:280f) probably for somewhat different reasons, since the former includes abundant rich meander belt soils and had a long (pre)history of intensive Mississippian occupation, while the latter have more restricted meander belts and were only occupied briefly by Mississippian cultures.

By A.D. 1400, Mississippian populations in northeast Arkansas were principally concentrated in two regions with

TABLE 7

MISSISSIPPIAN PHASES IN EAST-CENTRAL ARKANSAS AND ADJACENT REGIONS

Dates	Arkansas River Lowland	Lower White	Lower St. Francis	Memphis–NW Mississippi
A.D. 1700				
		??	(abandoned)	
A.D. 1600	Quapaw			
				(abandoned)
A.D. 1500	"Poor"	Old Town	Kent	
				Walls
A.D. 1400	?	?		
A.D. 1300				
	?	?	?	?
A.D. 1200				
A.D. 1100	?	?	Barrett Complex	?
A.D. 1000				
A.D. 900	(Plum Bayou Culture)		(Walnut Bend Phase)	

Note: Parentheses indicate non-Mississippian cultures/phases.

TABLE 8

MISSISSIPPIAN AND OTHER LATE PHASES IN SOUTHERN ARKANSAS AND ADJACENT WESTERN MISSISSIPPI

Dates	Felsenthal	Bartholomew		Macon	Yazoo
		North	South		
A.D. 1700	(abandoned?)	(abandoned?)		(abandoned?)	Russell
A.D. 1600	Caney Bayou	Tillar		Hog Lake	Wasp Lake
A.D. 1500			Wilmot		
A.D. 1400	?	?		?	Lake George
A.D. 1300	(Gran Marais)		(Bartholomew)	(Bellaire)	(Winterville)
A.D. 1200					
A.D. 1100					(Crippen Point)
A.D. 1000					(Kings Crossing)
	(Cypress Swamp)		(DeYampert)	?	
A.D. 900					

Note: Parentheses indicate non-Mississippian cultures/phases.

major concentrations of arable alluvial soils, in two phases which clearly had significant maize-based horticultural economies and complex chiefdom social organization: Parkin and Nodena (Morse and Morse 1983:284–295). The Morses (1983: 301) suggested that the core of the Nodena phase may have been the translocated Cairo Lowland phase population. Both Parkin and Nodena may well have been visited by De Soto's army in 1541 (1983:305ff), and both seem to have been depopulated, perhaps by Spanish-introduced diseases, and virtually abandoned before the French explorers arrived in the late 1600s (1983:314ff).

A third, apparently minor and isolated, post-A.D. 1400 Mississippian population cluster appeared well to the west and out of the present overview's territory, but it should be at least mentioned. It is known as the Greenbrier phase, and occupied the locality on and around the White River floodplain in the vicinity of the Ozark escarpment, near present-day Batesville. Its peoples may also have been contacted by De Soto's expedition (Morse and Morse 1983:298–300).

Table 6 presents the relevant phase data for the next tier of regions to the south, from west to east (more accurately, roughly from southwest to northeast) across east-central Arkansas. Also included here on the extreme right is the sequence for the region around Memphis and extreme northwest Mississippi.

A pattern compatible with that indicated in Table 7 is apparent. Although some pre-A.D. 1400 Mississippian sites and site clusters are known in this tier's regions along the Mississippi River (Morse and Morse 1983:241; House 1983, 1987: 49), no phases have yet been defined in these regions, nor in the regions to the south and west. The only phases yet defined for any of these regions are relatively late ones which appear to have begun after A.D. 1350 or 1400 (Morse and Morse 1983: 296–298), and perhaps not until the 1500s or later in the case of the Quapaw phase (1983:300–301). Again, a pattern of post-De Soto abandonments is apparent. The Old Town site, the major manifestation of its phase, was destroyed by flooding before it could be documented by modern archeologists. Morse (n.d.) suggested that the Quapaw phase included the translocated remnants of the Nodena phase.

Table 8 summarizes the next tier of regions, in southern Arkansas, again in west to east (left to right) order. The Bartholomew–Macon region is here split into Bartholomew and Macon subregions, since separate sets of complex or phase names have been proposed for these two meander belts. Also added for comparative purposes is the Yazoo Basin sequence of western Mississippi.

Once again, the general pattern of southward and westward spread of Mississippian culture is seen. However, the transition from non-Mississippian (Plaquemine-related) to Mississippian phases does not appear to have been an abrupt one, at least not in terms of ceramics.

As noted previously, the LMS account of Plaquemine origins, based on research in the Yazoo Basin at the northern margin of Plaquemine distribution, involves a thesis of

TABLE 9

MISSISSIPPIAN AND OTHER LATE PHASES IN NORTHEAST LOUISIANA AND ADJACENT WESTERN MISSISSIPPI

Dates	Lower Ouachita	Boeuf Basin		Upper Tensas	Lower Yazoo
		North	South		
	(Ouachita)	(abandoned)			
A.D. 1700	(Glendora)	Koroa		(Taensa)	Russell
	"Keno"		(abandoned)		
A.D. 1600		Jordan		(Canebrake)	Wasp Lake
A.D. 1500			Transylvania	(Fitzhugh)	
A.D. 1400	Myatt's Landing	Kinnaird	(Fitzhugh)		Lake George
A.D. 1300	(Pargoud)		(Routh)		(Winterville)
		(Bartholomew?)			
A.D. 1200	(McGuffee)				
A.D. 1100	(Routon)		(Preston)		(Crippen Point)
A.D. 1000	(Pritchard Landing)	?	(Balmoral)		(Kings Crossing)
A.D. 900					

Note: Parenthesis indicate non-Mississippian phases.

Mississippian–Coles Creek interaction, beginning in the A.D. 1100–1200 period (Brain 1969, 1971, 1978:344ff; Williams and Brain 1983:374ff). The Winterville phase (ca A.D. 1200–1400) is said to be characterized by a hybridization of Lower Valley (Plaquemine) and Mississippian ceramic traditions (1983:376–378).

The apparently coeval Bellaire phase of southeast Arkansas (Phillips 1970:944) is very inadequately defined but may include both Plaquemine and Mississippian artifacts in its assemblages (Jeter 1982a:105–106). The assemblages of the nearby Plaquemine Bartholomew phase do include some shell-tempered pottery (Rolingson 1976:115–116; Jeter 1986:49).

There also appears to have been a gradual increase in the frequency of shell-tempered pottery in the Felsenthal region, between the Gran Marais and Caney Bayou phases (Hemmings 1982:Table 25). The Felsenthal sequence is additionally complicated by the fact that it was an interaction zone between Plaquemine, Caddoan, and Mississippian cultures. Among other things, this has inspired the development of a new ceramic classification system for the nonshell-tempered Mississippi period ceramics of this region (Schambach 1981).

Again, the first true Mississippian phases only appear after A.D. 1400 in these regions. The Wasp Lake and Russell phases in the Yazoo Basin show a progressive settlement shift away from the Mississippi River, which may represent a "flight response" during a time of post-Spanish contact disruption (Brain 1978:354ff; Williams and Brain 1983:382–383). A similar suggestion has been made for the Hog Lake and Tillar complexes (phases) in southeast Arkansas (Jeter 1981). The Wilmot phase is represented by only a few small sites and one small mound center on the Bartholomew meander belt near the Louisiana state line (Rolingson 1974, 1976:117).

The Tillar, Hog Lake, Wilmot and Caney Bayou phases all may well represent the remains of Tunican groups (branches of the Tunica themselves, the Tunican-speaking Koroa, and perhaps others), who were reported to inhabit these regions by the earliest French explorers, and perhaps by De Soto's earlier entrada. There may have been a long continuity of Tunican occupations in southeast Arkansas, transcending the artifact change to a fully Mississippian assemblage. It appears, though that all of these southeast Arkansas regions were abandoned by about A.D. 1700. It appears that these indigenous Mississippian groups may have been driven out by the intrusive Quapaw Mississippians as much as (if not instead of) by European diseases (Jeter 1986).

However, the Russell phase of the Yazoo Basin appears to represent the remains of refugee groups who remained in that region into the early 1700s. These people probably included some of the Tunica, Yazoo, Ofo, and perhaps others, who were found in the lowermost Yazoo Basin locality by the French in 1699 (Williams and Brain 1983:383).

Table 9 summarizes the phase sequences in the next tier of regions, in northeast Louisiana, in the usual west-east/left-right order. Here, the sequence from the Lower Yazoo Basin is once again added at the right-hand margin.

TABLE 10

MISSISSIPPIAN AND OTHER LATE PHASES IN THE LOUISIANA COASTAL ZONE

Dates	Petite Anse	Lafourche–Terrebonne West	Lafourche–Terrebonne East	Pontchartrain–Eastern Delta West	Pontchartrain–Eastern Delta East
A.D. 1800		Various Tribes			
A.D. 1700					
A.D. 1600	Petite Anse	(Delta Natchezan)		Bayou Petre	
A.D. 1500					
A.D. 1400	(Burk Hill)	(Medora/Barataria)		(Barataria)	Bayou Petre
AD. 1300					
A.D. 1200					
A.D. 1100	(Three Bayou)	(St. Gabriel)		(“Mulatto Bayou”)	
A.D. 1000					
A.D. 900	(Morgan)			(Bayou Cutler)	

Note: Parentheses indicate non-Mississippian phases.

Whereas the two previous tiers of regions had true Mississippian phases after A.D. 1400, these regions in northeast Louisiana only had such phases after A.D. 1500. The late cultural sequences in these regions, like that in the Felsenthal region, are complicated by what are generally seen as interactions between and among two or all three of the great late prehistoric traditions of this study area.

In the Tensas Basin, the deeply rooted Coles Creek tradition shows strong continuity with the two Plaquemine phases, Routh and Fitzhugh (Hally 1972). However, at some time around A.D. 1500 or 1550, the northern portion of this region was impinged upon by a definitely Mississippian culture, best exemplified at the Transylvania mound center which gives the new phase its name. In the southern part of the region, though, the Fitzhugh phase apparently continued, coeval with Transylvania, until the 1600s, when the Transylvania locality was abandoned and the Fitzhugh locality was occupied by the hybrid Canebrake phase (Hally 1972; Jeter et al. 1979:40; Kidder 1986), which was in turn succeeded by the ethnohistorically known Taensa, whose artifact assemblage also appears to have been hybrid (Phillips 1970:945).

The Boeuf Basin sequence is just beginning to be defined (Belmont 1983; Williams 1983; Fuller and Williams 1985; Kidder 1986a, 1986b). The Kinnaird phase is at present only a word on a phase chart (1986b:Figure 3), and the most intensive efforts to date have been concentrated on the late Mississippian Jordan (pronounced “Jerdan”) site (Kidder 1986a: 248–378, 1986b, 1987). Jordan apparently was occupied between the mid-1500s and the late 1600s, and has been interpreted as another flight response situation (1986b:10; cf. Wasp Lake–Russell and Tillar, above). Kidder (1986b:9–12) suggested that the Jordan population may have included refugees from the Transylvania and Wilmot phases, and that the Jordan assemblage may represent the Koroa (see also Jeter 1986:45–49). He also noted the possibility that after the abandonment of the Jordan site, at least some of its occupants may have moved to the vicinity of the Bayou Barthalomew–Ouachita River junction to participate in the Keno–Glendora interactions.

On the basis of Moore’s (1909:32ff, 131ff) illustrations of numerous Caddoan vessels from the Glendora and Keno sites, it was formerly believed (e.g., by Phillips 1970:861) that the Boeuf, Bartholomew, and Ouachita drainages in northeast Louisiana, and adjacent regions in southeast Arkansas, were Caddoan in late prehistoric and protohistoric times. However, recent surveys in these regions, plus examinations of Moore’s unpublished vessels from Keno, Glendora, and other sites, indicate that “a Mississippian complex, not a Caddoan one, succeeds the Plaquemine throughout [these regions]" (Belmont 1983:281; Kidder, personal communication).

This Mississippian complex has never been formally named, but here, the name "Keno" will be provisionally used, as in Table 9, since Moore's Keno site collection has been found to be actually dominated by "Jordan-like Mississippian ceramics" (Belmont 1983:280). The Glendora site collection, however, is dominated by Caddoan ceramics, although Mississippian types are much more common than Moore's publication indicated. Therefore, the Glendora phase name probably should be retained, to represent "at most a brief Caddoan intrusion into the western fringe of the area, an appendix to [Ouachita] prehistory" (1983:281). It should also be noted that in 1700, Bienville found the Ouachita, a Caddoan group, living (only temporarily; Dickinson 1980:8) farther down the Ouachita Valley (McWilliams 1981:146–148).

No Mississippian phases have been recognized between the latter tier of regions and the Louisiana coastal regions. However, two separate Mississippian intrusions into the Plaquemine-related coastal sequence are now recognized, as summarized in Table 10.

Key Sites. The only thoroughly investigated Emergent Mississippian site in the study area, Zebree, has already been discussed, in the section on the A.D. 700–1000 period. Here, the major sites of the subsequent Mississippian phases will be mentioned in chronological order within each of the tiers of regions, from north to south as in the phase discussions.

After Zebree, the earliest Mississippian sites so far investigated intensively in northeast Arkansas, appear to be the Mangrum site (3CG636) and the McCarty site (3P0467). Mangrum was partially excavated by the Arkansas Archeological Survey for the Corps of Engineers, Memphis District, and a report was published in the Survey's Research Series (Klinger 1982). This site had both Late Woodland (Barnes) and Mississippian components, the latter dating around or shortly after A.D. 1000 (Morse and Morse 1983:238). McCarty was salvaged by Dan Morse and volunteers during 1981 land-leveling operations. It is much better known for its Tchula period occupation (1983:145ff; Morse 1986), but it also appears to have been a small farmstead coeval with the Mississippian occupation at Mangrum (1983:238–239, 1986:72ff, 89, Figure 7.2, Table 7.1).

The Banks mound group near Wapanocca Lake and the huge Bradley site on the Mississippi River can be viewed as a multicomponent situation. Banks Mound 3, excavated by the Gilcrease Institute in 1960, yielded a Mississippian assemblage probably dating to the late A.D. 1000s or early 1100s (Perino 1967; Morse and Morse 1983:239). A similar situation was encountered at the nearby Golightly site in 1932 excavations by the University of Arkansas Museum, but no report was published, and no phase has been defined (1983:241).

The Cherry Valley phase is based largely on excavations of burial mounds at the Cherry Valley site itself, by the Gilcrease Institute in 1958 (Perino 1967). The site, located on the western margin of Crowley's Ridge, probably dates between A.D. 1050 and 1150 (Morse and Morse 1983:241ff).

Although outside this overview's boundaries, the fortified mound centers of Towosahgy (Beckwith's Fort) and Lilbourn in the Cairo Lowlands provide useful comparative data for the period from around A.D. 1050 to 1350. Both were extensively excavated by the University of Missouri in the early 1970s (Chapman et al. 1977).

The Hazel site, in the St. Francis Valley near the mouth of Little River, was partly salvaged during highway construction (Morse and Smith 1973), and has produced radiocarbon and archeomagnetic dates suggesting that a Mississippian occupation occurred around A.D. 1150–1250 (Morse and Morse 1983:246–247).

The Wilson phase, ca A.D. 1150–1350, was tentatively proposed by Morse (1975:193–194), on the basis of excavations at two sites in the Cache River drainage of southeastern Lawrence County, just outside the boundary of the present overview. These were the Ward Wilson site (3LW44) and a small farmstead (3LW106). The Wilson phase was not discussed in the Morses' (1983) book but was provisionally redefined (Jeter 1987:Part III) and will be used here. Within this overview's territory, a nearby site, 3CG453, had been partly excavated but not reported upon by the Alabama Natural History Museum in 1932. Along with nearby site 3CG320, it was tested by the Cache River project in 1975, and assigned to the Wilson phase (House 1975:126–128). The Burris site (3CG218), in western Craighead County, was partially salvaged by the Survey in 1978 due to anticipated pipeline impacts and produced some settlement–subsistence–mortuary data (Jeter 1987:133ff). It apparently dated to the latter portion of the Wilson phase span (1987:189–193, 212)

As noted in Chapter 3, the Lawhorn site was the first thoroughly reported site in northeast Arkansas (Moselage 1962). It was a small village or hamlet, occupied during the A.D. 1250–1350 interval (Morse and Morse 1983:253–255). A second Mississippian occupation at the Zebree site also apparently dates to about this time. Morse and Morse (1977: Section VIII) referred to this occupation as belonging to the tentatively defined Lawhorn phase; although they did not use this phase name in their (1983) book, it will be used here as a heuristic device.

Although the Powers phase territory extends into northeast Arkansas (Morse and Morse 1983:256), most of the known sites, and all of the intensively investigated sites, are in southeast Missouri, in the extreme Western Lowlands below (and along, in a few known cases) the Ozark Escarpment (1983:Figure 11.9). The phase is very well dated to the A.D. 1275–1375 period and appears to have been a brief incursion by horticulturists into a marginal environment. The major reported excavations are those at the Snodgrass site (Price and Griffin 1979) and its very close neighbor, the Turner site (Black 1979). The former was a planned village of some 90 houses without a cemetery, and the latter was a smaller village with a cemetery which may have served for both sites and others. These large scale controlled excavations by the University of Michigan in the late 1960s and early 1970s, in response to site destruction by pothunters, are virtually unique in the recent history of the Lower Valley; many more such excavations would be welcomed by most archeologists. Another excavated Powers phase site, Gypsy Joint, is also in Missouri and consisted of a very small hamlet, possibly occupied only by one family (Smith 1978a).

Another order of magnitude is reached in a quantum leap, as it were, when we consider the sites of the terminal prehistoric Mississippian Parkin and Nodena phases (Morse 1973, n.d.; P. Morse 1981; Morse and Morse 1983:280–298). Many of them were investigated by early workers such as Curtis, Palmer, and Moore, again by various institutions in the 1930s, and by the Phillips, Ford and Griffin survey of the 1939–1947 period. Many of these sites were quite large planned villages with mounds, palisaded and with resident populations in the hundreds if not thousands. Here, reference is merely made to the publications by the Morses and others whom they cite, and it will be noted that occupation of many of these sites, such as Parkin and Nodena themselves, plus Pecan Point, Bradley, and others, may well have continued until the time of the De Soto entrada. Most of these sites are under virtually constant attack from pothunters.

In our second tier of regions, those in east-central Arkansas, the interval between Plum Bayou culture (and the coeval Walnut Bend phase) and very late Mississippian phases has been virtually a blank (House 1982:Figure 4-2). A “breakthrough in chronology building” occurred during the 1983 salvage excavations at the Barrett site (House 1983, 1987). Excavations in the lower levels of Barrett Mound A, which was being destroyed for agricultural purposes, plus surface collections in adjacent fields, revealed the presence of a Mississippian component estimated to date around A.D. 1100, and characterized by predominantly plain shell-tempered pottery.

Surface collections of plain shell-tempered pottery have been made from a number of other sites in these regions, and tentatively assigned to a Middle period Mississippian culture (House 1982:42, 44). One site which apparently dates to this period is Dumond, in the Grand Prairie between the Arkansas and White rivers, which was tested by the University of Arkansas Museum in 1967 (Scholtz 1968; House 1982:44).

Late Mississippian sites are common in these regions, though. The Walls phase includes sites in the Memphis, Tennessee locality, in northwest Mississippi, and across the river in Arkansas (Phillips 1970:Figure 447). It appears to date between around A.D. 1400 and the late 1500s and may have been contacted by De Soto’s army and/or by the diseases they brought (Morse and Morse 1983:296–297, 308–309). The Walls site itself is in Mississippi just south of Memphis. It is a mound–village–cemetery complex, and yielded numerous well made vessels, including a number with variant Southern Cult motifs, to collectors many decades ago (Brown 1926:288–319; Rands 1956). It was stratigraphically tested by Phillips, Ford, and Griffin (1951:243–248).

Chucalissa (Nash 1972; Morse and Morse 1983:296–297) is a mound–plaza–cemetery site within the southern portion of present-day Memphis. Belle Meade (3CT30) and Beck (3CT8) are major Walls phase sites in Arkansas and possible candidates for De Soto contacts (1983:296, 309). Such sites are currently being leased and mined with power equipment by relic collectors, and a field school was started at Belle Meade in 1987 by David Dye of Memphis State University in an effort to salvage some information before the data base is completely ruined.

The Kent phase (Phillips 1970:938–939; Morse and Morse 1983:297–298; House 1987) appears to date to the A.D. 1400–1600 interval (1987:47). The Kent site itself yielded a number of well made painted vessels to Moore (1911:406–410), as have other sites of this complex to more recent collectors (Brown 1978). Other major sites include Starkley and Clay Hill (House 1987). Small tests were conducted by House at several sites, and limited excavations were done at Clay Hill and Kent for his doctoral dissertation research. Such controlled excavations, however, are in danger of being overwhelmed by a tide of destruction. As noted by House (1987:48–49), several Kent phase sites are being mined by relic collectors with heavy machinery, as well as being potted by small time grave robbers.

The major site of the Old Town phase (Phillips 1970:940) was Old Town itself, now destroyed by the Mississippi River. It was visited by the Smithsonian Mound Survey in the 1880s, and summarized by Thomas 1894:234–235, Figure 142).

House (1986) analyzed collections from the Menard, Wallace, Massey, and Poor sites, located close together on a tongue of the Grand Prairie overlooking the lower Arkansas River, and found that Menard and Wallace (both of which have been suggested by various researchers to have been the late seventeenth century Quapaw village of Osotouy, with Menard the present candidate; Ford 1961) had consistently later assemblages, whereas the materials from Massey and Poor appeared somewhat earlier. No new phase has been defined, and since there is already a (much earlier) Massey phase, the name “Poor” is given in quotation marks for this complex in Table 7. The Quapaw phase sites will be summarized in the A.D. 1500–1700 period discussions.

In the third tier of regions, fully Mississippian sites do not appear to have existed before about A.D. 1400. In the Yazoo Basin, Williams and Brain (1983:409ff) suggested that “Mississippian influences” emanating mainly from Cahokia affected resident Coles Creek cultures in the A.D. 1000–1200 period, resulting in a transition to Plaquemine culture, and from that to Mississippian, ca A.D. 1200–1400, during what is now known as the Winterville phase, at both the Winterville and Lake George sites (1983:337–339) and a number of other sites (1983:376–378, Figures 11.17 and 11.18). The fully Mississippian Lake George phase is also in evidence at most of these sites (1983:339–342).

In southeast Arkansas, hints of at least a ceramic transition toward Mississippian culture are apparent before A.D. 1400 (Rolingson 1976:115–116; Jeter 1986:49). The first fully Mississippian phases include Wilmot and perhaps the earlier portions of the Hog Lake and Tillar phases. Both Hog Lake and Tillar appear to have been partially, if not primarily, phases of the subsequent A.D. 1500–1700 (Protohistoric) period, and the Wilmot phase may well have also continued into that period. No intensive site investigations have been made into the Wilmot phase, which is based on surveys and brief tests (Rolingson 1974, 1976). Sites of the Hog Lake phase include the Hog Lake site itself, which was actually a combination of sites on three parcels of property (Lemley and Dickinson 1937; Jeter et al. 1979:37–39), Gibson (1937:33–34), and Kelley–Grimes (Jeter et al. 1979).

The first semicontrolled investigation into the Tillar phase was an excavation at the Tillar site itself by Palmer in 1881 (Thomas 1894:240–241; Jeter 1980, 1981). Collectors have since excavated at several other Tillar sites, most notably Tillar Farms, which was potted by Lemley's agents in the late 1930s and partially salvaged by the Survey in 1973 (Jeter 1982, 1986); McClendon, which was potted by local collectors in the 1960s and 1970s, and tested by the Survey in 1983 (McKelway 1987); and Ables Creek, which had been potted a number of decades ago, was discovered during land-leveling operations in 1986 and salvaged by the Survey and Society at that time (Jackson 1987).

In the Felsenthal region, the first and only fully Mississippian phase, Caney Bayou, may belong wholly, or at least principally, to the A.D. 1500–1700 (Protohistoric) period. It was defined solely on the basis of a late cemetery component at the Shallow Lake site (Schambach and Rolingson 1981:193–198). Other, equally late Mississippian cemeteries are known in this region, e.g., at Gee's Landing (White 1970) and Gordon (White 1987).

Similarly, in the fourth tier of regions (northeast Louisiana), all of the true Mississippian phases date to the post-A.D. 1500 period. There was as well an apparent intrusion of Mississippi Valley Mississippians into the Petite Anse region of the south-central Louisiana coast around or after A.D. 1500. However, there was also a pre-1500 intrusion of Mississippian culture from the Florida–Alabama Gulf Coast into extreme southeast Louisiana.

Settlement Data. Although the Zebree site appears to have been a planned Emergent Mississippian small village well before A.D. 1000, evidence is lacking for habitation site plans from subsequent Mississippian occupations in northeast Arkansas until the A.D. 1100s.

The Mangum site seems to have been one of a number of hamlets scattered along the St. Francis Valley in a dispersed Mississippian settlement pattern around or slightly after A.D. 1000 (Klinger 1982; Morse and Morse 1983:238). A Mississippian component at the McCarty site may have belonged to the same or a similar system (1983:238; Morse 1986). A survey by the Morses (1983:241) revealed a dispersed settlement pattern of isolated house sites in the Wapanocca Lake vicinity around the Golightly site.

No village was associated with the Cherry Valley site (Perino 1967; Morse and Morse 1983:241). Other burial mound sites of this phase were excavated long ago, on and near Crowley's Ridge (1983:246), but little is known about the overall settlement pattern.

At the Hazel site, evidence was found for a village with houses oriented in rows, and an associated large mound, dating to the A.D. 1150–1250 period. Isolated house sites were near the village and beyond. The population appears to have been in the process of consolidating, with a hierarchical settlement pattern, and perhaps a hierarchical social system (Morse and Morse 1983:247).

The salvage excavations at the Burris site were restricted to a narrow pipeline corridor which only impacted the northwestern margin of the presumed village area (Jeter 1987:Figure 32). It encountered two houses, one of which was salvaged by Dan Morse (1979) after time and money ran out on the contract project. Both it and the other were open-cornered wall-trench houses (Jeter 1987:111-116, Figures 35 and 36), which apparently had wattle-and-daub walls, differing in both respects from known structures of the Powers and Lawhorn phases. They were oriented north to just east of north. The entire Burris village area appeared to be on the order of 200 x 100 meters (Jeter 1987:Figure 30) and could have contained dozens of such structures.

It is believed that the range of settlement types within the Wilson phase was hierarchical, with the Ward Wilson site as the paramount village. It may have been palisaded and may have included mounds. Several smaller villages, such as Burris, are known, as are small sites with remnant middens, probably representing individual–family farmsteads (House 1975:127; Morse 1975:193–194, 1979; Jeter 1987:212).

At the Lawhorn site, evidence of three rectangular houses was found (Moselage 1962:69–80). Although the discussion of the houses stated in several places that no evidence of daub was found, and a hypothetical A-frame structure with thatched walls was drawn (1962:Figure 40), the discussion of artifacts did mention burned clay fragments which were regarded as "not truly daub but rather fragmentary pieces of a multitude of domestic utility objects" (1962:58–63).

Another hierarchical settlement system is postulated for the Lawhorn phase (Morse and Morse 1983:253–255, Figure 11.1), at about the same time. This system may have included the second Mississippian occupation at Zebree and the Lawhorn site at the lowest or hamlet level. Houses were small, with posts set in wall trenches. No evidence of daub was found at Zebree. The next level could have included Old Town Ridge, a large village, and the Langdom mound and village site, across the present Missouri state line, at the apex. Comparative settlement plan data are available for this top level of the Lawhorn (and Wilson) phase hierarchy(ies) from the work in the Cairo Lowlands at the mound/plaza/village sites of Towosahgy and Lilbourn (Chapman 1976).

Powers phase structures and site plans were discussed in detail by Smith (1978a), Price (1978), and by Price and Griffin (1979); they also were summarized by Morse and Morse (1983: 256ff). Most of the known sites of this phase are located on easily tillable sandy ridges, on an ancient braided-stream floodplain of the Mississippi River. At Gypsy Joint, two contrasting structures may have served as summer and winter houses. At both Snodgrass and Turner, the house rows and the houses themselves were oriented just east of north. At the former, an interior compound contained most of the larger houses; some of the smaller houses outside this compound may have only been seasonally occupied. The apex of the settlement system appears to have been Powers Fort, a fortified mound center, once again reinforcing the inference of a hierarchical society. P. Morse (1981; Morse and Morse 1983:202–295) summarized the data on Parkin phase settlement. The Parkin site itself was by far the largest site of the phase, at around 7 ha (ca 17 acres), with "tell"-like deposits up to 2.5 m thick. Smaller palisaded village/mound sites were spaced more or less evenly along the St. Francis and Tyronza rivers. These smaller sites included at least four covering about 3 ha, at least eight covering about 2 ha, and several villages under 1 ha. Such sites with superimposed houses and middens, building up deposits on the order of 1 to 2 m thick (Morse and Morse 1983:294–295, Figure 12.8) were called St. Francis-type villages by Phillips, Ford, and Griffin (1951:329ff, 450). No isolated small farmsteads have been found, despite intensive surveys. The situation may well reflect the state of warfare that De Soto's chronicles recorded between the provinces of Casqui (Parkin?) and the encroaching stronger chiefdom of Pacaha (Nodena?).

Three geographical clusters of Nodena phase sites have been defined (Morse 1973, n.d.; Morse and Morse 1983:285–290). They occur along the Mississippi River from southeastern Mississippi County, Arkansas, into the southeasternmost Missouri bootheel. Although no concerted surveys have been made, more than 60 major sites are known in all. Morse (1973: 74ff, n.d.) identified several kinds of Nodena sites. Relatively small farmsteads are known (unlike the Parkin phase situation) and appear to represent one to a few houses. There are also medium to large habitation sites without mounds, ca 1 to 3 ha in extent. A different site type is the specialized cemetery with little evidence of actual habitation. Finally, the paramount villages included both mounds and intensively occupied habitation areas, covering as much as 6 to 8 ha. The capitals seem to have been at Bradley, Pecan Point, and Upper Nodena, all of which may have been occupied into Protohistoric–De Soto contact times. The Morses (1983:306–312) suggested that the Nodena phase represents the dominant province of Pacaha encountered by De Soto in 1541, and (1983:320) that the remnants of the Nodena–Pacaha chiefdom may have moved down the Mississippi Valley to form the nucleus of the Quapaw phase.

In the second tier of regions (east-central Arkansas), very little is known about settlement patterns of the earlier Mississippian occupations, which have not yet been identified clearly enough to define phases. According to House (1982:42, 44), the generally small habitation and mound sites which produce predominantly plain shell-tempered pottery and are assumed to belong to the Middle period appear to show some continuity with the preceding Plum Bayou settlement pattern: dispersed among a wide range of landforms rather than confined to the floodplains.

Sites of the Walls phase, by contrast, tend to be large mound-plaza and/or (fortified?) large villages, up to 4 to 8 ha, as well as small (ca 0.4 ha) habitation sites, generally on floodplains, though Chucalissa is an exception (Morse and Morse 1983:296).

As House (1982:44) noted, a similar change in settlement patterns occurred with the advent of the Kent and Old Town phases (and the somewhat later Quapaw phase). Concentrated populations produced middens up to 6 ha in area and 2 m or more in depth, again matching the description of palisaded and intensively occupied St. Francis-type villages. These site types are found on the floodplains of the lower St. Francis, the Lower White River Basin, and the Arkansas River Lowland, but apparently not in the White River Lowland. More specifically with regard to the Kent phase, House (1987:51ff) identified Kent, Starkley, and Clay Hill as St. Francis-type sites, and mapped and tabulated data on 15 other sites of this phase. Although noting the presence of small farmsteads or hamlets less than 1 ha in extent, he remarked on the lack of real evidence for a hierarchically organized society and emphasized the need for much more intensive research before the data base is obliterated.

In the third tier of regions, we will consider Yazoo Basin settlement patterning briefly, then move westward across south Arkansas. The Lake George phase in the Yazoo saw the decline of major centers like Winterville and Lake George, which had flourished during the preceding (ca A.D. 1200–1400) Plaquemine–Mississippian transition (Brain 1978:344–354; Williams and Brain 1983:378–381). However, the population probably grew, and began expanding onto marginal lands along tributaries away from the Mississippi. Williams and Brain (1983:380) noted that overall, "this rather dispersed settlement pattern is not typical of the usual Mississippian mode," resembling instead the earlier Coles Creek pattern, but that the mound centers took on a more Mississippian site plan (cf. 1983:Figures 11.12 and 12.16).

In southeast Arkansas, the little that is known about the Wilmot phase (eight small sites and a small mound center; Rolingson 1974, 1976:117) suggests a dispersed settlement pattern. Similarly, the Hog Lake and Tillar phases appear to have had dispersed small habitation sites (farmsteads?) along the old Arkansas River levees, with a community focus on mortuary ceremonialism at small mound and/or cemetery sites (Jeter 1982, 1986). These could perhaps be characterized as rural Mississippian settlement–subsistence systems (Jeter et al. 1979).

As noted above, the Caney Bayou phase (as well as Hog Lake and Tillar) may be later than the period under consideration here and is so far based virtually exclusively on mortuary components. Hemmings (1982:153, Figure 34) suggested that some of the mound centers overlooking the Felsenthal lowlands may have been occupied by Caney Bayou peoples, and at least two of the floodplain seasonal extractive sites were assigned to this phase (Hemmings 1982:Table 16).

Subsistence Data. Cochran (1982:67) conducted a catchment analysis around the Mangrum site and concluded that horticulture could well have been practiced in the immediate vicinity. However, this was not supported by a very small sample of water-screened (not floated) archeobotanical materials from the site, reported upon after a preliminary analysis by Harris (1982). No evidence of maize was found, nor of the native North American starchy-seed complex. Instead, only wild plants such as hickory nuts, walnuts, acorns, and persimmons were identified. It is not clear from the preliminary report whether the samples were clearly associated with the Mississippian component.

The Burris site yielded fairly abundant plant remains from several water-screened and partially floated feature fills. The only cultivated species identified (by Blake) was maize, which occurred predominantly in 8-, 10-, and 12-row varieties (Jeter 1987:179–181). Wild food plants included persimmon, various nuts, and wild bean. Animal bones were strongly dominated by deer, with turkey, raccoon, rabbit, and squirrel also present. Fish were present but probably underrepresented due to sampling bias. Subsistence data from Wilson phase sites other than Burris are minimal. At 3CG453, faunal preservation from a few tested proveniences appeared good, but the deposits were apparently mixed with remains from earlier occupations (House 1975:126–127). At 3CG230, one refuse-filled pit yielded nut hulls, persimmon, and unidentified seeds (1975:127).

Flotation and water-screening were not used at the Lawhorn site, but a few vegetal remains were recovered from features, including acorn hulls, (hickory?) nut hull, and seven maize cob fragments (Moselage 1962:63; Blake 1962). The cobs were 10- to 12-rowed. In connection with the Lawhorn phase and other Middle period Mississippian sites in northeast Arkansas, Morse and Morse (1983:255) noted the common occurrence of hoe chips from the resharpening of Mill Creek and Dover chert hoes. These implements are believed to be evidence of horticultural intensification. One possibly exhausted hoe and several polished chips were found at Lawhorn (Moselage 1962: 51, Figure 22-7). The recovered animal bones from Lawhorn were strongly dominated by deer, with a wide variety of other species present (Nash 1962).

Detailed archeobotanical and archeozoological analyses have not been published for the Snodgrass and Turner sites of the Powers phase, but both wild and domesticated plants (the latter probably including *Iva annua*, or marsh elder) were recovered; Mill Creek chert hoe flakes were also abundant, both on sand ridges (the probable field locations) and in structures (Price and Griffin 1979:18). Animal bones emphasized deer, apparently butchered at the kill sites, with only selected cuts brought back to the villages. The Gypsy Joint site yielded evidence of maize, plus ample wild plants and animal remains, and is believed to have been occupied on a year-round basis for only a few years (Wetterstrom 1978; Smith 1978a).

Blake (1986:Table 1.2) reported two finds of maize cobs from northeast Arkansas sites dating between A.D. 1200 and 1400. The Banks site produced 51 cob fragments, with a mean row number of 11.0, and the McDuffie site produced 26 more, with an average row number of 12.0.

Due to the lack of modern excavations involving flotation or water-screening in habitation sites of the Parkin and Nodena phases, direct evidence of maize and other cultigens is scarce. The University of Arkansas Field School excavations in 1973 at the Upper Nodena site did obtain macrosamples of maize cobs from the general village area and from what appeared to have been a burned corn crib. These were analyzed by Blake and Cutler (1979) and found to have a mean row number of 10.9, with a relatively wide range of variability. Cultivated beans, which have a nutritionally synergistic effect in combination with maize, were also found in nine different locations during these excavations (1979:55). Squash and gourds were not found in the Upper Nodena samples, but hickory nut hulls and persimmon seeds were common, and a few other wild plants were present (1979:58). Although direct evidence of cultigens is lacking from Parkin phase sites, a catchment analysis (P. Morse 1981:73–88) indicated that the sites were indeed oriented toward the best soils for maize cultivation.

Even given the presence of maize specimens, though, the ultimate tests of maize consumption are in the domain of bioarcheology, particularly through stable carbon isotope analysis and analyses of the frequency and patterning of dental caries. Particularly relevant here is an article by Lynott et al. (1986), who analyzed 20 skeletal samples from southeast Missouri and northeast Arkansas, covering a time span from Late Archaic to early Historic, for C-13/C-12 ratios. They concluded that "intensive maize agriculture in [these regions] began after ca A.D. 1000, and...the shift to substantial maize consumption was rapid" (1986:61). In fact, their graph (Lynott 1979:Figure 2) shows the four A.D. 1000 samples (including two from the Big Lake phase at Zebree) at about the ArchaicWoodland level, if not lower, and only the six A.D. 1200–1300 samples as indicative of a change toward heavy maize consumption. No samples were dated to the interval between A.D. 1000 and 1200, so the true nature of the change still needs to be investigated, with many more samples from good contexts.

In the east-central Arkansas tier of regions, neither direct evidence of cultigens nor bioarcheological evidence has been obtained. Instead, indirect evidence from settlement patterns (House 1982:42–44; 1987) indicates a shift toward concentrated settlements within the major floodplains, after A.D. 1400, and this in turn is believed to mark a change toward horticultural intensification.

In the third tier of regions, once again direct evidence of cultigens and bioarcheological analyses are lacking. It is commonly assumed that maize horticulture was present, but its importance remains to be demonstrated. The settlement pattern evidence reviewed above (cf. Jeter 1986:55) suggests that small rural Mississippian farmsteads may have been the maximal productive population concentrations. Hemmings (1982: 197ff, Tables 16 and 25) found both Gran Marais and Caney Bayou phase seasonal extractive sites on the Ouachita River floodplain in the Felsenthal region, plus some evidence for a gradual transition between these phases. So, even though the former phase is considered Mississippi period, Plaquemine culture and the latter may be Protohistoric period Mississippian culture, it would appear that this kind of subsistence system involving aquatic and wetlands resources was also in effect by pre-A.D. 1500 Mississippians or semi-Mississippians in this region.

Mortuary Data. Numerous Mississippian burials dating to this period have been excavated in and near northeast Arkansas. However, the data base is of low quality, as much of this work was done in the early decades of archeological investigations, when the main object of excavation was to obtain well preserved specimens of well made artifacts, especially pottery. Thus, most of that work was done at late prehistoric and protohistoric Mississippian sites, which tend to have more and better made grave goods. The continuing desire for these artifacts on the part of collectors has been inflicting a tremendous impact on the mortuary data base, as grave robbing on private lands continues essentially unabated. The pace seems to be accelerating, with the use of power equipment to mine burial sites, and at the present rate, virtually all of these sites will be ruined in a matter of a few decades at most. Here, the record will be reviewed in the usual order, from earlier to later phases within tiers of regions from north to south.

At Mangrum, three poorly preserved burials were found and partially analyzed by Sperber (1982). One was isolated (as far as the limited excavations could discern), with no associated artifacts. The other two were together, with Mississippian vessels. The manner of interment could not be determined (Klinger 1982:49, 52).

At the Burris site, one adult burial extended supine, with head to the south and no artifacts, was found near a house (Jeter 1987:146, Figure 35). Analysis was reported on by Condon and Rose (1987).

The Lawhorn site excavations encountered 42 burials which were given numbers, but only 35 of these were sufficiently preserved for minimal analysis (Nash 1962:Table 8). Most were extended-supine, but data on orientations were not published. Twelve of the 35 were accompanied by ceramic vessels.

Again, some contemporary comparative data are available from the Towosahgy and (especially) Lilbourn sites in southeast Missouri. In particular, at Lilbourn there was some evidence of a special-status burial group with exotic artifacts, and perhaps a female shaman, plus an individual with syphilis-like pathologies (Chapman 1976:140–143, Figures 7.11 and 7.12).

Only six burials were found in the entire Snodgrass site excavation, mainly extended-supine with heads to the southeast and with one or a few ceramic vessels (Price and Griffin 1979: 40–41). The main cemetery for this site appears to have been at the nearby Turner site, which was probably occupied and abandoned as a village somewhat sooner, and had its plaza converted into a cemetery. At Turner, the cemetery was completely excavated, revealing 54 burials containing at least 118 individuals, again generally extended-supine (but with many disarticulated), with heads to the east-southeast (Black 1979:7, Tables 40 and 41). Only 13 ceramic vessels were recovered during the excavations, but at least 29 others were known to have been removed by pothunters (1979:7, 10).

Curtis recovered more than 800 pottery vessels during his 1879 excavations into (primarily) Parkin phase burials along the St. Francis River (P. Morse 1981:20), but apparently no data were preserved on the burials themselves. As P. Morse (1981:21) has noted, vast quantities of undocumented mortuary pottery were removed from Parkin and related sites between Curtis's visit and Moore's expedition of 1909–1910.

Moore (1910:258–337) visited numerous sites along the St. Francis, and only a few will be summarized here. At the Big Eddy site, he found a potted and (to him) unimpressive cemetery with at least 26 burials, mainly extended-supine, and 67 poorly preserved vessels. About 5 km south of Parkin, at the enormous Rose Mound (a "tell"-like midden as much as 2.5 m deep and covering nearly 3 ha), he encountered 207 burials, the great majority of which were extended-supine, and 587 vessels, including two head pots and numerous other well made painted or incised specimens. At Parkin itself, a brief examination located 19 burials and netted 25 vessels. At Neeley's Ferry, he found 95 burials and 175 pots. At Miller, another "tell" (cf. Morse and Morse 294, Figure 12.8), he found 58 burials (all but one extended-supine) and 112 vessels.

Intensive excavations of Parkin phase sites by archeologists almost ceased after Moore's work, though of course the pothunters have continued. In 1966, a University of Arkansas field school at the Parkin site encountered 10 burials, seven of which had apparently been potted (Klinger 1977; P. Morse 1981:23).

Sites of the Nodena phase have also produced numerous poorly documented burials, although Moore was not so active there. He was preceded by a number of late nineteenth century diggers, such as the representatives of the Davenport (lowa) Academy of Natural Sciences, who obtained several head pots from Pecan Point and whose collections furnished the basis for Holmes's (1903) definition of the Middle Mississippi ceramic group. In the early 1880s, Palmer also worked briefly at some of these sites for the Smithsonian (Thomas 1894; Jeter n.d.). At the Bradley site, Moore (1911) discovered 181 burials, mostly extended-supine, and 258 pots. At Pecan Point, 349 burials, again mainly extended-supine, yielded 535 vessels, including a number of human effigy forms and a head pot which was by then the ninth known from that site. The most intensive

Nodena excavations, though, were those conducted by Dr. Hampson and his associates from the University of Arkansas Museum and the Alabama Museum in the 1930s. More than a thousand burials and vessels were excavated at Upper Nodena, Middle Nodena, and related sites, as summarized in various sections of Morse's (1973, n.d.) volume. Despite all of this burial excavation, relatively few physical anthropological analyses have been done on Nodena (or Parkin) skeletal materials.

In the third tier of regions, Moore (1911:369) found "neither bones nor artifacts" along the Mississippi between Vicksburg and the Winterville (Blum) mounds. At Shadyside Landing, just north of Winterville, he found burials of at least 27 individuals, some extended and some bundled. The scarcity of artifacts makes this situation impossible to assess, but one apparently shell-tempered vessel was found with a multiple bundle burial (1911:388–391).

No Mississippian burials were encountered during the Lake George excavations, but at Winterville, 16 burials were encountered in Mound B (Brain 1969:118ff). Four bundle burials without grave goods were regarded as Plaquemine (1969:123–124), although such burials are not unknown in Mississippian contexts (Jeter et al. 1979:36). Ten extended-supine Mississippian burials were usually accompanied by grave goods.

The Hog Lake, Tillar, and Caney Bayou burials, while definitely Mississippian, are believed to belong primarily to the A.D. 1500–1700 period, and will be discussed in that section.

Exchange and External Relationships. Mississippian peoples definitely engaged in widespread interaction, up and down the Mississippi Valley. This is most readily recognized in the similarities of various shell-tempered pottery types and varieties, and in the presence of nonlocal raw materials. Morse and Morse (1983:205–208, 255, Figures 10.2–10.4) have reviewed the evidence for exchange in materials such as Crescent Quarry chert from the St. Louis vicinity, Mill Creek chert from southern Illinois, Dover chert from Tennessee, basalt, copper, hematite and galena from the Ste. Francois Mountains of southeast Missouri, and large shells from the Gulf Coast.

As has been mentioned repeatedly, Williams and Brain (1983:408ff; see also Brain 1969, 1971, 1978) suggested that Mississippian influences upon indigenous Coles Creek peoples, beginning at some time between A.D. 1000 and 1200, were responsible for the origin of Plaquemine culture. Aside from a few examples of trade ceramics probably from Cahokia or nearby, and the interpretation of a change to a more Mississippian site plan for mound centers already in existence, the exact nature of the interaction remains rather nebulous, in the realm of "ideas rather than artifacts" (1983:412) and "continuing (but unspecified) Mississippian influence" (1983:413). These matters will be discussed further in the section on Plaquemine culture.

Coastal Mississippi Culture (Figures 19–21)

Definition and Location. Mississippian culture in the coastal zone of Louisiana has not been defined well enough to permit the formulation of phases or traditions with the same certainty that has been possible for the earlier culture periods. This appears to be at least partly due to the the inappropriate application in the delta region of a ceramic type–variety framework defined for the Lower Mississippi Valley. The problem is that the pottery sequence in south Louisiana for culture periods after Troyville–Coles Creek lacks the kind of temporal and spatial variability in ceramic distributions necessary for the type–variety method to succeed in discerning meaningful patterns (cf. Springer 1973; Gibson 1975, 1978; Atschul 1978; Davis 1981). Davis (1981) argues that the apparent social and demographic instability of the late prehistoric groups residing in the region and the resulting cultural mixing of groups and site deposits decreased the strength of ceramics, and in particular the success of the type–variety method, for elucidating fine scale chronological patterns. Many researchers have attempted to counter this problem by using alternate methods such as modal analysis (Altschul 1978; Davis and Giardino 1980). Davis (1981) does not suggest that the current type–variety system should be discarded, but does recommend that researchers recognize its limitations and use caution when dealing with temporally fine scale problems.

The result of this ceramic fuzziness (New World Research, Inc. 1983) is that there is little agreement among archaeologists over the correct placement of coastal Mississippian groups within existing cultural phases or complexes. At present, Bayou Petre remains the only phase defined for this region, but many researchers believe that it is poorly defined and is being over-extended (cf. Davis 1984:223). In addition, the boundaries of another cultural unit, the Pensacola complex, defined for the west Florida, Alabama, and Mississippi Gulf Coast is being extended into the delta region of Louisiana to include sites previously lumped into the Bayou Petre phase catchall (Knight 1984). Since only further study in the future of a larger sample of sites can resolve this issue, the present discussion can only provide a summary of the rather incomplete picture of coastal Mississippian culture along with some of the classificatory problems and inconsistencies.

According to traditional ideas of the prehistoric framework, true Mississippian culture in the coastal zone was limited to the Bayou Petre phase populations residing primarily in the St. Bernard Parish area of southeastern Louisiana, but also documented in Plaquemines, Lafourche, St. Charles, and Terrebonne parishes. The second wave of Mississippian expansion into Louisiana, represented by the Bayou Petre phase sites, occurred during the Early Plaquemine stage (ca A.D. 1200 to 1500) and originated from the Mobile Bay area. Judging from the Moundville style of some of the material culture, apparently this expansion can be traced ultimately to Mississippian influence coming, at various times, down the Mobile–Alabama–Tombigbee river system out of the important Mississippian center at Moundville, Alabama (Knight 1984:198; Phillips 1970:951–953).

The only other evidence of Mississippian culture on the coast is found on Avery Island in the Petite Anse region of central Louisiana. At Avery Island, investigations by the Lower Mississippi Survey (Brown and Brown 1978) have revealed sites dating to the sixteenth to early seventeenth century containing shell-tempered sherds of a type previously documented only in the southern Yazoo Basin in northwestern Mississippi. Many of the sherds are from large, thin flat bowls known as salt pans, suggesting that Mississippian groups were traveling from the Yazoo Basin to the Avery Island salt domes to obtain the highly prized and extensively traded salt. Although saline sources were located much closer than Avery Island (which is situated nearly 300 linear km from the Yazoo), it is suspected that the closer salt sources were under the control of other Native American groups forcing the Yazoo Basin Mississippian peoples to journey south to the coastal salt domes which were situated in a region of small dispersed populations (Brown and Brown 1978:1; Neuman 1984:279).

In general, the coastal Mississippian culture is characterized by shell-tempered ceramic wares sometimes decorated with Southern Cult ceremonial motifs. The surface collections made by Kniffen (1936) and McIntire (1958) from Bayou Petre phase sites in the eastern delta contain pottery specimens with eastern Gulf affiliations, including Pensacola Incised, Moundville Incised, and Fort Walton Incised comprising over 60% of the total decorated ceramics. A number of the same collections also include quantities of pottery types such as the *Natchez* variety of Leland Incised, Australia Incised, and Harrison Bayou Incised that are associated with ceramic complexes located farther north in the Lower Mississippi River Valley (Davis 1984:221).

Examination of the frequency of Mississippi components by parish, based on data published in the Comprehensive Archaeological Plan (Smith et al 1983:Tables 3 and 5), shows a general cluster of occupations in the eastern and central sections of the coast. The primary area of occupation appears to be the eastern part of the Mississippi River delta in the eastern Lafourche and St. Bernard subdeltas (Figure 5) where the Bayou Petre phase culture was based. The Mississippi components in the western part of this delta (Lafourche Parish) are pushing very close to the Plaquemine culture area and may represent contact between the two cultures or simply overlap in site occupation. To the west, the density of Mississippi use is much lower except for the central coastal salt dome region where seven components are shown in Iberia Parish.

Phases. As previously noted, Bayou Petre is the only phase defined for the coastal Mississippian culture in Louisiana. This phase was initially defined by the geographer Kniffen (1936) as a catchall without conditions on its geographical boundaries for late prehistoric sites postdating his earlier Bayou Cutler phase of the Coles Creek period. In an attempt at translating Kniffen's ceramic criteria into current typology, Phillips (1970: 952–953) listed shell and limestone tempering in general (specifically limestone-tempered Fatherland, Natchez Incised, or plainware) and noted the presence of Moundville, Fort Walton, or Pensacola Incised (temper specified or not) as useful criteria for separating Bayou Petre from Medora and Delta Natchezan phase Plaquemine. Phillips (1970:953) also noted that there is a zone of contact in which Delta Natchezan and Bayou Petre ceramic elements overlap but that Natchezan elements in Bayou Petre contexts diminish rapidly from west to east, with relatively unmixed Bayou Petre sites frequently occurring in Orleans, St. Bernard, and Plaquemines parishes.

The Pensacola complex has been reviewed recently by Knight (1984) who summarizes the history of archaeological research on this complex, its ceramic definition and distribution, and the economic base of Pensacola complex groups. According to Knight, the Pensacola complex was essentially defined by Holmes (1903) and refined by Willey (1949) and others based on work in the eastern Gulf region. The Pensacola complex encompasses several discrete culture–historical manifestations from Florida to Louisiana often having different histories, settlement types, settlement patterns, time depths, etc., but all sharing in a broad ceramic style. The temporal range of Pensacola is not well defined, but appears to appear about A.D. 1000 and extend in some places up to the eighteenth century (Knight 1984:202).

Key Sites. There are very few excavated Mississippi period sites from the coast of Louisiana. Sims is the only intensively studied site of this period in coastal Louisiana. Brown's (Brown and Brown 1978) study of Late Mississippi culture protohistoric period sites in the Avery Island salt dome region will be discussed in Chapter 9. Most information concerning Mississippi culture Bayou Petre phase sites has been gleaned from surface collections made during surveys in the delta region (cf. Kniffen 1936; McIntire 1958; Altschul 1978; Gagliano et al. 1975).

The Sims site (16SC2) is located in St. Charles Parish on a relict crevasse distributary a few miles from the present course of the Mississippi River (Davis 1984). This multicomponent Coles Creek, Mississippi, and protohistoric period site encompasses approximately 13 ha along a 900 m stretch of Bayou Saut D'ours, and at one time also included five earth mounds of which only three remain intact today. The Mississippian component at Sims has yielded a thermoluminescence date of A.D. 1088. Analysis of the ceramics from this component revealed elements that are similar to later Pensacola complex pottery from Mobile Bay and northwest Florida and other features that suggest influence from early Mississippian groups farther north up the Mississippi River Valley.

Davis also noted the existence of similar Pensacola tradition pottery samples from surface collections in St. Bernard, Plaquemines, Lafourche, St. Charles, and Terrebonne parishes (cf. Kniffen 1936; McIntire 1958; Gagliano et al. 1975; and Altschul 1978). He was unsure of the appropriate phase determination of the Sims site and other similar such components, and suggested that it would be premature to lump these sites into the Bayou Petre phase until a larger number of Mississippian sites have been sampled. Knight's (1984) recommendation that the Pensacola complex be extended west into southeastern Louisiana to include sites in the Mississippi River delta received support from Davis (1984:223), but he cautioned that this Pensacola pattern should be defined precisely to avoid confusion later.

Settlement Data. Data concerning the settlement systems of the coastal Mississippian groups in Louisiana are lacking. The settlement pattern was probably very similar to that described for the coastal Plaquemine culture consisting of important political and ceremonial villages containing mounds and plazas surrounded by smaller hamlets, camps, and extractive stations. The Sims site is the only well documented example of a high-order village mound center in the delta region (Davis 1981).

The incidence of new sites during the Mississippian period is low, but sites previously occupied during the Troyville–Coles Creek period show evidence of continued use by coastal Mississippian people (Gagliano et al. 1978; Weinstein and Gagliano 1985). Gagliano et al. (1978) suggested that this was a result of either a decrease in population or a centralization of the population, perhaps as a result of an economic shift toward horticulture. Many of the reoccupied sites in the Lafourche–Terrebonne delta such as Bayou La Carpe (16TR38), Bayou Blue (16TR63), and Rhodes Cemetery (16TR86) had become substantial hamlets containing at least one mound by this time and were probably important political and religious centers. Maize agriculture was probably practiced on the natural levees at these larger sites, which were also undoubtedly supported by small temporary fishing and shell gathering sites located in the nearby estuary zone (Weinstein and Gagliano 1985:145).

A number of researchers noted that coastal Mississippian settlements tend to concentrate on top of the narrow levees along the crevasse distributaries away from the main channel of the river (Beavers 1982b; Weinstein and Gagliano 1985; Pearson, Weinstein, Saucier; personal communications). Saucier (personal communication) suggested that such a settlement situation might also be important in terms of the control of water transportation routes by paramount villages situated at strategic access points. These observations have not been confirmed by field investigations but do constitute hypotheses that can be tested in future studies.

The settlement system of the southwestern coastal groups was very different from that on the delta. There is some indication that the late prehistoric lifestyle in this area paralleled that of the historic Attakapa residing in this area during early French contact. The Attakapa hunting, gathering, and fishing economy was based on seasonal transhumance between small family sized camps on the coast during the spring and summer and larger settlements along the inland streams during the winter. Gibson (1975) documented archaeological site location correlates along the Mermentau River and Bayou de Tortue, consisting of small scattered hamlets that mirror those expected for the Attakapa.

Subsistence Data. Subsistence data are also lacking for this culture period. At the one site that has produced some faunal data, the Sims site (16SC2), excavations in the village area revealed *Unio* freshwater clam, white-tailed deer, raccoon, and muskrat. The typical estuarine fish and mollusk species such as *Rangia* were underrepresented at Sims (Davis 1981; Neuman 1984), but this may be a factor of the sample size and location, since *Rangia* shell midden sites are well documented for the Bayou Petre phase sites in the delta (cf. Kniffen 1936; McIntire 1958). It is also possible that *Rangia* was being processed at small extractive sites near Sims to decrease transportation costs back to the village or base camp so that the importance of this food source is not reflected in shell counts at Sims. Pensacola complex sites in the Gulf Coast region outside of Louisiana have also been reported to contain *Rangia* clams (Knight 1984:205–206). Pensacola components at such sites usually overlie earlier Woodland occupations, indicating continuity in the procurement of estuarine resources (Knight 1984:207).

Curren (1978:49) reported that a tidal trap was noted in the Mobile Bay area in 1558 by the Spanish Bazares and suggested that the estuarine zone at the D'Olive Creek site in Alabama (1BA196) was exploited through such a weir and probably constituted the core of the faunal procurement system for this Pensacola complex site. Knight considered the tidal trap to be the most efficient method for extracting food from the estuary and suggests that it "is one of relatively great time depth" (McCurren 1984:207). Like Byrd (1976a, b) and Shenkel (personal communication), Knight (1984:207–208) suggested that tidal traps were placed to take advantage of mollusk predators such as black drum and sheepshead while *Rangia* were probably gathered only as a supplementary resource.

While there is little physical evidence for horticulture in coastal Louisiana Mississippian groups, based on the limited work to date, most researchers (cf. Neuman 1984; Weinstein and Gagliano 1985) agree that horticulture in some form was probably occurring on the fertile natural levees of the delta by this time. The scenario presented by Weinstein and Gagliano (1985:145) was one of basically sedentary occupation of moderate sized villages and hamlets where maize cultivation was carried out, supported by small seasonally occupied extractive camps where the village population dispersed during the fishing and shellfish gathering seasons.

There are not enough data from the southwestern coastal area to base a reconstruction of the settlement or subsistence strategies. Using an analogy from historic Native American groups, a mixed hunting, gathering, and fishing economy based on seasonal transhumance between the coastal cheniers and inland areas is likely for the late prehistoric Mississippi culture assuming some degree of continuity with the historic Attakapa residing in this area during early French contact. The Attakapa followed an annual seasonal round with the population dispersed into family groups on the coast during the spring and summer and aggregated into larger units along inland streams during the winter (Newcomb 1961).

The evidence for horticulture in the Pensacola complex sites elsewhere on the Gulf Coast is much stronger. Three models have been developed to describe the late prehistoric coastal adaptation of the Pensacola complex in the Mobile Bay region of Alabama. Larson's model (1980) shows adaptations on the coast to be qualitatively different from developments in the interior and presents a cautious view that horticulture did not play an important role in the subsistence economies of late prehistoric coastal groups in the Gulf area. Larson (1980) argued that, where horticulture did occur such as in the historic Orista and Guale cultures on the Atlantic coast, it was carried out by isolated families who worked small scattered parcels that were quickly depleted. The need to constantly shift to new parcels of productive land prevented any nucleation into permanent settlements and the chiefs residence served as a base during periodic aggregation of the population for annual ceremonies (Larson 1980:206–209, 216–218, 229).

Curren's model (1976) of late prehistoric subsistence in the Mobile Bay region is based on the interior noncoastal historic Choctaw annual cycle. In Curren's model, the Gulf coastal economy entailed scheduled movements between permanent villages, where horticultural activities were carried out, and various seasonally occupied hunting and gathering camps into which the population dispersed during the off-season between crop planting and harvesting. This model differs from Larson's in that Curren (1976) postulated permanent villages, relatively intensive horticulture, and less need for shifting or fallowing fields since the annual spring floods replenished the soil (Curren 1976). One weakness of this model is the reliance by Curren on a noncoastal analogy.

The third model is based on the early French accounts relating to the Mobile and Little Tomeh Native Americans in the Mobile Bay region. From this record, Knight (1984:211–213) constructed an economic model for the Pensacola complex consisting of a pattern of seasonal dispersal into small family units on isolated farmsteads in the delta where horticultural activities were pursued, coupled with a strategy of scheduled activities balanced among gathering, fishing, and hunting. Farmsteads of the Mobile Native Americans were tied to permanent villages situated in the bluff areas safe from flooding where the chiefly power resided and where public buildings, the square, and the temple were located. The annual late winter flooding of the delta levees replenished soil fertility in the Mobile Bay area and lessened or eliminated the need for fallowing or periodic field relocation. Knight (1984:214) postulated that:

> changes in demography, settlement, and social organization that probably occur with the appearance of Pensacola systems in the area are bound up with the integration of specialized delta horticulture into a traditional estuary-oriented mixed economy. The introduction of delta horticulture would have provided a calorie subsidy balancing the protein production of estuarine fishing, allowing an increased overall production level and the possibility of greater permanent population. The high cost of maize–beans–squash horticulture is offset by its year-round storage potential compared to that of fish, resulting in a more stable supply of nutrients. (Knight 1984:211–213)

The environment of the Mississippi Delta is somewhat different from that of the Mobile Bay region, so the particular mix of horticulture and traditional estuarine fishing, gathering, and hunting possibly departs from Knight's model. However, the apparent settlement system of the Bayou Petre–Pensacola complex groups in coastal Louisiana as indicated by the presence of both moderate sized hamlets focused on the fertile natural levees and estuarine-based extractive camps (cf. Weinstein and Gagliano 1985) would appear to be congruent with a mixed horticulture, hunting, gathering, and fishing economy. Resolution of the question of coastal subsistence during the late prehistoric period will require much more research on Plaquemine and Mississippian sites.

Mortuary Data. Mortuary data for the coastal zone are limited to Davis's (1981) excavations at the Sims site (16SC2). This evidence consists of five poorly preserved burials recovered from one area of the village midden including an extended adult burial, a flexed adult burial, an isolated adult skull, a flexed adolescent burial, and a flexed infant burial found lying next to the flexed adult. There were no grave offerings found in association with these burials (Neuman 1984:280).

It should be noted that the mortuary evidence from Sims is relevant only for the subset of the population that was buried in cemeteries. We know from sites excavated outside the coastal zone of Louisiana that people of higher status were often interred inside the structures on top of the temple mounds, after which the structure was burned (Weinstein and Gagliano 1985:138). In addition, some Southern Cult elements borrowed by coastal groups might have included the use of charnel houses to store the bodies of important individuals and mound burial of these high status people with elaborate funerary accompaniments (Neuman 1984:274–276).

Exchange and External Relationships. The external relationships between coastal Mississippian groups in Louisiana and cultures outside the region have been noted previously. The use of temple mounds, the presence of Southern Cult ceremonial motifs, and ceramic styles associated with pottery complexes in the Florida Gulf region and northern Lower Mississippi Valley all indicate participation in the pan-Southeastern interaction sphere. The proximity of Louisiana coastal Mississippi groups to coastal Plaquemine settlements also provided the opportunity for local contact and exchange of materials between these two cultures (Phillips 1970; Neuman 1984). However, the exact nature of the exchange and assimilation of cultural traits between the various groups in Louisiana and the general Southeast remains to be determined.

Caddoan Culture (Figures 17–21)

Definition and Location. The Smithsonian Mound Survey of the 1880s visited only a few Caddoan sites in south-central Arkansas (the northeastern margin of Caddoan territory; Thomas 1894:245–250), and none at all in Louisiana. Edward Palmer, representing the Mound Survey in 1883, excavated several vessels from burials at the Triggs Mounds on Caddo Creek (a Ouachita River tributary) near Arkadelphia (Thomas 1894:247; Jeter n.d.). Two of these were illustrated (Thomas 1894:Figures 152 and 153).

Archeological research on Caddoan sites effectively began, though, with the work of Moore (1909, 1912, 1913) in the drainages of the Ouachita and Red rivers in Louisiana and Arkansas. The first major archeological encounter with Caddoan remains was, unfortunately, atypical. During his ascent of the Ouachita River, Moore (1909:27–80) excavated numerous mortuary vessels at the Glendora site, and a short time later, encountered a similar situation at the nearby Keno site (1909:120–151). As will be seen, these sites represent a very late (Protohistoric to Early Historic, ca the A.D. 1600s and early 1700s) occupation by Caddoans (and quite probably, others; or alternatively, merely intensive trade with Caddoans), in a region that had not previously been inhabited by Caddoans. Also, Moore's illustrations emphasized the vessels which later became identified as Caddoan, leading later scholars to extend the Caddoan area to include this basically non-Caddoan region.

Although Moore (1912) was also the first to publish detailed descriptive reports on some of the classic prehistoric Caddoan sites in the true Caddoan heartland, he did not really make the Caddoan connection. That was accomplished instead by Harrington. In attempting to interpret his 1916–1917 finds at a number of other classic Caddoan sites, in his (1920) "Certain Caddo Sites in Arkansas," Harrington went well beyond the descriptive stage with an impressive use of ethnographic analogies. Since his report (yet another classic) has long been out of print and is almost inaccessible even to many professional archeologists, a brief summary of its crucial sections seems in order here. In Chapter X, explicitly entitled "Culture Identified as Caddo," he remarked,

> Leaving our description of the various sites visited and the phenomena there encountered during the expedition's twenty months of wanderings, we turn now to an account of the artifacts procured, endeavoring to present the information that may be derived from them, and the circumstances of their finding concerning the life and the identity of the ancient people who made them, amplified by accounts of early travelers....
>
> When the expedition commenced its work in the region of southwestern Arkansas, it was observed...that the objects found were not homogeneous, but seemed to fall logically into two classes, one quite crude, one very fine, which we took to be evidence of the presence of distinct cultures. On the one hand we found many sherds of coarse, heavy ware, decorated with bold, incised, mainly angular patterns crudely executed; on the other hand, numerous fragments of fine, thin pottery, handsomely decorated with engraved designs, carefully and gracefully drawn in many complex forms, and the designs intensified by filling the lines with red or white paint.... The same contrast was noticeable among the arrowpoints, for we found (1) a numerous class of flints, quite heavy and massive in workmanship... and (2) another entirely different class of very small, thin, and delicately formed arrowpoints.... But when we commenced to observe that both kinds of pottery and both varieties of projectile points were found on the surface of almost every site we examined, our hypothesis of two cultures began to lose strength; and when we finally found, not once but many times, both kinds of pottery in the same grave, and noticed that while small points predominated in these graves, large ones were frequently found also, we decided that, so far as the Ozan–Washington district was concerned, there was evidence of only one culture. (Harrington 1920:134–136)

Harrington went on to summarize "substantially the same" remains found at nearby Mineral Springs, and his similar finds in the Ouachita Valley:

> when we removed to the Hot Springs district, seventy miles to the northeast, we found the pottery still similar.— The impression derived from the results as a whole was that the culture of this region was a slightly less highly developed variant of that observed about Ozan. In fact, the culture of the entire region visited by the expedition may be regarded as a unit, and comparison of the specimens obtained with those from surrounding areas seems to indicate that the relationships of this unit were rather with the Southeastern type of culture than with that of the central Mississippi valley, and that its resemblances to the Plains and Pueblo cultures are few indeed. (1920:137–138)

From this conclusion about the artifacts, Harrington turned to a consideration of the identity of "the very last Indians living permanently in the region" (1920:139). He cited the evidence of the De Soto narratives and those of the earliest French explorers, and concluded,

> the writer feels safe in saying that the objects in our collection from the Ozan–Washington–Mineral Springs district

> were made by the Caddo Indians, and those from the Hot Springs region by some tribe nearly related to them. (1920:143)

In Chapter XI, "Distribution of Caddo Culture," Harrington (1920:144ff) summarized Moore's findings of similar materials in the Red, Ouachita, and Arkansas valleys. He suggested that Caddoan artifacts in Moore's collections from the Lower Arkansas Valley had "probably reached that district through intertribal trade" (1920:145). He suggested that Caddoan culture extended down the Red River at least as far as the Natchitoches vicinity, eastward to the Ouachita Valley in southeast Arkansas and northeast Louisiana, "although strong differences begin to develop here," and,

> as far north as the upper Ouachita valley above Hot Springs, and in such quantity that it seemed probable that the style must extend still farther north. Its exact westerly extension is unknown, but the writer is certain, from what was heard while in the field, that it must extend into eastern Oklahoma. There is no information at hand concerning its distribution south and southwest of Fulton [on the Great Bend of the Red River northeast of Texarkana], but we may look for it at least 150 miles in those directions. (1920:146)

Harrington concluded this discussion with remarks on historic Caddoan geographic distribution and social organization. Later chapters summarized early historic Caddoan subsistence, clothing, games, houses, beliefs, ceremonies, warfare, and mortuary customs, with comparative references to his archeological finds. Later researchers have of course refined the picture in many ways, but Harrington's synthesis has basically stood the tests of time.

Winslow Walker's (1935) report on the Fish Hatchery site near Natchitoches followed Harrington's lead on a smaller scale, and brought the Caddoan archeology concept to bear on Louisiana remains. Walker's site was later than those worked on by Harrington, and the direct historical approach was even more relevant (see Chapter 8).

Ford's (1935a, b, c, 1936b) influential early papers were focused on the Lower Mississippi Valley, but he also examined Caddoan materials from northwest Louisiana and adjacent Texas (1936b:72–97) and extended the concept of Caddoan pottery complexes or culture into northeast Louisiana, based mainly on Moore's (1909) finds at Keno and Glendora. In retrospect, this can be seen as an overextension:

> a Mississippian complex, not a Caddoan one, succeeds the Plaquemine throughout [northeast Louisiana]. The Glendora phase is at most a brief [late Protohistoric to Historic] Caddoan intrusion into the western fringe of the area, an appendix to [its] prehistory. (Belmont 1983: 281)

The next major influences on the concept of Caddoan archeological culture were contributed by Webb and Krieger (Webb and Dodd 1939, 1941; Webb 1940; Krieger 1944). They were instrumental in organizing the Caddo Conference and in adapting the Midwestern Taxonomic System to classify the Caddoan components which were beginning to multiply as a result of continued and expanded field work.

After World War II, a number of major site reports and syntheses formalized the concepts of Caddoan archeology. Krieger completed the report on the George C. Davis site (Newell and Krieger 1949). The site was in east Texas, but the report had a major influence on Caddoan archeology in Louisiana and Arkansas as well. The comparative and concluding sections (1949:186ff) defined the early Caddoan Alto focus (Alto is a small town near the Davis site) on the basis of finds at the Davis site and elsewhere. Orr (1952) authored a widely read summary of the Caddoan sequences from a four-state perspective. Webb's (1959) report on the Belcher Mound site north of Shreveport contributed basic data for the later foci (Bossier and Belcher).

Artifactually, Harrington's general characterizations of Caddoan engraved and other ceramics and the associated lithics were greatly elaborated upon in these and other reports. The Texas *Handbook* (Suhm et al. 1954; Suhm and Jelks 1962) provided descriptions, illustrations, and discussions of Caddoan artifacts from Louisiana and Arkansas, as well as Texas. The point type descriptions were updated by Webb (1981).

The 1958 symposia at the Caddo Conference and SAA meeting (E. Davis 1961a, 1961b) achieved a consensus on the definitions and distributions of Caddoan foci. These were updated in large part by several overviews of the Red River Basin or portions thereof (H. Davis 1970; Hoffman 1971; Commonwealth Associates 1981; Schambach and Rackerby 1982) and work in the Ouachita Valley (Early 1982, 1983; Weinstein and Kelley 1984:502, 506). State-based overviews can be found in the Arkansas State Plan (Schambach and Early 1982:SW99–SW133), the Louisiana Comprehensive Plan (Smith et al. 1983:211–222), and Neuman's recent volume (1984:215–255).

In summary, Caddoan archeology presents a somewhat more stable and self-contained image than does the archeology of contemporary non-Caddoan cultures in the present study area. One reason for this is undoubtedly that Caddoan culture (defined mainly in terms of artifact type clusters and their distributions) itself was apparently much more stable and continuous than, say, Mississippian or Plaquemine culture. Its roots in these regions clearly go back deeply into the preceding Fourche Maline culture, and probably into Archaic times. The continuities were clearer on the Protohistoric–Historic side, too: the early historic Caddo occupied essentially the same territory, and were somewhat less disrupted by European explorations and colonial activities than the Native Americans of the Mississippi Valley (cf. Gregory 1980:359, emphasizing the "wholly peaceful" nature of European contact in the Red River Valley).

Also, Caddoan archeological culture was relatively clearly and accurately defined by Harrington (1920) at an early stage, whereas Mississippian culture has been redefined to some

TABLE 11

CHRONOLOGICAL SEQUENCE OF CADDOAN SUBPERIODS

Dates	Arkansas Subperiods
	Caddo V
A.D. 1700	
A.D. 1600	Caddo IV
A.D. 1500	
	Caddo III
A.D. 1400	
A.D. 1300	Caddo II
A.D. 1200	
A.D. 1100	
	Caddo I
A.D. 1000	
A.D. 900	

extent and Plaquemine culture to a great extent but never adequately. And, there is a long-standing organization, the Caddo Conference, which has had some success in overcoming the problems inherent in dealing with a four-state cultural distribution.

Adding to the coherence of Caddoan archeology has been the long-established adaptation of the Midwestern Taxonomic System, and development of Caddo-specific artifact typologies. This has also led, however, to difficulties in making cultural comparative studies, and a recent trend is clearly toward a merger with the Willey–Phillips scheme which dominates the Lower Valley. A major contribution toward mutual intelligibility on the important level of ceramic classification is Schambach's (1981; Schambach and Miller 1984) collegiate system. This process of translation and comparison with Lower Valley cultures may well be a major focus of Caddoan research in the next decade.

Paleoenvironmental Data. Compared to the Lower Mississippi Valley and Gulf Coast, the Ouachita Mountains, West Gulf Coastal Plain and Trans–Mississippi South physical/biological environments that provided the setting for Caddoan culture have been relatively stable on a broad scale. The major problems have involved gaining some control over river regimes: e.g., Pearson's (1982) study of Red River meander belts, meander activity, and resultant site destruction in the Great Bend region, and Weinstein and Kelley's (1984:502–507) similar study of the Ouachita River in the northern Felsenthal region.

More in the Red River Valley than in most other portions of this study area, site destruction by natural causes is a definite possibility. Many kinds of sites were concentrated in, if not confined to, this relatively narrow valley, and the river has meandered widely. Nearly half of the mounds visited by Moore have been destroyed by the river (Schambach and Early 1982: SW102), and it is quite likely that some major sites were destroyed in prehistoric and early historic times. Sedimentation, especially inside of the historic levees, is another factor that archeologists must contend with: e.g., a 1900s Black cemetery in southwest Arkansas was found to be buried under a meter of sediment (Trubowitz 1984:1), and at the Fish Hatchery 2 site near Natchitoches, Belcher focus/phase materials in a point bar setting were found under 1.2 m of sterile alluvium (Gregory 1980:351).

Another interesting problem is that of the time and nature of formation of the Great Raft which effectively blocked the Red River until the nineteenth century. Webb (personal communication) suggested that it might have formed during the A.D. 1100s, based on the lack of riverine Caddoan sites dating after that time. Schambach (personal communication) thought a significant raft could have formed even earlier,

TABLE 12

CADDOAN PHASE (FOCUS) SEQUENCES IN AND NEAR THE NORTHERN PORTION OF SOUTHWEST ARKANSAS

Dates	Eastern Oklahoma	Little River	Ouachita Mountains	Middle Saline
A.D. 1700		Little River	?	?
A.D. 1600	McCurtain	Texarkana	undefined	?
A.D. 1500				
A.D. 1400	Fort Coffee	undefined	undefined	undefined
A.D. 1300	Spiro	Mineral Springs	undefined	?
A.D. 1200				
A.D. 1100				
A.D. 1000	Harlan	Miller's Crossing	Buckville	?
A.D. 900				

TABLE 13

CADDOAN PHASE (FOCUS) SEQUENCES IN AND WEST-EAST FROM THE GREAT BEND REGION OF SOUTHWEST ARKANSAS

Dates	Northeast Texas	Great-Bend	Little Missouri	Middle Ouachita
		Kadohadacho	?	Cahinnio
A.D. 1700		Chakinina		
A.D. 1600	Texarkana	Texarkana/Belcher	undefined	undefined
A.D. 1500				
A.D. 1400	Bossier?	Bossier	undefined	Mid-Ouachita
A.D. 1300		Haley	"Ferguson"	"East"
A.D. 1200				
A.D. 1100				
A.D. 1000	Alto	Lost Prairie	undefined	undefined
A.D. 900				

perhaps during late Fourche Maline times, ca A.D. 800, on the basis of ceramic distributions and comparisons.

Phases. The Caddoan foci are readily convertible into phases and will be treated as phase equivalents here. The phase/focus sequences of three tiers of regions summarized below will include some regions out of the present study area, for comparative purposes.

Unfortunately, the general schemes in use in Arkansas and Louisiana for dividing the Caddoan tradition into subperiods are slightly "out of sync" with each other; five subperiods are used in Arkansas (Schambach 1982; Schambach and Early 1982:SW98ff), following a scheme introduced in Texas (E. M. Davis 1968, 1970:40ff), but only four in Louisiana (Gregory 1980; Smith et al. 1983:211–222).

All of these schemes begin with a Caddo I subperiod that includes the Alto–Gahagan foci or phases and lasts until about A.D. 1200 (A.D. 1150 in Smith et al. 1983:211). All agree that the Belcher focus/phase dates from about A.D. 1500 to 1700, but Gregory called this span Caddo III whereas the Arkansas Sate Plan and Louisiana CAP called it Caddo IV.

The major differences are in the characterization of the interval between about A.D. 1200 and 1500. In Arkansas, this time span is divided (at least on paper, although the practical application has lagged) into Caddo II or the Haley focus/phase, from A.D. 1200–1400, and Caddo III or the Bossier and early Texarkana foci/phases, from A.D. 1400–1500. Gregory (1980:355) lumped Haley and Bossier into an undifferentiated Caddo II; Smith et al. (1983:213–214) expanded the Bossier focus/phase into an undifferentiated Caddo II and III subperiod and did not mention Haley, which is basically an Arkansas focus/phase.

The Louisiana schemes are relatively undifferentiated and somewhat contradictory. The Arkansas scheme will be given preference here, as summarized in Table 11.

The first and northernmost tier or group of regions to be considered here in terms of phase/focus sequences includes easternmost Oklahoma and the Little River region of southwest Arkansas (both of which are outside the present overview's coverage), plus the southern Ouachita Mountains and the Middle Saline region. These sequences are summarized in Table 12.

It is readily apparent from this table (and the discussions by Schambach and Early 1982) that more work needs to be done in these portions of the study area. No phases whatever have been defined in the Ouachita Mountains or Middle Saline regions. In many cases (denoted by question marks), it is not even known with any certainty whether or not the region was occupied during a given time span. In others, a few sites are known to have components of a given time span, but have not been investigated sufficiently to define a phase.

The next tier of regions to the south includes the Caddoan heartland as far as Arkansas is concerned: the Great Bend region. The phase/focus sequences of this region and the regions to the west and east of it are summarized in Table 13.

Here, the sequences are much more clearly defined, especially in the Great Bend region. The Alto focus/phase, as defined at the Davis site (Newell and Krieger 1949), became the prototypical early Caddoan phase and has been well dated and otherwise refined by more recent University of Texas research. The Lost Prairie phase was defined by Hoffman (1971:803), as was the coeval (but out of the present overview area) Miller's Crossing phase of the Little River region.

The Caddo II subperiod is best known for the Haley phase of the Great Bend region, characterized by rather bizarre looking baroque (Schambach and Early 1982:SW107) mortuary ceramics at sites such as Haley (Moore 1912:527–565). It also includes a less well known but important complex of sites in the Little Missouri and Middle Ouachita regions, apparently focused on the East site (Early 1982:219–222; Schambach and Early 1982:SW109).

The Caddo III subperiod in these regions is not as well known (Schambach and Early 1982:SW111–115). With reference to the Great Bend region, Schambach (1982:9) remarked,

> it is proving difficult to isolate distinct phase units... possibly there is no Caddo III in anything but a strict chronological sense. Other possibilities are that the Caddo III Bossier phase of northwest Louisiana [see below] extended into southwest Arkansas, or that the Cryer phase is actually Caddo III.

The Mid-Ouachita focus or phase is as yet poorly defined, but it is clear that a relatively large population was present in the Middle Ouachita region throughout the Caddo III subperiod (Schambach and Early 1982:SW113).

The southernmost and final tier of regions to be considered here has been painted with a broader brush, as it were. This is mainly due to the fact that the Arkansas regions considered above were rather small, and no such fine tuning has been attempted in Louisiana. The relevant sequences are summarized in Table 14.

The Gahagan (or Alto-Gahagan) focus/phase is particularly well known, both in terms of its mortuary/ceremonial and habitation site aspects. As was noted above, post-Gahagan sites, and therefore foci/phases, are absent in the lower portions of the Red River Valley, possibly due to the formation of the Great Raft on the river. The Northeast Louisiana sequence is presented here to reemphasize the lack of prehistoric Caddoan representation; the Protohistoric and Historic Caddoan intrusions into that portion of the Ouachita Valley are discussed later.

Key Sites. Perhaps somewhat more than is the case for the Mississippian and Plaquemine cultures, the Caddoan literature gives the impression of being dominated by extensively or intensively excavated type sites. These and other sites will be considered here in chronological order, by Caddoan subperiods (here, only Caddo I through III; the others are dealt with in Chapter 8). Within the subperiods, sites will be discussed in another kind of chronological order, that of their investigation and contribution to the definition of Caddoan cultural units. It should be noted at the outset that virtually all of the classic Caddoan sites were mortuary sites with abundant ceramics and other grave goods.

The first major Caddoan site encountered by Moore (1912:511ff) on his ascent of the Red River was Gahagan, which also happened to be a rather remarkable Caddo I mortuary site. It was also investigated by Webb and Dodd (1939). The Smithport Landing site in DeSoto Parish (Webb 1963) provided data from a contemporary habitation site. Mounds Plantation (16CD12; Webb and McKinney 1975) was another ceremonial center with abundant grave goods. The Hanna site (Thomas et al. 1980), excavated in 1977 under contract with the Corps of Engineers, New Orleans District,

TABLE 14

CADDOAN PHASE (FOCUS) SEQUENCES IN NORTHERN LOUISIANA AND ADJACENT TEXAS

Dates	East Texas	Northwest Louisiana	Northeast Louisiana
A.D. 1700		Natchitoches	Ouachita
A.D. 1600	Texarkana	Belcher	Glendora (possibly Caddoan) “Keno” (Mississippian)
A.D. 1500			
A.D. 1400	Bossier?	Bossier	(Plaquemine)
A.D. 1300	Haley?	Haley?	(Plaquemine)
A.D. 1200			
A.D. 1100			
AD. 1000	Alto	Gahagan	(Coles Creek)
A.D. 900			

Note: Parentheses indicate non-Caddoan cultures.

included the remaining portion of a river-eroded Caddo I village, and represented “the first large-scale excavation of an archeological site in Louisiana since the days of federal relief programs” (1980:v). It furnished much valuable data, including the first abundant evidence of subsistence for this subperiod.

In Arkansas, no Caddo I habitation sites have been excavated and reported upon (Schambach and Early 1982:101). However, a report is in preparation on the Martin site in Hempstead County, excavated in 1982 and 1984 by the Arkansas Survey/Society summer dig (Schambach, personal communication). Reports on Caddo I ceremonial centers are also unavailable, although two of these are well known from private collections and from professional excavations that are not fully reported. These are the Crenshaw site (3MI6) on the Red River near Texarkana, which appears to have been in use through the Fourche Maline 7–Caddo I transition (Schambach 1982: 150ff), and the Bowman site (3LR46) on the Red River near the Texas line and out of this overview’s territory. Both Crenshaw and Bowman may have been “vacant” ceremonial centers during Caddo I times; other centers may have been lost to the meandering Red River before historic contact (Schambach and Early 1982:101–102). A few probable Caddo I habitation sites have been identified in the Middle Ouachita region, but have not been investigated adequately (1982:103).

The Caddo II subperiod, in contrast, is best represented by southwest Arkansas sites. Haley (3MI1), the classic though poorly known site of this time span, is on the Red River a short distance above the Louisiana line. It was extensively excavated by Moore (1912:527–565), who illustrated numerous elaborate mortuary vessels and other artifacts. A possibly related habitation and lower echelon mortuary site is Cryer (3LA35; Taylor 1972; Schambach 1982b:9). In the Little Missouri region, two temple mound sites have been extensively excavated but not finally reported. The Hays Mound (3CL6) was surmounted by structures dating in the A.D. 1150–1250 range (Weber 1973a; Schambach and Early 1982:108). The Ferguson site (3HE63) was excavated by the Arkansas Survey and Society in 1972 (Schambach 1972; Schambach and Early 1982:107). The Myers Mound (3MI39) was salvaged in 1980 and reported upon (Miller 1986).

In the Ouachita Mountains region, the only known major center, the Adair site (3GA1) was excavated in a 1940 salvage project (Early 1982:226–228). In the Little Missouri region, there are major unresolved chronological problems, but the East site (3CL21) appears to have been a major mound center during at least part of this subperiod (Early 1982:219, Figure 8-2; Schambach and Early 1982:109).

The Haley (Caddo II in the Arkansas system) focus/phase or subperiod has not been clearly defined and differentiated from Bossier (Caddo III in Arkansas) in northwest Louisiana (Smith et al. 1983:213–214). The major Caddoan entity in Louisiana during at least some if not all of this time span is the Bossier focus (Webb 1948, 1983). Sites of this complex are concentrated in the extreme northwest corner of the state — Bossier, DeSoto and Caddo parishes (1948:102) — but are generally mixed with other complexes (1948:140), and excavations of sites with abundant pure component data are lacking. One component at the Belcher Mound appeared to represent the Bossier focus (Webb 1959:190) but was “difficult of interpretation or comparison, because of the limited amount of material available” (1959:203).

Webb (1983) mapped a number of Bossier-affiliated sites in northwest Louisiana, plus a few in adjacent Texas, but only one, Battle Mound (3LA1), in Arkansas. The most important Bossier sites he discussed in Louisiana were the Werner Mound, just north of the Shreveport–Bossier City vicinity in the Red River Valley, and the J. C. Montgomery I site near Bayou Dorcheat just south of the Arkansas line.

Caddo III in Arkansas is also “a hazy intermediate or transitional period” (Schambach and Early 1982:SW111). There is a major problem in dating site components to this relatively brief time span, in the absence of extensive modern excavations. In summary,

> there is no reason to suspect that occupation was not heavy during this [subperiod]... it is a safe bet that most of the major sites were in use at this time. (Schambach and Early 1982:SW114)

Settlement Data. Several recent publications have synthesized information on Caddoan settlement patterns in portions of the study area. They will be reviewed here as self-contained studies, rather than attempting to integrate and synthesize their nonsynchronous period schemes. Additional relevant reports will be cited within the summaries of these more general studies.

Gregory (1980) summarized a Caddo I–II–III–IV sequence in the Red River Valley of Louisiana. Only the first two of his subperiods are relevant here; the others will be taken up in Chapter 8. His Caddo I (Alto–Gahagan) subperiod was characterized by large ceremonial centers with multiple burial mounds, e.g., Gahagan, Mounds Plantation, and Crenshaw (cf. Davis in Texas); single mounds with villages; isolated mounds; hamlets with associated cemeteries but no mounds; and hamlets with isolated burials. The Hanna site (Thomas et al. 1980) fit the last category. Sites “were distributed throughout the valley from high hilly areas along springs and creeks, well out onto the active point bars along the Red River” (Gregory 1980:348). Webb and McKinney (1975:122–124, Figure 23) mapped some of the major Alto sites and summarized their relationships, stressing communications among the “rulers” of a society that was “presumably on the chiefdom level.”

Gregory’s Caddo II (Haley–Bossier) subperiod lumps the Caddo II and III subperiods now in use in Arkansas. He characterized this extended period (assigned to the A.D. 1150–1500 span by Smith et al. 1983:213) as represented by single mounds with villages, on natural levees; dome-shaped mounds with village areas, on bluffs overlooking creeks or "raft" lakes; and hamlets with isolated burials (1980:Table 44). Webb (1948:101–103), Gregory (1980:355–356) and Smith et al. (1983:213) noted a decline in mound building and a general move away from the Red River, into a more dispersed settlement pattern and simpler way of life, during this broadly defined period. Webb's (personal communication) suggestion that the beginning of the Red River's Great Raft was a factor in this change is of great interest and needs to be investigated thoroughly.

Schambach (1982b:7) remarked that the available evidence indicates that the historically observed "dispersed farmstead, vacant ceremonial center" settlement pattern type "is as old as Caddo culture itself in the Great Bend region." There do appear to have been some variations on this general theme, though. Schambach and Early (1982:SW98ff) characterized Arkansas Caddoan settlement patterns in terms of the five sequential subperiods, only the first three of which are relevant here. Marking the beginning of Caddo I times, a change occurred from the extremely rich late Fourche Maline midden sites to smaller and more ephemeral habitation sites. Also, "special purpose sites, featuring large-scale architecture, mound construction, and elaborate mortuary practices" appeared (1982: 100). As noted above, these centers may have been of the vacant variety. Salt extraction sites may also have appeared during this subperiod.

The Caddo II subperiod in Arkansas is restricted to the Haley focus/phase and related manifestations. In general, there appears to have been:

> a proliferation of small ceremonial centers in separate segments of drainage basins...composed of mounds, commonly one to three, structures of civic importance, and a small caretaker residential group [the vacant ceremonial center pattern]. They served a local population which appears to have been dispersed in small social and economic groups around the center. This is the archetypal Caddoan settlement system. (Schambach and Early 1982:SW106–107)

The most significant development of this subperiod, though, was "the appearance of true temple mounds with collapsed and burned structures on top" (1982:SW108), such as those at Hays and Ferguson. A third type of mound (in addition to temple mounds and burial mounds), the ceremonial fire mound, was postulated by Miller (1986:124–125), on the basis of his salvage excavations at the Myers Mound.

The Caddo III subperiod in Arkansas is essentially undocumented in terms of settlement patterning, due to the chronological difficulties on the more basic site/component level (Schambach and Early 1982:SW111–115).

Another approach was taken by Early (1982) in a comparative study of Caddoan settlement patterning in the Middle Ouachita region and that portion (partly within and partly outside the present study area) of the Ouachita Mountains region immediately adjacent to the Upper Ouachita River. She analyzed data on 242 recorded sites, with 271 Caddoan components but had to collapse the chronology into Early (ca A.D. 900–1300), Middle (ca A.D.1300–1450) and Late (ca A.D. 1450–1700) subdivisions for the former region, and she was unable to subdivide the latter (1982:215ff). Her findings were summarized in a table (1982:Table 8-1) adapted here as Table 15.

On the basis of the datable sites only, the major and most diverse occupation in the Middle Ouachita region appears to have occurred during Early's Middle period, which includes the Mid-Ouachita focus/phase and represents the shortest time span but had significantly more identifiable components. The major contrast between the two regions is the relative scarcity of major mound sites in the Upper Ouachita basin. Also, Focal (specialized extractive) sites were relatively more common in the Upper region.

Webb (1983) has modified his original belief that Bossier focus/phase settlement was confined to uplands, based on finds of related sites on three lateral streams in the Red River Valley, including the Werner Mound (1983:217ff), one of only two definitely known mounds of this period. He has also

TABLE 15

CADDOAN SETTLEMENT TYPES IN THE MIDDLE OUACHITA REGION AND UPPER OUACHITA BASIN
(After Early 1982:Table 8-1)

	Mound Center	Low Mound Cluster	Diffuse Activity	Focal Activity	Cemetery	Total
Middle Ouachita						
Early	4	2	6	-	-	12
Middle	15	14	20	1	5	55
Late	9	12	8	-	7	36
Uncertain	13	13	70	14	1	111
Upper Ouachita						
	1	18	22	9	7	57

investigated an isolated small upland settlement, the Montgomery I site (1983:203–217).

Another interesting aspect of Caddoan settlement, on a smaller scale, is furnished by studies of houses. Ethnohistorical examples are available (Webb 1940; Wilmsen 1961; Schambach 1982:7, Figures 1-3, 1-4, and 1-5), and once again there is some evidence for long term continuity. Two overlapping early Caddoan houses at the Martin site near Old Washington, in Hempstead County, excavated during the 1982 and 1984 Arkansas Survey/Society summer training programs, were outlined by circles of large postmolds, and resembled historically documented Caddoan structures (Schambach, personal communication).

At the Hanna site, remains of at least six Caddo I (Alto) structures were discerned (Thomas et al. 1980:111ff). Structures 1 though 4 were at least roughly circular. Structures 5 and 6 did not have coherent patterns preserved. Within Structure 2, a particularly interesting feature was noted:

> a hearth located in the center...contained a large amount of ash.... A postmold was located beneath the ash. The presence of a single postmold beneath a single ash bed is a common occurrence in Caddoan houses and has been interpreted as a scaffolding post erected during the construction of the roof and subsequently removed. (Thomas et al. 1980:129)

A similar finding was made at the Martin site (Schambach, personal communication). Similar houses were found at Crenshaw, Ferguson, and the Means site, in Caddo II (or III?) contexts.

At the Werner Mound site, Webb (1983:219–221, Figures 9 and 10) excavated two concentric rings of postmolds, about 15 m and 25 m in diameter. They were interpreted as representing the roof supports and wall, respectively, of "an immense lodge, presumably ceremonial" (1983:221).

Subsistence Data. Given the historic emphasis on Caddoan mortuary site excavations for the purpose of recovering well made artifacts, and the scarcity of modern excavations concentrating on recovery of subsistence data from habitation and other sites, it is not surprising that subsistence data are very sparse.

A few of the early Caddo site excavations encountered subsistence remains by chance. For instance, Harrington (1920:39) found a "little pot...full of charred beans" apparently on a house floor on a platform mound (Mound 2) at the Eb Brown site (Site 4) near Ozan in Hempstead County. The beans were not further identified; they could have been wild or domesticated, or even persimmon seeds. The pot was not illustrated. However, it appears that platform mounds surmounted by structures were an innovation of the Caddo II subperiod (Schambach and Early 1982:SW108). Domesticated beans are not known from the archeological record of the eastern U.S. until after about A.D. 1000. The earliest finds of domesticated beans in Louisiana were at the Belcher Mound, in a Belcher III or Caddo IV (protohistoric) context (Webb 1959:179–180; Neuman 1984:239–240).

By far the best data on early (Alto–Gahagan focus/phase) or Caddo I subsistence are from the Hanna site (Thomas et al. 1980). Shea (1980) analyzed the plant remains from 75 flotation and water-screened samples, and found the cultigens maize, squash and gourd in samples from all sectors of the site. Hickory nut and acorn fragments were very common, as were a number of wild plant seeds. Interestingly, none of the native North American oily- or starchy-seeded cultigens so common in Midwestern and some Mississippi Valley sites were identified in these samples. Six maize cob fragments were analyzed by Hugh Cutler and found to be mainly of the Eastern Eight Row type, with the North American Flint/Pop and Midwest 12 Row variants also present.

The Hanna site animal bones were analyzed by Byrd (1980). Deer were the most important meat sources, but a wide variety of terrestrial and aquatic resources was represented. There was also good evidence for spatial differentiation in general faunal utilization and deer utilization, though the meaning of this was not clear. Mollusks were also present but were scarce and basically restricted to two pits (Charles 1980).

The excavations at Mounds Plantation, basically a Caddo I (Alto) site, produced a fragment of a charred corncob "in Mound 5 excavation" (Webb and McKinney 1975:118). However, the precise provenience appears uncertain, and this mound did contain Belcher (Caddo IV, protohistoric) burials intruded into its upper levels (1975:48, 122). More definitely associated with the Caddo I component was a mass of seeds of *Portulaca oleracea* (purslane, a widely used wild plant), found beside the paramount male burial. An unidentified small fruit was also found with this burial (1975:119).

The recent Myers Mound salvage excavations only produced a small amount of badly preserved animal bone, including that of deer; wood and cane charcoal were recovered but not analyzed, due to lack of funds (Miller 1986:113).

Almost all of the sparse food remains recovered at the Belcher Mound (Webb 1959:179–181) were from Belcher phase/focus (protohistoric) contexts, rather than from the earlier Caddoan occupations.

Byrd (1983) analyzed animal bones from the Werner Mound and found evidence of exploitation of a wide variety of terrestrial (especially deer) and aquatic fauna. Deer were apparently also the principal game animals taken at the remote, upland Montgomery I site (Webb 1983:216). No analyses of floral remains were published for these sites.

Mortuary Data. Caddoan archeology began with the excavation of mortuary sites, primarily to obtain specimens of the well made ceramic vessels which commonly (and sometimes abundantly) accompanied Caddoan burials. Although the purposes have changed somewhat, this has remained the most common kind of excavation at Caddoan sites. The following paragraphs will summarize the major data sources on Caddoan mortuary practices, in chronological order of excavation.

At Glendora, Moore (1909:27ff) excavated at least 121 poorly preserved burials from an apparently nonmounded late Protohistoric and early Historic aboriginal cemetery. This site will be discussed later but will be summarized here because of its influence on Caddoan archeology of all periods and because it does seem that Caddoan vessels (and perhaps, people) predominated here. Moore inferred that both bunched and extended burials had been present, but did not furnish details. The major finds, though were some 322 vessels, many of them broken or poorly preserved. Nevertheless, Moore (1909:30) remarked that they included "some of the most beautiful vessels it has been our good fortune to obtain in our years of search. A veritable passion to decorate seems to have possessed the potters of Glendora."

Moore continued up the Ouachita into southern Arkansas, encountering only a few remains that might be called Caddoan, until he reached the Kent site (not to be confused with the late prehistoric to protohistoric Mississippian Kent site and phase in east Arkansas), just above Camden in Ouachita County. Here (1909:97ff), he found 44 poorly preserved burials in a nonmound cemetery; the predominant position was extended-supine, with the head in an easterly direction. Only 14 vessels were recovered, but the emphasis on engraved decorations, with lines filled with pigment, clearly indicates that Moore had entered the true Caddoan country of the Middle Ouachita region (1909:Figures 100–102; cf. Weinstein and Kelley 1984: 25–28).

Moore did not excavate any sites above Kent; he returned to east-central Louisiana and began exploring tributaries of the Ouachita. The only Caddoan site he encountered was the Keno site on Bayou Bartholomew near Glendora, and recent research indicates that Keno is more Mississippian than Caddoan (Belmont 1983:280).

During his Red River exploration, Moore (1912:511–522) first encountered Caddoan remains at the Gahagan site, above Natchitoches in Red River Parish. Here, he excavated a large pit in the top center of a flat-topped mound, and found a burial pit about 12 feet long, 8 feet wide, and 11 feet deep. Five individuals (three adults and two adolescents) were buried in extended-supine positions, with heads to the northwest or northeast (1912:512; Figure 12). Only three vessels were found, but they were noteworthy for their extremely well executed fine line engraving and their "very different quality from that found by us in sites farther down the river, that from Gahagan being hard, black, and with a surface having considerable polish" (1912:521, Figures 22–23). Also found was a unique effigy pipe (1912:515–519, Figures 13–17) and numerous well made flints, including several examples of the Gahagan knife type (1912:519, Figures 18–21). This site has been correlated with the Alto focus component at the Davis site in east Texas, as exemplifying the Caddo I subperiod.

Moore continued up the Red River with little success until he reached the Haley Place in Miller County, extreme southeast Arkansas (1912:527–565). Again, he excavated in the top center of a mound, and again he found burials. This time, there was a "remarkable" central "great pit," plus other shaft graves. The latter are described in detail by Moore (1912:528–544); they contained primarily individuals extended supine, accompanied by numerous ceramic vessels, arrow points (primarily of the Hays type; cf. Webb 1981:14), and other artifacts (including long, narrow celts and Haley pipes). These shaft pits may have been from six to 15 feet deep. The "great pit" at the center (1912:544ff) was discovered 11 feet below the mound summit, and extended some 12 feet below that level. It contained an "aged male" in the extended-supine position with the head to the south-southeast, accompanied by "fairly numerous" artifacts. Moore (1912:550) was "unable to give the number of vessels" from Haley due to breakage, but illustrated 23 of them (1912:Figures 40–57, Plates XXXVII–XLI). A majority of these are of the eccentric style which is regarded as characteristic of the Caddo II subperiod (Schambach 1982:9).

Moore's next productive stop along the Red River was the Battle Place in Lafayette County (1912:566ff). It produced protohistoric Caddo IV remains and will be discussed later, along with the McClure, Friday, Jones, Moore, and Foster sites, which yielded similar remains.

At the Crenshaw site, Moore (1912:620ff) excavated several poorly preserved burials from several different proveniences and recovered a total of 32 vessels. The burials and vessels are not readily correlated from Moore's summary, but the vessels clearly represent the Caddo I, II and III subperiods (1912:Figures 123–127; cf. Hemmings 1982:Table 5-1).

Harrington's (1920) productive excavations in southwest Arkansas began at Site 1, Ozan in Hempstead County (1920: 21ff), where he found 43 burials in Mound 2. Almost all of the identifiable burials were extended-supine, mainly with heads to the southeast (1920:27). Ceramics were abundant, with a total of 198 vessels recovered, plus 27 pipes, "many beautiful arrowpoints," celts and crystals (1920:27–28). A shaft grave more than 10 feet deep was also found, accompanied by 31 vessels and 31 arrow points. The artifacts appear to date mainly to the Caddo I subperiod.

At the Cole Place (Site 5) near Ozan, Harrington (1920: 41ff) found a nonmound cemetery with 16 burials generally extended-supine and oriented to the east and east-southeast, roughly in three rows (1920:Figure 4). With these were found 64 vessels, at least some of which may be protohistoric Caddo IV specimens. At a second nonmound cemetery nearby, he found six burials with 59 ceramic vessels (1920:44–47); this material is in the late Caddo IV range, comparable to Belcher assemblages (Schambach, personal communication).

Harrington found a few extended burials and vessels of uncertain date at mounds on the White Place near Ozan (1920:48–50). At the Robins Place (Ozan Site 6; 1920:50–53), similar finds included a "bottle of archaic form" which is probably a Caddo II specimen (1920:Plate LXXX, b). His next productive excavation was at the Goodlett site (Ozan Site 11; 1920:54ff), where he found 11 burials, all extended supine, in narrow pits dug into the clay of a natural knoll. With them, he found 38 vessels and a few other artifacts. He also dug into a bluff cemetery on the Goodlett place, finding 15 burials (almost all extended supine, with heads to the southeast) similarly dug into the clay, and accompanied by 67 vessels. Most of the vessels from these Goodlett sites were damaged, and Harrington did not illustrate them.

Harrington (1920:60ff) next worked at an upland mound group near Old Washington in Hempstead County. In Washington Mound 1, he found "a maze of burials at all depths from the surface to 8 ft. down, many overlapping one another" (1920:62–63, Plate XI). In all, 88 burials were counted; most were extended-supine, and oriented southeast or east. With them were 223 vessels, 17 pipes, 18 celts, "many beautiful tiny arrowpoints," and other artifacts. Clearly, this burial mound was in use for several decades, if not centuries; most of the vessels from it illustrated by Harrington appear to date to the Caddo I or II subperiods. He found little in the way of burials at the other mounds here.

Harrington's next stop (1920:83ff) was at the nearby Mineral Springs mound group, in Howard County. He excavated in 11 mounds here, finding burials in Mounds 1 and 2, and two small cemetery areas. Mound 2 is noteworthy in that in included a shaft grave more than 8 feet deep, two caches (probably the remains of quivers) of 52 and 65 well made tiny arrow points, and in one burial, the remains of three cremated skeletons. Mounds 6 and 8 at Mineral Springs were later salvaged in 1962 by the National Park Service as part of the Millwood Reservoir Project and yielded numerous additional vessels and other mortuary artifacts (Bohannon 1973). Evidence of several pre-Caddoan components was found, but the burials were primarily Caddo I and (especially) Caddo II (1973: 71). Harrington (1920:103ff, 118ff) also excavated Caddoan burials at several sites in Garland County, near Hot Springs.

The Fish Hatchery site at Natchitoches, Louisiana (Walker 1935) produced historic Caddoan burials. A similar site located nearby was excavated by Webb (1945).

Webb and Dodd (1939) revisited the Gahagan site and excavated two additional burial pits in the same mound. The first was 8 feet deep and contained five adults and an adolescent, all extended-supine. They were accompanied by various artifacts, including numerous arrow points, 11 Gahagan knives, copper ornaments and copper Long-Nosed God effigies (illustrated more recently by Neuman 1984:Plate 56c). A somewhat later burial intruded into this pit, a male extended supine, was accompanied by 61 well made arrow points. The second pit contained two adults and an adolescent, all extended supine, with another remarkable artifact cache (summarized by Neuman 1984:228–229), including a large stone pipe which is an effigy of a male bullfrog on a pedestal, holding a smaller female frog and, with his right forefoot, "expressing the eggs from the sac" (1939:103; cf. Neuman 1984:229, Plate 59k).

Webb's (1959) excavations at the Belcher Mound produced abundant evidence of Belcher III–IV (Belcher focus/phase, Caddo IV, protohistoric) mortuary practices, which are summarized in Chapter 5. This site also produced several Belcher I (Caddo I–II, late Alto–Haley focus/phase) burials. According to Webb's (1959:190) summary, the Belcher I burials at this site were characterized by large wide pits (one of them deep); multiple burials in pits; the extended-supine position with heads to the southwest, and rather scanty offerings. The site also had a Belcher II (Caddo III, Bossier focus/phase) component, but no burials were attributed to it.

The Smithport Landing site (Webb 1963) furnished data on nonmound burials at an early (Alto) Caddoan habitation site (see also the Hanna site, below). At least 14 extended-supine Caddoan burials (plus a flexed burial and a bundle burial, presumably earlier) were present, along with 19 vessels and numerous arrow and possibly earlier dart points.

Webb and McKinney (1975) reported on burials found at Mounds Plantation, primarily in Mound 5, during 1950s–1960s excavations. Some 15 burial pits plus a few other burials, representing at least 57 individuals, are described in detail in this report. Here, it will suffice to state that most could be assigned to the Alto focus/phase and were extended-supine (with various orientations), with apparent emphasis on males and male-related artifacts (cf. Gregory 1980:357–358, who commented on the "military overtones" of such offerings). Arrow points were common, and Gahagan knives were present. A large (about 6 feet tall) paramount male was buried with points, a Gahagan knife, and a preserved bow made of bois d'arc wood (Osage orange, well known ethnohistorically as used by the Caddo for bows). Excellent preservation in some of these graves permitted the partial reconstruction of designs in split cane matting (1975:Figures 16 and 17). The mortuary program was interpreted as possibly including retainer sacrifices and construction of log tombs (1975:121). A few later burials were also found here.

Excavations at the Cryer site in Lafayette County (Taylor 1972; Hemmings 1982:68) encountered some 30 extended burials and a bundle burial. Most of the burials were accompanied by one or two vessels. The placement is uncertain; it could be Caddo I (Taylor 1972), or Caddo II (Schambach 1982: 9, who also stated that Caddo III was a possibility).

At the Hanna site, five burial pits (all associated with houses), containing six individuals, were found (Thomas et al. 1980:145ff; Giardino 1980). One burial was flexed, but the others were extended and supine, with heads in southerly directions. No grave goods were associated.

Hoffman (1983) has published a useful comparative summary of changing mortuary patterns in the Little River region, adjacent to the present study area.

Exchange and External Relationships. There has been no recent synthesis of Caddoan exchange and relationships. At the 23rd Annual Meeting of the Society for American Archaeology, in 1958, a symposium was held on "Relationships between the Caddoan Area and Neighboring Areas," and the presentations were published in a volume edited by E. Mott Davis (1961). He acknowledged "with regret" that the discussions had not included "one set of relationships, perhaps the most fascinating of all...between the Caddoan area and Mexico" (1961:3).

That subject had been brought up earlier by MacNeish (1947), who postulated that Mesoamerican influences had been transmitted to the Mississippian peoples of the Southeast and Midwest by way of the Caddoan area. It was amplified by Krieger (1948; Newell and Krieger 1949:224ff), who concluded that the Alto focus occupation at the Davis site in east Texas represented "a migration, perhaps of only small scale, from Middle America during the Formative period" (1949: 231). Ceramic similarities such as engraving, and traits such as shaft graves with retainer burials, plus representations in various media resembling Mesoamerican deities, are still regarded as suggestive of Mesoamerican contacts (S. Smith et al. 1983:212; Neuman 1984:218), but the exact nature of any such interaction remains unexplained. In a recent review of this subject, Bruce Smith (1984:14–16) remarked that the present evidence indicates only "an intermittent diffusion of isolated cultural elements...over an extended period of time... probably influencing the Mississippian development to a minor degree."

The various papers in the SAA symposium explored relationships between the Caddoan area and central Louisiana (Webb 1961, with discussion by Krieger and Ford); the Mississippi Valley (Griffin 1961, with discussions by Phillips, Williams, and Krieger); the Plains (Bell 1961, with three Plains discussants; and Texas (Jelks 1961, with discussion by T. N. Campbell). These discussions emphasized ceramic and other artifact/trait resemblances, with the implication of diffusion, and made little mention of actual exchange except in the case of the Spiro site in eastern Oklahoma (see the Region 1 overview) and its connections with Cahokia and other Mississippian centers.

S. Smith et al. (1983:212–214) noted that imported materials, primarily lithics, are abundant in Alto (Caddo I) sites in Louisiana, but that the Bossier (Caddo II and III in their terminology; only Caddo III in the Arkansas system) sites have a "noticeable paucity" of such materials, "indicating that the widespread trade networks of earlier...times were no longer being utilized." Webb and McKinney (1975:98, citing work in Texas by Banks and Winters 1975) noted that many of the exotic stone materials used for Gahagan knives and many other artifact types are found in southeastern Oklahoma. A social organizational perspective on such exchange is provided by the situation at the Hanna site, which was a small village rather than a ceremonial center:

> The Hanna site, similar to the Alto village at Smithport Landing (Webb 1963), was not involved in this rather extensive trade network. With the exception of a few L'Eau Noire Incised pottery sherds that were brought in from the Lower Mississippi Valley, there were no trade items at Hanna. Therefore, the hierarchy in the ceremonial centers controlled the trade routes, a fact which explains these centers in the floodplain near navigable waters. Their control of the trade was exercised as a means to procure exotic materials utilized as symbols of status. The goods did not function in a redistributive system whereby the trade goods were dispersed among the members of the community. (Thomas et al. 1980:344–345)

Webb (1983:216) reported "virtually no evidence of trade" at the small isolated Montgomery I site. However, there was some evidence for exchange (or ceramic influence) in contemporary (Bossier or Caddo III) settlements along the Red River (1983:203, 229).

Finally, it should be noted that Gregory (1973, 1980:359) has emphasized the role of long institutionalized Caddoan trade in accommodating and even significantly influencing Europeans when they arrived in the early 1700s.

Plaquemine Culture (Figures 17–21)

Definition and Location. Plaquemine culture was originally named, but not formally defined, by Ford and Willey (1941), in a major or synthesizing article on Eastern U. S. prehistory. The concept has never been adequately defined (Williams and Brain 1983:373) and is probably in need of a thorough reanalysis and redefinition. As Brown (19856:252ff) noted, the "nebulous" nature of the concept is at least partly due to shifting emphases in criteria (especially ceramics and mounds), and it is also clear that changes in research locations and differing descriptions of the same artifact types have been major factors. Here, we will merely examine some of the major definitions, redefinitions, and misconceptions. For instance, according to Phillips (1970:946),

> the concept of a Plaquemine culture period was an outgrowth of Ford's [1936b] "Caddoan complex". In the Crooks site report, the late period in the Lower Valley sequence is "Caddoan" [Ford and Willey 1940:132]; in the following year, the word "Plaquemine" appears in its place [Ford and Willey 1941:Figure 2].

This is somewhat misleading and certainly does not present the whole story. It would be more accurate to say that the Plaquemine concept was a natural interpolation between Ford's previously defined Coles Creek and Natchez complexes. The 1941 use of the term Plaquemine in the Lower Valley sequence provided a logical correction for the hasty 1940 overextension of the Caddoan concept, rather than an outgrowth of it.

Ford's original (1935c:Figure 1) schematic map of the distribution of pottery decoration complexes extended the Caddoan complex as far east as Monroe, Bayou Macon, and the uppermost Tensas Basin in northeast Louisiana. However, in his more comprehensive study, his Caddoan discussion (1936b: 72ff), tabulation of sites by complexes (1936b:Figure 1) and the accompanying map (1936b:Figure 2) only included northwest Louisiana Caddoan sites, plus Moore's Keno and Glendora sites upstream from Monroe. As has been seen, those sites represent at most a very late protohistoric to historic temporary intrusion of Caddoans from the west into that region.

Ford and Willey's (1940:Figure 2) Caddoan Period is clearly just an overextended culture period label for a span of time that included "Natchez, Tunica, Choctaw, Chickasaw coeval." There is no evidence whatever that Ford construed Caddoan culture as occupying the territory he later came to subsume under the Plaquemine rubric. Instead, the Plaquemine insertion in the Ford and Willey (1941) time–space chart is under the general Mississippi River areal label, and specifically under the Baton Rouge regional label, between Coles Creek and Bayou Goula–Natchez. Clearly, between the writing of the Crooks site report and the *American Anthropologist* article, Ford (and Willey) had decided to use the Plaquemine concept to represent the then unpublished findings from the 1939–1940 excavations at the Medora site (Quimby 1951) and possibly those from the 1940–1941 work at the Bayou Goula site (Quimby 1957).

After the delays due to World War II, the Plaquemine period concept suddenly appeared in print in three major 1951 reports: Medora, Greenhouse, and the Lower Valley Survey volume. Ford was closely involved in all three.

The formal definition of Plaquemine culture was presented in the Medora site report. The name derives from the nearby small town of Plaquemine, Louisiana, where the landowner lived (Quimby 1951:88), and not from Plaquemines Parish in extreme southeast Louisiana. As noted by Quimby (1951:85) in the preface to that report, Ford directed the WPA–LSU project which excavated the site, and participated in the artifact analyses, comparative studies, and preparation of a preliminary report. In the introduction, Quimby (1951:87) explicitly referred to Ford's original sequence of Marksville–Coles Creek–Natchez for "the Mississippi Valley portion of Louisiana," and explicitly stated that the Medora excavation had been part of the second step in Ford's (1936b:6) program to "test, and if possible subdivide, the time scale." Quimby's formal definition and concluding summary (1951:128–132) stressed the intermediate position of Plaquemine culture between Coles Creek and Natchez.

Ford (1951:85ff) noted a minor Plaquemine component as the terminal occupation at the Greenhouse site and added his own descriptions of the decorated pottery types found there. He also attempted to align the Plaquemine (or Plaquemine–Mississippian) period with the Caddoan Alto Focus (1951: 127ff) and was sharply disputed by Krieger (1952) on that account. The Lower Valley Survey report (Phillips et al. 1951: 454–455) opted for a partial overlap between (terminal) Alto and (early) Plaquemine.

The most characteristic Plaquemine artifacts, of course, were and are pottery types. Unfortunately, or at least somewhat confusingly for the novice, both the general nomenclature and the descriptions of specific types have varied significantly during recent decades. Quimby (1951:107ff) described a number of types, including Addis Plain, Plaquemine Brushed, Hardy Incised, and Manchac Incised. Many of these were redefined by Phillips (1970), e.g.: Baytown Plain, *var. Addis*; Coles Creek Incised, *var. Hardy*; and Mazique Incised, *var. Manchac*.

The basic Addis Plain ware was originally said to have "Clay [probably crushed sherd "grog"] tempering almost to the exclusion of other tempering; small amounts of sand, or carbonized vegetal material...used rarely" (Quimby 1951:107). Phillips (1970:48–49), though, did not specifically identify the nonclay tempering ingredients in his *Addis* variety of Baytown Plain, and found it to have "no absolutely reliable criteria for sorting" on the basis of paste characteristics of body sherds alone. In another shift, Williams and Brain (1983:92) described *Addis* as having relatively homogeneous texture but distinctly heterogeneous tempering agents, and remarked that "the 'organic' nature of *Addis* is diagnostic and widely sortable." Other LMS publications, written more recently despite the 1983 date of the Lake George report, restored Addis Plain to type status, and emphasized its heterogeneous and variable paste containing both organic and inorganic matter (Brown 1978:3ff, 1985: 288; Steponaitis et al. 1983:139).

Another significant but problematical artifact class within what has been called Plaquemine culture is the projectile point. The Medora and Greenhouse sites did not yield enough clearly Plaquemine-associated points to address this question (Quimby 1951:103–104; Ford 1951:117). At the Bayou Goula site, however, 26 distinctive swordfish-shaped arrow points were found, along with 21 expanding-stemmed arrow points (Quimby 1957: 128–130, Figures 42 and 43). The former have also been found at the Lake George site, and named Bayogoula Fishtailed, *var. Bayogoula* (Williams and Brain 1983:222, Figure 7.2); they appear to belong to the Winterville I subphase there, but to have disappeared by subphase II, i.e., about A.D. 1300 (1983: 338). Rolingson (1971, 1976:116) defined the Ashley point, a bulbous-stemmed arrow point type, as typical of the Bartholomew phase of Plaquemine culture in southeast Arkansas. This and similar types have also been found in the Gran Marais phase of the Felsenthal region (Rolingson 1981:73–75, Figure 15; Hemmings 1982:229, Figure 58), and in Plaquemine contexts in the Catahoula Basin (Gregory et al. 1987:32, 95).

The above discussion of arrow points has virtually circumnavigated what could be called the Plaquemine heartland. However, within that heartland, it appears that chipped stone points were not a part of the Plaquemine assemblages, being supplanted instead by bone and (especially) antler points (Williams, Kean and Toth 1966; Hally 1972; Williams and Brain 1983:342).

With the realizations that true Mississippian phases characterized by abundant shell-tempered pottery are relatively late (post-A.D. 1400) south of the Arkansas River, and that true Caddoan foci or phases are very late (protohistoric to historic) intruders into the western margins of the Lower Valley, something of a conceptual cultural vacuum developed.

TABLE 16
PLAQUEMINE AND OTHER LATE PHASES IN SOUTHERN ARKANSAS AND ADJACENT MISSISSIPPI

Dates	Felsenthal	Bartholomew	Macon	Lower Yazoo
A.D. 1700	(abandoned?)	(abandoned?)	(abandoned?)	(Russell)
A.D. 1600	(Caney Bayou)	(Tillar)	(Hog Lake)	(Wasp Lake)
A.D. 1500		(Wilmot)		(Lake George)
A.D. 1400	?		?	
A.D. 1300	Gran Marais?[1]	Bartholomew	Bellaire	Winterville
A.D. 1200				Crippen Point?[2]
A.D. 1100				
A.D. 1000	(Cypress Swamp)	(DeYampert)	?	(Kings Crossing)

Note: Parentheses indicate non-Plaquemine phases.

[1]The cultural affiliation of the Gran Marais phase is uncertain, but at least Plaquemine-related (Schambach and Rolingson 1981).

[2]The Crippen Point phase has been called both Plaquemine (Phillips 1970) and transitional (or terminal) Coles Creek (Williams and Brain 1983).

With additional surveys and excavations in northeast Louisiana, the Yazoo Basin, and southeast Arkansas, the Plaquemine culture concept has been expanded to fill that vacuum, well beyond its original Baton Rouge–Red River Mouth territory; it has also been expanded into coastal Louisiana. Phillips (1970:950) explicitly noted that he was expanding it northward, although his successors at the LMS (Brain 1971, 1978; Williams and Brain 1983) drastically reinterpreted the meaning of this extended distribution.

Much variation has been taken in under the Plaquemine rubric, which may itself be overextended by now, and this should be kept in mind as we review its regional manifestations. For the purposes of this overview, a heuristically separated Coastal Plaquemine culture will be reviewed in a later section.

Paleoenvironmental Data. The Mississippi River was in its present meander belt well before the beginnings of Plaquemine culture. By the Saucier (1974) scheme, the Arkansas River would have made the major shift from its Bartholomew meander belt to the modern one in late Coles Creek times, or perhaps during the Coles Creek–Plaquemine transition. However, the revised chronology (Autin n.d.; Saucier, personal communication) places this important event much earlier. So, it would seem that the Arkansas River was in its modern meander belt during all of Plaquemine culture's existence, and that it was essentially at or beyond the northern boundary of Plaquemine culture's distribution. By both Saucier's 1974 estimate and the revised one, the Red River would have been in a meander belt trending southeastward from the Alexandria vicinity to the Gulf during all or most of Plaquemine times. However, Pearson (1986) suggested that the change to the modern Red River meander belt occurred much earlier. Under his scenario, the Red would have been in the modern belt during all of Plaquemine time.

As discussed in the Mississippian culture section, some very broad climatic patterns have been invoked in discussions of the late prehistoric periods and cultures. In particular, Rolingson (1976:109–110) suggested that such widespread changes may have affected the Bartholomew phase of Plaquemine culture in southeast Arkansas. Such general characterizations do not take account of regional variability, and it would seem that detailed work on baldcypress dendroclimatology, on a region-by-region basis, holds the best potential for significant control over such variability (Stahle et al. 1985).

Phases. The northernmost regions involved in this discussion overlap with the southernmost contiguous regions involved in the Mississippian phase discussions. It will be recalled that Mississippian phases have also been defined on the Louisiana Gulf Coast, and here again there will be an

TABLE 17

PLAQUEMINE AND OTHER LATE PHASES IN NORTHEAST LOUISIANA AND ADJACENT WESTERN MISSISSIPPI

Dates	Lower Ouachita	Boeuf-Basin	Upper Tensas	Lower Yazoo
	(Ouachita)	(abandoned)		
A.D. 1700	(Glendora)	(Koroa)	(Taensa)	(Russell)
	("Keno")		(abandoned	
A.D. 1600		(Jordan)	(Canebrake)	(Wasp Lake)
			(Transylvania)	
A.D. 1500			Late Ftzhugh	
A.D. 1400	Myatt's Landing	Kinnaird		(Lake George)
			Early Fitzhugh	
A.D. 1300	Pargoud		Routh	Winterville
		Bartholomew?		
A.D. 1200	McGuffee			
			Preston?[1]	Crippen Point?[1]
A.D. 1100	(Routon)			
		?		
A.D. 1000	(Pritchard Landing)		(Balmoral)	(Kings Crossing)

Note: Parentheses indicate non-Plaquemine phases.

[1]The Preston and Crippen Point phases might be considered either Plaquemine or transitional Coles Creek.

interfingering with the later Plaquemine phases. It should also be noted that there is another kind of intermingling involved here, among transitional Coles Creek and early Plaquemine phases. This is reflected in Brown's (1985b:Figure 2) phase chart, which includes the ca A.D. 1000–1200 phases in the Coles Creek culture period but shades them to indicate a sort of half-Plaquemine affiliation.

The northernmost tier of regions involved in Plaquemine or Plaquemine-related cultural developments is the one between the Arkansas River and the Arkansas–Louisiana state line. The late prehistoric phase sequences of these regions are summarized in Table 16.

The Yazoo Basin sequence is more finely subdivided than the others in this tier. Even though it is out of the present study area, it must be examined in some detail. The Crippen Point phase in the Yazoo Basin was defined by Phillips (1970:12–13, 558–560) as belonging to Plaquemine culture, but Williams and Brain (1983:373–374) redefined it as a transitional Coles Creek phase, dating well after what Phillips had considered to be the end of the Coles Creek culture period. This redefinition is part of a radical reinterpretation of the nature and origin of Plaquemine culture (Williams and Brain 1983:337ff), which had its roots in Brain's work at the Winterville site and elsewhere in the Yazoo Basin (Brain 1969, 1971, 1978).

In this reinterpretation, the Yazoo Basin is implied as the birthplace of Plaquemine culture, by Mississippian out of Coles Creek, as it were. According to this scenario, Plaquemine culture did not come into existence in the Yazoo Basin until the Winterville phase, when "a hybridization of both the Mississippian and Coles Creek cultures...describes the Plaquemine culture as we conceive it" (Williams and Brain 1983:338). The Winterville phase is seen as "the northernmost, and earliest, phase of the Plaquemine culture" (1983:338).

The fundamental nature of this reinterpretation may be illustrated by a few examples. The Crippen Point phase is characterized ceramically by the *Addis 1* subset of types/varieties (Williams and Brain 1983:318–319, Figure 9.4); most of these had previously been regarded as Plaquemine, and indeed, *Addis* ware itself had been regarded as the characteristic Plaquemine ware. The Winterville phase is defined ceramically by the Greenville set (1983:338), in which "the paste is equivalent to that of the *Addis* variety... however, there is one additional mode: some shell serves as the primary but not exclusive tempering agent" (1983:319). Furthermore,

> With Greenville, the full ceramic complex includes a strong Mississippian input: Yazoo 2 subset during the first part of Winterville and Yazoo 3, which was introduced with subphase II. Both of these subsets are

TABLE 18

PLAQUEMINE AND OTHER LATE PHASES IN EAST-CENTRAL LOUISIANA AND ADJACENT SOUTHWEST MISSISSIPPI

Dates	Catahoula-Red River	Natchez Bluffs	Baton Rouge
A.D. 1700	Avoyel?[1]	Natchez	Bayogoula?[1]
A.D. 1600	?	Emerald	Delta/Natchezan
A.D. 1500	Sanson/Mayes		
A.D. 1400		Foster	
A.D. 1300	Bennett Landing/Black Camp	Anna	Medora
A.D. 1200			
A.D. 1100	(Wild Hog)	(Gordon)	(St. Gabriel)
A.D. 1000	(Open Brake)	(Balmoral)	(Bayou Ramos)
A.D. 900	(Old River)		

Note: Parentheses indicate non-Plaquemine phases

[1]The relationships of the historic Avoyel and Bayogoula to earlier Plaquemine culture (s) are uncertain.

characteristically Mississippian. (1983:338)

It should be noted that these authors emphasized a more rounded approach to cultural classification:

> Phillips's distinguishing factors are all pottery related, whereas we believe that phases must now be defined within a range of criteria, which is why they are cultural phases and not just chronologies of ceramic periods. (1983:340)

Another, nonceramic, Winterville phase change toward characteristically Mississippian attributes will be discussed in the section on settlement patterns. Here, it will suffice to note that this reinterpretation of the nature and origins of Plaquemine culture not only differs radically from that of Phillips, but also from Ford's (and Quimby's) original conception of Plaquemine as the middle term in an essentially continuous development from Coles Creek to Natchez, farther south. Also, the later transition to the fully Mississippian Lake George phase seems fraught with ambiguity:

> The transition from the Winterville phase to the Lake George phase is quite gradual, indeed almost imperceptible. The emphasis is on continuity, although a fundamental cultural change is also occurring (1983:340)

In southeast Arkansas, a more coarsely grained sequence has been roughed out. The Bellaire phase was basically defined to accommodate a nineteenth century find of "a fine stone serpent–cat effigy pipe" (Phillips 1970:944–945; cf. Lemley and Dickinson 1937:31, Plates 5 and 6), plus a few "inadequate" sherd collections which Phillips compared to assemblages from phases that he, at least, considered Plaquemine. There may well be some mound and habitation sites in this Bayou Macon locality that could comprise a significant phase, but the necessary investigations remain to be done (Jeter 1982a: 105–106, 1982b).

Rolingson (1976) defined the Bartholomew phase as another and more explicitly Plaquemine manifestation, ca A.D. 1200–1400, in southeast Arkansas, on the basis of extensive surveys along Bayou Bartholomew just above the Louisiana state line. She interpreted the phase as "an intrusion of Plaquemine peoples...out of either the Tensas Basin or the Ouachita River Valley" (1976: 119). Clearly, this involves the more traditional concept of Plaquemine culture as originating to the south. However, at the time she was writing, it was generally believed that southeast Arkansas had been essentially vacant during the Coles Creek period; the Bartholomew phase thus appeared to be a case of immigration from another region. Since then, the concept of Plum Bayou culture, as a Coles Creek period manifestation dominated by plainwares and therefore hard to recognize, has been defined (Rolingson

TABLE 19

PLAQUEMINE AND OTHER LATE PHASES IN THE COLES CREEK–PLAQUEMINE HEARTLAND REGIONS

Dates	Baton Rouge	Natchez Bluffs	Tensas Basin	Lower Yazoo
A.D. 1700	Bayogoula[1]	Natchez	(Taensa)	(Russell)
			(abandoned?)	
A.D. 1600	Delta Natchezan		(Canebrake)	(Wasp Lake)
		Emerald		
AD. 1500			(Transylvania)	
			Fitzhugh	(Lake George)
A.D. 1400		Foster		
A.D. 1300			Routh	Winterville
	Medora	Anna		
A.D. 1200				
A.D. 1100	(St. Gabriel[2])	(Gordon[2])	(Preston[2])	(Crippen Point[2])
A.D. 1000				

Note: Parentheses indicate non-Plaquemine phases.

[1]The Bayogoula may have had a Mississippian rather than a Plaquemine culture.

[2]These phases might be considered either transitional Coles Creek or early Plaquemine.

1982), and additional surveys and excavations have revealed some evidence of a previous Plum Bayou occupation in the Bartholomew locality (House and Jeter n.d.).

More recent surveys have found Bartholomew-like assemblages to the north of the locality concentrated on by Rolingson (House and Jeter n.d.), at least as far north as central Lincoln County (Giardino 1979:126), and possibly slightly north of the Arkansas River. But for all practical purposes, the Bartholomew meander belt marks the northernmost extent of Plaquemine culture.

The Bartholomew phase ceramic assemblage includes a rather wide range of types and varieties (Rolingson 1976:115–116), some of which are assigned to separate phases in other regions (Williams and Brain 1983; Brown 1985:Table 2). Quite possibly, the Bartholomew phase may eventually be subdivided. The Ashley point (Rolingson 1971), a bulbous-stemmed arrow point, is quite common on Bartholomew phase sites and on sites of related phases in regions to the west and south.

The Gran Marais phase of the Felsenthal region was originally assigned to Plaquemine culture by Schambach (1979:30, Figure 3.1; see also Rolingson 1976:118), but he subsequently alluded to it more cautiously as "culture unknown" (Schambach and Rolingson 1981:189ff). The rather unusual clay-tempered (or grog-tempered) ceramics of this phase necessitated the development of a new classification system (Schambach 1981). The common practice of using different decorative techniques on the rims and bodies of vessels made the Phillips type–variety system essentially unworkable here (1981:106ff). Clearly, whether it is Plaquemine or not, this phase marks the northwestern terminus of Plaquemine culture.

In the next tier of regions, part of the traditionally defined Coles Creek heartland is included. The Plaquemine phases appear to have a more definite continuity from that tradition, and less in common with Mississippian culture. The regional sequences (again including the Yazoo Basin sequence, for ease of comparison) are summarized in Table 17.

In the Tensas Basin, the Preston phase has merely been named and inserted into a newly created transitional Coles Creek slot in recent LMS publications (Belmont and Williams 1981:Table 1; Belmont 1982a:Figure 3). No formal definition has been published, but it is likely that this phase's ceramic types and varieties would closely resemble those of the Crippen Point phase. It should be noted here that Hally (1972:256, 260, 298–307), in his dissertation on the later phases (Routh, Fitzhugh, and Transylvania) of this region, suggested that several types/varieties (including Coles Creek Incised, *var.*

TABLE 20

PLAQUEMINE AND OTHER LATE PHASES IN THE WESTERN MARGINAL REGIONS ADJACENT TO THE COLES CREEK-PLAQUEMINE HEARTLAND

Dates	Catahoula Basin	Lower Ouachita	Felsenthal
A.D. 1700	Avoyel?[1]	(Glendora)	(abandoned?)
		("Keno")	
AD. 1600	?		(Caney Bayou)
AD. 1500			
	Sanson/Mayes	Myatt's Landing	
AD. 1400			
A.D. 1300		Pargoud	Gran Marais
	Bennett Landing/Black Camp		
AD. 1200		McGuffee	
A.D. 1100	(Wild Hog)	(Routon)	
A.D. 1000			

Note: The order is south to north, from left to right; parentheses indicate non-Plaquemine phases.

[1]The relationships of the historic Avoyel to earlier Plaquemine cultures are uncertain.

Hardy and Mazique Incised, *var. Manchac*) traditionally regarded as Plaquemine were actually part of the late Coles Creek assemblages; these would probably now be assigned to the Preston phase.

The Routh phase was defined as the first true Plaquemine phase in this region, followed by the Fitzhugh phase (Hally 1972). Although the Fitzhugh phase was replaced in the northern Tensas Basin by the Mississippian Transylvania phase around A.D. 1500, it appears to have continued in the southern part of this region well into the 1500s (Hally 1972; Kidder 1986b:Figure 3). This and related Protohistoric developments will be discussed in a later section.

In the Boeuf Basin, the LMS has completed several seasons of surveys and initial testing, but has not published definitions of Plaquemine phases. In an early summary of the findings, Belmont (1983:279) reported that "the ceramics are increasingly divergent from the Plaquemine ceramics of the Tensas, and seem to approach Caddoan norms in technique, if not in design layout." As Belmont noted, this situation seems perhaps comparable to that in the Felsenthal region (Schambach 1981). However, Fuller and Williams (1985:11) compared the ceramics of the southern Boeuf Basin to those "typically referred to as Plaquemine in the Lower Mississippi Valley" and noted that some types "that can be related to well-developed Plaquemine phases to the south and east...often occur in minor amounts." Kidder (1986:Figure 3) compared the earlier Plaquemine remains of the Boeuf Basin to those of the Bartholomew phase. His (1986:Figure 3) phase chart also included an apparently late Plaquemine Kinnaird phase, but it was not described.

The Lower Ouachita Valley sequence, also poorly defined and documented (Gibson 1983d:325–327), is based to some extent on data from Moore's work of more than 75 years ago. The Routon phase (Gibson 1983b:Figure 6) has not been defined formally (or even discussed — just named) but would appear coeval with the transitional Coles Creek phases of other regions and, therefore probably belongs at least partially within the A.D. 1000–1200 period. In an earlier phase chart, Gibson (1977:Figure 3) showed Routon as a ca A.D. 900–1050 phase, preceding Pritchard Landing, but their positions were reversed in his 1983 chart, which is followed here.

The McGuffee phase has consistently been shown as the earliest Plaquemine phase in Gibson's (1977:Figure 3, 1983b: Figure 6) Lower Ouachita sequences. However, it is also undefined and undiscussed.

Pargoud (sometimes rendered as Pargaud or Paragoud) and Myatt's Landing are both named after sites visited briefly by Moore (1909:24–27). The phases remain essentially undefined. LMS researchers (Belmont 1983; Fuller and Williams 1985) included a portion of the Lower Ouachita Valley in their concept of the Boeuf Basin region. Fuller and Williams noted the presence of Pargoud Plaquemine or "Pladdo" ceramics (1985:11; cf. Jeter 1982a:103) in the Ouachita Valley portion of their survey area and have explicitly compared them to those of the Gran Marais phase (Schambach 1981).

The regions in the next tier to the south include some of the classic Plaquemine sites in the Baton Rouge and Natchez Bluffs regions and some long-standing enigmas in the Catahoula Basin and Lower Red River regions. The regional sequences are summarized in Table 18, which proceeds from the Catahoula Basin in the west to the Natchez Bluffs in the east, thence southward to the Baton Rouge region.

The St. Gabriel phase has not been formally defined, but is merely another name on a phase chart, in the transitional Coles Creek slot (Brown 1985b:Figure 2). It is based on Woodiel's (1980) thesis on the St. Gabriel site, but Woodiel did not present any phase definitions. St. Gabriel phase components have also been recognized in the premound levels at the Medora and Bayou Goula sites (Weinstein 1985:2–3).

The Medora phase was defined by Phillips (1970:950–951) on the basis of Quimby's (1951) report, plus data from four other sites reported upon in the 1950s: Greenhouse (Ford 1951); Anna and Gordon (Cotter 1951, 1952); and Bayou Goula (Quimby 1957). Phillips included a number of other sites in this region, on the basis of surface collections and test excavations, and noted the possibility that the phase would be subdivided chronologically. This appears to have been done by the LMS by restricting the Medora phase to the early Plaquemine slot, ca A.D. 1200–3500 (Brown 1985b:Figure 2).

However, the next Plaquemine phase listed by Brown for the Baton Rouge region in his phase chart, Bayou Petre, was regarded by Phillips (1970:950, 951–953) as clearly not Plaquemine, and Weinstein (1985) followed Phillips in assigning Bayou Petre to Mississippian culture in the Pontchartrain–Eastern Delta regions. The late prehistoric Plaquemine slot for the Baton Rouge region is therefore left blank here to imply that no appropriate phase has been named, let alone adequately defined. Bayou Petre is considered here to be an intrusive Mississippian phase in the southeastern Louisiana coastal zone. The Baton Rouge regional sequence is here regarded as continuously Plaquemine from St. Gabriel–Medora through the Protohistoric Delta Natchezan, if not the historically known Bayogoula (who may have had a Mississippian rather than Plaquemine material culture).

In the Natchez Bluffs, Phillips's (1970:947–949) Gordon and Natchez phases have been augmented by more recent LMS research (Brain 1978; Williams and Brain 1983:409ff; Brown 1985a, 1985b), and now stand as the initial (transitional Coles Creek) and final (historic) end members of Plaquemine culture. Three phases, Anna, Foster and Emerald, have been inserted between them. These are best characterized in Brown's recent publications.

The late prehistoric sequence in the Catahoula Basin appears to be in a rather chaotic state of incipient redefinition at present. Gibson (1977:Figure 3, 1983b:Figure 6) set up a preliminary phase sequence, as follows:

A.D. 1500
Bennet (*sic*) Landing
Sanson
Mayes
Black Camp
A.D. 1200
Wild Hog

However, subsequently, Gregory et al. (1987:53, Figure 16) rejected or ignored two of Gibson's phase names, reordered the others, and added one of their own, as follows:

LATE
Sanson
Mayes
Bennett Landing
EARLY

Later, Gregory et al. (1987:90) suggested a "collapse" of the Sanson and Mayes phases into one phase, and noted that there appears to be "little or no difference" between Gibson's Black Camp phase and their concept of the Bennett Landing phase. For the sake of simplicity, the approach taken here (see Table 18) is to collapse these remaining phases into an early (Bennett Landing/Black Camp) combination, and a late (Sanson/Mayes) combination.

An Alternative View of Plaquemine Phases. The above presentation of Plaquemine phases in terms of north-to-south tiers of regions may tend to obscure the overall pattern, by separating what some archeologists would consider the heartland Plaquemine phase sequences from each other and instead comparing them, tier by tier, with anomalous western phase sequences influenced by Caddoan interaction. Here, a different tack will be taken here (Table 19) in presenting the Plaquemine phases of the old Coles Creek heartland together.

This table perhaps gives a better overview of the mainstream or relatively pure Plaquemine phases. In contrast to the Brain–Williams view of Plaquemine origins, it stresses the continuities of Plaquemine phases with the preceding Coles Creek culture, a view still held by some Louisiana archeologists (e.g., Neuman 1984:258ff). It also affords a better view of the time-transgressive southward progress of Mississippian culture, first with the Lake George phase (after which the Yazoo Basin remains in the Mississippian tradition), then with the Transylvania phase of the northern Tensas, and finally with the historic Taensa phase of the southern Tensas, which appears to include a mixed Plaquemine (Natchezan) and Mississippian assemblage (Phillips 1970:945).

The northern margins of this heartland have already been summarized in Table 19, and the southern margins will be included in the Coastal Plaquemine discussion. A parallel overview of what might be termed western marginal Plaquemine phases is provided in Table 20.

The most striking thing about these phases is that most, if not all, of them which have been subjected to any kind of intensive artifact analyses have shown some degree of Caddoan influence and have been difficult to fit into existing culture–historical classifications. The enigmatic Sanson and Mayes sites/phases also have the unique trait of "killed" (perforated) mortuary ceramics (Phillips 1970:946–947; Gregory et al. 1987:95). The Pargoud Plaquemine or Pladdo assemblages of the Lower Ouachita–Boeuf Basin (Gibson 1983d:325–326; Fuller and Williams 1985:11–12, 15) resemble the Gran Marais assemblages which prompted Schambach (1981) to apply a new ceramic classification system. The remaining Plaquemine phases of these regions are really only names at present.

It may also be noteworthy that much of this territory is occupied by very low lands, including significant amounts of permanently or seasonally inundated wetlands. The Ouachita bottomlands of southeast Arkansas include the lowest lands (and water elevations) in the state (Jeter 1982a:78). Schambach (1971, 1979:22, 1981:103ff) for years stressed the unique characteristics of the Felsenthal region. Hemmings's (1982) bankline surveys along the Ouachita and Saline rivers in this region amplified this distinctiveness and clarified the possibilities for adaptations to this flood-prone environment (1982:269–277). Similarly, for years Gregory (1969; Gregory et al. 1987) stressed the unique characteristics of the Catahoula Basin, which has been referred to as a "Flood Bowl" (1987:1). Perhaps the Felsenthal and Catahoula lowlands and wetlands are not completely unique, and perhaps comparative studies of these regions and the intervening Ouachita Valley would be quite productive.

Taking the above distinctive attributes of artifacts, environments, and adaptations into account, a possibility presents itself. Some combination of these western marginal Plaquemine phases may eventually be redefined into a new archeological culture, in the sense defined by Belmont (1982c:77–78).

Key Sites. The Medora site, referred to repeatedly above, is the type site for Plaquemine culture by virtue of Ford's having chosen it in the late 1930s for WPA–LSU excavation to subdivide his cultural sequence, and by virtue of its site report (Quimby 1951) having been selected as the vehicle for the culture's formal, if preliminary, definition. The site is in West Baton Rouge Parish, a short distance southwest of Baton Rouge, and included two mounds about 125 m apart. Other key sites will be summarized in a generally north–south order.

For the transitional Coles Creek period, the St. Gabriel site stands as one of the best known. The site consisted of a low stratified mound capping a premound occupation, containing a circular wall-trench structure excavated by Woodiel (1980). From the area of the circular structure at the premound level, a mixture of typical late Coles Creek pottery and Plaquemine brushed ceramics were recovered along with burned thatch, carbonized wall posts, and hearths filled with ash and charcoal.

The Winterville site, just north of Greenville, Mississippi, is the northernmost extensively investigated site with a Plaquemine component. It is also one of the most important such sites from several aspects, including both its great size and its critical place in the Brain–Williams reinterpretation of Plaquemine origins. It was not studied by the Smithsonian mound survey of the 1880s, but was first explored (as the Blum mounds) by Moore (1908:593ff), who found little in the way of artifacts despite extensive excavations but did produce a good map. Much later extensive excavations furnished the data for Brain's (1969) dissertation. A brief summary is also contained in Phillips's (1970:476–483) Yazoo Basin volume, and it is referred to in several places in some of Brain's later publications (Brain 1978; Williams and Brain 1983).

Although the Bartholomew phase of southeast Arkansas probably extends farther north than any other manifestation that has been called Plaquemine, no sites of this phase have been intensively excavated and reported upon. The Boydell site, the northernmost Bartholomew ceremonial center mapped by Rolingson (1976:Figure 6.2) was the scene of salvage excavations on a multistage mound in 1977–1978, but the report has not been completed (House and Jeter n.d.).

In the Felsenthal region, a major Plaquemine or Plaquemine-related occupation occurred at the Shallow Lake site and was reported upon by Rolingson and Schambach (1981). This report is also noteworthy for the presentation of Schambach's ceramic classification system, which proved necessary to deal with the Gran Marais phase assemblage.

Another major mound center in the Yazoo Basin, Lake George, is in many ways similar to Winterville. It, too, was unproductive in terms of Moore's (1908:590–592) aims. After sporadic explorations over the next few decades, it was extensively excavated by the LMS in 1958–1960 and eventually reported upon (Williams and Brain 1983). This site furnished another critical set of data for the Brain–Williams reinterpretation of Plaquemine origins.

Along the Lower Ouachita River in northeast Louisiana, Moore (1909) investigated a number of sites which produced Plaquemine-like ceramics. Most of these have been potted and/or excavated without adequate reports; many of them were revisited by a Louisiana amateur who published a useful summary (Jones 1983). One of the most interesting Plaquemine-like sites in this region, Pargoud Landing, has produced a Gran Marais-like assemblage of mortuary vessels and a radiocarbon date of A.D. 1220 ± 50 (1983:115). The McHenry, Gerson, and Woods sites (1983:117–118, 127–128, 131–132) produced similar ceramics. Myatt's Landing, which was extensively excavated but inadequately reported and illustrated by Moore (1909:24–27), and which has been made the type site of a phase by Gibson (1983b:Figure 6) has never been analyzed (Jones 1983:118–119).

One other site in this vicinity, Salsbury, is little known but important. After sustaining extensive damage during levee improvements, it was salvaged in 1977 under contract with the Corps of Engineers, Vicksburg District. It yielded an unspecified number of burials (probably at least 20) and 14 grog-tempered Pargoud-like vessels, which are illustrated in the report (Price and Heartfield 1977). Unfortunately, the report was only reproduced in limited quantities, and few archeologists are aware of its existence.

Bennett (Bennet) Landing, a three-mound site on Little River near Catahoula Lake, was surface collected and mapped by Gibson (1977:89–91, Figure 13). Gibson interpreted it as relatively late in the Plaquemine sequence, but Gregory et al. (1987:53, 90) suggest that it is earlier — essentially initial Plaquemine if the LMS concept of transitional Coles Creek is used for the previous phase.

In the Tensas Basin, the type sites and other sites of the two Plaquemine phases, Routh and Fitzhugh, were reported upon at some length in Hally's (1972) dissertation. Unfortunately, this excellent summary is virtually unavailable.

Several major sites in the Natchez Bluffs area have Plaquemine components but are out of the scope of this overview. These include Emerald (Cotter 1951:18–24), Anna (Cotter 1951:24–28), Gordon (Cotter 1952; Johnson and Sparks 1982), and Fatherland (Neitzel 1965, 1983). Overviews of various aspects of this situation can be found in Brain (1978) and Williams and Brain (1983).

The Bayou Goula site was originally interpreted as including a relatively pure Plaquemine component (Quimby 1957: 143). However, Hally (1972:303) suggested that this was in fact a late Coles Creek component; today, it would probably be interpreted as mainly transitional Coles Creek, although a reanalysis is clearly called for.

Settlement Data. The major study of Plaquemine settlement patterning (Brain 1978) is concerned with the Yazoo Basin and Natchez Bluffs regions, outside this overview's boundaries. Briefly, in those regions the first Plaquemine phases, Winterville and Anna, witnessed a florescence in construction of mounds. Both Winterville and Lake George had more than two dozen mounds, with a double plaza arrangement focusing on a large central mound. These have been illustrated schematically, as Mississippian site plans, by Williams and Brain (1983:Figure 12.16.) Several sites in the Natchez Bluffs had imposing large mounds positioned at the bluff edge, to accentuate their height. There was also a definite orientation toward the Mississippi River Valley at this time, and both regions saw a trend toward population nucleation around the major centers, though true villages in the Mississippian sense have not been reported. The major mound sites may have served as redistribution centers, with secondary centers at intermediate points; Lake George itself may have been the primary center for a major secondary river drainage, that of the Yazoo (Brain 1978:349–350).

The succeeding phases, after about A.D. 1350, saw the Mississippianization of the Yazoo Basin (Lake George phase), as the Plaquemine frontier fell back to the Natchez Bluffs (Foster phase). The riverine focus decreased, and the huge Emerald Mound began to be built in an inland location, just north of Natchez. Although the Lake George social structure seems to have decentralized, with an emphasis on secondary centers, the trend toward dominance of a primary center continued in the Foster phase (Brain 1978:352).

On the west side of the Mississippi and within the present overview area, the Bartholomew phase settlement pattern has been characterized by Rolingson (1976:110–115) on the basis of extensive survey data, and augmented by a more localized and more intensive survey (House and Jeter n.d.). There are fewer and smaller mound centers in this region, and the research has given more attention to smaller nonmound sites, which appear to have been dispersed along the old Arkansas River levees and in a few seasonal backswamp locations. Social organization appears to have been relatively simple. The site hierarchy includes small ceremonial centers (apparently with one mound or rarely, two mounds), hamlets which may have had several houses, individual house sites, and special-purpose camp sites.

In the Felsenthal region, the site hierarchy in the vicinity of the Ouachita River includes mound sites on the terrace edges overlooking the seasonally flooded lowlands and pine islands within them; villages or (probably more accurately) hamlets, and seasonal extractive camps. The mound centers frequently have multiple mounds, and show evidence of occupation by previous Coles Creek-related peoples, with suggestions of maintenance (and burials), rather than intensive habitation, during the Gran Marais phase (Schambach 1979:30; Schambach and Rolingson 1981). Hemmings (1982:151–153, Figure 34) has noted an apparent centripetal pattern, with seasonal extractive camps along the river, and a ring of habitation sites and mound centers on the higher ground around the lowlands. However, as he noted, this pattern does not include data from the more distant uplands, which probably also contained seasonal extractive sites of other kinds, but few mounds. A report on one habitation/extractive site, occupied from Coles Creek through Plaquemine-affiliated Gran Marais phase times, has been published (White 1987).

In a preliminary report on LMS surveys in the Boeuf Basin, Belmont (1983:279) reported that Plaquemine occupation appeared to have been "surprisingly weak" in the southern part of that region, but "comparatively strong and dense" in the northern portion. In a more recent summary, Fuller and Williams (1985:15) mention "a consolidation of the riverine [natural levee] settlement pattern that started in Coles Creek times." No detailed summary of site types has yet been published, though.

Along the Lower Ouachita River in northeast Louisiana, Gibson (1983b:83) has reported:

> the discovery of Plaquemine components in the backswamps.... Plaquemine representation along the river levees proper seems to have been nearly nonexistent.... Perhaps the majority of Plaquemine peoples were off the Ouachita on its tributaries–distributaries. Certainly their major mound centers were.

Gibson (1983d:326-327) has also postulated a trend of general depopulation along this stretch of the Ouachita River itself, beginning perhaps around A.D. 1200 in the south and culminating by A.D. 1350–1400, with settlements removed to the tributaries as indicated above.

In the Catahoula Basin, by contrast, Gregory et al. (1987:82, 87) report that Plaquemine components "range across all the major environments," that population seems to have reached a peak during Plaquemine times, and that the Basin "was filling with people." Site types included "temple mound centers, primary mortuary mound centers, secondary burial centers, small sheet middens [especially on old levee ridges],...thin middens in the backswamps and on low levees, [possible camp sites], and a series of specialized [salt production?] sites on the beaches around Catahoula Lake." Site distributions (1987: Table 8) show a marked orientation toward the levee ridges, and these authors suggest that the larger midden sites, at least, represent agricultural activities.

Very little information exists on Plaquemine settlement patterns in the Baton Rouge region. Woodiel (1980:158–160) has noted that both Bayou Goula and Medora had two mounds with plazas between them, and St. Gabriel had only one mound with a habitation area. Other habitation sites, some with mounds, are located along the Mississippi River levees in this vicinity, but have not been investigated.

An overview of another aspect of Plaquemine settlement was provided in Brown's (1985b) study of Plaquemine house types, which focused on the Natchez Bluffs region but included data from other sources. There appears to have been an overall trend from earlier circular structures to later rectangular ones, but there was a great deal of regional variation in early Plaquemine times, especially from north to south. Comparative data are lacking for regions other than the Natchez Bluffs in later Plaquemine times.

Subsistence Data. One of the Lower Valley's major data gaps is the relative lack of data on Plaquemine subsistence. Most of the assumptions rest on inferences from settlement patterns: Plaquemine settlements tend to be located along natural levees, and it is inferred that this indicates a horticultural orientation (Neuman 1984:267; Brown 1985b:253–254). Citing an unpublished manuscript (Brain et al. n.d.), Brown (1985b:254) remarked that an increase in the number of small sites around A.D. 1200 is believed to reflect a burgeoning population, one that apparently took advantage of a new and better subsistence base. Adoption of the Mississippian complex of beans, squash, and Northern Flint maize is believed to have been the impetus.

However, data summarized by Blake (1986) show no evidence for Northern Flint maize in or near the Lower Valley during the A.D. 1200–1400 period, nor indeed for the A.D. 1400–1600 period. Only the late Protohistoric to Historic Fatherland site has furnished such evidence so far. As noted previously, the St. Gabriel site yielded one kernel of maize from a 12-row cob (i.e., probably Tropical Flint rather than Northern Flint), from a late Coles Creek context, ca A.D. 1000 (Woodiel 1980:84–85).

On the basis of settlement and artifact data, Rolingson (1976:119) hypothesized that Bartholomew phase subsistence "was based on corn–beans horticulture supplemented by wild resources including deer, various nuts, and other bottomland flora." Subsequent surveys (House and Jeter n.d.) reaffirmed the existence of small habitation sites on old levee soils and the common occurrence of Ashley points. One site (3DR178) on Bayou Bartholomew in extreme eastern Drew County yielded two flakes from a Mill Creek (southern Illinois) chert hoe (generally regarded as an agricultural implement) in a surface collection with Bartholomew phase-like ceramics.

Schambach and Rolingson (1981:201–202) reported that excavations at the Shallow Lake site in the Felsenthal region had furnished

> no indications of any major changes in either subsistence techniques or in the subsistence base between the Coles Creek period occupation and the Gran Marais phase.... During both of these periods the inhabitants of the site evidently made use of the full range of local resources: fish, turtles, migratory waterfowl, deer, and small mammals were all used.

There appear to be no direct data on Plaquemine subsistence from sites in the Tensas Basin, Boeuf Basin, or Lower Ouachita Valley. In the Catahoula Basin, Gregory (1969:119–122) tested several Plaquemine components and found bones of deer, raccoon, rabbit and squirrel, plus numerous arrow points. Also, bones of waterfowl were plentiful — the Catahoula Lake vicinity is a major feeding ground for migratory waterfowl — and fish bones were "omnipresent." Mussel shells were also common. Flotation was not done, and no data on plant exploitation were reported, although it was suggested that these people were "established agriculturalists" (1969:122) who would have also exploited a variety of wild plants. No new direct evidence of subsistence were reported from the recent survey of this region (Gregory et al. 1987).

No subsistence remains were reported from the Medora site, although Quimby (1951:129) did state that "direct evidence of agriculture was lacking." He did report finding "15 small, charred fragments of corncobs" in a pit "associated with the old humus level" at the Bayou Goula site (1957:133); this would have been a Plaquemine association, as Quimby had noted earlier (1951:129; see also Neuman 1984:267) or perhaps a transitional Coles Creek association (cf. Hally 1972: 303; Brown 1985b:Figure 2) in the LMS-revised terminology. These remains were not analyzed.

Mortuary Data. Adding to the difficulty of characterizing the nature of Plaquemine adaptations is the scarcity of well documented burials clearly attributable to Plaquemine culture, and beyond that, the absolute lack of modern analyses of such burials. The evidence, such as it is, will be summarized here in the usual north–south order. As will be seen, this evidence bears out Neuman's (1984:265) summary statement of an "unusually wide array of human burial practices attributable to the Plaquemine Culture."

In southeast Arkansas, the remains of at least 15 individuals were partially salvaged during the destruction of Boydell Mound A on Bayou Bartholomew (House and Jeter n.d.). Most of these were probably assignable to the Bartholomew phase, on the basis of associated artifacts and/or mound stratigraphy. Burial modes were difficult to discern due to disturbance by power equipment.

Bartholomew phase burials also occurred in small habitation sites, as exemplified at the MacArthur site (Rolingson 1976:113–114). There, two adult males and an adult female were buried in the extended-supine position under a house floor, along with four flexed burials of infants.

An unusual mortuary situation, possibly related to the Bartholomew phase, was encountered at the Clark site on the edge of the adjacent uplands (Jeter 1982a:105). There, amateurs recovered at least 50 crude Plaquemine ceramic vessels which had been associated with burials, during an earth-moving activity. The burials were said to be in bad condition, and none were preserved. The vessels generally resemble those from Pargoud Landing and related sites in northeast Louisiana, in that they are grog tempered and consist mainly of bag-shaped tall jars with sloppily incised encircling lines (Pargoud Incised, which may be a "degenerated" variant of Coles Creek Incised, *var. Hardy*), but the Clark site vessels much more frequently have the punctated body decorations common in the Bartholomew–Macon and Felsenthal regions.

At the Crane Lake site (16MO41) near Bayou Bonne Idee and between Bayou Bartholomew and the Boeuf River in northeastern Morehouse Parish (near the Arkansas line), salvage excavations in 1975 encountered two burials atop a mound (Price 1983:295–296). The burials were not preserved but appeared to be those of an adult and an extended-supine juvenile with head to the north. No associated artifacts were found, but the site was said to have produced both Coles Creek and Plaquemine artifacts (1983:316), and these stratigraphically late burials could have been Plaquemine-affiliated.

Along the Boeuf River, Moore (1909:105–109) encountered burials which might be attributable to Plaquemine culture at two sites. The first was Jones Landing (16FR220), where "human remains were found in great abundance" (1909:107). Some were extended-supine, others were bundles, and one group of five skulls was found. Only two skulls were saved by Moore, however. Only a few vessels were found, and none were illustrated, but both shell-tempered and grog-tempered specimens were described. At Dailey Landing (16FR141), excavations in the upper portion of a 14-foot mound encountered "one skeleton extended on the back and six bunched burials" (1909:108). At least 10 individuals were represented. Six nonshell-tempered vessels were found, but were not illustrated. They might well have been Plaquemine in affiliation.

Pargoud Landing (16OUl), a mortuary mound at the confluence of Bayou DeSiard and the Ouachita River in Monroe, Louisiana, has a long history of excavation summarized by Jones (1983:114–115) but never reported upon fully. Photographs of Pargoud mortuary vessels in private collections and at Northeast Louisiana University in Monroe have been circulated among archeologists. According to Frank Schambach (cited by Jones 1983:115), "the ceramic assemblage represents an early Plaquemine complex, contemporary with the Shallow Lake site in the Felsenthal region." A radiocarbon date of A.D. 1220 ± 50 has been obtained from the mound.

Although the Pargoud artifacts and mortuary data are unpublished, there is an out-of-print contract report on a nearby site which yielded a similar ceramic assemblage. At the T. E. Salsbury site (16OU15) on the Ouachita River south of Monroe, salvage excavations encountered at least 24 poorly preserved prehistoric burials and 15 historic burials (Price and Heartfield 1977:14–37). At least some of the prehistoric burials appeared to have been extended north–south with heads to the south, but at least one was extended east–west, and one was flexed. Most were represented only by tooth enamel fragments, though. Some 14 vessels, all grog tempered (1977:Table 2), were found in association and illustrated (1977:43ff, Plates 8–12, 15, 16). They appear to be consistent with the Pargoud Plaquemine complex.

The Coles Point site (16OU132) on Bayou D'Arbonne, a Ouachita River tributary near Monroe, Louisiana, was excavated by a relic collector in 1936 (Jones 1983:113–114). It was apparently a nonmound cemetery and reportedly had at least 14 burials, in four rows. All the burials recalled by the collector were extended (supine?), 12 of them with heads to the south. At least 11 of the 12 vessels from this site (Jones 1983:156–157, Figures 11 and 12) appear to match the Pargoud Plaquemine complex.

The McHenry site (16OU165), in the Ouachita Valley south of Monroe, was potted by the same collector, who reported to Jones (1983:117) that he had found "20 to 25 single, extended, articulated burials" with no obvious patterning in orientation or alignment with each other. The described and illustrated vessels (1983:158–159, Figure 15) appear to represent two components: one Pargoud-like, and the other very late prehistoric (Tunican?).

The Gerson or Filhoil Mound site (16OU2) on the Ouachita River south of Monroe was potted by the same collector, who recalled about 25 burials but did not recall their patterning. Some 27 whole or partial vessels were recovered; most of them appear similar to the Pargoud assemblage, but there is once again some evidence of a later component.

The Woods site (16CA62), near the Ouachita River in northern Caldwell Parish, was excavated in 1968 by the Northeast Louisiana Archaeology Society. Some 30 single extended burials were found and reburied, and 14 vessels were removed. The vessels described and illustrated by Jones (1983:164–166) predominantly resemble the Pargoud assemblage.

In the Catahoula Basin region, several sites have produced an unusual, if not aberrant, Plaquemine assemblage. The first of these to be widely reported was the Mayes Mound (16CT10) on Larto Lake. Some 30 km (ca 20 miles) to the northwest, the Sanson site (16RA1) was excavated by amateurs over a number of years, beginning in the 1930s. There, a low mound was found to include "bundle burials, a mass disarticulated burial, [and] scattered single burials presumed to have been made in the flesh" (Gregory 1969:112), along with numerous vessels and other grave goods. A few nearby sites have also produced some similar materials (Phillips 1970:947).

Webb and Gregory began a study of the Sanson materials in 1956, but no detailed descriptive–interpretive report has been published. Instead, we only have brief discussions (Webb, in Davis 1961:19, 113; various remarks in Ford 1952 and Gregory 1969; Phillips 1970:946–947; Gregory et al. 1987:48ff), sometimes including a few illustrations of ceramic vessels which combine Plaquemine and Caddoan influences plus "kill" holes made in mortuary vessels both before and after firing. The latter practice has been compared to possibly contemporary late prehistoric vessel "killing" in northwest Florida (Gregory 1969:130–131), but the major relationships involved seem to have been between Plaquemine and Caddoan peoples (Gregory et al. 1987:53, 95).

Moore (1912:492–495) excavated 39 burials from the L'Eau Noire site (16AV11), a mound near the juncture of L'Eau Noire Bayou and the Red River. Some (18) were single adults in the extended-supine position, but there were also 10 bunched burials, usually multiple and accounting for at least 55 individuals, and there was a great quantity of scattered bones. Artifacts were rare, but one (the only one illustrated; 1912: Figure 2) was a bottle of the L'Eau Noire Incised type, a Plaquemine marker, and the site has been included under the Plaquemine rubric by more recent archeologists (Phillips 1970: Figure 447; Toth 1979:37).

At the Lake St. Agnes site (16AV26) near the present mouth of the Red River and only about 5 km (ca 3 miles) from the L'Eau Noire site, a burial pit was found in the top of a flat-topped pyramidal mound. It contained the mixed remains of at least 10 individuals, and four Plaquemine vessels, plus sherds of Plaquemine and earlier types.

Exchange and External Relationships. Clearly, Plaquemine has meant different things to different archeologists over the past several decades, and the concept as it is generally understood today includes a great deal of variation. More than in most cases, the history of archeological investigations has affected views of external relationships. Early researchers (e.g., Quimby 1951:131) and workers in the western marginal Plaquemine regions (e.g., Gregory 1969; Gregory et al. 1987) tended to emphasize interaction with Caddoan groups. Subsequently, LMS workers in the Yazoo Basin (Brain 1969, 1971, 1978; Williams and Brain 1983) emphasized the Mississippian–Coles Creek interactions that in their view produced the hybrid Plaquemine culture.

In particular, this latter view focused on contacts with the great Mississippian center at Cahokia, Illinois (Williams and Brain 1983:375ff, 409ff). This is evidenced artifactually (especially ceramically) by "an impressive sample of Cahokian diagnostics from the Yazoo Basin" (1983:410). Neither the Natchez Bluffs nor (more relevant to the present overview) the Tensas Basin have yielded any such artifact evidence, despite intensive research by the LMS (1983:411–412, Footnote 14).

Coastal Plaquemine Culture

Definition and Location. Recent reviews by Weinstein (1985) and Brown (1985) document Plaquemine culture throughout the coastal zone of Louisiana (Figure 11) except for the extreme western Louisiana manifestation (Bayou Chene phase) which was apparently a blend of Plaquemine and local traditions that are not considered true Plaquemine (Weinstein 1985:6). The full Plaquemine cultural expression of the melding of Troyville–Coles Creek and Mississippian cultures was attained mainly at the larger agriculturally based ceremonial centers in the inland riverine areas well removed from the coast. Plaquemine occupations in the southern coastal area are characteristically less spectacular small and undistinguished hamlets (Neuman 1984:259). As Gibson (1978:44, 1975:20) noted, in some areas such as the Atchafalaya Basin and along the lower Teche–Vermilion, the resident groups appear to have remained outside the mainstream of Plaquemine culture.

The distribution of Plaquemine components is shown in Appendix B which was compiled from data published in the Comprehensive Archaeological Plan (Smith et al. 1983: Tables 3 and 5). The overall impression given by this map is a relative decrease in site density compared to the previous Troyville–Coles Creek culture period. This is particularly evident in the eastern section of the coast where only about 42 components have been recorded in the state site files. The absence or low frequency of sites in the area north and west of Lake Pontchartrain (Appendix B) may reflect the general population shift to areas south and southwest where locations such as the Barataria Basin saw an increase in use on the heels of the Mississippian culture expansion into the eastern delta area. The Plaquemine components shown in the southwestern part of the coast are undoubtedly Bayou Chene phase occupations which are not considered true Plaquemine by most researchers.

Paleoenvironmental Data. During the interval of Plaquemine culture development between about A.D. 1000 to 1500, the physical landscape remained similar to that established during the Troyville–Coles Creek period. Some landforms along watercourses continued to grow while others, abandoned by shifts in the configuration of distributaries, began to fill in, erode, or subside. The pattern of river flow continued to consolidate in the course that would become the present-day configuration of the Mississippi River. This shifting of flow into the present course undoubtedly impacted areas that had received river flow prior to this such as the St. Bernard delta where apparently no new sites were established during this period. The shift of river flow away from the des Familles–Barataria course resulted in an opening up of the Barataria Basin which also became more brackish or estuarine. This area became an important settlement area for the Barataria complex, a cluster of sites that was probably the politico–religious center for the Basin during the late prehistoric period. Also during this interval, Bayou Lafourche became an important distributary of the Mississippi River and active delta building was initiated at the mouth of this stream. However, the discharge down the other Lafourche–Terrebonne courses became so slight that almost all of the shoreline of Terrebonne Parish began to deteriorate and subside (Weinstein and Gagliano 1985).

Phases. The development of Plaquemine culture took place over a course of years that researchers now recognize in terms of three stages: Emergent Plaquemine, Early Plaquemine, and Late Plaquemine. The emergent Plaquemine or transitional Coles Creek cultural transformation that would eventually lead to true Plaquemine began between A.D. 1000 and 1200. By 1200 to 1500, the Early Plaquemine culture had developed to its fullest expression in the Lower Mississippi River Valley proper while to the east in the area of the St. Bernard Parish, the second wave of Mississippian culture was expanding east from the direction of the eastern Gulf. During the interval between approximately A.D. 1500 to 1700, the Late Plaquemine culture is identified with the protohistoric and historic Natchez and probably included in addition to the Natchez, historically documented Native American groups such as the Houma and the Bayogoula (Weinstein 1985:1–9).

Emergent Plaquemine on the coast includes the Three Bayous phase and the Holly Beach phase (Figure 11). The Three Bayou phase was defined by Brown (1985) for sites in the Vermilion Bay region and Salt Dome Islands area. Diagnostic ceramics include Plaquemine Brushed, Pontchartrain Check Stamped, Mazique Incised, Evansville Punctated, and Harrison Bayou Incised (Weinstein 1985:4). The Holly Beach phase, based on excavations at the Jeff Simmons site, is the transitional phase for extreme southwestern Louisiana. Excavation at Jeff Simmons (Stopp 1976) produced late Coles Creek pottery and yielded a radiocarbon date of A.D. 1120 (Weinstein 1985).

Other transitional Coles Creek components have been documented at the Mulatto Bayou site in St. Bernard Parish, the Bergeron School site located in Lafourche Parish, the Indian Mound site in Terrebonne Parish, and the Thibodaux site in Assumption Parish (McIntire 1958; Altschul 1978; Weinstein et al. 1978; Wiseman et al. 1979). Test excavations at the Thibodaux shell midden site (16AS35) by Weinstein et al. (1978: 34–55) revealed a transitional Coles Creek ceramic assemblage yielding a radiocarbon date of A.D. 975 in Occupation Level II, situated below an Early to Late Plaquemine component. These sites and others in Terrebonne, Lafourche, and Assumption parishes have not yet been placed into a regional transitional Coles Creek phase, but Weinstein (1986:5) suggested that additional work in this area would eventually result in the development of a new phase designation for these sites.

The Early Plaquemine culture on the coast is represented by two phases falling within the confines of the Lower Mississippi River Valley proper and bordering terrace lands (Figure 14). They include the Barataria and the Burk Hill phases. The Barataria phase, named by Holley and DeMarcay (1977) based on work at the Fleming site, is centered within the Barataria Basin, with most sites located along Bayou des Familles and Bayou Barataria. Characteristic ceramics include varieties of Anna Incised, L'Eau Noire Incised, Carter Engraved, Plaquemine Brushed, Maddox Engraved, and Mazique Incised. The relatively low frequencies of Plaquemine Brushed and the presence of Southern Cult motifs on some ceramics typifies sites of this phase. The Southern Cult design elements are attributed to the influence of the nearby Mississippian culture Bayou Petre phase people residing in the St. Bernard locality (Weinstein 1985:7).

The Burk Hill phase is located in the Vermilion Basin region in the same area as the transitional Three Bayou phase discussed earlier. The phase was named by Brown (1985) after the Burk Hill site, an earth midden located on Cote Blanche Island. This phase is marked by varieties of Anna Incised, Carter Engraved, Maddox Engraved, Fatherland Incised, and Leland Incised (Weinstein 1985:7).

Key Sites. The major coastal Plaquemine culture sites have been noted above in the discussion of phases. They include Jeff Simmons in Cameron Parish (Stopp 1976), Burk Hill in the Vermilion Basin (Brown 1985), Thibodaux in Assumption Parish (Weinstein et al. 1978), and Fleming in the Barataria Basin (Honey and DeMarcay 1977).

Settlement Data. In general, there is a lack of settlement data for the coastal Plaquemine culture period. The seriation analysis and review of settlement patterns by Altschul (1978) for Plaquemine sites in Terrebonne Parish is one exception. Relying on ceramic seriation to refine Plaquemine culture, he found what he considered to be two chronologically distinct culture units characterized by different settlement–subsistence systems. The early period Plaquemine site distribution suggested a pattern of early spring and summer utilization of the riverine resources in the southern part of the coast and fall and winter aggregation into larger semipermanent villages in the more northern inland part of the parish. The late period was characterized by relatively large villages located on broad fertile river levees, indicating a reliance on riverine resources and plant domestication during the latter part of the Plaquemine (Davis et al. 1979:53–54).

A similar settlement pattern shift from Emergent Plaquemine to Early Plaquemine has been noted in the Petite Anse region of central coastal Louisiana. As Brown et al. (1979:174–180) noted, the Emergent Plaquemine Three Bayou phase pattern was one focused in the estuarine marshes around Vermilion Bay, suggesting a traditional hunting, fishing, and gathering economy. However, the subsequent Burk Hill phase sites of Early Plaquemine times shifted to the nearby salt dome region where it is hypothesized salt resources could be exploited and the arable land on top of the domes could be utilized for agriculture.

There is evidence of a hierarchical system in the settlement pattern for the Barataria complex of Plaquemine sites along the Barataria Basin area in Jefferson Parish. Three paramount sites, probably representing the main centers of religious and sociopolitical organization for the basin, have been identified: the Fleming site (16JE36), Bayou Villars (16JE68), and Isle Bonne (16JE60), each containing extensive shell midden deposits, and shell and earth mounds. The complex also consisted of lesser stations and base camp sites strung out along bayous and smaller streams in the Basin such as the Stuck Boot site (16JE83) which is interpreted to represent a small habitation (Gagliano et al. 1978:4-45).

However, in other areas such as the Atchafalaya Basin, Gibson (1978:44), saw little evidence of change from the well entrenched Archaic economic tradition of estuarine focused subsistence economies. Gibson (1978) argued that the Atchafalaya Basin served as a natural barrier to the spread of horticulture during the previous Coles Creek culture period. He suggested that such areas remained outside the mainstream of cultural change occurring elsewhere, due to isolation and environmental constraints on the adoption of new lifestyles in an area of such natural abundance. There was possibly little incentive in some estuarine areas to change from the traditional coastal economic patterns of fishing, hunting, and gathering that proved so successful for previous cultures since the Archaic period.

Subsistence Data. Information concerning coastal Plaquemine subsistence patterns are very limited. In one of the earliest descriptions of coastal prehistoric faunal remains, McIntire (1958) reported that Plaquemine sites in the chenier region of southwestern Louisiana yielded fish and animal bones but sparse *Rangia* shell remains. He also noted slightly higher concentrations of mollusks in Plaquemine sites in the southeastern coastal Pearl River area. If true, this decreased use of *Rangia* would represent a drastic departure from previous coastal subsistence practices in the cheniers and elsewhere on the coast (Neuman 1984:268).

However, other studies in the coastal region widely report Plaquemine middens dominated by *Rangia* shell (Gagliano et al. 1978:4-44 through 4-48) suggesting, at least on the surface, a site content much like that of other pre-Plaquemine period coastal shell midden sites. The Barataria complex of shell midden and earth mound sites in Jefferson Parish, for instance, seems to represent a site cluster focused on estuarine resources in the tradition of all previous coastal cultures since the Archaic. Test excavations at the Thibodaux site (16AS35) in Assumption Parish revealed a basic estuarine focused faunal assemblage consisting of *Rangia*, fish, and mammals including deer, opossum, raccoon, and dog. In addition, two acorns, species unidentified, were also recovered (Weinstein et al. 1978:45–55).

Much of the debate over coastal Plaquemine subsistence revolves around the question of the importance of horticulture. In the inland areas near the coast, charred corncobs, as well as animal bone, were reported from the Bayou Goula site excavations near Baton Rouge (Quimby 1957). Closer to the coastal estuarine zone, maize cobs have also been recovered by Holly and DeMarcay from the Fleming site in Jefferson Parish (Davis et al. 1979:63). Indirect evidence for maize horticulture is also suggested by Altschul's (1978) seriation study of Plaquemine components in Terrebonne Parish. His seriation and settlement analysis suggests a settlement pattern during the early part of this period of seasonal transhumance between the coastal riverine areas during the spring and summer and inland areas during the fall. This pattern changed toward the latter part of the Plaquemine period to reflect a more sedentary focus on the fertile natural levees along riverine resources such might be expected for a culture exploiting both riverine resources and plant domestication (Davis et al. 1979).

Mortuary Data. The mortuary practices of the inland Plaquemine culture are generally considered a carryover from the preceding Coles Creek period. The storage of bodies in charnel houses followed by secondary bundle reburial continued as a major component of the ritual ceremonialism. As the authority and status of the ruling elite increased in response to the importance of horticulture, sedentism, and nucleated settlement, particularly toward the end of this period, the ritual associated with the treatment of the deceased expanded to include retainer sacrifice, funerary offerings, mound burial, and other practices associated with class structures societies (Gibson 1975; Neuman 1984).

There are no data concerning mortuary ceremonialism for the coastal Plaquemine populations, and it is unclear whether coastal populations fully adopted such practices documented for the inland Plaquemine groups or whether they existed in a somewhat watered-down form.

Exchange and External Relationships. It is clear from similarities in ceramics, house styles, and mound construction techniques (Brown 1985; Neuman 1984; Weinstein 1986) that Plaquemine populations were interacting with each other and with nearby Mississippian and Caddoan groups. For instance, the presence of Southern Cult motifs on ceramics of the Barataria phase Plaquemine groups residing in the Jefferson Parish area is undoubtedly a reflection of contacts with the Bayou Petre phase Mississippian groups residing in nearby St. Bernard Parish (Weinstein 1986:7). It was probably via this Barataria–Bayou Petre contact in southeastern coastal Louisiana that influences from the Mobile Bay–Pensacola region reached the central Gulf coast. Weinstein (1986:6) also notes the presence of Caddoan trade vessels and Plaquemine wares in the Bayou Chene phase, where a nebulous mixture of Plaquemine and local traditions emerged to form a hybrid culture that is not true Plaquemine.

PROTOHISTORIC AND HISTORIC NATIVE AMERICANS

Marvin D. Jeter

The Protohistoric period is here defined as the time span from A.D. 1500 to A.D. 1700, following common usage in and near the present study area (Dye and Brister 1986). The Historic period for Native Americans in the study area is defined as the post-A.D. 1700 period.

The Protohistoric period represents the vital connecting link between totally prehistoric Native American cultures and those which were historically documented by Europeans on a relatively continuous basis. As such, it also represents a theoretically crucial testing ground for ideas about the relationships between archeological concepts of phases and ethnohistoric concepts of tribes and ethnic groups. This is immensely complicated, because major disruptions of aboriginal populations occurred in late prehistoric times (Brain 1978:350ff), and disruptions intensified during the Protohistoric period.

Dye (1986) has suggested that the Protohistoric period can be usefully divided into Early, Middle, and Late subperiods. The Early subperiod, from A.D. 1500 to 1541, begins approximately with the first contacts between Europeans and Southeastern Native Americans, well outside this study area. However, it is likely that news of the strangers' arrival, and perhaps occasional trade goods and diseases, would have been transmitted to the Native Americans of the Lower Mississippi Valley and Trans–Mississippi South soon after A.D. 1500, and well in advance of the actual arrival of De Soto's army. The latter event, the entrada of 1541 across the Mississippi River and into northeast Arkansas, marks the end of the Early Protohistoric subperiod.

The long (A.D. 1541–1673) Middle Protohistoric subperiod was a time of major disruptions beginning with (and in at least some cases, directly or indirectly because of) the De Soto entrada. This subperiod has also been called the Protohistoric Dark Ages (Dye 1986:xiii), because written documentation is completely lacking for the 130 crucial years between the departure of the Spanish in 1543 and the arrival of the first French explorers in the study area in 1673.

The Late Protohistoric subperiod, from A.D. 1673 to 1700, includes the first French explorations and establishments. The year 1700 is a convenient approximation of the beginning of a permanent European presence in and near the Lower Valley, as signified by the colonial activities (actually beginning in 1698) of lberville, Bienville, and their associates, representing Louis XIV (Giraud 1974; McWilliams 1981).

This chapter will summarize the Protohistoric and early Historic Native American cultures of the study area within a framework similar to that established in Chapter 4. There are significant continuities between the major prehistoric cultures and their Protohistoric and Historic successors, despite the disruptions. Consequently, the major discussions presented here will be in terms of the Mississippian, Caddoan, and Plaquemine cultural traditions. Figures 21 through 23 map the distributions of these cultures at 100-year intervals through the Protohistoric and early Historic periods.

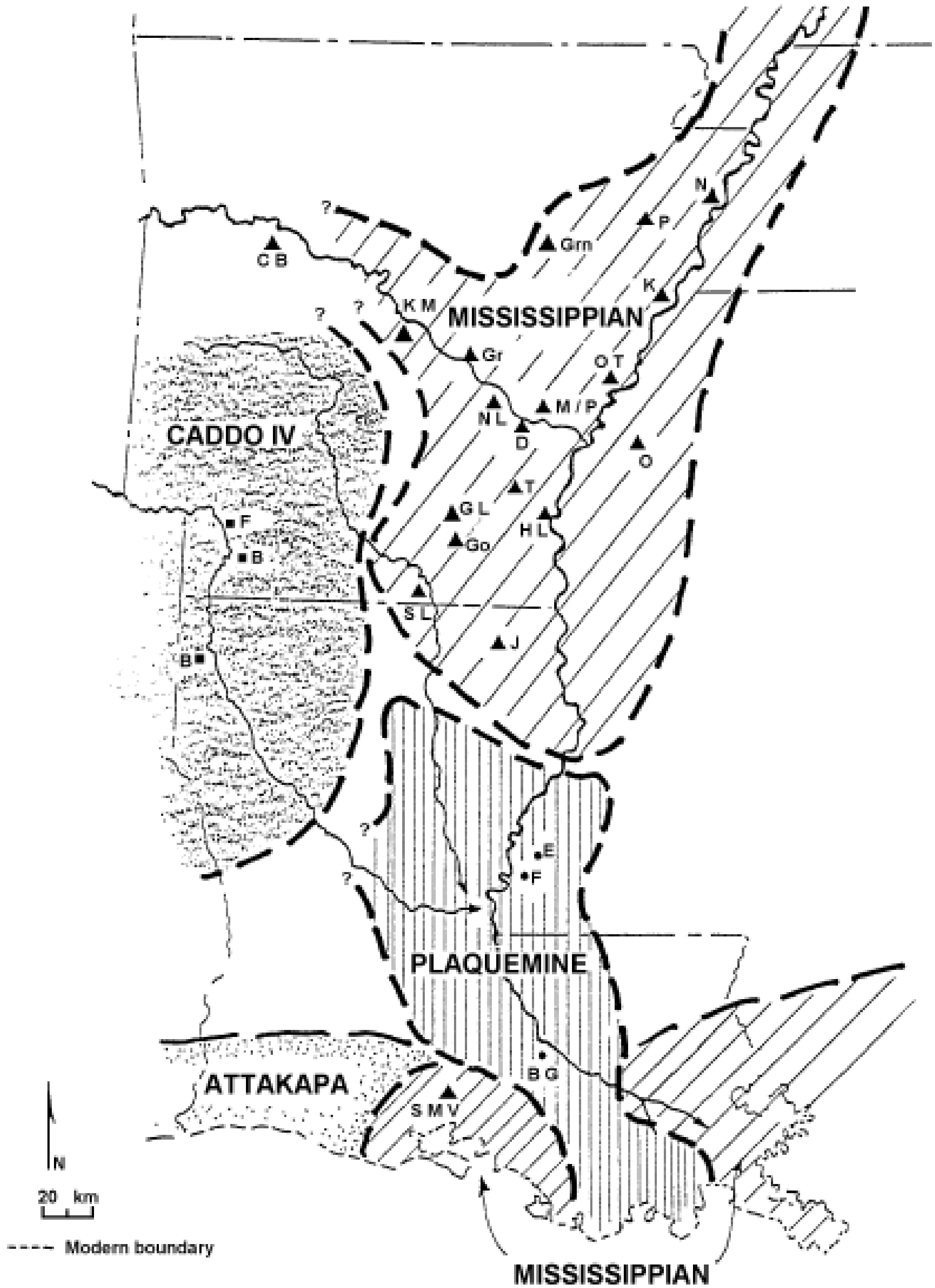
PROTOHISTORIC AND HISTORIC MISSISSIPPIAN CULTURE(S)

Definition and Location. The history of the Mississippian culture concept was summarized in Chapter 7. Here, it will suffice to outline the geographic distribution, during Protohistoric and Historic times, of cultures recognized as Mississippian by archeologists. Reference is made to Figures 24, 25, and 26, which map the approximate distributions of these and coeval cultures such as Caddoan and Plaquemine, at ca A.D. 1500, 1600, and 1700.

By the beginning of the Protohistoric period at A.D. 1500, Mississippian cultures had long since been established in northeast Arkansas (Morse and Morse 1983:201–301) and east-central Arkansas (House 1982a:42, Figure 4-2), and had recently appeared in southeast Arkansas (Rolingson 1976:117; Rolingson and Schambach 1981:193ff; Jeter 1982a:107, 1986a:49).

It appears likely that the Nodena phase of northeast Arkansas, especially if it is the province of Pacaha described in the De Soto chronicles, may represent a proto-Quapaw population (Swanton 1911:186; Brain et al. 1974:276–277; Jeter 1986:41; D. Morse n.d.), although there are some dissenting arguments (Swanton 1939:51–52; Phillips et al. 1951:420). There is also a fair amount of evidence that Tunicans (including some of the Tunica themselves and apparently related groups such as the Koroa) constituted the major population of the southeast quarter of Arkansas in late Prehistoric and early Protohistoric times but were gradually pushed southward by the Quapaw in later Protohistoric times (Brain et al. 1974; Brain 1977, 1979, 1981; Jeter 1986).

Both the Quapaw (Hoffman 1976:27; Morse and Morse 1983) and the Tunica (Brain 1977:1, 1979:224) appear to have been solidly Mississippian with shell-tempered pottery and other general diagnostics of Mississippian material culture. However, they differed significantly in terms of specific



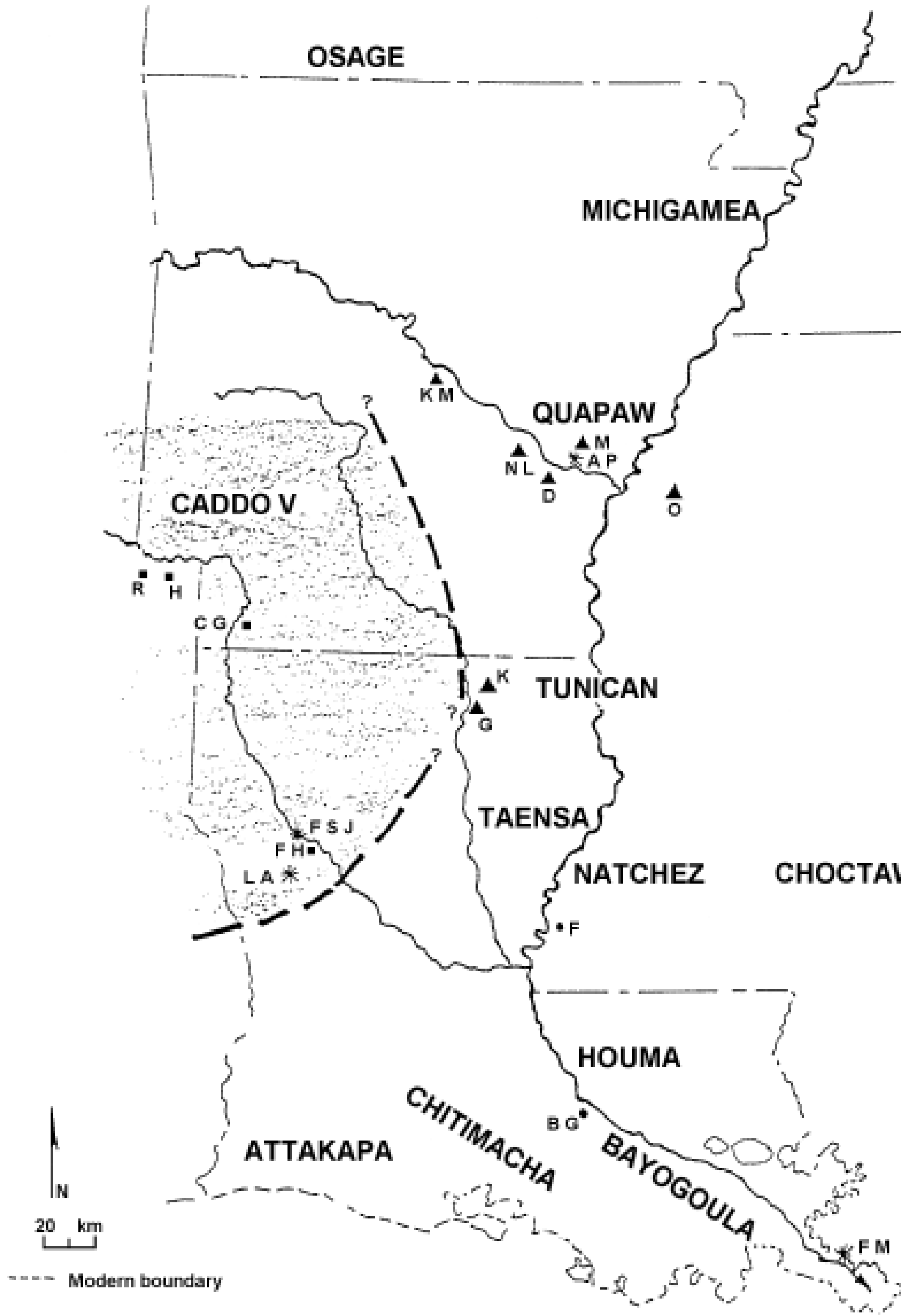
Key: **Protohistoric Mississippian culture (inland) sites:** CB = Carden Bottom; D = Douglas; Go = Gordon; Gr = Greer; Grn = Greenbrier; GL = Gee's Landing; HL = Hog Lake; J = Jordan; K = Kent; KM = Kinkead–Mainard; M/W = Menard and Wallace; N = Nodena; NL = Noble Lake; O = Oliver; OT = Old Town; P = Parkin; SL = Shallow Lake; T = Tillar

Caddo IV culture sites: B (Arkansas) = Battle; B (Louisiana) = Belcher; F = Foster

Protohistoric Plaquemine culture sites: BG = Bayou Goula; E = Emerald; F = Fatherland

Protohistoric Mississippian culture (coastal) sites: SMV = Salt Mine Valley

Figure 22. Map of cultural distributions and key sites in and near the study area ca A.D. 1600



Key: **Quapaw phase sites:** D = Douglas; KM = Kinkead–Mainard; M = Menard; NL = Noble Lake; O = Oliver
Caddo V culture sites: CG = Cedar Grove; H = Hatchel; R = Roseborough; FH = Fish Hatchery
Natchezan culture site: F = Fatherland
European outposts: AP = Arkansas Post; FM = Fort de Mississippi; FSJ = Fort St. Jean Baptiste aux Natchitos; LA = Los Adaes
Sites of uncertain or mixed cultural/tribal affiliation: BG = Bayou Goula; G = Glendora; K = Keno

Figure 23. Map of distributions of major Native American ethnic groups and key sites, and European outposts in and near the study area ca A.D. 1700.

artifact assemblages, types, and decorative techniques, with the Quapaw (and Nodena phase) placing more emphasis on painted pottery and the Tunicans emphasizing incised decorations. The Quapaw and Nodena phase peoples also shared the distinctive willowleaf or Nodena arrow point type, which the Tunicans lacked.

The southward spread of Mississippian culture was also evident by about A.D. 1400 in the Lower Yazoo Basin of western Mississippi, at sites such as Winterville (Brain 1969, 1978: 350–352) and Lake George (Williams and Brain 1983:337ff, 374ff, 408ff). By about A.D. 1500, the Mississippianization process also reached the Felsenthal region of south-central Arkansas (Rolingson and Schambach 1981:193ff) and northeasternmost Louisiana (Hally 1972:606; Kidder 1986b). At least some of the Mississippian remains in these latter regions may well represent proto-Koroa groups, whose archeological remains are only beginning to be characterized (Dickinson 1980:4–6; Jeter 1986:45, 49; Kidder 1988).

The southward Mississippianization process seems to have stalled in northeast Louisiana and the adjacent blufflands of western Mississippi. Although there was some spread of Mississippian culture within this macroregion in late Protohistoric times (Kidder 1986a, 1986b), the next tier of regions to the south (the Natchez Bluffs and adjacent east-central Louisiana) appear to have remained solidly in the Plaquemine cultural orbit, as far as the indigenous populations were concerned, into the Historic period (Neitzel 1965, 1983; Gibson 1983d: 326–329; Brown 1985:Table 1; Gregory et al. 1987:48–56, 82, 87, 91). Several isolated exceptions appear to represent Mississippian refugee or remnant groups such as the Koroa (Brain 1982:55) or the Tioux and Grigra (Brown 1985:2, 190ff), who had moved south in late Protohistoric times and settled among the Natchez.

On the Louisiana coast, however, two more Mississippian exceptions occurred in late Prehistoric and Protohistoric times. The first appears to have been a westward expansion of the Pensacola complex which was characterized by distinctive shell-tempered, incised ceramics related to those of the Moundville chiefdom of west-central Alabama (Phillips 1970:971; Knight 1984; Weinstein 1985). The other involved the appearance, in the Petite Anse region near the south-central Louisiana coast, of a Mississippian culture apparently related at least ceramically to those of the Yazoo Basin (Brown 1979; Weinstein 1985).

The De Soto entrada of 1541 encountered Mississippian chiefdoms in northeast Arkansas, though the exact (or even approximate) route and archeological equivalents of the provinces encountered are matters of long-standing and perhaps endless debate (Swanton 1939; Phillips et al. 1951:348ff; Brain 1978b, 1985a, 1985b; P. Morse 1981:61ff; Morse and Morse 1983:305ff; Hudson 1985; Dickinson 1986). It is virtually certain that these Spaniards traversed northeast Arkansas, but their route through south-central and southeast Arkansas, and whether or not they even entered northeast Louisiana, are matters of extreme disagreement (Dickinson 1980, 1986; Hudson 1985).

It is generally agreed that diseases and other European-influenced disruptions increased significantly during the "Dark Ages" after the entrada (Brain 1978:358; Ramenofsky 1985: 16). The Nodena, Parkin, and Kent phases had probably ceased to exist in their homelands by about A.D. 1650 (Morse and Morse 1983:271ff, 316; House 1987).

By the beginning of the fully Historic period around A.D. 1700, northeast Arkansas had been essentially abandoned by Native Americans (Morse and Morse 1983:301, 316), as had east-central Arkansas (House 1987:51). The Quapaw people were indeed present near the mouth of the Arkansas River (Phillips et al. 1951:392ff), but their relationship to the archeological Quapaw phase remains unclear (Hoffman 1986:25, 27, 30–34). They, or the apparently equivalent Akansea, were first documented by Marquette and Jolliet in 1673 as living along the Mississippi, just above and opposite the mouth of the Arkansas. They were also noted in this locality by La Salle in 1682. In 1686, La Salle's associate Henri de Tonti established Arkansas Post, the first European establishment in the study area, at Osotouy, a Quapaw settlement on the Lower Arkansas River. The Menard site has been suggested by Ford (1961) as the location of Osotouy.

The Quapaw were devastated by a smallpox epidemic in 1698 and were increasingly impinged upon by Euramerican settlers in the 1700s. By the 1750s, there may have been only about 1,500 Quapaw still living. In 1818, the remnant Quapaw sold all their land to the United States, except for a small reservation south of the Arkansas River in the region around Pine Bluff. In 1824, this reservation was also sold, and they were moved to the Red River to join the Caddo. After much suffering and some wandering back to their previous reservation, they were assigned a new reservation in 1833, in the present northeast Oklahoma and southeast Kansas.

It appears that the Tunican peoples had abandoned even southeasternmost Arkansas by A.D. 1700 (Jeter 1986a). The Tunica themselves were last reported in Arkansas along the Ouachita River by Joutel in 1687 (Jeter 1986a:42). Their subsequent movements were studied and summarized by Brain (1977, 1979, 1981). In 1699, the French found the Tunica and other refugee groups living near the mouth of the Yazoo River, near present-day Vicksburg, Mississippi. In 1706, they moved from there back into the present study area, to Angola, Louisiana, opposite the present Red River mouth (undoubtedly an advantageous location for the trade at which they were proficient). In 1731, they moved a short distance to Trudeau, Louisiana, where they remained until 1763; this is the famous Tunica Treasure site (Brain 1979). After a brief sojourn in the Mobile vicinity, around 1790 the Tunica moved to Marksville, Louisiana, where some of their descendants remain to this day (Kniffen et al. 1987).

In southeasternmost Arkansas and northeasternmost Louisiana, at least lingering remnants of the other major Tunican group, the Koroa, were present in the 1690s and very early 1700s (Dickinson 1980:4–6; Jeter 1986:45; Kidder 1988). However, most members of the Koroa were apparently living in southwestern Mississippi near their traditional allies, the Natchez, as early as 1682 (Brain 1982:50, 55–58). The Koroa were decimated by the French and allied Native Americans in the aftermath of the Natchez uprisings of the late 1720s, and the survivors were apparently absorbed by the Choctaw of southeast Mississippi (Swanton 1911:331–332).

Along the Louisiana coastal zone and in the adjacent Lower Mississippi Valley, no really intensive efforts have been made to correlate the archeologically recognized intrusive Mississippian culture(s) with historically documented Native American groups. The general situation was reviewed from varying perspectives by Knight (1984), Davis (1984), and Giardino (1984), and it seems very likely that there is at least some correlation between the Mississippian archeological remains and the Muskhogean Native American groups who occupied the regions along the Mississippi River and to the east. The Muskhogean groups of southern Louisiana included the Bayogoula, Mugulasha, Quinipissa, Acolapissa, Tangipahoa, Houma, Taposa, Ibitoupa, Washa, Chawasha, and Okelousa (Swanton 1911:274ff, Plate 1; cf. also discussions by Giardino 1984).

Only two of these groups have been claimed to be identified archeologically. Quimby (1957:100ff) believed that his Bayou Goula site (16IV11) had been the Bayogoula–Mugulasha village documented by Iberville in 1699–1700. The ceramic assemblage there was overwhelmingly Plaquemine in the lower (prehistoric) levels, and Natchezan (i.e., Protohistoric to Historic Plaquemine) in the uppermost level (Quimby 1957:142–143). However, Quimby's interpretation and identification of the site have been called into question (Brown 1976; Fredlund 1982). Surface collections and limited subsurface data from site 16IV134, only about 500 m from Quimby's site, suggested to Fredlund that it was the Bayogoula–Mugulasha village, instead. And, the ceramics from 16IV134 were overwhelmingly shell tempered (Fredlund 1982:109ff).

However, Guevin (1987:103) has recently argued that the shell-tempered ceramics were "culturally more indicative of the northern historic Taensa tribe" (who moved to Iberville Parish in 1706), and that Quimby's site had both prehistoric Plaquemine and protohistoric and/or early historic Bayogoula components, after all.

Paleoenvironmental Data. An essentially modern (presettlement by Euramericans) environmental situation prevailed in the study area throughout the relatively brief Protohistoric period, and in the early portion of the Historic period.

Phases and Ethnic Groups. This discussion, like that of Mississippian phases in Chapter 4, will proceed from north to south down the Mississippi Valley by macroregions. Reference is made to the phase charts (Tables 6–10) in Chapter 7, which include not only late prehistoric Mississippian phases, but also the Protohistoric and Historic phases and ethnic groups considered here.

In the northeast Arkansas macroregion, both the Nodena and Parkin phases continued from late prehistoric times, around A.D. 1350, well into the Protohistoric period, but ended by about A.D. 1650 (Phillips 1970:930ff; D. Morse 1973, n.d.; P. Morse 1981; Morse and Morse 1983:284–295).

The Walls phase (Phillips 1970:936–938; Morse and Morse 1983:296–297) is mainly in evidence in extreme northwest Mississippi and the Memphis locality, but also includes a few sites near the Mississippi River in northeast Arkansas. It has never been adequately described, let alone interpreted, but ceramic cross-dating and a few radiocarbon dates place it from late Prehistoric times, ca A.D. 1400, to the middle or late 1500s. The ending date is suspiciously close to the De Soto entrada, and some Walls phase sites have been suggested as possible De Soto contact sites (1983:309).

The Kent phase of the lower St. Francis Basin and adjacent Mississippi River in east-central Arkansas appears to have existed from about A.D. 1400 to 1600 (Phillips 1970:938–939; Morse and Morse 1983:297–298; House 1987:47). It has been the subject of intermittent investigations by John House of the Arkansas Archeological Survey for the past decade (House 1987), and is being more intensively studied as part of House's dissertation research. Again, De Soto contacts have been suggested, though there is disagreement as to which episode of the entrada (and therefore, which Native American province) was involved (Brain et al. 1974; Brain 1978b; Morse and Morse 1983:312–313; Hudson 1985).

The Old Town phase was called "a completely dubious setup" by its definer (Phillips 1970:940), who nevertheless thought it was necessary in order to categorize several sites along the Mississippi between the mouths of the St. Francis and the Arkansas. Once again, there are varied possibilities of De Soto contacts (Brain 1978b; Morse and Morse 1983:297–298), but little is known archeologically about the sites, and there is no ongoing intensive research.

Before discussing phases south of the Arkansas River, a few words should be said about the De Soto route in northeast Arkansas, since it is generally agreed that the first stage of the entrada in Arkansas occurred exclusively north of the Arkansas River. It is also the consensus of informed opinion that the Spaniards then moved westward (and temporarily out of this overview's coverage area) before crossing the Arkansas.

The De Soto Commission's report (Swanton 1939), commemorating the four hundredth anniversary of the beginning of the entrada reviewed previous hypothesized routes, examined the documents and the then-extant archeological evidence, and produced an official version of the route that settled the question for about a decade. (Swanton's report was reprinted in 1985 by the Smithsonian Institution.) This version was challenged, however, by Phillips et al. (1951:348–391).

The matter was taken up again, in the light of a much better archeological data base and chronology, by Jeffrey P. Brain of the Lower Mississippi Survey and his associates (Brain et al. 1974; Brain 1978b, 1985a, 1985b). His southern route, however, was challenged by the Morses (P. Morse 1981:61ff; Morse and Morse 1983:305ff) and Hudson (1985), who agreed on a more northerly route. Brain's position was also generally supported by the senior Arkansas ethnohistorian S. D. Dickinson (1980, 1986), who mainly concentrated on the southern Arkansas portions of the route. A major conference involving most researchers interested in the Mississippi, Arkansas, and Louisiana portions of the entrada was held in Fayetteville, Arkansas, in October, 1988.

In southeast Arkansas, the Quapaw phase is by far the most intensively investigated, but is generally believed to date solely to the post-De Soto times of the late Protohistoric and early Historic periods, around the A.D. 1600s and 1700s (Phillips et al. 1951:392ff; Ford 1961; Phillips 1970:943–944; Hoffman 1977, 1986; House and McKelway 1982; Morse and Morse 1983:300–301, 317ff). It includes more than 20 sites on both sides of the Lower Arkansas River and along the Mississippi above the mouth of the Arkansas, plus a few outliers to the north and south in the Arkansas interior (Hoffman 1986:25, 27, Figure 3.1).

Mention should also be made of two phases clearly related to the Quapaw phase but outside the present study area. The Oliver phase of the western Yazoo Basin, opposite the Arkansas River mouth (Phillips 1970:941–942, Figure 447), may well represent the Quapaw–Arkansas settlements reported in that locality by the French explorers in 1673. The recently defined Carden Bottoms phase, on the Arkansas River above Little Rock (Hoffman 1986:27–30, Figure 3.1), is more problematical. The sites in the Carden Bottoms locality itself suffered from "tremendous commercial pothunting in the 1920s and later" (Hoffman 1986:27–28), and none of them have ever been thoroughly or professionally reported.

As noted in Chapter 7, House (1986) summarized evidence for pre-Quapaw phase, late Prehistoric and/or Early to Middle Protohistoric, occupations along the Lower Arkansas River. His study was based primarily on artifacts from the Massey and Poor sites, just north of the Menard and Wallace sites, and also on apparently pre-Quapaw phase artifacts from Menard and Wallace. Although House cautions that attempts to assign these remains to high level cultural units such as Mississippian or Tunican would be premature, it is at least possible that they represent pre-Quapaw occupations by Mississippian–Tunicans. No new phases have been defined to include these remains, but since the names Menard and Wallace are already closely associated with the Quapaw phase and the Massey sites has already given its name to a Hopewellian phase, the name "Poor" has been tentatively used here.

In the southeast Arkansas Delta lands south of the present Arkansas River Valley, the Tillar and Hog Lake complexes along Bayou Bartholomew and Bayou Macon, respectively, have been described (Jeter 1982a:107–108, 1986a:49ff; Jeter et al. 1979). These are primarily known from mortuary sites, but are in effect equivalent to phases. Farther south along Bayou Bartholomew around the Arkansas–Louisiana state line, the Wilmot phase has been designated on the basis of surface collections from small habitation sites rather than mortuary data (Rolingson 1974, 1976:117), but remains poorly known. It appears that all of these phaselike entities may represent occupations from late Prehistoric times, ca A.D. 1400, into Protohistoric times. In particular, some of the Tillar and Hog Lakes sites may date well into the 1600s.

In the western portion of southeast Arkansas, the Caney Bayou phase has been designated on the basis of mortuary remains from the Shallow Lake site (Rolingson and Schambach 1981:193ff). Apparently closely related mortuary ceramics were also reported from the Gee's Landing and Gordon sites of the Saline River Valley (White 1970, 1987). No fully Historic phases have been defined for these regions of southeast Arkansas.

In northeast Louisiana, Hally (1972:606ff) defined the Transylvania phase as the first truly Mississippian phase in the Upper Tensas Basin. He suggested a beginning date of around A.D. 1550, but later LMS researchers tended to push this back to A.D. 1500 or earlier (Kidder 1986b). Kidder (1986a, 1986b) defined the Jordan phase, ca A.D. 1500 or 1550 to the late 1600s, in the Boeuf Basin region, and interpreted it as a proto-Koroa manifestation which may have included remnants of the Transylvania phase. He also designated but did not describe the Canebrake phase in the Lower Tensas Basin and stated it to be "closely related to Jordan" (1986b:7), which would imply a Mississippian–Tunican affiliation.

Near the juncture of Bayou Bartholomew and the Ouachita River, the Glendora focus or phase (Suhm et al. 1954:221ff) has long been designated as a terminal Protohistoric to early Historic Caddoan manifestation, based largely on Moore's (1909: 27ff, 129ff) illustrations of mortuary vessels from the Keno and Glendora sites. Reexamination of the nonillustrated vessels, plus further surveys in and near this region, indicated that:

> only at Glendora, which evidently has a very late and brief occupation, do the Caddoan types predominate... a Mississippian complex, not a Caddoan one, succeeds the Plaquemine throughout the Boeuf. The Glendora phase is at most a brief Caddoan intrusion into the western fringe of the area, an appendix to Boeuf prehistory. (Belmont 1983:281)

Since the Glendora phase name appears inextricably associated with Caddoan culture, a new name would seem to be appropriate for the Mississippian-affiliated Late Protohistoric and early Historic remains of this regions, but none has been assigned. Accordingly, the name "Keno" has tentatively been suggested in Chapter 7.

No Mississippian phases have been defined between northeast Louisiana (where Transylvania and possibly Canebrake are the southernmost Mississippian phases) and the Louisiana coastal zone. In the coastal regions, only two Mississippian phases have been defined. The first of these, Bayou Petre, occupies the Pontchartrain Basin and adjacent Eastern Deltaic Plains. It was originally defined by Kniffen (1936), and revived by Phillips (1970:950–953), who emphasized that it was "not a phase of Plaquemine culture" (1970:950) and that it was characterized by shell-tempered pottery (1970:952). Although he regarded Deer Creek and Lake George (both in the Lower Yazoo Basin) as "the southernmost phases that can be called Mississippian without qualification" except for "a superficial Mississippian overlay [later defined as the Transylvania phase by Hally] in certain Fitzhugh components" (1970:954), Phillips did consider Bayou Petre as representing:

> a grand hypothesis. Mississippian expansion blocked by a strong Plaquemine presence in the area between Natchez and Vicksburg finds another route via the Black Warrior–Tombigbee–Alabama system to the Gulf, westward to the Delta, and up the Mississippi (Phillips 1970: 954).

This phenomenon has recently been interpreted as a westward expansion of the Mississippian Pensacola complex (Knight 1984; Davis 1984), quite possibly involving Muskhogean groups (Giardino 1984), as noted above. Whether such ethnic/linguistic groups were already present in the study areas and accepted a Mississippianized artifact complex, or actually moved westward, or some combination of such factors was involved, is unknown.

The Mississippian expansion at the expense of Plaquemine culture(s), which is recognizable in recovered artifacts as the Bayou Petre phase (whatever it may represent in terms of populations and ethnic groups), has been mapped recently by Weinstein (1985). His maps were used as the models for the coastal portions of the Plaquemine culture maps in the present overview.

The other Mississippian manifestation on the Louisiana coast has been defined as the Petite Anse phase (Brown 1984: Figure 4.2; Weinstein 1985). Unlike the Bayou Petre phase, the Petite Anse phase's affiliations appear to be with Lower Mississippi Valley phases of the Yazoo Basin and adjacent southeast Arkansas and northeast Louisiana. No definite ethnic affiliation has yet been formally proposed for this phase on the basis of excavations and associated ethnohistoric research, but Neuman (1983:278, 323) suggested the Chitimacha, who have occupied this general region since early Historic times (cf. Kniffen et al. 1987:308; map, 304), to be the heirs of the Mississippian tradition.

Key Sites. For the Nodena phase, the type site is Upper Nodena (3MS4), which was excavated under several auspices during the 1930s and later, and never fully reported, but has been summarized by D. Morse (1973, n.d.; Morse and Morse 1983:287). It covered about 6 ha, was palisaded, and had a number of mounds and at least one plaza. It was probably abandoned in Early Protohistoric times, ca A.D. 1550. It belongs to the Wilson–Joiner cluster of Nodena phase sites along the Mississippi River in southeastern Mississippi County (D. Morse 1973:72, Figure 40), but was probably not the most important site in that cluster.

That distinction belongs to Pecan Point (3MS78), which was visited by Edward Palmer for the Smithsonian Mound Survey of 1881 (Jeter n.d.), and intensively excavated by Moore (1911:447ff). The Morses (1983:287) suggested that Pecan Point had been the capital of Pacaha, visited by De Soto in 1541, but they now prefer Hudson's (1985) suggestion that Pacaha was the Bradley site (D. Morse, personal communication).

Bradley is represented by three site numbers (3CT7, 9, and 43) and a scatter of debris almost continuously over a 2-km stretch (Morse and Morse 1983:285–286). It yielded copper or brass ornaments, glass beads, and "abundant evidence of aboriginal intercourse with the whites" (Moore 1911:435). It is the major site of the Wapanocca Lake cluster of Nodena phase sites (Morse 1972:74, Figure 40).

The major site in the third Nodena site cluster, in extreme northeast Mississippi County and adjacent Missouri, is the Campbell site (23PM5) in southeast Pemiscot County, Missouri, actually slightly outside this study area's boundary. Agriculture and pothunters have both had adverse effects on this site; surface collections and excavations of 39 burials were reported upon three decades ago (Chapman and Anderson 1955), and the site has continued to be potted by droves of graverobbers. Allegedly, a 5-m deep shaft grave yielded sixteenth century Spanish style artifacts (Morse and Morse 1983: 289), and it has been asserted that other possibly Spanish materials were found there (1983:312). The Morses (1983:312, Figure 13.2) suggested that this site was visited by one of De Soto's exploratory parties from Pacaha in 1541.

The most important site of the Parkin phase is Parkin itself (3CS29), at the junction of the St. Francis and Tyronza rivers in Cross County (P. Morse 1981:17ff; Morse and Morse 1983: 291–292). Like a number of other St. Francis-type sites or large rectangular village sites with temple mounds (Phillips et al. 1951:329), it is characterized by an "unusual depth of refuse" often exceeding 2 m. Sites of this type include Barton Ranch (3CT18), Rose Mound (3CS27), Big Eddy (3SF9), Neeley's Ferry (3CS24), Vernon Paul (3CS25), and Miller (3PO24). These sites are, in effect, analogous to certain "tells" of the Middle East, in that the overall mound form was apparently the result of repeated rebuilding atop the rubble of former houses (cf. Morse and Morse 1983:294–295, Figure 12.8).

The Kent phase type site, Kent (3LE8), and two others in the Lower St. Francis Basin, Clay Hill (3LE11) and Starkley (3LE17), are also St. Francis-type sites (House 1987:51ff). Professional excavations have been minimal to date, and these sites have been intensively attacked by relic collectors.

Limited excavations were conducted at Kent and Clay Hill during 1988 as part of House's dissertation research. A smaller Kent phase center, Barrett (3LE33), was the subject of salvage excavations in 1983, and brief preliminary summaries have been published (House 1983, 1987:49). As noted above, some of these sites may well have been visited by the De Soto entrada (Morse and Morse 1983:297–298; House 1987:50–51).

The Old Town phase type site (Thomas 1894:234–235, Figures 142–144) has been destroyed by the Mississippi River and remains poorly known (Phillips 1970:940).

Quapaw phase sites within the study area are dominated by Menard (3AR4), which Ford (1961) identified as the Quapaw village of Osotouy. This is the only example of convergence between the archeological Quapaw phase and a site of the ethnohistorically described Quapaw people. The nearby Wallace site (3AR25) was suggested as having been Osotouy by Phillips et al. (1951:414–415), but this view was superseded by Ford's interpretation of Menard as Osotouy. Wallace has been heavily despoiled by relic collectors, and has reportedly yielded abundant trade goods.

Several of the other Quapaw phase sites are known mainly through Moore's work (1908), which emphasized mortuary ceramics and other grave goods. They include Old River Landing, Douglas, and Greer. Although it is outside the present overview's study area, mention should also be made of the Kinkead–Mainard site (3PU2), an apparently early Quapaw phase site near Little Rock which was excavated by the University of Arkansas in 1932 but not analyzed and reported until much later (Hoffman 1977). A site that was apparently a seasonal Quapaw phase hunting camp will be discussed below in the Felsenthal region site summary.

The possibly pre-Quapaw phase Protohistoric Mississippian occupations of the Lower Arkansas Valley are primarily known from House's (1986) analyses of private collections from the Poor (3AR3) and Massey (3AR1) sites, just north of Menard and Wallace.

The major sites of the probably Tunican-related late Prehistoric and Protohistoric Mississippian complexes or phases of southeast Arkansas include the Hog Lake site (3CH5; Lemley and Dickinson 1937:20ff; Jeter et al. 1979:37–38) and Kelley–Grimes (3DE74; Jeter et al. 1979) in the Hog Lake complex or phase; and Tillar (3DR1), Tillar Farms (3DR30), McClendon (3DR144), and Ables Creek (3DR214) in the Tillar group (Jeter 1981, 1982c, 1986:49ff; McKelway 1987; Jackson 1987). All of these are mortuary sites, excavated mainly or totally by nonprofessionals.

In the Felsenthal region of south-central Arkansas, the Protohistoric Mississippian Caney Bayou phase was defined only on the basis of the Hale cemetery at the Shallow Lake site (3UN9/52; Rolingson and Schambach 1981:193ff). However, mortuary components at the Gee's Landing and Gordon sites in the Saline River Valley (White 1970, 1987) appear to be closely related. All these materials were excavated by amateurs. Also, Moore's (1909:81ff) materials from Boytt's Field (3UN13) on the Ouachita River in Union County appear to be quite similar. A very different kind of site was found by Hemmings (1982a:178ff) near the mouth of the Saline River. This site, One Cypress Point (3AS386), appears to have been a seasonal Quapaw phase hunting camp on the floodplain, far south of what is normally considered the Quapaw phase region.

In northeast Louisiana, the Transylvania site in the Upper Tensas Basin (Hally 1972:606ff) and the Jordan site in the Boeuf Basin (Kidder 1986a) are the major Mississippian (proto-Koroa?) mound centers of Early and Late Protohistoric times, respectively. Jordan may have been one of the last locations of major Mississippian mound construction.

Even later are Moore's (1909:27ff, 120ff) two nonmound cemetery sites, Keno and Glendora, near the juncture of Bayou Bartholomew and the Ouachita River. As noted above, Keno is now regarded as definitely Late Protohistoric to Historic Mississippian, and the cultural affiliation of the perhaps fully Historic Glendora site is questionable but possibly Mississippian, also.

Several of Moore's (1909–1913) other cemetery sites in this macroregion appear to have had significant Protohistoric to Historic Mississippian components. Reviewed by Jeter et al. (1979:39ff), these include Canebrake, Turkey Point Landing, Ward Place, Bray Landing, and possibly Sycamore Landing. Several of these sites, along with similar sites excavated over the past 50 years by Manning Durham, a Monroe, Louisiana collector, have been revisited and summarized by a northeast Louisiana amateur, Reca Jones (1983). Among the Durham sites that appear to have significant Protohistoric to Historic Mississippian (Koroa?) components are Rock Row Landing (16OU181), Moon Lake (16OU161), Rhymes (16RI185), and Ragland (16OU32).

In the Louisiana coastal zone, no detailed reports have yet been published on Protohistoric or Historic Mississippian sites. Clearly, the Bayou Petre phase type site (Phillips 1970:952, Figure 447) is of major importance, as is Salt Mine Valley (Brown and Brown 1979) in the Petite Anse region. A summary of the findings of limited investigations at the unnamed site 16IV134, which yielded abundant shell-tempered pottery and may well be the Bayogoula–Mugulasha settlement of 1699–1700, has been presented in a thesis by Fredlund (1982). The Sims site (16SC2) in St. Charles Parish is a major Protohistoric and/or Historic Mississippian site, which was extensively excavated by Tulane University but was only reported in meeting papers and a brief published summary (Davis 1984:221–223).

Settlement Data. Nodena, Parkin, Walls, Kent, and Old Town phase settlement patterns were characterized by the presence of at least some very large, probably palisaded, nucleated settlements. Nodena and Parkin, at least, had large paramount villages, and the same may have been true for Kent. Small farmstead or hamlet or household sites, however, are apparently very rare for the Nodena phase and unknown for the Parkin phase, though fairly common for the Kent phase (P. Morse 1981:40–43; Morse and Morse 1983:289, 292; House 1987: 54).

Hoffman (1986:25) summarized Quapaw phase site distributions as follows:

> Sites are overwhelmingly close to the present [Arkansas] river on old riverbanks or natural levees... many are located near sloughs or old channels. Site sizes are not well known, but 1.0 ha to 1.5 ha appear consistently.... The 16 ha Menard site may be much larger [than the average]. Low house mounds are common features,... and temple mounds, conical mounds containing burials, and plazas are known at several sites. Apparently, the settlement pattern consisted of fairly compact villages instead of the dispersed farmstead variety. Three houses attributed to the Quapaw phase in Arkansas have been excavated. All had a rectangular outline, as do the house mounds, but were not particularly large (9 m by 6 m at Menard is the largest).

House (1983, 1985) reported on analyses of his controlled surface collections at Noble Lake, a Quapaw phase site near Pine Bluff, Arkansas. He concluded that it represented "a large aboriginal community perhaps comprising 30 or more households, occupying a stable fortified village as late as A.D. 1700," comparable to the "St. Francis-type villages" of late Prehistoric and Protohistoric times in northeast Arkansas.

By contrast, the Protohistoric Mississippian phases of southeast Arkansas, such as Wilmot, Hog Lake, Tillar, and Caney Bayou, as far as is now known, included only small hamlets and moderate-sized mound or nonmound cemeteries, with a dispersed settlement pattern apparently integrated by mortuary ceremonialism (Rolingson 1976:117; Jeter 1986:55; Schambach and Rolingson 1981:201; White 1970, 1987). As noted above, a Quapaw phase hunting camp has also been found in the Felsenthal region of south-central Arkansas (Hemmings 1982a:178ff).

Brain (1978:350ff) called attention to "a dramatic change in settlement pattern orientation" after about A.D. 1400 in the Lower Yazoo Basin. Williams and Brain (1983:378–384), discussing this trend in more detail, noted that it increased after about A.D. 1500 (1983:382, Figure 11.21) and reached a culmination after about A.D. 1700 in the Russell phase, with "a remnant population clinging to a short stretch of the bluff margin" (1983:383, Figure 11.22). A possibly similar and related phenomenon may be represented by the Hog Lake–Tillar settlements, especially the latter (Jeter 1981, 1982c), and the Jordan site (Kidder 1986b). Kidder termed this a "flight response" from the diseases and social unrest precipitated by initial European contact.

Jordan differed from the southeast Arkansas situation, though, in that relatively large resident population may have been present and significant earthmoving, in the form of moundbuilding, took place (Kidder 1986a, 1986b). Also, quite possibly the Jordan occupants undertook the construction of earthen water control and conservation devices in a small prairie locality.

Kidder (1986b) further suggested that the move of the settlement center of northeast Louisiana again in terminal Protohistoric times to the Ouachita–Bartholomew juncture and sites such as Keno and Glendora was not a flight response. Instead, a relocation to a strategic economic location was suggested. This would seem to be in line with interpretations of Gregory (1973) and Brain (1979:280–282) emphasizing the adaptive importance of trade in fully Historic times.

In the Louisiana coastal zone, Davis (1984:223) has remarked on the very linear distribution of the Pensacola complex Mississippian sites, which appear to be confined to deltaic and estuarine environments within 30 to 50 km miles of the coast. He further stated that individual settlements were small, as were sociopolitical units, noting that there was "little historical evidence for any politically unified entity comprised of more than three villages" in these regions (1984:226).

Subsistence Data. As will be seen, both the minimal direct archeological evidence that is available and the fairly abundant indirect evidence agree that maize was generally quite significant in the chronicles of the De Soto entrada.

At least for the earlier portion of the period under consideration, it would appear that the older races of maize continued to dominate in and near the present study area. According to data assembled by Blake (1986:4, Figure 1.3, Table 1.3), maize samples from sites in these regions dating between A.D. 1400 and 1600 had mean row numbers above 10.0, and sometimes 12.0, whereas low row-numbered (below 10.0) samples were still restricted to the Northeast and the Upper Mississippi Valley. No samples were available from definitely post-A.D. 1600 sites in the study area, but comparative data from adjacent areas (including the Fatherland site at Natchez) indicated that low row-numbered maize had become dominant nearly everywhere in the eastern United States by later Protohistoric and Historic times (Blake 1986:f, Figure 1.3, Table 1.4).

A University of Arkansas field school tested the Upper Nodena site in 1973 and recovered a number of cultigens, which were analyzed by Blake and Cutler (1979). Ninety-eight maize cobs (45 from a burned corn crib and 53 from general excavations), 10 cultivated beans, and some wild plant remains were identified. The cobs from the crib were larger, and the Morses (1983:289) commented that "apparently, smaller ears were used first, and larger ones were put in storage for later consumption or for seed." No other cultigens have been recovered and analyzed from Nodena phase sites, but isotopic analyses of human bone from a ca A.D. 1600 burial at the Campbell site indicated a very high dependence on maize in that individual's diet — the highest recorded in any of 20 analyzed samples from southeast Missouri and northeast Arkansas (Lynott et al. 1986:Table 3, Figure 2). A sample from a nearby and probably contemporary site yielded a similar result.

Subsistence remains from Parkin phase sites have not been recovered for analysis. However, isotopic analysis of a Parkin phase burial from a probable ca A.D. 1600 context at the Hazel site indicated that maize had accounted for a significant portion of at least that individual's diet (Lynott et al. 1986: Table 3, Figure 2). Catchment analyses, with emphases on soils within 1 km of Parkin phase sites, strongly support the hypothesis that potential agricultural productivity was a major factor in selecting site locations (P. Morse 1981:73ff). Also, both riverine and backswamp aquatic resources would have been readily available from all of the analyzed sites (1981: Figures 24–28). Interestingly, despite intensive surveys, no small farmstead sites are known for the Parkin phase (1981:40–43), perhaps due to the threat of raids from the Nodena phase (Pacaha?) peoples.

Although once again no direct subsistence data are available, and no formal catchment analyses have been made, a similar situation with regard to site location criteria is apparent farther down the St. Francis Valley for the Kent phase (House 1987:48). However, small farmstead or hamlet sites are fairly common (House 1987:54).

No formal analyses of subsistence remains were derived from the classic excavations of Quapaw phase sites. However, Edward Palmer in 1882 encountered an 8 cm thick stratum of matting and corn in Mound B at the Menard site (Jeter n.d.). The predominant location of Quapaw phase sites along Arkansas River natural levees is at least potentially advantageous for agriculture; again, the sites seem to have been nucleated villages rather than farmsteads (Hoffman 1986:25). Hoffman (1986:25, 27) also noted that preliminary analyses of Quapaw phase burials from the Kinkead–Mainard site by Rose had revealed caries rates and pathologies characteristic of maize-dependent people.

Moore (1908:492) stated that there were many bison bones at the Wallace site. Ford (1961:159) remarked that animal bones were relatively abundant in refuse deposits he encountered at Menard, and that deer accounted for about 80% of the identifiable bones; other remains listed, but not quantified, included opossum, raccoon, domestic pig, horse, clam shells, drumfish and other fish, turkey and other birds, turtles, and, rarely, bison. Since bison are difficult to distinguish from domestic cattle as far as postcranial remains are concerned, these reports of bison should be regarded critically until modern reanalyses or analyses of new finds are reported. However, there are ethnohistoric reports of the Quapaw hunting bison (Dickinson 1982). Yet another aspect of Quapaw phase subsistence is evidenced by the seasonal hunting (and fishing?) camp near the mouth of the Saline River (Hemmings 1982a: 178ff).

No subsistence analyses have been published for the Hog Lake, Tillar, Wilmot, Caney Bayou, Transylvania, Jordan, Keno–Glendora or Canebrake phases/complexes in southeast Arkansas and northeast Louisiana. Similarly, nothing in the way of formal analyses has been published on subsistence from Louisiana coastal Mississippian sites, though subsistence remains have been recovered from the Sims site (cf. Davis 1984:221–223; Neuman 1984:280). According to Neuman, deer, raccoon, and muskrat were heavily exploited, whereas rabbits and various fish were less important. Also, in a rather dramatic variance from virtually all non-Mississippian sites in this region, shells of the freshwater mollusk *Unio* were abundant, instead of those of the brackish-water clam *Rangia*. The Sims site is on a relict crevasse distributary system (Davis 1984:221), and such microenvironments may have been among the most favorable for agriculture in the Deltaic plain (Richard Weinstein, personal communication).

Mortuary Data. Great numbers of Protohistoric and Historic Mississippian Native American burials have been excavated over the years in the study area, most abundantly by Moore and other early investigators. Accordingly, the artifacts have been abundant (though certainly not even approaching those collected by graverobbers), and some rather general data have been accumulated on burial positions or modes, but the bioarcheological data accumulated so far are disappointingly minimal.

Here, brief phase-by-phase summaries will be presented in the usual downvalley order. It should be noted that in several of the phases, especially those of northeast Arkansas, the Protohistoric and Historic burials are often not distinguishable from the Late Prehistoric Mississippian burials.

Nodena phase sites, especially Pecan Point, were mined by the Davenport (Iowa) Academy of Natural Sciences for artifacts in the late 1800s (Holmes 1903). Pecan Point and Bradley were also visited by Edward Palmer in 1881–82 (Jeter n.d.), but little information on the burials came from these expeditions. However, Moore (1911:447ff) excavated 349 burials, most of them extended supine, and recovered 535 pots at Pecan Point; at Bradley, he encountered 181 more burials, again mostly extended supine, and 258 pots (1911:427ff); at Rhodes, he found 65 burials, with extended supine again the favored position, and 123 pots (1911:413ff). He noted that bunched (bundle) burials were not found at any of these sites (1911:413). Dr. Hampson and his associates from the University of Arkansas and the Alabama Museum excavated more than 1,000 burials at Upper Nodena, Middle Nodena, and related sites (Morse 1973, n.d.).

Parkin phase burials were first excavated in large numbers by Edwin Curtis in 1879; he recovered more than 800 pots for the Peabody Museum (P. Morse 1981:20), but apparently preserved no data on the burials themselves. According to P. Morse (1981:20), vast quantities of pottery were removed from Parkin and related sites by relic collectors between Curtis's visit and Moore's expedition of 1909–1910. At the Rose Mound, Moore (1911:276ff) encountered 207 burials, the great majority again extended supine, and recovered 587 vessels, including two head pots and numerous other well executed painted or incised specimens. At Neeley's Ferry, he found 95 burials and 175 pots (1911:309ff). At Parkin itself, a brief investigation produced 19 burials and 25 pots (1911:303–305); at Miller, 58 burials (all but one extended supine) and 112 vessels (1911:329ff). Intensive investigations of Parkin phase burials by archeologists almost ceased after Moore's work, though of course the pothunters have continued unabated. In 1966, a University of Arkansas field school at the Parkin sites encountered 10 burials, seven of which had apparently been potted (Klinger 1977; P. Morse 1981:23).

Within the Kent phase territory, Moore (1911:406ff) excavated 54 burials, including extended-supine and partially flexed ones, and 69 vessels, at Kent itself. Since his time, the Kent phase sites have been intensively mined by relic collectors, more recently as commercial operations leasing sites and using power equipment, as noted by House (1987:48–49).

Hoffman (1986:25) summarized Quapaw phase mortuary treatment as characterized by "considerable variation...with bundle burials under charnel house floors in mounds, and bundle, flexed, sitting, extended, and skull burials in habitation areas clustering presumably around houses. Grave goods are primarily pottery, which occurs in modest amounts with individual burials." He also noted (Hoffman 1986:27) that "the Nodena point is the only type present in mortuary contexts. Euramerican trade goods, primarily glass beads, copper and brass objects, gunflints, and gun parts, occur in at least a half-dozen of the Quapaw phase sites."

Quapaw phase burials have been described in more or less detail at a number of sites, including Menard, where Moore (1908:486ff) found 160 burials and recovered 214 vessels; Old River Landing, where he excavated 64 burials and found 81 vessels (1908:511ff); Douglas, where he found 32 bunched burials and 53 vessels (1908:524ff); and Greer, which yielded 80 burials and 160 vessels (1908:532ff). Ford (1961:156, Table 1, Figure 10) recovered and summarized 24 additional burials from Menard, only three of which were accompanied by grave goods, probably because they were "robbed ...by the skillful professional pothunters who have been visiting the Menard site for at least a century" (Ford 1961:156).

From Hog Lake and Tillar mortuary data summarized by Jeter et al. (1979), Jeter (1981, 1982c), McKelway (1987), and Jackson (1987), it appears that charnel houses were in use and served as foci for mortuary ceremonialism, which was one means of integrating a populace dispersed in small homesteads or farmsteads. The predominant burial modes were quite variable from site to site, with varying proportions of extended supine (often arranged in rows), bundle, and isolated skull burials present. This may reflect different stages of completion of the initial burial–reburial sequence at the abandonment of different sites, and/or perhaps a situation with refugees from several groups affected by European diseases living together. Although mortuary ceramics and other grave goods are generally fairly common, they are somewhat less so than at the northeast Arkansas sites.

The Caney Bayou phase was defined on the basis of data from the Hale cemetery at the Shallow Lake site (Rolingson and Schambach 1981:193ff). This bottomland cemetery included only incomplete bundle burials, with generally Mississippian ceramics often present. However, at Boytt's Field, which seems to have been in a similar pine island setting on relatively high sandy soil in the Ouachita bottomlands, Moore (1909:82ff) found 55 burials, 45 of which were extended supine (but with no consistent orientation) and none of which were "bunched", and 24 vessels, almost all of which were shell tempered and probably closely related to those from Shallow Lake. Also, the Gee's Landing and Gordon sites, in nearby upland locations, produced similar ceramics associated with extended burials arranged in rows (White 1970, 1987).

Mortuary data are lacking from the LMS investigations into Transylvania and Jordan phase sites in northeast Louisiana. However, some data from this macroregion are available in the works of Moore, and from Jones's (1983) investigations and collector interviews.

At the Ward Place on Bayou Bartholomew in Morehouse Parish, Moore (1909:151ff) excavated 31 relatively well preserved burials, 30 of them extended supine. The 31 accompany vessels were nearly all shell tempered, but two of the three illustrated specimens resemble Natchezan designs. Given Moore's predilection for illustrating nonrepresentative vessels, it is quite likely that the site was basically Protohistoric Mississippian, though of course this should be checked by reanalysis of the vessels.

At Seven Pines Landing, also in Morehouse Parish, Moore (1909:157ff) found the poorly preserved remains of at least 42 individuals, including isolated skulls, skull-less bodies, at least four extended burials and one bundle. Most of the 39 vessels were shell tempered, and the two illustrated specimens show both Mississippian and Natchezan attributes.

The Moon Lake site (16OU161), potted in 1947, included at least 24 extended supine burials arranged in four rows (Jones 1983:111–112). The collector's vessels from this site (Jones 1983:Figures 6 and 7) appear to be mostly Tunican (Koroa?) but also include some Natchezan and Caddoan specimens. Trade goods have been reported from this site (Jones 1983:112; Gibson 1983b:78).

The Rhymes site (16RI185), potted in 1958, yielded an undetermined number of extended supine burials (Jones 1983:112–113). The ceramics (Jones 1983:Figures 8, 9, and 10) appear to be mainly shell-tempered late Protohistoric Mississippian types, again with some Caddoan and Natchezan specimens. No trade goods were found, but the site is clearly very late.

The Ragland site (16OU32) was potted in the early 1930s. It yielded about 12 to 14 extended supine burials, probably in a row, and nine vessels (Jones 1983:127). Although Jones (1983:127) remarked on "a mixture of Plaquemine and Caddoan traits" in this ceramic assemblage, most of the illustrated and described vessels (1983:159ff, Figure 16) appear to be Protohistoric Mississippian–Tunican (Koroa?) and are quite similar to the Jordan site ceramics.

At Canebrake, on the Tensas River in Madison Parish, Moore (1913:49ff) found 17 burials in one of the low mounds. Two were extended supine, and 15 were bundled; several of the latter were accompanied by skulls (1913:51). Moore only illustrated four of the 34 vessels, including Natchezan, Caddoan, and Mississippian specimens (cf. Hally 1972:179). These burials, which appear to have been intrusive, form the basis for the tentatively designated Canebrake phase (Kidder 1986b; cf. Jeter et al. 1979:40).

This review of northeast Louisiana Mississippian mortuary data would not be complete without summaries of Moore's (1909) famous Keno and Glendora sites. At Keno, Moore (1909:120ff) found some 255 burials, generally very poorly preserved, but he had the impression that the "bunched" mode was the most common. He recovered 485 vessels, 11 pipes, and fairly abundant trade goods. At Glendora (1909:27ff), he noted 121 features containing very poorly preserved burials, including both bundle and extended interments, and 322 vessels, plus trade goods. A significant number of the vessels from Glendora, including most of Moore's illustrated specimens, are regarded as Caddoan, and the cultural status of this site is open to question.

No detailed descriptive data have been published on burials from the coastal Louisiana Mississippian sites. According to Neuman (1984:280), the Mississippian midden at the Sims site yielded five poorly preserved burials. One was extended, three were flexed, and one was an isolated skull. No grave goods were associated.

Exchange and External Relationship. Although the Morses (1983:205–208) discussed outside resources most extensively at the beginning of their Mississippian sections, the acquisition, distribution, and exchange of these resources reached a peak in late Prehistoric and Protohistoric times (1983:274). Among the materials obtained by the Mississippians of northeast Arkansas were Mill Creek chert from southern Illinois for agricultural hoes and ceremonial artifacts; Crescent Quarry chert from near St. Louis; basalt for ground and polished stone artifacts, copper and galena for ornaments, and hematite for paints, all from the Ste. Francois Mountains of southeast Missouri; salt from various springs to the north, and shells from both the Ohio River and the Gulf Coast. The distribution of many of these materials may have become controlled by the Nodena phase peoples, who commanded the northern Lower Mississippi Valley (1983:274ff). Another material, which became important only in late Protohistoric and Historic times, was catlinite or pipestone, obtained in Minnesota and used for pipe bowls in the calumet ceremony (1983: 277–278).

European goods are present in some northeast Arkansas sites, but are mainly related to the De Soto entrada rather than to the French, as this macroregion was essentially abandoned by the middle to late 1600s (Morse and Morse 1983:278, 301).

Little is known about exchange and external relationships of the Walls, Kent, and Old Town phases; especially the latter. Some Walls phase engraved ceramics have consistently suggested connections with the Moundville center in west-central Alabama (Phillips 1970:169–170), but this has never been analyzed intensively. The Kent phase ceramics closely resemble those of the slightly later Quapaw phase (House 1987: 51), which reinforces the Morses' (1983:301; D. Morse n.d.) hypothesis that the Quapaw phase represents a downvalley movement of De Soto-impacted chiefdoms such as the Nodena and Kent phases. Again, European trade goods are sparse and apparently early (Spanish) rather than late (House 1987:50).

Along the Lower Arkansas River, little is known about trade or contacts of the pre-Quapaw phase people(s). According to House (1986), their ceramics show some basic Mississippian affinities, especially with the ceramics of the Old Town, Kent, and Walls phases, in that order (which is also the geographic order of their distance from the Lower Arkansas). Tunican attributes are present in the Poor and Massey assemblages, but Natchezan attributes are essentially absent, though present in the later assemblages at Wallace and Menard. Caddoan attributes are also infrequent in the Poor and Massey ceramic assemblages, and House noted an overall orientation toward the Mississippi River.

The Quapaw phase itself is noteworthy for a relationship (at least in terms of ceramics) with the Caddoans, which in general appears to have intensified up the Arkansas River, as might be expected (Hoffman 1977; Morse and Morse 1983: 300). This situation was reflected in Hoffman's (1986:27ff) designation of the new Carden Bottoms phase, which includes most of the former Quapaw or Quapaw–Caddo sites upstream from Little Rock. Although the French set up Arkansas Post in 1686 for the purpose of trading with the Quapaw, relatively few trade goods have been found at Quapaw phase sites, in comparison with the Natchezan Fatherland site (Neitzel 1965, 1983) and the Tunican Trudeau site (Brain 1979) farther down the Mississippi Valley. Ford (1961:159) attributed this to the fact that Quapaw phase sites coeval with Arkansas Post dated primarily to the pioneering phase of the French Colonial enterprise, when supplies were scarce, in contrast to the situation a few decades later.

The Hog Lake ceramics have been interpreted as basically Tunican from the inception of modern research in that locality (Lemley and Dickinson 1937). Attributes are also shared with ceramics of northeast Arkansas Mississippians, the Quapaw phase, the Natchez region, and to a lesser extent, the Caddoan area (Jeter et al. 1979; Jeter 1986a:49ff).

The very similar Tillar complex ceramics show even closer affinities to what are now regarded as Tunican ceramics. In particular, the Tillar vessels frequently have an encircling row or rows of punctations on or near the neck, which resembles what Brain (1979:224, 236–237) called the Tunica mode on Historic vessels. This Tillar mode is generally more neatly executed and placed higher than the Tunica mode, and may be its Protohistoric prototype (Jeter 1986a:49ff). Ceramic assemblages from Tillar sites apparently include more Caddoan vessels and attributes than those from Hog Lake sites. McKelway (1987) suggested that the ceramic diversity at Tillar phase cemetery sites may be related to the acceptance of refugees from European-induced disease and social disruption. The most obvious extraregional artifacts found at Tillar sites are Gulf Coast shell ornaments, including ear pins, beads, and pendants (1986a:55). No European trade goods are documented from any of these sites, but a relic collector recently claimed to have found some trade brass (or copper) and iron in a Tillar phase cemetery site (1986a:58).

The Caney Bayou phase of the Felsenthal region in south-central Arkansas clearly has its basic ceramic affinities to Lower Valley Mississippian (Tunican) assemblages, but as might be expected, Caddoan vessel and attributes are fairly common (Moore 1909:82ff; White 1970, 1987; Schambach and Rolingson 1981:193ff). A stemmed and barbed point type, originally reported by White (1970:15–16, Figure 16) from the Gee's Landing site, has also been found at two Tillar sites (Jeter 1986:55; McKelway 1987), and has been called the Jordan point or Alba Barbed, *var. Jordan* (Kidder 1986a) because of its common occurrence at the Jordan site. Although a number of the Caney Bayou vessels appear to be quite late in the Protohistoric period, no European trade goods are known from any of these sites.

Kidder (1986a, 1986b, 1988) suggested that many of the Protohistoric and early Historic remains of the northeast Louisiana macroregion may have been produced by the Koroa. He noted that the ceramics from these sites generally match the prediction (Jeter 1986a:45, 49) of a basically Tunica-like assemblage, with some Natchezan and Caddoan attributes. These ceramic assemblages resemble those of the Tillar and Hog Lake phases in general, but differ in having (apparently) much less frequent occurrences of the Tunica mode or similar punctations, and more frequent brushing (an attribute possibly derived from late Prehistoric Plaquemine ceramics) than the Tillar and Tunica assemblages. The sporadic occurrence of European trade goods in Moore's and other mortuary sites in these regions, and especially at Keno and Glendora, has been noted above.

The Tunica themselves had a long tradition of going westward into Arkansas and Louisiana to obtain salt from the Caddo (Brain 1977:8, 1979:280ff, 1981). Brain suggested that their adaptability and adeptness in carrying on this trade, and expanding it to include a trade in horses obtained ultimately from the Spanish in the Southwest, was one of the keys to their survival in the drastically changed milieu of the Lower Valley in Historic times. Certainly, the Tunica treasure (Brain 1979) is evidence of their proficiency at exchange with Europeans from their sequent eighteenth century vantage points (the Angola and Trudeau sites) near the juncture of the Mississippi and Red rivers.

Davis (1984) extensively discussed Protohistoric (especially Mississippian) cultural interaction along the Gulf coast. Although noting the overall ceramic similarities with the Pensacola complex (Davis 1984:222ff; cf. Knight 1984), Davis (1984:226ff) suggested that trade was probably not a significant mode of cultural interaction along the coast for these peoples but that instead, the major direction of trade was between the coast and interior. Here, it may be useful to recall the possible relation of the Mississippian salt-producing outpost at Salt Mine Valley in south-central Louisiana to the Mississippians of the Yazoo Basin and adjacent regions (Brown and Brown 1979; Weinstein 1985). Davis (1984:226ff) also suggested that repeated short-distance trade, itinerant traders, and small-scale reciprocal exchange, as well as erratic, short term and short-distance population movements related to shifting sociopolitical alliances among small tribal groups, may have produced the archeological record of the coastal Protohistoric Mississippians.

PROTOHISTORIC AND HISTORIC CADDOAN CULTURE

Definition and Location. Caddoan culture has been defined in archeological terms in the last chapter. Here, it should be noted that the Caddo IV period, placed by Caddoan archeologists at A.D. 1500–1700, coincides with the Protohistoric period as defined in this overview, and the Caddo V period, after A.D. 1700, is equivalent to our Historic period. It should also be reiterated that some of the literature (e.g., Gregory 1980) uses a four-period scheme rather than the five-period scheme used here. In that alternative scheme, Caddo III is approximately equivalent to Caddo IV as used here, and Caddo IV equates with Caddo V as used here.

The Caddo IV and Caddo V geographic distributions both include the traditional Caddoan area of southwest Arkansas, northwest Louisiana, and adjacent Texas and Oklahoma. During Caddo V (and probably late Caddo IV) times, there apparently was an expansion to the east and southeast, or at least several temporary movements in those directions by Caddoan groups. Also, interaction with Lower Mississippi Valley groups and ultimately with Europeans evidently increased significantly. The general situation is reflected in Figures 21, 22, and 23, which map the distributions of Caddoan and other cultures and key sites at ca A.D. 1500, 1600, and 1700.

The chronological basis of Caddo IV and Caddo V archeology was strengthened significantly by work at the Cedar Grove site in southwest Arkansas (Trubowitz 1984). By grave lot seriation of 67 ceramic vessels from 12 burials (Schambach and Miller 1984), a ceramic time scale was developed with resolution on the order of 20-year intervals, if not less (1984: 166), at least for the period ca A.D. 1650–1750. Also, the Cedar Grove analyses included promising results from the thermoluminescent dating of shell-tempered ceramics (Wolfman 1984:259–261).

The Caddo IV cultural manifestations in southwest Arkansas were summarized on a region-by-region basis in the State Plan by Schambach and Early (1982:SW115–121; Note: the caption for that study unit erroneously reads Caddo III). A similar summary of the Caddo V regional situation was given in the following pages (Schambach and Early 1982:SW122–129). Briefly, both Caddo IV and Caddo V are poorly known except in the Great Bend region. Recent work by the Arkansas Archeological Survey in the Middle Ouachita region holds the promise of significantly improving the data base in that region.

In northwest Louisiana, work by Webb (1945, 1959) and Gregory (1973, 1980; Gregory and Curry 1978; Webb and Gregory 1978) set up and summarized the basic sequences for both the Caddo IV and V periods. Again, by far the best data base is from sites along the Red River.

Caddo IV peoples were almost certainly encountered by the De Soto entrada in 1541 and/or 1542. However, as noted previously, there is strong disagreement with regard to this portion of the Spaniards' wanderings and the locations of their contacts with Native Americans (Swanton 1939; Dickinson 1980, 1986; Brain 1985a, b; Hudson 1985).

The history of European contacts with Caddoan peoples was summarized by Webb (1959:1–7) and Gregory (1973:9ff, Table 1), among others. Among the early French explorers, it appears that Henri Joutel in 1687 was the first to contact Caddoans within their own territories in and near the present study area. He and five other survivors of La Salle's disastrous attempt to colonize the Texas Coastal Plain crossed southern Arkansas from the Great Bend of the Red River to the mouth of the Arkansas. They visited the Nasoni and/or Kadohadacho settlements among the Red River, probably in Texas, and the Cahinnios on the Ouachita River (Dickinson 1980:6–7; Trubowitz 1984:32).

Traveling from Arkansas Post in 1690 in search of the lost La Salle colony, Henri de Tonti descended the Mississippi, crossed into the Ouachita–Black drainage in southeast Arkansas and/or northeast Louisiana, and followed this system downstream to its juncture with the Red River (Dickinson 1980:5–6). He ascended the Red River and made the first contact with the Natchitoches on their home ground (Webb and Gregory 1978: 17). He went on to visit several Texas Caddoan groups, including the Kadohadacho in the Texas–Arkansas borderlands.

Meanwhile, the Spanish from Mexico and the Southwest had begun contacting the east Texas Caddoans (Webb and Gregory 1978:17; Trubowitz 1984:33). One very important by-product of this activity was the 1691–1692 entrada of Don Domingo Teran de los Rios, the new governor of the Spanish territories in Texas. Teran visited the province of the Kadohadachos and produced a map of Caddoan (Upper Nasoni) settlements along the Red River, which was used by Schambach in his model of Caddoan dispersed settlement patterns (Schambach 1982b:7, 11, Figure 1-3; Trubowitz 1984:33, 263ff).

Bienville, traveling westward from the Mississippi River in northeast Louisiana in 1700, encountered the Ouachita, believed to have been a Caddoan group, on the Ouachita River (McWilliams 1981:148). He also met the Natchitoches, Yatasi, and Kadohadacho. In 1701, traveling from the vicinity of present-day New Orleans and accompanied by Louis Juchereau de St. Denis, he returned to the Natchitoches and visited other groups of Caddoans.

The Natchitoches moved temporarily to the Lake Pontchartrain vicinity but in 1714 returned to their homeland with St. Denis. Fort St. Jean Baptiste aux Natchitos was founded in 1714, as the first European settlement in northwest Louisiana (Webb and Gregory 1979:18). The fort was within the city limits of present-day Natchitoches but has not yet been definitely relocated archeologically (Gregory, personal communication).

In an unusual situation involving both competition and cooperation with the French, the Spanish in 1721 established the Presidio de Nuestra Senora del Pilar de Los Adaes, some 20 km to the west-southwest of Natchitoches, in the territory of the Caddoan Adai or Adaes. It endured for 50 years as a "hub for clandestine traders" (Webb and Gregory 1978:18) and has been the subject of ongoing archeological investigations since the late 1960s (Gregory 1973; Gregory et al. 1979, 1980, 1982, 1984, 1985).

The Cahinnio may have broken up by the mid-1700s, but at least one remnant remained in south-central Arkansas at least until the 1770s (Dickinson 1980:8). The Kadohadacho of the Great Bend region, harassed by Osage raiders from the north, moved out between 1778 and 1790; some moved temporarily to Prairie de Ann (Han) near present-day Prescott, Arkansas, but by 1797, they were on Caddo Lake near present-day Shreveport (Dickinson 1980:8–9; Schambach 1982b:10).

In 1835, the Caddo sold all of their lands in Arkansas and Louisiana to the United States, and moved to Texas, thence to Oklahoma. Their descendants retain an active interest in their traditional homelands in the present study area and have participated in the Caddo Conference archeological meetings of recent years.

Paleoenvironmental Data. In terms of general conditions of climate and vegetation, essentially modern (presettlement) conditions prevailed in the Trans–Mississippi South during Caddo IV–V times. The major environmental factor in Caddoan archeology of these or other periods is the actively meandering Red River. Schambach (1982b:11) noted that of 49 Caddoan mounds at 31 sites reported by Moore in the Great Bend region in 1912, only 26 have been relocated, and most of the missing ones have been destroyed by the river.

Pearson (1984) analyzed Red River meander belt activity and noted that lateral movements on the order of 2 km to 3 km were common in the last century. He also mapped the extent of the meander belt edges, as indicated by archeological site distributions (e.g., Pearson 1984:Figure 2-11, which depicts the situation at ca A.D. 1600). Guccione (1984) added a quantified study of Red River channel morphology and cyclic changes in southwest Arkansas, in connection with the Cedar Grove site research.

In Louisiana, the effects of the historically documented Great Raft or natural logjam on the Red River may go back as far as Caddo II times (Webb, personal communication), if not much earlier (Schambach 1982a:189). The location of the French Fort St. Jean Baptiste aux Natchitos at Natchitoches was chosen because this was just below the head of navigation, as determined by the Great Raft, in the early 1700s (Gregory et al. 1979:40).

Phases and Ethnic Groups. Two phases of the Caddo IV culture period have long been recognized in and near the study area (Tables 12 and 13). One Caddo V focus or phase has long been recognized but misunderstood until recently. Also recently, one Caddo V phase has been defined for the Great Bend region.

The Caddo IV phases (both formerly foci in the adaptation of the Midwestern Taxonomic System used by Caddoan archeologists) are the Texarkana phase and the Belcher phase (Schambach 1982a:9; Schambach and Early 1982:SW119–120). Texarkana phase sites are found along both banks of the

Red River, north and northwest of Texarkana, and especially in Bowie County, Texas, out of the present study area (Trubowitz 1984:5; Story and Guy, personal communication). The Belcher phase is based primarily on Webb's (1959) work at the Belcher mound site on the Red River north of Shreveport but also includes sites as far north as Fulton, Arkansas, i.e., northeast of Texarkana. Belcher sites also occur well down the Red River valley toward central Louisiana, approaching if not achieving a maximum distribution of Caddo culture (Gregory 1980:356).

Neither the Belcher phase nor any other phase designation has yet been made for the Protohistoric period in the Middle Ouachita region, to succeed the terminal Prehistoric Mid-Ouachita focus/phase. However, Arkansas Archeological Survey excavations of burials and settlement features at a saltmaking site near Arkadelphia may change this situation (Waddell and Early, personal communications).

In the Ouachita Mountain region, no phase has been designated for this period. However, the Tula, who may have been a Caddoan or an intrusive (Wichita?) group, may have been encountered in or near this region by De Soto in 1541 (Dickinson 1980:2–4; Schambach and Early 1982:SW116).

The only Caddo V phase as yet designated in southwest Arkansas is the Chakanina phase, defined primarily on the basis of the Cedar Grove site investigations (Schambach 1982b:10; Schambach and Early 1982:SW128–129; Schambach and Miller 1984:167). At this site, at least, the Chakinina phase was estimated to date to the period ca A.D. 1700–1730. It is believed to represent the remains of Historic period Kadohadacho Caddoans. It has not been extended into northwest Louisiana or northeast Texas and probably will not be extended in the latter direction. Schambach (Schambach and Early 1982:SW129) suggested that a Little River phase designation should be applied to the remains of these upstream (and out of the present study area) groups, such as the Nasoni.

No phase name has been designated for the Caddo V period in the Middle Ouachita region, but this was in all likelihood the location of the Cahinnio Caddoans in the early Historic period. Dickinson (1980:6) suggested that the Cahinnio settlements were nearer Camden than Arkadelphia, which had been suggested earlier. However, excavations near Arkadelphia did produce a late Caddoan component (Waddell and Early, personal communications), and it remains to be seen whether this will result in a phase and/or ethnic group designation.

Similarly, no formal phase name has been designated for Caddo V groups in the Natchitoches locality, probably because it is relatively well documented, and the names of ethnic groups or subgroups can be used. Webb and Gregory (1978:24–26) suggested correlations between specific archeological sites and documented settlements in this vicinity.

The Glendora focus or phase in northeast Louisiana was for many years taken as the panregional epitome of the historic Caddoan culture, on the basis of Moore's (1909) work at Keno and Glendora (Ford 1936b; Suhm and Krieger 1954:221–225). However, recent reexaminations of Moore's nonillustrated ceramics from these sites, and extensive new surveys, indicate that this region was basically Mississippian, and the Glendora phase was "at most a brief Caddoan intrusion... an appendix to Boeuf [Basin] prehistory" (Belmont 1983:281). Kidder (1986b) suggested that the Keno and Glendora peoples were basically Tunican Mississippians (Koroa?), who interacted intensively with Caddoans to the west. The relationships, if any, between these peoples and the apparently Caddoan Ouachitas who were observed a short distance downstream on the Ouachita River by Bienville in 1700, remain to be explained.

The major Historic Caddoan tribal groups were summarized by Gregory (1973:16ff; cf. Webb and Gregory 1978:22; Schambach and Early 1982:SW122ff; Kniffen et al. 1987). In the Great Bend region, they included the Kadohadacho (Great Chiefs) and several subordinate groups such as the Petit Caddo, Upper Natchitoches, Nanatsoho, and Nasoni; in the Middle Ouachita region of south-central Arkansas, the Cahinnio; in the Natchitoches region, the Natchitoches, Doustioni, Ouachita, and Yatasi; near the Sabine River, the Adaes (Adai), Ais, and Nadarko; and in east Texas, the Neches and the Hasinai, with the latter subsuming a number of small groups.

Key Sites. Clearly, the most important Caddo IV site is the Belcher site (Webb 1959; see Neuman 1984:234–243 for a summary). Excavated between 1936 and 1941 by Webb and his associates, it had two mounds. Eight houses and a number of other features, including 26 burial pits which were richly endowed with ceramic vessels and other grave goods, were excavated. The Belcher focus was defined on the basis of the final two components (called Belcher III and Belcher IV) at the site and comparative data from a number of other sites (Webb 1959:191–194).

Other major sites with Caddo IV (Belcher phase) components include several of Moore's (1912) Red River sites, such as Battle (3LA1), Foster (3LA27), Friday (3LA28), McClure (3MI29), and Moore (3MI30) in Arkansas (Hemmings 1982b: Table 5-1), and a late component at Mounds Plantation (16CD12) in Caddo Parish, Louisiana (Webb 1959:191; Webb and McKinney 1975).

For both Protohistoric and Historic periods, the late Caddo IV and early Caddo V, the most important site in Arkansas is Cedar Grove (3LA128; Trubowitz 1984). As noted above, analyses of materials from this site significantly improved our control, and prospects for control, of late Caddoan chronology. Modern research was also carried out on a more limited scale at the nearby Spirit Lake site (3LA83), where the remnants of a late Caddo IV component were salvaged by extensive testing (Hemmings 1982b). During 1987, the Arkansas Archeological Survey's contract excavations at the Hardman site near Arkadelphia encountered significant Caddo IV remains which should clarify the situation in the Middle Ouachita region (Waddell and Early, personal communications).

The Caddo V, or Historic, period was characterized by Schambach (1982b:9) as “the least known period” in Caddoan archeology. However, the work at Cedar Grove (Trubowitz 1984 and specialized studies cited therein) has remedied that situation somewhat. The work at Cedar Grove represented the first really modern research carried out on a Caddo V component in Arkansas.

As noted above, no Caddo V phase has been defined in the Great Bend region’s extension into adjacent extreme northwest Louisiana; no sites of this period have been adequately investigated and reported from there.

Schambach (Shambach and Early 1982:SW129) suggested that the Little River phase be designated for the known Caddo V sites in the Red River Valley in and near Bowie County, northeast Texas. These Caddo V sites in the latter locality include Rosebrough (or Roseborough) Lake, Hatchel, and Mitchell (Schambach and Early 1982:SW124–125), and are discussed in the East Texas overview volume.

In the Natchitoches locality, Walker’s (1935) salvage work at the Caddo V Fish Hatchery site was of major importance in the history of Caddoan archeology, and of Louisiana archeology in general. A comparable site in this vicinity, Lawton, was later salvaged by Webb (1945; Webb and Gregory 1978: 24–26). These and other Historic Caddoan sites were summarized in Gregory’s (1973) dissertation. Gregory’s continuing research at the Spanish site of Los Adaes (Gregory 1973; Gregory et al. 1979, 1980, 1982, 1984, 1985) has also produced substantial evidence on the material culture and acculturation of the Adai during the 1700s.

Another northwest Louisiana site which produced data on Caddo IV and Caddo V occupations is the Louis Procello site (16DS212) in eastern De Soto Parish. It was extensively excavated under contract in 1982 (Espey, Huston & Associates, Inc., 1983), and found to have Caddo III–V components, including probably late burials.

Even though they are no longer considered basically Caddoan sites, Keno and Glendora in northeast Louisiana remain important for Moore’s (1909) classic illustrations of Caddoan ceramics from them. Also important and open to question is the Greer site on the Arkansas River in northwest Jefferson County (Moore 1908:542ff), which produced a number of Caddoan vessels. Webb (1959:155) and (apparently) Ford (1961: 167) considered it a Caddoan site, but Hoffman (1977:34, 1986:25, 27) suggested that it is basically a Quapaw site with evidence of interaction with the Caddoans.

Settlement Data. The essential argument of Schambach’s (1982b:7, 9; Schambach and Early 1982:SW129–133) Caddoan settlement model is that early Historic references to Caddo villages actually referred to “dispersed communities composed mainly of small farmsteads, each with one or two houses..., several open sided bark- or brush-covered shelters, and a storage platform with a beehive-shaped thatched roof” (1982b:7). Schambach (1982b:7, 9) stressed the importance of understanding this settlement pattern in cultural resource management work.

This kind of pattern of small compounds is indicated in the Teran map of 1691–1692 (Schambach 1982b:Figure 1-3; Trubowitz 1984:Figure 2-1), and in two photographs taken between 1868 and 1872 by a photographer named Soule at a camp of Caddoan refugees living in Oklahoma (Schambach 1982b:Figures 1-4 and 1-5; Trubowitz 1984:Figures 2-2 and 2-3). The Teran map also suggests that there were several differences between the compounds of the “caddi” or community leader and those of the rest of the populace. Specifically, the caddi may not have had a storage structure in his own compound, but did have brush arbors or ramadas for community meetings.

Harrington (1920:247ff) assembled the available ethnohistoric and archeological data on Caddoan houses, emphasizing their rather standardized circular shape and thatched “beehive” roofs. Archeological evidence for such structures now goes back to Caddo I times. However, there is also some evidence for variation, especially in earlier times, when rectangular and oval structures were built (Webb 1959:59). The late Caddoan structures at Belcher and at Cedar Grove (Trubowitz 1984:92ff, 267, 270; Schambach and Miller 1984:167–168) were circular.

With regard to larger scale settlement patterning in terms of land use, Gregory (1980:356ff) suggested that in Belcher phase times (Caddo III in his terminology, but Caddo IV as used here), there was

> a return to older Alto–Gahagan patterns. Large truncate mounds served as house bases, probably the residences of priest–chiefs, and multiple burials suggest the practice of *suttee [sic]* in at least one site [Belcher]. In addition to the ceremonial sites, many small hamlets were scattered throughout the hill country, continuing a trend that began in the Bossier focus or period [Caddo III in this overview’s terminology]... raft lakes were the loci of sizable Belcher hamlets... the distribution is congruent with the earlier distribution of Alto [Caddo I] sites; the major difference seems to be the large numbers of small “hill country” hamlets in the Belcher focus. It seems wholly realistic to postulate a growing population... which] peaked in late Belcher times. (Gregory 1980: 356–357)

Gregory (1980:358) suggested that the basic settlements of the Caddo V (his Caddo IV) period were “hamlets, each covering a few acres and with its own cemetery.” This agrees with Schambach’s Teran–Soule model and the findings at Cedar Grove in Arkansas. Some of these settlements were located near European establishments. The use of mounds seems to have ceased (Gregory 1980:Table 44).

Gregory (1980:358–359) also noted the existence of salt producing sites in both Caddo IV and Caddo V periods in Louisiana (cf. the Hardman site near Arkadelphia, Arkansas, mentioned above). He further suggested (on the basis of ethnohistoric analogy) that there were probably ceremonial precincts, including dance grounds, away from the settlements. No such sites have yet been identified archeologically, and such an identification would certainly present an interesting and challenging problem for archeologists.

Subsistence Data. The Belcher site yielded a number of plant food remains, all from Belcher focus/phase contexts (Webb 1959:179ff). They included persimmons, hickory nuts and walnuts, maize cobs, and three common cultivated beans.

Extensive flotation from the Cedar Grove site (King 1984) yielded very widespread maize, plus a few specimens of cultigen gourd and squash. Nuts were also quite common, and a variety of seeds were identified. The published analysis, however, did not differentiate the Caddo IV and Caddo V associations, though this could perhaps be accomplished by laboriously scrutinizing the unpublished Appendix IX. Also included in this analysis for comparative purposes were some flotation samples from the nearby Sentell site (3LA128), which had Caddo II, III, and IV components (King 1984:209). Again, maize was present, and nuts were abundant; however, again the remains were not differentiated by components.

Animal bones and other remains recovered at Belcher included deer (accounting for about 80% of the bones), squirrel (second most common, mainly gray squirrel), rabbits and other terrestrial mammals, and various fish. Either some contact with Europeans or mixture with later deposits was indicated by the identification (by University of Michigan analysts) of bones of horse, pig, and cow or bison (Webb 1959:181). However, Webb (1959:191–192) emphasized the absence of definite bison bones.

The Cedar Grove site yielded the first well preserved faunal assemblages from a late Caddoan site in southwest Arkansas (Styles and Purdue 1984). The assemblage was clearly dominated by white-tailed deer, and turkey was also common. Fish were widely distributed, as were other aquatic and semiaquatic resources. However, once again, the published report did not explicitly differentiate and compare the Caddo IV and Caddo V remains, though this could probably be done by intensively studying the published tables and comparing them with feature characterizations given elsewhere in the report.

Mortuary Data. It appears that something of a trend toward egalitarianism, and ultimately, social disintegration occurred within Caddoan societies during the Caddo IV–V transition (Gregory 1973, 1980; Schambach and Early 1982: SW115, SW122). This is reflected in trends away from the use of mounds and elite burials with a disproportionate number of grave goods.

In his exploration of the Red River Valley, Moore (1912) made the first investigations of several classic Caddo IV burial sites. The first of these was the Battle Place (1912:566ff), where he found only five burials in a low rise. Three were extended-supine. They had an "ample allowance" of pottery, some 35 vessels in all. The eight illustrated specimens all appear very late but there is also a Caddo III component at this site (Hemmings 1982b:Table 5-1).

Next, Moore (1912:574ff) stopped at the McClure Place, where he found only two burials each in two mounds. Those from one mound (at least one extended supine), were accompanied by a total of 16 pots. Those from the other mound were both extended supine, and accompanied by at least a few vessels. Of the eight illustrated specimens from this site, seven are engraved, and all appear quite late, though perhaps not Historic.

At the Friday Place, Moore (1912:584ff) excavated six burials and 38 vessels, all from one of four tested mounds. All of the burials were extended supine, and one had 12 vessels and a conch shell cup. Once again, the four illustrated vessels are entirely consistent with a Protohistoric placement.

At the Foster Place, Moore (1912:591ff) found 11 burials in pits which may have intruded into a mound. Of these, 10 were adults extended supine, with the remarkable number of 246 preservable vessels, "and probably many more" (1912: 593). The site was also noteworthy for the finds of 18 remarkably delicate bone pins, shell and stone pendants, shell gorgets, and flint blades or ceremonial bifaces. The numerous illustrated vessels again appear quite consistent with a Protohistoric placement; they include several varieties of the type Foster Trailed-Incised, a number of engraved specimens, and at least three with encircling punctations resembling the Tunica mode or Tillar mode (see discussion above).

At the aptly named Moore place, Moore (1912:635–636) found only three burials and six vessels in a mound remnant. The one illustrated specimen is a Foster Trailed-Incised vessel with a rim decoration comparable to those on Caddo IV vessels from Cedar Grove (Schambach and Miller 1984:121ff).

The next major Caddo IV burial excavations were those of Webb (1959:66ff) at the Belcher site. Here, 22 of the burial pits (all within the two mounds) were assigned to the Belcher focus (Webb 1959:109). Of these, 19 pits were assigned to the early Belcher (Belcher III) component; they contained at least 30 individuals and 111 vessels. Three pits, containing nine individuals (seven in one pit) and 37 vessels (33 in the main pit), were assigned to the late Belcher (Belcher IV) component. The burials were almost all extended supine, and tended to occur in groups with parallel orientations of the included individuals, in association with structures.

Several of the Caddo IV burials or burial groups at Belcher were accompanied by indications of relatively high status. Burial Pit 5 included three individuals and 21 vessels, plus other offerings. According to Webb (1959:67), "the richest placements were associated with Skeleton 2, an adult male, who must have been a person of considerable importance." The artifacts associated with this burial are indeed numerous and of high quality (Webb 1959:Figures 62, 63, and 64).

Burial Pit 7 (Webb 1959:68-69) contained a child of 3 to 4 years, accompanied by 16 vessels, including several very ornate specimens (1959:Figures 66 and 67). Burial Pit 15 (1959:75–80; Figures 80 and 81) included seven individuals and 33 vessels; it was the only mass burial of the late Caddo

IV period (Belcher IV subperiod) at this site, and the only one which contained "carelessly or irregularly placed" burials. The vessels from this pit (1959:Figures 82 and 83) included a number of engraved bowls and bottles; also present were a number of Bassett type arrow points and shell ornaments (1959:Figures 84 and 85). Burial Pit 17 (1959:80–81, Figures 86 and 87) included only a child, aged 6 or 7, with 14 vessels and other artifacts (1959:Figures 88 and 89). Several of the vessels appeared to be quite late in the Caddo IV period.

In summary, Webb (1959:110) suggested that "each group of burials includes one individual whose significant rank is indicated" and that "the death of one individual, generally an adult male ...but in two instances an adult female, who was of ruling or priestly class, occasioned burials of ceremony which often included burning of the temple and immolation of family, relatives, or other chosen individuals."

At Spirit Lake, one burial, that of an child extended supine, was salvaged. It was accompanied by three Protohistoric vessels (Hemmings 1982b:78ff). Evidently, a number of other Protohistoric (and at least one Early Historic) Caddoan burials had eroded into the Red River, with the vessels being collected by local individuals before the salvage excavations were performed and the site destroyed (Hemmings 1982b:57; Figure 5-12).

At Cedar Grove, five of the burials (those assigned to ceramic groups 1 and 2; Schambach and Miller 1984:164–167, Table 11-12) were assigned to the Caddo IV component. Four of them (Burials 8, 11, 12, and 14) were extended-supine adults, and the fifth (Burial 15) was a semiflexed child (Trubowitz 1984:97ff). They were accompanied by 23 vessels and various other grave goods.

Another seven burials at Cedar Grove were assigned to the Caddo V component; most if not all of them were extended supine, and they were accompanied by 44 vessels and other grave goods. A bald eagle burial was also apparently associated with this component.

At the Fish Hatchery site, Walker (1935; cf. Neuman 1984: 252–253 for a much more accessible summary) was only able to salvage one burial himself, that of an adult female, extended supine, with two plain shell-tempered vessels (1935:3–4, Plate 1, Figure 1). The skull was "a remarkable example of extreme fronto-occipital deformation" (1935:4, Plates 2 and 3). His informants alleged that about 100 other burials in extended-supine positions had been destroyed, and that they were generally accompanied by ceramic vessels, shell beads, and trade goods such as glass beads and metal objects. Two horse burials said to have been accompanied by ceramic vessels were also reported.

At the Lawton site, Webb (1945; cf. Neuman 1984:253) salvaged four burials after six or seven had been destroyed. Again, all which were sufficiently preserved for determination of burial mode were extended supine, and again, both aboriginal ceramics and glass trade beads were present, although shell and metal artifacts were not. Several other excavations of small aboriginal cemeteries in the Natchitoches vicinity have also yielded trade goods (Neuman 1984:254–255).

At the Louis Procello site (Espey, Huston & Associates, Inc. 1983), which had Caddo III–V components, five aboriginal burials were excavated. They were in a variety of positions and had no grave goods, but they were near a trash pit (1983: Figure 2) containing numerous artifacts. The latter included seven partially reconstructable aboriginal vessels (1983:96ff, Figures 26–28). They were not typed, but all were shell tempered, and their shapes closely resemble those of certain Protohistoric to Historic Caddoan or Mississippian vessels. The trash pit also contained two iron tripod kettles (1983:103, 109, Figure 30) comparable to those found at the Tunica Treasure Trudeau site (Brain 1979:134–138).

Exchange and External Relationships. The major source for Caddo IV exchange and external relationships is Webb's (1959) report on the Belcher site. Some form of influence or interaction with Mississippian culture was indicated by the fact that most of the Belcher focus vessels were shell tempered (1959:151). Several of the vessels, especially those of the Cowhide Stamped type, featured a Mississippian-like globular jar shape (1959:130, Figure 109). This eastern orientation and interaction with Mississippians may well have been related to the latter's desire for salt and other items from the Caddo (Gregory 1973:286). Engraved and otherwise decorated shell items were quite common at Belcher (Webb 1959:169ff). They included eight Gulf Coast conch shells, 168 conch columella beads, and 67 zoomorphic shell pendants made from conch columellas. Webb (1959:195ff) also noted that some 15 or 16 of the traits then commonly listed for the Southern Cult of mortuary ceremonialism were present in the Belcher focus assemblages.

The major source on Caddo V exchange and external relationships is Gregory's (1973) dissertation. Briefly, Gregory argued against the then-prevailing model of a dominant–subordinate European–Indian relationship, and for a model of "an established Indian trade network... an indigenous Caddoan economic strategy into which various European groups were integrated... a situation which more nearly approaches a true symbiosis .... The Caddo are seen as contributors to, not merely recipients from, cross-cultural exchange" (Gregory 1973:v).

Gregory's model involved "a very complex system of barter, extending from the Mississippi River to eastern New Mexico... and from the Arkansas River to the Gulf (Gregory 1973:275). Items exchanged included ceramics, salt (which was available from saline springs in many portions of the Caddoan territory), hides, Osage orange (bois d'arc) wood for bows, and horses and Native American slaves from the Plains and Southwest. Gregory's (1973:Figure 22) schematic map of historic Caddoan interaction was also reproduced in a more accessible popular work (Webb and Gregory 1978:19).

Later in historic times, the French (but not the standoffish Spanish) lived with and intermarried with the Caddoans and other Native Americans, raising *metis* families and becoming securely compatible trading partners (Gregory 1973:282ff). As far as interactions with other Native American groups are concerned, Gregory (1973:286) suggested that after 1750 the Caddoans became much more western in their orientation. (Of course, many of the Historic groups of the Mississippi Valley, both of the Mississippian and Plaquemine traditions, had become decimated by this time.) But more and more the Caddoans shifted from direct exchange with other Native American groups to the role of "middlemen in an expanding trade between the French and the Indians to the southwest" (Gregory 1973:284). Pottery was still produced for sale to Europeans as late as 1803 in the Natchitoches locality, and salt production for the European market was important well into the 1800s (1973:284).

PROTOHISTORIC AND HISTORIC PLAQUEMINE AND NATCHEZAN CULTURE

Definition and Location. In contrast to the Mississippian and Caddoan expansions summarized above, the geographic extent of archeologically recognizable Plaquemine culture appears to have shrunk on several fronts during late Prehistoric, Protohistoric, and Historic times; after reaching a peak about A.D. 1350 (Brown 1985b:254). This is reflected in Figures 18 through 23, which map cultural distributions and key sites at ca A.D. 1200, 1300, 1400, 1500, 1600, and 1700.

Despite this apparent cultural decline, which may in part merely reflect stimulus diffusion of technologically superior shell-tempered pottery and other material items, at least one major manifestation of Plaquemine culture remained strong throughout the Protohistoric times and well into the early Historic period. It is generally agreed that the ethnohistorically documented Natchezan culture is essentially continuous with late Prehistoric and Protohistoric Plaquemine culture in and near the Natchez Bluffs region (Brain 1978a, 1982; Brown 1982, 1985a). Brown (1985b:252) characterized this as eastern Plaquemine culture.

If Brain's (1978a:356ff, 1985a, 1985b; Brain et al. 1974) scenario of the latter portion of the De Soto entrada is correct, it was a Protohistoric Natchezan chieftain of the province of Quigualtam who rebuffed De Soto's 1542 summons by saying,

> it is not my custom to visit anyone, but rather all, of whom I have ever heard, have come to visit me, to serve and obey me, and pay me tribute, either voluntarily or by force: if you desire to see me, come where I am; if for peace, I will receive you with special goodwill; if for war, I will await you in my town; but neither for you, nor for any man, will I set back one foot. (Brain 1978a: 357)

Brain (1978a:357) commented, "This was supreme power, and apparently intimidating enough that the Spaniards never pressed their demands nor actually visited Quigualtam." It must be noted, though, that Hudson (1985:11, Figure 1) disagreed with Brain's identification, suggesting instead that Quigualtam was in the Lower Yazoo Basin.

Whether or not Quigualtam was a proto-Natchezan Plaquemine society, the Natchez as documented by the French in the late 1600s and early 1700s (Swanton 1911:45ff; Neitzel 1965, 1983; Brain 1982; Brown 1982, 1985a) had a chiefdom level society dominated by a leader called the Great Sun who ruled over a social structure that has become an anthropological classic, with an upper class consisting of hereditary Suns plus Nobles and Honored People and a lower class of Stinkards (Swanton 1911:100ff, 107). Even so, the Historic Natchez observed by the French represented a significant decline in population, and probably in social complexity, from their Protohistoric ancestors as known archeologically in the Natchez Bluffs region (Brain 1978a:360-361; Brown 1985a:2).

The major data base for Protohistoric and Historic Plaquemine culture is in the Natchez Bluffs region, outside the present study area. This is due to two major factors. The first is the long-term interest in Natchezan "direct historical" archeology on the part of the Mississippi Department of Archives and History, dating back to excavations by Moreau Chambers at the Fatherland site in 1930 (Ford 1936b:59ff; Neitzel 1965:9), and continuing with excavations in 1962–1963 and again in 1972 by Neitzel (1965, 1983). The second factor is another long standing interest, by the Lower Mississippi Survey, in the same region (Brain 1978a; Brown 1985a). A major monograph summarizing the archeology of the Natchez Bluffs region (Brain, Brown, and Steponaitis n.d.) has long been in preparation for publication by the LMS and has often been cited (e.g., Brain 1978a:366; Steponaitis 1981:18; Williams and Brain 1983:476; Brown 1985a:303), but has not been published.

The LMS has also long been active in the Tensas Basin of northeast Louisiana, but publications have lagged in that region. The major LMS report dealing with the Protohistoric situation in that region, Hally's (1972) dissertation, is virtually inaccessible to most researchers due to Harvard University's policy of not participating in the otherwise widespread University Microfilms dissertation reprint series. Also, since it deals with the Upper (northern) Tensas Basin, this dissertation's major Protohistoric emphasis is on the Transylvania phase, which is Mississippian rather than Plaquemine.

To the northwest and west of the Upper Tensas Basin, both the Felsenthal region and the Boeuf Basin region were occupied by Mississippian rather than Plaquemine cultures during Protohistoric and Early Historic times (Schambach and Rolingson 1981:193ff; Belmont 1983:279–281; Kidder 1986b).

In the Lower (southern) Tensas Basin, little modern research has been done, and less has been published. The Fitzhugh phase of Plaquemine culture, defined by Hally

(1972) as existing from about A.D. 1350 to 1550, was gradually replaced from north to south in the Tensas Basin and only existed as a remnant in the southernmost portion into early Protohistoric times. The succeeding (Protohistoric) Canebrake phase, which is as yet only a name coined to include a few of Moore's classic excavations, was Mississippian rather than Plaquemine (Kidder 1986b). The following (Historic) Taensa phase is poorly known but appears to represent a mixture of Plaquemine and Mississippian attributes, perhaps reflecting a refugee situation (cf. Phillips 1970:945; Brown 1935b:Figure 2; Kidder 1986b).

In the lower Ouachita, Catahoula Basin, and Lower Red River regions, no Protohistoric or Historic Plaquemine phases have been defined (Gibson 1977, 1983b:Figure 6; Brown 1985b:Figure 2; Gregory et al. 1987:89–90), although the Lower Red River was historically the territory of a small Natchezan group, the Avoyel (Swanton 1911:272–274; Kniffen et al. 1987:48–49).

In the Baton Rouge and Delta regions, though, there was a Protohistoric (and possibly early Historic) Plaquemine presence, recognized as the Delta Natchezan phase (Phillips 1970:949–950, 952–953; Weinstein 1985; Brown 1985b:Figure 2). The relationship of Plaquemine culture to ethnohistorically documented tribes in these latter regions is not at all clear, as will be seen below.

Paleoenvironmental Data. The basic climatic and biological environments were in an essentially modern (presettlement) configuration by the time period under consideration here. H. Delcourt (1975, 1976) analyzed General Land Office survey records and reconstructed the presettlement vegetation in two Louisiana localities near the southeastern and northwestern margins of Plaquemine cultural distribution.

The Mississippi River had been long since in its modern meander belt by this time (Saucier 1974:Figures 1 and 3; Autin n.d.). Its Lafourche and Plaquemines delta complexes were available for occupation during Protohistoric times, but it appears that the Plaquemine delta complex underwent a significant extension, called the Balize delta complex (Gagliano 1984:Figure 1.28), during Historic times. Giardino (1984:236–237) suggested that this progradation has amounted to about 29 km since 1700. However, his model is based on part on acceptance of Ries's (1936) suggested location of the French Fort de Mississippi (also known erroneously as Fort de La Boulaye). Subsequent investigations (Jeter et al. 1986) cast doubt on the specific location suggested by Ries, though the fort may have well been in that general vicinity.

Phases and Ethnic Groups. The Protohistoric and Historic Plaquemine and Natchezan phases in and near the present study area were included in the phase charts in Chapter 7 for the sake of expressing the apparent cultural continuity. The Protohistoric phases include, in north-south order, the terminal Fitzhugh phase of the Lower Tensas Basin (Hally 1972; Kidder 1986b); the Emerald phase of the Natchez Bluffs region (Brain 1978a:354ff; Brown 1985a:56, 58, 110–111, 139, 188, Tables 1 and 2, 1985b:Figure 2) and the Delta Natchezan phase of the Baton Rouge and Deltaic Plains regions (Phillips 1970: 949–950; Weinstein 1985; Brown 1985b:Figure 2).

The Fitzhugh phase appears to have continued into the Protohistoric period only as a remnant in the Lower (southern) Tensas Basin. Almost nothing has been published about this remnant, but it was alluded to (from an Upper Tensas vantage point) in Hally's (1972) dissertation, in the LMS Lower Valley pottery sorting manual's phase chart (Brown 1978:Figure 1), and (from a Boeuf Basin vantage point) in a 1986 map and a phase chart in a paper by Kidder (1986b:Figures 3 and 4). Both Brown's and Kidder's phase charts show Fitzhugh being wedged out by the Mississippian Transylvania phase; Brown's shows it ceasing to exist at the time of French contacts in the late 1600s, but Kidder's indicates its demise at the time of the De Soto entrada of the 1540s.

The Emerald phase was not among those defined or recognized by Phillips (1970) in his Lower Valley synthesis. After speaking of the "difficulty of organizing the archaeology of the Lower Valley from the Red River and Natchez regions on south" and remarking that the problem was "even more acute in the Mississippi period" (1970:946), he defined a catchall Gordon phase (1970:947–948) which included essentially all of the late Prehistoric and Protohistoric Plaquemine manifestations of the Natchez region, including the Emerald site itself.

Although the Emerald phase was never formally defined in a publication, it has emerged in the phase charts and discussions of more recent LMS researchers. They restricted the Gordon phase to the Transitional Coles Creek (–Plaquemine) period, ca A.D. 1050–1200 and inserted the Anna, Foster, and Emerald phases between the Gordon phase and the Historic Natchez phase (Brain 1978a:Table 12.1; Brown 1978:Figure 1; 1985:Figure 2). The new phases were derived from unpublished Harvard B.A. honors papers by Ian Brown and Vincas Steponaitis and were summarized in terms of ceramics in a brief article by Steponaitis (1981) and in terms of ceramics and other attributes such as settlement patterns in a short chapter in the second Fatherland site report (Neitzel 1983:118–125). Undoubtedly they will be described in detail in the LMS's Natchez Bluffs monograph (Brain, Brown, and Steponaitis n.d.).

As presently construed, the Emerald phase represents a major, and perhaps the major, Plaquemine occupation of the Natchez Bluffs region (Brain 1978a:352ff; Brown 1985a:188). Brain (1978a:357) suggested that the Emerald phase represented the remains of the De Soto province of Quigualtam, a powerful chiefdom. It must be reiterated, though, that Hudson (1985:11, Figure 1) disagreed completely, suggesting instead that Quigualtam was located in the Lower Yazoo Basin.

The situation in the Lower Ouachita, Catahoula Basin, and Lower Red River regions is rather mysterious during the

Protohistoric and early Historic periods. The Myatt's Landing phase has been named but not discussed in any detail as a Plaquemine manifestation dating before A.D. 1500 in the Lower Ouachita region (Gibson 1977, 1983b:Figure 6). However, the materials from the type site located below Monroe, Louisiana, although inadequately described by Moore (1909:24–27), include shell-tempered Mississippian ceramics (1909:26), which may well date after A.D. 1500 in these latitudes. No post-A.D. 1500 phases of any culture have been designated for the Catahoula Basin (Gibson 1977, 1983b:Figure 6; Gregory et al. 1987:89–90), although the Plaquemine Bennett Landing phase which these authors recognize as ending ca A.D. 1500 might conceivably have lasted into the Protohistoric period. The only recent publication which even mentions the Lower Red River region's late Prehistoric and Protohistoric archeological situations is Brown's (1985b) summary of Plaquemine house types. His phase chart (Brown 1985b:Figure 2) shows the Bennett Landing phase in the A.D. 1350–1500 slot, and "Phases Not Defined" for the post-1500 periods.

Another very poorly defined entity, the Delta Natchezan phase, was called "very tentative, if not entirely hypothetical" and "frankly a catchall" by its creator (Phillips 1970:949–950). Brown (1985b:Figure 2) indicated this phase as including the period A.D. 1500–1730 in the Baton Rouge region, but did not discuss it. Weinstein (1985:Figure 1) showed the Delta Natchezan phase as including the period A.D. 1500–1700, but argued that two radiocarbon dates centering in the A.D. 1400s constituted a "good, dated Delta Natchezan component" (Weinstein 1985:10).

Brown's (1984:Figure 4.2) and Weinstein's (1985:Figure 1) phase charts also show a basically late Prehistoric Plaquemine Burk Hill phase in the central portion of the Deltaic Plain, including the period A.D. 1200–1600. However, Brown did not discuss this phase at all, and in his text, Weinstein assigned Burk Hill to the period 1200–1500 (Weinstein 1985:7) and later stated that the A.D. 1500–1700 period only included "one overextended phase...Delta Natchezan" (Weinstein 1985:8).

Turning to the fully Historic period, the northernmost exemplar of purportedly Plaquemine–Natchezan culture is the Taensa phase of the Lower Tensas Basin (Phillips 1970:945).

> However, when the probable Taensa villages described by the French during the period 1682–1706 were surface collected by the LMS, no objects of European provenience were picked up. The ceramic assemblage includes some Natchezan sherds together with shell-tempered pottery more suggestive of relationships to the north. The few stone artifacts obtained also appeared to be related to historic [Mississippian] complexes to the north.... Thus, disappointingly enough — since the Taensa spoke a language closely related to Natchez — these sites failed to reflect an integrated Natchezan culture as expected. (Phillips 1970:945)

As noted earlier in this chapter in several other instances, it is quite likely that some sort of refugee situation may be reflected here. On the opposite side of the Mississippi, just south of Vicksburg and out of the study area, Phillips (1970: 945–946) defined the Oak Bend phase to include a cluster of five Protohistoric to Historic sites which he thought could be safely referred to the Natchezan culture (1970:946). Brain (1978a:355) referred to one of these sites as a proto-Taensa center.

The next Historic Plaquemine–Natchezan phase to the south is the Natchez phase itself. It is outside the present study area, but since it is by far the best documented of these phases, it will be summarized briefly. It was defined by Phillips (1970: 948–949), who noted that "Natchez archaeology is surprisingly limited" but at least had a data base that included three excavated and reported-upon sites: Anna and Emerald had been briefly described by Cotter (1951), and Fatherland (the Grand Village of the Natchez) had been the subject of a monograph by Neitzel (1965). The Fatherland site was revisited in 1972 (Neitzel 1983); Natchez phase settlement patterns were been summarized by Brain (1978b:358–361); and surveys, private collections, and test excavations aimed at identifying specific ethnohistorically described settlements of Natchezans and others in the Natchez Bluffs region were summarized by Brown (1985a). There is little doubt that the direct historical approach has been, and is being, applied successfully in this region, and that the correlation of archeological data and ethnohistorical ethnic group or subgroup identifications is essentially correct.

This is in glaring contrast to the situation in the regions to the south. As already noted, no Protohistoric, let alone Historic, phases have been defined in the Catahoula Basin and Lower Red River regions, although sites of the Historic Avoyel might eventually be found here (Swanton 1911:272–274; Kniffen et al. 1987:48–49). It should be reiterated in passing here that individual sites of the Historic period Tunica have been identified in West Feliciana Parish, Louisiana, on the Mississippi River approximately opposite the Red River's mouth and were discussed in the Mississippian section of this chapter.

Speaking of the regions from the Red River's mouth to the Gulf, Phillips (1970:949) remarked, "Problems of ethnic identification in this area are so complex that nothing can be gained at this point in trying to establish 'historic' tribal phases." In this context, he tentatively named the Delta Natchezan phase as "a catchall to include all sites in [these regions]...that have yielded Natchezan pottery."

As has been seen, Brown (1985b:Figure 2) extended the Delta Natchezan phase into what is here called the Historic period, showing it as including the period A.D. 1500–1700 on his phase chart without discussing it at all. Weinstein (1985:Figure 1) showed this phase as solely Protohistoric, A.D. 1500–1700 (if not earlier; cf. the radiocarbon dates in the 1400s, cited below), and succeeded by various tribes in

Historic times. An examination of recent discussions of three of these tribes, the Houma, Bayogoula, and Chitimacha, will illustrate some of the complexities of the archeological-ethnohistorical research in these regions.

Weinstein (1985:9) stated that the Houma and Bayogoula “shared the same basic Plaquemine culture as the Natchez.” As has been noted, though, the Houma and Bayogoula spoke Muskhogean languages (Swanton 1911:274ff), and Muskhogeans are generally believed to be associated with the Pensacola complex intrusion of Mississippian culture (Bayou Petre phase) into Plaquemine territory in late Prehistoric, Protohistoric, and Historic times (Phillips 1970:949-954; McKnight 1984; Davis 1984; Giardino 1984; cf. also Weinstein 1985:Figures 1, 9, and 11). The evidence of their cultural affiliation(s) is sketchy and somewhat inconsistent, if not contradictory.

No Historic Houma (or Ouma) sites were identified, excavated, or reported in detail until recently (Guevin 1987). There may have been a Houma component at the Angola Prison Farm site. Despite their Muskhogean linguistic affiliation, their earliest recorded location, ca A.D. 1682-1700, was well up the Mississippi Valley, opposite the mouth of the Red River, on the blufflands of the present Mississippi-Louisiana border zone (Swanton 1911:285ff, Plate I; Galloway 1982b:Figures 1, 2, and 3; Giardino 1984:248; Kniffen et al. 1987:49), and it is at least possible that they were an offshoot of the Chakchiuma, a Yazoo Basin group (1987:49–50). They were apparently traditional enemies of the Muskhogean–Bayogoula (1984:249, 1987:51).

Quimby (1957) believed he had excavated the Bayogoula–Mugulasha village, but it now appears that he was wrong, and that the Historic Bayogoula had a Mississippian ceramic assemblage (Fredlund 1982:108ff, 1987:51).

Although Neuman (1984:278, 323) stated that the Chitimacha were probably, or at least possibly, the historic heirs of the Mississippian culture, Weinstein (1985:10) suggested that the Chitimacha were derived from Plaquemine stock. The Chitimacha were historically occupied lands west of the Mississippi River, including the coastal Petite Anse region (Swanton 1911: 337, Plate I; Giardino 1984:252–254; Kniffen et al. 1987:53), which was the scene of the intrusive Late Protohistoric Mississippian Petite Anse phase (Brown and Brown 1979; Brown 1984:Figure 4.2; Weinstein 1985:Figures 1 and 11). However, test excavations at a Chitimacha site complex in St. Mary Parish (Goodwin et al. 1985:201ff; R. Christopher Goodwin, personal communication) revealed a grog-tempered Natchezan (i.e., Plaquemine) ceramic assemblage, associated with European trade goods. It is also quite possible that many, if not most, of the Bayou Goula site’s Native American artifacts, dominated by Natchezan (and perhaps Plaquemine) ceramics, were made by a Chitimacha group (Fredlund 1982:36).

Patterns on Historic Chitimacha basketry have been compared to patterns on both Petite Anse phase Protohistoric Mississippian pottery (Giardino 1984:253–254) and on certain Prehistoric Coles Creek ceramics (Kniffen et al. 1987:150).

However, the Mississippian pottery type in question, Cracker Road Incised, is a shell-tempered variant of the Natchezan (i.e., Plaquemine) type Fatherland Incised (Brown and Brown 1979; Brown 1985a:190), and the Coles Creek period type (apparently, the Pontchartrain Check Stamped type; 1987:150) continued from the coastal Coles Creek well into the coastal Plaquemine culture (Brown 1982a:21).

Key Sites. At the northern end of the Protohistoric and Historic Plaquemine cultural distribution, no major sites have yet been reported from northeast Louisiana. Although a number of the sites reported upon by Jones (1983) along the Ouachita River near Monroe have yielded Plaquemine ceramics, they all appear to be basically late Prehistoric, ca A.D. 1200–1400. Some of these sites have also yielded Protohistoric ceramics, typed in that report as Fatherland Incised (Jones 1983:134ff), but they are virtually all shell tempered and should be reclassified as Cracker Road Incised.

In the Tensas Basin region, any site of the Protohistoric remnant of the Fitzhugh phase, or of the Historic Taensa phase, that might be excavated using modern techniques and reported upon fully, would automatically become the key site. Brain (1978a:355) remarked in passing that the Glass site, on the Mississippi side of the Mississippi River, was an important proto-Taensa site, but it has not been described.

The real key sites of Protohistoric and Historic Plaquemine–Natchezan culture, as far as present knowledge is concerned, are in the Natchez Bluffs region. They are thus outside the present study area, but must be at least mentioned. The key site of the Emerald phase is, of course, the Emerald Mound site itself, an enormous artificial bluff surmounted by mounds (Cotter 1931; Brain 1978a:352ff, Figure 12.6). In Brain’s (1978a: 357) reconstruction, but not that of Hudson (1985), the Emerald site “was probably the seat of that great chief’ of Quigualtam, who defied De Soto. Brain (1978a:356) stated that construction expanded on the Foster site and occurred at “an undetermined portion” of the Fatherland site during this Protohistoric period. Several other sites in this region with Emerald phase components have been described by Brown (1985a).

During the Historic period in the Natchez Bluffs region, the major site was of course the Grand Village or Fatherland site, just south of present-day Natchez. It was extensively excavated in 1962 by Neitzel, whose (1965) report also described the findings of unpublished excavations by Moreau Chambers in 1930. Neitzel conducted additional excavations at Fatherland in 1972; he died in 1980, and his “essentially completed” report was edited by LMS archeologists and published (Neitzel 1983). Fatherland was summarized, by comparison with Emerald, as a “modest site with only a few small mounds” (Brain 1976a:360), but its extensive excavations, relatively thorough and modern reports (especially the 1983 volume), and clear connection with the ethnohistorically described Natchez–French contact situation combine to make it one of the most important sites in the Lower Mississippi Valley, especially for this period.

Once again, Brown's (1985a) work contributed significantly. He divided the Historic period into early and late subperiods; the former (A.D. 1682–1699) is actually terminal Protohistoric in the terminology used here, and only the latter (A.D. 1700–1730) is in what is called the Historic period here. Brown worked at five sites with components of his early Historic subperiod, and found them to be "characterized by small numbers of historic European items." He also worked at two sites with Late Historic components, which "not only have larger quantities of historic trade goods, but they have much more variety in the kinds of materials" (Brown 1985a:133–139).

No Protohistoric or Historic Plaquemine sites have been excavated and/or reported upon in any detail in the Catahoula Basin or Lower Red River regions. However, the Angola Prison Farm site, briefly discussed by Ford (1936b:136–140), produced a mixed assemblage including some Plaquemine and Natchezan types (Phillips 1970:949). Although Angola is generally regarded as a Tunica site (Brain 1977:3, 10–13), it is also in the vicinity of Historic Houma settlement (Kniffen et al. 1987:49), and as noted above, the Houma may well have been in the Plaquemine–Natchezan cultural tradition.

The next region with any claim to a key site is the Baton Rouge region. This region includes the original Plaquemine culture type site, Medora, which was believed by Quimby (1951:91) to date between A.D. 1300 and 1600. However, Brown (1985b:256) remarked that it is now apparent that the site was occupied primarily if not exclusively during late Coles Creek and early Plaquemine times, between about A.D. 1000 and 1350.

The other classic Plaquemine culture site in this region is Bayou Goula (16IV11) (Quimby 1957). It had both Prehistoric Plaquemine and Historic (European goods with Natchezan Native American artifacts) components. The Plaquemine component is now regarded as mainly Transitional Coles Creek (–Plaquemine) and definitely prehistoric (Hally 1972:303; Fredlund 1982:32).

Phillips (1970:949) noted that he had questioned Quimby's suggested identification of the Bayou Goula site's Historic component as the Bayogoula–Mugulasha settlement observed by the French in 1699–1700, but was unable to offer any alternative suggestion. However, Brown (1976) reexamined the evidence and argued convincingly that the Historic component was actually the remains of a French concession which was known to have existed in that immediate locality from 1713 to 1730 (cf. also Fredlund 1982:29ff, 63ff).

Fredlund (1982:69ff) conducted a survey of the Bayou Goula site's locality, and only about 500 m away found another site, 16IV134, which he surface collected and tested. It yielded a predominantly shell-tempered ceramic assemblage (Fredlund 1982:90ff) and is now believed likely to have been the site of the Bayogoula–Mugulasha settlement visited by Iberville.

Returning for a moment to Quimby's Bayou Goula site itself, the question that remains is the identification of the Historic Native American group(s) responsible for the Natchezan (and perhaps, Plaquemine; Fredlund 1982:58–59) artifacts found in association with the remains of the 1718–1730 French occupation. Fredlund (1982:64) argued that this Native American assemblage was not as homogeneous as Quimby suggested, and that "several different aboriginal groups interacting with the concession" were probably responsible for the "variety of aboriginal artifacts, particularly ceramics." The aboriginal group living closest to the concession were Chitimacha; nearby were settlements of Houma, Acolapissa, and Bayogoula, and other groups were present at various times (1982:36–37).

In the Deltaic Plains, Plaquemine culture was being impinged upon in Protohistoric times, and especially by Historic times, by the Mississippian Pensacola complex from the east, by proto-Attakapa culture from the west, and by an apparent Yazoo Basin-affiliated Mississippian outpost in the Petite Anse region (Brown and Brown 1979; Knight 1984; Davis 1984; Weinstein 1985). No Plaquemine or Delta Natchezan sites dating to the Protohistoric or Historic periods have been extensively excavated and reported upon in these regions. Weinstein (1985:9–10) mentioned in passing the Thibodaux site, which was tested and had a Delta Natchezan ceramic assemblage in its upper levels. However, no trade goods were mentioned, and the radiocarbon dates, A.D. 1435 ± and A.D. 1490 ± 60, suggest a terminal Prehistoric date, or very early Protohistoric at the latest.

Settlement Data. This discussion will proceed from north to south by regions, and will include both Protohistoric and Historic settlement data in the discussion of each region.

Nothing has been published about the settlement pattern of the Protohistoric remnant of the Fitzhugh phase in the Lower Tensas Basin. The Taensa themselves were found by Iberville in 1699, living on Lake St. Joseph, a Mississippi River oxbow lake, in present-day Tensas Parish, northeast Louisiana (McWilliams 1981:127ff). Iberville described "about 120 huts stretched out over a distance of 2 leagues [about 10 km] along the lake shore" (1981:128). He added,

> In this place is a rather fine temple. Once this was a large nation, but now they are no more than three hundred men. They have very big fields and a very fine location. (1981:128)

In the Natchez Bluffs region, Brain (1978a:354ff) summarized selected settlement pattern data for the Protohistoric Emerald phase and the Historic Natchez phase. By the beginning of the Emerald phase, the major Prehistoric Plaquemine center, the imposing Anna mound site on the bluff edge overlooking the Mississippi River, had been abandoned, and an inland replica of Anna had been built up at the Emerald site (Brain 1978a:356, Figure 12.6). At Foster and Fatherland, mounds were arranged around plazas, with the major mound at the north end. Brain did not discuss minor mound sites or nonmound sites of the Emerald phase; however, several such sites were tested and described by Brown (1985a). Brown (1985b:264–272) also published a summary of Plaquemine house types, including those of the Emerald phase at his tested sites and classic sites. In summary, the rectangular wall-trench house type, ultimately derived from Mississippian peoples to the north, was adopted in the late Prehistoric Anna phase, and became the most popular type in the Natchez Bluffs in the Emerald and Natchez phases. Less popular were rectangular houses with individually set posts, and houses combining these techniques (Brown 1985b:277–278).

As for the Natchez phase, Brain (1978a:358–360) noted that it represented "a marked decline from earlier periods" although not as severe as the dramatic depopulation of the Yazoo Basin. (This is one of the lines of supporting evidence for Brain's contention that the De Soto entrada had never actually contacted Quigualtam–Emerald.) The focus of settlement had shifted (actually, by 1682, when La Salle arrived) to the modest Fatherland site. The dominant mound location had shifted to the northeast quadrant of the plaza margin (Brain 1978a:361). Brain (1978a:360) noted that in the Natchez locality only a small number of villages (5 to 12, depending on the source) were recorded by the French and that caution should be exercised, because these were probably not concentrated settlements. Brown (1985a:4) expanded on this theme:

> we now have a total of 31 protohistoric/historic components on record, situated in seven different village areas. Historical documents have revealed the existence of at least nine Natchez villages in the early eighteenth century, but we have adequate information on only seven of them [Swanton 1911:45–49; McWilliams 1981:72–73; some of these documents refer to the Natchez as the Theloel, a name which would certainly confuse inexperienced researchers]. Although the French employed the term "village," its application to the historic Natchez settlement pattern is confusing. The Natchez did not live in nucleated villages. The Grand Village, home of the Great Sun, served as the sociopolitical nucleus for the Natchez as a whole, but it was largely a vacant ceremonial center (Neitzel 1983:129–134). The rest of the society was scattered across the landscape in districts which came under the jurisdiction of secondary members of the Sun class. Each district was characterized by a minor ceremonial center and a number of hamlets, each of which consisted of several houses. A Natchez "village" therefore, often covered quite a large area, and should be referred to as a "village area." (Brown 1982a:4, 6)

As noted above, the house types used during the Emerald phase continued throughout the Natchez phase (Brown 19856).

South of the Natchez Bluffs, the quantity and quality of data on Protohistoric and Historic Plaquemine–Natchezan settlement diminished tremendously. Weinstein's (1985) review of Plaquemine culture in the coastal regions discussed settlement patterning only during the Prehistoric phases. With the demise of the hypothesis that the Bayou Goula site represented a historic Bayogoula–Mugulasha settlement, the settlement pattern of houses in a row there is now interpreted as a French settlement (Brown 1976; Fredlund 1982:54–55). This leaves us with no real basis for discussion of internal settlement patterning of Protohistoric Plaquemine or Historic Delta Natchezan sites in the Baton Rouge region or the Deltaic Plains.

Giardino (1984) reviewed the locations of Historic (and terminal Protohistoric, in the terminology used here) Native American settlements in the Deltaic Plains. He noted that, according to documents, in these regions, at least,

> the Louisiana Indians commonly moved their habitations, frequently settling in villages previously occupied by other Indian groups. In addition, several examples of Indians settling in village still inhabited by other groups are found. (Giardino 1984:237)

The difficulties for archeological interpretations of ethnicity that are posed by this situation are obvious.

Subsistence Data. Neuman (1984:267) summarized one of the major data gaps in Plaquemine studies:

> Data on Plaquemine subsistence patterns [are] not very substantial. It is generally assumed that the people of this culture were basically agriculturalists, but this assumption is not well documented in the archaeological record. Since the esteemed crop trinity of corn, beans, and squash had been reported from numerous sites in the eastern United States by this time... it is likely that comparable sites of the Plaquemine culture had an agricultural base as well. The almost total lack of physical evidence for these crops may be a case of poor preservation, or it may be due to the fact that more mound centers than hamlets have been investigated.

Certainly, another factor is the lack of modern excavations using flotation and other recovery techniques oriented to this data base. Brown's (1985a) work in the Natchez Bluffs region was oriented toward studies of private collections of mortuary ceramics, data from LMS surface collections, and test excavations (Brown 1985a:1). Although trash pits were encountered (e.g., Brown 1985a:176), no flotation efforts or macrofossils of plants (or animal bones) were reported.

In another publication, Brown (1985b:253–254) pointed out that Plaquemine sites were commonly located on natural levee soils favorable for agriculture and that "adoption of the Mississippian complex of beans, squash, and Northern Flint maize is believed to have been the impetus for the observed [late Prehistoric Anna phase] population explosion." However, he only cited the unpublished LMS monograph (Brain et al. n.d.).

The only real data base for Protohistoric–Historic Plaquemine–Natchezan subsistence is from the Fatherland site. Cutler (1965, 1983) analyzed the scanty plant remains from both of Neitzel's excavations there. He noted that maize from an old surface beneath Mound C was "typical for corn from about the 1500s" (Neitzel 1965:102; cf. Blake 1976:Table 1.4, who limits the Fatherland specimens to ca A.D. 1600–1700), and included late Eastern Flint as well as intermediate hybrids and a very few specimens of the older race of many rowed, small cobbed maize. A squash of a species probably brought from the Caribbean or Mexico by Europeans was also identified. In the later samples, a few additional maize fragments were found, along with an unspecified number of charred common cultivated beans, and a few hickory nut and black walnut fragments (1983:166).

Larger samples of faunal remains were recovered and were analyzed by Cleland (1965) and Penman (1983). Cleland (1945: 100–101) suggested that although bottomland or aquatic species were the most common among 26 identified animal species, upland deer hunting was probably the most important aspect of the hunting economy. Also, the deer bones were differentially distributed, with the choice fore and hind quarters apparently selected for Mound B, presumed to have been the Great Sun's domicile (Neitzel 1963:64–67). European animals (cow and pig) were extremely scarce. Penman (1983:164–165) found again that deer provided the greater part of wild meat, with bear, alligator gar, and channel catfish also common. However, in his samples, cow accounted for much more of the meat than deer. Horses and pigs were important food sources, and chickens were present. Again, the association of choice deer portions with the nobility was suggested. Bison and turkey, which had been absent from Cleland's samples, were also present. The differences in these two faunal samples from the same site clearly indicate the importance of sampling strategies in excavations.

Another aspect of Plaquemine–Natchezan subsistence was suggested by the excavation of the Sturdivant Fishweir site in northwest Amite County, Mississippi, about 40 km southeast of the Fatherland site (Connoway 1982). This site consisted of a woven structure of pine poles and split cane mats, in the Homochitto River, and was radiocarbon dated to the early 1600s (or late 1500s), contemporary with the Emerald phase.

At the Bayou Goula site, Quimby (1957:113, 133) reported that a charred locust bean and animal bones were found in a refuse pit. The pit included no trade goods, but was classed as a Historic feature due to its stratigraphic position and the present of Fatherland Plain sherds. Quimby (1957:133) also reported that "about 15 small, charred fragments of corncobs" were found "in a pit associated with the old humus level." This pit's other contents were not listed, but as noted above, the early occupation at this site appears to have been primarily during the Transitional Coles Creek–Plaquemine period, ca A.D. 1000–1200. Quimby (1957:132) noted that a preliminary identification of animal bones from Bayou Goula showed the presence of deer and several other terrestrial and aquatic animals, but no mention was made of their associations with the widely separated (in time) occupational components.

Mortuary Data. This data category is particularly nebulous on the Protohistoric level, and is dominated by one site (Fatherland) on the Historic level. At least one of Moore's sites from northeast Louisiana might possibly represent a Protohistoric Plaquemine burial situation. At Sycamore Landing on Bayou Bartholomew, Moore (1909:112ff) excavated a cemetery in a low rise and found 36 very poorly preserved burials, accompanied by 78 ceramic vessels and 11 pipes. The ceramics were regarded as generally "inferior" and without shell tempering, with "little originality of form or decoration" (1909:119). Only two well made specimens were illustrated; one is definitely Prehistoric, but the other could well be Protohistoric. The presence of a number of ceramic elbow pipes, often found in Protohistoric contexts, is also suggestive, as is the presence of stone pipes with Southern Cult-like designs (cf. Williams and Brain 1983:416ff). Jones (1983:106) revisited the land-leveled Sycamore Landing site; she observed a predominance of pottery with no shell temper, especially of the Coles Creek period, but suggested that several components seem to be represented.

Another possibly Protohistoric Plaquemine site visited by Moore in this region is Mound Place (1909:166ff). Here, he found 13 burials extended supine, plus two layers of bones containing 14 and 16 crania, and a bunched burial. There were 14 vessels (proveniences not indicated), 13 of which were not shell tempered. The only illustrated specimen, a long necked bottle with a peculiar compound body and curvilinear incised decoration, could be Protohistoric.

Two of the four vessels illustrated by Moore (1913:49ff, Figures 20 and 23) from the Canebrake Mounds site on the Tensas River appear to be Protohistoric (if not Historic) Natchezan specimens. However, the type(s) of associated burials are not stated, and the Canebrake phase recently named by the LMS (Kidder 1986b) is Mississippian; these may be merely trade vessels.

Along the Mississippi River south of Vicksburg, Moore (1911) excavated at two sites which yielded Natchezan ceramics; both are outside the present study area and inadequately reported upon. At Glass (1911:381ff), in a mound which had apparently contained burials that were totally disintegrated, he recovered 35 vessels. At Oak Bend Landing (1911:378ff), he found 28 burials, mostly bunched, and including many skulls, in a mound, with a total of 46 vessels.

Once again, the best data are from Fatherland, which will be summarized in some detail despite its location outside the present study area. In 1930, Chambers found 25 burials (erroneously reported as 59 burials by Ford 1986b:61–4) at the base of Mound C (Neitzel 1963:10ff). They were oriented in various ways, and buried in various modes, including extended, flexed, and bundled. At least two children were buried in wooden chests with metal hardware. Large quantities of European materials and Native American artifacts, especially pottery vessels, were found with them, and were described by Nietzel. Of particular interest was Burial 15, an adult extended supine and accompanied by a great quantity of varied, high quality trade goods (Neitzel 1965:43). It was suggested that, "This especially endowed individual may well have been the Great Sun, special friend and arbitrator for the French, who died about a year before the massacre in November, 1729" (Neitzel 1965:84).

Only one additional fragmentary burial was found in 1962 (Neitzel 1965:31, 40). Twelve new burials were excavated in 1972 (Neitzel 1985:43ff). They were concentrated near an important structure (Feature 1), which may have been the house of the Great Sun's brother Tattooed Serpent, who died in 1725, or of some other important parsonage. Two of these burials were extended supine, three were skull burials, and seven were carefully arranged bundle burials. Apparently, no grave goods were associated.

In his exploration of the Red River, Moore (1912:504–507) encountered only one site which yielded a vessel (1912: Figure 11) definitely of a Protohistoric–Historic Plaquemine–Natchezan type. This was the Laborde Place in western Avoyelles Parish, where 13 burial pits in a mound were excavated. A number of these contained, or included, multiple skulls. The illustrated (Fatherland Incised) bowl came from a burial pit which contained "twenty-eight crania lying with quantities of other bones (1912:506). One of the other burials yielded glass beads, and Moore (1912:507) concluded that, "Probably all the burials in this mound were post-Columbian." It is at least possible that this site was utilized by the poorly known Avoyel, a Natchezan group who were historically documented in the Lower Red River Valley (Kniffen et al. 1987:48–49).

Given the reinterpretations of the Bayou Goula site summarized above, none of the burials from that site can be attributed to Protohistoric–Historic Plaquemine or Natchezan peoples. The Medora site did not yield any burials. Delta Natchezan burials have not been reported.

Exchange and External Relationships. This subject has not been synthesized for Plaquemine culture in the Protohistoric period and is dominated by the European connections along the Lower Mississippi Valley during the Historic period. The impression given by the extant literature is that Plaquemine culture was on the retreat from its northernmost, southeasternmost, and southwesternmost expansions during late Prehistoric and Protohistoric times, faced by northern and Pensacola complex Mississippian cultures and by proto-Attakapa culture.

Brain (1978a) and Williams and Brain (1983:414) emphasized the Mississippian influence on the late Prehistoric origin and Protohistoric to Early Historic development of Plaquemine–Natchezan culture, with a time lag from north to south. They noted that the major ceramic influences were on the utilitarian wares and that the fine wares used for ceremonial purposes were less affected by the Mississippianization process. The mortuary ceramics from Fatherland (Neitzel 1965:Figures 19–21) appear to be a relatively homogeneous assemblage, with little evidence for trade other than one apparent Quapaw "teapot." Also, Gulf Coast shell appears to be much less common in reported Plaquemine and Natchezan assemblages than it was in Mississippian and Caddoan contexts. As noted above, it would appear that the Mississippian rectangular wall-trench house type was adopted by northern Plaquemine–Natchezan groups in late Prehistoric times and spread southward as far as the Natchez Bluffs (Brown 1985b:Table 4).

In the coastal zone, Phillips (1970:949–953) and Davis (1984:220–221) noted an intermingling of Delta Natchezan and Pensacola Mississippian ceramics at a number of sites. Phillips (1970:954) spoke of a Mississippian expansion on a large scale, but Davis (1984:228ff) suggested that small-scale "trickle trade" and reciprocal exchange, contacts by hunting (or war) parties, and frequent but irregular small population movements due to shifting sociopolitical alliances might account for the observed archeological situation. It should also be noted that the Deltaic Plains are inherently a rather unstable environment and that movements might have been forced fairly frequently by floods, hurricanes, etc.

As has been seen, one of the contending versions of the De Soto entrada involves significant contact between the Natchez and the Spanish in the 1540s. The French contacts with the Natchez began with La Salle's expedition in 1682 (Galloway 1982; Brain 1982; Brown 1982). Brain (1971, 1982:53ff) suggested that the Natchez were already a hybrid group by this time and that some of the complexities of their famous social structure were related to this process of assimilation. In particular, the Grigra, Tioux, and Koroa were closely tied to the Natchez, although they were apparently called by a confusing variety of names (Brain 1982:55; Brown 1932:179). The Koroa, in particular, may well have been middlemen between the Natchez and the Caddo (Jeter 1986:49; Kidder 1986b, 1988). Brown's (1985a) work suggested at least one possible site of an adopted northern group (Brown 1985a:16, 190).

Brown (1982:179) noted that by this means, the Natchez "maintained their position as a formidable power" and had "relatively few relations" with the French between 1682 and 1700, or even until 1712, when a trading post was established. By then, pro-English factions had developed in the localities northeast of the Fatherland site. Unlike the essentially peaceful history of Caddoan European contact, the Natchez–European relationships became unstable and sometimes violent. As summarized by Brown (1982:181; cf. Swanton 1911:186ff for details), four wars were fought between 1716 (when Fort Rosalie was built at Natchez; Wilson 1982) and 1729. This situation culminated in the Natchez Massacre of 1729 and retaliation by the French which effectively ended in a rout of the main remnant force of the Natchez near Natchitoches, Louisiana (Swanton 1911:223–250). Many of the scattered Natchez joined the Chickasaw in northeast Mississippi. Eventually, they were removed to Oklahoma in the nineteenth century.

OTHER PROTOHISTORIC AND HISTORIC CULTURES AND ETHNIC GROUPS

In addition to the Mississippian, Caddoan, and Plaquemine (Natchezan) Protohistoric and Historic cultures and ethnic groups summarized above, several other cultural entities are identifiable in the archeological and/or (especially) the ethnohistorical records of the study area. None of these other cultures or ethnic groups, however, has been the subject of a well reported intensive or extensive excavation, or of any other kind of thorough archeological study. Their treatment here, therefore, will be brief. Once again, a general north-south order will be used.

De Soto Provinces. Mention has already been made of a number of provinces reported by the De Soto entrada, and of the conflicting attempts to identify them in terms of archeological phases and sites. The following is merely a sequential summary of provinces visited or reported; reference is made to the various studies of the entrada for the detailed arguments for or against the proposed identifications (Swanton 1939; Brain et al. 1974; Brain 1978b, 1985a, b; Dickinson 1980, 1986; P. Morse 1981:61ff; Morse and Morse 1983:305ff; Hudson 1985).

It is generally agreed that the Spaniards entered northeast Arkansas upon crossing the Mississippi from the province of Quizquiz in northwest Mississippi in June, 1541. From there, they visited Aquito, Casqui, Pacaha, Casqui again, Quiguate, Coligua, Calpista, Palisema (Palisma), Quixila, Tutilcoya, Tanico, Cayas, and Tula. By this time, they were in western Arkansas. From here, they went down either the Ouachita Valley (Dickinson 1980, 1986) or the Arkansas Valley (Hudson 1985), visiting Quipana, Anoixi, Quitimaya, and Utiangue (Autiamque), where they spent the winter of 1541–1542.

According to the traditional version (favored by Swanton Brain, and Dickinson), the Spaniards then left Arkansas via the Ouachita Valley, never to return. In Hudson's version, though, they stayed in Arkansas most of the remainder of their time on land in North America. In any event, the Spaniards next visited Ayays, Anilco, and Guachoya, and De Soto died in that vicinity (either in northeast Louisiana or southeast Arkansas). Next, under Moscoso, they visited Catalte, Chauguate, Aguacay, Pato, Amaye, Naguatex, and Guasco, after which they retraced their route back to Anilco. They then wintered (1542–1543) in nearby Aminoya, from where an exploratory party visited Tagoanante. They built boats and eventually started down the Mississippi in July, 1543. They passed Huhasene (a settlement of the powerful chiefdom of Quigualtam), were pursued by a fleet of canoes, went through the territory of another (unnamed) chiefdom, and eventually escaped to the Gulf.

The vague and sometimes contradictory descriptions by the Spanish, and the major disruptions in Native American societies that occurred before, during and especially after the entrada, have combined to make it extremely difficult to identify these provinces archeologically. At present, none of the proposed identifications in or near the study area are universally accepted by interested and qualified scholars, and the prospects for resolution of the disagreements do not appear bright.

Mitchigamea. In 1673, Marquette and Jolliet recorded a settlement of people by this name west of the Mississippi River and north of the Quapaw (Arkansas) settlements (Phillips et al. 1951:396–398; Morse and Morse 1983:316). The settlement has never been identified, and indeed, Phillips and his colleagues agreed with a suggestion that it was simply another Quapaw village. However, D. Morse has suggested that an inland site in northeast Arkansas, out of the present study area, may have been a settlement of the Mitchigamea, a displaced Illinoian group; he tested the site in 1988 and recovered a number of European trade materials. (Morse, personal communication).

Other Marquette–Jolliet Groups. The maps made by, or at least attributed to, Marquette and Jolliet (Phillips et al. 1951: Figure 71; De Vorsay 1982:Figure 2) listed several other mysterious groups along the Lower Arkansas River (in addition to the Tanika or Tunica and Akoroa or Koroa; Dickinson 1980; Jeter 1986). These included the Matora or Malora, the Papikana or Papikaha (which sounds suggestively like Pacaha), and the Paniassa. Dickinson (1980:6) asserted that the latter were the same as the Maintou or Menton and the Wichita, but no evidence was cited, and the relationships of these names are certainly not obvious. Again, none of these groups have been identified archeologically, with the possible exception of the Tunica and Koroa in southeast Arkansas and northeast Louisiana (Jeter 1986; Kidder 1986b, 1988), as summarized in the Mississippian discussions above.

It should also be mentioned that during the Indian Removals of the 1800s, groups such as the Cherokees and Choctaws passed through Arkansas, and were permitted to settle in Arkansas briefly (McGimsey 1969:44–46; Dickinson 1980:9). However, once again, none of these settlements have been identified archeologically.

Kniffen et al. (1987:44ff) summarized the major Native American groups known to have inhabited Louisiana around A.D. 1700. Most of these have already been discussed, e.g., the Caddoan (Ouachita, Yatasi, Doustioni, Natchitoches, and Adaes), Plaquemine–Natchezans (Natchez, Taensa, Avoyel, and possibly Houma and Chitimacha), and Muskhogean-speakers along the coasts, probably related to the Protohistoric Mississippian Pensacola complex peoples (Bayogoula, Mugulasha, Quinipissa or Quinapisa, Acolapissa or Colapissa, Washa or Uachia, and Chawasha). Giardino (1984) summarized the data on the latter (coastal) groups and their settlements in more detail.

In addition to these groups, the major indigenous Native Americans of Louisiana were the Atakapa (Attakapa) group of southwest Louisiana. They included both the Attakapa themselves along the coats and the Opelousa, inland. They were summarized ethnohistorically by Swanton (1911:360ff) and by Kniffen et al. (1987:44ff); the latter noted that their "chief distinction lay in the meagerness of their material culture" (1987:44). They were tentatively identified on the basis of surface collections and test excavations (Weinstein 1985), as intruding upon the coastal Plaquemine culture from the west in late Prehistoric and Protohistoric times, but no reports on definitely identified Attakapa sites have been published.

The major displacements of Native Louisiana tribes after 1700 were summarized by Kniffen et al. (1987:71ff). The even more complex situations with regard to immigrant tribes in Louisiana were summarized by the same authors in another chapter (1987:83ff). Of these groups, only the Tunica have really been studied archeologically (Brain 1977, 1979, 1981). The others, both native and immigrant, await identification archeologically (Neuman 1984:327).

HISTORIC EUROPEAN PERIOD

G. Ishmael Williams, Jr.

Previous archeological research on the historic European period of occupation of the study area is very limited compared to the prehistoric Native American periods. This is due to a number of factors, with the most important one being that comparatively fewer archeologists have been engaged in historic sites research in the study area and over a much shorter length of time. In Arkansas, it was not until the 1970s that a professionally trained historic archeologist was stationed full time in the state. Historic archeology in Louisiana also began decades after research had been carried out on the prehistoric sites in the state, although the early contributions made in cultural geography at Louisiana State University went a long way towards providing a firm foundation for later development of historic sites research. The extent of focused historic archeological research tends to be unevenly distributed across the study area in that they either fall into select topical and regional areas depending on the specific research interests of the resident historic archeologists in Arkansas and Louisiana or in the locations where federal agencies have undertaken cultural resource investigations. For example, the substantial contributions made in Natchitoches Parish derive from the extended research by Pete Gregory at Northwestern State University on Colonial French and Spanish culture at Natchitoches and the Presidio de Los Adaes. Similarly, Charles Orser at Louisiana State University, has focused on plantation archeology in the Mississippi Delta and on Avery Island, and Skip Stewart–Abernathy on early urban development in the town of Old Washington in Hempstead County, Arkansas.

Historic archeological study is also prominent in areas under federal management such as rivers under the jurisdiction of the Corps of Engineers at districts in New Orleans, Vicksburg, Memphis, and Little Rock and at military reservations, national parks and forests. Compared to other areas in the region, the lower and middle reaches of the Mississippi, Red, Atchafalaya, and other rivers in Louisiana (where numerous archeological site studies have been required in advance of flood control and navigation construction and maintenance) have been exceptionally well documented by site surveys, site evaluation, limited excavation, and large inventories and overviews. The Fort Polk Military Reservation in Vernon, Sabine, and Natchitoches parishes is another intensively studied area. In Arkansas, the National Park at Arkansas Post in Arkansas County has been the subject of historical and archeological study, particularly during the planning stages of the park's inception. A number of existing and proposed state parks in Arkansas and Louisiana have been the subject of historic archeological study. Despite the vigorous research carried out at some locations in the study area, a great deal of Arkansas and Louisiana historic archeology remains unexplored.

In recognition of the importance of preserving and understanding a wide array of historic resources, the Arkansas and Louisiana archeological state plans (Davis 1982; Smith et al. 1983) emphasize a broad set of substantive research themes, study units, or activity periods to guide historic archeology in the region. These themes outline the significant historical topics and questions relevant to particular regions within the two states. The research themes derive from standard chronological–topical historical frameworks well known for the region, as well as sociocultural approaches originating from disciplines such as anthropology, geography, folklore, and architectural history. Important historical study themes identified for both states include such topics as the early exploration/contact period, frontier pioneer settlement, the development of transportation and industry, the antebellum yeoman farmstead and plantation economies, Civil War disruption, and urbanization, to name a few.

The following discussion of the historic cultural resources in the study area will not include a complete and detailed history of the period between early French and Spanish contact and the present. Rather, our objective is to summarize the significant historical events that shaped the settlement and development of the region and to highlight, as per the state plans for Arkansas and Louisiana, the major research themes and problems that have occupied historic archeologists working in the area. In addition, where gaps in the record occur for the study area, we have tried to draw from the larger regional body of historic sites research to suggest classes of potential historic archeological sites and possible unifying research themes that may guide future study.

ADAPTATION IN HISTORIC ARCHEOLOGY

This chapter, in carrying on the general organizing theme developed for the prehistoric periods, has attempted to lay out the range and general characteristics of socioeconomic adaptation for the historic occupations in the study area. This use of the adaptation concept is intended to facilitate regional comparison throughout the Southwestern Division of the state of historic archeological knowledge and to provide a framework for the development of recommendations for cultural resource management. In addition, it is hoped that the adaptation concept will serve the professional audience as a means of integrating and unifying the diverse approaches that have characterized historic archeology in a way that will bring new insights to our understanding of the historical development of Louisiana and Arkansas.

The use of an adaptation approach in the study of historic period culture would seem to be open to even broader and more dynamic applications as a result of the multifaceted nature of historic data. For example, by capitalizing on a rich data base of archival, oral, architectural, and archeological data available to historic archeologists, the temporal units of analysis can be drawn at fine levels and can be extended beyond the site level to encompass aspects of the kinship, social, economic, religious, and political spheres within which historic cultures developed and adapted.

One potential model for historic archeology with a strongly economic approach to cultural adaptation has been outlined by Bennett (1969) in his study of contemporary rural Northern Plains ranchers and farmers. Bennett approaches the question of adaptation of these modern historic groups in terms of short term adaptive strategies and long term adaptive processes. Adaptive strategies are defined as the patterns of behavior formed by the collective adjustments that people devise to obtain and use resources and solve other immediate problems. Adaptive processes are those changes produced over a long time span by repeated use of such strategies and adjustments that become part of the tradition or culture of a people. Bennett sees adaptation as operating both at a conscious level via trial and error coping by individuals and social kin networks and in terms of the development of a cultural tradition over a long period of time. He also views adaptation as both conditioned by and feeding back into the preexisting cultural, social, and economic dimensions of the groups in question (Bennett 1969: 321). Thus, it maybe possible through research on historic cultures to gain insights into the multidimensional processual aspects of adaptation.

Bennett's (1969) approach is only one of many potential theoretical models of historic period adaptation that could be employed in the study area. The use of the adaptation concept is not conceived here to represent a radical departure from much of the previous research in historic archeological study that has been carried out in Arkansas and Louisiana. Rather, it can be most feasibly employed, at this stage, as a framework for integrating a wide array of research strategies and points of view, all of which approach adaptation from some existing paradigm or data base. In fact, a great many historic archeologists, while not explicitly employing the term, have been investigating many of the processes involved in historic adaptation for years. Settlement patterns, subsistence and other economic strategies, material culture use, biological fitness, intrasite development, the process of urbanization, acculturation, and many other dimensions of historic archeology research can in a broad sense all be assimilated under the heading of adaptation.

Because of the variety and complexity of adaptation during the historic period, it has not been possible in this chapter to give adequate treatment to all aspects of sociocultural or ecological adaptation by the historic period occupants of the study area. The potential processes of adaptation that could be demonstrated by historic cultures in this region reach into so many different levels of cultural interaction and dimensions of economic and social lifeways that such a task would be impossible to carry out satisfactorily even without the gaps that exist in the data base. The fleshing out of the nature of adaptation for segments of the historic past will therefore be left to future researchers to explore and define. Some possible working constructs or adaptation types that have been drawn from the following discussion of the Historic period will be discussed in Chapter 12.

EARLY SPANISH AND FRENCH EXPLORATION PERIOD

The historic period begins with the initial Spanish forays into the region in the sixteenth century. The first Europeans to enter the area were survivors of the 1528 Florida expedition of Panfilio Navarez. The survivors included Alvar Nunes Cabeza de Vaca and four comrades who abandoned their ship near Sabine Pass and crossed the southwestern corner of Louisiana into southern Texas on their way to Mexico. The de Vaca journal, published in 1542, noted that the Spaniards came into contact with the Adayes (Adai), a group of Native Americans residing along the Sabine River west of present-day Natchitoches. Da Vaca's experiences led to further exploration of the New World several years later when Hernando De Soto led an expedition into Florida (Nardini 1961).

The De Soto entrada landed near present-day Tampa Bay, Florida in 1539. After years of wandering through the Southeast, De Soto's army arrived on the east bank of the Mississippi River near the mouth of the Arkansas River in April 1541. The expedition marched through Arkansas and Texas, returning to the west bank of the Mississippi River in 1542 where De Soto died. After a failed attempt to reach Mexico through an overland route, the army under the command of de Moscoso descended the Mississippi River in makeshift crafts in 1543 under constant harassment by the Native Americans and made their way to Mexico (Swanton 1946).

The exact route of De Soto's march through Arkansas and Louisiana is subject to some debate. The reconstruction by the De Soto Commission (Figure 24) suggests a route that took the entrada through southern Arkansas and northern Louisiana. Recent research by Hudson (1985) argues for a somewhat different interpretation (Figure 25). Evidence from archeological sites east of the Mississippi River lends support to the Hudson interpretation for the East, but incontrovertible evidence of the De Soto entrada is lacking for Arkansas and Louisiana (Morse, personal communication). Historical documentation by members of the De Soto expedition suggests that, depending on the route taken by De Soto west of the Mississippi River, we can expect the presence of Spanish camps and Spanish trade goods in some Native American habitation sites in the study area. If the Hudson reconstruction

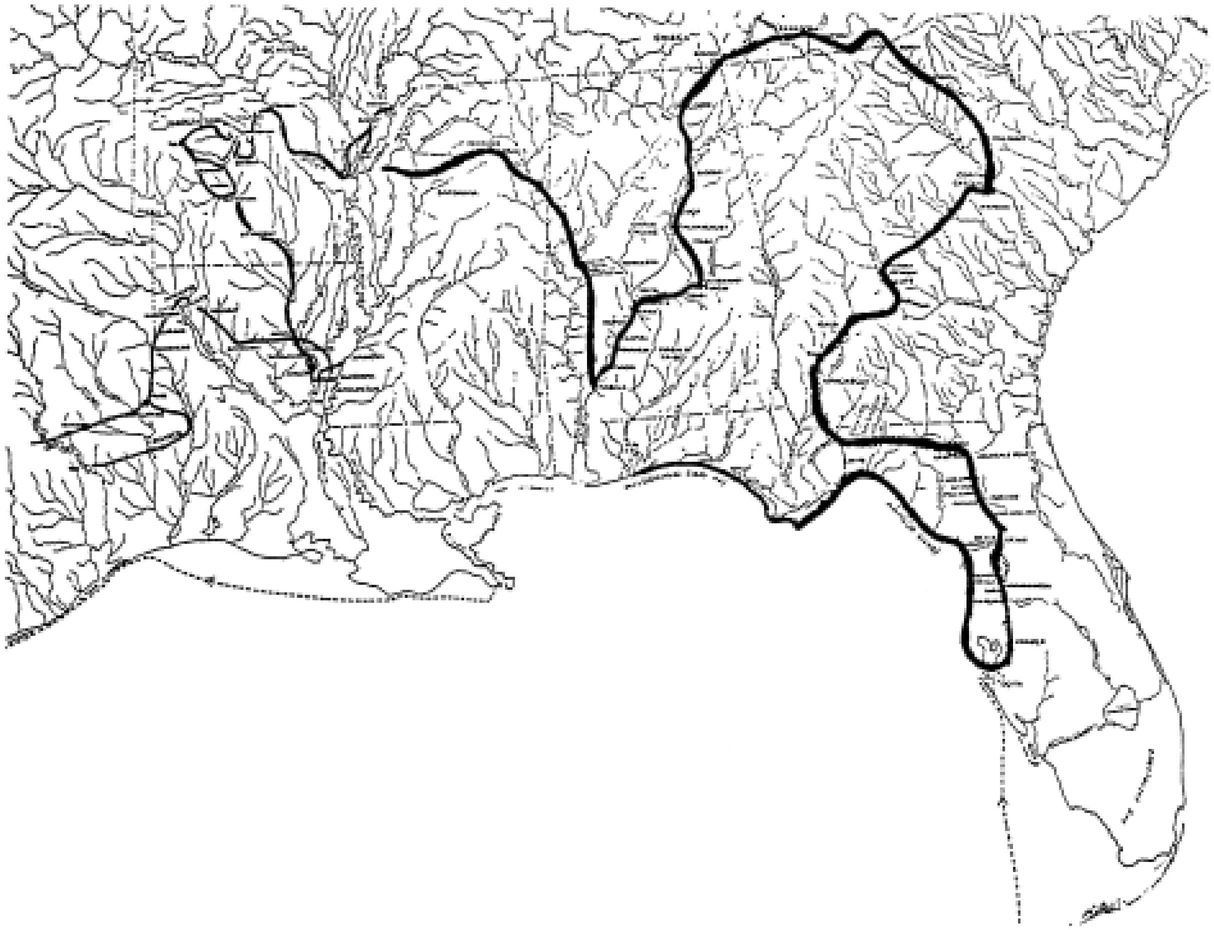


Figure 24. The route of Hernando De Soto based on the U.S. De Soto Expedition Commission findings

is correct, this archeological evidence will be restricted to Arkansas. If the interpretation of the De Soto Commission is accurate, then the route extended through both Arkansas and Louisiana and archeological evidence may be located in both states.

The next instance of European contact in the area occurred in 1673 when a party of Frenchmen led by Father Jacques Marquette and Louis Joliet journeyed down the Mississippi River and stayed for a short time with the Quapaw at the confluence of the Arkansas River. They returned to Fort Michilimackinac after only a short visit, but interest in the potential of the fur trade was kindled by this visit. In 1682, Robert Cavalier, Sieur de La Salle, and Henri de Tonti returned to the Quapaw village at the mouth of the Arkansas River and then descended the river to the Gulf, where La Salle claimed the entire Mississippi Valley for the French crown and named it Louisiana in deference to King Louis XIV and Queen Anna. At the same time, La Salle gave a tract of land along the Arkansas River above the Quapaw village to de Tonti for the establishment of a trading post named Arkansas Post which was established in 1686. However, this initial occupation of the post was abandoned around 1700 (Mattison 1957).

La Salle's ultimate objective in claiming the Mississippi Valley for France and establishing a post at the mouth of the Arkansas was to provide a base for carrying on trade with the Native Americans of the interior and to counter the Spanish moves into the region by driving a wedge between Spanish Florida and Mexico. Although France was at this time in control of Canada and had expanded into the St. Lawrence Basin and the Great Lakes region, the annual hard winter freeze made water transportation difficult. La Salle recognized that exploitation of the interior could be most efficiently done via the natural drainage transportation system of the Mississippi River. La Salle's long-range proposal to the French government was to establish a fortified post on the Gulf Coast, and to fortify a base of operations on the Mississippi River and collect there an army of Native American allies to contest the Spanish expansion from Mexico (Folmer 1953; Ogg 1968). However, LaSalle's

Figure 25. Charles Hudson's reconstruction of the route of Hernando De Soto west of the Mississippi River

attempt to establish a colony in the valley in 1684 was beset by hardship, starvation, disease, and desertion and ended with La Salle's murder by his own men in 1687 (Fortier 1904).

Settlement in Southern Louisiana

Further French exploration and settlement after La Salle was resumed by Pierre Le Moyne, Sieur d'Iberville, and Jean-Baptiste Le Moyne, Sieur de Bienville II, who in 1698 explored the Mississippi River and established a settlement at Biloxi, Mississippi. The next year, Iberville's expedition rediscovered the mouth of the Mississippi River and ascended the river as far as the confluence of the Red River. Iberville's party returned to the Gulf through Lakes Pontchartrain and Maurepas while his brother Sieur de Bienville, journeyed south via the Mississippi River. At a bend in the river below present-day New Orleans, known to this day as English Turn, Bienville encountered several English ships ascending the river but he was able to bluff the English into turning around and abandoning the area to the French (Fortier 1914).

To prevent further intrusion by the English and Spanish, Bienville had a small fort erected on the lower Mississippi south of English Turn, near the present-day town of Phoenix (Shenkel et al. 1977; Jeter et al. 1986). The fort, named Mississippi Fort or Fort de la Boulaye, consisted of a blockhouse and magazine and several small shelters housing the resident soldiers and settlers. The fort was officially used until 1715. During this time, before the founding of New Orleans, French settlement of the lower Mississippi River area was restricted to Fort de la Boulaye and was essentially a military occupation. A 1704 census of the colony reported a population of 180 soldiers, 27 French families, "a few" slaves, 4 ecclesiastics, 21 cattle, 100 hogs, 4 goats, and 400 chickens (Fortier 1914).

In 1712, King Louis XIV granted exclusive trading and governing rights to the entrepreneur Antoine Crozat, Marquis de Chatel. This move, designed to foster economic develop-ment, began the first of a series of private enterprises estab-lished to govern the Louisiana colony until 1731 when the King assumed control. Under Crozat, the Louisiana colony was successful in developing trade with the Native Americans, and initiating settlement along the Gulf Coast and along the Red River. However, in 1717 a change in policy designed to increase the settlement of Louisiana resulted in the revocation of the monopoly to John Law's Company of the West. John Law managed the economy of the colony and recruited thousands of French and German settlers. During Law’s tenure, large numbers of immigrants and slaves were brought to the colony and settlement gradually expanded up the Mississippi and Red rivers. New Orleans was laid out in 1718 and Biloxi was made the first capital before it was moved to New Orleans in 1722 (Fortier 1914).

Over the next two decades settlement proceeded slowly along the tributaries of the Mississippi River nearest the Gulf Coast. The territory was divided into nine districts, each one administered by a commandant and a judge. Trading posts, named after the Native American group with whom trade transpired, were also established within each district. Prominent trading posts in the southern part of the territory included the Poste des Opelousas, near the present-day town of Opelousas, and Poste des Attakapas, near St. Martinville, both situated along Bayou Teche (Fontenot 1976). These trading posts served as a base for the French–Canadian fur trappers who used the posts as a base to trade fur, tallow, bear grease, horses, and other items. This was soon followed by the establishment around the posts of more permanent settlement bases by Native Americans and trappers (Chambers 1925).

Other French enterprises in the lower Mississippi Valley were related to mineral exploitation. In 1719, Philip Renault, a mining agent of the Company of the West, explored in the area for silver and gold, and he discovered lead on the upper St. Francis River near present-day Clay County, Arkansas. By 1724, the amount of lead shipped downriver to the port at New Orleans from the French mines was estimated at 30,000 pounds (Surrey 1916:303). According to Johnson (1957:7), the stone bottom lead smelters from these mining operations were still evident when the early settlers began moving into the area in the early nineteenth century.

Also during the initial period of settlement, additional attempts were made to fortify the lower reaches of the Mississippi River. In 1721, construction of a second fort, Fort Balize at the mouth of the river was begun. However, due to construction difficulties in this low, frequently flooded environment, work on the fort proceeded slowly and was not completed for another 20 years. Toward the middle of the eighteenth century, the French also began construction of a fortification on the east bank of the Mississippi River at Plaquemines Bend, known as Fort Plaquemine, and a breastworks across the river on the west bank known as Fort Bourbon (Davis et al. 1979:78). Also at this time, stockaded batteries (Forts St. Leon and St. Mary) were completed on either side of English Turn.

Initial Settlement on the Red River

To further the goals of regional control of tributary trade routes in the northwest part of the territory, Louis Juchereau de St. Denis founded Natchitoches in 1714, the first permanent European settlement in that territory. Natchitoches was established at the head of navigation on the Red River just south of the “great Red River raft,” a large mass of logs which halted all traffic headed upstream. At this point, trade was carried out with various groups of the Caddo Federation, the Hasinai, the Calcasieu, the Doustoni, and the Catahoula, while goods shipped up the Mississippi and Red rivers intended for the Western market were debarked for transport overland. The major overland route was the San Antonio Road or El Camino Real which ran from Natchitoches through Los Adaes across the Sabine River to Nacogdoches, and west eventually to San Antonio. The route is said to have been originally a Caddo trail, which was in turn probably based on buffalo migration routes (Servello 1983:52).

Spain countered the French move into the Mississippi Valley by asserting their claim over Texas and most of Mexico and establishing a line of missions stretching from the Rio Grande to Nacogdoches, Texas. The Spanish increased their presence in the area by establishing missions and posts among the Adaes in 1717. In addition, a trading post was established that year by Jean-Baptiste Bernard de la Harpe in Caddo Parish and the Poste du Rapides was founded near present-day Alexandria, Louisiana. To check the threat posed by the French settlement at Natchitoches, the Presidio de Nuestra Senora del Pilar de los Adaes, a military administration center, was founded in 1721 about 8 km west of the French settlement. A small stream, the Arroyo Hondo, situated approximately midway between the two settlements became the conventional boundary between the French and Spanish territories (Nardini 1963). Settlement during this early period was generally confined to the areas within and surrounding Los Adaes and Natchitoches and consisted of town occupants and small outlying farms and ranches. Other settlements were located along El Camino Real, also known as the Southwest Military Road or San Antonio Road, and along the Red River northwest of Natchitoches (Bolton 1914; Hansen 1971).

The Spanish settlement at Los Adaes was handicapped by the lack of access to water routes connecting them to the Spanish trade network in Mexico. Although prohibitions were made against trade with the nearby French, the isolation of the presidio forced the Spanish colonists to deal through the trade hub at Natchitoches. The Spanish were in need of tobacco, medicine, liquor, firearms, salt, and other goods which they obtained from the French through the Red River network in exchange for Spanish silver and cattle (Grambling 1978). As Bolton (1914) notes, instead of meeting the goal of setting up a barrier zone between the two powers, the French frequently interacted with the Spanish and they traded in contraband, restored slaves and deserters, and disputed over the boundary line and control of the Native Americans.

Settlement on the Arkansas River

After the Scotch financier John Law acquired the commercial charter of the French colony at Louisiana, he immediately launched a campaign throughout Europe to induce investors to buy shares in his *Compagnie des Indies* and to entice immigrants to settle on the large concessions deeded to the investors. To push control further into the interior, Law attempted again to establish a base at the post at the mouth of the Arkansas River. In 1721, 200 German immigrants accompanied by 30 boats loaded with supplies and other belongings were sent to Law's concession at Arkansas Post. However, less than a year after its founding, the Law Colony consisted of "about 47 persons of all sexes" living in a "score of cabins poorly arranged and three acres of cleared ground" with "no fort on the place, only four or five palisaded houses, a little guard-house and a cabin, which serves as a storehouse" (Mattison 1957). The Law colony was all but abandoned in 1723 following the collapse of Law's financial empire.

When the Jesuit priest Father du Poisson arrived at Arkansas Post in 1727, the garrison numbered about 30 persons. By 1734, when Ensign Therese St. Langloiserie assumed command, the garrison consisted of only 12 men and the post habitations were described as follows:

> They consist of a wooden house on sleepers thirty-two feet long by eighteen feet wide, roofed with bark, consisting of three rooms on the ground floor, one of which has a fireplace, the floors and ceilings of cyprus, a powder magazine built of woods on sleepers ten feet long and eight feet wide, a prison built of posts driven into the ground, roofed with bark, ten feet long by eight feet wide, and a building which serves as a barracks, also of posts driven into the ground forty feet long by sixteen feet wide, roofed with bark.

Father Vitry who visited the post in 1738 wrote that "a few Frenchmen attracted by the hope of trade with the Indians are settled nearby.... The lodging of the Father is a makeshift hut: the walls are made of split log, the roof of cyprus bark, and the chimney of mud, mixed with dry grass which is the straw of the country" (Mattison 1971).

France's involvement in the War of Austrian Succession precluded the expenditure of money on improvements in the colonies and conditions did not improve greatly during the 1740s. The buildings and defense works continued to deteriorate and population remained sparse. The census for 1744 showed only "12 soldiers and 10 negroes" in residence and only "31 whites and 14 negroes" in 1748 (Mattison 1971).

Commerce during the pioneer settlement period in northern Louisiana and Arkansas continued to be based on the fur trade and other frontier products such as honey and bear oil. A large part of the fur trade was conducted with Native Americans through the trading posts established on the Red, Ouachita, and Arkansas rivers. These trading posts served as bases for the collection of furs and hides from trappers and licensed traders working the hinterlands far upriver, as well as for exchange with groups such as the Quapaw and the Caddo living in the vicinity of the post. At Arkansas Post, the usual method was for traders to journey up the Arkansas and White rivers by canoe once or twice a year and exchange trade goods with the Native Americans for furs, hides, and bear oil. When a sufficient quantity of these products had been accumulated at the post, they were floated downriver to New Orleans and exchanged for more merchandise to use in trading with the Native Americans (Johnson 1957:24–25).

Among the French traders living in Arkansas was Lewismore Vaugine, who in the late eighteenth century resided on the Arkansas River a few miles north of Arkansas Post, and Francois D'Armand, who settled in 1766 on the Mississippi River at the mouth of the White River. Most of the furs and other products passing through the Arkansas Post were transported by French Canadians who resided in the Illinois country up the Mississippi River (Johnson 1957:26). Trappers preferred the southern route to the market at New Orleans, along the middle and lower sections of the Mississippi drainage, over the longer upriver journey to the St. Lawrence River outlet (Kniffen 1971:39).

In the 1750s, Arkansas Post became important as a base for the French advance into the Southwest. This initiative had begun in 1721 when Bernard de La Harpe was commissioned to explore the lands on the upper Arkansas River to make alliances with the various tribes, to establish a post on the upper Arkansas at "Emerald Rock" (near Little Rock), to scout a route to Taos and Santa Fe, and to get cattle from the Spanish at New Mexico. This mission to establish trade relations with the Southwest Native Americans resumed in 1739 when the Mallet brothers were dispatched from the base at Arkansas Post to explore the Missouri River. The expedition ascended this river as far as the Arikara villages and then made their way overland across Comanche country to Taos and Santa Fe. This was followed by other expeditions to establish trade relations with the Native Americans and Spanish in New Mexico. These intrusions of French traders into the Spanish territory were halted in 1748 (Johnson 1957:6; Mattison 1971).

Settlement on the Ouachita River

The commercial potential of the fur trade prompted the other settlements, posts, and trade factories to be established along the rivers in north-central Louisiana. In 1718, the first recorded European settlement was founded on the east bank of the Ouachita River near present-day Monroe (Mitchell and Calhoun 1937). Another interpretation shows the settlement at Prairie de Lait near present-day Columbia by Sieur de Cantillion (Williams 1939). A map believed drawn between 1720 and 1725 shows a number of additional settlements on the Ouachita River including the habitation/general store of M. deVillemont located on the east bank opposite Brushy Bayou and an *entrepot* or warehouse owned by M. de Mezjeres on the west bank of the river a few kilometers north of Brushy Bayou near present-day Harrisonburg (Price 1979). The inhabitants of the Ouachita Valley consisted mainly of European and Canadian trappers and *gaboteurs* (peddlers) who were exploiting the fur and bear oil resources of the region. Though many of the establishments were abandoned during the Natchez unrest of 1729, the area continued to be visited by French–Canadian hunters and trappers (Mitchell and Calhoun 1937).

Problems in the Louisiana territory including uprisings by the Natchez in the 1730s, erosion of the commercial Native American trade by the English, low immigration, and poor returns on agricultural investments continued to hinder French control of the Mississippi Valley. These factors, combined with the overall increased isolation of the French settlements in the valley due to the loss of French Canada to the British during the French and Indian War, prompted the French to give the colony to the Spanish in the Treaty of Fontainbleau. Spain received New Orleans and both banks of the Mississippi north to Bayou Manchac while Great Britain received the left bank from Bayou Manchac north. During the Revolutionary War, Spain declared war on Great Britain and seized British Louisiana.

Though there were initial fears of Spanish domination of the resident French, the changeover actually brought little change in the local control of commercial Native American trade. The infiltration and stiff competition from the English traders and Native American unrest forced the Spanish to abandon their system of pacification through missionary work and adopt the French system of trade and presents (Bolton 1914). The Spanish began developing the outlying areas of their settlement around Los Adaes by issuing several large land grants including La Nana, Los Ormegas, Le Compte, and the Vincente grants. The Le Compte and Vincente grants were situated at major thoroughfares where the owners could monitor the flow of travelers and goods along the roads to the Spanish authorities. Among the chief exports of the region recorded by the commandant of Natchitoches during this period were livestock, indigo, tobacco, buffalo and deer skins, bear oil, tallow, and dried meats (Bolton 1914).

The Spanish also sought to exert control over unauthorized settlement in their territory. In 1767, a census was taken that showed 110 white settlers living in the Washita District of south Arkansas and northeast Louisiana. The area came under the supervision of Athanse de Mezieres, the Commandant of the Natchitoches District, who was ordered to remove the vagabonds living along the Ouachita River. In 1774, de Mezieres accomplished this with the help of the Caddo and reported the expulsion of at least 14 people including the Frenchman Pedra Champagnolle and the LeBoeuf family (Bolton 1914).

The constant threat from the British also forced the Spanish to keep on guard and maintain the system of forts first established by the French. Between 1767 and the 1790s, they constructed Fort Real Catolica at the mouth of the Mississippi, and new defensive works at Balize, English Turn, and New Orleans. To protect the northern border of the territory, the governor of Louisiana dispatched Jean Baptiste Filhiol up the Ouachita River to gather the European inhabitants and organize them for defense in military districts and defensive posts. One district based at Prairie des Conots (Monroe, Louisiana) extended north as far as Bayou De Saline and the other district was posted at Ecore a Fabri at present-day Camden, Arkansas (Greene et al. 1975:7–13).

Settlement During the Spanish Period

With the shift of control of the Mississippi Valley to the Spanish, Arkansas Post was able to play a more important role in the development of trade commerce. Arkansas Post, along with Natchitoches and St. Louis, were the chief centers for Native American trade for Spanish Louisiana. In addition to the fur trade, the post supplied New Orleans with bear oil, tallow, salted buffalo meat, indigo, tobacco, and various herbs. Goods imported from New Orleans for trade or gift to the Quapaw included a variety of items. One list of items destined for the Quapaw in 1775 included: l scarlet dress coat with silver braid, 1 pair of trousers, 25 rifles, 100 ounces of wool ribbon, 45 butcher knives, 24 pocket combs, 12 pair of scissors, 50 wad pullers, 300 flints, 4.5 ounces of red silk ribbon, 2 pair of shoes, 2 pair of stockings, 9.5 pounds of vermilion, 48 steels for striking flints, 150 needles, 9 hats with silver embroidery, and 1 decorated shirt (Mattison 1971).

The Spanish trade enterprise at Arkansas Post began to increasingly encounter difficulty with the Native Americans as a result of English intrigue from the east side of the Mississippi River. The English attempted to undermine the trade relations and rapport between the Quapaw by supplying unlicensed French traders with cheaper goods in an effort to divert commerce from the Spanish post. In 1775, the English further solidified their base in the Mississippi Valley with the construction of a settlement on the east side of the river near the mouth of the Arkansas River opposite the Quapaw villages.

The development of Arkansas Post was hampered by the presence of a lawless element regarded as dangerous to those wanting to settle there. Descriptions of these people suggests the development of hybrid Native American/European cultures similar to that documented for the *mestizo* in the Southwest and Natchitoches area. In the vicinity of Arkansas Post (on the lower Arkansas and White rivers) these “lawless” elements are described by Perrin de Lac as almost all originally French, who have migrated from Canada, are hunters by profession, and only cultivate maize for the support of their beasts of burden. About half the year only old men, women, and children are seen in the village. The men hunt wild oxen, castors, and squirrels, whose skins are less valuable than those of the northern countries. When at home, they pass the time in dancing, drinking, or doing nothing: similar in this respect to the savages, with whom they live the great part of the year and whose tastes and manners they contract (Mattison 1971).

Early explorers to the Arkansas Territory after the Louisiana Purchase noted the continued presence of the *coureurs de bois*, the French hunter–trappers who had taken native wives and adopted many of the lifeways of the aboriginals. These mixed Native American–French families lived in small groups along the lower White and Arkansas rivers. In 1818, the naturalist, Thomas Nutall, reported:

> Monsieur Bartholomus and two or three families, who are his neighbors, are entirely hunters, or in fact Indians in habit and pay no attention to the cultivation of the soil. There, with two or three families at the pine bluffs, are the remains of French hunters, whose stations have found a place in the maps of Arkansa.

These French–Native American families were so closely aligned to the Native Americans, that when the Quapaws ceded their land to the federal government in the treaty of 1824, a provision was included to allow certain Native Americans of mixed blood to keep designated tracts along the Arkansas River. Among those retaining land were Francis Imbeau, Joseph Duchassin, Baptiste Socie, Louis Bartelmi, Joseph Bonne, and Saracen, who received a grant of "eighty acres" to include his existing improvements opposite French trader Lewismore Vaugine's residence, north of Arkansas Post (Johnson 1957: 23).

Elsewhere, the colonial population continued to grow steadily by the influx of Atlantic seaboard, Canadian, and European immigrants into the Red and Ouachita river valleys. In 1769, a census of the Poste du Ouachita, described as a vast area stretching from present-day Columbia, Louisiana north to Hot Springs, Arkansas (a linear distance of about 320 km) revealed 110 persons of European decent, consisting of mostly hunters and trappers. The inhabitants of the post included true Louisiana Creoles, born in the earlier settled southern part of the territory, French–Canadian trappers, who came down from the north via Arkansas Post, and Europeans, who had arrived directly from countries such as France. Another population census was taken in 1783 after a new trade and military post was established at Prairie des Canots, near Monroe, Louisiana, showed 207 non-natives living within the post. In the ensuing years, small land grants were made along the Ouachita River, Bayou Bartholomew, and Bayou Desilard; however, the area remained sparsely settled and by 1790 only 242 non-natives inhabited the area of the Poste du Ouachita (Williams 1976).

In the latter part of the eighteenth century, Native American unrest and the pressure of American expansion from the east bank of the Mississippi River was threatening the Spanish hold on the Ouachita region. In 1791, Fort Miro was founded to provide protection for the settlers and an intensified push was made to colonize the Ouachita Valley as a buffer zone between the Americans and the Spanish settlements in western Louisiana and Texas. Large land grants on the Ouachita River were made to the Marquis de Maison Rouge and Baron Bastrop with the principal objective of growing wheat for the Spanish colony, however little settlement occurred (Williams 1976). In 1800 the territory was ceded to France again in the Treaty of San Ildefonso. Three years later, the colony was acquired by the United States in the Louisiana Purchase (Hansen 1971).

ARCHEOLOGICAL EVIDENCE OF THE EARLY EXPLORATION AND SETTLEMENT PERIOD

Arkansas Post

Archeological evidence of this early European phase of exploration and settlement within Louisiana and Arkansas is limited to a handful of the more notable occupations where investigations have been carried out. These include Arkansas Post in Arkansas, and Natchitoches and Los Adaes on the Red River in Louisiana.

In Arkansas, historical and archeological studies were sponsored by the National Park Service to determine the locations of the sites associated with the early European occupation of the Mississippi Valley. The investigations were to serve as the basis for the evaluation of locations of importance in the early history of North America for incorporation into the National Park Service. The study included an investigation of archival records relating to the various locations of Arkansas Post by National Park Service Historian Ray H. Mattison (1957). Mattison's documentation of nine different posts in the vicinity of the Arkansas River mouth underscores the fragile nature of these establishments and the changing economic and political role that these posts played through history.

To check some of the findings from Mattison's records review, archeological field investigations were conducted by Preston Holder (1956,1957) and James A. Ford (1961) at the present location of the Arkansas Post Memorial (the final location of the post) and in the Menard Mounds locality where it was believed the first trading post established by Henri de Tonti in 1686 was located. Several years later, Burney McClurkan of the Arkansas Archeological Survey conducted a reconnaissance to relocate "Fort Desha" (McClurkan 1971), one of the earlier locations of the French outpost that was occupied between 1756 and 1779 to guard the mouth of the Arkansas River. The fort was visited in 1882 by the archeologist/naturalist Edward Palmer, who described the outlines of an old fortification, a deep hole reputed to be the location of the powder magazine, the possible remains of an old forge, and house places. Palmer (Thomas 1894) also recounted earlier finds of artifacts of European and Native American origin. The site was last visited by Arkansas Archeological Survey archeologist, Leslie Stewart–Abernathy who noted that much of the fort had eroded into the river (Arkansas Archeological Survey site files).

The excavations by Holder in 1955 and 1957 were aimed at locating sites which related to the Spanish and French occupations prior to 1804. Holder (1957) found a complex system of trenches and features enclosing what appear to be compounds (Figure 26) that he considered evidence of the French post constructed in 1751, the first and second posts of San Carlos built in 1779 and rebuilt prior to 1787, and the third Fort San Carlos III built in 1787. However, Martin (1971) questions this conclusion in noting the late date range of most of the artifacts and the absence of military goods, and he argues that Holder's finds are in actuality lot lines and Spanish land grant markers. Westbury (1976) also questions the Spanish affiliation of Holder's finds in noting that only five sherds of Spanish origin were recovered and that this ceramic type (Puebla Blue-on-White) continued to be made into the nineteenth century.

After Arkansas Post was established by Congress as a National Memorial, additional limited test excavations were carried out by National Park Service archeologist Rex L. Wilson to locate building remains from the main period of

American occupation dating between 1804 and 1863 (Figure 26). The work by Wilson (1966) tentatively identified four structures thought to be associated with Frederick Notrebe (Wilson 1966): (1) the cotton gin, (2) the residence and store, (3) the warehouse, and (4) the Arkansas Post branch of the Bank of the State of Arkansas. Subsequent research at the post indicates that only the latter identification (the bank) was correct, although Wilson was correct that the other three structures were on property owned by Frederic Notrebe (Bearss 1971:68). Follow-up excavations by National Park Service archeologist John W. Walker at the Arkansas Post Bank branch exposed the remainder of the structure and revealed that the building was last used as a hospital by the Confederate garrison at the post and was destroyed by Union artillery during the battle of April 1863 (Walker 1971).

Additional investigations were conducted at Arkansas Post in 1971 by the University of Arkansas field school under the direction of Michael Hoffman and Patrick Martin to locate the remains of Montgomery's Tavern, the location of the first meeting of the Arkansas General Assembly in 1820 (Martin 1975). Though this study failed to find any buildings, it did delineate several concentrations of artifacts and features which seem to have been surrounded by palisade lines. Martin's study (1975) should also be recognized for the use of an explicit problem orientation based on a very thorough review of the background data and formulation of a research design relating to the material culture of taverns in the context of a frontier outpost. The latest research at Arkansas Post by William Westbury for the National Park Service in 1974 included limited excavation at the proposed visitors center and synthesis of all research conducted previously at the Arkansas Post National Memorial (Westbury 1975, 1976). The results of these investigations in the Arkansas Post vicinity are very detailed lists of the material culture of the French and early American occupants of the settlement and some limited but significant insights into the nature of town planning and lot construction in a frontier town. Most of these studies were generally exploratory in nature and reflect the basic particularist–descriptive focus of archeology on historically significant places and events. The studies well address the stated specific goals of archeological validation of historically documented places and people and have contributed an important comparative data base relating to the material culture of the occupants of the site. Some of this research, notably Martin's (1975) excavations at Montgomery's Tavern, went beyond the specific site case, to provide a model and test implications for recognizing French tavern and trade activities of the frontier period.

In addition to the site specific investigations at Arkansas Post, recent research by John A. Walthall has incorporated ceramic data from the Arkansas Post excavations in his regional analysis of Mississippi River Valley French Colonial material culture. Walthall's study draws from a number of excavations of French forts in the upper and central Mississippi River valley in order to delineate and define the various ceramic wares used in French Colonial period sites. Walthall also included materials from the Arkansas Post excavations, but the study focuses

Figure 26. Locations of archeological excavations and major features at the Arkansas Post National Memorial

on sites in the Illinois region (Walthall, personal communication). The study, intended for publication by the Illinois State Museum, will provide an important reference source for archeologists analyzing French Colonial ceramics in Louisiana and Arkansas.

Presidio de Los Adaes

The Presidio de Nuestra Senora del Pilar de los Adaes is the site of the Spanish post built in 1723 to thwart French expansion into the Spanish territory from their base near present-day Natchitoches 24 km to the east. The presidio at Los Adaes consisted of a hexagonal stockade containing three bastions and other associated structures within the stockade, and a complex of houses, fields, and pastures surrounding the stockade. Also located nearby was a mission operated by the Franciscans to convert the Adaes (Caddo) to Christianity. The site is important historically as an area of close interaction, trade, and confrontation between the Spanish, French, and Caddo. The relatively narrow time frame of the occupation at Los Adaes (ca 1723–1773), the wealth of documentary–supporting evidence, and the well preserved nature of the archeological deposits make this an important resource base for exploring material evidence of ethnic variability, frontier adaptation patterns, and culture change (Gregory et al. 1984). Investigations at Los Adaes have been sponsored by the Office of State Parks and carried out by Northwestern State University since 1979 and have been designed mainly to facilitate site development planning. Excavations at the site have provided information on site extent and content, material and structural data for site interpretation, and significant archeological areas to be preserved and avoided during planned construction of park facilities. Limited sampling at Los Adaes was initiated during 1966 and 1967 (Gregory 1974). In 1979, a 1% sample of the site was excavated to provide a general picture of the archeological deposits, and a resistivity survey was conducted to obtain information on subsurface features. This phase of study succeeded in locating the north bulwark, the palisade and moat lines, the eastern point of the hexagonal stockade, the south-southwestern bulwark, and an impacted portion of the Governor's house (Gregory et al. 1979). Between 1980 and 1982, further fieldwork including mapping, metal detector survey, shovel testing, posthole testing, and limited trenching was conducted at the Lucy Tract, an additional portion of the site acquired for the park. In addition to the extensive artifacts recovered from this work, a number of features including wells, trash pits, moats, and sections of the stockade line were recorded (Gregory et al. 1980). In 1984, additional investigations were undertaken in a 45 m^2 area planned for construction of parking facilities. The study consisted of a proton magnetometer survey, limited shallow scraping, metal detector survey, and test unit excavation. A number of architectural features related to possible *mestizo* houses situated outside the stockade were revealed through this work and some new artifacts classes were documented for the first time including cloth, various gold objects, a metal arrow point, and floral remains consisting of peas, corn, and peach pits (Gregory 1984). In 1985, salvage excavations were conducted at a large feature associated with a *jacal*, a primitive house outside the stockade, that had been impacted by looters. This work documented the house plan and a post-1740 midden containing French, Spanish, and Native American items (Gregory et al. 1985).

The extensive research by Gregory and his associates at Los Adaes has resulted in the accumulation of a wealth of evidence relating to the Spanish, French, and Native American occupation of the site. This information, when eventually synthesized by Gregory, will fill large gaps concerning the material culture of the diverse European and Native American groups residing in the area, the nature of frontier trade, the process of social stratification and ethnic acculturation, subsistence strategies, and other aspects of cultural interaction. From the fieldwork and analysis thus far, Gregory has observed apparent cultural differentiation between inhabitants inside the presidio versus *mestizo* occupations outside the compound, and has observed, contrary to the historic documentation, that the residents of Los Adaes were not poverty stricken, rather the quantity and quality of materials recovered suggests that they were materially well off and had access to a broad range of basic and luxury items available through the French and Spanish trade network. Gregory et al. (1984) note that now that salvage and exploratory work has been completed, a long range program of carefully controlled excavation to target areas for additional data recovery can be implemented to yield additional data for restoration and public interpretation and to address the needs of scientific research.

Research by Gregory and others in northwest Louisiana is revealing a great deal about European settlement and trade in the area during the end of the French and Spanish Colonial period and early period of American control. The survey and site inventory by Gregory in Natchitoches Parish has identified a number of sites including the second American trading post built by John Sibley and in operation between 1807 and 1827; the Tauzin–Wells House, a bousillage type house with midden which was the trading house for the Spanish Colonial firm of Davenport, Murphy and Barr; the Drake's Lick site, a Native American, Colonial European, and Confederate Civil War saltwork; the Chamard House, the residence of Athanase Demeziere who was commandant for Natchitoches in the eighteenth century; the Rocquier House, a trading post to the Appalachi, Couchatta, and Biloxi tribes; the town of Grand Ecore, an early port on the Red River after the removal of the Great Raft; and the town of Campti, a settlement and steamboat port during the 1840s (Gregory et al. 1979).

Gregory has also conducted limited excavations at the Badin–Roque House in Natchitoches Parish for the St. Augustine Historical Society who were undertaking protection and restoration of the building. The early nineteenth century Badin–Roque House is listed on the National Register of Historic Places as the last standing example of the French style *poteau en terre* or post in ground architecture, a building technique for which very few details are known. Gregory's investigations were designed to provide structural information, chronological parameters, and cultural interpretive data on the house.

At the Badin–Roque House, the poteau en terre construction consisted of posts placed vertically in individual sockets without sills or post supports around a prepared rammed earth floor. At the time of construction, a shallow ditch surrounded the house to keep the walls and footings dry. The lower walls were bousillage, a mixture of Spanish moss and mud, plastered between the uprights and reinforced with laths, and covered with cypress boards attached with cut nails. Bardeau or cypress shingles covered the roof and gable end of the house. The Badin–Roque House dates initially to the 1820 to 1840 period which is somewhat later than patterns of such construction elsewhere in Louisiana and in Illinois where peaks are seen in the early 1700s and again about 1785 with a rapid decline in the 1790s. Apparently, the rural Red River area was a conservative cul de sac where construction techniques and general material culture shows a definite lag compared to more urban locales. Gregory saw the same conservative theme reflected in the material goods such as housewares which were combined with plain iron spoons and ceramics (Gregory et al. 1982).

Another study of early European occupation in the region is the Louis Procello site investigations by Espey, Huston and Associates, Inc. for the Southwest Electric Power Company. The Louis Procello site, located along Mundy Bayou in De Soto Parish, was the home of the son of a Spanish soldier stationed at Los Adaes. Though the son of a common soldier, Louis Procello was a landowner with three slaves, who married the daughter of a wealthy neighbor, and served as a government official for a short term. Thus, he was probably a prominent upper-middle class member of society. Procello occupied the site in De Soto Parish from about 1814 to 1833 (Espey, Huston and Associates, Inc. 1983:32–34).

The excavations at the Louis Procello site exposed early nineteenth century historic material, some in close association with contemporaneous historic aboriginal Late Caddo shell-tempered ceramics and trade beads recovered in a trash pit. The historic component at the site included metal artifacts such as nails, two iron vessels, a bit, a small spur, a knife blade, and a plated brass cylinder; gunflints; eight Cornaline d'Aleppo and prismatic glass trade beads; 117 bottle fragments dating generally from the period between 1780 and 1850; and historic ceramics including whiteware, stoneware, creamware, and porcelain. Several vessels partially reconstructed include a feather edged dinner plate, a hand painted blue dessert bowl, a blue hand painted cup, and a transfer print design bowl. Other Late Caddo remains recovered at the site include chipped and ground stone tools, ceramics, bone tools, and five burials. Two postmolds were also excavated.

The origins of the historic materials exemplify the wide interaction and trade occurring in northwest Louisiana at the turn of the nineteenth century. The two iron tripod vessels are of the type *marmites de fer* which have been found throughout North America at French contact sites dating from the end of the seventeenth century to the first half of the eighteenth century. They were commonly used for food preparation and, in northeastern Louisiana and southwestern Arkansas, were frequently used in the boiling extraction of salt from springs. The spur found at the site is typical to that used by the U.S. military in the 1800s while the bridle is European in design. Bottle glass is mostly domestic and English while ceramics include domestic stoneware cooking and storage vessels, and English, Dutch, and/or Welsh service wares. The eight glass beads are Cornaline d'Aleppo, a form made from three layers of glass believed to have been manufactured in Amsterdam. The temporal range of these bead types is 1590 to 1836, but they have been found on sites dating as late as the 1850s. They were common trade items between the Europeans and Native Americans (Espey, Huston and Associates, Inc. 1983:59–125).

Analysis of the faunal remains from the Louis Procello site revealed that the inhabitants lived on a diet that was probably typical of the hinterland of the Louisiana Territory. Domestic animals such as beef and pork along with wild game including venison, turkey, turtle, and other species made up the diet. While saw marks were evident on two bones, some bones exhibited unusual butchering marks such as evidence of repeated striking with small knife or cleaver and spiral fracturing from smashing probably to extract bone marrow. Such marks are not typically made by Euramerican settlers with access to metal cutting implements.

The mixture of Late Caddo aboriginal material and early nineteenth century historic remains poses some problems for the interpretation of the Louis Procello site. The site shows evidence of one protracted or several intermittent occupations from Caddo III through Caddo V times (A.D. 1500 to 1800). The researchers express uncertainty whether this Indian occupation was followed by the settlement of the Procello family or whether the Caddo at the site in 1800 began to use Western trade goods. The question hinges on the combination of Caddo Indian and Western historic materials recovered together in the trash pit and whether this is evidence of contemporaneity or simply mixture of two distinct unrelated occupations (Espey, Huston and Associates, Inc. 1983:153–155).

A survey of sites along the Red River from Shreveport to the Mississippi River by Commonwealth Associates, Inc. (Newkirk 1981) for the New Orleans District of the Corps of Engineers recommended testing for a number of historic sites. Testing was conducted at 16NA236 and 16NA177 located at the town of Campti, which was situated on the Red River just below the Great Raft. The sites originally recorded by Gulf South Research Institute (1975) during a Corps of Engineers survey include the remains of a brick kiln and a domestic structure, located on two pieces of property believed to have belonged to Jean Baptiste Trizzini, a builder who immigrated to Campti from Milan with a number of Italian tradesmen in the 1830s. Testing of the domestic structure uncovered evidence of 150 years of occupation from 1830 to the present (Newkirk 1981:369–388).

In 1986, Heartfield, Price, and Greene, Inc. conducted additional testing at the two sites for the Vicksburg District of the Corps of Engineers. Their research could find no confirmation in the records of the ownership of the site by Trizzini of either of the two sites and their fieldwork could document no structural remains or discrete midden or kiln deposits from the middle of the nineteenth century (Heartfield, Price, and Greene, Inc. 1987:2-1 through 5-2). While the scope of the investigations at the site were limited, the Trizzini property sites represent one of the few archeologically documented studies of early nineteenth century European immigrant rural households in the project area. Undoubtedly, many more exist in the area in Southern Arkansas and northwestern and southern Louisiana.

Research at Other Early Outposts and Forts

In addition to research at the Presidio de Los Adaes and Arkansas Post, a number of other prominent outposts or forts in the Louisiana territory have been the subject of limited investigations. Prominent among these are the efforts to locate the French Fort du Mississippi in Plaquemines Parish and the Spanish Fort Miro in Ouachita Parish.

Fort Miro

The historic site of Fort Miro (16OU3) was a Spanish fortification constructed in the winter of 1790–1791 by Jean Baptiste Filhiol along the Ouachita River near present-day Monroe, Louisiana. The fort was constructed under order from the Spanish Governor Estevan Miro to serve as a refuge for settlers against Native American hostilities in the Poste du Ouachita region. The search for the eighteenth century site of Fort Miro began in the 1920s with archival efforts by a Monroe abstracter, John R. Humble, who researched the available land records to calculate the probable location of the site with respect to the present landmarks in the town of Monroe, Louisiana. This was followed up in the 1970s by archeological and historical investigations by members of the Northeast Louisiana Archeological Society (Greene et al. 1975) funded by the Ouachita National Bank of Monroe and an effort sponsored by the U.S. Army Corps of Engineers, Vicksburg District (Price et al. 1975)

The salvage excavations in 1973 and 1974 (Greene et al. 1975) consisted of detailed site mapping, surface collecting, hand excavation of five test units, and backhoe excavation of two deep trenches. While no definite evidence of Fort Miro was uncovered, Colonial period artifacts mixed with modern debris were recovered, and several deeply buried hewn log timbers were found that were interpreted to be possible remnants of the palisade structure. Follow-up work in 1975 found that the buried log timbers actually dated to the twentieth century and were not associated with historic Fort Miro (Price et al. 1975:37). It was concluded that the original fort had been destroyed by urban and floodwall construction in the nineteenth and twentieth centuries (Price et al. 1975:1).

Fort du Mississippi (Fort de la Boulaye)

Fort du Mississippi (16PL27) was constructed in 1700 by Iberville and Bienville to guard the mouth of the Mississippi River from the Spanish and English while the French consolidated their possessions in the New World and established their presence in the Gulf–Caribbean region (Jeter et al. 1986:82–87). Efforts to relocate the fort date back to the early 1930s (Ries 1936) and continued sporadically throughout the 1950s and 1960s. In 1982, a committee was formed by resolution of the Plaquemines Parish Commission Council to evaluate and summarize the state of knowledge about the fort and make recommendations for future work. The commission recommended that an archeological evaluation be conducted to confirm the location and boundaries of the fort. Negotiations were carried out between the commission and Coastal Environments, Inc. who prepared a proposal for investigations, however no fieldwork was funded (Jeter et al. 1986:375–392).

In 1986, investigations by Goodwin and Associates (Goodwin et al. 1986; Jeter et al. 1986) were sponsored by the New Orleans District, Army Corps of Engineers to obtain locational data on the site to insure that the historic fort would not be harmed by any proposed Corps construction in the area. The efforts of Goodwin and Associates focused on two locations along a high deltaic ridge along the river: (1) the Gravolet Canal locality, which had previously been the designated National Historic Landmark location for the fort, and (2) a second hypothesized location for the fort in the vicinity of Phoenix Cemetery. Through archival and field research, the Gravolet Canal area was rejected as a probable location of the fort. Jeter et al. (1986:444–445) recommended that further investigations of the fort focus on the Phoenix Cemetery locality, where limited archeological testing produced subsurface evidence of human occupation (Jeter et al. 1986:234).

Other Investigations at Military Sites

The Lower Mississippi Valley area abounds in French, Spanish, and American military fortifications and a number of battlefields primarily oriented around the defense of waterway routes, particularly the Mississippi River. Since this area of the Mississippi has also been the subject of flood control and navigation improvement by the New Orleans District of the U.S. Army Corps of Engineers, federally sponsored cultural resource surveys of proposed levees, revetments, and channel construction and maintenance have provided a great deal of information on the locations and preservation of these sites.

Two of these defensive works, Fort Jackson and Fort St. Philips, were subject to improvement and use from their initial construction in the late French and early American period of occupation through the American Civil War, the Spanish–American War, and World War I until their abandonment in the 1920s. Davis et al. (1979) provides a good historical overview of the development of these two National Register forts. Other studies of these two forts include Neuman's (1973) aerial survey of Fort St. Philip and Castille's (1978) survey for the protection levee around Fort Jackson.

Neuman's (1973) survey also provided information on the locations of Fort St. Leon, Fort de la Boulaye, Balize, Tower Dupre, and Battery Bienvenue. Fort St. Leon was also subject to further aerial survey and intensive backhoe testing by Gilmore and Noble (1982), although their results were not conclusive in pinpointing the suspected location of this early fort. Shenkel et al. (1977) also conducted archival research and limited test excavation at the defensive works at English Turn and reported midnineteenth century remains that may have been associated with the occupation of the fort.

Excavations at Fort Pike (160857) were initiated in response to a planned program of restoration at the Fort Pike Commemorative Area. Located in Orleans Parish on the south side of the Rigolets, the fort was constructed in the 1820s to guard New Orleans via the entrance to Lake Pontchartrain. Excavations at the site by George Castille under the sponsorship of the Louisiana State Office of Program Development and the Office of State Parks took place in 1978, but artifact analysis and a writeup of the work was delayed until 1981 when Coastal Environments, Inc. was contracted by the Office of State Parks to complete the study. The excavations which concentrated on the officer's quarters, a cistern, the flagpole foundation, and the cannon emplacements, revealed information on the construction and repair of the fort and of the material culture used by the fort's occupants.

A cultural resources survey by Coastal Environments, Inc. of the Mississippi River Gulf Outlet for the New Orleans District of the Corps of Engineers recorded several early American forts on Lake Borgne built after the War of 1812. These include Battery Bienvenue (16SB84) constructed after 1825, Martello Castle or Tower Dupre (16SB85) constructed between 1829 and 1830, an associated scatter of cultural material in the vicinity of the tower designated site 16SB71, and Fort Proctor (16SB83) built in 1856. Surface collections at 16SB71 recovered a large amount of cultural material possibly originating from a barracks or officers' housing including slate, concrete, earthenware tile, and brick construction material; ceramic eating utensils including coarse earthenware, lead glazed stoneware, and earthenware jar and crock fragments, and whiteware and pearlware plate, platter, and bowl fragments; liquor, wine, and beer bottle fragments; and medicine bottles (Wiseman et al. 1979:5-18, 5-19).

Fort Proctor built on Lake Borgne is a large iron reinforced masonry battery consisting of three floors and a tower for cannon. The tower also contained four cisterns, a magazine, and a ditch works with a drawbridge. Artifacts collected from the vicinity of the fort include mid-1800s green bottle glass, wine and whiskey glass bottle fragments, and hand painted whiteware, flow blue whiteware, semiporcelain, and stoneware and coarse earthenware. The fort is listed on the National Register of Historic Places (Wiseman et al. 1979:5-28, 5-29).

On the Red River in Natchitoches Parish, investigations by Commonwealth Associates, Inc. of the Red River waterway included intensive shovel testing and limited excavation at Fort Selden (16NA235). Fort Selden was designed to be a temporary encampment or staging point for a detachment of the Seventh U.S. Infantry under Lt. Colonel Zachary Taylor for the nine months from 1821 to 1822 to guard the Louisiana Territory from Spanish incursions from the southwest. After July 1822, the detachment was removed to Fort Jesup on the Saline River. Little information is known about the construction of the fort, but based on the temporary nature of the fort and the lack of budgetary and engineering records, it is believed that no major defensive works were ever built at the fort.

The investigation was conducted to determine the nature, extent, and significance of the fort's archeological remains. The excavation of 80 shovel tests and four 1 m^2 test pits revealed artifacts including whiteware, porcelain, and stoneware ceramics, metal, glass, a gunflint, and a clay pipe fragment; faunal remains; and a trash pit. Analysis of the faunal remains showed that domestic animals included cattle, pigs, and wild game consisting of birds, fish, turtle, and other terrestrial and aquatic species (Newkirk 1981:388–407).

CULTURAL DIVERSITY IN THE TERRITORY

The Louisiana/Arkansas territory consisted of an amalgam of people from a broad range of places and cultures. The present landscape still retains its distinctive cultural heritage in terms of regional architectural styles. Kniffen (1963:263) noted that the ethnic diversity of Louisiana is the result of the mixed history of the region:

> Indians were succeeded by French from Europe, from Acadia in Canada, and from the West Indies. Spaniards came from Spain, from the Canary Islands, and from other sections of the New World. Scotch–Irish from the Upland South settled in familiar-appearing parts of Louisiana. Planters from tidewater Virginia established new plantations in the bottomlands. Commercial lumbering brought northerners to the piney woods and swamp forests, while the opening of the prairies of southwestern Louisiana brought solid groups of farmers from the midwest.

This section outlines the ethnic diversity of the region and discusses the cultural mixing and change that accompanied adaptation of these immigrant groups to the new surroundings.

African Slaves

In the first years of the French occupation of the Lower Mississippi Valley, the total number of slaves in the province numbered less than 20. Slaves began to be introduced on a regular basis in the Louisiana territory in 1712 when Antoine Crozat began making yearly slave trading trips to West Africa. By 1722, 2,500 slaves had arrived and nine years later this number had increased to 6,000. The slave trade flourished during the seventeenth century. Slavery was most evident in Louisiana in the southern part of the state and along the major river bottoms along the Mississippi, Red, and Ouachita rivers where the plantation system achieved it fullest expression. Before emancipation during the Civil War, free African–Americans constituted a visible part of the population only in New Orleans.

In Arkansas, the introduction of slaves dates to the Law Colony at Arkansas Post in 1720. Although most of the German settlers abandoned the post a year later, a few of the settlers chose to remain with their slaves on the lower Arkansas River. Throughout the eighteenth century, the number of slaves in Arkansas remained low, and it was not until the region passed into the hands of the United States in 1803 that immigration of settlers with their slaves was renewed. However, the early decades of Arkansas settlement in the nineteenth century were marked by small farmers from the Upland South who owned few slaves. The census of 1820 revealed only 1,617 slaves out of a total population of 14,273 people; about one-ninth of the populace were slaves. The decades between 1820 and 1840 saw a large gain in the total number of slaves as well as an increase in the ratio of slaves to total population. The growing importance of cotton monoculture by 1840 combined with an expansion of settlement into the southern and eastern lowlands of Arkansas was the most significant factor in the establishment of slavery in Arkansas (Taylor 1958:3–27). It has been estimated that some 600,000 Africans were forcibly exported to the

North American mainland during this period. According to Curtin and Vansina (1968), the New World slave trade was acquired from at least 80 different African groups with the majority coming from West African cultures. In the first decade of the nineteenth century, both Britain and the United States outlawed further importation of slaves (Greene et al. 1984:269–270).

Colonial French

The French were the first Europeans to settle Louisiana arriving between 1714 and 1719 at New Orleans, Baton Rouge, and Natchitoches. Although some subsistence farming was practiced by the French particularly during the early years of settlement, they are most often associated with initiating the plantation system in Louisiana. The planter class arrived at the end of the eighteenth century following the slave uprisings in the Caribbean, followed by Royalists and other aristocrats during the French Revolution (Newton 1972).

In Arkansas, French trapper–traders were prominent during the eighteenth and early nineteenth centuries around the trading posts on the Arkansas and Ouachita rivers. Although many of these trappers remained in the area after the influx of immigrants from the Upland South in the 1800s, French culture seems to have had less of an impact on the development of Arkansas.

French culture was the dominant influence in the historical development of the Louisiana culture core (Greene et al. 1983: 287–288). French language, culture, and architectural design modes are distinguishing features of the Lower Mississippi Valley, the Bayou Lafourche area, Teche drainage, and parts of the Red River Valley.

Colonial Spanish

Although Spain had control of Louisiana and southern Arkansas for much of the last half of the eighteenth century, Spanish culture did not exert any lasting influence on the development of the culture of the region. The Spanish occupation was mainly limited to administrators and soldiers rather than permanent settlers during this period. The few sugar planters who did stay on tended to become absorbed in the dominant French culture by marrying French and adopting their lifestyle and language. Second and third generation Spanish–French offspring became Creoles (Greene et al. 1983:288).

The Islenos

The Islenos were immigrants from the Canary Islands who were recruited for settlement in Louisiana between 1777 and 1783. These immigrants were former Spanish settlers of the islands who had arrived there from Europe earlier in the eighteenth century. The introduction of the Islenos was encouraged by Spain to help establish a stable Spanish presence in the territory to counter the pro-French Acadian migration from Canada and to thwart American military expansion. The Islenos established settlements in St. Bernard Parish at Tierra de Bueyes and in Ascension Parish near Donaldsonville near the confluence of the Mississippi River and Bayou Lafourche. They were mainly subsistence and truck farmers who sold their produce at markets in New Orleans. Like the Acadians to be discussed later, the Islenos were displaced from the fertile natural levees on the major drainages by the Anglo–Americans who bought out the prime land to establish the plantation system. Islenos continued their small farming supplemented by hunting, fishing, and trapping and obtained seasonal work on the nearby sugar plantations of the Anglo–Americans.

The Filipinos

The Filipino populations in Louisiana were made up of refugees who had been forcibly impressed into sea service for the Spanish galleon trade between Manila, the Philippines, and Mexico in the eighteenth century. Many of these Filipinos jumped ship and made their way to coastal sections of the territory where they built the distinctive stilt fishing villages that used to mark areas like Barataria Bay. They eventually married women from other ethnic groups including French, Irish, German, English, Welsh, Spanish, and Native American and developed a mixed culture drawn from all of these groups. They established the important oyster and shrimp industry (Greene et al. 1983:293).

The Germans

German settlement in Louisiana occurred in several waves between the eighteenth and twentieth centuries. The first wave of German immigration occurred in the early 1720s as part of John Law's attempt to establish a colony on the lower Arkansas River. Thousands of German, Alsatian, and Swiss immigrants recruited by Law were stranded in Louisiana by the collapse of the Company of the West Indies before they could reach Arkansas Post. Some of these obtained passage back home to Europe, while about 250 others were induced to settle on the river by English Turn south of New Orleans and in an area 40 to 70 km above New Orleans in St. Charles and St. John the Baptist parishes. This area of German and Swiss settlement became known as La Cote des Allemands or the German Coast (Ogg 1968). The second wave occurred in the early nineteenth century after the Napoleonic Wars and the third wave took place in the midnineteenth century to escape persecution following the failed revolution of 1848. German settlement continued between the American Civil War and the outbreak of World War I; additional immigration has occurred between 1920 and the present (Stern 1980).

Up to about 1840, German settlement continued to concentrate along the German Coast section of the Mississippi River. After this, German immigrants went to the open frontier of the southwestern prairies where they established rice agriculture and cattle raising, or they moved to the urban areas of New Orleans where they were engaged as merchants and artisans. The German farmers of the river region produced vegetables, fruit, cattle, and poultry and sold their surplus in the New Orleans market (Stern 1980).

The German settlers quickly became assimilated into the French Creole culture in the first century of residence. The absorption of the German culture through intermarriage and language shifts was so complete that a century after initial settlement on the German Coast, little trace of the original could be found. German traditions seem to have persisted longer in the urban areas of New Orleans where German language newspapers, businesses, and industries such as German beer brewing flourished throughout the nineteenth century (Greene et al. 1983:295–297).

Other Eastern Europeans

A wave of immigrants from the eastern European countries of Germany, Italy, and Yugoslavia to southern Louisiana occurred in the late nineteenth century. This influx was at least partly in response to labor shortages in the reorganized postbellum plantation economy after the abolition of slavery and the shift to wage labor. Italians and Germans were recruited as day labor on the rice plantations where the Italians were instrumental in developing and expanding rice cultivation and truck farming. In contrast, the Yugoslavians settled in the old sugar plantations, which had been turned over to citrus production, and in the fishing villages and canning communities in the coastal strand, where they were employed primarily in the seafood industry. The new Slavonian immigrants soon developed and dominated the oyster growing and orange wine making industries (Goodwin et al. 1986:159–160).

The Chinese

During Reconstruction (1866–1876), Chinese immigrants were drawn to an area of the Mississippi River valley in southeast Arkansas and northwest Mississippi, known locally as the Delta, which was only just being drained, cleared, and planted in cotton. At first, local planters associations had attempted unsuccessfully to meet the large demand for labor in the region by recruiting Northerners and European immigrants. Some African–Americans from the surrounding area had also been brought in, but the new freedmen, who could now vote, were viewed with suspicion by the planters. The Chinese were seen as a viable solution to the labor shortage because they had earned good reputations as efficient, docile workers in the West and the Caribbean who would not upset the local political balance. Initially, the importation of Chinese workers was viewed as a good decision, but the planters were soon mired in court suits, strikes, walkouts, and dissension with the Chinese over terms of their contracts. As the Reconstruction Period ended and political power settled back to the planters, the impetus for outside labor was removed and the experiment in Chinese labor ended. The Chinese who remained in the area left the cotton fields to become peddlers and grocers where they remain a viable part of the rural economy of the Delta today (Schneider and Schneider 1987:83–86). According to Schneider and Schneider, the success of the Chinese shopkeeper can be attributed to their transitional position mediating exchange between African–American and Euramerican segments of the Delta society.

The Acadians

The Acadians arrived as refugees from Acadia or Nova Scotia in the mideighteenth century. They settled in large groups on a section of the Mississippi River known as the Acadian Coast, in St. John the Baptist, St. James, Ascension, and Iberville parishes. They were soon dislodged from the fertile natural levees along the river by the Anglo–American immigrants who bought out their landholdings to establish the plantation system.

The wealthiest and most ambitious of the Anglo–American immigrants, the middle class planter gentry from the tidewater region, expanded quickly into the limited tracts of undeveloped but fertile floodplain areas still available in some remote areas and then proceeded to vie with the native Acadians and others for landholdings along the previously settled rivers and bayous in the southern part of the territory. Although in regions like the Atchafalaya Basin, the Acadians had been among the first settlers of the natural levees in the basin, the land was soon transferred to the wealthier, more ambitious Anglo–American immigrants who were looking to establish cash crop agriculture based on the plantation system and slave labor. The Acadians sold the most productive agricultural land along the natural levees of the major tributaries which was also proximal to the primary water transportation routes and retreated to the levees of the smaller bayous and the swamp where they established a lifestyle and identity known as the Cajun culture. Comeaux (1972:11) notes:

> There were many good reasons why Acadians sold the good land and moved into the swamp. First, they could not afford to build and maintain the levees and roads as required by law for all front holders. Second, they feared debt, and once in debt they sold their land. And third, these poor, independent Acadians were considered to be a bad influence on the plantation slaves, and plantation owners were willing to buy their frontage at almost any price.

This pattern of Acadian dislocation and cultural isolation was noted by writers throughout the nineteenth century. In the midnineteenth century, Lyell (1849:113) observed that:

> The French had a fair start of us by more than a century. They obtained possession of all the richest lands, yet are now fairly distanced in the race. When they get into debt, and sell a farm on the highest land next to the levee, they do not migrate to a new region further west, but fall back somewhere into the low ground near the swamp. There they retain all their antiquated usages, seeming to hate innovation. To this day they remain rooted in those parts of Louisiana where the mother country first planted her two colonies two centuries ago.

The Acadian retreat to the swamp was a continuation of the geographical, linguistic, religious, and cultural isolation that extended back 50 years before the westward migration of the Anglo–American settlers. The Acadians were *petite habitats* or small farmers who originally settled in Nova Scotia, in the early seventeenth century until being forcibly deported by the British when in 1713, at the conclusion of Queen Anne's War, Canada was ceded by France to Great Britain under the Treaty of Utrecht. The first Acadians arrived from Canada in the mid 1700s, but the majority came between 1760 and 1790 along a variety of routes to settle along Bayou Lafourche and a stretch of the Lower Mississippi River known as the Acadian Coast. The historian Robert Gramling (Gibson 1982) discusses a number of factors in the emergence of the distinct Cajun culture group from the isolation of the Acadians. He notes that much of what distinguishes Cajun culture from other forms may be attributed to the traditional Catholic working class attitude toward their lifestyle and family as opposed to the Anglo–American Protestant work ethic of duty to one's occupation and the accumulation of personal wealth in the spirit of capitalism. Electing not to participate in the capitalistic ventures of commercial plantation agriculture, the Acadians were forced to poor swamplands where they turned to extraction of swamp resources to supplement their low level subsistence farming. When pushed further from tillable land by increased flooding caused by the removal of natural rafts to improve transportation from the plantations to the market, a gradual transition was made by the Acadians from a mixed subsistence farming to a total swampland extractive economy. This culminated in a lifestyle molded by adaptation to the south Louisiana wetland environment and the emergence of a distinct culture group known as the Cajuns. The Cajun ethnic group today is actually a composite of a number of cultures dominated by the Acadian traditions developed in isolation but also influenced by Germans, Black French Creoles, Houma, Islenos, and some Anglo–Americans absorbed over the years (Rushton 1979).

The Anglo–Americans

The English-speaking immigrants to Louisiana constitute another distinct ethnic group with distinguishable social and cultural traditions. Like the other groups that migrated to the territory, they were much transformed by close contact with the dominant French culture and in many areas underwent Cajunization and Creolization. The Anglo–American phase of settlement can be broken down into two major waves of immigration: the initial influx derived mainly from the lowland tidewater region of coastal Maryland, Virginia, and the Carolinas. The second major period of American settlement originated from the upland south region of the eastern Piedmont and Appalachian region. These periods of settlement will be discussed later in this chapter in the context of the development of the plantation system and the frontier settlement of the hinterlands of Louisiana and Arkansas after the period of United States rule.

EARLY AMERICAN PERIOD OF SETTLEMENT AND DEVELOPMENT

The Treaty of Paris in 1783 that formally ended the American Revolution did not resolve many of the terms pertaining to international boundary divisions between Spain and the United States and navigation access to the Mississippi River. In 1795, the Treaty of San Lorenzo established a new boundary between the United States and Spain at the thirty-first parallel and granted America the right of access to the Mississippi River and the port of New Orleans. Louisiana remained under Spanish control until 1800 when Napoleon, bent on rebuilding France's New World empire, arranged through the secret Treaty of San Ildefonso for Spain to cede roughly the entire western half of the Mississippi River Valley and New Orleans to France. However, French control over the Mississippi River Valley water transportation arteries threatened American commercial interests by blocking the major conduit and shipping port for transporting goods and products to market from the western frontier of United States. With the Louisiana Purchase of 1803, the United States acquired all of French Louisiana, virtually doubling her territory and assuring free access for the Ohio and Mississippi River Valley territory to regional and world market systems. Also by this act, the door was opened for the westward expansion and development across the Mississippi River of the growing Anglo–American populations along the eastern seaboard of the United States (Ogg 1968).

However, the Louisiana Purchase agreement left unresolved one large tract of land in western Louisiana in dispute between Spain and the United States. The United States claimed control of the land between the Mississippi River and the Sabine River while Spain asserted claim to the area west of the Red River. The disputed land, a strip bounded by the Sabine, Red, and Calcasieu rivers known as the Neutral Ground, remained an obstacle to American westward expansion until 1821. Despite the lack of governmental control in the Neutral Ground and its use as a refuge for bandits, immigrants continued to settle the disputed area and some trade went on with farmers producing corn, cotton, tobacco, and wheat. The Adams–Onis Treaty of 1821 provided for incorporation of the Neutral Ground into Louisiana in conjunction with the acceptance of the state into the Union. However, large scale economic development did not occur until Texas declared independence from Mexico in 1836 and steamboat commerce was permitted to extend up the Sabine River (Cantley and Kern 1984:41–42).

Elsewhere in Louisiana and Arkansas, settlement of Louisiana Purchase territory occurred smoothly throughout the first decades of the nineteenth century. Although some Anglo–American immigration from the South had occurred during Spanish control in the eighteenth century, it was not until after the agreement of 1803 that the international barriers to the growth of American settlement were lifted completely. Some migration of planters from the Tidewater region continued during this period, but the vast majority of the new settlers during this period came from the Upland South area of Virginia, the Carolinas, Georgia, Tennessee, Alabama, and Mississippi, as well as Texas.

A distinction can be made between the planters of Tidewater regions of Maryland, Virginia, and the Carolinas, who arrived in the first wave of Anglo–American immigration during the eighteenth century, and the hunter–herders and yeomen farmers of the southern Appalachian region immigrating after the Louisiana Purchase in the nineteenth century. The immigration from the lowland Tidewater region involved a distinct class of relatively advantaged Southern gentry preadapted to the Louisiana plantation form of commercial agricultural enterprises. They settled mainly in the plantation region along the rivers and bayous in the southern part of the territory. The second wave consisted of less prosperous lower and middle class rural peasantry adapted to a more simple self-sufficient economy based on mixed hunting and herding and low level subsistence farming. These immigrants settled on the hilly uplands in the northern part of Louisiana and northwest Arkansas. The eastern and southern lowlands of Arkansas were avoided by the early settlers because of the health hazards from malaria (Johnson 1957:42).

The attractiveness of the northern and western parts of Arkansas outdrew the eastern lowlands in the 1820s and 1830s for settlers from the Upland South, despite the remoteness of the Ozark–Ouachita highlands from previously settled areas on the lower Arkansas and White rivers. The shift in the population center of the state from the mouth of the Arkansas and White rivers to the northwest was officially recognized in 1821 when the territorial capital was moved from Arkansas Post to Little Rock which was situated in the center of the state at the edge of the highlands. The gain was so rapid during this time that by 1830 approximately 68% of the total population and 61% of the slaves lived in the twelve highland counties in the northwest part of the state. This settlement trend gained further momentum by the opening of new lands acquired from the Cherokees in the Treaty of 1830. The highlands continued to lead in total population until the end of the Civil War and it was not until 1840 that the lowlands exceeded the highlands in the number of slaves (Taylor 1958:26–27).

Although the lowlands of Arkansas east of the Ozark–Ouachita range contained some of the most fertile soils in the region, these fertile prairies and bottomlands were largely bypassed by settlers passing through on their way west to the uplands until sometime in the third decade of the nineteenth century. Settlement in the lowlands was avoided during this period because of the unhealthy conditions caused by the frequent floods and swarms of mosquitoes. Many early settlers of the eastern lowlands fell ill to a sickness termed by the people of the day as the "congestive chills", "ague", "bilious fevers", "chills and fever" or simply "the fever" (reported to have been malaria and yellow fever). The settlers and writers of the day usually attributed the bouts of sickness in these areas to "miasms" (or poisons) originating from the ground which was released by plowing and land clearing. In 1834 Featherstonhaugh described the conditions of one family he visited between Batesville and Little Rock:

> They had emigrated from Tennessee in the month of May last, and had been ever since so completely prostrated by the malaria that at one time there was not, during two whole days, a single individual of them able even to draw water for the family. A more sickly, unhappy set of creatures I never beheld: livid, emaciated, helpless, and all of them suffering extreme pain and nausea from an excessive use of calomel (Johnson 1957:71).

Henry Stanley described his bout with the sickness while residing at Cypress Bend near Pine Bluff, Arkansas to learn the merchandise business:

> Few visited our store who did not bear some sign of the pernicious disease which afflicted old and young in the bottom lands of Arkansas. I had not been a week at the store before I was delirious from the fever which accompanies ague... the young physician of our neighborhood communicated...[that] he had known many cases to terminate fatally within a few hours... Blacks as well as whites were subject to it... the frequency of ague attacks had reduced me to skin and bones (ninety-five pounds.) It was a strange disease, preceded by a violent shaking, and a congealed feeling as though the blood was suddenly iced, during which I had to be half-smothered in blankets, and surrounded by hot-water bottles. After a couple of hour's shivering, a hot fit followed, accompanied by delirium, which after the twelfth hour, was relieved by exhausting perspiration. When, about six hours later, I became cool and sane, my appetite was almost ravenous from quinine and emptiness. For three or four days afterward...I went about my duties as before, when suddenly, a fit of nausea would seize me, and again the violent malady overpowered me. Such was my experience of the agues of the Arkansas swampland; and, during the few months I remained at Cypress Bend, I suffered from them three times a month (Taylor 1958:153).

Despite the health hazards of life in the lowlands, the potential of the region for commercial crop production during the cotton boom of the 1830s and 1840s finally began to draw large numbers of farmers and planters from the Deep South slave states to the east. The incidence of disease continued to be prevalent in the lowlands throughout the midnineteenth century. A review of the letters of James Sheppard's overseers at Waterford Plantation near Cypress Bend on the Arkansas River gives some indication of the high incidence of malaria among slaves on these cotton plantations during the fever season in the summer and fall. Between 1852 and 1860, the overseer reported three cases of fever in 1852, sixteen cases in 1854, six cases in 1855, and as many as twenty cases a day in 1858 (Taylor 1958:154). Throughout the nineteenth century, malaria and cholera, which became epidemic in the Arkansas lowlands during the late 1840s and early 1850s, were the two leading causes of death among both whites and slaves.

Native American Removal

As the wave of Anglo–American settlement pushed north and west into Arkansas in the early nineteenth century, frictions over land rights occurred between the new settlers and the Native Americans and between native groups such as the Quapaw and the Chickasaw, and the Osage and Cherokee. In the early 1800s, pressure mounted on the federal government to buy Native American lands and open them up for intensive settlement. The Osage who claimed land north of the Arkansas River ceded all of their lands in Arkansas to the United States in treaties in 1808, 1818, and 1825. In 1818, the Quapaw were induced to cede their land south of the Arkansas River and northern Louisiana, and in 1833 a treaty was signed ceding their lands on the Red River to the United States. The Choctaw and Cherokee who had been displaced to Arkansas from points east of the Mississippi River were moved west to Indian Territory by treaties of 1825 and 1828. The treaty of 1825 established the western boundary of the state of Arkansas between Ft. Smith and the Red River and set this area aside for the Native Americans in requiring all Anglo settlers to move east of the western boundary. In 1835, the Caddo who were concentrated in Louisiana and Texas but still claimed tribal land in Arkansas, ceded their lands in southwest Arkansas to the federal government (Johnson 1957:10–22).

Early American Forts

The purchase of the Louisiana Territory from the French by the United States was accompanied by the takeover of existing French fortifications and the establishment of new defensive outposts to safeguard the settlers against native hostilities and Spanish incursions from their stronghold in the Southwest. Gregory et al. (1979) list a number of these sites and identify relevant collections and studies in their inventory of cultural resources of Natchitoches Parish. The early forts noted in this study include Fort Claiborne, the first U.S. military fort west of the Mississippi River, built in 1807 overlooking the Cane River in the present-day limits of Natchitoches (Gregory and Cook 1969). A second early U.S. military defensive outpost was Fort Seldon, built in 1812 above the junction of the Red and Cane rivers.

Early American Trading Posts and Factories

Another institution created to control relations with the Indians was the U.S. factory system. Established in 1795, the factory system was designed to carry on the fur trade with the Native Americans and protect them from corrupt private and foreign traders while making them dependent on U.S. government goods. At the same time, factories were to win the friendship of the Native Americans, to teach them civilized behavior such as agricultural techniques, and to acquire their land by driving them into debt. Before the factory system ended in 1822, 31 trading posts had been established with most of them concentrated along the Mississippi River and its western tributaries (Magnaghi 1978).

In Arkansas, U.S. factories were established at Arkansas Post in 1805, at Spadre Bayou in the northwestern section of the state in 1819, and at Sulphur Fork on the Red River in 1818. Private trading posts also existed at Arkansas Post and upriver on the Arkansas, in the Three Forks area on the Verdigris River in northeastern Oklahoma, on the upper reaches of the White River, at Montgomery's Landing at the mouth of the White River, at Cadron near present-day Conway, Arkansas, at Natchitoches, and at Pecan Point in southwestern Louisiana. Private traders were also dispatched from Arkansas Post, New Orleans, St. Louis, and other centers to rendezvous with trappers at points along the river routes in Louisiana and Arkansas. Despite government subsidy, these government factories failed from a combination of factors including poor cooperation from agents and military officials in limiting the number of unlicensed private traders, from the disruptions of Native American warfare, and from federal regulations prohibiting their employees from entering Native American camps where they could compete with private traders. Finally, in 1822, Congress voted to close the government trading houses. However, trading continued at Arkansas Post, Sulphur Fork, Natchitoches, and other posts under private firms (Magnaghi 1978).

Archeological evidence of the early American period government and private trading factories in the study area has been coming to light in recent years. The research done at Arkansas Post, Natchitoches, and Los Adaes has been summarized above. In addition, recent investigations by amateur archeologist Claude McCrocklin may have located the remains of the early nineteenth century Sulphur Fork Factory on the Red River. McCrocklin, a member of the Arkansas Archeological Society, is conducting this survey work with the assistance of members of the Kadohadacho Chapter of the society and members of the Louisiana Archeological Society with the cooperation of Arkansas Archeological Survey archeologist Frank Schambach and Northwest Louisiana State archeologist Pete Gregory. Two of the historic sites located during this survey are of the same period as the factory and may constitute the factory and a Native American homestead that was established near the post. Limited excavations at the two sites (3MI243 and 3MI266) have revealed the remains of at least two cabins, trash dumps, and pits containing artifacts including military buttons, ceramics, gun parts roughly dating from 1810 to 1840. These European artifacts have been found in association with native made pottery, glass beads, and a piece of brass pipe tomahawk. Preliminary analysis suggests that the aboriginal material could represent contact with Coushatta, Choctaw, or Delaware groups known to have resided in the area (Arkansas Archeological Survey site files).

FORMS OF EARLY AMERICAN SETTLEMENT

Hunter-Herders

The territory west of the Mississippi River offered the opportunity for a fresh start for Upland South immigrants. As McGinty (1963) noted: "Many of these settlers on the uplands, 1840–1860, possessed relatively few economic goods. They had been crowded out, or pushed westward, by their more prosperous neighbors in Carolina, Georgia, Tennessee, and Alabama. Some were endeavoring to escape debt and hardships associated with the Panic of 1837 and the depression that followed." Many were possibly seeking to escape the confines created by the close of the Eastern frontier in the developing Upland South and find a comparable free-ranging hunting–herding–farming niche in the Western frontier. As Owsley (1949) has documented, there were a series of distinct upland South lifestyles that were preadapted to the conditions on the Western frontier.

Upland South Anglo–American settlement during this period involved at least two distinct adaptations: the hunter–herders and the yeomen farmers. According to Owsley (1971), the settlement of the frontier involved two successive waves consisting first of herders who subsisted upon a grazing and hunting economy followed by the agriculturalists who converted the open range to farming. The herders who sought the vast open range of the public domain where they could raise livestock on the free range were usually the first to move into the unsettled frontier. They shifted westward with the opening frontier from points east where the influx of farmers had limited the former open range areas of the Carolinas, Georgia, Tennessee, and Alabama. The herders occupied the best agricultural lands in the new frontier west of the Mississippi River until the second wave of settlement by the yeomen farmers pushed the herders further west or displaced them from the arable lands to the less fertile hilly lands of the pinewoods region of Louisiana and Arkansas.

As Owsley (1971:150) noted, herding had a long tradition in the history of settlement and development of the South. The South assumed the lead role over more northern frontier areas because they were closer to the major commercial livestock markets and also enjoyed the advantage of the mild temperate climate and rich natural forage which permitted year-round grazing without the need for winter housing and feeding that was required during the cold winters in the north:

> The frontier ranges in the South were all that man and beast could desire as long as they were not overgrazed. The trees were loaded with nuts and mast for the swine, and the savannas and open forests, which had been kept clear of underbrush by the annual burnings by the Indians, billowed with wild oats and grasses, vetch, and peavines "tall enough to reach the shoulder of a man on horseback"; and the swamps and valleys were covered with dense canebrakes that furnished winter pasturage and protection from the cold (Owsley 1971:150).

From the Colonial period to the Civil War, the pastoral hunter–herders thrived in the less settled areas of the South from the Atlantic coast to the arid Southwest. During the colonial period, the vacant lands of the King or his appointed proprietors in South Carolina and Georgia were grazed by herds ranging from a few dozen animals to thousands. As these areas became settled, the herders shifted westward to the public lands of Alabama, Mississippi, Florida, and Louisiana where both the sizes of herds and the profits from herding increased dramatically. By the early nineteenth century, travelers like Estwick Evans, Thomas Nuttall, and John Peck noted the presence of herds in the thousands feeding along the banks of the Mississippi River, on the prairies in southwest Louisiana, and in the Red River district of Arkansas. In these areas, some herders were grazing as many as 15,000 head of cattle and 2,000 horses, though as a rule most had no clear idea of the number of animals they actually owned (Beavers et al. 1985). It was reported that "the emigrant grows wealthy, from the bounties of nature with but little labor" (Owsley 1971: 152).

In southern Louisiana, the successful large herder often settled down as a planter–cattleman and placed his herd in the hands of cowboys who pastured the livestock on the fringe of settlement along with the herds of smaller owners living on the frontier. Many of these planter–cattlemen established plantations in the sugar country in the Teche region of south central Louisiana and employed cowboys to manage their herds on the prairies of southwest Louisiana in exchange for one-fifth of the increase of the herd. The southwestern prairies produced the bulk of the meat for the urban areas and the large plantations. Duperier (1979) described how the commercial livestock trade operated:

> The principal industry of the country was grazing large herds of cattle that ranged from the Cypremort to the Mermentau and Calcasieu. The entire Opelousas country, including Lafayette and St. Landry parishes, was used for grazing purposes. The Pellerins, the Wickofs, the Dupres and Moutons branded thousands of calves annually. The cattle trade of the early days supplied the Mississippi River plantations with beef. The use of western pork and cured meats was unknown at this period.... Immense herds of cattle were constantly driven to the point of embarkation...which after a few hours were landed on Bayou Plaquemine to be driven thence up and down the Mississippi coast.

By 1840, the arable lands in the public domain of Louisiana had been sufficiently settled by farmers to interfere with the livelihood of the large herders. Those herders that did not settle down as planters or small farmers or shift further west with the open frontier were pushed into the less fertile hilly pine forests along the coastal plain and the mountains to the north where many other small hunter–herders had previously settled. In many areas throughout the South, the hunter–herder adaptation persisted until the sawmills cut the timber and disrupted the remaining free range grazing lands in the late nineteenth century. In contrast to the large commercial enterprises of the planter–cattlemen, herding in these marginal areas was a relatively small-scale low-intensity operation. The small hunter–herder adaptation involved a lifestyle organized around scheduled seasonal shifts between hunting and trapping wild game and raising livestock on the open range as a secondary pursuit.

The most complete documentation of the small upland hunter–herder lifestyle comes from the accounts of Schoolcraft's travels through the Arkansas Ozarks between 1818 and 1819. Schoolcraft noted that these people lived a highly mobile lifestyle traveling light and frequently changing residence to be nearer areas of abundant wild game. They primarily subsisted on wild meats and some corn which was grown primarily for horses, and produced skins from beaver, otter, raccoon, deer, and bear to trade for salt, iron pots, axes, blankets, knives, rifles, and other staples. These items were obtained from commercial traders who made regular trips up the rivers to rendezvous at designated areas at the mouths of streams in the region where the hunter–herders could barter furs, wild honey, bear's bacon, and buffalo-beef for the vital staples they could not produce for themselves (Schoolcraft 1955 in Sabo et al. 1988). In other instances, traders ascended the rivers in small crafts to deal directly with the small farmer families settled along the river. One family living on the Arkansas River in 1816 noted trading with the French for calico, coffee, a green-edged dish, teacups, and saucers in exchange for furs, bear oil, bees wax, and honey (Johnson 1957:36–37).

Frequent mention is made in these early travel accounts of the primitive "savage state" of the hunter–herders. Schoolcraft (1955:86–87; 1819:174) noted that:

> In manners, morals, customs, dress, contempt of labor and hospitality, the state of society is not essentially different from that which exists among the savages. Schools, religion, and learning are alike unknown.... Composed of the unruly and the vicious from all quarters, insulated by a pathless wilderness, without the pale of civil law, or the restraints upon manners and actions imposed by refined society, this population are an extraordinary instance of the retrogression of society. So far as is not necessary for animal existence, they have abandoned the pursuit of agriculture, the foundation of civil society, and embraced the pursuit of hunting, so characteristic of the savage state in all countries.

One significant component, often overlooked in the contemporary accounts was the importance of livestock to the hunter–herder economy. Owsley (1945) notes that the livestock economy was not visibly evident because the herds of cattle and hogs were given free-range in the forests and were seldom seen by anyone passing hurriedly through the country. The fertile soils of the mountain and hill region provided abundant forage for sizable but unseen herds which were turned into the forests from May to October. The owners salted the herds once a week to keep them gentle and prevent them from straying too far. In the fall, the livestock were collected from the range and driven to the market (Owsley 1945:155). The hogs were also allowed free range to fatten up and in the fall were killed from the woods (Schoolcraft 1819).

The basic pattern of hunter–herder adaptation that emerges from the contemporary accounts is an economy based on scheduled seasonal hunting, trapping, livestock raising, cottage crafts, and limited gardening. During the summer season, men tended to the livestock while the women were engaged in gardening. After the cattle were delivered to the market and livestock were slaughtered and processed for personal consumption, the late fall and winter seasons were devoted to hunting and trapping by the men based at temporary camps scattered throughout the woods. Descriptions of women and children alone in the cabins during these hunts (Featherstonhaugh 1844) suggests that women remained based at home where they probably tended to crafts and other maintenance activities, and tended to the few head of livestock kept nearby to sire the herds for the next season. In the spring or summer, these livestock were turned out to graze in the uplands while new garden crops were put in (White 1931; Sabo et al. 1988).

Yeomen Farmers

Settlement Patterns

In the second wave of frontier settlement, the yeomen farmers expanded behind the shifting zone of the hunter–herder/herder–farmer wave. Owsley (1949) described this in terms of two contemporaneous processes involving shifts by those herder–farmers who stayed in place rather than follow the westward shift of grazing land toward increasingly more agriculture than livestock grazing. This transformation of the hunter–farmer to small farmer was combined with a second wave of immigrant agriculturalists, the yeomen farmers, migrating into the vacuum left by the expansion of the frontier and the Native American border.

The yeoman farmers began arriving in Arkansas in large numbers after the first public land surveys in 1815. From Louisiana, settlement extended north up the Ouachita River and from Missouri south down the Arkansas, White, Black, and St. Francis rivers. They arrived by wagon across the rough trails to the south, east, and northeast and by flatboat or keelboat along the navigable streams of the territory. In these early years of settlement before an adequate overland road system had been developed, good access to river transportation routes was a necessity for moving materials and trade goods from homes to markets downstream in Louisiana. The only permanent settlements in south-central Arkansas were located on such routes as Camden and Champagnolle on the Ouachita River (Weinstein et al. 1984:54–55), at Briscoeville on the Caddo River, and at Tate's Bluff at the mouth of the Little Missouri (Klinger 1979:33). On the upper Black River in Randolph County, one of the first permanent planned towns was Davidsonville platted in 1815 or 1816 (Dollar 1977). Along the White River below the mouth of the Black River, settlers congregated along the low bluffs near the present-day towns of Des Arc and DeValls Bluff. On the eastern bank of the White River, settlers clustered along the low sandy ridges close to river access where important settlements like Chickasaw Crossing, Litchfield, Elizabeth, and Jacksonport grew up (Klinger 1976:164–165). In the St. Francis River area, settlement was disrupted and retarded for several years by the New Madrid earthquake of 1811–1812. The federal government responded to the calamity by awarding certificates to settlers with land in the region damaged by the quake for resettlement elsewhere. It was not until the 1830s that permanent settlements were established in the region. Also about this time, settlers began to move inland from the riverbanks and construct roads from the riverside settlements and the major overland trails along which immigrants had been entering the state.

One important overland immigrant route was the Old Southwest Trail which linked St. Louis, the gateway to the west, to the Arkansas and Louisiana territory and beyond to the Southwest territory and Mexico. The trail was possibly part of the original Caddo salt trade network (Gregory et al. 1979:11). The Southwest Trail (also called the National Road or the Military Road) entered Arkansas from Missouri north of Pocahontas and extended due southwest following the route of least resistance along the outer, less mountainous, edge of the Ozark escarpment. It crossed the White River below Batesville and the Little Red River near Searcy and from there extended southwest to Little Rock, Benton, Malvern, Washington, and Fulton on the Red River. From the Red River country, the Southwest Trail linked up with roads extending south to Grande Ecore, Natchitoches, and Los Adaes in Louisiana where it joined other roads and trails leading to New Orleans and the San Antonio Road to Texas (Johnson 1957:113–114; Newton 1972:136).

The Southwest Road was little more than a rough trail through the wilderness until it was improved and incorporated into the federal National Road system in the 1830s. In the early nineteenth century, the newspaper, the St. Louis *Republican*. reported that "100 persons a day passed through St. Charles, Missouri one third of whom passed southward into Arkansas, distributing themselves as they went all the way to Red River in the southwest part of the territory" (Johnson 1957:113). The trail intersected a number of subsidiary trails and roads linking the main settlements in the territory in Arkansas and Louisiana. The Southwest Trail remained the main route for migration of settlers from Pennsylvania, Ohio, Illinois, Kentucky, Tennessee, and the Carolinas throughout the nineteenth century.

Another major route of immigration was the Little Rock–Memphis Road or Memphis Military Road built by the U.S. Congress in the late 1820s and 1830s to link Tennessee to central and western Arkansas. After completion, the Memphis Road became the main route of migration for settlers from Tennessee, Alabama, and the Carolinas while the Southwest Trail was the preferred route from the Northeast and Midwest. The tide of immigration along these two routes was apparently immense at times. For instance in the 1840s, items in the *Arkansas Gazette* noted:

> Emigrants for South Arkansas and Texas are crowding through our city thicker and faster than ever. The rush is tremendous. The two ferries are constantly engaged in crossing the movers.

> We are pleased to find that the tide of emigration to Arkansas has recommenced this fall, with renewed vigor. The ferry, at this place, has been crowded, for several days with movers, going South, some to Texas, but principally to settle the fertile lands in the Red River country. Among those who have passed through town, since Sunday morning, we presume that there were not less than 300 negroes. We also understand that the road leading from Memphis to this place, is literally lined with movers — all destined for the southern part of the state. They are generally from Tennessee and Alabama, and a large number from North Carolina (Taylor 1958: 50–51).

The process of migration followed a pattern whereby settlers sought a homestead as nearly as possible like the one in which they formerly lived, in terms of topography, environment, and climate. Many of the immigrants from the hilly Piedmont and highlands of the Upland South region of the Carolinas, Georgia, Alabama, and Tennessee sought identical conditions in the uplands of Louisiana and Arkansas and continued an agricultural tradition evolved from generations of Appalachian existence. They did not necessarily seek the most productive lands in the territory and they actually shunned the rich soils of the lowlands and prairies for the easily tillable sandy, silty soils of the uplands (Owsley 1971:170). In Arkansas, the Upland South yeomen–farmer usually sought hilly lands of the Ozark–Ouachita range in the northwest quarter of the state (Walz 1953).

So prevalent was the trend of settlers colonizing environments similar to their points of origin that a study conducted by the U.S. Census Office in 1860 concluded that "men seldom change their climate... because to do so they must change their habits.... The almost universal law of internal migration is, that it moves west on the same parallel of latitude" (Owsley 1971:167). In accordance with the latitudinal pattern of settlement, Tennessee contributed a large number of settlers to Arkansas, many of whom were attracted by the commercial prospects of the expanding cotton industry during the middle of the nineteenth century. Louisiana, having been colonized early by the French and Spanish, had a somewhat different settlement history, but in 1860, the largest contingent of immigrants originated from the adjacent states of Mississippi, Alabama, and Georgia (Lynch 198 :517). In turn these settlers from Tennessee, Mississippi, Alabama, and Georgia had come from the adjacent territories of the Carolinas. As Owsley (1971: 164–170) noted, there were psychological as well as practical reasons for migrating along latitudinal or environmental clines:

> The basic and sound assumption of the farmer who seeks a country similar in appearance, climate, and soil to the old community in which he has lived is that he can continue in the new country to grow the field crops, fruits, and vegetables, the tillage, habits, and marketing of which are part of his mental furniture.

In contrast to the independent and isolated settlement patterns of the trappers, hunters, and herders who came before, the yeomen farmers frequently migrated in large groups of relatives, friends, or church congregations and would settle in a body as a predefined self-sufficient community. Owsley (1971:172) pointed out that the early communities of the territory were essentially transplanted organisms made up of a cooperative group of families with close social ties well established prior to migration. This cooperation greatly increased the margin of safety of the settlers both during the difficult and hazardous journey as well as during the initial efforts to establish a foothold in the new settlement. Close cooperation in the arduous tasks of land clearing, house and barn building, road construction, and farm production gave such communities a clear advantage over isolated settlement efforts in insuring the success of the community by spreading out the risks of migration.

These group migrations were carefully planned and coordinated by scouting the territory in advance to select a likely settlement location and to work out the best migration routes with close attention to any overwintering and resupply stops necessary. It was a frequent practice for settlers on long journeys to stop temporarily during the spring and to plant and harvest a crop before moving on to their ultimate destination. Upon arrival at their designated homestead, they were often reunited with relatives who had departed earlier to begin land clearing, camp preparation, and to put in a crop of corn in preparation for the arriving settlers.

> a few strong men, generally their sons, without families, [were sent] deep into the then wilderness in the fall, to make corn and prepare for them. The father generally went with them and chose the place, and then went back to prepare for moving when the corn was made (Owsley 1971:172).

Many researchers noted the strong patterns of socioeconomic cooperation exhibited by these isolated frontier settlements. As Sabo (et al. 1988) commented, these patterns of cooperation went beyond the popularly cited examples of "house raisings" to constitute a form of social insurance upon which a family could fall back in times of hardship. Newton (1970) further suggested that cooperation was not just a function of hard times, but rather was a part of the daily task of coping with the rigorous isolated existence in these communities:

> A single family lacked organizational depth during periods of stress; it lacked variety of personnel for many human situations. But the cluster of relatives and friends in the settlement provided deacons, curers, folk political leaders, and persons with greater skill in many of the homely crafts such as blacksmithing, weaving, meat curing, cattle management, farm equipment repairing, and basket making. It was the settlement that provided children with the models appropriate to peasants; it would also provide them with peers, a modicum of schooling, religious training, a mate, and possibly a foster home.

This pattern of group migration and close community cooperation has been confirmed by quantitative settlement studies. Efforts to delineate the potential environmental factors that influenced settlement such as soil productivity, distance to water, topography, etc. reveal little or no strong correlation between such factors and historic site location; rather, social factors appear to have been a more significant factor determining settlement (cf. Orser and Nekola 1985; Joyce 1981). One problem with some previous historic period settlement studies discussed by Joyce (1981:14) is that such attempts to model settlement only address a minor subset of the cultural landscape, that being the visible remains of occupations such as foundation ruins, wells, privies, artifact scatters, etc. that have been recorded as archeological data. As Joyce (1981) noted, the locations of farms were chosen with reference to the agricultural potential of the entire landholding, and the placement of the residential structure was determined only after the parcel of land had been secured:

> With property ownership the universe is the total purchasable region: whereas with the individual structure the universe is the purchased or claimed property. The confusion arises because settlement is usually viewed as a structure or activity center which generates physical remains, rather than a physical space which includes fields, woods, and improvements, as well as structures and refuse areas. The latter view probably more closely approximates the emic view of settlement.

Joyce's (1981) analysis of the War Eagle Creek locality in northwest Arkansas revealed that the earliest settlement focused on highly productive lands along the floodplains of major creeks, followed in popularity by sloping uplands and flat uplands. In general, the presence of water was desirable with high ranking streams preferred over lower ones. Swamps, prairies, and mountainous settings were rejected. Wooded areas were also desirable. The role played by kinship was determined to be a significant, often overriding factor in the placement of farmsteads. For instance, the early settlements along the major floodplain stream locations were all kin-based, and land selection patterns of subsequent settlers, many of whom came as extended families, also indicate a desire to maintain close kinship connections. If only isolated plots were available on War Eagle Creek, but larger contiguous plots were available on the upland slopes, these connecting plots would be selected in preference to the more productive but isolated tracts. She also noted that ethnicity, religion, and regional ties also structured the process of settlement as whole groups of families selected large contiguous plots for the establishment of new communities (Joyce 1981).

An archeological assessment of the Ouachita Basin by Heartfield et al. (1976) for the Soil Conservation Service includes a detailed study of the patterns of nineteenth century American settlement. A survey of U.S. Land Entry Books from parish and county courthouses and state land offices from both states, revealed a picture of the patterns of land acquisition for northeastern Louisiana and southeastern Arkansas between 1800 and the early twentieth century. In the Ouachita Basin, land surveys by the U.S. General Land Office were initiated by 1830 and were completed by 1850. Before these systematic surveys, land holdings reflect the influence of Spanish grants, particularly the Spanish long lots which were rectangular as opposed to the Spanish square grant or *sitio* which covered one square league. The American long lots were generally oriented towards slightly higher landforms than were the Spanish grants in areas referred to as prairies by the early explorers. In addition, some American land claims lie with the long axis parallel to the river rather than extending back.

After the land surveys of 1830, settlement in the Ouachita Basin gained momentum. Settlement during this period can be broken into three distinct environmental niches (Heartfield et al. 1976:37–39). One niche was a basic continuation of the river orientation as exemplified in parts of Richland Parish, Louisiana and Arkansas, Clark, and Hot Springs counties, Arkansas. The second type was associated with slight elevations in the floodplain and uplands, such as Macon Ridge in Louisiana (e.g., Franklin Parish) and Crowley's Ridge in Arkansas (e.g., Drew County) where settlements were compact and large. The third type of settlement niche was found in higher lands located to the west of the Ouachita River where landholdings tended to be smaller and more scattered. Examples of this form of settlement were found in Lincoln, Ouachita, Claiborne, and Union parishes, Louisiana and Saline, Clark, Union, and Ouachita counties, Arkansas.

In Louisiana, an important source of information on early American settlement patterns include theses and dissertations produced in the Louisiana State University, Department of Geography and Anthropology. Of particular relevance are settlement succession studies by Taylor (1956) for the prairie region of southwest Louisiana, Wright (1956) for the uplands of northern Louisiana, Comeaux (1969) for the Atchafalaya Basin, Lewis (1973) for the Boeuf Basin, and L'Herrison (1981) for northwest Louisiana. These studies provide useful information both as historical case studies and for modeling settlement and land-use patterns that could be tested from archeological data.

The most comprehensive efforts to understand the early American period historic settlement patterns in Louisiana from an archeological perspective come from the Fort Polk studies. However, as Anderson et al. (1987:241) note in the most recent technical synthesis of Fort Polk, the focus of most settlement analysis at Fort Polk have been the prehistoric occupation with little attention paid to the development of historic patterns. Previous research on the fort by New World Research (Thomas et al. 1982; Campbell and Weed 1986) have been cited as the most comprehensive assessments of historic period settlement. In general, these studies have produced inconclusive results that have been attributed to the low site density and perceived random distribution of historic sites (Anderson et al. 1987).

In analyzing these attempts at historic settlement predictive modeling, Anderson et al. (1987:241–281) point out the general difficulties entailed in historic archeological settlement studies and the methodological analysis. Their comments parallel those criticisms levied by Joyce (1981) in her War Eagle Creek, Arkansas study. They note that a large part of the failure of previous studies stem from the application of incomplete information about the natural and cultural environment. Two major problems include the poor treatment of cultural variables such as the locations of kin groups, road patterns, and communities that determine settlement and the overemphasis on the physical archeological remains of the residential structure to the exclusion of the fully perceived environment such as the distribution of agriculturally productive soils (Anderson et al. 1987:241–249).

A reanalysis of the Historic period site settlement at Fort Polk by Anderson et al. (1987) reveals some interesting departures from the pattern described by Joyce in the uplands of Arkansas. These differences are largely the result of the nature of the environment in west-central Louisiana, which consists of heavily dissected Gulf Coastal Plain terraces having limited fertile cropland available and usually only in small tracts along drainages. Statistics gathered from surveys of the time indicate that the average farm size was 8 to 12 ha while plat maps showing field size indicate that most fields were about 2 ha in area and were located along the major and minor drainages. Thus, in order to bring enough land into cultivation, most farmers would have had to work three or more of the dispersed streambottom fields. The usual pattern at Fort Polk was for house complexes to be situated on ridge noses and slopes overlooking drainages possibly in locations suited to reaching several dispersed fields. The disproportionate number of fields compared to residential units in the area also suggested that many of those who farmed the fields commuted from homes in communities outside the immediate area. The isolated pattern of settlement would require more dispersed interaction with kin and social groups compared to the tight knit communal networks seen by Joyce in Arkansas or a case of farmers choosing a long commute to their field in order to reside in communal settings outside the area (Anderson et al. 1987).

Farmstead Development

Yeoman farmer agriculture was a subsistence level operation with some supplementation by hunting wild game. An autobiography of one small farmer in the Vernon Parish region of Louisiana (Cantley and Kern 1984:47) reveals the kind of hardships involved in starting up a small farm:

> They would clear...from 5 to 10 or 15 to 20 acres depending on the size of the family. It was a job to plow the ground and it was full of stumps. So lots of work was done with the hoe. The cotton and corn was barred off in large strips and the row was hoed out.... What plowing was done was done in a primitive way, wooden sticks were used at an early time and later different kinds of plows were used.

The German traveler Frederick Gerstaecker described the early settlers as being:

> not very fond of hard work; in those wild regions they prefer rearing cattle and shooting to agriculture, and are loth to undertake the hard work of felling trees and clearing land. To make the labor as light as possible, yet still to increase their fields, they generally clear a small space every autumn, and ploughing it very slightly sow it with turnips, which answers best for new ground. Next year it is fenced in and added to the field.

Gerstaecker also described what appears to be a "slash and burn" method for making clearings.

> The American (settler) looks out for the longest and straightest oaks, which he fells, and splits into poles from ten to twelve feet long, for fencing. When he thinks he has enough for this purpose, the rest is cut up and piled; next the trees which have a diameter of eighteen inches and under, are felled, at half a yard from the ground, and cut into lengths while the larger trees are girdled all around with the ax and very soon die. The shrubs and bushes are then rooted up with a heavy hoe, and with the help of the neighbors who are invited for the purpose, the whole except the poles for the fence, is rolled into a heap and set on fire.
>
> As soon as the land is cleared of all that can be easily removed it is fenced and ploughed. This last work is very severe, and gives the ploughman and cattle many a rough shake, as the ploughshare, catching in the roots, has constantly to be lifted out of the ground, or to be moved out of the way of the standing stumps. These stumps give the fields a very extraordinary appearance; it takes from six to ten years before they rot away entirely.

Settlers in the lowlands of areas like the Ouachita Basin usually followed a pattern of clearing one single field usually next to the river and built their homestead nearby, close to the river. In some cases, they had to adapt their fields to the pattern of alternating accretional ridge and swale topography in which the narrow ridges or natural levees were cleared and farmed while the swales where water or moisture remains all year were left alone. This resulted in what has been called a ribbon pattern of fields which persisted until the midtwentieth century when the equipment and methods to level ridges and fill the swales were developed (Heartfield et al. 1976:46–49).

The first houses built on the frontier were crude log structures after the Anglo–American Pen Tradition of the Upland South. This building tradition is based on a core house measuring about 5 by 5 m which served as the initial residence and could be expanded later by the addition of other pens and often with a connecting space in between to form a "double pen" or "dogtrot" house. The original core was erected from hewn logs or heartpine with notches and pegs to hold the rough logs in place. Cracks between the logs were closed or chinked with smaller pieces of wood and mud. The floor was either dirt or consisted of roughly cut puncheons laid on log "sleepers." An exterior stick and mud chimney was erected at one end of the structure connected to an interior fireplace and stone and mortar hearth. The cabin was usually one-story in height and was covered by a shingle roof on a pole frame that ran the length of the structure. Window openings were covered with greased paper, scraped animal skin, or in rare instances glass (Kniffen 1936; Newton 1971).

For the successful yeomen farmers, the basic pen-type house design provided a flexible core for later additions and improvements made as families expanded in size and the economies stabilized. At first, residential space was increased in a modular fashion by the addition of more pens to form dogtrots, triple pen basic L-shaped units, and triple dogtrot L-shaped units. Eventually, these basic modes were upgraded to styles such as the Bluffland House (Newton 1971), the I-House (Kniffen 1936), and varieties of Upland South and French Creole generally associated with the relatively prosperous middle class rural farmer. Henry Glassie (1975) approached the question of folk housing dynamics through a structural analytic approach in order to examine the rules of architectural design and modification. His results, and those of Newton and Kniffen, provide important insights in folk building traditions, yeomen farm life cycles, the development of the modern rural landscape, and the nature of rural cultural adaptations.

Other structural features of the yeomen farmstead included log and stone springhouses for protecting water sources and storing farm products, barns, corncribs, wellhouses, privies, and other pens, corrals, and buildings central to the farm operation. Figure 27 illustrates a typical upland small farm of the upland region. As settlement density increased, the practice of open range grazing of livestock was replaced by confinement to particular parcels within one's own landholding. Early fences were stacked rail or stone, but by the late nineteenth century commercial barbed wire appeared. The use of wood picket fences to enclose gardens and partition farm space from yard space also emerged as a common rural farm pattern (Anderson et al. 1987:248; Sabo et al. 1988).

A few attempts have been made to explore the nature of intrasite settlement patterns in the partition of space and arrangement of farm structures and activity areas (cf. Weaver and Doster 1982; Glassie 1975; Lafferty et al. 1981). Joseph (Anderson et al. 1987:248) reviewed some of the general trends observed on yeomen farmsteads:

> the main dwelling, wells, privies, and chicken houses were usually found in close association, as these represented areas associated with female activities. Barns, equipment shelters, and animal pens, representing male activity areas, were usually separate from the house focus. The house normally faced its route of access, and the house was shaded. Fields and pastures tended to be irregularly arranged and followed topographic features and zones of superior agricultural soils. Houses were often constructed on the least productive agricultural soil, thus maximizing the agricultural productivity of the land.

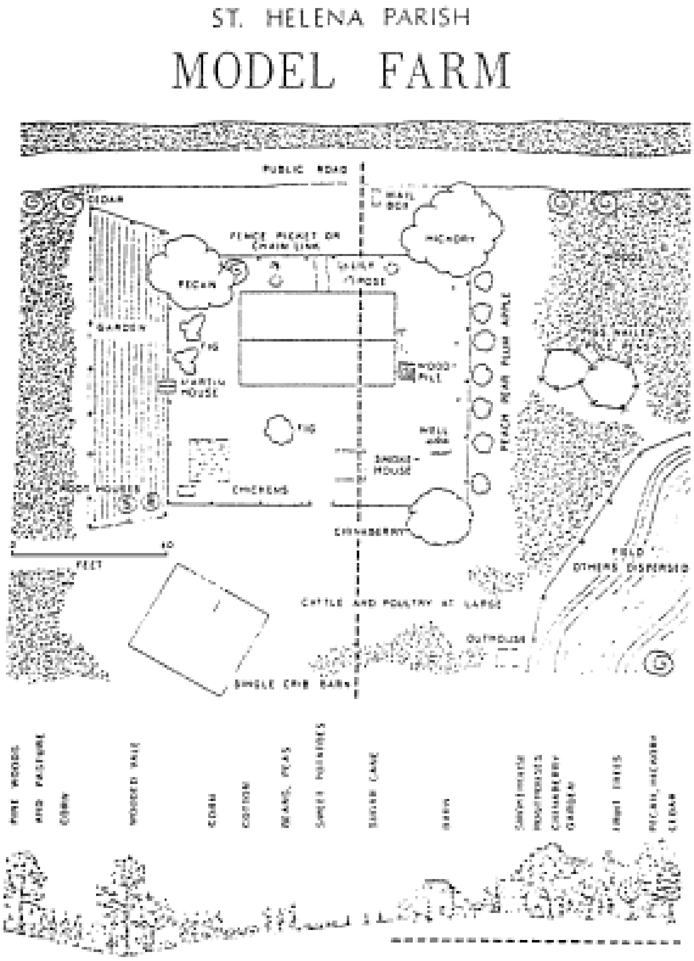


Figure 27. Upland Louisiana yeoman–farmer farm plan, St. Helena Parish, Louisiana (Rehder 1978). Courtesy of *Geoscience and Man*.

Historic site investigations of yeoman farmer occupations have been conducted in both Arkansas and Louisiana. However, these studies have often focused on only a fraction of the total residential and activity area of the farmsteads encountered in the course of low intensity exploratory excavations to determine National Register eligibility. Compared to other classes of historic and prehistoric sites, the data on yeoman farmer sites and other non-plantation occupations is very small, and no large site excavations are documented for the study area. However, a relatively large number of limited excavations have been done and taken together these studies have produced some important results.

In Louisiana, investigations of yeoman farmer sites are concentrated in the areas where either long-term research sponsored by state or university or by federally funded surveys have occurred with the most frequency. These include primarily the Mississippi River area, Natchitoches Parish, and the Fort Polk Reservation. The Fort Polk area is one of the most extensive data bases for historic yeoman farmer sites in the study area. The many cultural resource inventories conducted there (Thomas et al. 1982; Cantley and Kern 1984; Servello 1983; Campbell and Weed 1986; Anderson et al. 1987) systematically amassed an extensive data base on historic sites. However, as noted in the most recent overview (Anderson et al. 1987), the typology only recognizes homesteads as a broad site type and detailed information about the nature of variability within this class has not been achieved at this stage.

In Arkansas, there are no excavated data from yeoman farmer sites for the study area. However, there is at least one oral history and literature study funded by a minigrant from the Arkansas Endowment for the Humanities for the Jefferson County Historical Museum of the Bunyard–Rice farmstead located in northern Jefferson County. The oral history, archival research, and documentation of early family photographs provides a wealth of data about the changing ownership and uses of the farm between 1857 and 1965 as well as information about daily life and social interaction in rural Arkansas (Stewart–Abernathy 1984).

Two stages of frontier settlement comprising two distinct lifeways have been summarized in this discussion: the hunter–herder and the yeomen farmer adaptations. These adaptations required a wide ranging and highly mobile lifestyle in a setting of low population density that could not persist in the face of the third pioneer development stage of intense yeomen farmer settlement that followed the herder–farmer strategy. However, these lifestyles undoubtedly persisted for many years in some areas in somewhat altered forms, particularly in more remote areas. In some cases, strategies such as fur trapping, livestock raising, and cottage crafts were absorbed as specialized activities by the upland South settlers of the territory or, in the case of livestock raising, were elevated into intensive specialized commercial enterprises such as the cattle ranches in the western prairie. However, in the end, the distinct adaptations that characterized the early development of the frontier faded in importance, while the yeomen farmer adaptation established the basic settlement foundations upon which the modern landscape and structure of society of the area would evolve.

Although archeology represents one other source for this period, the remains of these highly mobile, semipermanent, materially impoverished people tend to be difficult, if not impossible, to locate and identify on the ground. In many cases, evidence of sites have been affected by subsequent settlement, agricultural activities, and logging, or are indiscernible as discrete deposits from the remains of the early yeomen farmer occupation and special extractive sites. There has also been far too little attention paid by historic archeologists to this little known pioneer stage of settlement, and it remains a huge gap in our understanding of the factors that shaped the modern system. Certainly, any such archeological evidence of these early stages of frontier development that may eventually turn up would be considered of extreme importance from a historical and research perspective.

SETTLEMENT PERIOD

Early Commercial Development on the Frontier

During the Colonial period, commerce in the frontier regions of the Mississippi Valley was founded on the fur trade with the Native Americans plus exchange of cottage products such as wild game, bear oil, furs, honey, beeswax, and livestock with the pioneer settlers. As the frontier became settled by the pioneer farmers, agricultural production began to assume an increasingly important role in the commerce of the territory.

Before agricultural production had become well developed in the southern territory of Louisiana and Arkansas, the settlers in southern Louisiana relied on the French farmers in the Illinois country for farm products. As early as the 1740s, downriver cargos from the Illinois country bound for the local market at New Orleans included items such as pork, flour, corn, tobacco, bacon, hog and bear hams, salt pork, buffalo meat, tallow hides, lead, copper, buffalo wool, venison, bear oil, tongues, poultry, clothing, and other goods (Surrey 1916:293). As agriculture developed in the southern part of the territory, most excess agricultural goods from Illinois went to New Orleans for export rather than for internal consumption. However, two items, wheat flour from Illinois and cloth from the South, continued to be an important part of a reciprocal trade between the Illinois country settlers and the settlers in southern Louisiana throughout the Colonial period and beyond. This reciprocal trade relation provided both regions with a high demand item that could not be produced locally. The French inhabitants of the southern territory were averse to bread of any other grain than wheat, but they could not grow it in Louisiana. The French in Illinois could grow wheat, but did not have the resources to produce woven cloth. The exchange of wheat flour for woven cloth between the two regions continued until Anglo–American settlement in the nineteenth century introduced the means to produce cloth in Illinois and wheat production in more southerly areas (Kniffen 1971:40) such as northern Arkansas.

With increased settlement of the Louisiana and Arkansas territory in the eighteenth and nineteenth centuries, commerce shifted from fur, hides, and other pioneer products to food crops, corn, poultry, dairy products, livestock, and plantation staples such as indigo, tobacco, rice, sugar, and cotton. In the nineteenth century, commerce in the Mississippi Valley came to be dominated by cotton monoculture which expanded north into northern Louisiana and southern Arkansas and eventually to its climatic limit at the mouth of the Ohio River (Kniffen 1971:40–55).

Community Settlement Patterns

A number of researchers have investigated the nature of yeomen farmer social organization and the establishment of community settlement patterns in the rural South. Cultural geographers such as Newton (1967, 1971, 1974) and Kniffen (1965; Kniffen and Glassie 1966) maintain that the rural yeomen farmer culture of Louisiana and Arkansas is a complex of adaptive cultural traits including agricultural practices, settlement patterns, building styles, and social characteristics, that developed during the eighteenth century in the eastern Piedmont of the South. These culture traits molded in the rugged isolation of the eastern upland frontier, proved to be fortuitously preadapted to conditions in the frontier of Louisiana and Arkansas. The resulting settlement system and social structure that evolved provided an orderly system for low-level but efficient agricultural production and laid the foundations for the growth of early town market centers. This pattern consisted of a hierarchy of organizational levels linking the family farms to increasingly larger social and economic segments of society (i.e., extended family, hamlet, community, town) culminating with the county or parish as the primary economic and political unit (Newton 1971).

The organizational structure that evolved has been characterized as a two-part system comprised of a rural population dispersed around a centrally placed town in which was concentrated the literate elite urban segment of the population consisting of doctors, lawyers, bankers, publishers, merchants, and other professionals. The focus of urban development in the countryside commonly emerged naturally from the patterns of rural settlement and the growth of modest-sized community service centers, grist mills, and hamlets that grew up at strategic crossroads. Such strategically placed hamlets often provided the basis for the locations of courthouse towns for the new counties that formed throughout the nineteenth century. As Newton (1970:152) notes:

> The simple flexibility of this peasant system, together with a similarly flexible courthouse–town system, allowed for the sudden, far-flung occupancy of the Old West between 1775 and 1825.... Courthouse squares, I-houses, dogtrots, notched-log construction, open range, generalized grain and livestock economy, dispersed hamlets, and so forth, all were spread over a third of a nation in scarcely more than a generation.

One of the classic case studies of this type of settlement organization was conducted by anthropologist Milton Newton at the Darling Creek community in St. Helena Parish, Louisiana (Newton 1971). The Darling Creek settlement is a rural community of black farmers located in the hilly Florida parishes region. Although these people possess certain unique culture traits that distinguish them from the predominantly white Upland South yeomen farmer tradition, Newton (1971:41) argued that this isolated community appears to continue more of the traditional patterns of yeomen farmer adaptation than does the white community in the region and serves as an accurate model of the nineteenth century Upland South culture.

Newton (1971:43) recognized three levels of social organization of the rural farming settlements: the homeplace (family farm unit), the hamlet, and the community. The family farm consists of the nuclear family parcel ranging in area from 10 to about 80 ha, of which only about 10 to 12 ha are under cultivation at any one time, plus many additional hectares of unimproved woodlands used in common by all as foraging grounds for firewood, nuts, herbs, and berries, and for hunting, fishing, and grazing livestock. Cultivated crops include the historic "food-and-feed" complex of corn, peas, beans, squash, sweet potatoes, greens, and pigs, all raised to be consumed on the farm as food for people or feed for animals. Cotton, green beans, cucumbers, and calves are sometimes raised for sale. A type of land rotation is followed in which "tired" plots are retired after up to 20 years of use and turned first to pasture and then woodland. Old fields are reclaimed by deadening trees and burning the slash in a manner similar to the infield–outfield system of Atlantic Europe. Primary fields near the house and the truck gardens are rarely taken out of cultivation; instead fertility is maintained by commercial fertilizer, stockpenning, limited mulching, and stubble burning. The traditional annual planting round is followed in which for four months fields lie fallow except for their use for cattle and mules, which are penned in the idle fields to forage on the stubble (Newton 1971: 45).

The settlement or hamlet is a loose clustering of several cooperative nuclear farm units, most or all of which belong to kinsmen. This extended patriarchical based family is presided over by the eldest male and most of its members are sons, brothers, or cousins and their wives and offspring. The settlement or hamlet is the largest social unit that is comprised entirely of farmers; it includes no professionals or merchants. Social relations within the settlement are close, and cooperative activities tend to reinforce these close ties. After the third generation, goods and services are exchanged within the settlement with a minimum of money (Newton 1971:43).

The next level of organization is the community, which is made up of several settlements oriented around a more prosperous hamlet. In the center are located a number of services and functions including a church, cemetery, school, post office, store, Masonic temple, etc. (Newton 1971:43). These community service centers often grew up around the crossroads frontier store where the farmer could obtain supplies and market his produce. These stores usually operated the first post offices and in time assumed an important role as a center for general news and gossip, for the dissemination of information about crop prices, farming techniques, and political affairs, and for social gathering (Sabo et al. 1988).

Churches also serve as a focal point for decision making in marketing, agriculture, local politics, and civic projects. The local leaders are often important members of the church that have gained eminence through their demonstrated knack for dealing with the white elite of the county or parish, their success in negotiating market terms for the benefit of the community, the size and success of their hamlet's farm enterprise, and the status they have gained by being a descendant of the founder of a settlement. The leader serves a vital role as a mediator between his hamlet or community and the ruling white elite in the towns and county seats. He obtains concessions for political support and works out preferred-purchase–preferred-seller agreements with market leaders who solidify their relations to the community by getting all of their client's produce sold and supplying the staples demanded by the larger consumer segment of the society (Newton 1971:42–43).

The next level of organization primarily arises from the economic tie that brings the rural hamlets and communities into contact with the courthouse–market towns and railroad centers where various transactions between rural producers and urban consumers and suppliers are worked out. The courthouse square is the oldest form of the market center in the rural Upland South. The squares were laid out by the state as market centers and as governmental centers for court trials, county business, voting, and land registration. Early on during initial settlement, they were planned also to restore law and order to the frontier, to regularize methods for legalizing land deeds, and to provide a basis for local representation in state matters. They were generally laid out in a grid plan incorporating a central courthouse and square, although frequently settlement developed in a linear plan focused along a major thoroughfare between towns (Sears 1979). The main routes linking the rural hamlets and communities of the county or parish converged at the courthouse square, a cluster of the county governmental structure, the newspaper, lawyer's row, the county agents office, the doctor's clinic, larger stores, and other establishments. The white elite lived off the courthouse square, and the poor white and black town dwellers resided in segregated quarters at the edges of town (Newton 1971:43–44).

A successor to the courthouse square (or county seat) were the railroad towns planned to take advantage of the transportation routes linking regional market redistribution centers. The railroad town often provided the base for commerce and industry and was often typified by warehouses, small factories, shops, and worker housing in addition to the typical array of establishments found in the courthouse town (Newton 1971: 44). Access to the regional market transportation network was provided by the railroad and riverport towns and served as the basis for the growth of nonagricultural industry and the process of urbanization of the region.

The model of social organization outlined by Newton (1971) has important implications for regional level analyses of Historic period archeological sites. Despite this, no archeological investigations in the area have focused on the multiple hierarchical levels of integration that link sites, hamlets, and communities. Few historic site investigations in the area have encompassed a broad enough area or built an extensive enough data base to provide the kind of firm foundation needed for exploring the social and economic interactions within hamlets and communities. Even when site settlement patterns or historic locational models have been the expressed goal of regional analysis, such as the research at Fort Polk where years have been spent surveying lands and collecting site data, researchers have discovered that the historic site data base alone is too limited to approach complex settlement questions (Anderson et al. 1987). Fort Polk and other federal lands where archeological surveys have amassed a large data base of historic period sites would be an ideal place to initiate such work. However, the archeological data will need to be complemented by additional information from documentary, archival, cartographic, and oral history sources before such endeavors can provide insight into complex questions dealing with community interaction.

Investigations into the emergence and growth of town centers have received little attention in historic sites studies. One of the few examinations of the development of the cultural landscape was attempted at the Sparta Mine project conducted in Calhoun County, Arkansas, by the Arkansas Archeological Survey for Shell Mining Company. This study, using central place theory, looked at the historical development of the community of Hampton, its hinterland, and the emergence of surrounding secondary centers. The town of Hampton emerged in the middle of the nineteenth century as the seat of the county's government as well as a hub for trade and a center for specialized commercial services. As population increased late in the century, the outlying areas were infilled and secondary functional centers such as the towns of Strickland, Means, Harrell, and Pickett developed. These secondary centers contained schools, churches, and other services. Analysis of the spacing of these centers show them to be spaced on a hexagonal grid approximately 3 km apart. Later, sawmills, cotton gins, and other small industries grew up and a pattern of roads and railways connecting Hampton with other centers and collection points were also part of the cultural landscape tying the county into a larger regional market system (Lafferty and House 1986: 220–224).

Research in southwest Arkansas at Old Washington State Park by Stewart–Abernathy of the Arkansas Archeological Survey has shed some additional light on the nature of urban development at these town centers. The town of Washington was a commercial center and county seat for Hempstead County serving a region of cotton plantations and yeoman farms during the middle and late nineteenth century. Although the scale of urban development at Washington remained low compared to present-day urban centers, the town maintained a range of commercial, administrative, and judicial services typical of county seats throughout Arkansas and the South. Excavations at Washington have explored the building phases of structures and associated archeological deposits at the Sanders Kitchen and the Block–Catts House from a number of research perspectives. Of particular interest to Stewart–Abernathy are the patterns and processes involved in the development of the discrete town blocks and the emergence of an urban adaptive strategy termed the "urban farmstead" (Stewart–Abernathy 1982, 1983, 1986a, b, c).

Stewart–Abernathy defined the urban farmstead as a form of occupancy of town in which many of the functional elements of the rural farmstead were translated into a settlement pattern geared to the spatial constraints of the town block design. The model developed by the research at Washington recognizes that such rural features as chicken houses, pig sties, stables, fences and stockades, storage facilities, smokehouses, garden etc. which may be thought to be alien components in an urban context were a very necessary part of life in early towns in the absence of certain retail services. As Stewart–Abernathy (1986: 6) notes

> Each household thus when possible had to grow some of its own food, feed and care for some of its own animals, acquire its own water through wells, dispose of its own organic and inorganic waste, and store its own fuel for cooking and heating. All these tasks were undertaken in addition to a trade or craft to provide livelihood for the family.

Stewart–Abernathy also recognizes that the urban farmstead may represent the result of designed or inadvertent neglect by larger institutions in many urban neighborhoods even today. The urban farmstead may also represent the extent to which the household is required to or chooses to maintain some measure of independence from larger institutions due to economic, ethnic, religious, or other sociopolitical factors. In the case of Washington, Arkansas and similar towns that grew in size and complexity throughout the nineteenth and twentieth centuries, there is a diachronic dimension at work in that the urban farmstead was part of an ongoing adaptive process involving additions, substitutions, and subtractions of many elements in response to the changing picture of urban development. The growth of meat, dairy, and produce markets, city trash and sewer facilities, the increase in population and land values, the creation of zoning laws, and shifting concepts of how people use residential space all played a role in the alteration of the urban landscape. As Stewart–Abernathy makes clear, the study of the development of urban farmsteads can provide many insights into the nature of the groups and processes that created the American urban system (1986:5–15).

In Louisiana, an ambitious research design to document the early twentieth century town of Montz in St. Charles Parish, Louisiana, is both comprehensive and integrative in its treatment of the community from both a humanistic and scientific perspective and bears mention even though the project has not been funded. The proposal prepared for the New Orleans District of the U.S. Army Corps of Engineers was a component of the cultural resource impact study for the proposed construction of a freshwater diversion facility at Montz. The scope of services issued by the New Orleans District called for a cultural/social anthropological effort concentrated on community structure, cohesiveness, ethnicity, and religiosity of Montz. The proposed research was to determine the effects of the proposed construction project on the community and to provide information for the development of a plan for relocation of the residents that considered the important social aspects of life that characterize the existing community including the psychological attachment to the local church and cemetery. As a study of this nature had never been conducted for any federal development project, the Montz project promised to provide a theoretical and methodological analog for any future relocation projects undertaken by the government.

Methods to be applied at Montz included census analysis of census records, church and cemetery records, formal interviews, oral history, and observation. The research design included close attention to the theoretical basis of community structure and identity and incorporated rigorous cultural anthropological methods of data collection and analysis to accomplish the objectives. Among the general research goals developed in the proposal were to determine the nature and source of community cohesiveness; kinship and quasi-kinship ties and networks; family histories and genealogies; the role of the church, cemetery, and the nature of religiosity; the relationships between marital, kinship, and residence patterns; delineation of community values; and patterns of land tenure and the use of space (Franks and Yakubik, personal communication). The proposed Montz community project represented a unique opportunity to bring a number of different subdisciplines of anthropology together on a research problem of the nature of social cohesiveness and community development and to lessen the social impact of large federal projects. In combination with a concerted historical and archeological data recovery effort, projects such as the proposed Montz study could begin to make some real progress into unraveling the complex evolutionary development of contemporary societies. Though the Montz study was not realized, the New Orleans District is to be commended for envisioning such a project.

At the other end of the urban spectrum, urban archeological research at large cities has also been accomplished in the study area. In Arkansas, site research in a large urban context are limited to excavations by the Arkansas Archeological Survey at the Ashley House in Little Rock (Stewart–Abernathy 1986: 5), which is located in Pulaski County just outside the study area. In Louisiana, research on urban life includes several studies conducted in the environs of Baton Rouge and New Orleans. One of the first urban archeological studies in the country was accomplished by William Haag in 1970s at the proposed Baton Rouge Civic Center where excavations at Catfish Town on the Mississippi River examined the nature of nineteenth century life in this Euramerican enclave (Castille, personal communication). Since then, numerous archival reviews, architectural surveys, archeological surveys, and limited excavation have been conducted mostly in the New Orleans environs. A sample of some of the significant urban studies are reviewed below.

One of the best examples of problem-oriented research in urban archeology is the excavations at Esplanade Avenue and North Rampart Street in New Orleans by Coastal Environments, Inc. of a nineteenth century upper middle class townhouse and a lower middle class residence both built between 1826 and 1840 (Castille et al. 1982). These investigations sponsored by the Interagency Archeological Services Division of the National Park Service focused on four major research objectives which have since become important components of most large urban studies in Louisiana. These were (1) to develop an urban residential unit model including lot land-use and artifact disposal patterns, (2) to examine ethnicity and socioeconomic status differences reflected by the archeological material culture and subsistence strategies, (3) to assess the material culture expression of urban slavery, and (4) to explore the site occupant's participation in national economic spheres.

One of the most extensive efforts in urban archeology included survey and limited testing of an urban square to be affected by the proposed Greater New Orleans Mississippi River Bridge (Beavers and Lam 1980), which was followed up by data recovery at sites within a 20 block commercial and industrial area to be destroyed by the bridge (Castille, personal communication). These investigations were directed at the archeological remains of nineteenth century upper lower and middle class German and Irish households located along the waterfront. Coastal Environments, Inc. research at 13 of 25 previously recorded sites revealed an assemblage that included indications of a range of activities typical of an urban farmstead strategy including pig butchering and processing as well as remains of life in a more developed urban context consisting of multiple family tenement residences. The study examined social, ethnic, economic, and status variability within the archeological record as revealed by land-use patterns in the development of the urban residential unit and the material culture and subsistence remains deposited at each site. Using archival data including directories, census records, and Sanborn Insurance maps combined with archeological data, the study was able to make some significant progress at modeling urban change in New Orleans.

Another archeological study of urban life of New Orleans was conducted by Goodwin and Associates (Goodwin et al. 1982) at the New Orleans General Hospital site (160869) in the Lowe Garden District. The archival study and excavations were directed at an antebellum orphanage dormitory and the Fulton Colored School. Excavations at the orphanage and a later nineteenth and twentieth century shotgun residence nearby showed that material culture was clearly differentiated between a charitable institution versus an urban residential component. Both occupations had relatively high frequencies of ceramic bowls suggesting a diet high in stews, pottages, and soups which Goodwin et al. (1982:192) suggest might be reflective of the Irish settlement in the area. Analysis of faunal remains showed a higher than expected incidence of wild game and beef on these sites and it was suggested that such subsistence patterns may be more common in urban contexts and less an indicator of low status than originally believed.

Another type of historic archeological study in an urban context with a somewhat different focus than the anthropologically oriented problems previously discussed are those investigations directed at answering specific architectural questions in conjunction with restoration projects. One of the best examples of this type of project is Shenkel's (1977) study for the Christian Woman's Exchange at the Hermann–Grima House located in the old French Quarter (Vieux Carre) of New Orleans. The house is a complex of buildings originally constructed in 1831 by Samuel Hermann, a wealthy merchant. The site was eventually purchased by the Christian

Woman's Exchange who have been engaged in restoration of the property to reflect the Golden Age of New Orleans. The focus of the work was on assessing the original nature of the kitchen and other rooms on the first floor of the servant's quarters, the use of other buildings in the back of the courtyard, the creation and preservation of the well, privies, the nature of the plumbing in the cistern, and the sequence of construction of the courtyard. Shenkel succeeded in answering many of the details on the age and functions of the property so that restoration could proceed. While Shenkel's research was not directed specifically at anthropological questions, the archeological data recovered and the clearer understanding of architectural aspects of the site has produced an important data base from an affluent household for future urban archeological research.

An archival study and survey of significant architectural resources by Reeves and Reeves (1982) of a proposed floodwall extending from Louisiana Avenue to Jackson Avenue for the New Orleans District of the Corps of Engineers also reveals much about the city's urban development. Reeves and Reeves found that land-use in this segment of the city corresponded to four stages of use. Before 1830, four sawmills were known to be in operation in the area. Between 1830 and the Civil War, the area became settled by the Germans who constructed small homes and warehouses. After 1860, the area became more commercial with grain elevators, breweries, and other industrial establishments taking over areas formerly in residential use. In 1908, a large part of this area was cleared for a railroad right-of-way (Greene et al. 1984).

Another important reference for urban culture that should be mentioned is the multivolume overview and inventory by Greene et al. (1984) of the Denver Service Center of the National Park Service for the New Orleans District of the Corps of Engineers. This inventory of the cultural resources adjacent to the Mississippi River in southeast Louisiana includes an extensive overview of the historic period in southeast Louisiana and documentation of previously recorded historic sites and structures, may of them in New Orleans and nearby river towns. This study also includes an annotated bibliography of previous archeological investigations in southeast Louisiana and though somewhat dated at this time, it is recommended to the reader for a more detailed treatment of the history and information on specific sites in this part of the study area.

THE PLANTATION SYSTEM

In the United States, the plantation system is a uniquely Southern socioeconomic phenomenon incorporating a variety of forms in operation from the seventeenth century up to the twentieth century. Orser (1984:1–2) summarizing Prunty (1955) listed as the primary organizational characteristics of the plantation institution: a large landholding in an area with an existing plantation tradition, sharp division between labor and management, specialized agricultural production including a large input of cultivating power, and a settlement pattern reflecting centralized control. Although particularly in the South, the plantation system is commonly associated with the institution of black slavery, geographers like Prunty (1955) acknowledge the postbellum persistence of the plantation system well into the twentieth century.

Although the development of a commercially viable plantation system was the main objective for the initial establishment of French settlements in Louisiana, the system failed to catch on until around 1750. Efforts during the French period included a failed attempt by John Law's Company of the Indies to attract French and German immigrants to grow tobacco, wheat, rice, sugarcane, fruit trees, and indigo. However, with the exception of indigo production, these early enterprises failed for a number of reasons, including the lack of basic agricultural skills and labor coupled with faulty staple crop selection, limited capital, and the attraction of greater commercial rewards from the Native American trade. The early agricultural base consisted of small family units pursuing a subsistence level of farming, but no exportable staples were produced (Kniffen 1968; Usner 1981).

Agricultural production increased during the Spanish period of rule from 1762 to 1800. This also coincided with the influx of immigrants including the Acadians (Cajuns) from Nova Scotia, Creole French forced out of Santo Domingo during the slave rebellion, Islenos from the Canary Islands, and American settlers from Virginia and the Carolinas. This period also saw an increase in the number of slaves brought into the country which was a prerequisite for the emergence of the plantation system. After the Louisiana Purchase, the American control of the Mississippi Valley saw a dramatic increase in population and agricultural diversity. Between 1803 and 1810, the slave population doubled, and over the following ten years the entire population of the state of Louisiana doubled (Robin 1966; Rushton 1979).

A review of Norman's Chart of the Lower Mississippi River published in 1858, which shows the distribution of cotton and sugar agriculture, reveals a well established plantation system along the major drainages by the middle of the nineteenth century. Though there was some overlap between the two plantation types, in general, the distribution of sugar producing areas is confined to the Mississippi River and other drainages south of Baton Rouge. In contrast, cotton plantations are dominant on the Mississippi and Red rivers above a point at approximately the northern boundary of the West Feliciana Parish. Between this point and Baton Rouge is an area of overlap in the distribution of cotton and sugar plantations (Norman 1858).

In contrast to Louisiana, Arkansas was just beginning its period of initial frontier settlement after the first public land surveys in 1815. Most of this early settlement and agricultural development occurred in the northern and western upland valleys; the lowlands were considered unsafe for habitation due to the threat of malaria. It was not until Arkansas became a state in 1836 that the eastern and southern portions of the state were occupied. It was not until the late 1840s and 1850s that the eastern and southern portions of the state began to exceed the highlands of northwest Arkansas in total population and percentage of slaves. The increased attractiveness of the lowlands can be attributed to the expansion of cotton production throughout the South. At the peak of antebellum cotton production, the counties in southern Arkansas (Chicot, Jefferson, Union, Phillips, and Lafayette) led the state in the total number of slaves, in the numbers of large slave holdings by individual planters, and in cotton production (Taylor 1958:50–53; Cathey 1936:89–100).

A roster complied by Walz (1953) of the major slaveowners in Arkansas in 1850 owning 20 or more slaves closely approximates a list of plantation owners in the state. A map of the distribution of the major slaveowners who defined their occupations in the census records as either farmers or planters reveals the expected clustering pattern in the southern and eastern lowlands. The highest densities are found in those counties fronting the major rivers including the Mississippi, Arkansas, Ouachita, and Red rivers. The absence of planters in northeast Arkansas is probably a function of both the northern limits of cotton production and the poorly drained wetland conditions of this area before drainage and channelization. The planters in Crittenden and Mississippi counties were probably situated on the better drained natural levees adjacent to the river. The low density of planters in Ashley and Drew counties, which encompass much of the interriverine zone between the Mississippi and Ouachita rivers in southeast Arkansas, may be a reflection of the transportation constraints on cotton production away from the river navigation arteries.

A number of factors were responsible for the development and growth of the commercial plantation system in the Lower Mississippi Valley. The advent of the steamboat during the early nineteenth century provided the means for transporting staple crops to the port at New Orleans. The introduction of new varieties of sugar cane and the invention of steam-driven sugar mills and the cotton gin also contributed to an increase in productivity necessary for the success of the plantation system. By the early nineteenth century, cotton and sugar formed the twin pillars of Louisiana agriculture persisting up until the Civil War (Rushton 1979; Schmitz 1974).

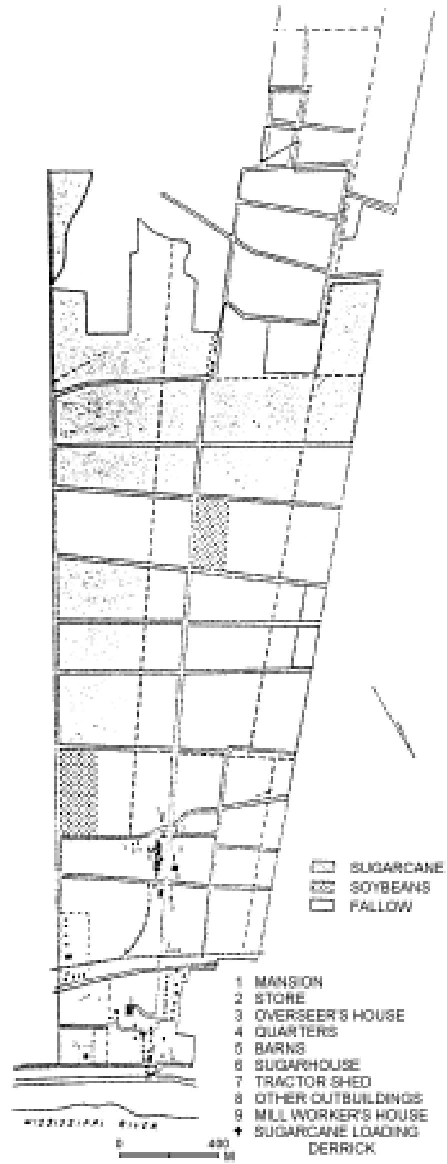


Figure 28. French linear plantation plan, Cedar Grove Plantation, lbervbille Parish, Louisiana (Rehder 1978). Courtesy of *Geoscience and Man*.

Plantation Settlement Patterns

The plantation system developed a distinct form of settlement both in terms of the distributional pattern of individual plantations and in the internal arrangement of buildings and activities within the plantation unit. Rehder (1978) identified and discussed the basic activity components of the sugar plantation in Louisiana and observed that variability within sugar plantation settlement patterns were related to the ethnicity of plantation founders. The typical layout of the sugar plantation included a nucleus of buildings fronting the road and water transportation routes with the extensive tract of cane fields stretching out posterior to the cluster of residence and agricultural structures (Figure 28). This cluster included the owners mansion, overseer's house, workers' quarters, storehouses, barns, the mill, and other buildings (Rehder 1978:146–147).

Although all sugar plantations contained the basic elements described above, Rehder (1978) noted three basic varieties in the way in which these components were arranged: the French linear pattern, the Anglo–American nodal–block, and the bayou–block patterns (Figure 29). The linear pattern, located along the Mississippi River, reflects a combination of the French practice of parceling land in narrow linear arpent units (1 arpent = 57.6 m) from stream to backswamp at a standard depth of 40 arpents, and the high demand for water frontage land which dictated that the width of these parcels were narrowly set at 2 to 10 arpents wide. The nodal–block

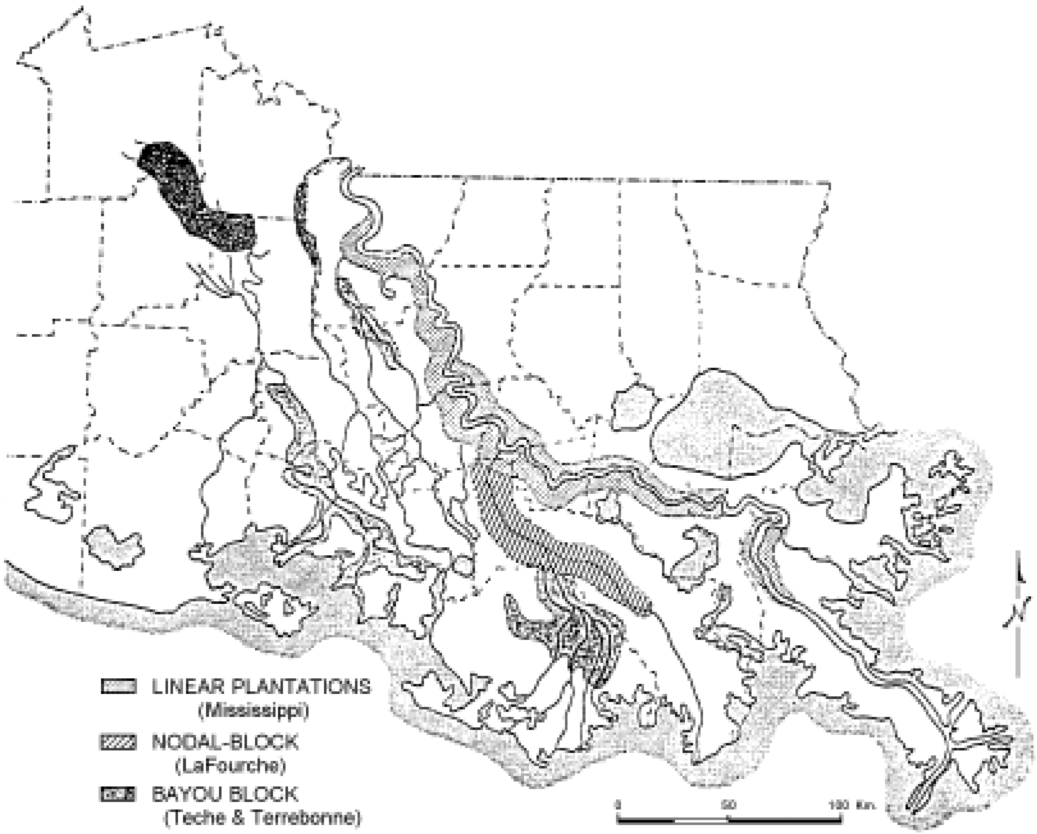


Figure 29. Distribution of plantation sites in Louisiana (Rehder 1978). Courtesy of *Geoscience and Man*.

pattern is associated with the Anglo–American phase of settlement that occurred after the Louisiana Purchase. Because the initial French Creole settlement had occupied the best lands with wide stream frontage, the American settlers were forced to take the unoccupied lands in the backlands away from the streambank levee area along with limited narrow access parcels to the bayou transportation routes. As a result, the cluster of houses and buildings was situated well back from the bayou and was linked to the bayou loading dock via a road through the narrow access parcel. The bayou–block pattern occurs in the Bayou Teche area of Terrebonne Parish where the Anglo–American settlers turned for land after finding the Mississippi River and Bayou Lafourche fully occupied by the French. This area was surveyed in wider arpent units to compensate for the narrow depths of arable land resulting in landholdings that were square or rectangular units having wide frontages along the bayous (Rehder 1978:143–149).

Rehder (1978) also discussed ethnic and regional architectural patterns in the building construction styles found on these plantations. The Creole style included the classic French hip roof, gallery overhang, raised height, interior chimneys, multiple front doors, exterior stairs, and construction methods employing *colombage* (half-timbering), *bousillage* (brick or mud nogging between the timber frame), and *barreaux* (support rods for nogging). The Anglo–American building traits incorporated Upland South and Atlantic Tidewater architectural folk traditions and popular Old World and Georgian styles in vogue at the time. These patterns differ from the Creole style in many ways including exterior chimneys, central hallways, a single front door, front-facing gables (Tidewater) or side-facing gables (Upland South), and decorative facades incorporating Greek Revival elements such as pediments, pillars, and porticos (Rehder 1978:136–140).

Some French architectural elements are also evident at Arkansas Post and at nearby plantations at the mouth of the Arkansas River. Mattison's (1957) report on the history of Arkansas Post cited the accounts of early travelers in the territory who noted the presence of full galleries and other French stylistic elements of the houses in the village. A survey of plantations in the vicinity of Arkansas Post conducted by the University of Arkansas Field School (Cobb et al. 1971) includes some early photographs of French construction such as the Julius Menard House which formerly stood at the Menard Mounds site in Arkansas County. The Menard House was a classic raised cottage style house with a hipped roof and a second floor gallery typical of the Louisiana plantation houses of the late eighteenth century (1971:10). Another example cited in this survey is the Old Doby House located along the lower White River. According to their documentation, the Old Doby House was built in 1839 by a German carpenter for Charles Belknap and was considered one of the finest houses at that time on the White River. A photograph of the house, which has since burned, reveals what appears to be a French style half-timbered house with bousillage. Other nineteenth century farm and plantation houses inventoried by Cobb et al. (1971) represent both Upland South and Tidewater Anglo–American building styles including a hewn log double-pen dogtrot house at the Terry Lane farm and a three-story brick Georgian style house at the Mound Grove Plantation (1971:10–29).

Yeomen Farmer Agricultural Development

Agricultural development and the institution of slavery took on many forms in the South. Traditionally, most research efforts and most of our information on slave lifeways have come from the large plantation enterprises in the Piedmont and lowland South like those discussed for southern and eastern Louisiana and the lowlands of southern Arkansas. Although slavery was also a component of small yeomen farmer operations in the uplands of both states, we know very little concerning the socio-economic conditions of slave life on the small farm nor about how slave labor was organized and integrated into the culture of the Upland South. Although the small upland farms did trend towards increased cash crop production in the midnineteenth century, for the most part, the operations of the yeomen farmer were on a much smaller scale than the plantation and were geared more towards self-sufficiency through diversified agriculture rather than commercial production. In this setting, slavery was integrated as a form of partnership in the family farm.

One of the rare studies of slavery among the small yeomen farmers of the uplands is Otto's (1980) historical analysis of slavery between 1840 and 1860 in the mountains of Yell County, Arkansas. Yell County is situated in the Ouachita highlands bordering the Arkansas River in northwest Arkansas. In 1860, slaves made up one-sixth of the total population of the county which ranked twenty-eighth among Arkansas's 55 counties in number of slaves. There were few large plantations with extensive slaveholdings, and yeomen farmers typically owned no more than a family of slaves. In 1850, only two of the top cotton producers in the county possessed over twenty slaves and might be considered true "plantations." Although cotton production in the county ranked twenty-third out of 51 in the state and constituted a relatively important agricultural industry, half of the farmers including one-third of the slaveowners grew no cotton. Instead, these small slaveowning operations were subsistence oriented and emphasized the traditional pursuits of herding, hunting, and gardening (Otto 1980:39–43).

One example of the self-sufficient upland slave owner in Yell County discussed by Otto is Hardy Banks, a prosperous small farmer, married with three young sons, who in 1860 owned four slaves, probably a single nuclear family which included two boys, one woman, and one man. Banks and his slaves cultivated only 60 acres and harvested 1,500 bushels of corn, 100 bushels of legumes, 40 bushels of Irish potatoes, and 50 bushels of sweet potatoes. They also raised fifty hogs, three sheep, and seven cattle. For extra cash and to pay taxes, Banks manufactured "hoopolas," thin white-oak straps for binding cotton bales, which they sold to the steamboats at the landing at Dardanelle. The two families farmed and hunted together, and lived in adjoining dogtrot log cabins. The house of the slave family included its own well, corn crib, and smokehouse. By all indications, the slave family of Hardy Banks shared in the bounties of the farm and probably enjoyed roughly the same standard of living as their owner. As Otto notes, upland yeomen farmers like Hardy did not focus their slaves on commercial cotton output; they "owned slaves in order to ease the drudgery of farm work and to provide a full larder.... a full smokehouse and a full corn crib was how they looked on wealth" (Otto 1980:51–52).

Owsley (1949) examined the nature of yeoman farmer settlement in the Piney Woods area of Washington Parish, Louisiana. In general, farm size was small to moderate with 83% of the nonslaveowning farms less than 500 acres in size and less than 1% of the farms exceeding 1000 acres in area. The slave owners in the parish generally resided on larger landholdings with 48% of the farms exceeding 500 acres in area and 72% of the slaveowning farms exceeding 300 acres in size. Of the larger farms employing slaves, only three farms in the parish owned more than 50 slaves. Most of the moderate sized farms and small plantations where slave labor was employed held relatively small groups of slaves compared to the major sugar and cotton growing plantations in the lowlands. Beavers (et al. 1985) noted that we know virtually nothing from historical or archeological sources about slave life on these small upland plantations.

A similar situation existed in the northwest corner of the Louisiana territory where a dichotomy existed between the poor upland farms versus the extensive slaveowning plantations in the lowlands of the Red River Valley (Newkirk 1981:126). For instance, of the 830 farms listed in the 1860 census, the 120 located in a section of the Red River Valley encompassed nine-tenths of the land value in the parish, 11,000 out of 15,000 of the slaves and produced about 83% of the cotton crop (Highsmith 1955). The poor yeomen farmers of the pine hill region did not have the land, soil fertility, slaves, or capital to support extensive cotton production and they were a minimal factor in the region's commercial agricultural production. Land prices also reflected the variable commercial potential of valley versus hill farmland. In 1850, land prices in the hills around Natchitoches went for two to six dollars an acre while along the Red River prices ranged from 15 to 35 dollars an acre (Davis 1959).

The Yell County Arkansas example of yeomen farmer agricultural production is probably relevant for a majority of the farmers in the hilly sections of northern Arkansas and Louisiana as well as the Upland South in general. For instance, Cathey (1936) noted that in 1860 Washington County in northwest Arkansas contained 1,493 slaves but produced such products as corn, wheat, rye, oats, and potatoes instead of cotton. Other leading products of northern Arkansas counties included dairy products, livestock, wool, buckwheat, barley, and fruit (Cathey 1936:99). Historical research in other parts of the South reveal the yeomen farmer as a pragmatic, "independent," self-reliant farmer who practiced "safety-first" agriculture, making self-sufficiency their top economic priority and engaging in production for the market only after a safe proportion of their resources had been allocated to subsistence crops (cf. Ford 1986:19).

The changeover in the yeomen farmer economy from a purely subsistence orientation to a measured involvement in the marketplace occurred during the onset of the cotton boom in the early nineteenth century. In Arkansas, the cotton revolution peaked in the mid-nineteenth century after the close of the initial stage of frontier settlement and the establishment of steamboat transportation networks. The marketability of cotton during this period made it possible for even small nonslaveholding farmers to make modest profits without sacrificing crop diversity or economic self-sufficiency. This limited participation in cotton production provided a means for yeoman farmers to have disposable cash for paying taxes, buying land, and, for the first time, slaves. The percentage of households owning slaves showed a major increase all over the South as even small farmers in the uplands outside the plantation belt achieved the means to purchase small numbers of slaves. In Arkansas, the increase in small slaveholdings was such that 55.5% of all holdings in 1850 contained five or fewer slaves and one holding in four consisted of but one slave (Walz 1953: 39–40).

Of course many yeomen farmers, particularly in the northern part of Arkansas, focused on cash crops and farm products other than cotton such as tobacco, grain (corn, wheat, barley, buckwheat), and livestock. The lack of cotton production in the north part of the state was mostly related to the environmental constraints on cotton cultivation in the uplands. However, the production emphasis may also have been related to forage and food deficits in the southern and eastern parts of the state where planters and farmers were sacrificing self-sufficiency and crop diversity in favor of the increased profits from cotton monoculture. As Ford (1986:30) noted for South Carolina, the expansion of railroads and increased cotton prices in the midnineteenth century "broadened the scope and quickened the pace of market activity" and encouraged farmers to specialize more heavily in cotton at the expense of subsistence crops and livestock. This was possible because the improvements in rail transportation had the effect of diminishing the small farmer's vulnerability to crop shortages caused by disruptions in the local supply and smoothing out fluctuations in local food prices. As a result, "small farmers could afford to operate with a smaller margin-of-safety" (Ford 1986:34–35), and make up the difference by purchasing foodstuffs from the market from the proceeds of cotton production.

Plantation Archeology

In a review, Charles Orser (1984) outlined the economic and sociocultural elements that made up the uniquely Southern phenomenon of the plantation system and discussed the progress made in plantation archeology over the past decade. As Orser (1984:1–3) noted, the plantation system has interested historians and geographers for years, but it has only been since the early 1970s that archeologists have managed to make substantive contributions to ongoing historical and anthropological research in this area. The most recent trend includes wide involvement in the study of plantations within the framework of cultural resource management.

Plantation archeology has been conducted along two basic lines of inquiry paralleling the dominant theoretical orientations in American historical archeology. The first line of study consists of research that is essentially historical in scope and is marked by attention to the historical significance of people, events, and places and the time–space perspective of material culture and the associated property from which it was excavated. The second is a more anthropological approach that focuses on plantation structure and the dynamics of sociocultural interaction between the class divisions of labor and management. This line of research has focused on the institution of slavery in terms of diet, acculturation, and general slave lifeways as well as the postbellum changes in plantation structure from the Civil War through the twentieth century. Both lines of investigation have served important roles in contributing to a greater understanding of the plantation phenomenon (Orser 1984:4–8).

Plantation archeology over the last decade has stressed the importance of both historical and anthropological elements. For instance, the study of slavery through archeology presents the only opportunity to reconstruct the history of a vast people who did not leave a written legacy and as a result have been largely ignored by traditional historical approaches. However, it has been the emphasis on the latter investigation of plantation structure and slave culture where some of the most significant advances have been made. One of the most successful of the interdisciplinary approaches to plantation slave culture and the standard by which subsequent research has been measured is the landmark anthropological and historical study by Handler and Lange (1978) on Barbados in the West Indies. By integrating data from archeology, history, ethnography, and bioarcheology through a broad problem oriented design, the researchers at Barbados have been able to bring into focus a wide range of issues including slave lifeways, religion, folklore, nutrition, material culture, African acculturation, African–Anglo interaction, and the structure of the plantation system (Handler and Lange 1978, 1979; Handler and Corruccini 1983; Handler et al. 1982; Corruccini et al. 1982).

Other studies in Florida, Georgia, and South Carolina have probed the nature of slave life including the acculturation of African slaves (Ferguson 1978; Wheaton et al. 1983), slave diet (Otto 1979; Miller and Lewis 1978; Reitz et al. 1983), architectural developments in slave housing (Wheaton et al. 1983), and plantation social organization (McFarlane 1975; Singleton 1980; Moore 1981). Investigations of postbellum period plantations have continued the anthropological orientation in focusing on changes in the plantation system following the Civil War. Of particular significance are studies focusing on slave adaptations to freedom and the emergence of new forms of plantation labor such as the squad system, sharecropping, and tenancy (Adams 1980; Orser et al. 1983; Orser 1984; Orser 1986).

Parallel trends in the development of plantation archeology are seen in Louisiana where the LSU Department of Geography and Anthropology under the guidance of Fred Kniffen, Milton Newton, and more recently Charles Orser have been influential in the development of this line of study. A number of theses and dissertations reflect the interest on the distribution and development of the plantation system (cf. Lee 1960; Rehder 1971; Castille 1979; and Holland 1986). Particular emphasis has been placed on the isolation of geographic, economic, and ethnic trends in the structural arrangement or layout of various plantation types. Other scholarly historical and economic studies of Louisiana plantations that figure prominently in the record include a review of indigo production in Louisiana (Holmes 1967), studies of the sugar cane industry (Thorpe 1853; Begnaud 1980; Schmitz 1977), the history of rice production (Ginn 1940), a history of the antebellum Canebrake Plantation (Reinder 1950), and a review of the architectural patterns at early sugar plantations (Wilson 1980).

Contract archeology in Louisiana has also had an impact on the study of the material culture and organization of the plantation system. This partial summary of plantation archeological studies includes Orser's review (1984:7) plus a number of others uncovered during the background study: Oakley Plantation (Holland and Orser 1984), Grand Ecore (Newkirk 1981), Flint (Guevin and Pearson 1983), Magnolia (Shuman and Orser 1984), Magnolia Mound (Burden and Gagliano 1977; Lane 1980), Star and Bourbon (Goodwin et al. 1983), Tezcuco, Monroe, and Bruslie (Castille and McCloskey 1981), Welcome (Castille 1979a, 1979b; Pearson and Castille 1979), and Wilton and Helvetia (Castille 1982; Pearson et al. 1979). State Historic Preservation Office grants through the Louisiana Division of Archeology have sponsored research at Acadia (Beavers et al. 1983), Destrehan (Lamb et al. 1983), Elmwood (Goodwin et al. 1983b), and Magnolia (Goodwin and Yakubik 1982).

These studies contain interesting historical information specific to each plantation as well as useful overviews of a more general nature on the development of the plantation economy, histories of agricultural production, evolution of plantation technology, annual work cycles, and descriptions of processing and storage facilities found on plantations. The analysis of the material culture found in the excavations on these sites has also provided a wealth of information on the temporal use patterns of ceramic, glass, brick, and other artifact classes.

The growing sophistication of method and theory in plantation archeology over the past decade has been phenomenal. From its beginnings as a handmaiden of the history of famous people and places, plantation archeology has grown to employ an anthropological problem orientation that seeks to uncover the underlying cultural and social dimensions of plantation life. Much credit is due the historic archeologists working in Louisiana because they have not only embraced these paradigms in their contract research but have also made substantial contributions to the discipline through their work in the state.

There are no archeological plantation studies in the Arkansas portion of the study unit.

AGRICULTURAL DEVELOPMENT AFTER THE CIVIL WAR

In the years following the Civil War and reconstruction, the South began a period of slow adjustment to the changes brought about by the collapse of the antebellum period social and economic system. The plantation economy had been devastated by the erosion of capital, the destruction of property, and the loss of the slave labor pool. The sugar growing region of southern Louisiana was disrupted very early in the war when the Federal troops took New Orleans and the Lower Mississippi River in 1862. At the outbreak of the war, many of the sugar plantation owners had joined the Confederate Army and invested liberally in war bonds which reduced the capital available for funding sugar production. In addition, when the Union Navy approached New Orleans in 1862, banks sent their gold and other assets to areas still under Southern control which removed the means of commerce for everyone. With the occupation of this region by Federal troops and emancipation of the slaves, the critical plantation labor pool was dissolved and access to European markets through the port of New Orleans was closed (Greene et al. 1984:194).

The cotton growing regions of northern Louisiana and Arkansas fared much better than the sugar region of the southern area. Much of this region remained under control of the Confederacy until early 1864, and plantation cotton production, which required much less labor and capital than sugar monoculture, continued by transporting crops overland through Texas to Mexico. After the fall of Vicksburg in 1863 and the Red River campaign of early 1864, the northern region of Louisiana and southern Arkansas fell under the control of the Union Army, the cotton economy was disrupted, and production became reduced. The cotton monoculture rebounded relatively quickly after the war, and by the 1870s production had reached the levels attained in 1850. However, sugar production was never able to recover from the devastation of the war, and about 75% of the sugar plantation owners sold or lost their holdings to banks for nonpayment of debts. The new owners of the sugar plantations, unable to return to sugar production, turned successfully to rice cultivation (Greene et al. 1984:195).

The revitalization of agricultural production in the aftermath of the Civil War and the emancipation of the slaves necessitated major modifications in the organization of the plantation system. As noted by Orser (1986), this transition was met through experimentation with a number of arrangements in the organization of the predominantly black former slave labor pool. One of the first of these experimental forms to emerge was the wage system in which "contracted" laborers were housed in the former slave quarters and paid a regular monthly wage by owners for their work. The wage laborers were usually subdivided into gangs of workers organized around specific tasks such as plowing, hoeing, picking, etc. which were supervised by black drivers or foremen similar to the labor organization of the slave system. There were actually many different forms of wage system arrangements between the owner and the laborer. In his review of postbellum agricultural practices, Orser (1984:113) listed six different kinds of wage contracts:

> (1) standing wages, where the planter paid the freedman a fixed wage in addition to a weekly ration of meat and meal; (2) share of the crop, where the freedman provided labor and a portion of the crop, and the planter supplied the land, seed, implements, animals, and feed; (3) sharing of time, where the freedman received rent-free land in return for working for the planter a specified number of weekdays, in a system called "private cropping" or "the four-day plan"; (4) standing rent, where the freedman paid the planter a specified amount of farm produce for rent; (5) wages in kind, where the freedman received a set amount of farm products in the place of cash wages; and (6) incentive schemes, where the freedman was paid for work done beyond the amount required (Edwards 1913:39, Shlomowitz 1979:561–562).

The wage system presented problems for both the freedman laborers and the plantation owners. To the laborers, the wage system proved to be as severe and restrictive as the former slave system. The twin roots of this laborer dissatisfaction over the wage system were a distrust of the contracted legal bond between the laborers and the former slave owners, and the desire of most freedman laborers to exercise their new freedom to acquire or at least rent and farm a piece of land of their own without personal supervision. Frustrated by the low wages, slavequarter housing, legally binding contracts, and excessive intrusion by the planter into their personal lives, the emancipated slaves called for land tenure reform. For the owners, the benefits of retaining ownership and control over the plantation had become outweighed by the high economic costs of the wage system. As Southern banks became less solvent, owners found it difficult to pay weekly or monthly wages. The problem was complicated by the competitive labor market created by high cotton prices and the scarcity of labor. Many laborers under contract could simply leave one estate for another where wages were higher (Orser 1984:114, 1986:11).

The wage system was ultimately replaced by the sharecropping system in which laborers received a percentage or share of the crop produced rather than a set monthly wage. The transitional form of this system was the squad system, in which the labor unit was based on small semiautonomous self-regulating groups made up of family, extended kin relations, and friends. Unlike the owner-supervised task-oriented gangs of the wage system, under the squad system much of the planning and decision making process of agricultural production including the recruitment and allocation of labor was left up to the squad peer group and leader. Thus the squad system placed much more of the risk, as well as the rewards of agricultural production on the laborers of the squad in exchange for some measure of freedom from direct control by owners and drivers (Orser 1984:114, 1986:12).

The squad system represented an intermediate form of plantation tenure between the centralized operations of the slavery period and the succeeding wage system to the dispersed tenant system of the postbellum era. The wage system had originated out of the refusal of the plantation owners to sell or rent their lands to former slaves. In an attempt to prolong the old ways of the plantation slavery system, wage gangs were housed in central cluster of quarters where, like the slaves, they were under the direct control of the owner and were allowed to exercise little self autonomy. However, with the advent of the squad system, decision making became more decentralized and settlement on the plantation grew more segmented with housing segregated into a number of discrete village or hamlet-sized units representing a kind of labor share collective (Orser 1986:12).

Over time, the nucleated hamlets of the squad system split into smaller units probably along generational, affinial, or consanguineal lines to form the dispersed settlement system of the southern tenant plantation system. This transformation is associated with the change from the squad system to various forms of sharecropper and renter land tenure forms. Sharecropping was an arrangement whereby the landlord supplied the land, housing, tools, animals, animal feed, and half the fertilizer in exchange for half of the crop produced by the labor of the tenant farmer. Rental agreements could be quite varied and included share renting, standing renting, and cash renting, which required that the tenant pay a fixed rent in exchange for rights to the crops produced on his leased land. In share renting, the landlord supplied land, housing, and one quarter to one third of the fertilizer costs while the tenant supplied labor, animals, animal feed, tools, seed, and the remainder of the fertilizer. The produce from this arrangement was divided according to the percentage of fertilizer supplied by the landlord and tenant. In the Red River Valley and Mississippi River delta, the most common form of the share renting agreement was the "straight third" where the landlord received a third of all crops produced. In the less productive lands of Louisiana, the "straight fourth" agreement where the landlord received a fourth of the cotton and corn produced was common. Cash renting was an arrangement in which the landlord supplied land and housing, and the tenant supplied the rest of the equipment, supplies, and labor. The landlord was compensated with a fixed rent per acre in either cash or cotton. Standing renting was similar to cash renting except that the laborer paid a fixed amount of the staple crop rather than cash (Orser 1984:115).

Documentary evidence suggests that most sharecroppers sought to become renters, specifically fixed renters, to escape supervision by the landlord and to reap fuller economic benefits of their labor. This mirrors the struggle noted earlier of the freedman wage earners to escape the restrictions of the early postbellum gang system in squad system sharecropping. As Orser (1986:13) pointed out, the socioeconomic mobility of the Southern agricultural laborer was a ladder ranging from simple wage earner at the bottom rung to farm ownership at the top that was characterized by increased personal and economic freedom gained through access to land resources and crop ownership. In between the wage earner and the farm owner, the rungs of the agricultural ladder included, from lowest to highest, the sharecropper, the share tenant, the standing renter, and the cash renter. Although from an archeological point of view the distinctions between these farm tenure systems are sometimes subtle, Orser (1984:117) noted differences in the quality of the houses and the length of occupational duration, with renters generally occupying the more improved tenant houses and staying in place for longer periods than sharecroppers. In addition, he suggested that cash and standing renter laborers had the economic means to acquire greater material wealth than sharecroppers or sharerenters. It is very significant that he also cited evidence that material differences between the various forms of land tenure were socioeconomic ones rather than strict racial or ethnic distinctions (Orser 1984).

Orser (1986:14-16) documented evidence of the settlement transition from the centralized antebellum plantation system to the segmented squad system at Millwood Plantation on the Savannah River in South Carolina and Georgia. Using cartographic, photographic, documentary, and archeological evidence along with oral interviews, Orser identified a cluster of five structures, associated with the late nineteenth century squad system period of use, located 245 m east of the main administrative nucleus of the plantation. He noted that, aside from the clustering of multiple houses away from the plantation core, the archeological evidence of squad segmentation was difficult to distinguish from the later dispersed tenant house sharecropper system. In fact, he noted the apparent implementation of both the squad and the renter or sharecropper tenant systems at the same time on a plantation and sometimes by the same laborers who shifted between different habitation bases in a serial manner during the postbellum period. In reviewing evidence for the development and change in the plantation system, Orser (1984) noted that settlement shifts seem to provide the most sensitive indication of the dynamic changes from slavery to the tenant system. The pre-Civil War clustered plantation settlement system termed the “Ante Bellum Occupance Form” (Prunty 1955) is typed by the presence of slave dwellings in rows called quarters located near the plantation administrative nucleus. This was succeeded by the wage system whereby freedman laborers were organized into gangs and housed in the former slave quarters. The settlement pattern of the gang system should be difficult to discern superficially since it involved little real difference from the manner of housing slaves before emancipation. The advent of the squad system should be indicated by the appearance of one or a few isolated clusters of buildings representing a kind of hamlet for the extended family squad groups. Succeeding the squad system, the tenant sharecropper/renter settlement system which gained popularity in the late nineteenth century was one of complete dispersal of relatively autonomous family units across the plantation (Prunty 1955; Orser 1984:116).

The tenant form of the postbellum plantation system continued to increase in the South throughout the early twentieth century. The most dense concentration occurred in parts of a five-state cotton growing area including Missouri, Tennessee, Arkansas, Mississippi, and Louisiana that encompass the fertile cotton region of the Mississippi River Valley and adjacent loess plains. Within this broad area, the densest concentration of tenant sharecroppers or renters occurred in the Yazoo Basin area of the state of Mississippi. Other lower concentrations in the study area can be seen along fertile floodplain of the Mississippi River in Arkansas and along tributaries of the Mississippi including the Red, Ouachita, Arkansas, White, and St. Francis rivers. There are relatively few cotton tenant farmers shown in the old sugar producing areas of the Mississippi Delta in Louisiana nor in the southwestern part of the chenier coastal region. Census data indicate that in general black tenant farmers outnumbered whites except in parts of the Missouri bootheel, and upland portions of Louisiana and Arkansas where white tenant farmers made up the majority (Aiken 1978:151).

The number of sharecroppers and renters peaked in 1930 when the census enumeration showed 317,240 tenant farmers operating in a five-state area of the Mississippi Valley. However, between 1930 and 1959, this region saw a 84% decrease. In Louisiana, the number dropped from 50,219 in 1930 to 4,238 in 1959, and in Arkansas, during this same period, the numbers dropped from 75,034 to 7,792. In Crittenden County, Arkansas, situated on the Mississippi River, only 13 tenant sharecroppers remained in 1959 from a high of 6,473 in 1930. In Bolivar County, Mississippi, which is situated in the Lower Mississippi Valley heartland of the tenant system, the numbers declined from 10,643 to 975 between 1930 and 1959 (Aiken 1978:151, 164).

The wholesale decline of the tenant tenure system between 1930 and 1959 was a part of the overall reorganization and transformation of the plantation system and agriculture in general that took place during the midtwentieth century as a result of a complex of interrelated factors. Aiken (1978) notes that the process was an evolutionary one that consisted of gradual changes over the thirty-year period involving three generations of farmers. The 1930 benchmark represents a peak in the frequency of the tenant system and was also the end of a cotton production tradition that had remained largely unchanged from that practiced in 1830 except for the reorganization of labor after the emancipation of the slaves. The basic techniques of land breaking, planting, cultivating, thinning, weeding, and harvesting common in 1930 were virtually identical to the methods used before the Civil War (Aiken 1978:152).

The upheaval in Southern agriculture that initiated the modernization of cotton production began in the period between the World Wars. This included the devastation caused by the spread of the boll weevil in the South, which raised the cost of production when combined with the competition from overseas cotton producers and the introduction of new synthetic fibers. Beginning in the 1930s, it was widely recognized that southern cotton production would have to be made more efficient if the industry was to survive. This was accomplished by the introduction of techniques to reduce the amount of labor involved in the three major operations of cotton production: planting, weeding, and harvesting (Aiken 1978:154).

Three critical developments occurred over a span of 30 years to effect these changes. These labor-saving innovations included the adoption of the tractor for ground breaking, planting, and cultivation between 1935 and 1946; the introduction of mechanical cotton pickers or harvesters between 1948 and 1956; and the introduction of herbicides between 1955 and 1964. As Aiken (1978:157) pointed out, the development of the full set of mechanical and chemical methods of cotton production as a replacement for intensive human labor was not complete until around 1955. During this time interval, cotton producers were cautious about replacing the traditional means of cotton agriculture and accepted these new methods gradually and only after a period of experimentation and slow integration of machines and chemicals into the existing set of methods. As a result, the changeover from the tenant sharecropper tenure form to what Prunty (1962) calls the "Neoplantation" was not complete until the 1960s.

The introduction of the tractor did not immediately result in any drastic alterations of the tenant sharecropper system of cotton production, since at first the tractor was suited to only the ground breaking and planting phases. Weeding, thinning, and harvesting were still achieved through the use of human labor. The only change that tractors brought about initially was the introduction of the "through-and-through" method of ground breaking and planting, whereby the fields were mechanically prepared in one operation over the entire plantation as though the sharecropper boundaries did not exist. Only after the stand of cotton had been achieved did the sharecroppers assume responsibility for their individual plots with traditional human labor and mules. As a consequence of the use of tractors, the scattered fields of sharecropper families which had formerly been delimited by strips of idle land were consolidated and individual sharecropper units were instead marked by stakes at the ends of rows. Another change was the appearance of plots of "company crops" or "day crops" grown by the owner who drew from the sharecropper families for thinning, weeding, and picking in exchange for wages (Aiken 1978:158).

The adoption of mechanical harvesters on plantations in the late 1940s and 1950s resulted in a further reduction of sharecropping production as owners increased the size of their plots of company crops. The sharecropper land tenure form was not completely eliminated since the owner needed residual sharecroppers as a source of day laborers for weeding and operating planting and harvesting machinery. However, the sizes of sharecropper units were decreased in size to permit time for day work in the owner's fields. The sharecropper system persisted in a much attenuated form even after the introduction of herbicides as a means of compensation for the skilled machinery operators (Aiken 1978:158).

The adoption of herbicides was the final piece of labor saving technology necessary for the complete replacement of the postbellum sharecropper land tenure system by the neoplantation (corporate) agricultural system in the late 1950s and 1960s. The dispersed settlement system of the sharecropper system was replaced by the nucleated pattern characteristic of the neoplantation system. This was generally accomplished through the construction of new facilities to house tractors and harvesters and other modern equipment and the abandonment and destruction of former tenant houses on the margins of the plantation and in areas where these buildings obstructed efficient mechanical agricultural production (Aiken 1978:161).

Aiken (1978) and other researchers emphasized the complexity of the socioeconomic and technological changes involved in the reorganization of southern land tenure, the demise of the sharecropping system, and the rural flight to the cities. The shift from sharecropping to corporate farming was brought about by a number of developments. For instance, in addition to the increased savings possible with mechanical production methods, governmental policies such as the Federal Minimum Wage and Hour Law of 1967 and the reduction of cotton acreage allowed under the Agricultural Adjustment Act had the effect of further driving up the costs of sharecropper labor relative to the costs of mechanical production. The economic benefits of not sharing the limited federal crop diversion and price support payments with tenants was a factor in increasing the size of owner "company crops" to the detriment of sharecropper plots. The period of changeover from the sharecropper system to modern mechanized agriculture also coincided with a period of intraregional and interregional migration of rural laborers, particularly blacks, to the northern industrial cities. This outmigration of former sharecroppers to the cities has often been cited as a result of the modernization of the plantation system and the expulsion of rural farm laborers. However, many researchers in noting the evidence of a labor shortage before the full changeover to the neoplantation system, have pointed to the poverty of the sharecropper families and the desires of most to move up the economic ladder as a cause, rather than a result, of the demise of the sharecropper system.

Rice Agriculture

Rice production was introduced to Arkansas in 1896 by J. W. Fuller of Lonoke County, Arkansas, who modeled his enterprise after the successful well irrigation techniques in use on the prairies of southwestern Louisiana that he had observed during a hunting trip to the Gulf coast. In the first decade of the twentieth century, the first rice mills had been established in Stuttgart, Dewitt, Carlisle, Lonoke, Wheatley, and a rice growers association was formed to facilitate fair marketing. By World War I, rice was being cultivated in parts of southwestern and southeastern Arkansas, the Grand Prairie region of east-central Arkansas, and in northeastern Arkansas. In the northern section of Arkansas, rice cultivation was hindered by the shorter growing season in areas like Clay County, but became well established in Craighead and Jackson counties (Spicer 1964:3–46).

Early rice cultivation depended on the four-horse team which employed either horses or mules and, in rarer cases, even oxen. Tractors were introduced to the rice regions of Arkansas during the middle of the second decade of the twentieth century. After some experimentation, a design was patented in 1915 by G. I. Dill that would efficiently perform cultivating and harvesting tasks and hold up under the wet boggy conditions of irrigation farming. This was followed in 1918 with the Ford Company's Fordson Tractor, which incorporated added features to cope with the difficult conditions of irrigation farming such as a water air filter, enclosed drive gears lubricated by oil, enclosed steering gear, etc. These technological advances were improved in the early 1920s by the creation of the direct "power take-off' on tractors for more efficient assembly and operation of harvesting machines and other mechanical means of production. Other innovations to maximize rice irrigation efficiency included land leveling and levee construction techniques which began during the late twenties and early thirties (Spicer 1964:47–91). Rice cultivation continues to be an important agricultural industry in the southeastern and northeastern parts of Arkansas.

The Development of the Lumber Industry

The last quarter of the nineteenth century saw renewed interest by both progressive Southern leaders and Northern investors in the undeveloped natural and mineral resources of the South. The North and Midwest needed the vast untouched timber, coal, and iron reserves to fuel the booming industrial-based economy that began to develop after the Civil War. The movement to develop the resources of the South was aided by a legislative act passed in 1876 that repealed all restrictions on public land in Alabama, Arkansas, Florida, Louisiana, and Mississippi that had been reserved for homesteaders. Between 1877 and 1888, 2.3 million hectares of federal land was sold, most of it passing into the hands of Northern industrialists (Anderson et al. 1987:100).

The largest timber developers purchased large tracts and constructed their own mills and company towns. At first, timber was shipped to market on the river systems by steamboats. By the 1880s, a network of railroads stretched across both Arkansas and Louisiana providing easier access to markets for isolated upland areas of the region. In northeast Arkansas, the construction of the Kansas City, Ft. Scott, and Gulf Railway and the St. Louis and Iron Mountain Railway spawned the development of new communities such as Sedgewick, Portia, Hoxie, Black Rock, Imboden, Ravenden which began as railroad construction camps and survived as sawmill towns. In south-central Arkansas, towns such as Artesia, Stillion, and Little Bay all developed lumber mills along the right-of-way of the St. Louis Southwestern Railroad (Lafferty and House 1986:48; Weinstein et al. 1984:57). In west-central Louisiana, the Kansas City Southern Railroad opened up the growth of mills at Leesville, Fullerton, and a number of other short lived sawmill towns (Anderson et al. 1987:102–103).

A study by Stewart–Abernathy (1982), funded by a mini-grant from the Arkansas Endowment for the Humanities, of the Sawdust Hill community located on the grounds of the Parkin site provides information about life in a sawmill town. Sawdust Hill was founded in the early 1900s by the Northern Ohio Cooperage and Lumber Company to mill lumber in Cross County, Arkansas. The oral history, maps, and collection of early photographs of logging and life in this small black community, plans of the mill, and the houses built by the company for the workers reveals the rich sense of community that prevailed in these company towns. When the mill closed in the mid-1940s, the mill housing passed to the millworkers who adapted the company town into an independent neighborhood of farmers. The Sawdust Hill community has declined in the last two decades and its future as a viable community is in doubt.

In western Louisiana, the sawmill towns were characterized by a number of features common to sawmill towns throughout the south. The towns were founded to concentrate on the performance of a single function for the timber industry to the point that when the function could no longer be carried on, the town died. Sawmill towns were characterized by a mill complex linked to the logging operation by a rail network, a company-owned commercial district, and segregated residential areas for blacks and whites and for workers and management. The residential structures also tended to be prefabricated from a single pattern which was repeated across the town and nearby towns (Stokes 1957:257; Anderson et al. 1987:108).

The coming of the intrastate and interstate railroad system made possible the construction of logging railroads to link more of the hinterland to the transportation system. Watkins (Lafferty and House 1986:46–48) describes this method of timber harvesting for Calhoun County, Arkansas. One of the first logging railroads in the county, the Thornton and Alexandria Railroad was chartered by the Stout–Greer Lumber Company in 1904. Logging first began near the mill, and then extended outward along the special temporary railroads called trams. The trams were laid out on cleared ground in conjunction with normal logging activities along the contours of the ground with a minimum of grading and roadbed preparation. The logs were skidded from the woods to the tramway by mules and oxen (later mechanical skidders and loaders were used) where they were hauled back to the sawmill by lightweight 10-ton steam engines. As the logging operations moved farther from the mill, more durable shortline railroads such as the Thornton and Alexandria were constructed to link up the trams with the mill. A heavier, faster engine was employed on the shortline which had a graded, prepared roadbed to bring the lumber from the tram collection points to the mill for processing.

When an area on either side of the tram had been cut through, the tram would be dismantled and the steel transported to another line being built into uncut timber. In Vernon and Allen parishes in Louisiana, Stokes (1957) examined abandoned tram lines on aerial photographs which revealed patterns of railroad and tram logging for west-central Louisiana. In Vernon Parish, the steeper, heavily dissected topography resulted in a dendritic pattern while the subtle topography of Allen Parish resulted in a regular row pattern much like the furrows of a field (Stokes 1957:260; Anderson et al. 1987:106).

As the logging operations moved even farther from the mill, the companies established temporary camps near the logging sites for the loggers. Many of these camps included a full range of facilities such as stables, commissaries, blacksmith and tool shops, schools, and hospitals and could hold 200 to 300 people including the loggers, administrators, and their families. The camp buildings were designed to be easily picked up and transported on flatcars to the next camp location (Lafferty and House 1986:48). In southern Louisiana, archeological investigations in Terrebonne Parish by Coastal Environments, Inc. (Pearson, personal communication) has shed light on life in an early twentieth century black sawmill community. The excavations sponsored by the Louisiana Department of Transportation Development focused on two house sites located in the right-of-way of the proposed highway. Historic and archival research revealed that the sawmill community was connected with the Goodland Cypress Company sawmill (16TR114) and had been established in 1903 and abandoned around 1916 and was occupied by "swampers," a term for the low-paid workers who logged cypress from the swamps. Because of the short 13-year history of the community, the site provided an ideal time capsule for looking at the lifeways of one generation of black workers.

The researchers were interested in looking at how the residents of a sawmill community lived as compared to other less structured communities and whether occupation and the black identity of the residents could be recognized from the archeological remains. They were not able to find any material indications of the occupation or black ethnic identity of the community residents. Instead, they found that the material remains were structured by the fact that workers bought from the single company store with script issued by the company. The material culture consisted of simple inexpensive wares that could have been purchased from country stores or mail order catalogs anywhere in the country at this time. The ceramic and glass container remains were marked by low incidence of stonewares and storage wares and few canning jars suggesting that processing and long term storage of raw food materials was not a major part of the subsistence strategy. A high frequency of bowls compared to flatwares suggests that soups and stews made up a high proportion of the diet and maybe an indication of efforts to stretch out food by adding liquid.

The absence of garden utensils suggested that gardening may not have constituted an important supplement to the diet. However, shotgun shell cartridges and the remains of raccoon, opossum, turtle, alligator, and birds indicate that workers were taking advantage of wild game, possibly as opportunistic exploitation during trips to the work site and while on the job. Domestic animals were also present in the assemblage and represented chicken and middle to moderately priced cuts of pork and beef. There was apparently no home raising of livestock, possibly because of lack of space (Kelly, personal communication).

Overall, the study suggests some indications of the way that life in company-run communities differed from typical domestic life. This is partly reflected in the absence of domestically produced livestock and garden products which probably accounts for the lack of long term storage materials. Aside from the opportunistic taking of wild game, it would appear that timber workers had little time, space or energy to engage in supplementary enterprises typical of rural farmsteads. While the material goods purchased from the store with script or credit were determined and constrained by the company inventory, there may be something else occurring on a more global scale with commercially produced goods. It is possible that by this time, the popularity of inexpensive household wares available in country stores and mail order catalogs was narrowing the choices available to many buyers and that many assemblages throughout the country from this time period will be dominated by this sameness. Such a process may also contribute to the fact that the material culture does not reflect either the occupation or the ethnicity of the residents (Pearson and Kelly, personal communication).

Near Hampton, Arkansas, in Calhoun County, survey investigations at the Sparta Lignite Mine for Shell Mining Company revealed the remains of a railroad bed associated with the Mississippi, Ouachita, and Red River Railroad. The route of the railroad bed was also located and mapped from U.S. Department of Agriculture aerial photographs. This railroad was graded in the 1850s but the laying of rail was never completed. The railroad company never recovered from the substantial losses during the Civil War and the Panic of 1873, and in 1891 the land passed back to the original owner (Lafferty and House 1986:233–235). Archeological investigations revealed some details about the construction of the roadbed that are probably relevant for many such railroads including the shortline roads that were built in conjunction with the logging industry. In fact, the railroad bed was seen to be intersected by two logging tram beds (3CA92 and 3CA150) associated with early twentieth century operations of the Knapp–Stout Lumber Company.

The investigation showed that the railroad bed was first surveyed and marked and then right-of-way clearing and construction of the bed was carried out. Records indicate that the construction began in 1854 and was carried out by local landowners probably using slave labor contracted by the railroad company. The more complex track laying and bridge construction which was never completed involved more critical tolerances and were probably planned for more specialized construction crews. Excavation of the bed showed that when the forest was cleared for the construction zone, brush was piled on the proposed roadbed and burned. On top of this, the roadbed was built up by excavating ditches on either side of the bed to improve drainage and the fill was loaded onto the middle to build the platform for the tracks (Lafferty and House 1986:240–241).

Investigations in Louisiana have shown that logging has left many visible archeological remains of the various components of the timber industry. At Fort Polk, archeological surveys have recovered evidence of tramlines, temporary logging camps, and turpentine work stations. The separation of the temporary work stations from the remains of homesteads has received some attention in the Fort Polk studies. Analysis by Campbell and Weed (1986) and Anderson et al. (1987) have resulted in the generation of behavioral models that allow for the construction of predictive models of the archeological remains that would be produced at each type of site. Temporary turpentine gathering stations are characterized by privies, structural remains, old roads, and the appearance of glass in greater quantities than ceramics with the presence of turpentine cups constituting at least a third of the total assemblage. Temporary work stations associated with lumbering exhibited similar traits with the exception that turpentine cup fragments are absent or constitute less than a third of the total assemblage. Campbell and Weed also focus on the ratio of ceramics to glass to distinguish short versus long term behavior and note that logging camps should be marked by a nonelaborate food service and storage containers for food brought into the camp (1986). To this list, Joseph has added the absence or low percentage of nails as another good indicator of turpentine and logging camps as well as the high incidence of recreational glass beverage containers (Anderson et al. 1987:251).

WATER TRANSPORTATION

There have been three major inventories of submerged or buried shipwreck resources in the study area. The first study, sponsored by the National Park Service and carried out by Coastal Environments, Inc. (1977), dealt with submerged shipwrecks, missile impact areas, dumping grounds, and other historic underwater features within the marine zone of the northern Gulf of Mexico continental shelf. This evaluation also includes a history of commerce and shipping in the Gulf of Mexico, a discussion of underwater remote sensing survey methods, and an evaluation of the status of underwater archeology. This study compiled a list of 1904 reported vessel losses and known shipwrecks and estimated that there are between 2,500 and 3,000 total shipwrecks located along the continental shelf of the northern Gulf of Mexico between the Florida Keys and the Rio Grande River. Approximately 70% of these date from the nineteenth and twentieth centuries and the remaining 30% date from the sixteenth through eighteenth century. It was estimated that approximately two-thirds of the total number of shipwrecks in the northern Gulf are within 1.5 km of the coastline and are associated with seaport approaches, maritime routes, and shipping hazards such as straits, shoals, and reefs (Coastal Environments, Inc. 1977:iv, 142).

The second inventory covers a restricted area of the Mississippi River between New Orleans and Baton Rouge and only for the years between 1814 and 1979. The inventory, compiled from a literature search, was sponsored by the New Orleans District of the Corps of Engineers. The report is two volumes in length and includes maps showing the locations of the re-ported sinkings (Detro, Davis, and Middleton 1979). This study had been superseded by the much larger inventory of the total inland) waterway system discussed below.

The third study, sponsored by the New Orleans District, Army Corps of Engineers was conducted as a joint project by Cal Jennings of Colorado State and Coastal Environments, Inc. (1987), and concerns buried and submerged shipwreck resources along the inland river transportation and commercial shipping arteries north of the marine zone. As part of this shipwreck overview, the Corps of Engineers in conjunction with Cal Jennings of Colorado State University and Coastal Environments Inc. is drawing up a nautical management plan for shipwreck resources in the New Orleans District (Chase, personal communication).

In addition to these inventories, several surveys have been conducted for underwater resources on the Red River. These include an exploratory magnetometer survey of the Red River in the vicinity of Simmsport, Louisiana (Gulf South Research Institute 1980) and of the Philip Bayou Realignment in Rapides Parish (Coastal Environments, Inc. 1983a). Magnetic anomalies detected in Saltus' Rapides Parish survey were tested (Saltus 1983) and in the Philips Bayou survey the same year (Coastal Environments, Inc. 1983b). Further south, remote sensing of locations near the shoreline of Lake Pontchartrain north of New Orleans included a magnetometer survey of two proposed borrow pits to determine the potential for shipwrecks and to assess the potential for drowned prehistoric sites. Remote sensing was also employed by Coastal Environments, Inc. to locate the wreck of the *El Nuevo Constante* off the southwestern coast of Louisiana. Coastal Environments, Inc. are also completing a report on another magnetometer survey and testing project on the Red River during the data collection part of the present study. The reader is advised to consult the New Orleans District inland waterway shipwreck survey mentioned above for a more current inventory of known shipwrecks and previous underwater and remote sensing studies in Louisiana.

Arkansas has no large formal inventory and assessment conducted of the shipwreck resources in the state. The Office of the State Archeologist of Arkansas does possess a tabulation entitled "Known Shipwrecks in Arkansas Waters from Jack Hudson 3-28-77" (Arkansas Archeological Survey Site Files), but this table is not accompanied by any formal report. Hudson is listed in Appendix B of the 1977 CEI shipwreck study as a "Marine Archeological Surveyor" and was acknowledged as a source of some of the compiled shipwreck data sheets for the Gulf of Mexico Study (Coastal Environments, Inc. 1977: 165). The only other report that deals with underwater resources in Arkansas was a literature review of steamboat wrecks in the Calion navigation pool of the Ouachita River by Watkins (Weinstein and Kelly 1984:57–60). Watkins presents a short history of the development of navigation hazards and improvements and documents five steamboat wrecks that occur in the Calion Pool project area and four boats for which wreck locations are so vague that it was not possible to determine whether they were located within the project area.

Another useful source of information on shipwrecks, shipping routes, and landings for the inland river transportation system is Bragg's (1977) study for the Mississippi River Commission entitled *Historic Names and Places on the Lower Mississippi River*. This popular account, compiled from primary records and other secondary sources, is designed to serve as a supplement to navigation maps published by the Mississippi River Commission. Although written for the general public, this study contains data useful to cultural resource managers, in lieu of a more systematic inventory, for identifying and locating some potentially significant underwater and associated bankline historic resources.

A third shipwreck investigation in Arkansas was conducted on the west shore of the Mississippi River opposite Memphis, Tennessee by Stewart–Abernathy of the Arkansas Archeological Survey, Survey staff, and members of the Arkansas Archeological Society. The salvage investigation took place during the summer of 1988 when the low level of the river caused by severe drought exposed five wrecks including two late nineteenth century steamboat wrecks on a sandbar at Engineers Beach. The investigation included aerial and detailed photodocumentation and limited excavation in the holds of the two steamboats.

Beyond Stewart–Abernathy's recent salvage efforts near Memphis, there have been no excavations or recoveries of early historic shipwrecks in the Louisiana–Arkansas study area. However, two shipwrecks located just outside the study area, have been extensively documented: the Civil War ironclad *Cairo* and the eighteenth century Spanish merchant vessel *El Nuevo Constante*. The Union gunboat *Cairo*, sunk by a mine near Vicksburg, in 1862, was raised from the Yazoo River in 1964 (Bearss 1980). The *Cairo* and associated artifacts are housed in a special museum at the Vicksburg National Military Park. The Spanish ship *El Nuevo Constante*, which ran aground off the chenier region during a hurricane in 1766, was excavated between 1980 and 1981 (Pearson et al. 1981).

HISTORY OF BIOARCHEOLOGY AND BIOARCHEOLOGICAL RESOURCES OF THE LOUISIANA AND ARKANSAS STUDY AREA

Jerome C. Rose and Anna M. Harmon

The purpose of this chapter is to provide a guide for incorporating bioarcheology into the cultural resource management process of the Southwestern Division of the U.S. Army Corps of Engineers. The region being considered includes all of northeastern, southeastern, and southwestern Arkansas not covered by the previous study units and all of Louisiana except the western portions of two parishes (i.e., De Soto and Sabine). A list of the bioarcheology target counties and parishes is presented in Table 21. This list differs by two Arkansas counties from that employed in the archeology sections of the overview. Garland and Montgomery counties are included within the bioarcheology sections of the Archeological Synthesis of the Ozark Mountains, Arkansas River Valley, and Ouachita Mountains (OAO) study area. This chapter consists of five sections beginning with the introduction. The next section is a short history of the recovery and analysis of human skeletal remains within the Arkansas portion of the study area. This history is presented within the context of the history of American bioarcheology which is briefly described in Chapter 7 of the Archeological Synthesis of the Ozark Mountains, Arkansas River Valley, and Ouachita Mountains Region and the history of archeology of the Arkansas–Louisiana study area provided in earlier chapters of this overview. The third section provides a history of the bioarcheology of Louisiana. The reason that the two states are treated separately is that the political boundaries and the advent of “home rule” archeology in the 1930s profoundly influenced the history of bioarcheology in this study unit. Although the bioarcheology histories are presented separately, state lines will be freely crossed when necessary to provide a readable narrative. The fourth section is a description of the available human skeletal data base within the Arkansas and Louisiana portions of the study area and an analysis of the ecological, geographic, archeological, temporal, and cultural distributions of these skeletal samples. These data were collected and are discussed within the regional bioarcheology research design previously described in Chapter 7 of the Archeological Synthesis of the OAO Region. The fifth and final section presents a summary of the material and recommendations presented in this chapter.

HISTORY OF BIOARCHEOLOGY IN THE ARKANSAS PORTION OF THE LOUISIANA AND ARKANSAS STUDY AREA

Early Expeditions

The earliest period of mortuary site excavation was the period of expeditions sponsored by East Coast research and educational institutions. These institutions sent a number of representatives into the area searching for mortuary sites that would produce large quantities of display quality ceramics and other artifacts. The earliest excursions into northeast Arkansas were probably encouraged by Dr. Frank L. James, a local physician, who excavated numerous prehistoric graves and sent pots to a number of institutions including the Smithsonian (Morse and Morse 1983). In 1879–1880 Edwin Curtis was sent by the Peabody Museum of Harvard University to northeast Arkansas to collect along the St. Francis River. Here he excavated at Stanley Mounds (now known to be Parkin, 3CS29), Rose Mound (3CS27), Neeley’s Ferry (3CS24), and Fortune Mound (3CS71) among others (Putnam 1881). From these excavations, one individual from Fortune Mound and 20 individuals from various other sites were retained for curation. In addition, 33 individuals from the Wittsburg site (3CS138) were obtained. No osteological analyses have ever been done on these skeletal remains. Between 1881 and 1886 the Mound Exploration Division of the Bureau of American Ethnology sent Palmer and other field assistants to excavate mounds in northeast (e.g., Pecan Point), southeast (e.g., Menard and Tillar), and southwest Arkansas (e.g., Carpenter or Moore Mounds) for the purpose of collecting data on mounds and their contexts. Palmer excavated at least 15 sites with human skeletal remains in the study area, exposed hundreds of skeletons, and sent back portions of an undetermined number of individuals for curation (Jeter n.d.). None of these received any research attention except the Tillar site (3DR1) collection of some 21 crania, and this was not until the presentation of papers at the Southeastern Archeological Conference in 1980 (Jeter 1980; Goodwin et al. 1980).

TABLE 21

LIST OF COUNTIES AND PARISHES WITH ABBREVIATIONS IN THE LOUISIANA–ARKANSAS STUDY AREA

ARKANSAS

County	Ab.	County	Ab.
Arkansas	AR	Hot Springs	HS
Ashley	AS	Jefferson	JE
Bradley	BR	Lafayette	LA
Calhoun	CA	Lee	LE
Chicot	CH	Lincoln	LI
Clark	CL	Miller	MI
Clay	CY	Mississippi	MS
Cleveland	CV	Monroe	MO
Columbia	CO	Nevada	NE
Craighead	CG	Ouachita	OU
Crittenden	CT	Phillips	PH
Cross	CS	Pike	PI
Dallas	DA	Poinsett	PO
Desha	DE	Prairie	PR
Drew	DR	St. Francis	SF
Grant	GR	Union	UN
Greene	GE	Woodruff	WO
Hempstead	HE		

LOUISIANA

Parish	Ab.	Parish	Ab.
Acadia	AC	Franklin	FR
Allen	AL	Grant	GR
Ascension	AN	Iberia	IB
Assumption	AS	Iberville	IV
Avoyelles	AV	Jackson	JA
Beauregard	BE	Jefferson	JE
Bienville	BI	Jefferson Davis	JD
Bossier	BO	Lafayette	LY
Caddo	CD	La Fourche	LF
Calcasieu	CU	La Salle	LA
Caldwell	CA	Lincoln	LI
Cameron	CM	Livingston	LV
Catahoula	CT	Madison	MA
Claiborne	CL	Morehouse	MO
Concordia	CO	Natchitoches	NA
De Soto	DS	Orleans	OR
East Baton Rouge	EBR	Ouachita	OU
East Carroll	EC	Plaquemines	PL
East Feliciana	EF	Pointe Coupee	PC
Evangeline	EV	Rapides	RA
Red River	RR	Tangipahoa	TA
Richland	RI	Tensas	TE
Sabine	SA	Terrebonne	TR
St. Bernard	SB	Union	UN
St. Charles	SC	Vermilion	VM
St. Helena	SH	Vernon	VN
St. James	SJ	Washington	WA
St. John the Baptist	SJB	Webster	WE
St. Landry	SL	West Baton Rouge	WBR
St. Martin	SM	West Carroll	WC
St. Mary	SMY	West Feliciana	WF
St. Tammany	ST	Winn	W

In the 1880s Riggs and Hall excavated thousands of graves in northeast Arkansas and sent pots to a large number of institutions (Morse and Morse 1983). There is no record of any skeletal material having been saved or described.

Between 1908 and 1913, Moore, sponsored by the Philadelphia Academy of Science, conducted mound surveys and excavations during six expeditions along a number of river systems in Arkansas and Louisiana (Moore 1908, 1909, 1910, 1911, 1912, 1913). Again, the goal was to acquire large quantities of exhibition quality specimens for the museum, as reflected in the following statement.

> Along the Red River in Arkansas...indeed, we know of no other region in all our fields of investigation where the proportion of deposits with the dead was so great.... Along the Red River in Arkansas, to come upon a burial unaccompanied by artifacts is indeed a rare occurrence. (Moore 1912:485)

The excavation of human skeletons was not in itself the focus of work and, like the artifacts, only exhibition quality specimens were occasionally retained. Despite the fact that Moore continued the pot collecting tradition of his predecessors, he must also be considered the "godfather" of Arkansas osteology. First of all, Dr. M. G. Miller, an anatomist, accompanied Moore on most of his expeditions and may have been the source of age, sex, pathology, and skeletal descriptions scattered throughout each of Moore's detailed descriptions of his excavations. Second, "a number of skulls...were preserved and sent...to the United States National Museum" (Moore 1908: 482). These were then examined by Ales Hrdlicka (1908:558–563), curator of physical anthropology at the Smithsonian, and the results were published as an appendix to Moore's promptly prepared and published report. Thus Arkansas osteology was born and the tradition of publishing osteological research as appendices to site reports and monographs was established. In contrast to crania, pathological skeletal speci-mens were sent to the U.S. Army Medical Museum for analysis, and the diagnoses were then included within Moore's text (e.g., Moore 1908:487).

During his expedition up the Arkansas River, Moore and his crew excavated 349 graves from the following sites: Menard (3AR4), 160; Sawyer's Landing, 7; Old River Landing (3AR14), 64; Goldman Field, 6; Douglas (3LI19), 32; and

Greer (3JE50), 80. Despite the statement that "human remains found by us along the Arkansas river were usually so badly decayed as to be worthless for scientific investigation" (Moore 1908:482), four crania from Menard (3AR4) and eight from (3JE50) Greer were sent for analysis. Hrdlicka's analysis included descriptions of pathological lesions, dental decay, tooth wear, and extensive cranial measurements (1908:558–563). He also made comparative comments on the fact that dental decay was more frequent and tooth wear less than at other prehistoric sites with which he was familiar. Paleopathology was primarily contributed by Dr. D. S. Lamb of the U.S. Army Medical Museum, whose observations were included within Moore's descriptions of the graves. Of particular note is the diagnosis of tuberculosis at Douglas (3LI19) and extensive inflammatory lesions of Burial 59 from Greer (Moore 1908). These were thought by Moore to be of little consequence because he could not demonstrate that these sites were pre-Columbian (Moore 1908:482).

In 1909–1910, Moore (1910) visited 21 sites along the White, Black, and St. Francis rivers in northeast Arkansas where he excavated 552 graves. He sent 38 boxes and cases to the U.S. National Museum where he hoped that "these remains, at a later period, will be fully described by Dr. Ales Hrdlicka" (Moore 1910:256). Between 1910 and 1911 Moore (1911) explored sites along the Mississippi River from New Orleans, Louisiana, almost to the Missouri line in Arkansas. From these excavations he sent 65 skulls "in good condition" and other skeletal components to the National Museum where he continued to hope that "Dr. Hrdlicka..., will, we trust, describe these remains at a later period" (Moore 1911:370). Neither of these two reports contained an osteological appendix nor comments on pathology from the Army Medical Museum. It seems that after the masterful description of Moore's material published in 1909, Hrdlicka had turned his attention to other concerns. There is evidence that skeletal material from these expeditions was obtained from the following identified sites: Kent Place, 3LE8; Pecan Point, 3MS78; Big Eddy, 3SF9; Miller Mounds, 3PO24; and Rhodes Place, 3CT3. These materials were never analyzed by Hrdlicka and received no attention until the 1960s when Mehta and Sensenig (1966) published their study of tooth wear and dental decay in the *Australian Dental Journal*. This broad ranging article included data from Rhodes Place (3CT3) and Pecan Point (3MS78) from the 1910–1911 expedition, as well as from Boytt's Field (3UN13) from the 1908–1909 expedition, which had been examined by Hrdlicka (1909).

In 1911–1912 Moore (1912) investigated sites along the Red River from its mouth to a short way into Texas. The contrasts between the Louisiana and Arkansas portions of the Red River are evident in his statements.

> Throughout the Red River region in Louisiana, one hears almost nothing of the finding of bones or of artifacts.... Along the Red River in Arkansas conditions in the main are different. Stories of the discovery of Indian objects ...and mounds containing burials...are fairly abundant. (Moore 1912:485)

In southwest Arkansas, Moore excavated numerous burials at sites such as Haley (3MI1), Battle (3LA1), Friday (3LA28), McClure (3MI29), and Crenshaw (3MI6). Unfortunately, skeletal preservation was poor. For example, at a mound near Taylortown, he found "thirteen burials, none of which was in a condition to save" (Moore 1912:523). At Battle Place, "all the skeletal remains in this mound were too much decayed for preservation" (Moore 1912:567), while at Crenshaw Place, "the bones were badly decayed... none being in a condition to save" (Moore 1912:620). As a consequence, only 13 skulls and a few other skeletal components from the entire Red River Expedition met the conditions of excellent preservation and were "sent as a gift to the United States National Museum" where selected specimens were studied by Hrdlicka (Moore 1912:487). Two skulls, associated mandibles, and parts of one skeleton representing burials five and nine from Haley Mound (3MI1) were described in an osteological appendix by Hrdlicka (1912). He described cranial deformation and dental disease, provided limited measurements, and assigned these crania to the Natches. Additional crania mentioned, but not described, included four from McClure Place (3MI29) and two from L'Eau Noire Bayou, Louisiana.

During the 1912–1913 expedition through Louisiana and Arkansas, Moore investigated nine sites along a 80 km portion of the Saline River in Arkansas. Moore found skeletal remains at seven of the excavated sites and noted that skeletal preservation was universally poor. One fractured femur from Burial 1 at Wherry Landing, Bradley County, Arkansas, was sent to the U.S. Army Medical Museum and is illustrated in the expedition report. No skeletal material was sent to the Smithsonian.

M. R. Harrington of the Museum of the American Indian, Heye Foundation, was captivated by Moore's fabulous discoveries and in 1915 asked Moore's advice about mounting an expedition "to supplement his studies and get to places he could not reach" (Harrington 1920:13). Harrington left for the field in February, 1916 and spent 20 months working in Hempstead County, Arkansas, before proceeding to other southwest Arkansas locations. Harrington (1920) excavated literally hundreds of graves at such sites as the Flowers Mound group, Ed Brown Place, the Robins Place, mounds near Washington, and Littler and McClendon near Hot Springs. One of his major contributions was to bring to light the cultural richness of the prehistoric upland Caddo. If any skeletal material was retained for curation, this fact was not mentioned in his report (Harrington 1920) and they cannot presently be found. One explanation for not retaining skeletal material is the fact that, like Moore before him, Harrington found skeletal preservation to be poor.

Locally Conducted Expeditions

The 1920s began the period of locally conducted expeditions to excavate mortuary sites by both amateurs and professionals. The only change from the previous period was that while the focus remained upon the acquisition of display quality mortuary artifacts, the majority of the excavated materials were retained within the state. Kelley, an amateur, excavated several mortuary sites in Desha and Chicot counties of southeast Arkansas. No skeletal material was curated and no osteological studies were conducted. Lemley, often in conjunction with Dickinson, excavated or funded the excavation of numerous mortuary sites throughout southwest and southeast Arkansas during the 1930s and 1940s: these included Crenshaw (3MI6), Bellaire (3CH46), Alma Brown (3DE3), and May Mound (3CL29), among many others (Lemley and Dickinson 1937). Although Lemley did retain a small portion of the many hundreds of excavated human remains, they have been subsequently lost. During the same period, Dr. and Mrs. T. L. Hodges of Bismarck, Arkansas, excavated at least four sites in the Middle Ouachita Valley. Of the 50 or more excavated skeletons, a few bones were donated to an eastern institution where they remained unstudied, while none of the others were retained.

Beginning in 1897, Dr. James K. Hampson of Nodena Plantation began an amateur archeology career devoted to the excavation of the Middle and Upper Nodena sites (3MS3, 3MS4) in northeast Arkansas (Morse and Morse 1983). He conducted sporadic excavations in 1897–1907 and 1927, major excavations were conducted between 1932 and 1941. In 1932 major excavations were also conducted by the University of Arkansas Museum and the Alabama Museum of Natural History. Of the many individual skeletons excavated by these three groups (a conservative estimate might be about 3,000) there remain only 211 crania available for analysis (Powell 1983). Following the tradition established by Moore and Hrdlicka, all of the Nodena excavators retained well preserved crania and some well preserved postcranial bones, especially those exhibiting unusual morphology or pathological lesions. As a physician, Hampson had an active interest in paleopathology, and as a consequence, he not only retained numerous pathological specimens but was also generous in sending specimens to paleopathologists throughout the United States. Despite the large collections of skeletal material and an active interest in pathology, it was not until the late 1970s that Powell, with partial funding by the Arkansas Archeological Survey, conducted a definitive study of the extant Nodena collections. *The People of Nodena* (Powell 1983) provides a description of the collections, measurements, demography, and an evaluation of the health status of these Late Mississippian peoples.

There has been no greater advocate of local control of Arkansas antiquities than Samuel C. Dellinger, curator of The University Museum (University of Arkansas, Fayetteville) from 1925–1960. Irate over the "pillaging" of Arkansas' prehistoric treasures by "Eastern Institutions," Dellinger began the systematic excavation of Arkansas sites (Hoffman 1981) and, like those who preceded him, singled out mortuary sites as the source of display quality artifacts. Funded in part by a $20,000 grant from the Carnegie Foundation, he sent field crews throughout the state to excavate sites as he attempted to build the museum collections. In addition to the previously mentioned excavations at the Nodena sites, work was conducted at Hazel (3PO6), Neeley's Ferry (3CS24), Barton Ranch (3CT18), Vernon Paul (3CS25), Parkin (3CS29), and Wapanocca (3CT9), among others. Again, following the standard procedures of the day, well preserved crania and postcranial bones of anomalous interest were saved for curation.

Continuing to follow the lead of Moore, pathological specimens were sent for study to a physician, in this case, Elmer G. Wakefield of the Mayo Clinic. This practice eventually led to a number of collaborative studies, two of which are pertinent to this overview. In 1937, Wakefield, Dellinger and Camp (also of the Mayo Clinic) published in the *American Journal of Medical Science* an overview of specimens obtained from the excavation of over 400 graves in Crittenden and Mississippi counties. This study should be noted for its use of radiographs in diagnosis of the bone lesions and the descriptions of lesions such as anemias, extreme osteomyelitic infections, and possible trephining (cranial surgery). Despite its use of modern techniques, it also exhibited the typical deficiencies of this era, which are treating the material as individual specimens and not identifying the sites which produced the material. In a later article, Wakefield and Dellinger (1940) not only employed the latest techniques in paleopathology (i.e., bone growth arrest lines observed in radiographs, coprolite analysis for dietary reconstruction), but also attempted regional comparisons to evaluate adaptation. The Mississippi Valley "mound builders" were contrasted with the Ozark "bluff dwellers," and they concluded that the mound builders were larger, better developed, and had less arthritis but more infectious disease than the bluff dwellers (Wakefield and Dellinger 1940). This article, with all of its defects, represents the first attempt at what we today would call bioarcheology.

Despite these landmark efforts at osteological analysis, the majority of these specimens had to wait until the 1970s to receive further examination. Wolf (1977) employed nonmetric skeletal traits collected in part from Hazel (3PO6), Vernon Paul (3CS25), and Upper Nodena (3MS4) collections to reconstruct Mississippi Valley migration patterns. Turner (1983) collected dental morphology data from Vernon Paul (3CS25), Wapanocca (3CT9), and Neeley's Ferry (3CS24) for use in establishing the point of American Indian origin on the Asian continent. Various student projects provide excellent analyses of Vernon Paul (UA Osteology), Parkin (3CS29) (Murray 1985), and Wapanocca (Harmon 1984).

WPA Excavations

The Great American Depression provided an additional source of funding for large excavation projects when archeology was chosen as one of a number of public projects utilized by the Work Projects Administration to provide employment and income to large numbers of destitute individuals. The WPA program provided funds for continuing mortuary site excavations by the University of Arkansas Museum under the direction of Dellinger. The only WPA–sponsored excavations within the Arkansas portion of the study area were conducted in the Ouachita drainage. The four sites producing skeletal collections were Cooper (3HS1), Watermelon Island (3HS3), Adair (3GA1), and Poole (3MA42). Other than age and sex data obtained in the field and provided in the field notes, no other osteological research has been done on these collections. The entry of the United States into the Second World War brought a virtual halt to archeological excavations in Arkansas.

Academic Archeology

A major event in Mississippi Valley archeology was the formation of the Lower Mississippi Archeological Survey by Phillips (Harvard University), Griffin (University of Michigan), and Ford (Louisiana State University). This consortium commenced a site survey within the Mississippi Valley in 1940–1941 and continued after the war in 1946–1947. As described earlier in the archeology chapters, this group changed the orientation of Mississippi Valley archeology from a focus on collecting exhibit specimens from mortuary sites to working out chronology from the excavation of habitation sites and midden deposits. Although numerous sites with mortuary components were visited and tested during these surveys, no mortuary excavations were conducted, and no skeletal collections were obtained. In fact, with one or two exceptions, the work conducted by these individuals effectively eliminated all mortuary site excavations by professional archeologists in eastern Arkansas until the advent of Cultural Resource Management in the 1970s.

At this point in time, critical theoretical and methodological changes were taking place in both the fields of physical anthropology and archeology (see Buikstra 1979; Gruber 1981; Willey and Sabloff 1974 for detailed discussions). Up to this time archeologists working in the study area would occasionally send their skeletal specimens to osteologists (e.g., Hrdlicka) for description, and pathological specimens to physicians (e.g., Army Medical Museum) for disease diagnosis. What research was done by the osteologists appears to have been left up to their own discretion. Hrdlicka's analyses included age, sex, skeletal measurements, disease diagnosis, and racial attribution; they represented state-of-the-art research for that time. Wakefield and Dellinger employed state-of-the-art medical technology (i.e., radiology) and paleopathological techniques (i.e., growth arrest lines and coprolite analysis) to address questions of disease diagnosis and dietary reconstruction, while comparisons of disease frequencies between geographic areas were also performed. This osteological research certainly ranks with the best being done anywhere in the world at that time and was generally better than most.

One event which may have significantly changed the relationship between osteologists and Southeastern archeologists was the publication of *Archeology of Eastern United States*, edited by Griffin (1952). The second chapter in this major regional synthesis had as its goal the exposition of a "framework for the reconstruction of the racial history of the American Indian" using cranial typology of undeformed adult male crania (Neumann 1952:13). This chapter contained no mention of paleopathology, dietary reconstruction, or any of the other potentially interesting results produced by osteologists working in the eastern United States. Because Griffin's "Green Bible" was widely read by archeologists (especially graduate students), some of whom were turning their attention to questions of context and function (Willey and Sabloff 1974), Neumann's chapter on cranial typology received wide exposure. If archeologists assumed that this chapter represented the best that osteologists had been able to accomplish, then it is no wonder that an entire generation of archeologists could see no purpose in having their excavated skeletal material analyzed. This focus upon cranial typology and migration may have sounded the death knell for osteology in the study area over the next 25 years.

With a return to a peace time economy after the war, the late 1940s ushered in the era of reservoir construction and its associated salvage archeology programs. In 1946, the Inter-Agency Archeological Salvage Program was instituted. This cooperative was composed of a working relationship between the Smithsonian Institution, National Park Service, and U.S. Army Corps of Engineers (Jelks 1961b). The Smithsonian Institution administered funds it received from the National Park Service through the River Basin Surveys, a unit of the Bureau of American Ethnology. Using funds provided by the River Basin Surveys, the University Museum at the University of Arkansas conducted excavations in the Millwood Reservoir area under the field direction of Ronald Thomas (Hoffman 1970). The resulting burials have already been discussed in the bioarcheology sections of the Eastern Portion of the Gulf Coastal Plain overview. No other River Basin Survey burial excavations were conducted within the Arkansas portion of this study area.

In the late 1950s, the National Park Service sponsored excavations at a number of colonial forts. Following two periods of testing, James Ford conducted extensive excavations at the Menard site (3AR4), which had previously been excavated by Moore. The 1958 season produced 24 burials, but no osteological analyses were conducted, because "none were well enough preserved to make it possible to save it for measurements" (Ford 1961:156). While working on the Menard site, Ford learned about the destruction of mounds by highway construction near Helena, Arkansas. He excavated 19 burials at the Hopewellian-affiliated Helena Mounds site (3PH11) (Ford 1963). Roselle Tekiner prepared a descriptive osteological report which was published as an appendix to Ford's monograph (Ford 1963:48–54). This study included information on cranial deformation, age and sex, skeletal measurements, and dental caries.

In the late 1950s there was a short return to mortuary excavations with the objective of collecting display quality ceramics. Between 1957 and 1960 the Gilcrease Museum of Tulsa, Oklahoma, sponsored the excavations of Banks Village (3CT13), Banks Mound (3CT14), and the Cherry Valley site (3CS40) by Gregory Perino. A total of 1,033 individuals were excavated from these three sites, no skeletal analyses were conducted, and only 27 individuals are still available for study.

In the mid-1960s, the University of Arkansas Museum held its summer archeological field school for anthropology students at the Hazel (3PO6) and Parkin (3CS29) sites. Neither of the skeletal collections from these sites were subjected to osteological analysis until 1985 when Kathi Murray completed her senior honors thesis on the bioarcheology of the Parkin site (Murray 1985). This thesis provides demographic data, paleopathology, skeletal measurements, and a comparative analysis focussing on adaptive efficiency. The University Museum conducted salvage excavations in 1965 at the DeRossitt site (3SF49). Only teeth remained of the individuals interred at this site and no analysis has been conducted.

Arkansas Archeological Survey

Major changes in mortuary site excavation and skeletal recovery in Arkansas took place with the founding of the Arkansas Archeological Survey and the Arkansas Archeological Society in the 1960s. Over the next decade, eight Research Stations were established throughout the state. The most significant impact that the Arkansas Archeological Survey had upon bioarcheology was a change in sampling strategy (i.e., choice of sites to be excavated). In the past, large mortuary and mound sites, usually from the later ceramic making cultures, were the usual choice for excavation, but now burials from habitation sites, small cemeteries, and preceramic horizons were being excavated. This alteration in orientation provided a better sampling of mortuary components over time, cultural sequence, and social status ranges. For example, excavation of the McArthur site (3CH49), as part of station research, provided a sample of infants and older handicapped adults (University of Arkansas Osteology Laboratory [OL] files). This sample is composed of adults who would not have been interred in the mortuary location reserved for full cultural participants and thus would probably never have been excavated under the previous research and excavation designs.

Pothunting as both a hobby and for profit had been going on for over a century throughout Arkansas, but most intensively in the northeast. The pothunters located and dug into graves, removed pots, and left skeletal material in the grave or scattered upon the ground. The establishment of the research stations provided full time professional archeologists who could document, to some extent, this destruction and, when possible, salvage some of the skeletal material. The building of bridges between the station archeologists and pothunters has resulted in the occasional delivery of the skeletal material to the stations. One example is the Hedges site (3HS60), where seven individuals were deposited. Osteological data from this site are available from a volunteer osteology student analysis (OL files). Station archeologists also performed salvage excavations (often on weekends) at mortuary sites which were scheduled for destruction by construction or other land altering activities, but were not subject to conservation legislation requiring mitigation. This activity has provided 11 small skeletal series just in northeast Arkansas (e.g., Hyneman I — 3PO52; Frierson II — 3CG54). The importance of this station activity is that these recovered burials often represent components which had been neglected by the previous excavation strategies. Some osteological data from these collections has been collected by students in osteology classes at the University of Arkansas.

The initiation of in-house research designs and surveys by the station archeologists has also provided increased knowledge of mortuary components which might have gone unrecorded under other circumstances. For example, the McClendon site (3DR144) was intensively surface collected and tested by University of Arkansas Monticello AAS Station staff. That activity produced the skeletal remains of a number of individuals who had been disturbed and scattered by both plowing and pothunting. This material has been analyzed by a student taking an osteology class and thus we have some information about these Tillar complex people.

Cooperative ventures between station archeologists and amateur archeologists have also produced significant collections. One example of this cooperation is the Fraser (or Saline Sand and Gravel) site (3BR40), where cooperative excavation produced seven individuals. Preliminary osteology data are available from student volunteer analyses. This interaction, especially with the Arkansas Archeological Society, has made it possible for the Survey to conduct massive salvage excavations and save osteological samples scheduled for destruction. One such example is the Ables Creek site (3DR214) where several station archeologists, anthropology student volunteers, and Society members removed almost 150 individuals from an area being land leveled. There were as many as 60 people working on the excavation on any one day.

Another aspect of this cooperation is the Arkansas Archeological Society training program in field excavation techniques held each summer. Training sessions held between 1972 and 1974 at the Ferguson site (3HE63) produced a total of 17 individuals. Avocational archeologists who had participated in the training program have also excavated mortuary sites and have continued the process through analysis and report preparation. For example, Mr. and Mrs. Ed White have excavated the Gordon site (3AS152) and the 18 individuals have been analyzed by osteology student volunteers (OL files). All of the above mentioned activities made possible by the formation of the Archeological Survey and Society have improved our sampling of mortuary components, instituted for the first time systematic retention and curation of all human skeletal remains, and provided material from sites which would have normally been destroyed. Despite these improvements, the care and osteological analysis of this skeletal material continues to depend upon student and, increasingly, amateur archeologist volunteer efforts.

Cultural Resource Management

Between 1966, when the Historic Preservation Act was passed, and the early 1970s, the archeological orientation known as Cultural Resource Management took shape and matured. The advent of CRM in Arkansas had a considerable impact upon the way that prehistoric osteological research was and is conducted. First, the range of mortuary site types being excavated expanded to include the entire range: isolated burials, habitation burials, cemeteries, mound interments, and historic cemeteries. Many of the sites now being excavated would probably never have been chosen for excavation during the previous historical periods. Thus, the recently excavated skeletal series are more representative of the prehistoric populations. Second, archeologists were entering the market place and osteological research was being conducted within a low bid environment. Third, funding for extensive osteological analysis was available for the first time, especially for nonimpressive mortuary sites (i.e., those not likely to be funded by the National Science Foundation). In fact, CRM provided the opportunity for comprehensive osteology research (i.e., bioarcheology) to be conducted on a routine basis for the first time. Finally, the CRM protocol required the preparation of reports. Thus, osteological analyses, when conducted, were included within the final project reports, and for the first time the skeletal data became as accessible as the archeology. Although these reports often had small distributions, the osteological data became far more available than previously, when they had existed only as manuscripts filed away in an archeologist's office. The gradual introduction of these changes can be seen in the selected history of CRM osteology presented below.

The initial testing of the Zebree site (3MS20) in northeast Arkansas was conducted by the Arkansas Archeological Survey without external funding. The 1969 block excavation was funded by the National Park Service and eight burials were excavated. Ditch construction resulted in mitigation excavation with funding provided by the Memphis District of the U.S. Army Corps of Engineers. An additional 23 burials were excavated. Although no funds were provided for osteological analysis, a comprehensive bioarcheological analysis was conducted by Powell (1977) for her M.A. thesis at the University of Arkansas. In addition to providing a wide range of osteological data, this thesis focused upon paleodemographic interpretation and dietary reconstruction within a regional synthetic framework. Of historical note, the thesis title was one of the earliest uses of the term *bioarcheology.*

A 1976 survey in Craighead County by the Arkansas Archeological Survey led to the mitigation of the Mangrum site (3CG636) in 1977. Three burials were excavated, and osteological analysis produced a short descriptive report. Funding consisted of a small fee paid to a graduate student. Mitigation of the Burris II site (3CG218), discovered during the 1978 Texas Eastern survey by the Arkansas Archeological Survey, produced a single burial. A small fee was again paid for a short descriptive osteological report. Private archeological contract firms followed a similar practice of paying small fees for descriptive osteological analyses. The Brougham Lake site (3CT98) was mitigated by Historic Preservation Associates, and a graduate student was paid to prepare a short descriptive analysis of the two recovered burials. The basic osteological information (i.e., age and sex) was incorporated into the standard feature descriptions within the final report (Klinger et al. 1983:182).

The mitigation of Little Cypress Bayou (3CT50) by New World Research in 1982–1983 produced the first fully funded bioarcheological analysis in northeast Arkansas. Only four burials were recovered and analyzed, but this report included a fairly complete inventory of regional osteological resources and a synthesis of the extant bioarcheological data base (Rose et al. 1985). Stable carbon isotope analysis was conducted on the four Little Cypress Bayou individuals and two individuals from Banks Mound (3CT14). The primary focus of the research was on dietary reconstruction and the origins of maize agriculture in northeast Arkansas.

Cultural Resource Management bioarcheology followed a similar historical development in southeast Arkansas. In 1975, a complex agreement between the Arkansas Archeological Survey and a number of federal agencies resulted in the testing of the Shallow Lake site (3UN52) within the Felsenthal National Wildlife Refuge. No funding was provided for the four burials recovered, but short paragraphs describing age, sex, and gross pathology provided by a graduate student were included within the feature description section of the final report (Rolingson and Schambach 1981). Bridge realignment and construction resulted in the mitigation of the Powell Canal site (3CH14) by the Arkansas Archeological Survey with funding provided by the Arkansas Highway and Transportation Department. The six recovered burials were accorded comprehensive bioarcheological analysis, which also included the experimental use of Scanning Electron Microscope observation of dental microwear for dietary reconstruction (Blaeuer and Rose 1982). A cultural resource survey and testing operation conducted by Coastal Environments Inc. of Baton Rouge, Louisiana, resulted in the recovery of three individuals from the Little Mud Lake site (3CA265). The final report included a comprehensive analysis of the burials, in addition to a regional synthesis of the extant bioarcheological data base (Mires and Owsley 1984). This report should be noted for introducing the practice of total skeletal data collection and reporting (e.g., dental and skeletal measurements, Harris line counts from radiographs) rather than limiting the collection of data to the minimum required to meet the research design and scope of work.

In southwest Arkansas, the funding of CRM bioarcheology was initiated with the mitigation of the Cedar Grove site (3LA97) by the Arkansas Archeological Survey. This site, discovered during revetment construction (a cooperative effort by the local levee board and the New Orleans District of the U.S. Army Corps of Engineers) along the Red River consisted of a late prehistoric/historic Caddo farmstead and a historic African–American cemetery dating to 1890–1927. Mitigation of the Caddo farmstead produced 15 individuals. These were accorded a comprehensive bioarcheological analysis, which complimented the extensive multidisciplinary research design conducted during this mitigation project. The Cedar Grove project should be noted for the extensive analytical and interpretive feedback which occurred between the various specialists: archeologists, bioarcheologist, paleobotanist, and paleozoologists. In addition, an inventory of the regional osteological resource base and a regional bioarcheological synthesis were provided in the final report (Rose 1984). More than two years were to pass before a decision was reached concerning the fate of the historic African–American cemetery. In the summer of 1982, it was determined that the cemetery was eligible for the National Register and archeological mitigation was conducted by the Arkansas Archeological Survey. The time limitation of 24 hours between grave excavation and relocation to a new cemetery limited the amount of osteological data which could be collected in the field laboratories set up at the site. Despite funding limitations on the analysis and interpretation of the osteological data, a report interpreting the data within the historical context of southern African–American life was prepared (Rose 1985). Archeological and osteological data are still in the process of analysis.

Summary of Arkansas Bioarcheology

The previous sections provided a short history of mortuary excavations, skeletal analyses, and the development of bioarcheology in Arkansas by referencing key historical events, significant individuals, and sufficient examples of specific sites to illustrate the historical trends. This section will summarize the various historical trends using data from the 187 mortuary components and 4759 individuals contained in the Arkansas portion of the Louisiana–Arkansas bioarcheology data base for which we have dates of excavation.

Examination of Table 22 shows that the excavation of both mortuary components and number of individuals per component varied significantly between 1880 and the present. The decade which produced both the largest percentages of excavated mortuary components (21.4%) and individuals (26.7%) is 1910–1919. Moore is primarily responsible for these high percentages (as well as those of the preceding decade) due to his efficient system of locating mortuary components, his quick decisions to abandon excavations at sites with poor preservation or low artifact yields, his rapid field methods of excavation, and his timely publication of the results. The latter factor is most important to this analysis because the data base employed is derived primarily from the published literature and, as a consequence, Moore is probably the only archeologist whose entire record of excavation activity within the study area is represented in the data base. Moore's most important contribution to Arkansas bioarcheology is the fact that he initiated analysis of excavated human skeletal remains from Arkansas by sending them to Hrdlicka at the Smithsonian, and provided for the prompt publication of the results as appendices to his excavation reports. The percentages of individuals analyzed presented in Table 22 are misleading because the methodology employed in producing this table assumed that all individuals within a mortuary component were analyzed if a report was prepared. This was not the case, however, due to Moore's practice of only sending a few of the better preserved individuals to the Smithsonian for analysis. It should also be noted that it was not until the Cultural Resource Management period of the 1970s that osteological appendices were again regularly published with the excavation reports.

The next highest percentage (17.7%) of total mortuary components excavated is from the 1970–1979 decade and is followed closely by both the preceding and subsequent decades, both with 13.9%. The large proportion of mortuary components excavated during these three decades is due almost entirely to CRM excavations. However, when these three decades are compared by the proportion of total number of excavated individuals, they rank among the lowest of the eleven decades. This clear contrast with the Moore decades illustrates the most important change in mortuary site excavation which

TABLE 22

MORTUARY EXCAVATION AND ANALYSIS BY DECADE IN THE ARKANSAS PORTION OF THE LOUISIANA–ARKANSAS STUDY AREA

	Total		Total		Demographics		Demog. +	
	# Sites	% Total	# Indiv	% Total	% Sites	% Indiv	% Sites	% Indiv
1880-89	9	4.8	118	2.5	11.1	1.7	22.2	3.4
1890-99	0	0.0	0	0.0	0.0	0.0	0.0	0.0
1900-09	17	9.1	590	12.4	17.6	45.4	5.9	9.8
1910-19	40	21.4	1270	26.7	7.5	20.8	12.5	65.9
1920-29	3	1.6	10	0.2	0.0	0.0	0.0	0.0
1930-39	211	1.2	1047	22.0	23.8	13.8	19.0	69.8
1940-49	4	2.1	99	2.1	25.0	86.9	0.0	0.0
1950-59	8	4.3	1113	23.4	12.5	1.5	25.0	4.1
1960-69	26	13.9	161	3.4	7.7	16.8	26.9	38.5
1970-79	33	17.7	178	3.7	9.1	29.2	27.3	42.7
1980-87	26	13.9	173	3.6	7.7	1.7	46.2	76.9
TOTAL	*187	100.0	4759	100.0	11.2	18.1	22.4	40.9

*These 187 components and 4,759 individuals are those with dates of excavation and represent 76% and 91 % of the total sample of components (246) and individuals (5,204) respectively.

TABLE 23

SOURCE OF EXCAVATION FOR ARKANSAS SITES WITH A MORTUARY COMPONENT AND ANALYSIS LEVEL BY PERCENT

	% Total Excavation				% Demographic Data				% Demographic +			
	Components		Individuals		Components		Individuals		Components		Individuals	
Amateurs	30.5	(75)	11.8	(613)	8.0	(6)	8.8	(54)	10.7	(8)	13.5	(83)
Field Schools	1.6	(4)	0.2	(8)		(0)		(0)		(0)		(0)
Organizations	52.5	(129)	84.6	(4402)	12.4	(16)	18.6	(817)	24.8	(32)	41.1	(1810)
*BAE	1.6	(4)	1.3	(67)		(0)		(0)	50.0	(2)	6.0	(4)
*Gilcrease	1.2	(3)	19.8	(1033)		(0)		(0)	33.3	(1)	2.6	(27)
*Phillips Academy	11.0	(27)	28.9	(1504)	18.5	(5)	–		22.2	(6)	–	
*Peabody	0.8	(2)	0.3	(15)		(0)		(0)		(0)		(0)
*University Museum	6.5	(16)	22.1	(1149)	37.5	(6)	19.7	(226)	25.0	(4)	63.6	(731)
Cult. Res. Management	8.9	(22)	2.8	(147)	9.1	(2)	2.0	(3)	50.0	(11)	86.4	(127)
Unknown	6.5	(16)	0.6	(34)	18.8	(3)	14.7	(5)	12.5	(2)	35.3	(12)
TOTAL	2465.0		204.0		11.0	(27)	16.9	(879)	21.5	(53)	39.0	(2032)

*Selected subdivisions of source category

occurred during this 107 year period. Where the earlier archeologists only excavated large mortuary sites to the total exclusion of small sites, the CRM philosophy required the excavation of “significant” sites regardless of size, and burials were excavated when encountered. It is this change in excavation strategy which has made significant improvements in the representative nature of the demographic samples. Without these samples from the smaller habitation sites, our picture of prehistoric biology would be greatly distorted.

As Table 22 demonstrates, the proportion of both mortuary components and individuals receiving analyses more extensive than age and sex determination increases over time and most dramatically between the 1970s and 1980s. These figures demonstrate that the CRM philosophy clearly improved the quantity of skeletal analysis being preformed in this portion of Arkansas. This period also represents the first time in Arkansas that osteologists were compensated or received financial support for their research. Thus, there is a significant correlation between the availability of funding and both the quantity and quality of osteological research.

The next highest peak, after Moore, in the number of individuals excavated occurs in the 1950–1959 decade, when 23.4% of the total individuals were excavated. This burial excavation node is the product of Perino’s excavations at only three sites (i.e., Banks Mound, Banks Village, and Cherry Valley) and accounts for 98.7% of the burials excavated during the decade. Of this large sample, only 27 individuals are still available for analysis and none were analyzed at the time of excavation. Despite the fact that these excavations represent a return to the exhibition quality artifact retrieval orientation of the earliest decades, there is actually a decline in the proportion of individuals receiving osteological analysis.

The third highest node in the number of individuals excavated is the 1930–1939 decade, when the University Museum is responsible for the majority of excavated individuals. Although this decade represents a continuation of the artifact acquisition orientation, two important changes had taken place. First, there was a radical increase in the number of individual human skeletons retained during excavation and curated for future research. Second, the skeletal analyses performed by Dellinger and his physician colleagues were state of the art for that time and, in fact, were not exceeded in quality and innovation until the late 1970s. It should also be noted that the comparison of disease types and frequencies between archeological regions was unique and progressive even for that time period. The reader should be alerted to the fact that the majority of the more complete skeletal analyses listed in Table 22 for this decade were conducted more than thirty years after excavation. Despite the quality of Dellinger’s work for the time, if these skeletal series had not been retained for later analysis, we would now possess few meaningful data from 22% of the total skeletal resource base in the study region.

Examination of Table 23 provides information on the affiliation of the excavators and the extent of osteological analysis. Amateurs account for the excavation of 30.5% of the total mortuary components and 11.8% of the individuals. These figures only represent those sites excavated by amateurs which have been reported in the literature or the state site record files. These figures do not include sites excavated by pot hunters. A conservative estimate of the number of mortuary sites destroyed by pot hunters is ten times the total recorded mortuary data base. It is also evident in these figures that responsible amateurs who report their activities never attempted to excavate sites of the same size magnitude as the early archeologists (e.g., Moore and Dellinger). All of the osteological analyses of amateur excavated material have been done long after excavation and mostly by students.

Field schools have excavated only four mortuary components with a total of eight burials. None of these have been analyzed. This fact points out the primary problem with field schools. In Arkansas financial support is provided for the instruction of the students and field expenses. No provisions are made for analysis of the excavated artifacts or human remains, which often are not even washed and properly curated.

Various academic and museum organizations account for 52.5% of the excavated mortuary components and 84.6% of the individuals in this sample. Under the sponsorship of the Academy of Natural Sciences of Philadelphia, Moore excavated the largest proportions of sites and individuals. Although their record of osteological analysis is excellent for the time, only selected individuals were retained for analysis. The University Museum follows with the next highest number of excavated sites and individuals. The majority of osteological analyses presented in Table 23 were performed long after the excavations. However, these collections are still available for analysis.

The lowest proportion of mortuary components (8.9%) and individuals (2.8%) have been excavated under the auspice of Cultural Resource Management. Thus, only these small proportions of the entire bioarcheology resource base have been analyzed under the conditions of financial support and modern osteological methodologies. Despite having the best record for osteological analysis, the CRM system has not achieved the desired level of 100% analysis and considerable improvement is still required.

Table 23 provides an excellent picture of the bioarcheological knowledge base for the Arkansas portion of the study area. A total of 27 excavated mortuary components (11%) have received osteological analyses which included the determination of age and sex. More comprehensive analyses account for an additional 53 components (21.5%). Of these 80 osteological analyses, 49 (61%) are available only in manuscript form. Thus, only 39% of the bioarcheological analyses are available to researchers working in this portion of Arkansas.

HISTORY OF BIOARCHEOLOGY IN THE LOUISIANA PORTION OF THE LOUISIANA AND ARKANSAS STUDY AREA

Local Discoveries

The early history of Louisiana mortuary site archeology differs from the Arkansas portion of the study area in the large number of very early reports concerning the discovery of prehistoric human skeletal remains. These earliest periods are extensively discussed by Neuman (1984:7–52) in his *Introduction to Louisiana Archaeology*, and thus they will only be highlighted here. In 1809 the American Philosophical Society published the discovery of a human skull and teeth 30–35 feet below the surface of the ground during the digging of a well. Monette presented a paper in 1838 describing a human cremation excavated from a mound. Later in 1843, Dickeson described the characteristics of human crania excavated in Concordia parish. National attention was again drawn to Louisiana with the publication, in the *Annual Report of the Smithsonian Institution*, of information concerning prehistoric human remains provided by Lockett and Hotchkiss. Some of these early skeletal collections were distributed to a number of museums and thus Louisiana figures prominently in the early history of American osteology and paleopathology. Morton (1838), an American pioneer in the measurement and racial classification of crania, included Louisiana specimens in his classic work *Crania Americana: Or, A Comparative View of the Skulls of Various Aboriginal Nations of North and South America*. Jones was the first American paleopathologist to describe and discuss the evidence of disease observed on excavated human remains and initiated the long lasting debate on the presence of syphilis in prehistoric America (Ubelaker 1982:339). In his second article on paleopathology, Jones discussed the impact of various diseases, including syphilis, upon the prehistoric Americans and included Louisiana skeletal material in the discussion (cited in Neuman 1984:37). In the first of his many refutations of an "early peopling of the New World" Hrdlicka (1907) discussed the lack of evidence for early dates of a number of specimens including the "Doctor Dowler's Red Indian" or "New Orleans Skeleton" discovered more than one half century earlier (see Neuman 1984:37).

Local Academic Investigations

Again, Louisiana differs from Arkansas because archeological research was conducted by local academicians almost a quarter of a century earlier. In 1898, Veatch, a Louisiana State University geologist, reported finding human skeletal remains at Stormy Point, Belle Isle, and Morton Shell Mound (Neuman 1984). Beyer, a Tulane University biologist, earned a place in the history of Louisiana archeology by being the first to receive funding for excavations. In 1896 he received funding from the Louisiana Historical Society. In addition to describing the prehistoric burial patterns, he also took cranial measurements, giving Beyer historical precedence as having performed the earliest osteological research in Louisiana (Neuman 1984). His cranial measurements were then used to support his conclusions that the Native Americans were of substandard intelligence. It is obvious that Beyer was a follower of Warren (1822), who in a standard anatomy text, A *Comparative View of the Sensorial and Nervous Systems in Men and Animals*, used cranial measurements of prehistoric crania to establish estimates of human intelligence. Like Dellinger 25 years later in Arkansas, Beyer, as the curator of the Tulane University Museum, decried the removal of Louisiana antiquities from the state.

Early Expeditions By East Coast Institutions

As in Arkansas, East Coast research and educational institutions sent representatives into the area searching for mortuary sites which would produce large quantities of display quality ceramics and other artifacts. Between 1909 and 1913, Moore, sponsored by the Academy of Natural Sciences of Philadelphia, conducted mound surveys and excavations during four expeditions along a number of river systems in Louisiana (Moore 1909, 1911, 1912, 1913). Many details of these expeditions and their operating procedures have been discussed in the Arkansas section of this history.

During the 1908–1909 expedition Moore explored the Ouachita River, Bayou Bartholomew, Little, and Boeuf Rivers, and excavated a minimum of 726 human skeletons (Moore 1909). Along the Ouachita, the following sites produced 263 individual skeletons: Harrelson Landing (16CA13) 22, Pritchard Landing (16CT14) 74, Myatts Landing (16OU17) 38, Glendora (16OU18)121, and Booth Landing (16CT31) 8. Bayou Bartholomew was more productive producing a total of 430 individuals: Sycamore Landing (16MO30) 38, Keno Plantation (16MO31) 255, Ward Place (16MO12) 31, Seven Pines Landing 42, Bray Landing (16MO11) 17, and Mound Place 47. The Little River was not very productive with only 18 individuals excavated: Bushley Creek 4, Frazier Place 3, and Nugent Landing (now known as Clear Creek Bay 16GR20) 11. Poor preservation along the Boeuf resulted in only 15 individuals: Jones Landing (16FR220) 2, Dailey Landing (16FR141) 4, White Oak Landing (16FR161) 5, and Alabama Landing 4. Of these excavated remains, eight pathological specimens were sent to the Army Medical Museum for diagnosis: Myatts Landing 1, Glendora 2, Bray Landing 1, Jones Landing 1, and Dailey Landing 1. Within the 39 cases of skeletal material sent to Hrdlicka at the Smithsonian Institution were a total of 52 individuals, mostly skulls, from Louisiana (Moore 1909:10). These included Harrelson Landing 6, Myatts Landing 18, Ward Place 20, Bray Landing 5, Mound Place 1, and Jones Landing 2. All together partial remains from 60 individuals were retained for curation. This constitutes 8.3% of the total sample excavated and thus Hrdlicka's data cannot be considered sufficiently representative to provide reliable interpretations of the prehistoric biology. The two largest retained samples comprise 50.0% of the individuals at Myatts Landing and 71.0% of the Ward Place individuals.

During Moore's 1910–1911 expedition up the Mississippi River, only two Louisiana sites produced human skeletal material: Shaw Field 27 and Glendora Landing 15 (Moore 1911). Although 65 skulls from this expedition were sent to Hrdlicka, none were from Louisiana (Moore 1911:370).

Although the work was not as exciting as that in the Arkansas portion of the Red River (Moore 1912:485), Moore excavated a minimum of 462 human skeletons in Louisiana during his 1911–1912 expedition: Keller Place 107, L'Eau Noire (16AV11) 84, Saline Point 30, Johnson Place (16AV14) 97, Laborde 91, Briar Bend 19, Norman Landing 1, Rodriques 1, Lacroix 1, Gahagan (16RR1) 5, and Taylortown 26. Of these remains, one mandible was sent to the Army Medical Museum, and two skulls from L'Eau Noire and four skulls from Johnson Place were sent to Hrdlicka at the Smithsonian. These seven individuals represent only 1.3% of the excavated sample.

During his last expedition in Louisiana (1912–1913), Moore excavated 1186 human skeletons (Moore 1913). The Atchafalaya River produced 282 individuals: Miller Place 3, Bonnet Bayou 2, Sorrel Bayou 270, Schwing Place 6, and Moro Plantation 1. One fractured humerus was sent to the Army Medical Museum, and 16 skulls and some postcranial material (one individual) from Sorrel Bayou were sent to Hrdlicka. Mayes Mound (16CT10) on Lake Larto produced 310 individuals. The Tensas River produced 147 remains: Alphena Plantation 36, Fool River 66, and Indian Bayou (16MA9) 45. Individuals numbering 447 were obtained along Bayou Macon: Dean Lake (16FR13) 53, Turkey Point (16FR10) 68, Canebrake Mounds 92, Mott place (16FR11) 110, Montgomery Place 100, Insley Place 5, Lake Place 8, Richardson Place 2, and Jackson Place 9. None were found along Bayou D'Arbonne. The retained sample from Sorrel Bayou represents 1.5% of the total sample and only 6.3% of the Sorrel Bayou sample.

Hrdlicka (1909) prepared a complete and masterful description of the 52 individuals obtained from the Ouachita expedition of 1908–1909, which was published as an appendix to Moore's report. This complete description of the materials, tables of skeletal measurements, age and sex data, discussions of skeletal and dental pathology, and comparisons of the data to other regions represents the first state of the art (for that date) skeletal analysis of Louisiana skeletal remains. This is supplemented by the descriptions of skeletal lesions from eight individuals provided by the Army Medical Museum which were included within Moore's text. The fact that two large series from Myatts Landing and Ward Place were described makes this appendix the most meaningful analysis by Hrdlicka in the Louisiana and Arkansas study area. Hrdlicka's next appendix on the Red River material is a disappointment because the six Louisiana skulls were discussed in only six lines, where they were compared verbally to the Haley skulls (Hrdlicka 1912). Little data are provided because the crania are deformed and therefore considered useless by Hrdlicka. Hrdlicka's 1913 appendix on the Sorrel Bayou material is more detailed; it provides cranial measurements and includes discussions of fronto-occipital cranial deformation, glenoid fossa arthritis (now referred to as temperomandibular joint disease), three cases of auditory exostosis, six dental caries, and a possible case of tuberculosis of the spine. It should be mentioned that auditory exostoses are now thought to be associated with frequent swimming.

Fowke was sent by the Bureau of American Ethnology in 1926 to make a survey of mound sites. He visited and reported on 48 mounds (Neuman 1984) and conducted excavations at the Marksville site (16AV1). Although the Marksville burials were curated, none have been studied. In the same year, Collins (1927), also from the BAE, excavated a total of 68 individuals from eight mortuary sites: Morgan (16VM9), Veazey (16VM7), Copell (16VM102), C. Foret's Farm, Bayou

Du Large, Pointe a la Hache, Charenton (16SMY2), and Gibson (16TR5). Crania from Veazey, Morgan, and Copell were included in Hrdlicka's (1940) "Catalogue of Human Crania in the United States National Museum: Indians of the Gulf States." Tables are provided which include data on sex, sometimes age, and cranial measurements of the undeformed specimens. Collins later published an article on the cranial remains from the Copell site. Using cranial morphology and measurements from Copell, along with numerous data from throughout North America, Collins (1941) attempted to demonstrate that the Copell crania, representing the then recently defined Tchefuncte culture, derived from a southern migration of peoples from the northeast (i.e., Kentucky, Tennessee, Virginia, and Illinois) and eventually gave rise to the historic Gulf cranial type.

In 1931, the United States Bureau of Fisheries constructed a fish hatchery near Natchitoches. During the construction more than 100 human skeletons were exposed and disturbed. Walker (1935), from the Smithsonian, was excavating nearby and, hearing of the find, went to investigate and perform limited salvage excavations. He excavated a single undisturbed burial and Hrdlicka provided a two paragraph description for inclusion into the final report (Walker 1935:4). Walker later learned of the destruction of a mound at the Troyville site (16CT7) and managed to salvage 12 burials from this site. These have not to date been studied.

Locally Conducted Excavations

Ford, while working for the Louisiana State Geological Survey, conducted surveys and excavations within the state (Neuman 1984). Between 1933 and 1936, he conducted excavations at nine mortuary sites and recovered a total of 34 individual skeletons: Peck (16CT1&2), Lake Louis (16CT24), Angola Farm (16WF2), Angola Prison Gate (16WF3), Nicks Plantation (16AV4), Hudson Mounds (16CT9), Allen Place Cemetery (16NA4), Fredricks Place, and Wilkinson (16NA3). None of these skeletal remains have been analyzed. Ford was not only instrumental in establishing a basic chronology for Louisiana and the Lower Mississippi Valley, he also initiated the modern period of academic based mortuary excavations.

WPA Excavations

WPA excavations in Louisiana were far more productive than in the Arkansas portion of the study area. The first Federal Emergency Relief Administration sponsored excavations were conducted by Setzler of the Smithsonian Institution at the Marksville site (16AV1) in 1933. No osteological analysis has been conducted on this material. Only fragments of one skull and eight teeth remain in curation (Manhein 1985). It was not until 1938 that WPA excavations resumed under the overall direction of Ford who was headquartered at Louisiana State University. Eight sites produced a total of 1468 burials: Greenhouse (16AV2), Troyville (16CT7), Bayou Goula (16IV11), Crooks (16LA3), Little Woods (16OR1), Big Oak Island (16OR6), Lafayette Mound Group (16SM17), and Tchefuncte (16ST1). The Crooks site produced the vast majority of these burials (i.e., 1175). Similar to Arkansas, but unlike Oklahoma and Texas, Louisiana did not have an osteologist associated with the WPA professional staff. However, Snow (1945), associated with the Alabama and Kentucky WPA organizations, provided an analysis of the skeletal material from Big Oak Island, Lafayette Mound Group, Little Woods, and Tchefuncte. This analysis, published as an appendix to the Ford and Quimby (1945) report, includes data on cranial morphology, cranial deformation, mean cranial measurements for males and females, postcranial measurements of the few retained long bones, and pathological descriptions of dental caries, dental wear, cribra orbitalia, and infection (i.e., periostitis). Following the tradition established by Hrdlicka, Snow's primary focus was upon population variation in cranial morphology and shape. In addition to reporting primary cranial data, Snow provided comparisons with published southeastern skeletal material, as well as available published cranial data from throughout North America. It was not until the 1980s that any additional skeletal analyses were conducted upon the WPA excavated material. Barnes and Frame (1981) provide an excellent analysis of the Greenhouse material, which includes age, sex, stress indicators, paleopathology, and cultural modifications. This student conducted analysis is only available in manuscript form. A comparison of discrete skeletal traits (i.e., inherited features) was made between the Little Woods skeletal series and the Big Oak Island material (excavated in the 1970s) in a student paper (Pool 1983). These two studies demonstrate the utility of long term skeletal curation, for without it, we would not have any osteological data from these sites.

Amateur and Avocational Archeologists

Excluding from this discussion the numerous pot hunters who do not report their excavation activities, amateur and avocational archeologists have played a significant role in our understanding of Louisiana mortuary customs and its bioarcheological data base. Webb, a Shreveport pediatrician, is an avocational archeologist of national prominence who not only excavated numerous mortuary sites and published exhaustive reports but was also instrumental in the introduction of the Midwestern Taxonomic System into the Caddo area. His work at Caddo sites provides the primary basis for our understanding of the bioarcheology of northwest Louisiana. He and his colleagues excavated and reported on ten of the mortuary sites in this bioarcheology overview data base. Unfortunately, analyses have not been conducted on any of these skeletal series, the most famous of which include Gahagan (16RR1), Belcher Mound (16CD13), and Mounds Plantation (16CD12).

Despite being a physician, Webb apparently was little interested in the skeletal material and, consequently, the only osteological data provided are sex and age determinations for the Belcher Mound site. Colquitt and Webb (1940) coauthored an article which focused its attention upon the relationship between prehistoric diet and dental caries. In particular, they demonstrated that dental caries increased with increased carbohydrate (i.e., maize) consumption. In addition to using published prehistoric caries data, they also include data from Gahagan and Belcher. In 1944, Webb published his second and last article on paleopathology (or osteology for that matter) titled "Dental Abnormalities as Found in the American Indian" in the *American Journal of Orthodontics and Oral Surgery*. Webb's purpose was to dispel the mistaken belief that dental disease, especially caries, is only a product of modern civilization and not found in prehistory. This was a common theme for dental publications from the 1940s into the 1950s and served to focus the attention of the dental profession on the potential research utility of prehistoric human skeletal remains. In addition to providing a thorough literature review of prehistoric dental disease, Webb (1944) also provided caries and dental anomaly data on 30 skulls from Belcher Mound and some limited caries data from the poorly preserved Gahagan burials. Of particular note, this article discusses Caddoan supernumery teeth and constitutes the first publication of this anomaly which has since been shown to be an important identifying characteristic of Caddo populations (Rose 1982).

Amateur archeologists continued to make significant contributions to mortuary site archeology from the 1930s to the present. One amateur archeologist is Manning Durham who excavated numerous sites especially in northeast Louisiana. Information from eight mortuary sites and a total of 101 burials excavated by Durham are included within this bioarcheology overview data base. Unfortunately, none of the skeletal remains from these sites have been studied and none are available for future analysis. One recent example is the revisiting and testing of Moore's Myatts Landing site by the Northeast Chapter of the Louisiana Archeological Society (Hodges 1978). Another example is the discovery of the Gold Mine site (16RI13) by four members of the Northeast Chapter of the Louisiana Archeological Society (Woodrow Duke, Nina Helfert, Reca Jones, and Dwain Kirkham). These amateurs began the excavation of this complex mortuary site and a preliminary report on the recovered human effigy vessels was published (Jones 1979). Help and advice was obtained from a number of professional archeologists and graduate students, but the vast majority of the excavations were conducted by the amateurs. A small National Science Foundation grant was obtained to help provide excavation expenses and professional excavation help from Belmont (Harvard University) and Galatzan (University of Arkansas, Fayetteville). The skeletal remains were washed by volunteers from the Northwest Arkansas Archeological Society. Although far from complete, this skeletal collection has produced two senior honors theses and two masters theses, with work being continued by Harmon of the University of Arkansas, Fayetteville. The Gold Mine project is an excellent example of cooperation between professionals and amateurs.

Academic Archeology

As described with more detail in the Arkansas section above, the formation of the Lower Mississippi Archeological Survey changed the orientation of Mississippi Valley archeology from a focus on collecting exhibit specimens from mortuary sites to working out chronology from surface collections and excavations of habitation sites and midden deposits. The results of this change in orientation can be clearly seen in the decline in academic mortuary site excavations between the pre-World War II era and the 1980s. With a few exceptions, archeological field schools have been the dominant excavators of mortuary sites. Northeast Louisiana State University held its field schools at the Pargoud site (16OU1) during the 1975, 1976, 1977, and 1979 seasons. A total of 14 burials were excavated, but no osteological analysis has been conducted. The University of New Orleans archeological field schools were conducted at Big Oak Island (16OR6) during the 1972, 1973, 1974, 1982, and 1985 seasons. Analysis of the Big Oak Island human remains makes these field school excavations unique within the Louisiana–Arkansas study area. Fertel's Louisiana State University masters thesis (1985) provides a detailed analysis of these fragmentary and poorly preserved human remains. This thesis attempts a comparison of the demographic and health profiles of the 25 (MNI) Tchefuncte and 48 (MNI) Marksville individuals. The skeletal material from the last field season was analyzed for Helis's BA honors thesis at the University of New Orleans (Helis 1986).

In 1969, Neuman of Louisiana State University began the excavation of the Morton Shell Mound (16IB3) with the financial support of the Morton Salt Company which owned the land (Neuman 1969). Approximately 24,900 human bone fragments were obtained from 15 burial features and osteological analysis demonstrated that a minimum number of 275 individuals of various ages are represented (Robbins 1976). It is unfortunate that this osteological analysis is only available on file at Louisiana State University. The most significant finding was the presence of a common infection which has been diagnosed as a yaws-like disease (Robins 1978). Again, these significant data are not readily available, as the article is published in a little known and hard to find journal, *Medical College of Virginia Quarterly*. A later analysis of the faunal remains also integrated the human skeletal data and, in particular, trace element analysis of 14 tibiae from Morton Shell Mound and 10 tibiae from the Greenhouse site (16AV2) into an ecological interpretation of the Coles Creek diet (Futch 1979, 1980). Once again, the utility of long term curation of human skeletal remains is demonstrated. Otherwise, the very informative trace element analysis could never have been conducted. These last analyses of the Morton Shell Mound skeletal material represent the first integration of human osteology and archeology and thus represent the first stirrings of bioarcheology in Louisiana.

Academic Bioarcheology

The 1980s witnessed a major change in mortuary site excavation and skeletal analysis with the introduction of the theoretical orientation and methodology of bioarcheology into Louisiana. An excellent example of this reorientation is the excavation of the Cowpen Slough site (16CT147) by Louisiana State University (Ramenofsky and Mires 1984).

This site is located on land owned by the Louisiana Delta Plantation which has developed an excellent reputation for archeological conservation of its resources. The L.S.U. archeological field school was used, and partial funding for the excavation was obtained from the Louisiana Department of Culture, Recreation, and Tourism. The exhaustive analysis of these poorly preserved Late Archaic human remains by Mires is included as a chapter in the final report (Ramenofsky and Mires 1984). Although this analysis focuses upon the mortuary program and, in particular, cremation practices, data on minimum number of individuals, demography, dental data, and paleopathology are included.

It is not surprising to find that with Louisiana's long and rich history, bioarcheological analysis would be extended to its historic cemeteries. In 1984, a grant from the National Endowment for the Humanities to the Save Our Cemeteries of New Orleans organization was used to fund a study of the St. Louis II Cemetery in New Orleans by Coastal Environments Inc. (1985). This "study was designed to gather, through archaeological excavation, material items related to funeral and mourning...ritual which occurred in the cemetery through the nineteenth century and into the twentieth" (Coastal Environments Inc. 1985:1). In addition to the analysis and interpretation of the material culture, life table and seasonality of death analyses were conducted on the demographic data obtained from the mortuary inscriptions.

In 1986, the Assembly of the Town of Jackson and the East Feliciana Parish Chamber of Commerce sought to verify the location of the town founder's grave site (Manhein et al. 1987). Douglas Owsley, then a bioarcheologist at L.S.U., was asked to conduct excavations at the reputed location of the Horton Family cemetery plot. Owsley and his team of bioarcheologists identified human remains at the location and used variation in the monument architecture to identify the location of Captain John Horton's grave. The town intends to employ this information and photographs of the excavation to prepare an exhibit which will become part of its overall plan to promote tourism.

A similar project was undertaken by the town of Port Hudson as it attempted to upgrade the military cemetery at its Civil War historic site (Manhein and Owsley 1987). During the 1960s, 100 monuments were placed to mark the graves of unknown Confederate soldiers, but local conservationists and historians doubted the legitimacy of the location. Again, Owsley and his team of bioarcheologists were brought in to excavate and verify the location of the military graves. Excavation and analysis of the grave goods and skeletal remains indicated that the monuments marked the location of a civilian cemetery and that the military graves were located some distance away. Bioarcheological analysis is continuing.

Cultural Resource Management

The impact of Cultural Resource Management upon osteological research in Louisiana was very similar to the changes documented above for Arkansas. The development of contract bioarcheology was also similar with minimal or no funding for osteology in the 1960s to nearly adequate funding in the most recent years. The major difference in the history of CRM between the two states is that areal surveys and resource inventories are more common in Louisiana, while there are few site mitigations (see the archeology chapters for more detail).

Mitigation of the Mount Nebo site (16MA18) was conducted by Louisiana State University in 1968–1969 for the Louisiana Department of Transportation and Development. A minimum of 86 individuals (with 29 possible additional individuals represented by fragments) were excavated. Although osteological analysis was not funded, Giardino (1977, 1982) conducted the research for his masters thesis at Tulane University. The thesis contained data on demography, skeletal measurements, dental wear and caries, dental morphology, skeletal nonmetric traits, paleopathology, and a discussion of mortuary patterns. The interpretive portion of the thesis was limited in its contribution to bioarcheology by the absence of adequate comparative osteological data from Louisiana. One important observation made is that the skeletal material suffered considerable disintegration between excavation and cleaning prior to analysis (Giardino 1982, 1977:4). This points out the necessity for funding prompt skeletal conservation and analysis. The Crane Lake site (16MO41) was mitigated by Northeast Louisiana State University for the Soil Conservation Service. The five excavated burials were not analyzed.

Revetment construction by the New Orleans District of the U.S. Army Corps of Engineers endangered the Hanna site (16RR4) and its mitigation by New World Research constitutes the first CRM multidisciplinary analysis in Louisiana to include osteology. In addition to specialized analyses in the areas of geomorphology, lithics, zooarcheology, malacology, and paleobotany, an osteologist was employed to analyze the six excavated burials (Thomas et al. 1980). Giardino's osteological contributions were included as a chapter in the final published report (Giardino 1980a). Data on skeletal metrics, dental pathology, dental wear, and paleopathology were included, in addition to discussions of cranial deformation and mortuary patterns. The major weakness of this osteological report is a failure to integrate the important Hanna series into the already extant Caddo osteological data base. This common flaw of CRM bioarcheology is caused by inadequate funding for the osteologist.

The report on the mitigation excavations of the St. Gabriel site (16IV128) is available as a manuscript on file at the Louisiana Division of Archeology (Woodiel 1980b) and, in a slightly modified form, as a Louisiana State University masters thesis by Woodiel (1980a). The contract report contains an osteological analysis of the 18 individuals by Giardino (1980b). Analysis of these fragmentary redeposited cremations includes age, sex, dental wear, paleopathology, and a discussion of mortuary practices.

The Louis Procello site (16DS212) was mitigated by Espey, Huston and Associates Inc. of Austin, Texas, for the Southwestern Electric Power Company. A descriptive osteological report on the five burials included data on age, sex, skeletal measurements, dental pathology, paleopathology, and cranial deformation. A descriptive report on the two individuals discovered during testing of the Coquille site (16JE37) was submitted by Diana Young (1986) of Texas A and M University to the National Park Service.

It is obvious from the review of the above mentioned contract reports that the contractors attempted to adequately analyze the excavated human skeletal material, but that the impact and usefulness of the collected data was minimized by the absence of available comparative osteological data from Louisiana. It is also apparent from the report bibliographies that much of the osteological data is so poorly distributed that it is unknown to the individuals conducting the osteological analyses. If this situation is to improve, funds must be provided for literature searches, and the contracting agencies must require that the collected osteological data be integrated into the extant osteological data base.

CRM archeology parallels academic interests in historic cemeteries. In 1984, construction of condominiums exposed historic human burials in the abandoned St. Peter Street Cemetery, the first cemetery in New Orleans (Owsley et al. 1986). After settlement of complex legal considerations (detailed in the report), funding was provided by the Louisiana Division of Archeology for mitigation by bioarcheologists from Louisiana State University. The analysis of the two Euro–Americans, 13 African–Americans, one possible Native American, and two possible mulattos excavated from this site constitutes the first comprehensive CRM bioarcheological study conducted in Louisiana (Owsley et al. 1986).

The New Orleans District of the Corps of Engineers contracted with R. Christopher Goodwin and Associates, Inc. to conduct a cultural resources inventory of the Bonnet Carre spillway (Yakubik et al. 1985). Two historic African–American cemeteries (Kenner, 16SC50 and Kugler, 16SC51) were located, surveyed, and tested by probing and trenching with a backhoe. Although caskets were encountered and described in detail, no skeletal remains were excavated and the cemeteries were stabilized. The bioarcheological significance of this report lies in the arguments presented for nomination to the National Register of Historic Places of sites which integrate archeology, osteology, and history.

Street widening in New Orleans disrupted numerous graves in the previously covered Cypress II/Charity Hospital cemetery (16OR108). Funding for mitigation was provided by the City of New Orleans, the Louisiana Department of Transportation and Development, and the Federal Highway Administration. A total of 280 interments dating between 1849 and 1929 were excavated and a comprehensive bioarcheological analysis is currently underway (Owsley et al. 1987).

In 1986, R. Christopher Goodwin and Associates, Inc. conducted a cultural resources inventory of the Moritz freshwater diversion project corridor for the New Orleans District of the Corps of Engineers (Franks et al. 1986). One important resource identified was the Moritz cemetery, containing approximately 280 graves dating between 1935 and 1985. “The Moritz cemetery was studied in detail, and the configuration, chronological placement, and individual components of that cemetery, including grave types, funerary architecture, inscriptions, and grave goods were recorded” (Franks et al. 1986). Although no mortuary excavations were conducted, the bioarcheological significance of this report resides in the detailed presentation of a theoretical framework and methodology for studying historic cemetery sites.

TABLE 24

MORTUARY EXCAVATION AND ANALYSIS BY DECADE IN THE LOUISIANA PORTION OF THE LOUISIANA–ARKANSAS STUDY AREA

	Total #Sites	%Total	Total #Ind	%Total	Demographics %Sites	Demographics %Ind	Demog. + %Sites	Demog. + %Ind
1819–79	8	4.4	8	0.2	0.0	0.0	0.0	0.0
1880–89	0	0.0	0	0.0	0.0	0.0	0.0	0.0
1890–99	6	3.3	17	0.3	0.0	0.0	0.0	0.0
1900–09	32	17.6	749	14.6	0.0	0.0	18.8	20.2
1910–19	27	14.8	1052	20.6	7.4	2.8	3.7	1.8
1920–29	10	5.5	100	2.0	30.0	1.6	10.0	55.0
1930–39	37	20.4	1772	34.7	10.8	3.4	16.2	13.8
1940–49	6	3.3	42	0.8	0.0	0.0	0.0	0.0
1950–59	4	2.2	46	0.9	0.0	0.0	0.0	0.0
1960–69	16	8.8	412	8.0	12.5	1.0	18.8	80.8
1970–79	17	9.3	69	1.3	0.0	0.0	17.6	34.8
1980–87	19	10.4	850	16.6	10.5	17.8	47.4	46.1
TOTAL	*182	100.0	5117	100.0	7.1	5.1	15.9	23.8

*These 182 components and 5117 individuals are those with dates of excavation and represent 80.5% and 98.0% of the total sample of components (226) and individuals (5222) respectively.

TABLE 25

SOURCE OF EXCAVATION FOR LOUISIANA SITES WITH A MORTUARY COMPONENT AND ANALYSIS LEVEL BY PERCENT

	% Total Excavation		% Demographic Data		% Demographic +	
	Components	Individuals	Components	Individuals	Components	Individuals
Amateurs	25.3 (57)	6.2 (326)	7.0 (4)	15.6 (51)		
Field Schools	2.7 (6)	2.0 (104)	–	–	33.3 (2)	73.1 (76)
Organizations	53.4 (120)	77.2 (4028)	7.5 (9)	5.2 (210)	15.8 (19)	19.1 (771)
*BAE	4.9 (11)	3.8 (198)	8.2 (2)	6.6 (13)	18.2 (2)	28.3 (56)
*LSU	10.7 (24)	6.6 (344)	4.2 (1)	0.3 (1)	12.5 (3)	81.7 (281)
*Phillips Academy	24.4 (55)	34.1 (1783)	3.6 (2)	1.7 (30)	12.7 (7)	9.5 (170)
*WPA	4.0 (9)	28.1 (1468)	11.1 (1)	0.8 (12)	66.7 (6)	17.8 (262)
Cult. Res. Management	14.2 (32)	14.3 (747)	–	–	34.4 (11)	55.7 (416)
Unknown	4.4 (10)	0.3 (17)	10.0 (1)	47.0 (8)	– –	
TOTAL	225.0	5222.0	6.2 (14)	5.2 (269)	14.2 (32)	24.2 (1263)

*Selected subdivisions of Organizations source category

Summary of Louisiana Bioarcheology

The previous sections provided a short history of mortuary excavations, skeletal analyses, and the development of bioarcheology in Louisiana by referencing key historical events, significant individuals, and sufficient examples of specific sites to illustrate the historical trends. This section will summarize the various historical trends using data from the 226 mortuary components and 5222 individuals contained in the Louisiana portion of the Louisiana and Arkansas bioarcheology data base. These trends will be discussed with appropriate comparisons to the Arkansas trends presented in Tables 22 and 23.

The chronological distribution of Louisiana mortuary site excavations is presented in Table 24. Louisiana has about twice as many early (pre-1900) reported skeletal excavations as Arkansas. Moore and the other expeditions from the East Coast had a significant impact on Louisiana mortuary site excavations. A total of 38% of known mortuary components were excavated in the first three decades of this century. The proportion of mortuary sites excavated during this period is approximately equal in both states.

The 1930s represents the decade with the largest proportion of both mortuary sites and individuals excavated in Louisiana. The impact of WPA excavations is clearly evident and contrasts significantly with the situation in Arkansas where there was little WPA work. Mortuary site excavations continue at a very low rate through the 1940s and 1950s. These low rates contrast significantly with that portion of Arkansas not within this study area and the eastern portions of Oklahoma and Texas (see the bioarcheology sections in the Eastern Portion of the Gulf Coastal Plan and Ozark Mountains, Arkansas River Valley, and Ouachita Mountains overviews). The primary reason for this situation is the absence of reservoir construction within both the Arkansas and Louisiana portions of the study area. It appears that this situation had a profound effect upon the development of salvage excavations in Louisiana. The River Basin Surveys served as an organizational base for the rapid development of state salvage programs in Arkansas, Oklahoma, and Texas. In these states, the same RBS sponsoring institutions and many of the same personnel were involved in the establishment of state salvage programs and later cultural resource management offices. Thus, in our opinion, the absence of a River Basin Survey program in Louisiana inhibited the development of a state salvage and CRM program. This may also explain the absence of a large state CRM agency and the large number of private CRM firms working within the state.

Mortuary site excavations began to increase in the 1960s with the advent of cultural resource management legislation and remained relatively stable, averaging approximately 9% of the mortuary excavations, during each of the most recent three decades. Both the number and proportion of mortuary sites excavated between 1960 and 1987 are smaller in Louisiana than in Arkansas. Examination of the proportions of excavated mortuary components receiving adequate descriptive osteological analyses by decades shows that it took Louisiana longer to achieve the same proportion of analyzed components as Arkansas, but by the 1980s both states were equal with 46% to 47% of the components receiving analysis.

Table 25 provides data on the sources of mortuary site excavations in Louisiana. Despite the inclusion of Webb's excavations, Louisiana has a slightly lower percentage (25.3) of mortuary components excavated by amateur archeologists than Arkansas (30.5). Since there is no reason to suspect that amateur excavations and pot hunting differ between the states, this slight difference appears to be the result of more consistent recording of this information in Arkansas by the Arkansas Archeological Survey station archeologists. Louisiana's archeological field schools have been far more active in mortuary site excavation than those in Arkansas, and they have a far better record of osteological analysis.

The proportion of mortuary components and individuals excavated by research and academic organizations are virtually the same in Louisiana (53.4% components, 72.2% individuals) and Arkansas (52.5% components, 84.6% individuals), although Arkansas has a slightly better overall record for osteological analysis. There are some obvious differences between the two states when the data are examined by individual organizations. Moore excavated twice the number of sites in Louisiana than in Arkansas, and yet the proportion of individuals excavated is roughly the same for the two states (Arkansas 28.9%, Louisiana 34.1%). These figures tend to corroborate Moore's statements that Arkansas sites proved to be richer sources of mortuary ceramics. WPA excavations made a significant contribution to Louisiana mortuary archeology. Although only 4% of the mortuary components were excavated, WPA is responsible for 28.1% of the individuals. This large proportion of individuals is entirely due to the WPA excavations at the Crooks site.

An interesting difference between the states is observed when the activities of the two major academic institutions (i.e., Louisiana State University and the University of Arkansas Museum) are compared. LSU is responsible for excavating only 10.7% of the mortuary components and 6.6% of the individuals, while the The University Museum excavated 6.5% of the components and 22.1% of the individuals. The disparate ratio of components to individuals makes it apparent that the The University Museum focused on the collection of display quality ceramics, while LSU excavators had other archeological interests.

Thirty-two mortuary sites in Louisiana and 22 in Arkansas have been excavated under CRM procedures, but it should be mentioned that the study area covers virtually all of Louisiana, while only about one half of Arkansas is included. The difference is even more dramatic when the numbers of individuals are compared. Louisiana CRM excavations are responsible for 14.3% of the total sample, while Arkansas CRM work has produced only 2.8% of its individuals. This difference is explained by the more frequent mitigation of large mortuary sites in Louisiana. At present, Louisiana's record of CRM osteological analyses (34.4% components, 55.7% individuals) is not as good as the Arkansas record (50.0% components, 86.4% individuals). It should be pointed out and underscored that neither of these records of CRM osteological analysis are satisfactory.

Overall, the two states are remarkably similar in both their histories of mortuary site excavations and in the total number of excavated mortuary components and individuals. Louisiana is below Arkansas in its overall record of osteological analysis with only 20.4% of its components and 29.4% of its individuals with at least descriptive analyses. Despite this record few, if any, of these skeletal series have ever been subjected to complete analysis, and the most useful analyses in both states have been performed on curated skeletal collections. A review of the bioarcheology data base clearly demonstrates that we do not as yet have sufficient osteological data to adequately reconstruct prehistoric biology and that conservation of the existing osteological resources is crucial to our ever achieving this knowledge.

DISTRIBUTION OF MORTUARY COMPONENTS AND TOTAL SKELETAL SAMPLE SIZE FOR THE LOUISIANA AND ARKANSAS STUDY AREA

Methodology

Following the research and management protocol for bioarcheology established in Chapter 7 of the Archeological Synthesis of the Ozark Mountains, Arkansas River Valley, and Ouachita Mountains Region, the first step in the preparation of this overview was to prepare a descriptive inventory of human skeletal resources. The goals of the descriptive–inventory phase include: (1) an inventory of all mortuary components; (2) assignment of these components to their proper temporal, cultural, and ecological contexts; and (3) an analysis of the distribution of the skeletal remains for assessing sampling biases prior to synthesis. Minimum data categories required for this phase of analysis are defined as follows: site number, site name, drainage, cultural designation, number of individuals excavated, status of osteological analysis, burial context, project type, date of project, excavator, adaptation type, and literature citations. This information was entered into a data base system for sorting and tabulation. Seven categories of information sources were used to identify archeological sites containing a mortuary component, and to obtain the information concerning each site.

1. State Site Files: A computerized search for prehistoric sites in Arkansas containing human bones was conducted for this project by the registrar's office of the State Archeologist. Although comprehensive, it did not contain some of the most important sites already in the bioarcheology data base. A similar computer search was conducted by the Louisiana Division of Archeology for the three Louisiana parishes that had been computer coded as of June 1987: Caldwell, Catahoula, and Franklin.

2. University of Arkansas Bioarcheology Data Base: All sites previously entered into the University of Arkansas bioarcheology data base for the Lower Mississippi Valley were reverified and utilized in this overview.

3. Major Archeological Syntheses: Monographs and published syntheses were examined for mention of mortuary components. Syntheses of Arkansas archeology include *Archaeological and Historical Assessment of the Red River Basin in Arkansas* by Hoffman (1970a), *An Outline of Fourche Maline Culture in Southwest Arkansas* by Schambach 1982a, *Archeology of the Central Mississippi Valley* by Morse and Morse (1983), and the *Arkansas State Plan*. Syntheses of Louisiana archeology include *An Introduction to Louisiana Archeology* by Neuman(1984), *Prehistory of the*

Ouachita River Valley, Louisiana and Arkansas volume 10 of *Louisiana Archeology*, and the Louisiana State Plan. These served as the key sources to identify the appropriate literature which are cited throughout this report.

4. Bioarcheological Syntheses: There are three excellent masters theses which contain both collections of mortuary data and syntheses of the bioarcheology. These include: *Louisiana Skeletal Material* by Manhein (1985), *Bioarcheological Study of the Adaptive Effciency of the Caddo* by Mires (1982), and *A Social Analysis of the Mortuary Behavior of the Central Caddo* by Zahn (1985).

5. Journals and Bulletins: The following journals and bulletins were examined for the mention of mortuary components and osteological analyses: *American Journal of Physical Anthropology*, *Texas Archaeological and Paleontological Bulletin*, *Midcontinental Journal of Archaeology*, *Louisiana Archaeology*, *Southeastern Archeology*, and *Geoscience and Man*.

6. Archeological Data Repositories: The following repositories of archeological and osteological data were utilized to obtain mortuary site data: the University Museum at the University of Arkansas, the Arkansas Archeological Survey, and the Division of Archaeology in the Louisiana Department of Culture, Recreation and Tourism. Copies of inventory cards were provided by the Peabody Museum at Harvard University and the Smithsonian Institution. In addition, discussions were held with the following individuals to obtain guidance in understanding the bioarcheology of Louisiana: George Castille, David Kelley, Richard Weinstein, and Charles Pearson, all of Coastal Environments, Inc. of Baton Rouge; Kathleen Byrd and Philip Rivet of the Louisiana Division of Archaeology; Douglas Owsley, Mary Manhein, and Murray Marks, all of the Department of Geography and Anthropology at Louisiana State University. Each of these individuals contributed knowledge, references to the literature, and copies of published and unpublished bioarcheological reports.

7. Cultural Resource Management Reports: Cultural resource management reports and manuscripts were individually examined in the following Arkansas repositories: University of Arkansas Mullins Library, Department of Anthropology collections, and the Arkansas Archeological Survey. A systematic search of the contract reports on file in the Louisiana Division of Archeology was conducted. All mentions of sites with human burials were verified in the Louisiana site files.

Mortuary Data Base

The area surveyed in this overview consists of 35 counties in Arkansas and 64 parishes in Louisiana. A list of counties and parishes is provided in Table 21. The total bioarcheological resource base organized by site number is presented in Appendix C1. It should be pointed out that the unit of study is the occupational component and thus, when a site produced human remains from different cultural units, each of the cultural units is treated as a separate entity. Appendix C2 provides a cross reference to site numbers arranged alphabetically by site name, where available. Appendix C3 provides a cross reference to site names arranged by site number.

The bioarcheology data base presented here is incomplete because it does not include the large number of mortuary sites and human skeletal material excavated by treasure hunters who do not report or who underreport their discoveries. We are confident that the data base includes the majority of mortuary sites reported in the literature, virtually all sites where the skeletal material is either still curated or has been reported upon in the literature, and all sites with osteological analyses. The various analyses presented here will vary in both the number of sites and individuals excavated from the totals in these lists because analyses could only be performed on sites with the appropriate information and all categories of information are not available for each of the components. Finally, some variation occurs in the numerical data presented in the tables because sites were added to the data base while this analysis was underway.

It should be cautioned that the interpretations of mortuary component distributions in this chapter are derived from this data base with its various imperfections. In particular, both the number of components and individuals excavated per component are minimum numbers and reflect only the information which is officially known. For example, a site might be reported here as having produced only 15 burials, but even though someone may know that pot hunters have opened more than 50 graves, this information has not been recorded. It is intended that this data base be an ongoing enterprise and that missing information will be added and incorrect information will be modified as time goes on.

Distributions By Count

The data base survey of 35 Arkansas counties identified 246 mortuary components which had produced a minimum of 5204 individual human skeletons. This is an extremely conservative number because components which produced an unknown quantity of skeletons (i.e., not available in the records) are listed as having only one individual. The mean frequency is 7 components per county with a minimum of 0 and a maximum of 35 (S.D. = 7.5). The seven counties with more than ten mortuary components are: Hempstead, 35; Mississippi, 24; Poinsett, 19; Crittenden, 14; Cross, 13; Bradley, 13; and Lafayette, 13. These same 35 counties contain a minimum of 8363 archeological sites and it was thought that the frequency of mortuary components per county might be related to the total number of sites per county (i.e., intensity of archeological research). However, the low correlation (Pearson's r = 0.33) between total sites and mortuary components per county suggests that the intensity of site identification is not the primary factor in the discovery and excavation of mortuary components.

The data base survey of 64 Louisiana parishes identified 226 mortuary components which had produced a minimum of 5222 individual human skeletons. The mean frequency is 3.5 components per parish with a minimum of 0 and a maximum of 22 (S.D. = 4.7). The eight parishes with more than ten mortuary components are: Ouachita, 22; Catahoula, 18; Franklin, 14; Avoyelles, 13; Madison, 12; Caldwell, 11; Morehouse, 11; and Natchitoches, 11. These same 64 parishes contain a minimum of 8871 archeological sites and the correlation (Pearson's r = 0.22) between total sites and mortuary components per parish is low, suggesting that the intensity of site identification is not the primary factor in the discovery and excavation of mortuary components.

In Arkansas, the mean number of individuals per county is 149 with a minimum of 0 and a maximum of 943 (S.D. = 241). The county average of the mean number of individuals per mortuary component is 19 individuals per component. The eight counties with the largest average number of individuals per component are: Miller, 91; Jefferson, 80; Crittenden, 67; Cross, 59; Arkansas, 44; Poinsett, 32; Lincoln, 32; and Mississippi, 29. The seven counties with the least average number of individuals per component are: Dallas, 1; Columbia, 1; Prairie, 2; Clay, 2; Cleveland, 2; Monroe, 2; and Union, 2. Counties with no mortuary sites are: Nevada, Pike, and Grant.

In Louisiana, the mean number of individuals per parish is 82 with a minimum of 0 and a maximum of 1216 (S.D. = 182). The parish average of the mean number of individuals per mortuary component is 32 individuals per component. The ten parishes with the largest average number of individuals per component are: La Salle, 608; Iberia, 247; Pointe Coupee, 107; St. Martin, 57; Orleans, 51; St. Charles, 51; St. Tammany, 43; Richland, 40; Morehouse, 40; and Madison, 30. Parishes with no mortuary components are Acadia, Allen, Calcasieu, Claiborne, Evangeline, Jackson, Jefferson Davis, Lincoln, Sabine (in the eastern portion of this parish which is within the overview area), St. Helena, Union, Vernon, Washington, Webster, West Baton Rouge, and West Carroll.

These figures do point out some differences between the two states. Arkansas averages twice as many mortuary sites per county/parish as Louisiana and averages slightly less than twice as many individuals per county/parish. On the other hand, Louisiana has a higher parish average of individuals per mortuary component (32) than Arkansas (19). Louisiana has three parishes which average more than 100 individuals per mortuary component, while the highest Arkansas county average is only 91. In summary, Arkansas has a higher density of reported mortuary sites, while Louisiana has more reported mortuary sites which have produced large skeletal samples.

Distribution By Drainage

When the distribution of Arkansas mortuary components is examined by drainage, a number of patterns emerge (Table 26). The ranking by greatest percentages of the total mortuary component sample is St. Francis with 29.7%, Ouachita with 24.0%, Red with 20.3%, and Mississippi with 11.8%. The drainages with the fewest mortuary components are the White with 7.7%, Bayou Bartholomew with 4.5%, and the Arkansas with 2.0%. The ranking by percent of total number of individuals in the sample is St. Francis with 42.3%, Mississippi with 22.5%, the Red with 14.5%, Ouachita with 9.4%, and the Arkansas with 7.1%. The ranking of drainages by the ratio of individuals per component is the Arkansas with 73.6, Mississippi with 40.4, St. Francis with 30.2, the Red with 14.8, and Bayou Bartholomew with 14.7. The St. Francis ranks first in both the percentage of components and individuals, making it the best known of the drainages. It holds its first place in both categories because it has the third highest ratio of individuals per component (30.2). These figures suggest that there is a high probability of encountering a mortuary component in the St. Francis drainage and that the mortuary component will be relatively large. The Ouachita drainage ranks second in the number of sites (24.0%), but only fourth in the percentage of individuals (9.4%). This disparate ranking is due to the small ratio of individuals to component (8.2). Although there is a high probability of encountering a mortuary component in the Ouachita drainage, the mortuary samples will be small. The Red River drainage ranks third in the number of mortuary components (20.3%) and fourth in the number of individuals (14.5%). The Mississippi Valley ranks fourth in the percentage

TABLE 26

DISTRIBUTION OF MORTUARY COMPONENTS AND INDIVIDUALS BY DRAINAGE IN THE LOUISIANA–ARKANSAS STUDY AREA

Drainage	Mortuary Components %	Mortuary Components No.	Individuals %	Individuals No.	Individuals /Comp
ARKANSAS					
Arkansas	2.0	5	7.1	368	73.6
Bartholomew	4.5	11	3.1	162	14.7
Mississippi	11.8	29	22.5	1172	40.4
Ouachita	24.0	59	9.4	488	8.2
Red	20.3	50	14.5	756	14.8
St. Francis	29.7	73	42.3	2202	30.2
White	7.7	19	1.1	56	2.9
TOTAL	100.0	246	100.0	5204	21.2
LOUISIANA					
Atchafalaya	4.9	11	1.7	89	8.1
Bartholomew	4.0	9	8.2	429	47.7
Bayou LaFourche	2.5	6	0.2	13	2.2
Boeuf	5.8	13	3.5	182	14.0
Lower Red	15.5	35	35.0	1827	52.2
Mississippi	16.4	37	18.0	939	25.4
Ouachita	18.1	41	8.1	421	10.3
Pontchartrain	5.3	12	3.3	172	14.3
Red	16.4	37	6.8	353	9.5
Tensas	6.2	14	9.0	473	33.8
West Gulf	4.9	11	6.2	324	29.4
TOTAL	100.0	226	100.0	5222	23.1

TABLE 27

DISTRIBUTION OF MORTUARY COMPONENTS BY DRAINAGE AND ANALYSIS IN THE LOUISIANA AND ARKANSAS STUDY AREA

Drainage	% Analyzed	% Total Analyzed	No. Analyzed.	Components
ARKANSAS				
Arkansas	40.0	2.5	2	5
Bartholomew	36.4	1.6	4	11
Mississippi	27.6	3.2	8	29
Ouachita	46.4	10.6	26	56
Red	17.0	3.6	9	53
St. Francis	35.6	10.6	26	73
White	26.3	2.0	5	19
TOTAL	32.5	32.5	80	246
LOUISIANA				
Atchafalaya	18.2	0.9	2	11
Bartholomew	22.2	0.9	2	9
Bayou La Fourche	33.3	0.9	2	6
Boeuf	15.4	0.9	2	13
Lower Red	14.3	2.2	5	35
Mississippi	32.4	5.3	12	37
Ouachita	9.8	1.8	4	41
Pontchartrain	41.7	2.2	5	12
Red	21.6	3.5	8	37
Tensas	0.0	0.0	0	14
West Gulf	36.4	1.8	4	11
TOTAL	20.4	20.4	46	226

of components (11.8%), but second in the number of individuals (22.5%). Although the probability of encountering a mortuary site is lower in the Mississippi Valley, the chances of encountering a large mortuary sample is high due to the high proportion of individuals per component (40.4). These statements concerning the Arkansas and Ouachita drainages may greatly underestimate mortuary site numbers and size due to the large amount of pot hunting which has taken place but has not been reported in the official records.

In Louisiana, the distribution of mortuary components follows a similar pattern (Table 26). The ranking by greatest percentages of the total mortuary component sample is the Ouachita with 18.1%, the Red with 16.4%, the Mississippi with 16.4%, and Lower Red with 15.5%. The ranking by percent of total number of individuals in the sample is the Lower Red with 35.0%, the Mississippi with 18.0%, the Tensas with 9.0%, Bayou Bartholomew with 8.2%, the Ouachita with 8.1%, and the Red with 6.8%. The ranking of drainages by the ratio of individuals per component is the Lower Red with 52.2%, Bayou Bartholomew with 47.7%, Tensas with 33.8%, West Gulf with 29.4%, and the Mississippi with 25.4%. The Ouachita, Red, and Mississippi hold approximately the same rankings by mortuary component in both states and relatively similar positions by number of individuals. This pattern is produced by the low ratios of individuals per component in the Ouachita and Red, while the ratio is high in the Mississippi Valley. The probability of encountering mortuary sites is highest in the Ouachita, Red, Mississippi, and Lower Red drainages. However, large mortuary components are most common along Mississippi and adjacent drainages (Bayou Bartholomew, Tensas, and West Gulf). Drainages to the west and north (Ouachita and Red) have smaller mortuary components.

In Arkansas, the ranking by proportion of excavated mortuary components with at least some osteological data is Ouachita (46.4%), Arkansas (40.0%), Bayou Bartholomew (36.4%), St. Francis (35.6%), Mississippi (27.6%), White (26.3%), and Red (17.0%) (Table 27). The Arkansas, Bayou Bartholomew, and White rank high on this list because of the relatively small number of mortuary components excavated in these drainages. In proportion of total excavated mortuary components, the Ouachita and St. Francis are the best represented by osteological analyses. In Louisiana, the ranking by proportion of excavated sites with osteological analysis is Pontchartrain (41.7%), West Gulf (36.4%), Bayou LaFourche (33.3%), Mississippi (32.4%), Bayou Bartholomew (22.2%), and Red River (21.6%). The first three hold their rank entirely because of the low frequency of mortuary site excavations. When considered by total number of mortuary components, the drainages with the largest proportion of analyses are the Mississippi (5.3%), Red (3.5%), Pontchartrain (2.2%), and Lower Red (2.2%).

The two states differ dramatically when compared by source of excavation (Table 28). Amateurs excavating in Arkansas contributed a similar proportion of the total reported effort in each of the drainages, averaging 30.4%. Amateurs expended their greatest efforts in the Red (28.0%), St. Francis (24.0%), Ouachita (22.7%), and Mississippi (14.7%). These four drainages are also the four highest with respect to total mortuary components and individuals. Three of these (i.e., Mississippi, St. Francis, and Red) also have the highest ratio of individuals to component. When examining the efforts of various organizations, the Arkansas drainage has been removed because all five recorded components were excavated by Moore. Ranking the drainages by the proportion of excavations by organizations is as follows: St. Francis (31.8%), Ouachita (22.5%), Red (15.5%), and Mississippi (12.4%). Although the ranking is different, these are the same four drainages in which the amateurs concentrated their efforts. The history of mortuary site excavations presented previously makes it clear that both amateurs and organizations were choosing drainages and sites to excavate which would produce the largest yields of mortuary ceramics. The patterning of CRM excavations is also similar to both amateurs and organizations: Red (36.4%), Ouachita (31.8), and St. Francis (27.3). Since CRM excavations are not determined by the presence of mortuary vessels (we hope), the explanation for these same drainages receiving the greatest CRM activity must be the high frequency of mortuary sites in these drainages. It should also be mentioned that the Ouachita and St. Francis have the highest proportion of osteological analyses. This is due to both CRM efforts and to the excavations

TABLE 28

DISTRIBUTION OF MORTUARY COMPONENTS BY EXCAVATOR AND DRAINAGE IN THE LOUISIANA-ARKANSAS STUDY AREA

	Amateur		Organization		Cultural Resources Management		
Drainage	% Total	% Drainage	% Total	%Drainage	% Total	% Drainage	Components
ARKANSAS							
Arkansas			3.9	100.0			5
Bartholomew	5.3	36.4	5.4	63.6			11
Mississippi	14.7	37.9	12.4	55.2			29
Ouachita	22.7	30.4	22.5	51.8	31.8	12.5	56
Red	28.0	38.9	15.5	37.0	36.4	14.8	54
St. Francis	24.0	24.6	31.8	56.2	27.3	8.2	73
White	5.3	21.0	8.5	57.9	4.5	5.3	19
TOTAL	30.4	75.0	52.2	129.0	8.9	22.0	247
LOUISIANA							
Atchafalaya	3.5	18.2	7.5	81.8			11
Bartholomew	3.5	22.2	5.8	77.8			9
Bayou LaFourche	1.8	16.7	3.3	66.7	3.1	16.7	6
Boeuf	1.8	7.7	7.5	69.2	3.1	7.7	13
Lower Red	5.3	8.6	22.5	77.1	3.1	2.8	35
Mississippi	10.5	16.2	10.8	35.1	46.9	40.5	37
Ouachita	29.8	41.5	12.5	36.6	18.8	14.6	41
Pontchartrain	3.5	16.7	5.0	50.0	3.1	8.3	12
Red	31.6	48.6	10.0	32.4	18.8	16.2	37
Tensas	1.8	7.1	10.8	92.8			14
West Gulf	7.0	36.4	4.2	45.4	3.1	9.1	11
TOTAL	25.2	57.0	53.1	120.0	14.2	32.0	226

by organizations which curated the skeletal remains for later analysis by osteology students.

Unlike in Arkansas, the proportion of Louisiana components excavated by amateurs is highly variable between drainages. The amateur efforts are concentrated in the Red (31.6%), Ouachita (29.8%), and Mississippi (10.5%) drainages, while the others are virtually ignored. These are also the highest ranking drainages in proportion of mortuary components, although the individual to component ratio is high only for the Mississippi. It is possible that, like Moore, the amateurs found the greatest yield of mortuary ceramics in these drainages. However, the best explanation is that these drainages have the best reported amateur excavations. Webb published his excavations; thus, these sites entered this bioarcheology data base, as did the Ouachita Valley sites reported by Jones (1983), another amateur. The ranking by organization efforts is Lower Red (22.5%), Ouachita (12.5%), Tensas (10.8%), Mississippi (10.8%), and Red (10.0%). These drainages all hold their high ranks because of excavations by Moore. The variation in percentage is due to excavations by Louisiana State University in the Lower Red, Mississippi, and Red. The first place rank of the Lower Red is attributable to WPA excavations. The drainage rankings by CRM excavations is fairly different from the other two excavation sources: Mississippi (40.5%), Bayou LaFourche (16.7%), Red (16.2%), and Ouachita (14.6%). This ranking appears to be associated with extensive flood control and drainage projects by the Corps of Engineers in drainages with high mortuary component frequencies.

The conclusions which can be drawn from this analysis are as follows:

1. The low correlation between the number of mortuary components and archeological sites by county/parish indicates that the discovery and excavation of mortuary sites is not related to the intensity of archeological site discovery in either Arkansas or Louisiana. Burials other than highly visible mortuary structures and cemeteries must be specifically looked for and the usual methods for site survey and testing are not necessarily suitable for the discovery of small burial features and burials associated with nonmortuary site types such as farmsteads.
2. There are twice as many mortuary components per county in Arkansas as there are mortuary components per parish in Louisiana. This difference may be entirely due to better reporting of amateur and pot hunting activities in Arkansas.
3. Louisiana has a higher per parish proportion of individuals to mortuary component than Arkansas. Overall, the Louisiana mortuary components produce slightly larger skeletal samples than those in Arkansas.

TABLE 29

DISTRIBUTION OF COMPONENTS AND INDIVIDUALS BY KNOWN SITE TYPE IN THE LOUISIANA AND ARKANSAS STUDY AREA

Drainage	Habitation	Open	Shell	Cem.	Mound
ARKANSAS					
No. Components	45.0	14.0		24.0	86.0
% Components	26.7	8.3		14.2	50.9
No. Individuals	1358.0	35.0		400.0	2852.0
% Individuals	29.2	0.8		8.6	61.4
LOUISIANA					
No. Components		22.0	5.0	23.0	46.0
% Components	11.3	2.6	11.8	23.6	50.8
No. Individuals	180.0	47.0	499.0	1333.0	3004.0
% Individuals	3.6	0.9	9.8	26.3	59.3

4. In Arkansas the highest probabilities of encountering a mortuary component are in the St. Francis, Ouachita, and Red River drainages. The largest mortuary components will probably be encountered in the Arkansas, Mississippi, and St. Francis River drainages. These statements are derived from comparison of the excavations of amateurs, organizations, and cultural resource management agencies. In Louisiana, the highest probabilities of encountering mortuary components are in the Ouachita, Red, Lower Red, and Mississippi River drainages. The largest mortuary samples will probably be encountered in the Lower Red, Bayou Bartholomew, Tensas, West Gulf, and Mississippi drainages.
5. In Arkansas, the drainages for which we have the most osteological data are the Ouachita and St. Francis. In Louisiana, the drainages with the most osteological data are the Mississippi, Red, Pontchartrain, and Lower Red.

Distribution By Site Type

A total of 68.7% of the mortuary components and 89.2% of the individuals have been classified by burial context in Arkansas, while 86.3% of the components and 97.0% of the

TABLE 30

DISTRIBUTION BY PERCENT OF KNOWN SITE TYPES WITHIN DRAINAGE IN THE LOUISIANA AND ARKANSAS STUDY AREA

Drainage	Habitation	Open	Shell	Cem.	Mound	Total
ARKANSAS						
Arkansas	50.0	25.0			25.0	4
Bartholomew	16.7				83.3	6
Mississippi	34.8	8.7		17.4	39.1	23
Ouachita	23.1	15.4		15.4	46.1	39
Red	12.2	8.2		24.5	55.1	49
St. Francis	42.5			2.5	55.0	40
White	25.0	12.5		12.5	50.0	8
TOTAL	26.7	8.3		14.2	50.9	169
LOUISIANA						
Atchafalaya			33.3		66.7	9
Bartholomew				87.5	12.5	8
Bayou LaFourche			25.0		75.0	4
Boeuf	18.2			9.1	72.7	11
Lower Red	3.0		6.1	12.1	78.8	33
Mississippi	8.8		2.9	44.1	44.1	34
Ouachita	11.8	8.8	5.9	32.4	41.2	34
Pontchartrain			100.0			10
Red	31.0	2.7		18.9	41.4	29
Tensas	7.7				92.3	13
West Gulf	20.0	10.0	40.0	10.0	20.0	10
TOTAL	11.3	2.6	11.8	23.6	50.8	195

TABLE 31

DISTRIBUTION BY PERCENT OF KNOWN SITE TYPES BETWEEN DRAINAGES IN THE LOUISIANA AND ARKANSAS STUDY AREA

Drainage	Habitation	Open	Shell	Cem.	Mound
ARKANSAS					
Arkansas	4.4	7.1			1.2
Bartholomew	2.2				5.8
Mississippi	17.8	14.3		16.7	10.5
Ouachita	20.0	42.8		25.0	20.9
Red	13.3	28.6		50.0	31.4
St. Francis	37.8	4.2			25.6
White	4.4	7.1		4.2	4.6
TOTAL	45.0	14.0	0.0	24.0	86.0
LOUISIANA					
Atchafalaya			13.0		6.1
Bartholomew				15.2	1.0
Bayou LaFourche			4.3		3.0
Boeuf	9.1			2.2	8.1
Lower Red	4.5		8.7	8.7	26.3
Mississippi	13.6		4.3	32.6	15.2
Ouachita	18.2	60.0	8.7	23.9	14.1
Pontchartrain			43.5		
Red	40.9	20.0		15.2	12.1
Tensas	4.5				12.1
West Gulf	9.1	20.0	17.4	2.2	2.0
TOTAL	22	5	23	46	99

TABLE 32

RATIOS OF INDIVIDUALS TO COMPONENTS WITHIN KNOWN SITE TYPES AND DRAINAGES IN THE LOUISIANA–ARKANSAS STUDY AREA

Drainage	Habitation	Open	Shell	Cem.	Mound
ARKANSAS					
Arkansas	124.5	7.0			80.0
Bartholomew	34.0				5.6
Mississippi	21.2	3.5		32.0	92.9
Ouachita	4.2	2.5		16.8	10.0
Red	11.2	1.2		13.0	20.2
St. Francis	46.8				53.1
White	2.0		1.0	12.0	2.5
TOTAL	30.2	0.0	2.5	17.3	33.2
LOUISIANA					
Atchafalaya			1.3	13.7	
Bartholomew				61.0	1.0
Bayou La Fourche			1.0		3.3
Boeuf	1.0			1.0	21.8
Lower Red	1.0		3.0	7.8	68.7
Mississippi	35.3		2.0	43.1	11.6
Ouachita	11.0	15.0	4.5	9.7	13.5
Pontchartrain	17.0				
Red	2.7	1.0		17.1	16.4
Tensas	1.0				31.4
West Gulf	1.0	1.0	76.5		6.5
TOTAL	8.2	9.4	21.6	29.6	30.3

TABLE 33

DISTRIBUTION OF INDIVIDUALS AND COMPONENTS BY ECOLOGICAL ZONES IN THE LOUISIANA–ARKANSAS STUDY AREA

	Ind.	%	Comp.	%	Counties	%
ARKANSAS						
Alluvial Valley	3986	76.6	141	57.4	20	57.1
Small Valley	436	8.4	52	21.1	12	34.3
Great Bend	782	15.0	53	21.5	3	8.6
TOTAL	5204		246		35	
LOUISIANA						
Alluvial Valley	3712	71.0	155	68.7	20	31.2
Deltaic Valley	787	15.1	24	10.6	10	15.6
Small Valley	208	4.0	19	8.4	24	37.6
Chenier Plain	73	1.4	6	2.6	2	3.1
Coastal Delta	442	8.5	22	9.7	8	12.5
TOTAL	5222		226		64	

individuals in Louisiana have been classified (Table 29). The type sites have been grouped into five categories: burials associated with habitations or habitation debris (midden material), burials found in the open with no indication in the reports of habitation debris or patterning characteristic of cemeteries, burials in shell mounds or heaps, burials in cemeteries with no habitation debris and exhibiting cemetery patterning, and burials associated with mounds. In Arkansas, mounds (see Table 30) are the most frequent location of burials (50.9%) followed by habitation burial (26.7%), cemetery burial (14.2%), and open burial (8.3%). In Louisiana, mounds are also most frequent (50.8%), followed by cemeteries (23.6%), shell heaps (11.8%), habitation burials (11.3%), and open burials (2.6%).

Mound associated mortuary components are the most common burial location in all Arkansas drainages except the Arkansas, while they are the dominant type (83.3%) along Bayou Bartholomew (Table 30). The highest proportion of mounds (31.4%) is found in the Red River drainage, which is closely followed in frequency (25.6%) by the St. Francis (Table 31). Arkansas mounds tend to produce large mortuary samples (i.e., ratio of individuals to component, see Table 32) in the Mississippi (92.9), Arkansas (80.0), and St. Francis (53.1) drainages. Mounds produce relatively small samples along the Red (20.2), Ouachita (10.2), Bayou Bartholomew (5.6), and White (25) drainages. Mound associated mortuary components are the most common Louisiana type in all drainages except Bayou Bartholomew, Pontchartrain, and West Gulf. The highest proportion of mounds is found in the Lower Red (26.3%), while the Mississippi (15.2%), Ouachita (14.1%), Red (12.1%), and Tensas (12.1%) have produced much lower percentages of mounds. Louisiana mounds have produced smaller average skeletal samples than Arkansas. The largest ratio is found in the Lower Red (68.7) followed by the Tensas (31.4), and Boeuf (21.8). The remaining drainages have produced average ratios below 20 individuals per component.

In Arkansas, the St. Francis drainage (Table 31) has produced the most habitation site burials (37.8%) followed by the Ouachita (20.0%) and Mississippi (17.8%). Habitation burials are the dominant type along the Arkansas and are the second most common along the Mississippi, Ouachita, St. Francis, and White (Table 30). Habitation sites (Table 32) produce the second highest average ratio of individuals to components (30.2) and are largest along the Arkansas (124.5), St. Francis (46.8), Bayou Bartholomew (34.0), and Mississippi (21.2). In Louisiana, the Red River (Table 31) produced the most habitation mortuary components (40.9%) followed by the Ouachita (18.2%) and Mississippi (13.6%). Habitation burials are equally dominant with mounds in the West Gulf and are the second dominant type along the Red and Boeuf. Habitation site ratios are the fourth from the top in Louisiana and the average ratio is only 22 individuals per component.

Cemeteries in Arkansas are most common along the Red (50.0%) followed by the Ouachita (25.0%), and Mississippi (16.7%). Cemeteries are the second most dominant type compared with mounds along the Red (24.5%), rank third or below in the Mississippi, Ouachita, White, and St. Francis drainages. They are not found along the Arkansas or Bayou Bartholomew. Cemetery skeletal sample ratios are relatively low and average only 17.3. The largest ratio is in the Mississippi drainage where it is 32.0 individuals per component. Louisiana cemeteries are most common on the Mississippi (32.6%) and less common along the Ouachita (23.9%) and

Red (15.2%). Cemeteries are equally as frequent as mounds along the Mississippi (44.1%), the dominant type along Bayou Bartholomew (87.5%), and the second most dominant type in the Ouachita (32.4%) and Lower Red (12.1%). Cemetery sample ratios are larger than in Arkansas, averaging 23.6 individuals per component. Cemetery ratios are largest in the Bayou Bartholomew (87.5), Mississippi (44.1), and Ouachita (32.4) drainages.

Arkansas open sites are most common in the Ouachita (42.8%), Red (28.6%), and Mississippi (14.3%) drainages. Open sites are the least dominant in all drainages. They also produce the smallest mortuary samples, averaging only 2.5 individuals per component. Open sites are not frequent in Louisiana and are most common along the Ouachita (60.0%), Red (20.0%), and West Gulf (20.0%). Open sites are either the least or next to least frequent site type in all drainages. Except along the Ouachita with a ratio of 15.0, this type produces very few individuals in Louisiana.

No shell heap burials have been reported from Arkansas. Shell mortuary components are the most common in the Pontchartrain drainage (43.5%), where they constitute the only mortuary site type, and are less common in the West Gulf (17.4%) and Atchafalaya (13.0%). Shell heaps are the only type with burials in the Pontchartrain drainage, the dominant type in the West Gulf (40.0%), and the second dominant to mounds in the Atchafalaya (33.3%) and Bayou LaFourche (25.0%) drainages. Shell heaps have relatively low individual to component ratios except in the West Gulf where it is 76.5.

Examination of Table 30 reveals some patterning of mortuary site types in Arkansas, in addition to the fact that mounds are the most common burial locations. The Mississippi has the most diverse pattern, with mound and habitation sites almost equally frequent. The adjacent St. Francis and White drainages are similar, with the exception of fewer cemeteries in the St. Francis. The Red and Ouachita also have diverse distributions, with habitation burials more common in the Ouachita and cemeteries more common in the Red River drainage. Arkansas and Bayou Bartholomew samples are too small to produce a reliable interpretation of the patterning.

Louisiana displays more differences in the mortuary site type patterning between drainages. The Mississippi and Ouachita show the greatest diversity in mortuary site type with mounds and cemeteries being almost equally common. Mounds are clearly the dominant type in the Atchafalaya, Boeuf, Lower Red, and Tensas drainages. The upper Red is virtually identical in pattern to the Red River in Arkansas. Bayou Bartholomew stands out as having virtually all cemetery sites. As expected, the southern drainages have frequent shell heap burials especially in the Atchafalaya, Pontchartrain, and West Gulf drainages.

Distribution By Ecological Zone

The portion of Arkansas within the study area has been divided into three macro-ecological zones based upon vegetation, alluvial valley width, and general topography (see Figure 30). It was not possible to obtain the exact location and/or ecological context for each mortuary component in the data base and thus entire counties and parishes were assigned to an ecological zone. The assignment was made if the majority of the county or parish land area or the majority of mortuary components belonged to the ecological zone. The total number of ecological zones was kept to a minimum because the sample size is relatively small and it was thought that a finer grained classification would obscure the presence of ecological patterns in the data. The Mississippi Alluvial Valley encompasses 20

TABLE 34

DISTRIBUTION OF ANALYSES BY ECOLOGICAL ZONES IN THE LOUISIANA-ARKANSAS STUDY AREA

	Individuals				Components			
	Demog.		Demog. +		Demog.		Demog. +	
	%	No.	%	No.	%	No.	%	No.
ARKANSAS								
Alluvial Valley	19.9	792	32.6	1298	12.8	18	20.6	29
Small Valley	19.7	86	35.8	156	15.4	8	30.8	16
Great Bend	0.1	1	73.9	578	1.9	1	15.1	8
TOTAL	16.9	879	39.0	2032	11.0	27	21.5	53
LOUISIANA								
Alluvial Valley	6.5	243	10.5	390	5.2	8	9.7	15
Deltaic Valley	0.0	0	43.3	341	0.0	0	20.8	5
Small Valley	0.5	1	34.1	71	5.3	1	15.8	3
Chenier Plain	17.8	13	75.3	55	33.3	2	16.7	1
Coastal Delta	2.7	12	91.8	406	13.6	3	36.4	8
TOTAL	5.2	269	24.2	1263	6.2	14	14.2	32

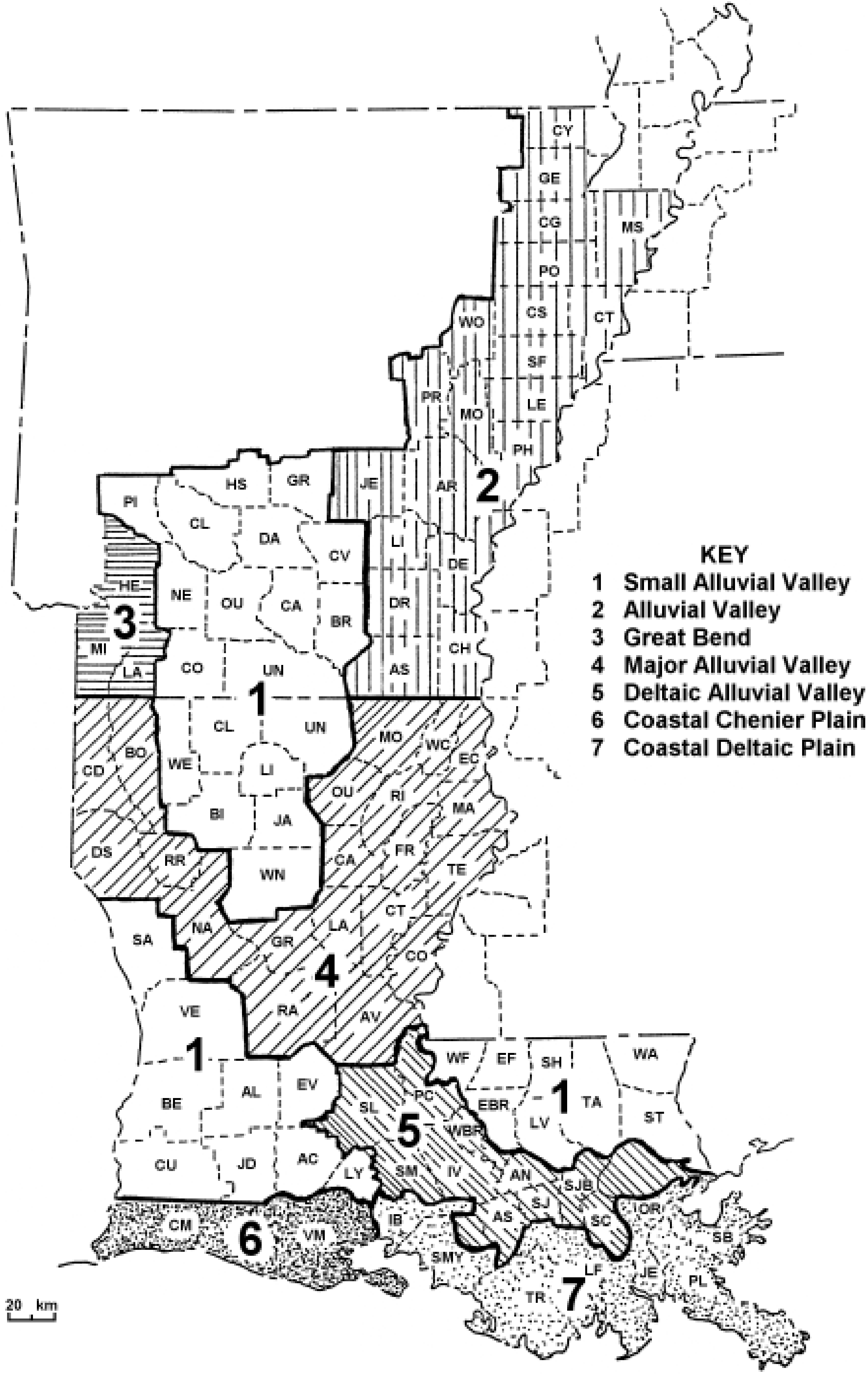


Figure 30. Physiographic areas of Region 6, Louisiana–Arkansas.

TABLE 35

DISTRIBUTION OF COMPONENTS, INDIVIDUALS, AND ANALYSES BY PERIOD AND CULTURE IN THE LOUISIANA-ARKANSAS STUDY AREA

PERIOD Culture	% Components		% Individuals		% Analysed Comp.	Indiv.
DALTON	0.2	(1)	0.1	(12)	100.0	100.0
Dalton	0.2	(1)	0.1	(12)	100.0	100.0
MID. ARCHAIC	0.2	(1)	0.0	(2)	0.0	0.0
Tom's Brook	0.2	(1)	0.0	(2)	0.0	0.0
LATE ARCHAIC	1.0	(5)	0.4	(39)	40.0	89.7
Late Archaic	0.8	(4)	0.4	(38)	50.0	92.1
F. Maline 1	0.2	(1)	0.0	(1)	0.0	0.0
L. Archaic Coast	0.2	(1)	0.5	(55)	100.0	100.0
TCHULA	3.0	(14)	3.5	(370)	57.1	64.0
F. Maline 2	0.4	(2)	0.1	(16)	0.0	0.0
Tchefuncte	0.6	(3)	1.1	(115)	0.0	0.0
Tchef. Coastal	1.7	(8)	2.3	(184)	87.5	98.9
E. MARKSVILLE	1.7	(8)	12.1	(1266)	25.0	5.3
Hopewellian	0.4	(2)	0.2	(21)	50.0	90.5
F. Maline 3	0.4	(2)	0.9	(4)	0.9	0.0
Marksville	0.4	(2)	11.4	(1192)	0.0	0.0
Marks. Coastal	0.4	(2)	0.5	(49)	50.0	98.0
L. MARKSVILLE	1.9	(9)	0.8	(87)	44.4	43.7
Plainware	0.4	(2)	0.0	(3)	50.0	66.7
F. Maline 4	0.2	(1)	0.3	(28)	100.0	100.0
Issaquena	0.6	(3)	0.4	(47)	0.0	0.0
Issaq. Coastal	0.6	(3)	0.0	(9)	66.7	88.9
MARKSVILLE?	0.8	(4)	0.1	(12)	0.0	0.0
BAYTOWN	6.1	(29)	5.5	(578)	44.8	63.1
Barnes	0.4	(2)	0.0	(4)	0.0	0.0
Baytown	3.2	(15)	0.7	(77)	46.7	57.1
Troyville	1.9	(9)	4.5	(472)	66.7	68.0
F. Maline 5-6	0.6	(3)	0.2	(25)	0.0	0.0
TROYVLL-C.C.	0.8	(4)	0.1	(8)	0.0	0.0
Inland T-C.C	0.2	(1)	0.0	(2)	0.0	0.0
Coastal T-C.C.	0.6	(3)	0.0	(6)	0.0	0.0
E. COLES CR	6.4	(30)	2.4	(254)	36.7	31.9
L. Woodland	0.2	(1)	0.0	(1)	0.0	0.0
Plum Bayou	0.4	(2)	0.0	(2)	0.0	0.0
F. Maline 7	1.9	(9)	0.4	(40)	44.4	87.5
Coles Creek	3.2	(15)	1.9	(195)	33.3	16.9
Col. Cr. Coastal	0.6	(3)	0.2	(16)	66.7	81.2
E. MISSISSIPPI	5.1	(24)	8.8	(919)	62.5	86.0
E. Miss.	0.8	(4)	1.0	(100)	75.0	95.0
Caddo 1	1.7	(8)	4.2	(441)	50.0	84.4
L. Coles Creek	1.3	(6)	1.0	(104)	66.7	49.0
L.C.C. Coastal	1.3	(6)	2.6	(274)	66.7	99.3
M. MISSISSIPPI	5.7	(27)	12.2	(1267)	44.4	54.1
M. Miss.	2.5	(12)	10.1	(1053)	58.3	51.9
Plaquemine	2.1	(10)	0.9	(94)	20.0	24.5
Caddo 2	1.0	(5)	1.2	(120)	60.0	96.7

TABLE 35, CONTINUED

L. MISSISSIPPI	19.1	(90)	26.4	(2749)	41.4	58.9
L. Miss.	12.1	(57)	20.5	(2134)	42.1	67.1
Plaquemine	1.7	(8)	2.5	(265)	12.5	1.1
Caddo 3, 4, 5	3.8	(18)	2.0	(210)	55.6	65.2
Protohist. Koroa	1.5	(7)	1.3	(140)	28.6	34.3
MISS. UNKN	10.8	(51)	7.6	(797)	13.7	6.0
Miss.	3.2	(15)	6.0	(629)	6.7	4.8
Plaquemine	1.5	(7)	0.7	(73)	14.3	2.7
Caddo	6.1	(29)	0.9	(95)	17.2	16.8
PREHISTORIC	26.5	(125)	6.6	(687)	4.8	7.7
HIST. NATIVE	4.0	(19)	6.1	(635)	5.3	0.2
HIST. IMMIG	6.6	(31)	7.1	(743)	29.0	56.7

encompasses 20 counties (Table 33) and includes the following drainages: Mississippi, St. Francis, White, Arkansas, Bayou Bartholomew, Bayou Macon, and the Boeuf. The small alluvial valley area to the west of the Mississippi includes 12 counties and the region known as the Felsenthal in addition to the portions of the Saline and Ouachita Rivers north of the Felsenthal. The Great Bend area includes only the three counties which contain the Great Bend of the Red River and the surrounding area.

Louisiana has been partitioned into five macro-ecological zones. The major alluvial valley zone encompasses 20 parishes and includes the Mississippi, the former channels of the Arkansas, and the Red River. Avoyelles is the southernmost parish within this zone. South of this zone is the Deltaic Alluvial Valley consisting of the ten noncoastal deltaic parishes. The Deltaic Coastal Plain consists of the eight delta parishes which are also coastal. The Chenier Plains consists of Cameron and Vermilion parishes. The remaining 24 parishes have been classified as the Small Alluvial Valley zone.

Table 33 shows the distribution of mortuary components and individuals within these macro-ecological zones. For convenience, parishes and counties are used in this analysis to represent geographic area, despite the variation in size which does occur. In Arkansas, the Mississippi alluvial valley zone has approximately the same percentage of mortuary components (57.4%) as the percentage of counties (57.1%). In contrast, it contains a much larger percentage of the total number of excavated individuals (76.6%). The small alluvial valley zone contains a smaller percentage of mortuary components (21.1%) than it does counties (34.3%), and an even smaller percentage of individuals (8.4%). This indicates that the densities of both excavated mortuary components and individuals are much smaller than in the major alluvial valley zone. In contrast, the Great Bend zone has a much larger proportion of components (21.5%) than counties (8.6%), while the proportion of individuals (15.0%) is almost twice the county proportion. As expected, the Mississippi alluvial valley zone is the best represented in the Arkansas mortuary sample and these mortuary sites have produced the largest per component sample sizes. Despite its small size, the Great Bend zone has produced the same percentage of components and almost twice the percentage of individuals as the small valley zone. It may be that there are significant differences in prehistoric population densities between the two zones, but it may also mean that the small valley mortuary components have not been adequately sampled.

In Louisiana, the major alluvial valley ecological zone has produced the largest percentage of mortuary components (68.7%), which is about twice its percentage of parishes (31.2%). The relationship is the same for the proportion of individuals (71.0%). The deltaic valley zone has produced approximately the same proportion of individuals (15.1%) as parishes (15.6%), but a smaller proportion of components (10.6%). The density of sites is less than in the major alluvial valley zone, but the proportion of individuals per component is larger. Although the small valley zone contains more parishes (37.6%) than the major valley zone, it has produced only 8.4% of the components and 4.0% of the individuals. Site densities are proportionally less and skeletal samples sizes are very small. Once again, it may be that prehistoric population densities were very low, but the possibility remains that the mortuary sites have not been adequately sampled. The Chenier Plain zone contains only two parishes and has produced only 2.6% of the components and 1.4% of the individuals. The proportion of components (9.7%) to parishes (12.5%) is approximately the same in the coastal delta zone as in the Chenier zone, but the larger proportion of individuals (8.5%) suggests that mortuary samples are larger.

Table 34 provides data on osteological analyses by macroecological zone. In Arkansas, 16.9% of the individuals and 11.0% of the components have age and sex data, while 39.0% of the individuals and 21.5% of the components have osteological analyses which have gone beyond age and sex determination. The alluvial valley and small valley zones have roughly the same percentages of individuals (19.9%, 19.7%) and components (12.8%, 15.4%) with demographic data. They are also similar in the proportion of individuals with more than demographic analysis (32.6%, 35.8%), but differ in that the small valleys have a higher percentage of analyzed components (30.8%) than the alluvial valley (20.6%). This differential distribution is due to the smaller per component sample sizes in the small valley zone. The Great Bend zone has the highest proportion of analyses which have gone beyond age and sex (73.9%), but has the lowest proportion of studied mortuary components (15.1%). In summary, none of the Arkansas zones has been adequately studied, but the small valley zone is the best known in relation to proportion of total components analyzed. The Great Bend zone has the best known total mortuary sample, but there is a definite bias toward the analysis of the larger mortuary sites.

In Louisiana, 5.2% of the individuals and 6.2% of the components have age and sex data, while 24.2% of the individuals and 14.2% of the components have analyses which go beyond age and sex determination. There is a clear bias toward the analysis of large mortuary samples, and the virtual exclusion of the smaller. The coastal delta is the best known with 91.8% of the excavated individuals and 36.4% of the components having analyses which go beyond age and sex. The Chenier Plain is the second best known with 75.3% of the individuals and 16.7% of the components analyzed. However, both these zones have relatively small mortuary samples and thus give an unrealistic picture of the analytical attention devoted to them. The deltaic valley is the next best known with 43.3% of its individuals and 20.8% of its components analyzed. The small valley zone is next with 34.1% of its individuals and 15.8% of its components analyzed. The least known is the major alluvial valley zone with only 10.5% of its individuals and 9.7% of its components analyzed. It should be pointed out that the major alluvial valley has produced 47% of all the analyses which have gone beyond age and sex determination. Throughout Louisiana, there is a clear bias toward the analysis of large mortuary samples to the exclusion of the smaller ones. This, unless corrected, will ultimately result in a very biased picture of prehistoric biology in Louisiana.

Distribution By Period and Culture

The distribution of mortuary components and individuals is presented in Table 35. The mortuary components are organized by named time periods and by archeological cultures as described and defined in the earlier archeology chapters. The mortuary component data are displayed by percentage of the total 472 components in the study area, as well as absolute number. Data for both the culture and the period total are provided. The same is true for the number of individuals, which totals 10,476 within the study area. The percentages of analyzed components and individuals for each period and culture are presented. This presentation combines the two previously used analysis categories: (1) demographic data only and, (2) more complete osteological analysis. A review of the literature (presented in Chapter 11) indicates that no analysis within the study area would meet the modern criteria of a complete and comprehensive osteological data presentation.

Examination of the temporo-cultural distribution shows differential sample representation. The Dalton, Middle Archaic, and Late Archaic periods contain very small samples ranging between one and four components each. The components are scattered throughout the study area, and each contains very few individuals. These three periods must be considered osteologically unknown, therefore, any future samples from these periods should be considered highly significant and unique.

The Tchula period is better represented and has produced 3.0% of the components and 3.5% of the individuals. The coastal Tchefuncte culture encompasses 64% of the Tchula period components, while no components from this period are located in the northern portion of the Lower Mississippi Valley. The coastal Tchefuncte sample is 2.3% of the total individuals, of which 98.9% have received some osteological analysis. This makes the coastal Tchefuncte culture the best known of any within the earliest periods.

The Early Marksville period with 1.7% of the components and 12.1% of the individuals is not proportionally well represented by mortuary components but does contain a significant proportion of the total sample of individuals. Unfortunately, 1175 of these individuals are from the Crooks site, where the skeletal sample was poorly preserved. Only 73 individuals from this total are still available for study (Manhein 1985). When the situation at the Crooks site is taken into consideration, the Early Marksville period is found to contain a far less representative sample than the earlier Tchula period. Only two of these components have received any osteological analysis (i.e., Helena Mounds, 3PH11, and Big Oak Island, 16OR6); only demographic and caries data are available for Helena Mounds and demographics for Big Oak Island.

The mortuary sample from the Late Marksville period is similar in representation to the Early Marksville. The distribution ranges between one and three components available from each of the four cultures, but the Plainware and coastal Issaquena contain only three and nine individuals respectively.

The Baytown period is the first where the samples both of components (6.1%) and individuals (5.5%) can be considered meaningful, although relatively small. The coastal area is not represented at all, and the Barnes and Fourche Maline 5-6 cultures are not only poorly represented, but have received no analysis. As a whole, this is the first period to contain a significant number of analyzed individuals (i.e., more than 350).

The Troyville–Coles Creek division contains only eight individuals from four mortuary components. None of these individuals have been studied, and thus nothing is known about this group.

The Early Coles Creek period contains approximately the same proportion of mortuary components as the Baytown period, but only one-half the individuals. Only the Coles Creek and Fourche Maline 7 cultures can be considered to have meaningful samples of mortuary components and individuals. Some osteological data are available for 87.5% of the Fourche Maline 7 individuals but only 16.9% of the Coles Creek individuals. The Late Woodland and Plum Bayou samples are exceedingly small (i.e., three components and individuals), which leaves the entire northern portion of the Lower Mississippi Valley completely unknown.

The Early Mississippi period, a critical time period for studying the origins of maize agriculture, has a slightly smaller proportion of components than the Early Coles Creek period, but more than three times the number of individuals. The sample is moderately well distributed among the cultures, with the Early Mississippi being the least represented. Small as these samples are, each culture's sample of individuals has received some analysis, making this the first period where each of the cultures is represented by osteological data. Thus, no comparative bioarcheological analyses can be conducted prior to the Early Mississippi.

The Middle Mississippi period is represented by a proportion of components similar to the preceding Early Mississippi, Early Coles Creek, and Baytown periods, but almost twice the proportion of individuals. This situation arises because the skeletal samples per component are larger. The best represented cultures are the Middle Mississippi and Plaquemine with 12 and 10 components respectively. The Caddo 2 are one half as well represented, and the coastal area not at all. Although our data base indicates that over 600 of the individuals have received at least some osteological analysis, this figure is inflated because often less than one-half of an excavated skeletal series received analysis.

The Late Mississippi period is the best represented of all, with 19.1% of the mortuary components and 26.4% of the individuals. The Plaquemine is the least represented culture within this period, with only 1.7% of the component sample. The late Caddo are represented by a fairly large number of components (18), but, because of small mortuary sample sizes, there are only 210 individuals. Again the almost 1500 Late Mississippi individuals indicated as having at least some osteological data available is inflated because complete series of skeletons were seldom analyzed.

A very large proportion of the mortuary component sample (10.8%) are attributable only to the Mississippi period in general and cannot be broken down into early, middle, and late. Most of these components have never been given adequate archeological attention and thus the possibility remains that they can be more precisely assigned in the future. Unfortunately, 26.5% of the total prehistoric component sample and 6.6% of the individuals have not been assigned to any specific time period. These tend to be small mortuary components which have never been properly analyzed.

The historic Native American sample from European contact to the late 19th century includes 4.0% of the components and 6.1% of the individuals. This is a fairly large sample and is comparable to, if not better than, the prehistoric periods. Despite the adequate sample size, only 0.2% of the individuals have been examined osteologically. The sample of historic immigrants (i.e., Euramericans and African–Americans) is slightly larger in both components (6.6%) and individuals (7.1%) than the historic Native Americans. In contrast, they have received far more scientific attention with 56.7% of the individuals having analyses. If any group in the study area has been given osteological analysis approaching the level which we might consider comprehensive, it is the historic African–Americans.

In summary, the period sample sizes of both mortuary components and individuals decreases with increasing distance into the past. Prior to the Baytown period, the analyzed samples are small to nonexistent, and these periods should be considered unrepresented and osteologically unknown. Even when there is a significant number of analyzed skeletons, they are from at most one or two mortuary components. It should be again mentioned that the numbers of individuals listed for a particular unit in Table 35 are the numbers excavated and not the numbers analyzed or still in curation. Both the excavation and the osteological analysis of samples from these periods should have the highest priority and will prove to be the most scientifically significant. The Baytown, Early Coles Creek, and Early Mississippi periods have small but meaningful mortuary samples. These sample sizes are by no means sufficient to provide a bioarcheological understanding of these periods, but, if completely analyzed, these skeletal samples could produce a basic bioarcheological data base for hypothesis formulation. The future excavation and analysis of mortuary samples from these periods have the second highest priority and will ultimately prove, in every case, to make significant analytical contributions. The Middle Mississippi period component sample is proportionally the same as the preceding three periods, but, because of larger mortuary sample sizes, contains a larger proportion of individuals. This period has a lower priority for excavation, but osteological analysis of the available samples is inadequate for hypothesis testing. Comprehensive osteological analysis has a very high priority and many mortuary sites from this period will prove to be significant and critical for hypothesis testing. The Late Mississippi period is the best represented by both the proportions of components (19.1%) and individuals (26.4%). Unfortunately, the osteological data available is not sufficient for hypothesis testing and a high priority must be placed on adequate analysis of the extant collections.

The bioarcheological sample distribution pattern by time period is relatively simple, but it becomes more complex when examined by culture units. For this discussion four culture area units will be employed: northern portion of the Lower Mississippi Valley (NPLMV), southern portion of the Lower Mississippi Valley (SPLMV), the coastal area of Louisiana, and the Fourche Maline–Caddo area.

In the northern portion of the Lower Mississippi Valley there are only a total of seven mortuary components from the Dalton, Poverty Point, Early Marksville, and Late Marksville periods, with no burials preserved from the Tchula period. Thus, the preBaytown of the NPLMV is virtually unrepresented and unknown. This completely eliminates any study of the origins of agriculture and adaptive efficiency in this significant area. The Barnes culture skeletal samples which will play a significant role in the interpretation of later culture change are also virtually unknown and unrepresented. Any study of the origins of maize agriculture would require adequate samples from this culture. The Baytown samples from further south are reasonably adequate to begin hypothesis formulation, but the available osteological data is at best only intriguing.

The Late Woodland and Plum Bayou cultures are a bioarcheological data gap. The Early Mississippi is only 0.8% of the total sample, but the 75.0% analysis rate is good. The bioarcheological data from this period are also sufficient to produce interesting interpretations. A significant jump in sample size and number of osteological analyses occurs with the Middle Mississippi culture and improves even more within the Late Mississippi. In summary, there are no data prior to Baytown, and thus all mortuary components from the earliest cultures will be highly significant. The Baytown and Early Mississippi data are of interest but have produced more bioarcheological questions than answers. Simply put, a diachronic study could be conducted from extant bioarcheological data from the Baytown to the historic period, but the important skeletal samples from preceding periods are not available for adequate interpretations of the trends. Thus, all samples dating prior to the Middle Mississippi are crucial to the bioarcheological interpretations of this region.

In the southern portion of the Lower Mississippi Valley there are only ten mortuary components representing all the cultures prior to Baytown, and only one of these has produced any osteological data. Thus, like the northern portion of the valley, all mortuary components prior to Baytown are highly significant. There are nine Troyville components, with 68.0% of the individuals having provided at least some osteological data. There are 15 Coles Creek components with data on 16.9% of the individuals, and six Late Coles Creek components with 49.0% of the individuals analyzed. These data are sufficient to produce interesting questions concerning diet and the possibility of native cultigens, but, without data from the preceding cultures, these hypotheses cannot be tested. Although the Plaquemine culture has a reasonable skeletal sample size, so little osteological data are available that the Coles Creek culture stands in isolation with little known about preceding and succeeding biocultural events. None of the SPLMV cultures have large mortuary samples and, thus, all mortuary components would be significant. Priority must be given to the analysis of the available Plaquemine skeletal samples and the unstudied Coles Creek material.

Similar to the other portions of the valley, the coastal/coastal deltaic area has only one mortuary sample prior to the Tchula period, but unlike the other areas there are both samples and analyses from the coastal Tchefuncte, Marksville, Issaquena, Coles Creek, and Late Coles Creek. Although not large, these samples do provide an opportunity to construct hypotheses concerning diet and adaptive efficiency. There are no samples from the Middle and Late Mississippi time periods (St. Gabriel 16IV128 is technically not a coastal site). The coastal zone stands out from the entire Lower Mississippi Valley in that its largest mortuary samples occur at those times when the other cultural sequences have little or no representation. The biological characteristics of these coastal mortuary people are interesting and unusual, but there are no comparative data from the same time periods in the other cultures to test for their uniqueness. This situation makes the scarcity of Tchula, Early Marksville, and Late Marksville period samples from the Lower Mississippi

Valley even more critical for bioarcheological hypothesis testing. Furthermore, the scarcity of coastal samples from the Late Archaic period and earlier, as well as from the Middle and Late Mississippi periods, prevents us from finding out if this situation is unique to the environment or if it also varies with culture change. Accordingly, the excavation and osteological analysis of mortuary samples from any time period is critical to hypothesis testing, and all such samples will be significant.

The situation in the Caddo and Fourche Maline area is essentially identical to that throughout the southern and northern portions of the Lower Mississippi Valley. There are only 10 Fourche Maline mortuary components from the earliest through the Baytown time periods. Only one of these Fourche Maline components with 28 individuals (Fourche Maline 4) has had any analysis, and this produced only demographic data. All mortuary samples from these early periods will be significant and critical for any study of the origins of agriculture within this culture area. Fourche Maline 7 is represented by nine components with a 87.5% analysis rate, and the Caddo 1 has eight components and an analysis rate of 84.4%. The sample size is smaller from the Caddo 2 with only five components, but the number of individuals is larger (120) and the analysis rate is excellent (96.7%). Increasing the sample sizes of these cultures is critical for evaluating hypotheses (e.g., appearance of early maize agriculture along the Red River). The late Caddo mortuary samples (Caddo 3, 4, and 5) are adequate with 3.8% of the components and an analysis rate of 65.2%.

In summary, all the cultures from the Dalton through the Late Marksville periods in the NPLMV, SPLMV, and Fourche Maline areas are poorly represented, if at all, and are essentially unknown. In contrast, representation from the same periods is slightly better in the coastal zone. This produces a situation where the coastal data stands in isolation without any contemporary comparative data. All mortuary components will be highly significant and critical for hypothesis formulation as well as the testing of existing hypotheses. The Baytown period only has significant representation from the Baytown culture area and thus hypotheses concerning the adoption of maize agriculture cannot be tested. The Early Mississippi period samples are small, but this period contains the first occurrence of comparative samples from all four culture areas. At present this is the only period where a comparative synchronic bioarcheological study could be conducted. The Middle and Late Mississippi periods are reasonably well represented in all areas except the coastal zone.

Distribution By Adaptation Type

A total of 73.5% of the components and 93.4% of the individuals have been assigned to one of the adaptation types: Late Pleistocene, Early Holocene, Middle Holocene, and the Late Holocene subtypes which include Inland Semisedentary, Coastal Semisedentary, Unknown Sedentary, Dispersed Sedentary, Aggregated Sedentary, Paramount Sedentary, Native Americans at European Contact, and Historic Old World

TABLE 36

DISTRIBUTION OF COMPONENTS, INDIVIDUALS, AND ANALYSES BY ADAPTATION TYPE IN THE LOUISIANA–ARKANSAS STUDY AREA

ADAPTATION TYPE	% Total	Indiv.	% Total	Comp.	Analysis % Demog.	Analysis % Demog. +
Late Pleistocene	0.0	(0)	0.0	(0)	0.0	0.0
Early Holocene	0.1	(12)	0.2	(1)	0.0	100.0
Middle Holocene	0.0	(0)	0.0	(0)	0.0	0.0
Late Holocene						
Semisedentary						
Inland	19.8	(2,063)	12.1	(57)	8.8	22.8
Coastal	5.7	(593)	5.5	(26)	15.4	38.5
Sedentary						
Unknown Type	0.7	(78)	2.3	(11)	9.1	0.0
Dispersed	19.7	(2,051)	27.8	(131)	9.2	22.1
Aggregated	15.6	(1,631)	4.4	(21)	9.5	42.8
Paramount Agg.	12.8	(1,331)	5.9	(28)	17.8	21.4
European Contact	11.9	(1,237)	8.7	(41)	12.2	19.5
Hist. Immigrants	7.1	(743)	5.5	(26)	3.8	26.9
Unknown Type	6.6	(687)	26.5	(125)	4.8	0.8
TOTAL		10,426		472		

Immigrants (Table 36). There is only one site with 12 poorly preserved individuals from the Early Holocene. The Late Pleistocene and Middle Holocene are not represented by a mortuary component. The Late Holocene Inland Semisedentary is well represented with 19.8% of the individuals and 12.1% of the components. This material has not been well analyzed; only 22.8% of the components have received more than demographic osteological analysis. The Late Holocene Coastal Semisedentary adaptation type is not as well represented with 5.7% of the individuals and 5.5% of the mortuary components. This adaptation type has the second best analysis record with 38.5% of the components having more than demographic data. The Late Holocene Sedentary adaptation type is the best represented. The Dispersed Sedentary is represented by 19.7% of the individuals and 27.8% of the mortuary components. The osteological analysis rate is low with only 22.1% of the components having more than demographic data. The Aggregated Sedentary adaptation type is less well represented with only 15.6% of the individuals and 4.4% of the components. This type has the best analysis record with 42.8% of the components with more than demographic data. The Paramount Aggregated Sedentary adaptation type is represented by 12.8% of the individuals and 5.9% of the mortuary components. The analysis rate is average with 21.4% of the components having more than demographic data.

The Native Americans at European contact are surprisingly well represented with 11.9% of the individuals and 8.7% of the components. As this is a critical period for Native American cultures, this large sample size is important. Unfortunately, the analysis rate is only average with 19.5% of the components having more than demographic data. The Historic Old World Immigrants from Europe and Africa are represented by 7.1% of the individuals and 5.5% of the components. This group has an average analysis rate of 26.9% but has received the most extensive of the reported osteological analyses, making it the best known bioarcheologically of all the adaptation types.

In summary, the Late Pleistocene, Early Holocene, and Middle Holocene are not represented in the mortuary record and are bioarcheologically unknown. Any mortuary samples from these types will be highly significant. The semisedentary and sedentary adaptation types are much better known. The obvious reasons for this is that these sites are identifiable using standard archeological survey techniques and because ceramics frequently present in the graves made them features to be purposefully sought and excavated by both professionals and amateurs. It is apparent that mortuary samples from the earlier adaptation types are rare because standard survey techniques often cannot identify them and the absence of grave goods made them less desirable as targets for excavation. Although the Sedentary adaptation types are reasonably well represented, their analysis rates are not satisfactory. Comprehensive osteological analysis must be preformed on all mitigated sites from these adaptation types. Our knowledge of the Historic Immigrants adaptation type is improving, but it is presently confined primarily to African–Americans. Unfortunately, these data are not as meaningful without comparable Euramerican samples for comparative purposes.

SUMMARY OF HISTORICAL AND STATISTICAL DATA

Research interests of osteologists during the first six decades of the twentieth century include cranial deformation, genetic relationships, population migrations, and the discovery of new prehistoric diseases. Osteological research and the presentation of the results as an appendix to the archeological report began in both Arkansas and Louisiana with the publication by Hrdlicka (1909) of his analysis of skeletons excavated by Moore. Although Wakefield and his physician colleagues employed state of the art methodologies in their analysis of prehistoric skeletal material, osteological research languished for almost thirty years within the study area.

Although there has been no consistency in the analysis of excavated skeletal remains, osteologists along with physicians and dentists have maintained an interest in working with skeletal material from the study area. Unfortunately, the results are often published in unusual and hard to find journals such as the *American Journal of Medical Science,* the *Australian Dental Journal*, and the *Medical College of Virginia Quarterly*. Many of the best osteological data are available only from unpublished masters and honors theses. Because neither of these two academic productions are indexed like doctoral dissertations, they are difficult to locate. Finally, many osteological analyses are available only in manuscript form. These circumstances have made the acquisition of comparative osteological data extremely difficult and, as a consequence, have prevented the production of synthetic bioarcheological studies within the study area. Funding of mortuary component mitigation must include funds for literature search and bioarcheological data synthesis.

In Arkansas, the first quality osteological analyses were conducted within the CRM environment. In contrast, Louisiana's first high quality studies were conducted within the academic environment. The gradual incorporation of osteology within CRM projects followed the same course in each state. In the earlier projects, small amounts of money (i.e., $50 to $200) were paid to graduate students for producing basic descriptive analyses which included age, sex, and gross pathology. Over time, both the funding for, and quality of, the osteological research increased within the CRM environment. In fact, CRM archeology provided the first funding for osteological research within the study area; up until this time, all osteological research was conducted by university personnel without funding for supplies, equipment, or assistants. By the 1980s bioarcheologists had become full participants in multidisciplinary CRM projects.

Despite this success, the CRM record for osteological analysis as part of mortuary site mitigation is not yet at an acceptable level. It is obvious that CRM contract granting agencies must prepare scopes of work that specify comprehensive osteological analysis as part of adequate mitigation. Compliance agencies must demand that these scopes of work be realistically funded and their requirements met. The literature confirms that severe deterioration and data loss occurs when skeletal remains are not promptly cleaned, stabilized, and analysed. At the same time, the number of excellent studies conducted on curated skeletal samples indicates that long term curation and conservation is required for the testing of newly developed hypotheses and to take advantage of newly available technology.

The bioarcheology resources are distributed unevenly among the temporal periods and the culture areas within each time period. Prior to the Baytown period, mortuary samples are rare and the bioarcheology of these early periods is unknown. The only exception to this generalization is that the coastal zones of Louisiana have moderately frequent samples from the Tchula and Early Marksville periods. The Early Mississippi period is the only one to have samples from all four culture areas. The Late Mississippi period has the largest proportion of skeletal remains.

The distribution of the mortuary samples and the history of investigations make it obvious that mortuary sites prior to the Mississippi periods must be specifically sought or they will not be found. The implication of this conclusion is that the traditional methodologies employed in site survey and testing must be altered if skeletal samples from nonmortuary sites (e.g., habitation sites) are to be identified prior to major earth alteration projects such as reservoirs, highways, and water control projects.

BIOARCHEOLOGY OF THE LOUISIANA AND ARKANSAS STUDY AREA

Anna M. Harmon and Jerome C. Rose

The purpose of this chapter is to provide a bioarcheological synthesis of the Louisiana and Arkansas study area for incorporation into the cultural resource management process of the Southwestern Division of the U.S. Army Corps of Engineers. A compilation of excavated skeletal materials within the study area is provided in Chapter 10. This bioarcheological data base can be used as a starting point for developing a bioarcheological knowledge base for the study area, and as it is preliminary in nature, the intention is that it will be added to, refined, and elaborated. The possibility exists that, once in a mature state, this data base can be used for predictive modeling and other management decision processes. But until that stage is reached, mechanisms must be provided to ensure its continuous growth. This data base has been compiled from the perspective of the entire study area, but maturation must be accomplished from the perspective of the local level. In other words, each project must examine the data base for completeness and accuracy within the project domain and provide updates and refinements as part of the management strategy. This data base is a beginning, not a final product.

The bioarcheology data base served as a vehicle for identifying the sources of osteological data, which were then compiled into this synthesis of the bioarcheology of the Louisiana and Arkansas study area. After compiling the osteological data incorporated into this synthesis, it became apparent that we know considerably less about the biology of the prehistoric inhabitants of the study area than was originally thought. In fact, after synthesis, it became apparent that no definitive statements concerning bioarcheology could be made for the study area. Consequently, the data have been used to generate hypotheses which can be used for guiding and focusing future bioarcheological research.

This synthesis can play at least three roles within the management process. First, the compiled data can be used for assessments of significance. The extent and limitation of our knowledge have been clearly delimited. Second, the hypotheses can be employed as an aid in the design of cogent scopes of work. By necessity, scopes of work for specific projects have often been vague, frequently have not specified any research directions, and seldom identify the basic kinds of osteological data that must be collected to meet the requirements of adequate mitigation. Again, this synthesis can not be taken as an end product to be used mechanically, but it must remain an organic document responding to local circumstances and growing as each project is completed. For example, as hypotheses are tested and found to be wanting, they need to be refined, rejected, or held for further testing, while new hypotheses are generated and added to the synthesis. Third, this synthesis and the hypotheses contained within it should provide for greater efficiency in conducting CRM bioarcheology. Frequently projects have of necessity had to conduct preliminary literature searches, compile the available data, and generate hypotheses for testing prior to the initiation of the osteological laboratory work. It is the intention of this chapter to make it possible for each project to move knowledge forward, rather than to expend energy rediscovering the past.

In this chapter, the bioarcheological data will be discussed sequentially by named time period and archeological culture within each period. Because the organizational theme of this chapter is biocultural process, the primary study units are the archeological cultures described and mapped in earlier chapters of this overview. The areal extent of each culture varies between periods and the skeletal series incorporated within each section will vary with the areal extent of that culture. The entire study area can be roughly divided into four culture areas: the northern portion of the Lower Mississippi Valley, which includes the temporal sequence of cultures from Dalton through the Protohistoric Mississippian; the southern portion of the Lower Mississippi Valley which includes Tchula through Protohistoric Plaquemine; the coastal cultural variants of the southern portion of the Lower Mississippi Valley; and the sequence from Fourche Maline 1 to Caddo 5 in the Trans–Mississippi South. The historic period will encompass the entire study area.

Each archeological culture is presented as a unit and the following information categories are discussed for each where the data permit: dietary reconstruction, evaluation of nutritional adequacy, reconstruction of lifeways (i.e., activity patterns, etc.), and estimation of the adaptive efficiency. Hypotheses are developed and presented for each archeological culture, and upon completing the discussion of the sequence for each culture area (e.g., northern portion of the Lower Mississippi Valley), a series of integrated hypotheses and/or research domains are listed.

METHODOLOGY

Identification of Resources

The mortuary components with osteological analyses discussed in this chapter were identified by a computer search of the bioarcheology database. Because the veracity of any bioarcheological analysis is directly proportional to the propriety of dates assigned to each specific mortuary component, all cultural affiliations were examined and verified by the coordinating archeologists. Ideally, cultural affiliation would be assigned to each individual burial. Unfortunately, this ideal could not be achieved from the existing literature and burials are here associated with the most likely component, within multicomponent sites. When cultural assignments could not be ascertained, the data were collected, but the analyses were omitted from the interpretive portion of this study.

Data Collection

The bioarcheological data presented in this chapter were derived from osteological reports in the published literature, unpublished dissertations, theses, manuscripts, and brief reports on file at various universities and state agencies. In rare instances, data were collected directly from burial forms and records on file at the University of Arkansas Osteology Laboratory. No readily available source of data was ignored.

Since these analyses were performed by a number of researchers over a period spanning 80 years, it was necessary to devise a simple method of extracting data from these reports, a method that would be both consistent and conservative. Whenever possible, the data were collected as raw scores, and the investigator's methodology and criteria for data interpretation (either explicit or implied) were used to transform the data into consistent categories. If there was any evidence that the data from a skeletal series were suspect or not comparable to other series, the data were collected but not used in the synthetic summaries.

A preliminary review of all reports was conducted to identify the major data categories to be collected. The decision to collect data in each category was based on both the availability of the data and the research potential of the category. The types of data selected include: (1) those most representative of the resources, (2) those most crucial to the identification of cogent research questions, and (3) those most conducive to the formulation of hypotheses. For a discussion of the strengths and weaknesses of these categories, and additional bibliographical resources, the reader is referred to Goodman et al. (1984).

Dental caries are cavities produced on tooth surfaces by the acidic waste products of microorganisms. Dental caries are well established indicators of dietary carbohydrate consumption. An increase in caries rates is invariably associated with a shift to high carbohydrate diets. In the study area, 2.0 caries per person has been established as the Rubicon for differentiating agricultural and nonagricultural diets (Rose et al. 1984). Dental caries rates are derived here as the total number of dental caries divided by the total number of individuals with observable dentitions.

Dental wear, or toothwear, is the erosion of enamel surfaces by the processes of attrition from direct tooth-on-tooth contact and abrasion from contact with foreign substances such as grit (Powell 1985:308). Correlations between diet, food preparation techniques, and toothwear are well established. Heavy toothwear is typically associated with the use of stone grinding implements used to prepare coarse foods. A decrease in toothwear is associated with improvements in food processing techniques which produce comparatively soft, nonabrasive diets. It is important to add that toothwear is exceedingly complex. Systematically collected numerical scores provide the most sensitive and objective means of comparing toothwear within and between populations. However, since these data were rarely available in sufficient quantity to warrant tabular presentation, toothwear is discussed in the text according to the information that was available for a given component.

Microwear refers to the patterns of toothwear observed with the aid of scanning electron microscopes (SEM). The authors have identified three specific microwear patterns that can be used to infer diet. The number, size, and morphology of striations are used to indicate hard, gritty substances in the diet. The relative proportions of enamel polishing indicate the amount of vegetable fiber in the diet. The number of compression fractures observed indicates the relative proportion of hickory nuts included in the diet and can be used to infer seasonal exploitation of these substances as well as seasonality of death. SEM microwear patterns are discussed within the text where these data are available.

Enamel hypoplasias are observed as indentations in the enamel surface that appear as transverse (horizontal) lines, bands, or pits, on the vertical (nonocclusal) surfaces of teeth. Hypoplasias form as a result of metabolic disturbances that occur during tooth formation. As such, hypoplasias provide a permanent record of stress episodes during childhood and can be used in conjunction with other data to estimate levels of childhood stress. Because the methodologies of scoring and recording enamel hypoplasias are still being developed, these data are rarely reported, but they are discussed in the text when available.

Infection is indicated by the positive response bone makes to repair and heal itself when damaged. The infectious response is to isolate and remove damaged bone tissue and to lay down new bone in its place. Because bone responds in this characteristic fashion regardless of the source of insult, specific diseases can rarely be diagnosed and specific etiologies (causes and origins) can rarely be identified. While it is judicious to group infections into categories that distinguish degrees of infection severity, for purposes of this overview, infectious lesions are grouped into a single category in order to compute average infection rates that can be compared within and between populations. Because synergistic relationships exist between individual susceptibility to infection, nutritional adequacy, and social stress, infection rates can be used in conjunction with other data sets to evaluate dietary adequacy and adaptive efficiency. The infection rates presented here reflect the number of individuals with at least one infectious lesion divided by the number of individuals who could be examined for that lesion (i.e., the number of individuals with infected tibiae divided by the number of individuals with observable tibiae).

Porotic hyperostosis is observed as an abnormal thickening (expansion) of the inner portion (diploe) of the cranial vault bones which results in the exposure of the diploe (trabecular bone), giving the outer skull surface a pitted appearance. This condition can arise when the body is deprived of an adequate iron supply and, as such, is broadly associated with iron deficiency anemia. Porotic hyperostosis is thus employed as a marker of significant nutritional stress. It should be noted that other anemias, such as sickle cell, can produce porotic hyperostosis, but these conditions are rare in prehistoric North America. In this synthesis, a diagnosis of porotic hyperostosis was only accepted if the lesions discussed met the criteria stated above. Rates are presented as the number of individuals exhibiting the lesion divided by the number of individuals with observable crania.

Osteoarthritis (major joint arthritis) is a degenerative process that involves the gradual erosion of the articular surfaces of the major joints. As such, arthritis rates can be employed to reconstruct patterns of physical activity and physical stress in archeological populations. Arthritis frequencies are here reported as the number of individuals with arthritic lesions of the long bones divided by the number of individuals with observable long bones.

Osteophytosis (spinal arthritis) is a form of degeneration that can be observed as "marginal lipping" of the vertebrae. Spinal arthritis is associated with herniation of the vertebral disks, which is both age-related and stress-related. Patterns of spinal arthritis observed in a skeletal series can be used with other indicators to reconstruct patterns of physical activity and physical stress in archeological populations. The rates reported here represent the number of individuals with osteophytosis divided by the number of individuals with observable vertebrae.

Traumatic lesions are most commonly observed in skeletal populations as fractures, dislocations, and wounds. Certain activities predispose individuals to accidental trauma. Specific types of trauma can be used to infer specific types of behaviors, for example, "parry fractures" are often associated with interpersonal violence. The extent of healing evidenced by traumatic lesions can sometimes be used to estimate how long before death the lesion occurred. Trauma patterns can be used in conjunction with arthritis patterns to infer the relative physical stress load for a given population. The rates presented here represent the number of individuals with traumatic lesions divided by the number of individuals observable for those lesions.

Trace element analysis can provide direct information concerning dietary adequacy and dietary deficiencies. These analyses are included when available and appropriate.

Stable carbon isotope analyses contribute to our understanding of dietary change by establishing the presence of certain cultigens such as maize in the diet, segregating groups of individuals with differential access to these cultigens, and determining the proportion of specific cultigens in the diet. Stable carbon values are provided and discussed when these data are available in the published literature.

As a rule, the data presented here follow the formulae stated above for each category of pathological lesion. This rule was ignored in rare instances when the total number of lesions was given and the number of observables could not be determined, but the skeletal material was described as being relatively complete, and/or in good condition, and virtually no other data were available. This judgment call was based on the overall veracity of the report, including acceptable descriptions of the pathological lesions involved. In these instances the total number of observable individuals became the denominator.

BIOARCHEOLOGY OF THE NORTHERN PORTION OF THE LOWER MISSISSIPPI VALLEY

Introduction

There are three publications which provide partial bioarcheological syntheses for this portion of the Lower Mississippi Valley. *Bioarcheology of the Alexander Site* (Rose and Marks 1985) provides a synthesis of the bioarcheology of the lower Arkansas River. This monograph chapter focuses upon dietary reconstruction and provides comparative scanning electron microscope dental microwear data from a number of locations within the Lower Mississippi Valley. *Paleopathology and the Origins of Maize Agriculture in the Lower Mississippi Valley and Caddoan Culture Areas* (Rose et al. 1984) employs bioarcheological data to determine the time of transition to a maize dependent diet. *Bioarcheology of the Little Cypress Bayou Site* (Rose et al. 1985) focuses upon the transition between the Baytown and Early Mississippian cultures in northeast Arkansas. This contract report provides stable carbon isotope data and comparative scanning electron microscope (SEM) dental microwear descriptions. The present overview draws heavily upon these publications, but it incorporates considerable new data and revised interpretations.

Dalton Period

Although numerous Dalton period components have been recorded, Sloan (3GE94) is the only site in the entire study area to have produced human skeletal material. There are no documented human skeletal remains dated to earlier than the Dalton period anywhere in the study area and, thus, these periods are bioarcheologically unknown.

The Sloan site was completely excavated in 1974. The high quality and patterned distribution of the artifacts throughout the site led to the interpretation that this was a cemetery containing between 12 and 25 individuals (Morse and Morse

TABLE 37

NORTHERN LOWER MISSISSIPPI VALLEY SITES WITH ANALYSES BY PERIOD, CULTURE, DRAINAGE, AND SITE TYPE

CULTURE AND SITE	ANALYSIS	DRAINAGE	SITE TYPE
DALTON			
Sloan (3GE94)	C	White	Cemetery
LATE ARCHAIC LATE ARCHAIC			
Frierson 2 (3CG54)	D	White	Mound
EARLY MARKSVILLE HOPEWELLIAN			
Helena Mounds (3PH11)	C	Mississippi	Mound
LATE MARKSVILLE PL AINWARE			
Taylor Mounds (3DR2)	C	Bayou Barth	Mound
BAYTOWN BAYTOWN			
Banks Mound 1 (3CT14)	C	Mississippi	Mound
Mangrum (3CG636)	C	St. Francis	Unknown
Wampler 2 (3CS117)	C	St. Francis	Mound
Little Cypress (3CT50)	C	St. Francis	Habitation
Brougham Lake (3CT98)	D	St. Francis	Habitation
Hyneman I (3PO52)	C	St. Francis	Mound
Les Johnson (3AS159)	C	Ouachita	Habitation
EARLY MISSISSIPPI EARLY MISSISSIPPIAN			
Golightly (3CT19)	D	Mississippi	Habitation
Zebree (3MS20)	C	St. Francis	Habitation
Hyneman II (3PO54)	C	St. Francis	Mound
MIDDLE MISSISSIPPI MIDDLE MISSISSIPPIAN			
Burris II (3CG218)	C	White	Open
Earl Keels (3GE2)	D	St. Francis	Unknown
Zebree Farm (3MS20)	C	St. Francis	Habitation
Bay Village (3PO3)	C	St. Francis	Habitation
Floodway Mounds (3PO46)	C	St. Francis	Mound
Hyneman I (3PO52)	C	St. Francis	Mound
LATE MISSISSIPPI LATE MISSISSIPPIAN NPLMV			
Menard Mound (3AR4)	D	Arkansas	Habitation
Greer Mound (3JE50)	D	Arkansas	Mound
Wapanocca (3CT9)	C	Mississippi	Mound
Middle Nodena (3MS3)	C	Mississippi	Mound
Upper Nodena (3MS4)	C	Mississippi	Cemetery
Neely's Ferry (3CS24)	D	St. Francis	Mound
Vernon Paul (3CS25)	D	St. Francis	Mound
Parkin (3CS29)	C	St. Francis	Mound
Rhodes Place (3CT3)	C	St. Francis	Unknown
Bradley Place (3CT7)	D	St. Francis	Habitation
Clay Hill (3LE11)	C	St. Francis	Cemetery
Gant (3MS11)	D	St. Francis	Unknown
Smith (3MS71)	C	St. Francis	Unknown
Pecan Point (3MS78)	C	St. Francis	Mound
Hazel (3PO6)	C	St. Francis	Habitation
Big Eddy (3SF9)	D	St. Francis	Habitation
Walnut Ridge (3MO61)	C	White	Unknown
Cazer (3PR67)	D	White	Habitation
LATE MISSISSIPPI LATE MISSISSIPPIAN SPLMV			
Tiller Farms (3DR49)	D	Bayou Barth	Mound
McClendon (3DR144)	D	Bayou Barth	Unknown
Gordon (3AS152)	C	Ouachita	Mound
Saline Sand/Gravel (3BR40)	C	Ouachita	Habitation
Boytt's Feld (3UN13)	C	Ouachita	Cemetery
Shallow Lake (3UN52)	D	Ouachita	Cemetery
Myatt's Landing (16OU17)	C	Ouachita	Cemetery
LATE MISSISSIPPI LATE MISSISSIPPIAN PROTOHISTORIC KOROA SPLMV			
Bray Landing (16MO11)	C	Bayou Barth	Cemetery
Ward Place (16MO12)	C	Bayou Barth	Cemetery

KEY:
C = comprehensive analysis
D = only age and sex

1983). A total of 141 bone fragments were found in proximity to the artifacts and have been examined by Rose and Condon for taxonomic identification (UAO Files). Visual, tactile, and histological comparisons provided the following identifications: 91 (64.5%) human bone fragments, 26 (18.4%) probable human bones fragments, 13 (9.2%) probable non-human bone fragments, and 11 (7.8%) indeterminate fragments. The obvious conclusion which can be drawn from these data is that Sloan is a prehistoric cemetery. This conclusion is further supported by a soil analysis conducted by Carol Spears (Morse and Morse 1983:90–91). Thus, Sloan is the earliest organized cemetery within the study area. Unfortunately, no other data are available concerning these individuals and the Dalton period remains bioarcheologically unknown.

Late Archaic Period

Although one mortuary sample assigned to the Late Archaic period has been examined (Table 37), sufficient analysis was not conducted to provide any significant bioarcheological data. The Late Archaic period remains bioarcheologically unknown.

Tchula Period: Pascola/Burkett Culture

The only available information from this period is a stable carbon isotope value from the McCarty site (3PO467). The -21.7 value indicates that there was no maize consumption (Lynott et al. 1986). The Tchula period is bioarcheologically unknown.

Early Marksville Period: Hopewellian Culture

Helena Mounds (3PH11) is the only mortuary component representing the Hopewellian culture which has produced bioarcheological data (see Table 37). The caries rate of 1.5 caries per individual is below the 2.0 caries per person Rubicon for indicating a significant consumption of carbohydrates (Rose et al. 1984). No pathological lesions are reported for this collection. The implication of this caries rate is that these individuals consumed relatively small quantities of processed carbohydrates. Despite documentation that more northerly Hopewellian peoples incorporated a number of native cultigens into their diet (Asch and Asch 1985), the caries data do not support their consumption in quantity at Helena Mounds.

The primary research question concerning the Hopewellian culture is the presence of native domesticates. A full battery of bioarcheological analyses (e.g., enamel microwear, trace element analysis, stable isotope analysis, etc.) are required to resolve this question. The virtual absence of bioarcheological data from this culture is a major deficiency in the bioarcheological data base.

TABLE 38

DENTAL CARIES PER PERSON IN THE NORTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	N	CARIES/ PERSON
EARLY MARKSVILLE HOPEWELLIAN			
Helena Mounds (3PH11)	Ford 1963	13	1.5
LATE MARKSVILLE PLAINWARE			
Taylor Mound (3DR2)	UAO File	2	0.0
BAYTOWN BAYTOWN			
Little Cypress (3CT50)	Rose et al. 1985	3	2.7
Mangrum (3CG636)	Sperber 1982	1	2.0
Banks (3CT14)	Rose et al. 1985	7	0.9
		(11)	(1.5)
EARLY MISSISSIPPI EARLY MISSISSIPPIAN			
Zebree (3MS20)	Powell 1977	13	2.4
Hyneman II (3PO54)	Rose et al. 1984	1	0.0
		(14)	(2.2)
MIDDLE MISSISSIPPI MIDDLE MISSISSIPPIAN			
Bay Village (3PO3)	Rose et al. 1984	1	9.0
Floodway (3PO46)	Rose et al. 1984	1	3.0
Burris II (3CG218)	Condon and Rose 1979	1	1.0
Zebree (3MS20)	Powell 1977	2	0.0
		(5)	(2.6)
LATE MISSISSIPPI LATE MISSISSIPPIAN NPLMV			
Clay Hill (3LE11)	UAO Files	2	24.5
Parkin (3CS29)	Murray 1985	8	5.9
Upper Nodena (3MS4)	Powell 1983	103	3.9
Wapanocca (3CT9)	Harmon 1984	13	3.9
Middle Nodena (3MS3)	Powell 1983	52	2.7
Hazel (3PO6)	Powell 1983	33	2.6
Pecan Point (3MS78)	Mehta/Sensenig 1966	13	1.1
Rhodes Place (3CT3)	Mehta/Sensenig 1966	4	1.1
		(228)	(3.5)
LATE MISSISSIPPI LATE MISSISSIPPIAN SPLMV			
Gordon (3AS152)	UAO Files	14	5.6

Late Marksville Period: Plainware Culture

Again there is only minimal data representing the Plainware culture. The absence of caries (see Table 38) indicates the possibility of low carbohydrate consumption. There is a virtual absence of data from the Plainware culture, and it remains bioarcheologically unknown.

Baytown Period: Barnes Culture

There are no bioarcheological data from the Barnes culture within the study area. Two stable carbon isotope values from the Meramec Springs Complex in southeast Missouri (-19.9 and -20.1) indicate no maize consumption (Lynott et al. 1986).

Baytown Period: Baytown Culture

The Baytown culture is the first in the northern portion of the Lower Mississippi Valley to provide an interpretable body of bioarcheological data. The average caries rate is 1.5 caries per person for the three skeletal series from this culture (Table 38). This rate is below the 2.0 caries per person Rubicon and indicates a low intake of processed carbohydrates. However, there is considerable variability with the Mangrum (3CG636) individual at 2.0 and the Little Cypress Bayou (3CT50) series at 2.7. The bulk of the 2.7 rate is contributed by Burial 3, which will be discussed further below.

Dental attrition rates from the Baytown molars indicate that the diet was coarse and contained large quantities of abrasive particles (Rose et al. 1985:IV,17). Observation of the Little Cypress Bayou molar surfaces with a scanning electron microscope makes possible a reconstruction of the diet (Rose et al. 1985:IV, 23); it was coarse and contained many abrasive particles. Hickory nut consumption is indicated, and large quantities of minimally processed plant fiber were consumed.

Stable carbon isotope values from the Banks (3CT14) (-21.2 and - 21.5) and Little Cypress Bayou (3CT50) (-22.3, -21.2, and -15.7) sites indicate that the majority of individuals did not consume maize (Rose et al. 1985). The one maize consuming value (-15.7) is from Burial 3 (3CT50), which is the one with the high caries rate previously mentioned. The dental wear scores and scanning electron microscope microwear pattern of this individual are very different from the other Baytown individuals, which suggests a very different diet. This individual is radiocarbon dated to A.D. 1000 and may not belong temporally with the other Baytown individuals from this site. Regardless, this individual is the only pre A.D. 1250 burial which has produced a maize consuming stable carbon value (see Lynott et al. 1986).

Taken together, the caries rates, dental wear patterns, microwear patterns, and stable carbon data all suggest a coarse, minimally processed diet containing plant fiber, hickory nuts, but no maize. These data do, on the other hand, lend support to the hypothesis of a Baytown diet which contains native cultigens. In particular, the dental attrition rates and microwear patterns are consistent with large amounts of grit (i.e., rock flour from the grinding stones) which could have been introduced by the increased effort required to process the starchy seeds. In addition, the polishing observed with the scanning electron microscope could be produced by the seed coats. Although these data support the hypothesis of native cultigens in the Baytown diet, more data are required to provide an adequate test. It must also be remembered that the one anomalous individual from the Little Cypress Bayou (3CT50) site suggests that maize consumption did occur, at least sporadically.

Dietary adequacy can be indirectly measured by a number of techniques, but the only data available are for infections and porotic hyperostosis. Since adequate protein intake is required to maintain a healthy immune system, inadequate protein intake can result in an increased infection rate. Examination of Table 39 shows that the Baytown infection rate is 23.3%, at the high end of what is considered a normal infection rate. The frequency of Baytown infections suggests adequate protein intake. The absence of porotic hyperostosis in the Baytown samples (see Table 40) indicates adequate iron intake. Although these data are not sufficient for confirmation of this hypothesis, they do suggest that the Baytown diet was nutritionally adequate.

A variety of skeletal anomalies and pathological lesions can provide information useful for the reconstruction of prehistoric lifeways. For example, the patterning of arthritis can indicate the widespread participation in specific activities such as extensive canoe travel. Such detailed data are not available for the Baytown people. The frequency of arthritis of the major joints is only 12.0% at the Banks (3CT14) site (Table 41). This level is perfectly acceptable and suggests that there was minimal strain on the major joints. Spinal arthritis (osteophytosis) is slightly higher at 22.6% (Table 42). Taken together, the two arthritis rates suggest that the Baytown way of life was not particularly strenuous. This absence of a strenuous lifeway is confirmed by the low trauma (broken and healed bones) rate of 10.7% (Table 43).

Adaptive efficiency is an approximate measure of how well the culture has adapted its participants to the environment. As mentioned above, the Baytown infection rate is only 23.3% and indicates an average to good level of adaptive efficiency. Enamel hypoplasias (i.e., transverse grooves in the teeth) are an excellent indicator of childhood stress levels. The three individuals from the Little Cypress Bayou (3CT50) site have a hypoplasia frequency of nine per individual and 0.69 per each half year period of childhood growth (Rose et al. 1985:IV, 29). These rates are three time higher than those from Powell Canal (3CH14), a Troyville culture site located to the south. Although minimal and only from one site, the hypoplasia rate

TABLE 39

PERCENTAGES OF ADULT INFECTION
IN THE NORTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	ADULT INFECTION N	%
BAYTOWN BAYTOWN			
Wampler 2 (3CS117)	UAO Files	1	100.0
Banks Mound I (3CT14)	Rose et al. 1985	25	24.0
Little Cypress (3CT50)	Rose et al. 1985	2	0.0
Mangrum (3CG636)	Sperber 1982	2	0.0
		(30)	(23.3)
EARLY MISSISSIPPI EARLY MISSISSIPPIAN			
Hyneman II (3PO54)	Rose et al. 1984	1	100.0
Zebree (3MS20)	Powell 1977	8	37.5
		(9)	(44.4)
MIDDLE MISSISSIPPI MIDDLE MISSISSIPPIAN			
Zebree Farm (3MS20)	Powell 1977	1	100.0
Burris II (3CG218)	Condon and Rose 1979	1	100.0
Bay Village (3PO3)	Rose et at. 1984	1	0.0
Floodway Mounds (3PO46)	Rose et al. 1984	1	0.0
		(4)	(50.0)
LATE MISSISSIPPI LATE MISSISSIPPIAN NPLMV			
Smith (3MS71)	UAO Files	1	100.0
Hazel (3PO6)	Powell 1983	72	87.5
Upper Nodena (3MS4)	Powell 1983	43	86.0
Middle Nodena (3MS3)	Powell 1983	16	56.2
Wapanocca (3CT9)	Harmon 1984	9	55.5
Parkin (3CS29)	Murray 1985	12	41.7
Greer (3JE50)	Hrdlicka 1908	8	25.0
Menard (3AR4)	Hrdlicka 1908	4	25.0
Clay Hill (3LE11)	UAO Files	2	0.0
		(167)	(73.6)
LATE MISSISSIPPI LATE MISSISSIPPIAN SPLMV			
Boytt's Field (3UN13)	Hrdlicka 1909	25	36.0
Ward Place (16MO12)	Hrdlicka 1909	20	25.0
Gordon (3AS152)	Rose et al. 1984	16	18.7
Myatt Landing (16OU17)	Hrdlicka 1909	18	11.1
		(79)	(24.0)

TABLE 40

PERCENTAGES OF ADULT POROTIC HYPEROSTOSIS
IN THE NORTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	PORITIC HYPEROSTOSIS N	%
BAYTOWN BAYTOWN			
Banks Mound I (3CT14)	Rose et al. 1985	25	0.0
Little Cypress (3CT50)	Rose et al. 1985	2	0.0
Hyneman I (3PO52)	Rose et al. 1984	4	0.0
Mangrum (3CG636)	Sperber 1982	1	0.0
		(32)	(0.0)
EARLY MISSISSIPPI EARLY MISSISSIPPIAN			
Hyneman II (3PO54)	UAO Files	1	0.0
Zebree (3MS20)	Powell 1977	9	11.1
		(10)	(10.0)
MIDDLE MISSISSIPPI MIDDLE MISSISSIPPIAN			
Zebree (3MS20)	Powell 1977	1	0.0
Bay Village (3PO3)	Rose et al. 1984	1	0.0
Floodway (3PO46)	Rose et al. 1984	1	0.0
Burris II (3CG218)	Condon and Rose 1979	1	0.0
		(4)	(0.0)
LATE MISSISSIPPI LATE MISSISSIPPIAN NPLMV			
Parkin (3CS29)	Murray 1985	6	16.7
Greer (3JE50)	Hrdlicka 1908	8	12.5
Upper Nodena (3MS4)	Powell 1983	118	3.4
Middle Nodena (3MS3)	Powell 1983	53	1.9
Wapanocca (3CT9)	Harmon 1984	9	0.0
Clay Hill (3LE11)	UAO Files	2	0.0
Menard (3AR4)	Hrdlicka 1908	4	0.0
		(200)	(3.5)
LATE MISSISSIPPI LATE MISSISSIPPIAN SPLMV			
Gordon (3AS152)	Rose et al. 1984	16	31.2
Ward Place (16MO12)	Hrdlicka 1909	87	8.0
Boytt's Field (3UN13)	Hrdlicka 1909	25	4.0
Myatt Landing (16OU17)	Hrdlicka 1909	18	0.0
		(146)	(8.9)

suggests the possibility of higher than normal childhood stress.

In summary, we possess sufficient bioarcheological data to formulate hypotheses concerning life in the Baytown culture. The diet appears to be adequate for normal health and disease resistance. The presence of native domesticates is consistent with the skeletal evidence and requires testing with additional analyses. Maize consumption does not appear to be a part of Baytown subsistence, but the single maize value from Little Cypress Bayou leaves open the possibility of maize, at least by A.D. 1000. Physical stress appears to be at an acceptable level, and the Baytown lifeway does not appear to be strenuous. Adaptive efficiency is also adequate, but the possibility of high childhood stress loads exists. There are three crucial hypotheses which require extensive testing during future bioarcheological analyses. The first is establishing the inclusion of native domesticates within the Baytown diet. The second is establishing the absence of Baytown maize consumption. Third, the possible increase in childhood stress loads must be tested.

Early Coles Creek Period: Plum Bayou Culture

There are no bioarcheological data for the Plum Bayou culture within the study area. For the little Plum Bayou data that are available, the reader is referred to the bioarcheology of the Ozark, Arkansas, and Ouachita study area. The only hypothesis derived from the Ozark, Arkansas, and Ouachita overview of the Plum Bayou culture is that domesticated native starchy seeds comprised a significant portion of the diet.

Early Mississippi Period: Early Mississippian Culture

Although bioarcheological data are available from only three Early Mississippi sites (see Table 37), their interpretations are of considerable interest. A caries rate of 2.2 caries per person (Table 38) suggests a moderate consumption of carbohydrates. This rate is above the 2.0 Rubicon for indicating the presence of agriculture (Rose et al. 1984). Scanning electron microscopy of the Zebree (3MS20) enamel surfaces suggests a coarsely prepared diet with numerous abrasive particles and a variable consumption of hickory nuts (Rose et al. 1985:IV, 33). Of particular note is the fact that the Zebree SEM microwear pattern does not deviate from the preceding Baytown culture. The stable carbon isotope values for Zebree (-21.2, -21.2, and -20.5) indicates the absence of maize consumption (Lynott et al. 1986). The presence of a moderately

TABLE 41

PERCENTAGES OF ADULT OSTEOARTHRITIS IN THE NORTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	OSTEOARTHRITIS N	%
BAYTOWN BAYTOWN			
Banks Mound I (3CT14)	Rose et al. 1985	25	12.0
EARLY MISSISSIPPI EARLY MISSISSIPPIAN			
Hyneman II (3PO54)	UAO Files	3	0.0
Zebree (3MS20)	Powell 1977	12	25.0
		(15)	(20.0)
MIDDLE MISSISSIPPI MIDDLE MISSISSIPPIAN			
Zebree (3MS20)	Powell 1977	2	0.0
LATE MISSISSIPPI LATE MISSISSIPPIAN NPLMV			
Upper Nodena (3MS4)	Powell 1983	86	3.5
Middle Nodena (3MS3)	Powell 1983	7	0.0
Parkin (3CS29)	Murray 1985	12	16.7
Clay Hill (3LE11)	UAO Files	2	0.0
		(107)	(4.7)
LATE MISSISSIPPI LATE MISSISSIPPIAN SPLMV			
Boytt's Field (3UN13)	Hrdlicka 1909	25	4.0
Gordon (3AS152)	Rose et al. 1984	16	18.7
Ward Place (16MO12)	Hrdlicka 1909	20	0.0
Myatt Landing (16OU17)	Hrdlicka 1909	18	0.0
		(79)	(5.1)

TABLE 42

PERCENTAGES OF ADULT OSTEOPHYTOSIS IN THE NORTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	OSTEOPHYTOSIS N	%
BAYTOWN BAYTOWN			
Banks Mound I (3CT14)	Rose et al. 1985	25	16.0
Little Cypress (3CT50)	Rose et al. 1985	2	50.0
Hyneman I (3PO52)	UAO Files	4	50.0
		(31)	(22.6)
EARLY MISSISSIPPI EARLY MISSISSIPPIAN			
Hyneman II (3PO54)	Rose et al. 1984	3	66.7
Zebree (3MS20)	Powell 1977	12	33.3
		(15)	(40.0)
MIDDLE MISSISSIPPI MIDDLE MISSISSIPPIAN			
Zebree (3MS20)	Powell 1977	2	0.0
Bay Village (3PO3)	Rose et al. 1984	1	100.0
		(3)	(33.3)
LATE MISSISSIPPI LATE MISSISSIPPIAN NPLMV			
Clay Hill (3LE11)	UAO Files	2	0.0
Upper Nodena (3MS4)	Powell 1983	12	8.3
Parkin (3CS29)	Murray 1985	9	44.0
Middle Nodena (3MS3)	Powell 1983	2	50.0
		(25)	(24.0)
LATE MISSISSIPPI LATE MISSISSIPPIAN SPLMV			
Bray Landing (16MO11)	Hrdlicka 1909	4	25.0
Gordon (3AS152)	Rose et al. 1984	15	26.7
Boytt's Field (3UN13)	Hrdlicka 1909	15	47.0
Sal. Sand and Gv (3BR40)	UAO Files	4	50.0
Shallow Lake (3UN52)	Powell 1981	2	50.0
Myatt Landing (16OU17)	Hrdlicka 1909	13	53.8
Ward Place (16MO12)	Hrdlicka 1909	17	88.0
		(70)	(52.9)

TABLE 43

PERCENTAGES OF ADULT TRAUMA
IN THE NORTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	ADULT TRAUMA N	%
BAYTOWN BAYTOWN			
Banks Mound I (3CT14)	Rose et al. 1985	25	8.0
Mangrum (3CG636)	Sperber 1982	2	50.0
Wampler 2 (3CS117)	UAO Files	1	100.0
		(28)	(10.7)
EARLY MISSISSIPPI EARLY MISSISSIPPIAN			
Hyneman II (3PO54)	Rose et al. 1984	2	0.0
Zebree (3MS20)	Powell 1977	16	6.2
		(18)	(5.6)
MIDDLE MISSISSIPPI MIDDLE MISSISSIPPIAN			
Zebree (3MS20)	Powell 1977	2	50.0
LATE MISSISSIPPI LATE MISSISSIPPIAN NPLMV			
Wapanocca (3CT9)	Harmon 1984	9	0.0
Middle Nodena (3MS3)	Powell 1983	2	0.0
Upper Nodena (3MS4)	Powell 1983	58	5.2
Parkin (3CS29)	Murray 1985	14	28.6
Clay Hill (3LE11)	UAO Files	1	100.0
Walnut Ridge (3MO61)	UAO Files	2	100.0
		(86)	(11.2)
LATE MISSISSIPPI LATE MISSISSIPPIAN SPLMV			
Ward Place (16MO12)	Hrdlicka 1909	19	0.0
Bray Landing (16MO11)	Hrdlicka 1909	10	0.0
Myatt Landing (16OU77)	Hrdlicka 1909	12	0.0
Boytt's Field (3UN13)	Hrdlicka 1909	27	3.7
Gordon (3AS152)	Rose et al. 1984	16	12.5
		(84)	(3.6)

high caries rate suggesting increased carbohydrate consumption in conjunction with nonmaize stable carbon values suggests the continuation of domesticated starchy seeds from the Baytown into the Early Mississippian culture.

The increase in the infection rate to 44.4% (Table 39) suggests a possible decline in protein intake. The ten percent porotic hyperostosis rate (Table 40) is among the highest in the northern portion of the Lower Mississippi Valley and suggests inadequate iron intake. Unfortunately, the Early Mississippian sample is so small that this 10% rate may be a sampling aberration. Analysis of a large sample of individuals from this culture is needed to confirm this possibility. These data suggest the hypothesis that there was a significant decline in dietary quality between the Baytown and Early Mississippian.

Arthritis rates can be used for preliminary lifeway reconstruction. The major joint arthritis rate of 20% (see Table 41) is almost double that of the Baytown. Similarly, the spinal arthritis (osteophytosis) rate of 40.0% is almost double that of the Baytown rate. In contrast, the trauma rate has declined from 10.7% to 5.6%. Although the sample sizes are small, the increases in joint and spinal arthritis indicates an increase in physical stress and workload. This increase in physical stress could be associated with increased subsistence efforts.

Comparisons with the preceding Baytown data suggest changes in the level of adaptive efficiency. The infection rate is double that of the Baytown people and indicates an increase in stress and a possible decline in dietary quality for the Early Mississippian adults. In contrast, the hypoplasia rates for Zebree (3MS20) are 1.6 per person and 0.19 per half year growth period (Rose et al. 1985). This is half the rate of the preceding Baytown sample and suggests a decline in childhood stress.

In summary, the dental data suggest an increased consumption of carbohydrates but a continuity in the physical consistency of the food. This interpretation is further supported by the absence of maize consuming stable carbon values. These data suggest the hypothesis that native cultigens became increasingly important in the Early Mississippian diet. An increased effort to produce native domesticates could be reflected in the increased arthritis rates. Together these data suggest the hypothesis that a need developed to increase the caloric content of the food base, resulting in a disproportionate increase in the workload, as reflected in increased arthritis. These hypotheses require extensive testing with adequate samples. Since these skeletal samples are not available in the curated bioarcheology resource base, the excavation of Early Mississippian samples must be a high priority.

Middle Mississippi Period: Middle Mississippian Culture

Skeletal samples from the Middle Mississippian culture are relatively abundant, but osteological analyses are rare (see Table 37). The mean caries rate for the five Middle Mississippian individuals is 2.6, which is only slightly higher than the Early Mississippian rate of 2.2 caries per individual. Within the sample there is considerable variability (i.e., from 0 to 9), but overall there does not appear to be a substantial increase in carbohydrate consumption.

There are no dental attrition scores available for the Middle Mississippian, but scanning electron microscope data are available on file in the University of Arkansas Osteology Laboratory (UAO Files). The molar microwear pattern for the Middle Mississippian occupants of Zebree (3MS20) is substantially different from that of the Early Mississippians from the same site. There is a 50% reduction in large striations and an increase in the amount of smooth enamel surfaces exhibiting only the smallest striations. These observations indicate a substantial reduction in the quantity of abrasive particles in the diet, which could be associated with a major change in food preparation technology or subsistence resource utilization.

Lynott et al. (1986) report four Middle Mississippian stable carbon isotope values from southeast Missouri samples. These average -14.5 and indicate a maize dependent diet. The single available value from Zebree is -13.0 and establishes comparable maize dependency. Although not reflected in the caries rate, the Middle Mississippian diet appears to contain substantial amounts of maize. The change in the dental microwear pattern between the Early and Middle Mississippian components at Zebree (3MS20) also indicates a major change in the composition of the diet. The hypothesis to be tested is that there was a substantial increase in maize consumption between the Early and Middle Mississippian cultures. In particular, maize was not an important component of the Mississippian diet prior to A.D. 1250.

With only four analyzed individuals, little can be said concerning the adequacy of the Middle Mississippian diet. The adult infection rate is 50% (see Table 39) which is part of a continuing trend of increased infections from the Baytown into the Late Mississippian. None of the four analyzed individuals exhibit porotic hyperostosis. Evaluation of the quality of the Middle Mississippian diet is a critical research domain.

Lifeway reconstruction is also not feasible because of the paucity of osteological data. There is no arthritis of the major joints (Table 41), a spinal arthritis rate of 33.3% (Table 42) and a trauma rate of 50.0% (Table 43). These data are not sufficient to produce any hypotheses concerning increases or decreases in physical stress between the Early and Middle Mississippian. Lifeway reconstruction is a critical research domain for this culture.

Similarly, there are no data available to assess the adaptive efficiency of the Middle Mississippian culture. However, the limited data do suggest that the Middle Mississippian culture incorporated the transition to a maize dependent diet. Thus, evaluation of adaptive efficiency is critical to understanding the biosocial dynamics of culture change in the northern portion of the Lower Mississippi Valley.

Late Mississippi Period: Late Mississippian Culture

With the southward expansion of the Late Mississippian culture, more environmental diversity is present than during the previously discussed cultures. As a consequence, the bioarcheological data will be discussed in two environmental segments: the northern (NPLMV) and southern (SPLMV) portions of the Lower Mississippi Valley. In addition, differences between the prehistoric components and the European contact components of the Late Mississippian will be compared. The contact period, as used here, begins with the arrival of Europeans in the Caribbean in the early 1500s.

The average caries rate for the NPLMV Late Mississippian culture is 3.5 caries per individual and indicates an increase in carbohydrate consumption from the previous period. The two contact sites of Clay Hill (3LE11) and Parkin (3CS29) have the highest caries rates (i.e., 24.5 and 5.9), as does the contact period SPLMV Gordon (3AS152) site with a 5.6 (Table 38). The increase in the caries rate during the contact period suggests that the Late Mississippian carbohydrate consumption climbed even higher after contact.

Dental attrition data are available in the site files of the University of Arkansas Osteology Laboratory for the Middle Nodena (3MS3), Upper Nodena (3MS4), Wapanocca (3CT9), and Parkin (3CS29) sites: maxillary molar scores are 17.9, 17.3, 19.4, and 22.0 respectively; mandibular molar scores are 16.4, 16.5, 18.5, and 22.5 respectively. These attrition scores are consistently lower than the Baytown culture rates and indicate a reduction in the abrasive quality of the diet.

Lynott et al. (1986) report three stable carbon isotope values (i.e., two from southeast Missouri and one from the Hazel site, 3PO6) which average -12.3. These data not only indicate a maize dependent diet, but they also represent a possible increase in maize consumption from the Middle Mississippian culture.

Scanning electron microscope observations are available only from the Gordon (3AS152) site (Rose and Marks 1985: 92). The molar surfaces are fairly smooth with areas of polishing, low to moderate frequency of large striations, and frequent small striations. These features indicate a relatively soft diet, few abrasive particles, and the consumption of hickory nuts. This microwear pattern is substantially different from all other Lower Mississippi Valley molars and suggests the presence of a distinctive diet, at least at the contact period Gordon site.

The Late Mississippian diet is the only one discussed where there is any evidence for dietary deficiencies. The average infection rate is 73.6% in the NPLMV and suggests that protein intake may have been deficient (Table 39), while the SPLMV rate of 24.0% is comparable to that of the Baytown culture. The infection rates have shown a consistent increase over time in the northern portion of the Lower Mississippi Valley. Evidence of anemia (i.e., porotic hyperostosis) is variable between the sites and averages 3.5% lesions in the NPLMV and 8.9% in the SPLMV (Table 40). It is interesting that two of the contact sites, Parkin (3CS29) and Greer (3JE50), have the highest rates (i.e., 16.7% and 12.5% respectively). These higher rates, at least at Parkin, are associated with increased carbohydrate consumption. As high maize intake in conjunction with limited red meat intake often results in iron deficiency anemia, the hypothesized increase in maize consumption during the contact period is supported. Similarly in the SPLMV, the high caries rate at Gordon (3AS152) is associated with a high rate of porotic hyperostosis. These data suggest the hypothesis that maize consumption was high during the Late Mississippian, and that it increased even more during the contact period. In addition, the contact period diet appears to have been lower in nutritional quality.

Reconstruction of the Late Mississippian lifeway is complicated by small sample sizes and intersite variability. The average joint arthritis rate is 4.7% in the NPLMV and 5.1% in the SPLMV (Table 41). These are the lowest rates reported for any of the cultures. It is interesting that the highest arthritis rates in both environmental zones are found at the contact sites of Parkin (16.7%) and Gordon (18.7%). These data suggest the hypothesis that an increase in physical stress or work load is associated with increased maize consumption during the contact portion of the Late Mississippian.

Spinal arthritis follows a similar pattern (Table 42). If the small (and biased) sample from Middle Nodena (3MS3) is not considered, the contact period Parkin (3CS29) site has the highest osteophytosis rate at 44.0%. In contrast, the SPLMV spinal arthritis rate is 52.9%, with the contact site, Gordon (3AS152), having the lowest rate among the sites with reasonably large sample sizes. This differential distribution of spinal stress suggests that changes in the activity patterning differs between the northern and southern portions of the Lower Mississippi Valley during the Late Mississippian. Although all groups share a common cultural heritage, the physical activity levels required by the subsistence practices appear to be different between the southern and northern portions of the area.

A similar pattern is shown by the trauma rates, which average 11.2% in the NPLMV and 3.6% in the SPLMV (Table 43). The contact Parkin site has the highest trauma rate of 28.6%, which is well above that from the large Upper Nodena sample. The Walnut Ridge (3MO61) site has one individual with an arrow or spear point embedded in the bone, while the other displays a healed compressed fracture of the forehead. At Clay Hill (3LE11), there is a male who had been shot twice with arrows. These data indicate that interpersonal violence occurred during both the prehistoric and contact components of the Late Mississippian in the NPLMV. In the SPLMV, trauma is highest at the contact Gordon (3AS152) site.

These data suggest the hypothesis that life became more arduous during the Late Mississippian and even more so during the contact period. Since all the evidence for interpersonal violence is found in the Late Mississippian, it is hypothesized that this was a time of great social stress and conflict.

The data clearly demonstrate that there was a significant decline in adaptive efficiency among the Late Mississippian populations. The average infection rate for the NPLMV is 73.6%, indicating that both susceptibility to disease and exposure to pathogenic organisms had increased significantly. Evidence for childhood stress is limited, but Parkin (3CS29) has a hypoplasia rate of 80% with childhood stress remaining high between 1.5 and 5.5 years of age (Murray 1985). This rate and the duration of the childhood stress are both much greater than that found at either Zebree (3MS20) or Wapanocca (3CT9).

There is evidence for increased maize consumption, which may be associated with a decline in the availability of more nutritious wild foods. This is one explanation for a decline in disease resistance. Pathogen contact can be increased by the accumulation of waste around living sites and increased contact between people. The aggregated settlement pattern characteristic of many of the Late Mississippians would produce both increased waste accumulation and frequent interpersonal contact.

The lowest infection rates are found at the contact sites of Parkin (3CS29), Greer (3JE50), Menard (3AR4), and Clay Hill (3LE11). This decline could be associated with some significant change in the subsistence settlement pattern and/or the arrival of European infectious diseases. The dietary reconstruction suggests that maize consumption increased; improvement in the quality of the diet is therefore unlikely. The concurrent settlement pattern data indicate a reduction in the size of the settlements. In the SPLMV, the pattern is similar to that of the contact Gordon site, which had one of the lowest infection rates. This comparison of the two areas further suggests the hypothesis that the primary reason for decreased infections in the NPLMV during the Late Mississippian at contact is the appearance of Old World viral infections. The diseases are acute and rarely impact the bone. Thus, the mortality rate would increase while the frequency of bone infections would decline. There is some support for the presence of Old World diseases in the study area. Tuberculosis has been diagnosed at the Parkin site (Murray 1985) and there is evidence for smallpox in the Ouachita Mountains just to the west.

Summary and Recommendations

There are no bioarcheological data available prior to the Baytown period and, thus, the analysis of skeletal series from any of the early periods in the northern portion of the Lower Mississippi Valley must have a high priority.

Despite the availability of paleopathological data, some stable carbon assays, and dental microwear data, there is a general dearth of bioarcheological data from all periods. Consequently, it is imperative that any mitigations involving skeletal material must require the collection of all bioarcheological data sets.

The most critical hypothesis to be tested in future research is establishing the dietary role of native domesticates during the Early Mississippi and earlier periods (i.e., Baytown, Late Marksville and Early Marksville). Both the time of initial introduction and the amount consumed need to be determined.

Determination of the adaptive efficiency level for the Baytown culture is crucial to understanding the changes which occurred during subsequent periods. In particular, the hypothesis of increasing childhood stress during the Baytown period requires testing. High quality Baytown bioarcheological data are required to serve as a base line for evaluating the impact of Mississippianization.

The hypothesis that maize did not play an important role in the subsistence system of the Early Mississippian culture requires extensive testing with data obtained during future research. A corollary hypothesis is the continuity of subsistence activities from the Baytown to the Early Mississippian cultures. If these hypotheses are supported, then the hypothesis that maize agriculture became an important part of the subsistence base during the Middle Mississippian culture must be tested.

The hypothesis that an increase in infection rates over time is the consequence of increasing settlement density can be tested once the subsistence practices have been determined for the Baytown, Early Mississippi, Middle Mississippi, and Late Mississippi periods.

The relationship between quantities of domesticated carbohydrates in the diet and the arthritis levels (i.e., work load stress) must be evaluated.

The presence and extent of interpersonal violence during the Late Mississippian must be established.

The presence of Old World infections during the contact component of the Late Mississippi must be established. In particular, demographic and disease models must be developed to recognize the contribution which these diseases made to the mortality pattern.

BIOARCHEOLOGY OF THE SOUTHERN PORTION OF THE LOWER MISSISSIPPI VALLEY

Introduction

This section draws upon two synthetic resources mentioned in the introduction to the preceding section (Rose et al. 1985; Rose et al. 1984) and upon a third publication, *Bioarcheology of the Powell Canal Site* (Blaeuer and Rose 1982), which provides additional comparative data for the Southern Portion of the Lower Mississippi Valley.

During the preparation of this overview, unpublished data were collected from the University of Arkansas Osteology files and new data were extracted from recent reports throughout the study area. These data are incorporated into this synthesis and interpretations were revised where appropriate. A listing of sites included in this section is presented in Table 44.

TABLE 44

SOUTHERN LOWER MISSISSIPPI VALLEY SITES WITH ANALYSES BY PERIOD, CULTURE, DRAINAGE, AND SITE TYPE

PERIOD AND CULTURE	ANALYSIS	DRAINAGE	SITE TYPE
LATE ARCHAIC LATE ARCHAIC			
Cowpen Slough (16CT147)	C	Lower Red	Cemetery
BAYTOWN TROYVILLE			
Gold Mine (16RI13)	C	Boeuf	Mound
Greenhouse (16AV2)	C	Lower Red	Mound
Mount Nebo F (16MA18)	C	Mississippi	Mound
Powell Canal (3CH14)	C	Mississippi	Habitation
EARLY COLES CREEK COLES CREEK			
Watts Field (3UN18)	D	Ouachita	Mound
Shallow Lake (3UN52)	C	Ouachita	Mound
Harrelson Landing (16CA13)	C	Ouachita	Mound
Saline Sand/Gravel (3BR40)	C	Ouachita	Habitation
EARLY MISSISSIPPI 1 COLES CREEK			
Mount Nebo A (16MA18)	C	Mississippi	Mound
St. Gabriel (16IV128)	C	Mississippi	Mound
EARLY MISSISSIPPI 2 LATE COLES CREEK			
Bangs Slough (3CA3)	C	Ouachita	Habitation
Little Mud Lake (3CA265)	C	Ouachita	Open
Hayes Field (3UN23)	C	Ouachita	Open
MIDDLE MISSISSIPPI PLAQUEMINE			
Boydell Mound (3AS58)	D	Bayou Barth	Mound
McArthur (3CH49)	C	Mississippi	Habitation

Late Archaic Period: Late Archaic Culture

This is the earliest period for which any degree of skeletal analysis exists in the southern portion of the Lower Mississippi Valley (SPLMV). Late Archaic culture is represented by a single mortuary sample from the Cowpen Slough site (16CT147). In a thorough analysis of this material, the oldest in Louisiana, Ramenofsky and Mires (1985) reported a normal demographic profile and provided an excellent review of what is presently known concerning analyses of cremated skeletal material. Despite the thoroughness of this report, poor preservation limited the collection of osteological data, and the Late Archaic period, including both Late Archaic and Poverty Point cultures, remains bioarcheologically unknown.

Tchula Period: Tchefuncte Culture

No curated mortuary samples and, consequently, no skeletal data exist for this early period in the SPLMV region. The Tchula period is bioarcheologically unknown.

Early Marksville Period: Early Marksville Culture

A single mortuary sample exists for the Early Marksville period in the SPLMV, but no skeletal analyses have been conducted. Consequently, no skeletal data exist for this early period in the SPLMV region. The Early Marksville period is bioarcheologically unknown.

Late Marksville Period: Issaquena Culture

A single small mortuary sample exists for the Late Marksville period in the SPLMV. No skeletal analysis has been performed and, consequently, like all of the preceding periods, the Late Marksville period is bioarcheologically unknown.

Baytown Period: Troyville Culture

The Baytown period is the first in the southern portion of the Lower Mississippi Valley for which an interpretable body of bioarcheological data exists. Before presenting the Baytown period data, the cultural and temporal placement of the Mount Nebo (16MA18) skeletal material requires discussion. The skeletons from Mount Nebo derive from mound stages A and F. The stage F individuals reported on here have been assigned to Late Troyville/Early Coles Creek circa 600–800 A.D. by John Belmont (personal communication to the authors in 1982) and are discussed in this overview with the Troyville material

TABLE 45

DENTAL CARIES PER PERSON
IN THE SOUTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	N	CARIES/ PERSON
BAYTOWN TROYVILLE			
Gold Mine (16RI13)	Walker 1980	89	1.1
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	0.5
		(93)	(1.1)
EARLY COLES CREEK COLES CREEK			
Shallow Lake (3UN52)	Powell 1981	2	2.0
EARLY MISSISSIPPI 1 COLES CREEK			
Mount Nebo (16MA18)	Giardino 1977	86	8.1
St. Gabriel (16IV728)	Giardino 1980b	7	3.0
EARLY MISSISSIPPI 2 LATE COLES CREEK			
Bangs Slough (3CA3)	UAO Files	1	2.0
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	0.0
		(2)	(1.0)
MIDDLE MISSISSIPPI PLAQUEMINE			
McArthur (3CH49)	UAO Files	3	0.33

TABLE 46

PERCENTAGES OF ADULT INFECTION
IN THE SOUTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	ADULT INFECTION N	%
BAYTOWN TROYVILLE			
Mount Nebo F (16MA18)	Giardino 1977	30	3.3
Gold Mine (16RI13)	Berg 1984	31	25.8
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	25.0
		(65)	(15.4)
EARLY COLES CREEK COLES CREEK			
Shallow Lake (3UN52)	Powell 1981	2	0.0
EARLY MISSISSIPPI 1 COLES CREEK			
Mount Nebo A (16MA18)	Giardino 1977	24	16.7
St. Gabriel (16IV128)	Giardino 1980b	7	42.8
EARLY MISSISSIPPI 2 LATE COLES CREEK			
Bangs Slough (3CA3)	UAO Files	1	0.0
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	0.0
		(2)	(0.0)
MIDDLE MISSISSIPPI PLAQUEMINE			
McArthur (3CH49)	UAO Files	3	66.7

from other sites. This placement appears to be the best fit. Belmont assigned the stage A individuals to either Middle to Late Coles Creek or Early Plaquemine. Because Giardino (1977) did not report his data by individual, the material assigned to a mound stage must be considered as a group. This material was placed within the Early Mississippi period for presentation here because this is the best fit for the estimated mean date.

The average caries rate for two Troyville culture sites is 1.1 caries per person (Table 45). This rate is similar to the Baytown culture caries rate in the northern portion of the Valley which is only 1.5 per person (Table 38). Although caries frequencies were not reported for Greenhouse (16AV2), severe caries (including at least two interproximal caries) were reported for one individual, and "many teeth display minor pitting due to caries" (Barnes and Frame 1981:33). This implies that the Troyville caries rates and, by inference, carbohydrate consumption could be higher than reported here.

Differences in patterns of dental attrition suggest the possibility that diets within Troyville may be highly variable. The Mount Nebo (16MA18) molars are characterized by very rapid and extreme dental attrition which produces an angled and cupped occlusal surface (Giardino 1977). This pattern is produced by a coarse and highly abrasive diet. Toothwear at Greenhouse (16AV2) was also described as "extreme" (Barnes and Frame 1981:33). Dental attrition at Gold Mine (16RI13) and Powell Canal (3CH14) differs from that at Mount Nebo by being less extreme and producing relatively flat occlusal surfaces. Scanning electron microscope (SEM) studies have shown that Gold Mine and Powell Canal molars are characterized as having a rough surface with large striations, numerous microstriations, a variable frequency of compression fractures, and variable moderate polishing (Blaeuer and Rose 1982). These data suggest that the Baytown diet was composed of foods coarsely processed with stone implements, minor amounts of minimally processed vegetable fiber, and seasonally available hickory nuts (Rose et al. 1985). No SEM data are available for Mount Nebo.

The Gold Mine and Powell Canal caries rates, dental attrition scores, and microwear patterns all suggest a coarse, low carbohydrate diet containing modest amounts of plant fiber and ample quantities of hickory nuts, but low quantities of carbohydrates (Rose et al. 1985). It is hypothesized that these populations followed a hunter–gatherer subsistence regime which did not include cultigens (native or tropical).

Dietary adequacy can be measured by a number of techniques, but the only data available are for infections and porotic hyperostosis. The average infection rate for three Troyville culture sites is 15.4 (Table 46). Infection rates for Mount Nebo (16MA18) (3.3%) are significantly lower than those for Gold Mine (16RI13) and Powell Canal (3CH14) (25%), which are virtually identical. This suggests the possibility of greater protein intake and, consequently higher resistance to disease at Mount Nebo. These differences may be due to the Mount Nebo stage F individuals being later in time than those from Gold Mine and Powell Canal. Whatever the explanation for this discrepancy of infection rates between sites, the combined infection rate at Gold Mine and Powell Canal (25.7%) is essentially the same as the Baytown culture sites (23.3%) in the northern portion of the Valley (Table 39). The highest rates in the Troyville culture sample are still at the upper end of the acceptable range and indicate adequate nutrition. In addition, no porotic hyperostosis was reported (Table 47). Lacking a more suitable body of data with which to test dietary hypotheses, the existing data show no evidence of dietary deficiency, and dietary adequacy is tentatively assumed.

In the absence of more diverse data sets, lifeway reconstruction is inferred from patterned frequencies of osteoarthritis (arthritis of the major joints), osteophytosis (spinal arthritis), and traumatic lesions, such as fractures and wounds.

The average Troyville culture osteoarthritis rate of 44% (Table 48) is substantially higher than that reported for a comparable Baytown culture site (12%) in the NPLMV (Table 41), and is broadly indicative of an arduous lifestyle. Once again the difference in the Mount Nebo stage F (16MA18) material should be noted. Similar, though less striking, patterns prevail for osteophytosis and trauma. The average osteophytosis rate for Troyville culture is 28.7% (Table 49), which is slightly higher than for comparable Baytown culture sites (22.6%) in the NPLMV (Table 42). The trauma frequencies are also slightly higher for the Troyville culture (14.2%) in the south (Table 50), than for the Baytown culture (10.7%) in the north (Table 43). Overall, life in the southern portion of the Valley appears to be slightly more physically demanding than in the north, which may be associated with a heavier workload required by subsistence strategies.

In addition to these differences noted between the northern and southern portions of the Lower Valley, distinctively different patterns of physical stress can be detected between sites within the Troyville culture sample. Osteoarthritis rates are lowest at Mount Nebo (16MA18) (8.3%). Osteophytosis rates are moderate to high at Mount Nebo (33%) and Greenhouse (16AV2) (42.1%). Trauma rates are similar and low at both Mount Nebo (15%) and Greenhouse (11%). The data from these two sites describe a pattern of physical activity that involves minimal stress on the major joints of the limbs, but moderately intense lower back stress. The majority of traumatic lesions were minor healed fractures. One wound was located when x-ray revealed an Alba point embedded in a synostosis of the left tibia and fibula of an adult female from Mount Nebo (Giardino 1982). The woman didn't die of the injury, but there is no way to determine whether the injury was accidental or violent in nature. Alba points have been interpreted as the first evidence of the presence of the bow and arrow in Louisiana (Giardino 1982:115). What effect this new technology had on hunting practices and interpersonal relationships is presently unknown.

At Gold Mine (16RI13), the overall pattern of physical stress is reversed. Gold Mine has the highest frequency of osteoarthritis (74.2%) and the lowest frequency of osteophytosis (20.4%), while no trauma data have been collected. These frequencies suggest a pattern of regular and intense physical activity that severely stressed the major joints without producing undue stress to the lower back.

At Powell Canal (3CH14) the osteoarthritis rate (25%) is intermediate, relative to the other sites; osteophytosis (50%) and trauma (25%) are higher than at either of the other two sites. However, these frequencies are all inflated by the small sample size of the Powell Canal series and cannot be reliably interpreted (Blaeuer and Rose 1982).

Taken together, these data suggest the hypothesis that more arduous lifestyles prevailed, at least for some sites, in the southern portion of the Lower Valley during the Baytown period. The particular patterns of physical activity differ among the sites discussed. Markedly more intense patterns of physical stress to the major joints are noted for the Gold Mine (16RI13)

TABLE 47

PERCENTAGES OF ADULT POROTIC HYPEROSTOSIS IN THE SOUTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	POROTIC HYPEROSTOSIS N	%
BAYTOWN TROYVILLE			
Mount Nebo F (16MA18)	Giardino 1977	30	0.0
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	0.0
		(34)	(0.0)
EARLY MISSISSIPPI 1 COLES CREEK			
Mount Nebo A (16MA18)	Giardino 1977	24	0.0
St. Gabriel (16IV128)	Giardino 1980b	(?)	0.0
EARLY MISSISSIPPI 2 LATE COLES CREEK			
Bangs Slough (3CA3)	UAO Files	1	0.0
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	0.0
Hayes Field (3UN23)	UAO Files	1	0.0
		(3)	(0.0)
MIDDLE MISSISSIPPI PLAQUEMINE			
McArthur (3CH49)	UAO Files	3	33.3

TABLE 48

PERCENTAGES OF ADULT OSTEOARTHRITIS IN THE SOUTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	OSTEOARTHRITIS N	%
BAYTOWN TROYVILLE			
Mount Nebo F (16MA18)	Giardino 1977	24	8.3
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	25.0
Gold Mine (16RI13)	Berg 1984	31	74.2
		(59)	(44.0)
EARLY MISSISSIPPI 1 COLES CREEK			
Mount Nebo A (16MA18)	Giardino 1977	30	0.0
St. Gabriel (16IV128)	Giardino 1980b	7	0.0
		(37)	(0.0)
EARLY MISSISSIPPI 2 LATE COLES CREEK			
Bangs Slough (3CA3)	UAO Files	1	0.0
MIDDLE MISSISSIPPI PLAQUEMINE			
McArthur (3CH49)	UAO Files	3	66.7

TABLE 49

PERCENTAGES OF ADULT OSTEOPHYTOSIS
IN THE SOUTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	OSTEOPHYTOSIS N	%
BAYTOWN TROYVILLE			
Powell Canal (3CH14)	Blaeuer and Rose 1982	2	50.0
Greenhouse (16AV2)	Barnes and Frame 1981	19	42.1
Mount Nebo F (16MA18)	Giardino 1977	24	33.3
Gold Mine (16RI13)	Berg 1984	49	20.4
		(94)	(28.7)
EARLY COLES CREEK COLES CREEK			
Sand and Gravel (3BR40)	UAO Files	2	50.0
Shallow Lake (3UN52)	UAO Files	2	50.0
Harrelson (16CA13)	Hrdlicka 1909	4	100.0
		(8)	(75.0)
EARLY MISSISSIPPI 1 COLES CREEK			
Mount Nebo A (16MA18)	Giardino 1977	30	0.0
St. Gabriel (16IV128)	Giardino 1980b	4	50.0
		(34)	(5.9)
EARLY MISSISSIPPI 2 LATE COLES CREEK			
Bangs Slough (3CA3)	UAO Files	1	0.0
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	100.0
		(2)	(50.0)
MIDDLE MISSISSIPPI PLAQUEMINE			
McArthur (3CH49)	UAO Files	3	100.0

TABLE 50

PERCENTAGES OF ADULT TRAUMA
IN THE SOUTHERN LOWER MISSISSIPPI VALLEY

PERIOD AND CULTURE	REFERENCE	ADULT TRAUMA N	%
BAYTOWN TROYVILLE			
Mount Nebo F (16MA18)	Giardino 1977 [1 wound]	20	15.0
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	25.0
Greenhouse (16AV2)	Barnes and Frame 1981	19	11.0
		(43)	(14.2)
EARLY COLES CREEK COLES CREEK			
Harrelson Landing (16CA13)	Hrdlicka 1909	6	66.7
Shallow Lake (3UN52)	UAO Files	2	0.0
		(8)	(50.0)
EARLY MISSISSIPPI 1 COLES CREEK			
Mount Nebo A (16MA18)	Giardino 1977	28	3.5
St. Gabriel (16IV128)	Giardino 1980b	7	0.0
		(35)	(2.9)
EARLY MISSISSIPPI 2 LATE COLES CREEK			
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	0.0
MIDDLE MISSISSIPPI PLAQUEMINE			
McArthur (3CH49)	UAO Files	3	33.3

site, where dental caries and toothwear analyses argue for a hunter–gatherer subsistence regime. Spinal arthritis rates at Mount Nebo (16MA18) and Greenhouse (16AV2) approach the rates reported for Late Mississippian agriculturalists in the NPLMV. More detailed and extensive analyses from large skeletal samples are needed to adequately test these hypotheses.

Adaptive efficiency is an approximate measure of how well the culture has adapted its participants to the environment. As mentioned previously, while a disparity exists between the lowest and highest infection rates within the sample, the average Troyville infection rate is low, at 15.4% (Table 46), indicating good adaptive efficiency. The highest rate within the sample (25.8%) is still within the acceptable range. Enamel hypoplasias are excellent indicators of childhood stress. The systematic collection of these data is a recent phenomenon and reliable numerical data are few. However, preliminary data exist for two sites. Hypoplasia frequencies for four individuals at Powell Canal (3CH14) are 3.0 per individual and 0.27 per each one-half-year period of childhood growth (Blaeuer and Rose 1982). The Powell Canal sample is small and the hypoplasia rate is inflated by one burial that alone contributed 42% of the total number. Still, these rates are only one third of those reported for burials at Little Cypress Bayou (3CT50), in the northern portion of the Valley, where higher than normal childhood stress is hypothesized. One individual at Greenhouse (16AV2) displayed hypoplastic lesions indicative of two or three stress episodes; hypoplasias observed on other individuals were minor in comparison (Barnes and Frame 1981). Though the examination of stress indicators was made difficult by the nature of the Greenhouse remains, severe stress was not indicated (Barnes and Frame 1981). Collectively, the low levels of infection and childhood stress suggest a high level of adaptive efficiency.

To summarize, we possess sufficient bioarcheological data to formulate preliminary hypotheses concerning diet and lifeways for the Baytown period. The data examined here argue that the subsistence strategy appears to provide adequate nutrition for normal health and resistance to disease. A high degree of adaptive efficiency is indicated by low levels of infection and childhood stress, although these data are minimal. The subsistence strategy represents a more arduous lifestyle than is postulated for comparable groups in the NPLMV. This lifeway appears to represent a continuation of hunting and gathering practices that evolved out of the Archaic.

Early Coles Creek Period: Coles Creek Culture

From a bioarcheological perspective, the Coles Creek period of the southern portion of the Lower Mississippi Valley is poorly understood. The only caries data for this period indicate a rate of 2.0 caries per person (Table 45), which is the precise division point between low and high carbohydrate consumption. No toothwear data are available. An infection rate of 0.0 is derived from the same sample (Table 46). No data are available for porotic hyperostosis. The Coles Creek diet is essentially unknown.

Lifeway reconstruction is also based on a small sample. No arthritis rates have been reported. The osteophytosis rate is high at 75% (Table 49) for three sites in the Ouachita drainage. The average trauma rate is also high at 50%, but all traumatic episodes occur at one site (Table 50). It is significant that the highest rates in both categories occur at Harrelson Landing (16CA13), where all of the reported lesions were found on four adult females who ranged in age from young to old. The traumatic lesions were identified as parry fractures, fractures to the lower arm bones which often occur when the arms are raised in self defense to protect the face and body from physical assault. Multiple cases of parry fractures in a population can be interpreted as evidence of violence, in this instance a specific kind, interpersonal violence perpetrated against women. The only hypothesis that can be offered is that interpersonal strife is indicated for the Coles Creek culture, at least in the Ouachita drainage.

Levels of adaptive efficiency cannot be estimated from the data at hand, although an infection rate of 0.0 for two individuals is acknowledged (Table 46).

The paucity of data for the Coles Creek period represents a major deficiency in the bioarcheological data base. All significant curated collections are analysed. Indeed, apart from the data presented here, no Coles Creek period analyses exist for any portion of the entire Lower Mississippi Valley, from northeast Arkansas to the Gulf coast, because no adequate material exists in the curated resource base. The excavation, curation, and thorough analysis of Coles Creek skeletal remains should be a high priority in future investigations.

Early Mississippi Period 1: Coles Creek Culture

The first portion of the Early Mississippian period is represented by two Coles Creek culture skeletal series in the Mississippi drainage (i.e., Mount Nebo, 16MA18 and St. Gabriel, 16IV128). The Mount Nebo stage A material is placed here despite the fact that it contains Early Plaquemine individuals whose data cannot be sorted out. Mount Nebo and St. Gabriel will be discussed separately because of the mixture of individuals at Mount Nebo.

Clearly, Mount Nebo stands apart with an unusually high caries rate of 8.1 (Table 45), well within the agricultural carbohydrate consuming range, and with a distinctive cupped toothwear pattern indicating a coarse, highly abrasive diet. Typically these traits are incompatible. Strict hunter–gatherers customarily exhibit few dental caries (less than 2.0 per person) and extensive toothwear. Carbohydrate consumers typically exhibit caries rates in excess of 2.0 per person and comparatively moderate toothwear. Since there is no evidence of maize agriculture in the Lower Valley at this early date, yet substantial carbohydrate consumption is indicated by the dental caries data, the native cultigen hypothesis is proposed to explain the Mount Nebo anomalie. Rose and co-workers (1985:IV, 32) suggested that the carbohydrates were derived from large quantities of such native (possibly cultivated) starchy seeds as maygrass, knotweed, and goosefoot, rather than maize. The small size of these seeds and their hard seed coats would require extensive grinding. The rock flour from the grinding implements and seed coat particles would produce a very abrasive food, which could explain the extensive, distinctively cupped, patterns of toothwear. (Rose et al. 1985). This hypothesis must be extensively testedwith adequate skeletal samples. In conjunction with the collection of basic data, scanning electron microscope and stable carbon isotope analyses are required to firmly establish the presence and identity of cultigens in the diet.

A caries rate of 3.0 per person is reported for the St. Gabriel (16IV128) site (Table 45). This rate passes the 2.0 caries per person Rubicon which indicates moderate carbohydrate consumption. This rate also signals a significant increase in carbohydrate consumption similar to Mount Nebo, but not as great. Extensive toothwear, reported for most individuals at this site (Giardino 1980), also suggests a similarity to Mount Nebo.

The Mount Nebo (16MA18) infection rate increased to 16.7% (Table 46), which is similar to the earlier Troyville culture average (15.4%) but significantly higher than for the earlier Troyville Mount Nebo component (3.3%). This suggests some local variation has occurred in the adequacy of the Mount Nebo diet between the Baytown and Early Mississippian periods. This change might indicate a decline in protein intake, which is associated with decreased levels of resistance to disease. The change could also be related to altered settlement patterns, population increase, or other factors that result in elevated levels of social stress. The increased infection rate is still within the acceptable range and there is no evidence of porotic hyperostosis (Table 47). Thus, there is no solid evidence for dietary inadequacy, but there is evidence to suggest a subtle change in the level of dietary adequacy.

The moderately high infection rate for St. Gabriel (16IV128) (42.8%) suggests inadequate levels of protein in the diet, which results in lower disease resistance. No porotic hyperostosis, and thus, no evidence of anemia is reported for this site (Table 47), which suggests dietary iron was adequate. In the northern portion of the Lower Mississippi Valley, suspected starchy seed consumers exhibit moderate infection rates but no porotic hyperostosis. Among the Late Mississippi maize consumers in the northern portion of the Valley, moderate to high infection rates are correlated with some degree of anemia that results from an iron poor maize diet. The St. Gabriel data tentatively support the “starchy seed” hypothesis.

A change in lifeways is also indicated for Mount Nebo (16MA18). During the Early Mississippi period, Coles Creek osteoarthritis dropped to 0.0% (Table 48), osteophytosis dropped to 0.0 (Table 49), and, trauma dropped to 3.5% (Table 50). These frequencies indicate that patterns of physical activity were radically altered, in the direction of decreased physical stress, by the later period. The change is most notable for osteophytosis, which dropped by 33% between the Baytown and Early Mississippi periods. In brief, there was a significant change in the activity patterns associated with arthritis.

A slight decline in adaptive efficiency is indicated by the increased infection rate, but, since this rate is within the acceptable range, and additional data are not available, no change in adaptive efficiency is hypothesized. In summary, comparisons between Baytown and Early Mississippi populations from Mount Nebo suggest the following hypotheses: 1) no significant change occurred in dietary adequacy, although protein intake may have declined slightly during the Early Mississippi period; and 2) patterns of physical stress, particularly lower back stress, declined dramatically in the Early Mississippi period. It would appear that either the physical demands related to subsistence were reduced by Early Mississippi times, or the patterns of physical stress observed in the earlier Baytown sample were related to activities other than subsistence. The fact that arthritis totally disappeared from this population in the later period provokes the alternative hypothesis that this particular mortuary sample represents a segment of the population that was not involved in food producing activities.

Lifeway reconstruction is also considered separately for St. Gabriel. No osteoarthritis was reported for St. Gabriel (Table 48), but osteophytosis (spinal arthritis) was reported for 50% of the sample (Table 49). This suggests a pattern of physical activity that produces minimum stress on the major joints and maximum stress on the lower back. No trauma was reported (Table 50). This pattern of physical stress has been observed for other populations in the northern and southern Lower Valley, where it is thought to be associated with increased agricultural subsistence activities. This hypothesis must be tested with additional data.

The moderately high infection rate at St. Gabriel (42.8%) suggests a substantially lower level of adaptive efficiency than is indicated for Mount Nebo (Table 46). This may be related to lower intake of protein in the diet or higher levels of stress.

In summary, the pattern of bioarcheological data for St. Gabriel suggests moderate consumption of carbohydrates, an abrasive diet, significant lower back stress, and a possible protein deficiency that resulted in decreased resistance to disease.

We propose that the subsistence strategy included the cultivation of native domesticates. While the caries rates for these two sites are well within the range indicative of maize agriculture, there are no data indicating the presence of maize.

Extensive analyses of large skeletal samples are required to test the hypotheses suggested by these data. These analyses must include SEM, stable carbon isotope, and trace element studies. Specifically, the following hypotheses require immediate testing: 1) maize was not a component of the Coles Creek diet; 2) native seeds (possibly domesticates) were collected or cultivated and included as dietary staples at some sites; and 3) distinctive patterns of physical stress are associated with the practice of agriculture.

Early Mississippi Period 2: Late Coles Creek Culture

The later portion of the Early Mississippi period is represented by minimal data for a few individuals from three sites in the Ouachita drainage (Table 44).

A caries frequency of 1.0 per person is reported for two individuals, indicating low carbohydrate consumption (Table 45). One individual displayed moderate dental attrition and a pattern of oral health associated with abrasive hunting and gathering diets (Mires and Owsley 1984:565). No additional data are available.

Dietary adequacy cannot be reliably inferred for this small sample of individuals, however, no infection (Table 46) and no porotic hyperostosis (Table 47) were observed.

Lifeway reconstruction is not feasible with this small sample. No arthritis was reported for one individual (Table 48). The average osteophytosis rate is 50% (Table 49), for two individuals. No trauma was observed (Table 50), for one individual.

Adaptive efficiency can be inferred only for the individual from Little Mud Lake (3CA265). Though no infection was observed (Table 46), repeated episodes of metabolic stress were indicated by the presence of both enamel hypoplasias and transverse lines (Mires and Owsley 1984). This suggests a moderate degree of childhood stress, a more significant amount than has been indicated for any other culture yet discussed in the southern portion of the Valley.

In summary, little is known about Late Coles Creek culture. Osteological data are lacking in all categories. No large skeletal series have been curated or examined. Since no additional skeletal samples are available in the curated resource base, the mitigation of Early Mississippian sites in the southern Lower Valley must provide for the complete excavation, curation and thorough analyses of all skeletal materials encountered. These analyses must include SEM, stable carbon isotope, and trace element studies, among others.

Middle Mississippi Period: Plaquemine Culture

Apart from the Boydell Mound (3AS58) series, which provides nothing beyond demographic data, Plaquemine culture in the Lower Mississippi Valley is represented by a single sample of three adults and five children from the McArthur site (3CH49). This sample is unique in several respects. The burials were dug near an isolated habitation. All three adults suffered major crippling disabilities. One was deaf, one had Paget's disease, one walked with a limp, and all had extensive arthritis and a variety of pathologies. One child lived to be 1 to 2 years of age. The other children died within six months after birth. This population may represent an example of the prehistoric poor and disabled. They represent a portion of the mortuary segment that does not show up in mounds or cemeteries because they are not full participants in society.

Though the data are presented for the three adults in this series, the sample is too unique to be meaningfully interpreted within a diachronic framework. The Middle Mississippi period and the Plaquemine culture remains bioarcheologically unknown.

Late Mississippi Period: Late Plaquemine Culture

No curated skeletal series exist for the Late Plaquemine culture in the southern Lower Mississippi Valley region. Consequently, no data are available and the Late Plaquemine culture is bioarcheologically unknown.

Late Mississippian Period: Protohistoric Plaquemine Culture

No curated skeletal series exist for Protohistoric Plaquemine culture in the southern Lower Mississippi Valley region. Consequently, no data are available, and the Protohistoric Plaquemine culture is bioarcheologically unknown.

Summary and Recommendations

In the southern portion of the Lower Mississippi Valley, there are no bioarcheological data available prior to the Baytown period. Although the Baytown period bioarcheological data are well suited to the formulation of preliminary hypotheses, the sample size is insufficient for adequate hypothesis testing. The Early Coles Creek period sample is too small to be meaningfully interpreted within a diachronic framework. The Early Mississippi period Coles Creek sample is adequate for hypothesis formulation, but only for two sites. The Early Mississippi Late Coles Creek sample is too small to be meaningfully interpreted. Consequently, the spectrum of Coles Creek culture is bioarcheologically unknown. There are no bioarcheological data for the ensuing Middle Mississippi Plaquemine culture or for the Late Mississippi Plaquemine and Protohistoric Plaquemine cultures. Thus, the spectrum of Plaquemine culture is also bioarcheologically unknown.

The derivation, testing, and refinement of key hypotheses requires extensive analyses of large, temporally documented, demographically representative skeletal samples. Most of the curated collections have been studied and the remaining curated resources are insufficient for this task, even if all were thoroughly analysed. For this reason, the mitigation of sites containing a mortuary component must require complete excavation, curation, and analysis of all skeletal material.

The extant bioarcheological data base in the Lower Valley has generated preliminary hypotheses for only two periods: Baytown and Early Mississippi. Despite the merit of this fact, there is a pervasive lack of consistent data in all categories (dietary reconstruction, dietary adequacy, lifeway reconstruction and adaptive efficiency). Perhaps the most significant omission is the total absence of stable carbon isotope studies in the southern Lower Valley. The systematic collection of comparable basic skeletal data sets must be a high priority in all analyses. Consequently, it is imperative that any mitigations involving skeletal remains must require the collection of all bioarcheological data sets, including, but not limited to, scanning electron microscopy, stable carbon isotopes values, and trace element assays.

The cardinal hypotheses suggested for immediate testing in the southern Lower Mississippi Valley are: 1) to establish the presence or absence of domesticates in the diets of Coles Creek peoples; 2) to establish the presence or absence of tropical cultigens in the Coles Creek diet; 3) to establish relative proportions of protein and carbohydrates in Troyville and Coles Creek diets; 4) to examine dietary adequacy for these cultures; S) to establish the relationship between subsistence practices and patterns of physical stress for these cultures; 6) to evaluate adaptive efficiency for these cultures; and 7) to test for differential subsistence patterns between large and small sites and ceremonial and nonceremonial sites in the Troyville and Coles Creek cultures.

BIOARCHEOLOGY OF GULF COASTAL LOUISIANA

Introduction

The Louisiana Gulf Coastal region is poorly understood from a bioarcheological point of view. Sound bioarcheological data are rare and sparse for this region and no previous

TABLE 51

GULF COASTAL LOUISIANA SITES WITH ANALYSES BY PERIOD, CULTURAL AFFILIATION, DRAINAGE, AND SITE TYPE

PERIOD AND CULTURE	ANALYSIS	DRAINAGE	SITE TYPE
LATE ARCHAIC LATE ARCHAIC COASTAL			
Copell (16VM102)	C	West Gulf	Shell Midden
TCHULA COASTAL TCHEFUNCTE			
Bayou Sorrel (16IV4)	C	Atchafalaya	Mound
Lafayette Mounds (16SM17)	C	Atchafalaya	Mound
Little Woods (16OR1)	C	Pontchartrain	Shell Midden
Big Oak Island (16OR6)	C	Pontchartrain	Shell Midden
Tchefuncte (16ST1)	C	Pontchartrain	Shell Midden
EARLY MARKSVILLE COASTAL MARKSVILLE			
Big Oak Island (16OR6)	C	Pontchartrain	Shell Midden
LATE MARKSVILLE COASTAL ISSAQUENA			
Coquille (16JE37)	C	Mississippi	Unknown
EARLY COLES CREEK COASTAL COLES CREEK			
Veazey (16VM7)	D	West Gulf	Mound
Morgan (16VM9)	D	West Gulf	Mound
EARLY MISSISSIPPI COASTAL COLES CREEK			
Bowie (16LF17)	D	B. La Fourche	Mound
Mulatto Bayou (16SB12)	D	Pontchartrain	Shell Midden
Morton Shell Mound (16IB3)	C	West Gulf	Shell Midden
LATE MISSISSIPPI COASTAL PLAQUEMINE			
Bowie (16LF17)	D	B. La Fourche	Mound

TABLE 52

DENTAL CARIES PER PERSON
IN THE LOUISIANA GULF COASTAL REGION

PERIOD AND CULTURE	REFERENCE	N	CARIES/ PERSON
TCHULA COASTAL TCHEFUNCTE			
Bayou Sorrel (16IV4)	Hrdlicka 1913	16	0.8
Little Woods (16OR1–5)	Snow 1945	9	0.0
Lafayette (16SM17)	Snow 1945	3	0.0
Tchefuncte (16ST1)	Snow 1945	8	0.0
Big Oak (16OR6)	Snow 1945	1	0.0
		(37)	(0.3)

TABLE 53

PERCENTAGES OF ADULT INFECTION
IN THE LOUISIANA GULF COASTAL REGION

PERIOD AND CULTURE	REFERENCE	ADULT INFECTION N	%
TCHULA COASTAL TCHEFUNCTE			
Lafayette Mound (16SM17)	Snow 1945	3	66.0
EARLY MISSISSIPPI COASTAL COLES CREEK			
Morton Shell (16IB3)	Robbins 1977	201	20.0
LATE MISSISSIPPI COASTAL PLAQUEMINE			
Bowie (16LF17)	Smith 1983	3	33.3

TABLE 54

PERCENTAGES OF ADULT POROTIC HYPEROSTOSIS
IN THE LOUISIANA GULF COASTAL REGION

PERIOD AND CULTURE	REFERENCE	POROTIC HYPEROSTOSIS N	%
TCHULA COASTAL TCHEFUNCTE			
Big Oak (16OR6)	Helis 1986	8	0.0
Lafayette Mound (16SM17)	Snow 1945	3	0.0
Little Woods (16OR1)	Snow 1945	9	0.0
Tchefuncte (16ST1)	Snow 1945	7	0.0
		(27)	(0.0)
EARLY MARKSVILLE COASTAL MARKSVILLE			
Big Oak (16OR6)	Helis 1986	35	0.0

TABLE 55

PERCENTAGES OF ADULT OSTEOARTHRITIS
IN THE LOUISIANA GULF COASTAL REGION

PERIOD AND CULTURE	REFERENCE	OSTEOARTHRITIS N	%
LATE MISSISSIPPI COASTAL PLAQUEMINE			
Bowie (16LF17)	Smith 1983	3	33.3

TABLE 56

PERCENTAGES OF ADULT OSTEOPHYTOSIS
IN THE LOUISIANA GULF COASTAL REGION

PERIOD AND CULTURE	REFERENCE	OSTEOPHYTOSIS N	%
LATE MISSISSIPPI COASTAL PLAQUEMINE			
Bowie (16LF17)	Smith 1983	3	33.0

synthesis of these data has been attempted. This section will follow the format established in the preceding sections of this chapter, but an additional effort will be made to extract data from a series of reports that vary considerably in analytical focus, quality, utility, and scope.

Late Archaic Period: Coastal Late Archaic and Poverty Point Cultures

From a bioarcheological perspective, this highly significant early period in Louisiana Gulf Coastal prehistory is entirely unknown. Minimal osteological data are reported for a single skeletal series excavated in 1926 at the Copell site (16VM102) on Pecan Island, in the West Gulf drainage (Table 51).

Hrdlicka (1940) provided basic demographic data, cranio–facial measurements and indices for 33 individuals, including 20 adult males and 13 adult females. Male age ranged from 50 to 75 years with a mean age of 63.5 years; while female age ranged from 20 to 65 years with a mean age of 46.2 years (Hrdlicka 1940; Snow 1945). The skulls were undeformed and showed no pathological lesions (Collins 1927), but none of the poorly preserved postcranial remains were ever studied (Snow 1945). No reliable bioarcheological data can be derived from these reports.

Subsistence data and artifactual recovery from nearby sites in this region suggest competing hypotheses concerning food procurement strategies, preparation techniques, and consumption practices (see Byrd and Neuman 1978). Long standing questions exist concerning settlement patterns, exchange networks, Mesoamerican influences, and burial customs (see Steponaitis 1986; Neuman 1984). These research domains are ideally suited to bioarcheological inquiry, but representative skeletal samples must be made available for analysis so that baseline data can be collected and hypotheses can be generated. Since this material does not exist in the curated resource base, this early period must be targeted for maximum recovery and analysis of human skeletal remains. This is particularly urgent in the coastal regions where site destruction is all but absolute.

Tchula Period: Coastal Tchefuncte Culture

The Tchula period is poorly understood. Analyses for five Coastal Tchefuncte sites (Table 51) comprise the extant

TABLE 57

PERCENTAGES OF ADULT TRAUMA
IN THE LOUISIANA GULF COASTAL REGION

PERIOD AND CULTURE	REFERENCE	ADULT TRAUMA N	%
TCHULA COASTAL TCHEFUNCTE			
Big Oak (16OR6)	Helis 1986	17	0.0
EARLY MARKSVILLE COASTAL MARKSVILLE			
Big Oak (16OR6)	Helis 1986	35	2.9
LATE MISSISSIPPI COASTAL PLAQUEMINE			
Bowie (16LF17)	Smith 1983	3	33.0

bioarcheological knowledge of the Tchula period in the entire study area.

Dietary reconstruction is made difficult because dental data are rarely reported in quantitative form. In all but one instance (Hrdlicka 1913), dental carie frequencies were reported in unquantifiable terms such as “no caries were observed” (Snow 1945) and “few caries were observed” on any of the specimens (Helis 1986). The only feasible interpretation of subjectively reported data is to err on the conservative end of the spectrum. Since the actual number of individuals observed and the number of caries observed cannot be known, the maximum number of individuals in the sample is taken as the denominator and the lowest caries frequency is accepted as the numerator. Given this caveat, a cumulative average rate of 0.3 caries per person can be computed for five Tchefuncte samples (Table 52). This rate is indicative of a diet that is low in processed carbohydrates. Toothwear was reported as “advanced” (Hrdlicka 1913), “extreme” (Snow 1945), and “heavy” (Helis 1986), suggesting a highly abrasive diet, possibly related to the consumption of shellfish contaminated with grit and sand.

Dietary adequacy is difficult to evaluate due to the caveat mentioned above and to sampling problems that limit accurate data collection. The infection rate of 66% (Table 53) reported for Lafayette Mound (16SM17) suggests possible protein deficiency in the diet, and concomitantly lower resistance to disease, but this rate could be an artifact of the small sample size. Lacking more reliable information, this will serve as a baseline.

Infection rates for Big Oak Island (16OR6) cannot be directly compared to this percentage. Due to the highly fragmented nature of those collections and the complexity of the mortuary program at Big Oak, the infection rates were presented as percentages of total identifiable bone fragments, rather than as the percentage of individuals who could have exhibited at least one infection (Fertel 1985; Helis 1986). Consequently, there is no way to determine whether these rates are high or low. However, since both researchers studied two temporally sequential cultures (Coastal Tchefuncte and Coastal Marksville), internal comparisons of their data are possible.

In a Coastal Tchefuncte sample, Fertel (1985) identified infectious lesions on 41 of 6,674 bone fragments (0.66%). Helis (1986) identified infectious lesions on 30 of 4,038 bone fragments (0.74%). The majority of these lesions were minor infections on adult leg bones. As will be seen in the next section, Fertel’s infection rate remained the same for the later Marksville sample; but Helis’s infection rate almost doubled in the Marksville sample. This tentatively implies a higher level of dietary adequacy for the Tchefuncte relative to the Marksville culture. There was no evidence of porotic hyperostosis in either sample, suggesting the diet supplied adequate amounts of iron (Table 54). The pervasive pitting of the skull, reported by Snow (1945) and sometimes misinterpreted as porotic hyperostosis, was not observed by Helis (1986) or Fertel (1985).

Infant mortality rates are lower for Tchefuncte culture (12%) than for the later Marksville culture (18.7%). Subadult (under 5 years of age) mortality rates are three times lower for Tchefuncte (12%) than for the later Marksville culture (35.4%) (Fertel 1985). Taken together the data suggest that diet was more adequate in Tchefuncte culture, relative to Marksville.

Inference concerning lifeway reconstruction is limited. Because there are no data for arthritis, we know nothing about patterns of physical stress in Tchefuncte populations. The absence of traumatic lesions (Table 57) in a sample of eight adults suggests that aggression might have been uncommon in this group (Helis 1986). The absence of “cut marks” suggests that defleshing prior to burial must have been accomplished by natural decomposition (Helis 1986).

Estimates of adaptive efficiency are also problematic, given the nature of the data. As will be seen, infection rates and subadult mortality increase in the Marksville period. Hypothetically, it is reasonable to suggest that Tchefuncte culture was characterised by a higher level of adaptive efficiency than the succeeding Marksville.

In summary, low caries frequencies and heavy toothwear indicate a dietary regime that was probably low in carbohydrates and included abrasive particles or accidental contaminants that accrued from an, as yet, unidentified source, possibly shellfish. Dietary adequacy cannot be evaluated on the basis of the available data, but was presumably superior in Tchefuncte culture, relative to Marksville.

Though the “shellfish consumption” hypothesis is attractive and logical given that most of these sites are shell middens, it has not been adequately tested with systematically collected dental and skeletal data. Though shellfish were undoubtedly included in the diet, the amounts consumed and the relative proportions of other dietary components consumed are presently unknown.

Subsistence data derived from a Tchefuncte component at the nearby Morton Shell Mound site, on Weeks Island, indicate that the Tchefuncte people hunted deer, muskrat, raccoon, opossum, mink, rabbit, geese, crane, swan, ducks, turkey, and alligator; collected turtles; caught bowfin, catfish, drum, gar, sheepshead, bass, sunfish, crappie; and gathered large quantities of the local, brackish water mollusk, *Rangia* (Byrd and Neuman 1978:15). The presence of non-dietary tropical cultigens (squash and bottle gourd) attests that agriculture was practiced to some extent at this early date. The role of cultigens (tropical and native) in the Tchefuncte diet remains unknown.

Indeed, despite the number of analyses available, little is known about the diet, lifeways, or adaptive efficiency of Tchefuncte culture. This represents a major deficiency in the bioarcheological data base. While the above mentioned skeletal collections do exist among the curated resources, all Tchefuncte remains reported upon are poorly preserved and/or highly fragmented. In addition, the older series (Snow 1945) consist primarily of adult skulls. This period must be targeted for maximum recovery and analysis of representative skeletal samples.

Early Marksville Period: Coastal Marksville Culture

The analysis of two skeletal series excavated at Big Oak Island (16OR6) (Fertel 1985; Helis 1986) also contain all of the known osteological data for Coastal Marksville culture.

The Coastal Marksville diet is not well known. Helis's (1986) Marksville sample resembles the earlier Tchefuncte sample exhibiting few dental caries, heavy toothwear, and a high frequency of periodontal disease. Thus, no change in diet from the preceding Tchefuncte culture is hypothesized.

Dietary adequacy is difficult to measure, given the limitations of the data discussed in the preceding section. As was previously mentioned, the distribution of infections within these populations (the number of individuals with infectious lesions) could not be determined; infections were therefore expressed as a percentage of the total number of bone fragments.

In a Marksville sample, Fertel (1985) identified infectious lesions on 91 of 13,692 bone fragments (0.66%). This is identical to his Tchefuncte rate (0.66%), suggesting no change between the two temporally sequential populations. In another Marksville sample, Helis (1986) identified infectious lesions on 260 of 20,321 bone fragments (1.3%), thus doubling Fertel's Marksville rate and her own earlier rate for the Tchefuncte sample (0.74%). While the majority of the Tchefuncte lesions were minor infections on adult leg bones, the Marksville lesions were typically more severe, were more widely dispersed throughout the body, and sometimes occurred in subadults (Helis 1986; Fertel 1985). Whether the reported infection rates are "high" or "low", the fact that they doubled in frequency, became more severe, and began to show up in children, suggests the diet became less adequate in Marksville times, at least for some segments of the population at Big Oak Island (16OR6).

No definitive porotic hyperostosis (anemia) was reported (Table 54). One resorptive lesion on a cranial fragment was diagnosed as porotic hyperostosis, but since no thickening of the cranial vault was indicated this diagnosis is questionable (Fertel 1985).

Infant mortality rates are higher for Marksville culture (18.7%) than for Tchefuncte culture (12%). Subadult (under five years of age) mortality rates are three times higher for Marksville (35.4%) than for Tchefuncte (12%) (Fertel 1985). Though Helis (1986) reported 9% subadult mortality for the Marksville sample, she attributed this low frequency to burial practices that would result in underrepresentation of subadult material.

Taken together, a twofold increase in infection rates and a threefold increase in subadult mortality rates suggest a significant drop in dietary quality from the preceding Tchula period.

The potential for Coastal Marksville lifeway reconstruction is limited. We know nothing about the frequency or patterning of arthritis in these early populations. However, existing data do suggest hypotheses related to interpersonal violence, food procurement, and burial customs.

One parry fracture was reported for the Marksville series (Helis 1986). It had not been reduced or set but had healed with an S-shaped displacement and exhibited no evidence of infection. Interestingly, Helis found skeletal evidence for habitual use of the bola, a device used to ensnare small game (1986:57–58). On one humerus (upper armbone), from the Marksville ossuary sample, the attachment point of the deltoid muscle is enlarged and split into two parts, producing a general curvature of the shaft. Many other humeri show this development to a lesser extent. Plummets found at the Big Oak site are thought to have functioned as bola weights (Neuman 1984:120) or possibly fishnet weights (Byrd and Neuman 1978). Since the relative importance of small mammals and fish in the Coastal Marksville diet is undetermined, this hypothesis deserves examination.

Two hypotheses concerning mortuary practices are suggested. Significant differences were noted between the Tchefuncte and Marksville demographic profiles. The Tchefuncte sample was skewed toward adults and males, while the Marksville sample was normal, in that all age and sex classes were represented (Fertel 1985). The variant age and sex distributions between the two temporally sequential populations suggest the hypothesis of differences in cultural selection for burial.

Helis (1986) reported that no cut marks were observed on the Marksville burials, and hypothesized that preburial defleshing was accomplished by natural processes, suggesting no change from the preceding Tchefuncte culture. However, Shenkel (1984b) observed numerous cut marks and extensive evidence of intentional bone breakage in a mass burial from another Marksville component at Big Oak. Clearly, this hypothesis calls for further testing.

A significant decline in adaptive efficiency from the preceding Tchefuncte culture is indicated by an increase in the frequency and severity of infections and tripled subadult mortality rates. These data suggest elevated levels of stress, possibly associated with nutrition, but this must be examined in conjunction with aspects of the mortuary program that influence the demographic composition of the mortuary sample.

In summary, the extant data suggest that the Early Marksville diet did not differ significantly from that of the Coastal Tchefuncte, which was low in carbohydrates and high in abrasives. However, no quantitative data exist to support the qualitative assessments of dental caries and toothwear patterns reported (Helis 1986).

Though dietary adequacy cannot be precisely assessed, a decline from the preceding Tchefuncte culture levels is hypothesized on the basis of higher infection rates for both adults and children and higher subadult mortality rates.

The existing data suggest several hypotheses related to interpersonal violence, food procurement, and burial customs, but patterns of physical stress revealed by arthritic lesions remain unknown.

Considerable debate exists as to the nature of the Marksville diet and subsistence regime. Much of this debate is focused upon the presence of agriculture. The broad scenario suggests Marksville populations hunted and gathered wild foods, mainly deer, raccoon, turkey, fish, waterfowl, turtle, shellfish, acorns and hickory nuts; they possibly grew cultigens (native or tropical) in small adjacent areas (Byrd and Neuman 1978; Steponaitis 1986; Smith 1985; Ford 1979; Toth 1979b). Evidence for native plant domestication exists as early as the Tchula period (Byrd and Neuman 1978), but the prevalence and purposes of such practices remain a mystery. Questions concerning dietary reliance upon native or tropical cultigens are among the most significant questions waiting to be addressed bioarcheologically in the entire Southeast.

The skeletal series just discussed constitutes the entire curated resource base for Coastal Marksville culture. Although hypotheses are generated, they pertain to a single site and derive from limited data. Little is known about the diet, lifeways, or adaptive efficiency during the Early Marksville period. This represents a major deficiency in the bioarcheological data base. As is recommended for all of the preceding periods, this period must be targeted for maximum recovery and analysis of representative skeletal samples.

Late Marksville Period: Coastal Issaquena Culture

The preceding discussion of the Early Marksville period is equally applicable to the Late Marksville period, except for the fact that the latter is substantially less well known.

A single analysis exists for one site from this period on the Louisiana Gulf coast. In a student paper, Young (1985) analyzed a series of disarticulated human infant bones found in a postmold test pit at the Coquille site (16JE37) in the Mississippi drainage. Young identified 53 of the 57 small bone fragments as human, and determined they represented at least 2 individuals. One was a fetus, the other an infant 9 to 10 months old. Young included an inventory and some fetal bone measurements. She found no pathological lesions and no evidence of intentional preburial bone breakage. No other data are available.

Coastal Issaquena culture is bioarcheologically unknown.

Baytown Period: Coastal Troyville Culture

The Baytown period Coastal Troyville culture represents a bioarcheological vacuum. There are no curated resources. No known skeletal series have been assigned to this culture. Part of the reason for this may be the fact that traditionally coastal Louisiana archeologists have found it difficult to differentiate Troyville and Coles Creek occupations (Neuman 1984:169ff). Hypotheses generated by Baytown period Troyville culture data in the southern portion of the Lower Valley must be examined with reference to the Coastal Troyville variant of that culture. Maximum recovery and analysis of skeletal material from this period is imperative.

Early Coles Creek: Coastal Coles Creek

The Early Coles Creek period is another for which no bioarcheological data exist on the coast. Hrdlicka (1940) reported cranial measurements and indices for three burials excavated at Veazey (16VM7) and Morgan (16VM9), but no systematic analysis of the material was ever performed. Few, if any, postcranial remains were saved. At Veazey, a group of low burial mounds yielded fragmentary bones including some skulls with slight frontal flattening. The burials at Morgan were excavated from large stratified mounds and the skulls showed pronounced fronto–occipital flattening. The long bones observed at both sites displayed lesions thought to derive from syphilis (Collins 1941:147), but this diagnosis is unconfirmed and thoroughly questionable. No further data were recorded and no estimate of the frequency or type of pathologies can be derived from the descriptive report.

Thus, the Early Coles Creek period is bioarcheologically unknown.

Early Mississippi Period: Coastal Coles Creek Culture

Although three analyses exist for the Early Mississippi period, one of these was not obtained (Willey n.d.); one contained no usable data (Smith1983) and bioarcheological data are sparse in the one remaining (Table 51). However, these are of considerable interest.

An infection rate of 20.0% (Table 53) at Morton Shell Mound (16IB3) is at the upper end of the acceptable range. This suggests that the diet is moderately adequate.

No arthritis or trauma data are available for Morton Shell Mound, so little is known concerning physical activity patterns at that site. Robbins (1976) reported the frequent occurrence of “auditory exostoses,” particularly in males. These exostoses are small bony protrusions within the ear opening, which frequently occlude the passage, causing deafness. They are thought to be related to swimming and diving practices and in this respect may be associated with aquatic resource exploitation. Robbins (1976) also detected evidence of a specific burial custom in the excessively fragmented Morton Shell Mound skeletal series. Though fragmented remains are the rule, not the exception, in Louisiana, in this instance Robbins concluded that the fragmentation was not due to soil conditions but to intentional bone breakage as a facet of the mortuary ritual. This could represent the continuation of a practice that was underway at Big Oak Island (16OR6) during the Early Marksville period (Shenkel 1980).

The Morton Shell Mound (16IB3) infection rate (20.0%) is at the upper end of the acceptable range and indicates a moderately good level of adaptive efficiency. Low childhood infection (7.6%) and low infant mortality (7.6%) argue for low levels of childhood stress, which supports this assessment (Robbins 1976).

With only one poorly preserved skeletal series, the Coastal Coles Creek is essentially unknown.

Middle Mississippi Period: Coastal Coles Creek–Plaquemine Culture

No bioarcheological data exist for this period on the Louisiana Gulf coast. The sample size of curated resources is insufficient to furnish the necessary data. This period must be targeted for maximum recovery and analysis of skeletal remains. The Middle Mississippi period is bioarcheologically unknown.

Late Mississippi Period: Coastal Plaquemine Culture

The Late Mississippi Coastal Plaquemine culture is almost completely unknown, bioarcheologically. Dietary reconstruction is not possible because there are no dental data available. An infection rate of 33.3% (Table 53) represents an increase from the Early Mississippian average (20.0%). No porotic hyperostosis is reported (Table 54). This suggests no significant change in dietary adequacy.

TABLE 58

SITES WITH ANALYSES BY PERIOD AND CULTURAL AFFILIATION IN THE TRANS–MISSISSIPPI SOUTH

PERIOD AND CULTURE	ANALYSIS	DRAINAGE
LATE MARKSVILLE FOURCHE MALINE 4		
Cooper Place (3HS1)	D	Ouachita
EARLY COLES CREEK FOURCHE MALINE 7		
Hood (3HE54)	C	Ouachita
Ferguson (3HE63)	C	Ouachita
Watermelon Island (3HS3)	D	Ouachita
Jones Mill (3HS28)	C	Ouachita
EARLY MISSISSIPPI CADDO 1		
Crenshaw (3MI6)	C	Red
Gahagan (16RR1)	D	Red
Hanna (16RR4)	C	Red
MIDDLE MISSISSIPPI CADDO 2		
Ferguson (3HE63)	C	Ouachita
Bayou Sel (3CL27)	D	Ouachita
Haley Place (3MI1)	C	Red
Belcher Mound (16CD13)	D	Red
LATE MISSISSIPPI CADDO 3, 4		
Saline Bayou (3CL24)	C	Ouachita
Carpenter Mound (3CL56)	C	Ouachita
Denham Mound (3HS15)	C	Ouachita
Albritton Bottom (3OU128)	C	Ouachita
Belcher Mound (16CD13)	D	Red
Copeland Rdg (3CL195)	C	Ouachita
Sam Hedges (3HS60)	C	Ouachita
HISTORIC CADDO 5		
Lou Procello (16DS212)	C	Red
Spirit Lake (3LA83)	C	Red
Cedar Grove (3LA97)	C	Red
Gahagan (16RR1)	D	Red

An osteoarthritis rate of 33.3% (Table 55) indicates physical stress to the major joints. The osteophytosis rate is 33.3% (Table 56) and the trauma rate is 33.3% (Table 57).

No viable estimate of adaptive efficiency is possible, given this paucity of data. With only three individuals, the Late Mississippi period is bioarcheologically unknown.

Late Mississippi Contact: Coastal Protohistoric Plaquemine

No bioarcheological data and no curated resources exist for Coastal Protohistoric Plaquemine culture. This period must be targeted for maximum recovery and analysis of skeletal remains. Coastal Protohistoric Plaquemine culture is bioarcheologically unknown.

Summary and Recommendations

A series of bioarcheological data vacuums exist for Gulf Coastal Louisiana. No bioarcheological data are available for the following temporal periods: Late Archaic, Late Marksville, Baytown, Early Coles Creek, Middle Mississippi, and Late Mississippi Contact. Thus, thorough analyses of skeletal series from any of these periods must have a high priority.

Minimal bioarcheological data exist for the Tchula, Early Marksville, Early Mississippi and Late Mississippi periods. Major deficiencies exist in all data categories: dietary reconstruction, dietary adequacy, lifeway reconstruction, and adaptive efficiency. Consequently, it is imperative that any mitigations involving skeletal material must require the collection of all bioarcheological data sets.

The most crucial hypothesis to be tested in future research involves establishing the origins of plant cultivation, determining the species and proportions of plants consumed, and assessing the nutritional consequences that accrued during successive temporal periods and cultures. Similarly, the dietary role of aquatic and terrestrial protein resources must be determined.

Patterns of physical activity are not well known for any of the Coastal cultures. Typically, arthritis rates have not been reported. Hypotheses concerning the relationship between physical stress patterns and subsistence practices can be tested once these data are collected.

Baseline levels of adaptive efficiency must be established for all cultural periods.

BIOARCHEOLOGY OF THE TRANS–MISSISSIPPI SOUTH

Three publications provide partial bioarcheological syntheses for the Trans–Mississippi South. *A Bioarcheological Study of the Regional Adaptive Efficiency of the Caddo* (Mires 1982) provides a summary of the published Caddoan bioarcheoIogical literature in addition to a model for evaluating adaptive efficiency. *Paleopathology and the Origins of Maize Agriculture in the Lower Mississippi Valley and Caddoan Culture*

TABLE 59

DENTAL CARIES PER PERSON
IN THE TRANS–MISSISSIPPI SOUTH RED RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	N	CARIES/ PERSON
UNKNOWN MISSISSIPPI			
Purtle (3HE70)	UAO Files	1	19.0
EARLY MISSISSIPPI CADDO 1			
Crenshaw (3MI6)	Powell 1977b	8	5.6
Hanna (16RR4)	Giardino 1980a	4	2.5
		(12)	(4.7)
MIDDLE MISSISSIPPI CADDO 2			
Belcher I (16CD13)	Webb 1959	5	8.0
LATE MISSISSIPPI CADDO 4			
Belcher 2–3 (16CD13)	Webb 1959	15	2.3
HISTORIC CADDO 5			
Cedar Grove (3LA97)	Rose 1984	9	11.7
Lou Procello (16DS212)	Green 1983	4	1.0
		(13)	(8.2)

TABLE 60

DENTAL CARIES PER PERSON
IN THE TRANS–MISSISSIPPI SOUTH OUACHITA RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	N	CARIES/ PERSON
COLES CREEK FOURCHE MALINE 7			
Ferguson (3HE63)	UAO Files	6	4.3
Hood (3HE54)	UAO Files	1	2.0
Jones Mill (3HS28)	Burnett and Marks 1982	1	10.0
		(8)	(4.8)
UNKNOWN MISSISSIPPI			
Middle Meadow (3HS19)	UAO Files	2	4.0
MIDDLE MISSISSIPPI CADDO 2			
Ferguson (3HE63)	UAO Files	7	4.4
LATE MISSISSIPPI CADDO 3			
Saline Bayou (3CL24)	UAO Files	1	2.0
Carpenter Mound (3CL56)	UAO Files	1	26.0
Denham Mound (3HS15)	UAO Files	4	9.3
Albritton Bottom (3OU128)	UAO Files	3	3.0
		(9)	(8.2)
LATE MISSISSIPPI CADDO 4			
Copeland (3CL195)	Burnett 1984	19	7.8
Hedges (3HS60)	UAO Files	14	7.5
		(33)	(7.6)

TABLE 61

PERCENTAGES OF ADULT INFECTION
IN THE TRANS–MISSISSIPPI SOUTH RED RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	ADULT INFECTIONS N	%
EARLY MISSISSIPPI CADDO 1			
Hanna (16RR4)	Giardino 1980a	4	0.0
MIDDLE MISSISSIPPI CADDO 2			
Haley Place (3MI1)	Hrdlicka 1912	2	0.0
HISTORIC CADDO 5			
Cedar Grove (3LA97)	Rose 1984	7	28.5
Lou Procello (16DS212)	Green 1983	4	25.0
		(11)	(27.3)

Areas (Rose et al. 1984) employs published bioarcheological data to determine the time of transition to a maize dependent diet in the Trans–Mississippi South. *Bioarcheology of the Cedar Grove Site* (Rose 1984) includes a literature review, in addition to comparative data on paleopathology and dental microwear patterns from other sites in the vicinity.

Late Marksville Period: Fourche Maline 4 Culture

There is only one studied skeletal series from the Fourche Maline 4 culture, and only sex data are available (see Table 58). As a consequence, this period is bioarcheologically unknown. There are no bioarcheological data from the Trans–

TABLE 62

PERCENTAGES OF ADULT INFECTION IN THE TRANS–
MISSISSIPPI SOUTH OUACHITA RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	ADULT INFECTIONS N	%
COLES CREEK FOURCHE MALINE 7			
Ferguson (3HE63)	UAO Files	6	0.0
Jones Mill (3HS28)	Burnett and Marks 1982	1	100.0
		(7)	(14.3)
UNKNOWN MISSISSIPPI			
Middle Meadow (3HS19)	UAO Files	1	0.0
MIDDLE MISSISSIPPI CADDO 2			
Ferguson (3HE63)	UAO Files	9	11.1
LATE MISSISSIPPI CADDO 3			
Denham Mound (3HS15)	UAO Files	1	100.0
Saline Bayou (3CL24)	UAO Files	2	100.0
		(3)	(100.0)
LATE MISSISSIPPI CADDO 4			
Copeland (3CL195)	Burnett 1984	8	0.0
Hedges (3HS60)	UAO Files	8	75.0
		(16)	(37.5)

TABLE 63

PERCENTAGES OF ADULT POROTIC HYPEROSTOSIS IN THE
TRANS–MISSISSIPPI SOUTH OUACHITA RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	POROTIC HYPEROSTOSIS N	%
COLES CREEK FOURCHE MALINE 7			
Hood (3HE54)	UAO Files	5	20.0
EARLY MISSISSIPPI CADDO 1			
Hanna (16RR4)	Giardino 1980a	4	0.0
Crenshaw (3M16)	Powell 1977b	8	12.5
		(12)	(8.3)
MIDDLE MISSISSIPPI CADDO 2			
Haley Place (3M11)	Hrdlicka 1912	2	0.0
HISTORIC CADDO 5			
Cedar Grove (3LA97)	Rose 1984	9	11.1
Spirit Lake (3LA83)	UAO File	1	0.0
Lou Procello (16DS212)	Green 1983	1	0.0
		(11)	(9.1)

Mississippi South representing the following periods: Late Archaic, Tchula, and Early Marksville. The collection of bioarcheological data from the Late Marksville period and earlier must be a high priority.

Baytown Period: Fourche Maline 5–6 Culture

There are no bioarcheological data from the Fourche Maline 5–6 cultures. Unlike the other culture areas within the Louisiana and Arkansas study area, where the Baytown period has produced the best data, these cultures are bioarcheologically unknown.

Early Coles Creek Period: Fourche Maline 7 Culture

Bioarcheological data are available from four sites within the Ouachita drainage (Table 58). The dental caries rate of 4.8 per individual indicates high carbohydrate consumption within the small valleys of the Ouachita drainage (Table 60). Unpublished stable carbon isotope data, on file at the University of Arkansas, establish that the carbohydrates at Ferguson (3HE63) were derived from the consumption of maize.

Analysis of the Jones Mill (3HS28) molar wear pattern with a scanning electron microscope showed it to be very similar to patterns observed on Late Fourche Maline molars from Oklahoma (Burnett and Marks 1982). The low molar attrition score from Jones Mill suggests a relatively soft diet. Although limited, these data suggest the hypothesis that maize was making an important contribution to the Fourche Maline 7 diet, at least at some sites. An explanation of why there was an earlier adoption of maize agriculture in the Trans–Mississippi South, than in the Lower Mississippi Valley must be sought (see Chapter 9).

The absence of infections at Ferguson (3HE63) suggests an adequate diet (Table 62), while the presence of a 20% rate of porotic hyperostosis (Table 63) at the Hood site (3HE54) indicates the possibility of dietary inadequacy. Unfortunately, there are no caries or stable carbon data from the Hood site. The single individual from Jones Mill (3HS28) exhibits both an infection (Table 62) and porotic hyperostosis (Table 64). This concordance of a high caries rate, infection, and porotic hyperostosis suggests both maize consumption and dietary inadequacy in the Ouachita drainage. The early acquisition of maize and the possibility of iron deficiency anemia recommends the hypothesis that the Fourche Maline 7 culture experienced a major change in subsistence pattern, at least within the Ouachita drainage.

TABLE 64

PERCENTAGES OF ADULT POROTIC HYPEROSTOSIS
IN THE TRANS–MISSISSIPPI SOUTH OUACHITA RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	POROTIC HYPEROSTOSIS N	%
COLES CREEK FOURCHE MALINE 7			
Ferguson (3HE63)	UAO Files	7	0.0
Jones Mill (3HS28)	Burnett and Marks 1982	1	100.0
		(8)	(12.5)
UNKNOWN MISSISSIPPI			
Middle Meadow (3HS19)	UAO Files	1	0.0
N/A (3CL63)	UAO Files	1	0.0
		(2)	(0.0)
MIDDLE MISSISSIPPI CADDO 2			
Ferguson (3HE63)	UAO Files	3	0.0
MIDDLE MISSISSIPPI CADDO 3			
Carpenter Mound (3CL56)	UAO File	2	0.0
LATE MISSISSIPPI CADDO 3			
Saline Bayou (3CL24)	UAO Files	1	0.0
Denham Mound (3HS15)	UAO Files	4	0.0
		(5)	(0.0)
LATE MISSISSIPPI CADDO 4			
Copeland (3CL195)	Burnett 1984	2	0.0
Hedges (3HS60)	UAO Files	9	0.0
		(11)	(0.0)

TABLE 65

PERCENTAGES OF ADULT OSTEOARTHRITIS
IN THE TRANS–MISSISSIPPI SOUTH RED RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	OSTEOARTHRITIS N	%
EARLY MISSISSIPPI CADDO 1			
Hanna (16RR4)	Giardino 1980a	4	0.0
MIDDLE MISSISSIPPI CADDO 2			
Haley Place (3MI1)	Hrdlicka 1912	2	0.0
HISTORIC CADDO 5			
Cedar Grove (3LA97)	Rose 1984	9	55.6
Lou Procello (16DS212)	Green 1983	4	50.0
		(13)	(53.8)

TABLE 66

PERCENTAGES OF ADULT OSTEOARTHRITIS
IN THE TRANS–MISSISSIPPI SOUTH OUACHITA RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	OSTEOARTHRITIS N	%
COLES CREEK FOURCHE MALINE 7			
Ferguson (3HE63)	UAO Files	2	0.0
MIDDLE MISSISSIPPI CADDO 2			
Ferguson (3HE63)	UAO Files	8	0.0
MIDDLE MISSISSIPPI CADDO 3			
Carpenter Mound (3CL56)	UAO File	1	0.0
LATE MISSISSIPPI CADDO 3			
Saline Bayou (3CL24)	UAO Files	3	0.0
Denham Mound (3HS15)	UAO Files	1	0.0
		(4)	(0.0)
LATE MISSISSIPPI CADDO 4			
Copeland (3CL195)	Burnett 1984	4	50.0
Hedges (3HS60)	UAO Files	7	42.9
		(11)	(45.5)

major joints is represented at Ferguson (Table 66), and no data for spinal arthritis or trauma exists.

Adaptive efficiency is not possible to assess because of the absence of data. It is crucial that the impact of dietary change be evaluated for the Fourche Maline 7 people. Data on demography, infections, childhood stress, and adult physiology are needed from large skeletal series.

Early Mississippi Period: Caddo 1 Culture

The Caddo 1 culture is represented by data from three sites on the Red River; there is none from the Ouachita drainage (Table 58). The Red River caries rate is high with 4.7 caries per person (Table 59) and indicates a high carbohydrate consumption (presumably maize). The difference in caries rates between Crenshaw (3MI6) and Hanna (16RR4) suggest that maize is more important at some Caddo 1 sites than at others. In other words, the adoption of maize agriculture within the Trans–Mississippi South appears to be the result of local circumstances. This hypothesis has been proposed and provisionally tested in an earlier overview of the area (Rose et al. 1984). Testing this hypothesis will require both dental data and stable carbon isotope assays from all Fourche Maline 7 and Caddo 1 skeletal series. The absence of any dietary data from the Ouachita drainage makes dietary analysis of this area even more important.

Once again, the data are not sufficient to evaluate adaptive efficiency. There are no infections (Table 61) or anemia (Table 63) at the Hanna (16RR4) site, which suggests that, in the absence of a high carbohydrate diet, adaptive efficiency was adequate. There is a single case (12.5%) of porotic hyperostosis at Crenshaw (3MI6) which may be associated with iron deficiency anemia resulting from a high maize diet. Employing data from throughout the Trans–Mississippi South, Rose et al. (1984) have hypothesized that dietary deficiencies should be relatively common as the Caddo 1 people adjusted to a new dietary regimen.

Lifeway reconstruction is not possible due to a paucity of data. There is no joint arthritis or trauma at Hanna, but the spinal arthritis rate is 66.7% (Table 67). There are no other data. It would be important to determine if there were any changes in physical stress associated with the hypothesized adoption of agriculture, as has been suggested for the Lower Mississippi Valley. This category of data needs to be collected in all future osteological research.

Data are not sufficient to evaluate the level of adaptive efficiency. Rose et al. (1984) suggested that data obtained from sites to the east of the study area indicate that the Caddo 1 people were subjected to increased stress and a decline in adaptive efficiency. They further suggested that this decline in adaptive efficiency resulted from the stress of adjusting to a new subsistence system (i.e., maize agriculture).

TABLE 67

PERCENTAGES OF OSTEOPHYTOSIS
IN THE TRANS–MISSISSIPPI SOUTH RED RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	OSTEOPHYTOSIS N	%
EARLY MISSISSIPPI CADDO 1			
Hanna (16RR4)	Giardino 1980a	3	66.7
MIDDLE MISSISSIPPI CADDO 2			
Haley Place (3MI1)	Hrdlicka 1912	2	0.0
HISTORIC CADDO 5			
Cedar Grove (3LA97)	Rose 1984	9	33.3
Lou Procello (16DS212)	Green 1983	3	66.7
		(12)	(41.7)

TABLE 68

PERCENTAGES OF OSTEOPHYTOSIS
IN THE TRANS–MISSISSIPPI SOUTH OUACHITA RIVER DRAINAGE

PERIOD AND CULTURE	REFERENCE	OSTEOPHYTOSIS N	%
MIDDLE MISSISSIPPI CADDO 2			
Ferguson (3HE63)	UAO Files	3	33.3
MIDDLE MISSISSIPPI CADDO 3			
Carpenter Mound (3CL56)	UAO Files	1	0.0
LATE MISSISSIPPI CADDO 3			
Denham Mound (3HS15)	UAO Files	1	0.0
Saline Bayou (3CL24)	UAO Files	3	0.0
		(4)	(0.0)
LATE MISSISSIPPI CADDO 4			
Copeland (3CL195)	Burnett 1984	4	25.0
Hedges (3HS60)	UAO Files	5	60.0
		(9)	(44.4)

TABLE 69

PERCENTAGES OF ADULT TRAUMA IN THE TRANS–MISSISSIPPI
SOUTH RED AND OUACHITA DRAINAGES COMBINED

PERIOD AND CULTURE	REFERENCE	ADULT TRAUMA N	%
EARLY MISSISSIPPI CADDO 1 RED RIVER			
Hanna (16RR4)	Giardino 1980a	4	0.0
MIDDLE MISSISSIPPI CADDO 2 RED RIVER			
Haley Place (3MI1)	Hrdlicka 1912	2	0.0
LATE MISSISSIPPI CADDO 4 OUACHITA RIVER			
Copeland (3CL195)	Burnett 1984	(?)	0.0
Hedges (3HS60)	UAO Files	(?)	0.0
HISTORIC CADDO 5 RED RIVER			
Cedar Grove (3LA97)	Rose 1984	8	37.5
Lou Procello (16DS212)	Green 1983	4	25.0
		(12)	(33.3)

Middle Mississippi Period: Caddo 2 Culture

The Caddo 2 culture is represented by data from two Red River and two Ouachita drainage sites. The caries rate increases to 4.4 and 8.0 caries per individual (Tables 59 and 60), suggesting increased consumption of maize. The differential caries rate suggests the possibility of variable maize dependency among the Caddo 2 people, especially in the Ouachita drainage. This is an important hypothesis for testing during future research.

The infection rate is 11.1% (Table 62) at Ferguson (3HE63) and there is no anemia (Table 64). This suggests dietary adequacy, but extensive testing is required.

There is no arthritis of the major joints (Tables 65 and 66); there is a 33.3% spinal arthritis rate (Table 68). No trauma is indicated. (Table 69). The low level of degenerative disease suggests that physical stress levels were acceptable. Considerably more data are required before reliable statements concerning lifeway can be made.

The presence of a single infection suggests that adaptive efficiency is relatively high, but, again, more data are required. Rose et al. (1984) hypothesize that the Caddo 2 adaptive efficiency level had returned to the normal high level after reaching a low point during Caddo 1.

Late Mississippi Period: Caddo 3–4

The Late Mississippi period has the most bioarcheological data of any period in the Trans–Mississippi South. The caries rate shows a significant drop to 2.3 caries per person along the Red River (Table 59). This suggests the possibility that maize consumption has declined in favor of a more diverse diet. Rose et al. (1984) suggested that this trend does not indicate a drop in the importance of agriculture, but rather a diversification of the crops grown producing a more balanced diet. These authors suggested further that the complex agricultural system documented for the historic Caddo had been developed by this time. In contrast, the caries rate is much higher (8.2 and 7.6) in the Ouachita drainage and suggests a greater reliance upon maize (Table 60). A similar trend toward increased or maintained carbohydrate consumption in the upland region is also reported in the Ozark, Arkansas and Ouachita study area. The hypothesis proposed here is that, within the Trans–Mississippi South, maize dependency is highest in the upland or marginal ecological zones and that a more diverse diet was available in the major river flood plain zones.

There is no infection reported for the two individuals in the Red River Valley (Table 61), but the infection rate is 47.4% for the Ouachita drainage Caddo 3 and 4 samples. No anemia is reported for either drainage. These data might suggest that the diet was not as adequate as hypothesized above, but the absence of other data and small sample sizes makes this conclusion unlikely. Dietary adequacy clearly needs to be evaluated for Caddo 3 and 4.

The joint arthritis rate is 45.5% (Table 66) and the spinal arthritis rate is 44.4% (Table 68) for the Caddo 4 peoples in the Ouachita drainage. No trauma is reported. These data suggest that physical stress levels among Caddo 4 people increased beyond that found earlier in the Ouachita drainage. These data suggest the hypothesis that as the agricultural system increased in complexity, that there was a corresponding increase in the work load and physical stress. A corollary hypothesis is that an increased caloric requirement in the Ouachita drainage resulted in an increase in maize consumption and increased physical stress.

Adaptive efficiency cannot be estimated for the Red River Caddo 3 and 4 because there are no data. Rose et al. (1984) hypothesized that adaptive efficiency had reached its highest level for the Late Mississippi period Caddo along the Red River. Both infections and other indicators of stress had declined significantly. In contrast, the data presented here for the Ouachita drainage argue for a reduction in adaptive efficiency during the Late Mississippi period. The hypothesized reduction in upland adaptive efficiency corresponds with the evidence for increased maize consumption and work loads.

Historic Period: Caddo 5 Culture

The only data available within the study area for this period are from four sites located along the Red River. Cedar Grove (3LA97), which was the subject of a large multidisciplinary mitigation effort (Trubowitz 1984), is also the best studied skeletal series in the study area. This discussion of the Caddo 5 culture will be extracted primarily from the Cedar Grove bioarcheological analysis (Rose 1984). It should be mentioned that as extensive as this study was, it was not enough to be considered adequate skeletal mitigation.

The 8.2 caries rate indicates extensive reliance upon maize agriculture, a conclusion which has been confirmed by stable carbon isotope analysis at Cedar Grove (Table 59). The seven stable carbon assays average -14.4, which is well within the maize dependency range of values (Trubowitz 1984:258). Dental attrition scores indicate that the Cedar Grove attrition rate is comparable to Caddo 3, 4 samples in the Ouachita drainage and far below that obtained from Middle and Late Fourche Maline inhabitants of southwest Arkansas and southeast Oklahoma. More extensive comparisons of attrition rates were precluded because there has been no consistency in the scoring system employed in the various osteological studies. This comparison suggests that the Cedar Grove (3LA97) diet was relatively soft and contained few abrasive particles. A total of ten molars were examined with a scanning electron microscope to determine their enamel microwear patterns. These data suggest that the Cedar Grove inhabitants consumed neither hickory nuts nor minimally processed vegetable fiber, and that the overall diet was soft with few abrasive particles. These data are consistent with the contention that the Caddo employed wooden utensils to process their food. Differences between the three temporal groups of burials at Cedar Grove suggest that minor dietary changes did occur over time.

The adult infection rate is 27.3% (Table 61), while the anemia rate is 9.1% (Table 63). These data suggest that the diet was not sufficient to maintain disease resistance at the levels observed among the earlier Caddo. The single case of anemia indicates that there was some dietary iron deficiency anemia resulting from the high maize diet. It should be noted that no iron deficiency anemia was found among the children. These data suggest that the diet was adequate but possibly not as good as prior to the advent of agriculture. A more complete series of analyses should have been performed on the Cedar Grove (3LA97) sample to fully assess dietary adequacy (e.g., bone histology for bone biodynamics study and trace element analysis for determining animal protein intake).

The degenerative disease data employed for lifeway reconstruction suggests that the work load was comparatively high and strenuous. The joint arthritis rate is 53.8% (Table 65), the spinal arthritis rate is 41.7% (Table 67), and the trauma (fracture) rate is 33.3% (Table 69). It is hypothesized that the complex agricultural system which matured during Caddo 4 required an increase in the individual work load and increased physical stress.

Evaluation of adaptive efficiency employs the following analyses: demography, disease frequency, and childhood stress. Because there are only 14 burials from Cedar Grove (3LA97), life table analysis could not be performed, but comparisons of the proportion of dead at various age intervals were made with 17 Caddo skeletal series representing Caddo 1 through 4 from Arkansas, Texas, Louisiana, and Oklahoma. The percentage of individuals dying prior to 5 years of age at Cedar Grove (14.3%) is comparable to the lowest rate, and one half the highest rate for the Caddo 4 samples (Rose 1984:239). This rate is slightly higher than the Red River Caddo 1 and 2 but half that of the upland Arkansas River Caddo. The percentage of adults dying prior to 35 years of age at Cedar Grove (33.3%) is slightly lower than the average Caddo 4 Red River rates. These comparisons provide the following conclusions: the sample size, sex ratio (i.e., two males for each female), and the proportion of children (35.7%) are all typical of Red River Caddo sites, and the proportions of childhood and young adult deaths suggest an average adaptive efficiency when compared to the earlier Caddo samples.

The 28.5% infection rate at Cedar Grove is slightly higher than the average Caddo 4 rate of 17.6% and about the same as the average Caddo 2 rate of 26.2% (Rose 1984:241). The implication is that the adaptive efficiency has been declining slightly since Caddo 2 times. In addition, Rose (1984) postulated that Old World diseases had already had an impact on Cedar Grove but that infectious viral diseases leave few, if any, markers on the skeleton.

A total of 12 mandibular canines and 11 maxillary incisors were thin-sectioned and examined for enamel defects which indicate the frequency and age distribution of childhood stress. Unfortunately, comparative data are available from only one other Caddo site (Roden, 34MC215) and the Libben site in Ohio (Rose 1984:249). The Cedar Grove frequency and age distribution of enamel defects (i.e., Wilson Bands) are virtually identical to Roden and about twice as high as the well adapted Libben site. This suggests a slightly higher than optimal level of childhood stress in the Caddo 4 and 5 cultures. More enamel defect data are needed to fully evaluate this conclusion.

Overall, the adaptive efficiency level of Cedar Grove (3LA97), and possibly the Caddo 5 peoples in general, appears to be slightly lower than optimum, but not so low as to indicate inordinate stress. The presence of Old World diseases among the Caddo 5 requires extensive evaluation with numerous skeletal samples, but this must await sample acquisition.

This is the first Caddo analysis to attempt comparisons of genetic affinity between various Caddo samples. The Cedar Grove sample has a dental agenesis (i.e., the tooth never developed) rate of 18.2% and a supernumerary (i.e., the development of additional teeth) tooth rate of 9.1% (Rose 1984: 250–252). The frequency of rhomboid fossae (i.e., small defect of the clavicle) is 30.8%, while a femur defect located just superior to the medial epicondyle is found at a frequency of 50%. In addition, a full suite of skeletal nonmetric inherited traits was compared with five other Fourche Maline and Caddo skeletal series. Skeletal and dental anomalies such as dental agenesis or rhomboid fossae are commonly found within Caddoan skeletal series (see Rose 1984:252 for a summary), but usually only one anomally is found at any one site. These data suggest that genetic analysis of the Caddo should provide data concerning mate/marriage rules. Comparisons of the genetic markers on the skeleton indicate that the Caddo of Arkansas, Oklahoma, Texas, and Louisiana all share a common genetic heritage and that they derived genetically from the preceding Fourche Maline peoples (Rose 1984:252).

Summary and Recommendations

There are virtually no data from any period in the Trans–Mississippi South prior to the Early Coles Creek (Fourche Maline 7) period. Acquisition of bioarcheological data from these earlier periods is crucial for investigating later culture change and the adoption of maize agriculture. If it is correctly assumed that increased stress leads to the adoption of agriculture, then the evidence for this increase in stress must be found during these earlier unknown periods.

It is hypothesized that the adoption of maize agriculture occurred at the larger Fourche Maline 7 sites and that the stimuli for this adoption were local phenomenon. It is possible that major theoretical advances in the explanation for the transition to agriculture can be made by identifying the reasons why maize utilization occurred earlier in the Trans–Mississippi South than in the Lower Mississippi Valley (see Chapter 9 for further discussion). In addition, it is postulated that work loads and physical stress increased with the adoption of maize agriculture. Testing these hypotheses requires a rigorous reconstruction of Fourche Maline 7 diets and determination of the levels of adaptive efficiency.

It is hypothesized that differential adoption of maize continued into the Caddo 1 and that all of the hypotheses posited for the Fourche Maline 7 are also applicable here.

During Caddo 3 and 4, maize consumption declined and the agricultural system became more complex and diversified. Testing this hypothesis requires the acquisition of dietary data not now available. A corollary hypothesis is that maize consumption increased in the Ouachita drainage and that the postulated dietary diversification did not occur. The Ouachita drainage data for Caddo 3 and 4 support the hypothesis that maize agriculture is more intense, the work loads higher, and the diets less nutritionally adequate in the upland or peripheral zones when compared to the contemporary large flood plain locales.

It is hypothesized that the Caddo practiced a marriage system which encouraged the formation of genetic isolates. The hypothesis that the Caddoan populations from the entire four state area share a common gene pool and descent from the earlier Fourche Maline populations requires extensive testing.

BIOARCHEOLOGY OF HISTORIC POPULATIONS

Introduction

There are three reports which provide basic background information and insight into historic period bioarcheology. *Gone to a Better Land* (Rose 1985) provides an overview of African–American history and describes the important role which bioarcheology can play in the study of American history. *Cultural Resources Inventory of the Montz Freshwater Diversion Project Corridor, St. Charles Parish, Louisiana* (Franks et al. 1986) provides a detailed presentation of a theoretical framework and methodology for studying historic cemetery sites. *Burial Archaeology and Osteology of Charity Hospital/ Cypress Grove II Cemetery, New Orleans* (Owsley et al. 1987) contributes a detailed methodological framework for conducting comprehensive osteological analysis.

Eighteenth Century Urban Slaves

Archeological testing associated with construction activities recovered 29 individuals from the St. Peter Street Cemetery, the first cemetery in New Orleans (16OR92). The use of this cemetery began in 1721–1725 and ended in 1789 (Owsley et al. 1986). This sample includes 1 newborn, 2 children, 3 teenagers, and 23 adults. Although genetic heritage could not be determined for all individuals, the vast majority are African–Americans, who were, in all probability, slaves. Osteological analysis was conducted to determine health, nutritional status, and lifeways for urban slaves. Analysis of the New Orleans death records from the same time period showed no differences in the mortality experiences of Euramericans and the African–American slaves (Owsley et al. 1986). This finding is very different from other analyses where African–Americans have been shown to experience higher mortality at all ages (see Rose 1985). Owsley et al. (1986) postulate that the lower mortality found in their sample was due to urban slaves having a less strenuous life than was typical for those working on plantations.

The most frequent skeletal lesions are arthritis and hyperdevelopment of the muscle attachment areas. The distribution of these lesions indicate that some, but not all, of the African–Americans experienced high physical stress associated with strenuous labor. Although these frequencies are below those reported for rural slave populations, the presence of two parry fractures (i.e., fracture of the lower arm resulting from warding off a blow) indicates that life was not easy (Owsley et al. 1986). The frequencies of infection and anemia are well below those reported from other African–American skeletal series. Similarly, the frequency of growth arrest lines (i.e., a childhood stress indicator) in the long bones is relatively low and is clearly below the the level found in rural slaves. In contrast to the low skeletal lesions, the frequency of dental caries is high and reflects the high sugar and carbohydrate diet of this seaport city, which is located in a sugar producing region. The major conclusion which can be drawn from this analysis is that these early urban slaves were far better off than their rural counterparts (Owsley et al. 1986).

Nineteenth Century Urban Population: Mixed Ethnic Sample

Road construction in 1986 led to test excavations at the Charity Hospital/ Cypress Grove II cemetery (16OR108) by Douglas Owsley and colleagues from Louisiana State University (Owsley et al. 1987). The partial or complete remains of 255 individuals were obtained from this cemetery, which was used between 1849 and 1929. This skeletal collection is important because it represents a period in history when New Orleans not only experienced major epidemics (i.e., yellow fever, cholera, and small pox), but also the stress associated with the Civil War and Reconstruction.

Because it is a cemetery associated with a hospital, it is not surprising to learn that pathological lesions are very frequent and include infections, gun shot wounds, and other trauma. Analysis is still underway, and no quantifiable results are available. The preliminary report (Owsley et al. 1987) provides a num-ber of valuable kinds of information, which will be of use to anyone conducting historic cemetery research. First, there is a detailed discussion of the negotiations and legal opinions associated with the excavation of this historic cemetery. Second, the field methods employed in the recovery and conservation of the skeletal material are described in detail. Third, the methodology which will be employed in this comprehensive osteological analysis is provided along with recording forms and coding keys.

Nineteenth Century Euramericans

In 1986, Owsley and his colleagues at Louisiana State University were asked to conduct excavations at the Horton Family Cemetery (16EF66). Extensive excavations produced only two human bone fragments which appeared to belong to a young male and thus, served to identify the grave as belonging to Col. John Ball Horton (Manhein et al. 1987).

Civic improvement concerns prompted the testing of the Port Hudson military cemetery (16EF68) by bioarcheologists from Louisiana State University (Manhein and Owsley 1987). Further details of the excavation rationale can be found in Chapter 10. Testing of the designated military cemetery produced bone fragments and teeth along with artifacts which indicated that this was a civilian cemetery. Testing of a second location produced nine burials with military buttons which revealed it to be the Civil War cemetery. All skeletal fragments and teeth are currently being analyzed.

Nineteenth and Twentieth Century Rural African–Americans

An intensive survey and reconnaissance of the Kenner (16SC50) and Kugler (16SC51) cemeteries were conducted as part of a cultural resources inventory of a portion of the Bonnet Carre Spillway by R. Christopher Goodwin and Associates, Inc. (Yakubik et al. 1986). No complete test excavations were conducted and observations were made only on exposed caskets. These cemeteries contain the remains of rural African–Americans dating between 1830 and 1929. The only skeletal material available is from a 1975 disturbance of the Kenner Cemetery. There are 52 bones representing a minimum of five individuals. The skeletal material is in an excellent state of preservation and exhibits pathologies such as healed fractures and arthritis. These two cemeteries represent excellent resources for studying African–American biohistory from slavery through the post-Reconstruction era, if mitigation is ever required.

Analysis of 80 skeletons interred between 1890 and 1927 at the Cedar Grove site (3LA97) provides data on the lives of rural African–Americans during the post-Reconstruction period (Rose 1985). Comparison of the paleodemographic profile with model life tables indicates that this is a highly stressed population. The infant mortality rate is 27.5%, and the average ages at death for males and females is 41.2 and 37.7 years respectively. There is abundant evidence for both iron deficiency anemia and vitamin D-deficient rickets among the children. The chronological distributions of age at death, infections, and markers of dietary deficiencies which all peak at 18 months, clearly indicate the presence of weaning diarrhea (Rose 1985). This syndrome is the hallmark of protein malnutrition throughout the modern Third World.

Adults also show abundant evidence of dietary deficiencies and high infection rates. A detailed analysis of histological sections taken from the femur reveal that these people experienced a diet low in calcium, iron, and protein, chronic infectious disease, and a physically demanding way of life (Martinet al. 1987).

Both adult males and females display high frequencies of arthritis of the major joints, hands, and feet, as well as extensive spinal arthritis. Accidents resulting in bone fractures and violence (i.e., bullet wounds) are also common (Rose 1985). The incidence of these degenerative diseases and trauma indicates a hard physical lifeway which contrasts significantly with the urban slaves in New Orleans.

The evidence from demography, paleopathology, and microscopic analysis of bone thin sections all indicate that life for Afro–Americans during the post-Reconstruction era was one of dietary deprivation, hard physical labor, and frequent disease. The picture of life obtained from this skeletal material is an important supplement to the historic record, because there is a virtual absence of historical documents for this period of time.

Summary and Recommendations

There are obvious gaps in the bioarcheological data base for the historic period in the study area. There is a virtual absence of data concerning the Euramerican inhabitants. Ongoing research by Owsley and colleagues may soon provide some data for this ethnic group. Extensive osteological data from Euramericans are needed for proper interpretation of the other historic ethnic populations. There is also no data on Native Americans during this period of direct contact with Old World immigrants. This data gap needs to be filled if we are to understand the devastating impact which Old World diseases had upon these once thriving populations.

The best known ethnic group in the study area is the Afro–American and testable hypotheses are derived from these analyses. It is hypothesized that urban and household slaves did not suffer the same dietary deficiencies and physical stress loads as the plantation/rural slaves. Historical studies indicate that the agricultural systems differed greatly between southern Louisiana and the rest of the study area. Consequently, differences in health and nutrition should be apparent when data from Arkansas and northern Louisiana are compared with southern Louisiana.

There is considerable historical debate concerning the extent of deprivation and stress present among southern slaves (see Rose 1985). Resolution of this debate will depend upon the dietary reconstructions and evaluations of adaptive efficiency obtained from osteological analyses of African–Americans during the period of slavery. These conflicting hypotheses cannot be tested with historical records because they do not exist in the quantity and quality demanded. Testing these interpretations will also require similar skeletal data from contemporary Euramericans.

Similar debates abound for the Reconstruction and post-Reconstruction eras, where opinions of the quality of African–American life range from good to abysmal (see Rose 1985). Osteological data are still required for these recent periods because adequate historical and demographic records do not exist until 1930.

CONCLUSIONS AND RECOMMENDATIONS

Data Gaps

Synthesis of the bioarcheological data for the Louisiana and Arkansas study area identified numerous data gaps. In the northern portion of Lower Mississippi Valley, there are no osteological data for the following periods: Dalton, Archaic, Tchula, Early Marksville, Late Marksville, the Plum Bayou culture of the Baytown period, and all ethnic groups within

within the Historic period. Curated skeletal resources are rare for the Early and Middle Mississippi periods. In the southern portion of the Lower Mississippi Valley the periods with no bioarcheological data are: Dalton, Poverty Point culture within the Late Archaic, Tchula, Early Marksville, Late Marksville, the Plaquemine of the Middle Mississippi, and Late Mississippi periods. Available samples are deficient for the Early Mississippi period and there are no data for historic Native Americans. Data gaps are found in the following periods in the Coastal area: Dalton, Archaic, Late Marksville, Early Coles Creek, Middle and Late Mississippi, and Contact periods. Trans–Mississippi South data gaps include: Dalton, Archaic, Tchula, Early Marksville, Late Marksville, Baytown, historic Native Americans, and Euramericans.

Proposed Hypotheses

Hypotheses have been presented for each cultural unit within the study area where osteological data are available. Integrated hypotheses have been provided in the summary for each culture area. These have been integrated to produce a series of cogent hypotheses which are applicable to an overview of the entire study area. Although not exhaustive, the hypotheses presented here are considered the most important within the context of our present bioarcheological knowledge base.

It is hypothesized that native cultigens, in particular starchy seeds, played an ever increasing role in the subsistence systems of the Marksville and Baytown periods. Furthermore, intensification of the consumption of native cultigens was a response to local circumstances and not necessarily an area wide phenomenon.

It is hypothesized that increased stress and lowered adaptive efficiency are characteristic of the late Baytown and Early Mississippi periods and contributed to the intensified consumption of domesticates. Conversely, stress was increased and adaptive efficiency was lowered as a consequence of intensified cultivation, which was motivated by nonbiological phenomena. The debate of whether increased stress was the cause or the result of the adoption of agriculture is prominent in the bioarcheological literature at the present time (Cohen and Armelagos 1984).

It is hypothesized that stress declined after the initial intensification or adoption of agriculture and that it had returned to acceptable levels by the Middle Mississippi period.

It is hypothesized that the coastal variants of the prehistoric cultures remained immune to the inland trend of increased dependence upon agricultural products. A corollary problem domain is establishing the proportion of marine foods incorporated into the diets of the coastal peoples.

It is hypothesized that increased requirements for carbohydrates have, under certain but unknown circumstances, required abnormal increases in the individual work loads, resulting in increased joint and back arthritis. This hypothesis must be tested for each culture and its ecological variants (i.e., upland and alluvial valley etc.) once the levels of carbohydrate consumption have been established.

It is hypothesized that maize agriculture was adopted in the Trans–Mississippi South by at least A.D. 850, but not until A.D. 1250 in the northern portion of the Lower Mississippi Valley. If this hypothesis is validated, then the mechanisms which resulted in a 300 year difference in the dates of maize adoption must be ascertained. A corollary research domain is establishing the reasons for differential adoption of maize at some of the early (i.e., Fourche Maline 7 and Caddo 1) Trans–Mississippi South locations and not at others.

It is hypothesized that the cultural variants located in the upland and small alluvial valley areas relied more heavily upon domesticated carbohydrates than their major alluvial valley counterparts. Furthermore, this greater reliance upon domesticated carbohydrate crops required higher individual work loads and resulted in a nutritionally inferior diet. Overall these peripheral ecological zones experienced a lower level of adaptive efficiency than their major alluvial valley counterparts.

It is hypothesized that population nucleation in the northern portion of the Lower Mississippi Valley was the primary cause of the increased infection rates and lowered levels of adaptive efficiency.

It is hypothesized that the nutritional quality of the contact period diets declined significantly and that carbohydrate consumption increased to replace a variety of nutritionally adequate foods which were no longer available.

It is hypothesized that Old World viral infections arrived during the early part of the sixteenth century and the resulting epidemics resulted in depopulation. Models for identifying the presence of Old World viral diseases and epidemics must be devised before this hypothesis can be tested.

It is hypothesized that urban African–American slaves had access to more nutritionally adequate diets, experienced lower work loads, and were subjected to lower stress levels than their rural counterparts. A corollary hypothesis is that nutrition, disease stress, and work loads varied significantly throughout the study area depending upon the particular agricultural or commercial systems which dominated specific regions.

It is hypothesized that life improved significantly for African–Americans during the short Reconstruction period, but that it soon returned to levels far worse than during the period of slavery.

Recommendations For Osteological Data Collection

Syntheses of the bioarcheology of the Louisiana and Arkansas study area clearly demonstrates that there is a paucity of high quality osteological data. Testing the above listed hypotheses will require more extensive data collection than has thus far been attempted. There is not a single osteological report dealing with any skeletal series from anywhere within the study area which provides all the categories of data required to test any of these hypotheses. It is thus obvious that scopes of work for future mitigations of osteological resources must specify the hypotheses which will be tested or problems domains which will be explored during the mitigation. Judging compliance with the scopes of work must be based on whether or not the data collected are appropriate for testing the specified hypotheses. Furthermore, the data collected must be compatible with the extant data base. For example, if all of the dental attrition scores available for a particular area were obtained using the Murphy system, then it would be inappropriate for a project to collect attrition scores using only the Scott system. In other words, the data must be collected in such a way that they are compatible with the location specific data base. This should not be construed as an attempt to limit the data which are collected, but rather as an attempt to guarantee that the bulk of the data are comparable with that already in existence. Following these recommendations will assure that a regional bioarcheological data base will develop as part of the management activities within the Southwestern Division of the U.S. Army Corps of Engineers. These recommendations are especially cogent within the current climate of demands by various groups and government agencies for reburial of skeletal remains.

There are minimum sets of osteological data which are accepted by most bioarcheologists as forming the standard basis of any analysis and the collection of these minimum sets should be required during the mitigation of all skeletal series within the study area. The reader is referred to two publications which briefly outline these minimum data categories and provide references to the literature. Owsley prepared a series of osteological data set recommendations for the Missouri National River (Ludwickson et al. 1981:221–230). Goodman et al. (1984) have prepared a list of data collection methodologies which can be used to reconstruct diets, evaluate nutritional adequacy, and to estimate stress levels from the analysis of skeletal collections. A list of osteological data categories (taken from the two previously cited references) pertinent to testing hypotheses in the Louisiana and Arkansas study area are presented below. This list should be considered minimal and not exhaustive. The application of the methodologies must be guided by the choice of hypotheses to be tested.

1. Demography – Demographic analysis is the most informative for evaluating adaptive efficiency.

2. Growth assessment – Collection of long bone lengths from subadult skeletons which are then analyzed in relation to dental ages can be used to assess nutritional adequacy and overall stress levels. Similar information can also be obtained from measurements of adult long bone lengths, widths, and cross sections.

3. Dental measurements – Measurements of the teeth can be used to calculate temporal trends in tooth size and fluctuating dental asymmetry (differences in size between the right and left sides). These analyses can be used to assess overall stress levels.

4. Harris lines – Growth arrest lines observed in radiographs of long bones can be used to compute the rates of childhood stress episodes and to calculate age specific patterns of childhood stress.

5. Enamel hypoplasias – These defects in the formation of enamel can be used in the same fashion as Harris lines (see above) but have the added advantage that they are not altered during the life of the individual. Wilson bands are microscopic enamel defects observed in thin sections of the teeth. They provide the same information as enamel hypoplasias, but they have the advantage of producing reliable results from small samples of individuals.

6. Pathological indicators of nutritional deficiencies – Porotic hyperostosis is the most frequently reported indicator of a dietary deficiency, but there are other skeletal lesions which attest to the presence of rarer conditions such as rickets and scurvy.

7. Infectious lesions – The frequency and patterning of infections by age and sex are excellent indicators of adaptive efficiency. It is critical that healed and active lesions be distinguished.

8. Bone histology – Analysis of histological features of bone can provide information about nutritional adequacy, metabolic disorders, and overall stress loads.

9. Trauma – The frequency and patterning of physical damage to the skeleton by age, sex, social status, and bone category are useful in the reconstruction of various behavioral practices.

10. Degenerative conditions – The frequency of degenerative lesions (e.g., arthritis, etc.) by age, sex, social status, and location on the skeleton are important for evaluating physical stress levels, reconstructing activity patterns, and assessing individual work loads.

11. Dental pathologies – Caries and other pathological lesions of the teeth are important for the reconstruction of dietary content.

12. Dental attrition – Measures of dental attrition are critical for evaluating the consistency of the foods consumed and can contribute to dietary reconstruction. Dental microwear patterns observed with a scanning electron microscope are an important supplement to dental attrition rates and are useful in identifying certain food categories, such as vegetable fiber and hickory nuts.

13. Stable isotope analysis – Stable isotopes such as carbon and nitrogen, among others, are the only means for identifying

the consumption of certain foods (e.g., maize, marine foods) and estimating the quantities eaten of each.

14. Trace element analysis – Trace element analysis offers the opportunity to test for the presence of specific foods. For example, strontium levels can be used to estimate the amount of meat eaten.

15. Nonmetric genetic markers – Analysis of nonmetric traits of the teeth and skeleton can be used to estimate genetic relationships, test migration hypotheses, and estimate bio-social interaction (e.g., marriage patterns). Craniometric analysis is not as useful within the study area because of the poor preservation and infrequent recovery of complete skulls.

16. Postmortem skeletal modifications – Patterns of breakage, cut marks, burning, etc. observed on the skeletons are important for reconstructing mortuary customs.

ADAPTATION TYPES

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This chapter presents a summary of the cultural adaptation types of the study area. This is an initial attempt to integrate the archeological data — especially the data on subsistence and settlement — with the bioarcheological data. Ideally, all of these data bases would be ample and trustworthy, and we would be able to present a series of well documented adaptation types, cross-cutting the cultural divisions based on archeological analyses of artifact styles and other cultural attributes.

In a number of cases, however, bioarcheological and/or subsistence data are totally lacking, and settlement data are sketchy at best. This is especially true in the cases of most, though not all, of the earlier archeological cultures, but it is also the case with regard to some of the later and supposedly well known cultures. For these reasons, we are forced to rely to some extent on analogies from apparently similar situations and to emphasize the tentative nature of all of these formulations.

After comparing the archeological and bioarcheological records for the cultures of the study area, we have found it convenient to define ten major adaptation types, some of them subdivided. These adaptation types and their subdivisions are as follows:

- **A. Late Pleistocene/Holocene Transition Adaptations**
- **B. Early Holocene Adaptations**
- **C. Middle Holocene Adaptations**
- **D. Late Holocene Semi-Sedentary Inland Adaptations**
  - **1. Inland**
  - **2. Coastal**
- **E. Late Holocene Sedentary (Inland) Adaptations**
  - **1. Dispersed**
  - **2. Aggregated**
  - **3. Paramount Aggregated**
- **F. Contact Period Adaptations**
- **G. Initial European Exploration Adaptations**
- **H. Early European Settlement Adaptations**
- **I. European and American Pioneer Settlement Adaptations**
- **J. Developed Settlement Adaptations**

In the following sections, we will briefly define these adaptation types and summarize both their data deficiencies and the most salient data about them.

LATE PLEISTOCENE/HOLOCENE TRANSITION ADAPTATIONS

Definition. This adaptation type is primarily based on the known Paleo–Indian cultures who used the diagnostic fluted points during the Early Holocene, ca 9500–8000 B.C. It also includes the hypothetical pre-10,500 B.C. Late Pleistocene cultures and the somewhat less hypothetical Pre-Fluted Point cultures dating to initial Holocene times, ca 10,500–9500 B.C.

Also included here, as a sort of catch-all gesture, are the poorly known peoples who are probably at least partly identical to Paleo–Indian fluted point users and Dalton point users. They used unfluted lanceolate points ca 9000–7000 B.C., along with the makers of Agate Basin-like points, possibly dating between 8500 and 8000 B.C.

Environment. The environmental settings for these cultures were quite variable within this enormous study area but were in general significantly different from modern environments. Continental glaciers were waning but still present to the north, and the Mississippi River was carrying glacial meltwaters in a braided stream mode to a Gulf of Mexico that stood at a sea level much lower than the current level.

The Pleistocene–Holocene transition was reflected in changing vegetation patterns. A strange spruce forest along the Lower Mississippi Valley was beginning to be replaced by the cypress–gum bottomland forest more familiar to us today. The spruce–jack pine forest of the uplands in the northern part of the study area was concurrently being replaced by forests dominated by oaks and other hardwoods. On the Coastal Plain uplands of the southern parts of the study area, forests dominated by oaks, hickories, and southern pines continued to exist and expanded northward.

Animal populations were also changing very significantly during these times. The Pleistocene megafauna were dying out, and the consensus of opinion appears to be that both climatic change and the unprecedented presence of skilled human hunters were factors. Whatever the causes, all of the extinct megafaunal species seem to have died out by about 8000 B.C.

Subsistence and Settlement. We have no direct evidence of Paleo–Indian subsistence from the study area, nor do we have any bioarcheological data relevant to subsistence practices. Our characterization of this adaptation type therefore depends on settlement data, chiefly on the locations of isolated point finds, interpreted with the help of knowledge about formation processes of the archeological record plus a few analogies from other eastern U.S. areas.

Data from Florida (Clausen et al. 1979) and Missouri (Graham et al. 1981) associate Paleo–Indians with the remains of both extinct and modern fauna. Both positive and negative data from within the study area and elsewhere in the eastern U.S. associate these peoples with major stream valleys, but essentially not with uplands and rock shelters. The coastal subsistence–settlement adaptations of Paleo–Indians and their near contemporaries are very poorly known in general and unknown in the study area.

Data Gaps. The major problem in dealing with this adaptation type is the total dependence on surface finds of more or less diagnostic artifacts. Within the study area, no excavated sites have yielded abundant *in situ* artifactual materials, let alone subsistence-related materials or burials, relevant to Paleo–Indians or closely related peoples. Two sites in Louisiana, John Pearce (Webb et al. 1971) and Eagle Hill (Gunn and Brown 1982; Servallo 1983) have yielded a few Clovis-like and Folsom-like points from excavated contexts, but these are no more enlightening for evaluation of adaptation types than so many surface finds.

Clearly, the crying need in (and near) the study area with regard to this adaptation type is for buried sites with abundant *in situ* artifacts sufficient for documentation of tool kits and activity areas. The examples of Dalton sites such as Brand and Lace, which are almost as ancient, suggest that such hopes are not completely unrealistic. Given the right conditions, subsistence related remains and/or burials may also be found.

EARLY HOLOCENE ADAPTATIONS

Definition. The major cultural entities included here are the Dalton and San Patrice cultures which existed from about 8500 to 7500 B.C. and about 8000 to 7000 B.C., respectively. Also included are the rather hypothetical Angostura-like lithic horizon, which may represent Plains-related groups dating ca 8000–7000 B.C. and the Early Corner-Notched Point lithic horizon of ca 7500 to 7000 B.C.

Although Dalton points, and to a lesser extent San Patrice points, are found over much of the study area where landforms of sufficient age are exposed, the Dalton occurrences are much more common in northeast Arkansas, and the San Patrice finds are concentrated in and near northwest Louisiana. It is also only in these regions that true assemblages and tool kits have been identified from good excavated contexts.

The early corner-notched points may well be related to both late Dalton and late San Patrice forms and occur widely, generally in limited numbers, on most landforms of sufficient age. The Angostura-like points, however, are quite scarce, essentially limited to the western portions of the study area, and are problematical as to age and cultural affiliation.

Environment. The most salient points about the Dalton paleoenvironment appear to be that the northeast Arkansas zone of Dalton concentration was well along the way in a change from boreal or near boreal forest conditions in the uplands, and from spruce forest to cypress–gum and mixed hardwood associations in and near the Mississippi Valley; that the Pleistocene megafaunal species were either extinct before Dalton times or went extinct during Dalton times; and that the Mississippi River itself was in a braided-stream mode in the Eastern Lowlands. All of the these factors may have combined to produce a unique, if transitory, ecotonal situation in northeast Arkansas, and the relationship of this situation to the apparent Dalton fluorescence should be explored more thoroughly.

The San Patrice heartland also appears to have included an ecotonal situation but perhaps a less productive one. Here, the southwestern portion of the newly established oak- and chestnut-dominated forest merged with the oak–hickory–Southern pine forest of the Coastal Plain. The Red River's situation is very poorly known for this period.

The latter centuries of existence for all these cultures or horizons would probably have been marked by increasingly warm and arid conditions, leading toward the Hypsithermal maximum of ca 6700 to 4500 B.C. This situation may well have been a factor in the eastward spread of Plains hunters and their Angostura-like point forms.

Subsistence and Settlement. No direct evidence of subsistence has been recovered from any sites of these cultures or horizons in the study area. However, fauna from excavations in other states and functional experiments with replicated tools have supported the inference from northeast Arkansas sites that Dalton peoples emphasized the hunting of whitetailed deer. Other modern fauna have also been found with Dalton materials in Missouri, but no extinct megafauna have yet been found in Dalton contexts anywhere. Evidence for exploitation of wild plant foods is minimal but suggests some emphasis on nuts, with no formalized plant food processing tools. The Dalton adz suggests an adaptation to exploiting the burgeoning hardwoods and perhaps baldcypresses for tools and construction purposes, possibly including dugout canoes.

Dalton settlement is a much discussed and somewhat controversial subject. The Morses' (1983:80ff) "refined model" involves banana-shaped home territories for Dalton bands, with base settlements, hunting/butchering camps, plant food collecting/processing camps, quarries, and cemeteries. Dalton peoples are also noteworthy for apparently being the first in the study area and the Southeast to exploit uplands extensively and to use rock shelters frequently.

San Patrice sites have thus far produced no direct evidence of subsistence whatever, but the points and other items in the well defined tool kit suggest a Dalton-like emphasis on deer. A few ground stone fragments which may have been used in wild plant food processing were found at the Whatley site in east-central Louisiana. San Patrice settlements are known mainly from settings along terrace edges overlooking streams or lakes and along small streams in the uplands. However, the activities of the Red River may have buried or obliterated evidence of San Patrice settlements in the major valley.

Subsistence data are absent for the makers of Angostura-like and corner-notched points in the study area, although of course hunting is again an obvious inference. Settlement data are inadequate as they are essentially based only on scattered and isolated finds in upland settings.

Bioarcheology. Only one burial site is known to represent this adaptation type. Several lines of evidence, including the identification of 91 definite and 26 probable human bone fragments, support the inference that the Sloan site in northeast Arkansas was a Dalton cemetery and, indeed, the earliest known cemetery (as opposed to a simple burial site; it may have contained 12 to 25 individuals) in North America. Unfortunately, the fragments are so small that no further bioarcheological analyses are possible.

Data Gaps. Although Dalton culture is relatively well known for such an early manifestation, a number of major gaps in our knowledge remain. Despite several extensive to intensive excavations in the project area, no preserved subsistence-related faunal or floral materials have been recovered. Despite the extraordinary finds at the Sloan site, Dalton peoples remain bioarcheologically unknown. Additional tests of the contending hypotheses about Dalton settlement patterns and systems would be highly desirable.

These data gaps expand to chasms when we consider the San Patrice and other examples of this hypothesized adaptation type. In all cases, excavations of sites with preserved organic remains in good associations would be most welcome. In the cases of the Angostura-like and corner-notched point horizons, excavations of merely an *in situ* lithic assemblage would be a major advance.

MIDDLE HOLOCENE ADAPTATIONS

Definition. This is perhaps the least known of all the adaptation types tentatively suggested here. Even so, it seems clear that a great deal of variation, over a very long span of time (ca 7000 to 3000 B.C.), is included within this huge study area.

This period includes the Hypsithermal climatic interval in its varied regional and temporal manifestations as its main distinguishing environmental characteristic, and the cultural adaptations to, or perhaps in spite of, these variable conditions were probably rather complex. If we had much better data, we might well propose several subtypes of this adaptation type, if not several different adaptation types. But for now, the suspected variation is simply not well enough documented.

Included in this adaptation type are the Early Stemmed Point horizon, ca 7000 to 6000 B.C., of the eastern portions of the study area; the possibly related Scottsbluff–Eden–Cody-like horizon of southwest Arkansas and northwest Louisiana, which may represent an intrusion of Plains hunters; the Rice (point type) horizon, ca 6000 to 3000 B.C., known from scattered finds in northeast Arkansas but concentrated in the Ozarks; the Basal Notched Point horizon, ca 5000 to 4000 B.C., of the eastern and especially northeastern portions of the study area; the Tom's Brook culture or Johnson point horizon, also ca 5000 to 6000 B.C., of the Ouachita Mountains, Ouachita Valley, and adjacent Ozarks northwest of this study area; and the Side-Notched Point horizon, ca 4000 to 3000 B.C., known at least from northeast to south-central Arkansas.

A wide spectrum, if not discontinuous sets, of adaptations would appear to be represented here. Perhaps the greatest contrast is between the hypothesized Plains-like, relatively open ground upland hunting practices of the Scottsbluff–Eden–Cody-like horizon peoples and the riverine adaptation of the Tom's Brook culture peoples. Yet the Tom's Brook culture, which is moderately well known, also includes upland components in Arkansas within and outside the present study area (Bartlett 1963; Schambach 1979:27), and in Oklahoma has been said to have several relationships to Early Archaic technologies (Wyckoff 1984:138). And on the other hand, the Scottsbluff phenomenon is poorly understood, based mainly on scattered finds from uplands. The Scottsbluff distribution straddles the Red River Valley but is totally undocumented within that valley, probably due at least in part to site destruction and burial by the river. So the question of whether the Scottsbluff–Eden–Cody peoples had a riverine adaptation of their own is simply unanswerable at present.

Possibly coeval with the later horizons listed above but not related to them in any demonstrable way are the mysterious Middle Archaic mounds of southern Louisiana, dated before 3000 B.C. (or even 4000 B.C. in one case) by radiocarbon analyses. Even if these early dates are correct, the task of relating these mounds to cultural contexts still remains. It is not beyond the realm of speculation to suggest that they may eventually be assigned to an adaptation type quite distinct from some of the subtypes listed above, perhaps to one ultimately related to the Poverty Point phenomenon. Some other attributes once thought distinctive of Poverty Point culture have recently been pushed back in time (Morse and Morse 1983:115ff), and mound building may well be another of these "Poverty Point previews," an adaptation in the realm of social integration.

Environment. The Hypsithermal climatic interval, which was the major environmental factor for this adaptation type, was probably at its warmest and driest in at least the northeast portion of the study area between about 6700 and 4500 B.C., with relatively warm/dry conditions continuing until about 3000 B.C. Its manifestations in different regions were probably quite variable, though.

In terms of vegetation change, the Oak Savannah belt intruded from the west into east Texas and western Arkansas, followed by Plains grasslands. Also during this interval, forests dominated by oak, hickory, and southern pines "migrated," species by species rather than by communities, northward out of the Coastal Plains and into northern Arkansas. On the Coastal Plains, a significant expansion of the southern pines occurred by around 4000 B.C. Perhaps this forest type, which is relatively unproductive for humans, is related to the scarcity of Middle Archaic remains in Louisiana.

The Mississippi River had become a meandering stream as far north as Memphis by about 7000 B.C. and soon was meandering throughout the portion of its valley within the study area.

Subsistence and Settlement. Only the Tom's Brook culture has yielded subsistence remains; these come from the Paw Paw site in the Felsenthal region, but they have not yet been analyzed and published. Artifactual evidence (points, netsinkers, grinding stones) indicate a diverse subsistence pattern with some reliance on fishing in the riverine sites for Tom's Brook culture. It should also be emphasized that upland sites of this culture are known and that they lack the netsinkers. Settlement data from within and outside of the study area indicate that this culture probably had a seasonal round between the riverine and upland sites and that bluff shelters were used where available.

No subsistence data whatever have been associated with any of the other lithic horizons in the study area. Since all of them are based on projectile point styles, it is obvious that the peoples were to some extent hunters, but the animals exploited remain undocumented, as does the question of whether or not the patterns of exploitation were affected by Hypsithermal conditions. The scanty settlement data available from scattered finds indicate that the generally hot and dry northeast Arkansas lowlands were probably used only sporadically or seasonally at best, with the major sites probably located outside of this study area in the nearby Ozark margins, which were cooler and afforded some permanent water sources. As noted above, the Red River has probably obliterated or buried the remains of the riverine component of Scottsbluff–Eden–Cody and other horizons' settlement systems.

Possible Mesoamerican cultigens (cucurbits) have been documented in the Midwest by ca 5000 B.C. and around 3750 B.C. However, both their Mesoamerican derivation and their importance have been questioned (Smith 1987). They may only have been wild gourd species that migrated eastward during the Hypsithermal from what is now the western U.S. Whether they are Mesoamerican or western, portions of the study area are between their presumed source(s) and the Midwestern sites, and the potential for significant discoveries within this study area should be emphasized.

Bioarcheology. There are no bioarcheological data for any of the cultures/horizons under discussion here. Burials were present in the Tom's Brook component at Paw Paw (Schambach and Early 1982:SW50) but have not been analyzed. The Monte Sano Mound near Baton Rouge yielded a date of 4270 B.C. on charred bone which may have been from a human cremation, but again no analyses have been published, and no evaluation can be made (Neuman 1985:32).

Data Gaps. The major data gap for this adaptation type is virtually the entire state of Louisiana (Neuman 1984:82). Even where some cultural remains are known, as in the case of the Scottsbluff-related materials in northwest Louisiana, the dating is very uncertain, and where radiocarbon dates have been obtained, as in the case of the problematical southern Louisiana mounds, the cultural contexts are lacking.

The Louisiana data gap may be due at least in part to environmental factors. Much of the uplands were probably covered by relatively unproductive pine-dominated forests, especially during the latter portion of the Middle Holocene.

The riverine zones, on the other hand, have been subjected to much meander belt activity since this period, and coastal deposits have been subjected to reworking and subsidence; these factors may have obliterated or buried many sites of this general period.

The Arkansas situation is generally much better in terms of known lithic horizon distributions, but it is essentially a data base derived from surface collections. Only two major excavations in the study area relate to this adaptation type, and both involve the Tom's Brook culture. One is the 1930s WPA excavation at the Cooper site, analyzed much later by Schambach (1970) in his dissertation, which is not available in microfilm/hard copy form due to Harvard policy. The other is the Paw Paw site, tested in 1971 but only represented by an unpublished preliminary report (Weber 1973) on part of the excavated area.

In summary, and once again, any extensive and well reported modern excavations yielding good artifactual and ecofactual assemblages for any of the cultures/horizons of this adaptation type would be major contributions.

LATE HOLOCENE ADAPTATIONS

Soon after the beginning of the Late Holocene, i.e., the period from about 3000 B.C. to the present, the prehistoric societies of the study area developed several regionally and/or culturally distinctive adaptations. Although we generally have much more in the way of bioarcheological data and data directly related to subsistence for the Late Holocene than for the earlier periods, these data bases are still spotty in coverage and quite variable in quality. Settlement has therefore remained our "common denominator" for comparing these cultural adaptations.

We have recognized two basic kinds of Late Holocene adaptations on the basis of settlement; these are Semi-Sedentary and Sedentary. Within the Semi-Sedentary category, there are two further subdivisions, Inland and Coastal. The Inland Semi-Sedentary adaptations may be seen as prelimi-naries to more or less sedentary successors. The Coastal adap-tations, however, appear essentially to have remained in the Semi-Sedentary category for the rest of prehistoric time as elaborations on a basic theme established at least as early as the Late Archaic and consolidated at least as early as the coastal Tchefuncte culture.

Within the Sedentary category, which applies only to Inland settings, we recognize three subcategories: Dispersed, Aggregated, and Paramount Aggregated. We emphasize that this is not a simple unilinear evolutionary sequence that can be applied at one time or another to all or most parts of the study area. Instead, the situation in any given region at any given time appears to have been the result of a complex interplay of natural-environmental, social-environmental, and internal cultural-system factors.

The Sedentary–Aggregated subcategory is basically, though not exclusively, associated with certain "developed" Mississippian cultures. However, it seems to have also emerged at the end of the Fourche Maline sequence in and near southwest Arkansas just before the reversion to a Dispersed system with the advent of Caddoan culture.

The Sedentary–Paramount Aggregated subcategory is exclusively associated with major Late Prehistoric and Protohistoric Mississippian societies. Specifically, the Nodena and Parkin phases of northeast Arkansas are definite examples of this adaptation type. Other phases, such as Walls and Kent, may have achieved or approached it.

We now turn to the discussions of these Late Holocene adaptation type categories and subcategories in the order discussed above.

Late Holocene Semi-Sedentary Adaptations (Inland)

Definition. This adaptation subtype includes a rather wide variety of cultural entities, covering a long time span (perhaps too long) when considered collectively and occurring at one time or another over most of the study area. This appears to have been the basic Inland Late Archaic adaptation and to have persisted through most of the Woodland cultural equivalents. Included here are the Pascola, Lake Cormorant, Inland Tchefuncte, Hopewellian, Inland Marksville, "Plainware," Issaquena, Barnes, Baytown, Inland Troyville, and Fourche Maline 1 through 5 cultures.

Environments. The most basic environmental factor for this entire adaptation type is the Late Holocene emergence for essentially modern (presettlement) climatic, geographic, and biological environments. The Lower Mississippi Valley had long since become dominated by the modern Cypress–Gum bottomland and hardwood forest type. The Southern Pine Forest had emerged to cover the Coastal Plains of the Trans–Mississippi South, and to the north were mixed forests of oak, hickory, other hardwoods, and pines.

The Mississippi River was in premodern meander belts at the beginning of the Late Holocene, but it appears to have changed to its modern meander belt between 1000 B.C. and 500 B.C. The Arkansas River was near the Bayou Bartholomew meander belt at the beginning of the Late Holocene and moved into that belt around 2000 B.C. According to the recent revision of its paleogeography, the Arkansas River made the major change to its modern meander belt around A.D. 1000 as estimated previously. The Red River's meander belt situations below Alexandria are perhaps more controversial now than they were a few years ago.

Subsistence and Settlement. Data on Late Archaic subsistence are extremely scarce, mainly derived from the Cowpen Slough site in east-central Louisiana (Ramenofsky and Mires 1985). Largely on the basis of that work, Ramenofsky (1986) characterized the basic Late Archaic subsistence strategy as "diffuse" (exploiting a wide variety of resources) and "redundant," that is, within age and sex distinctions, any given individual performed about the same tasks as any other.

Although Ramenofsky (1986:299) suggested that Late Archaic occupation at Cowpen Slough may have been relatively permanent, the data are probably not adequate to really test that interpretation. The Morses (1983:130–132) suggested that Late Archaic midden sites in northeast Arkansas may represent seasonal aggregated settlements of societies that fragmented in other seasons. This kind of semi-sedentary adaptation is tentatively suggested here as the basic Late Archaic type, and something like it appears to have continued well into the Woodland equivalent cultures.

Although in other areas of the Eastern U.S. data are accumulating on the domestication of native North American plant species before and during Early Woodland times (Smith 1987), plant subsistence data are lacking for the coeval Pascola, Lake Cormorant, Fourche Maline 2, and Inland Tchefuncte cultures. Storage or trash pits have fairly consistently been found on the few extensively excavated sites, but recovery technology has not been adequate.

It does appear from sites of this period in most regions of the study area that the exploitation of bottomland and aquatic resources was emphasized. Many if not most of the known sites are in or near lowlands. The question of mounds and their uses during this period is not at all resolved.

The scarcity of subsistence data, especially data relating to plants, continues through the Middle Woodland equivalents of the study area (Hopewellian and "Plainware" in the northeast; Inland Marksville and Issaquena in the south; and Fourche Maline 3–4 in the southwest). This is extremely unfortunate, as it is at about this time that native North American cultigens become common and abundant in areas where intensive flotation has been accomplished (Smith 1987). If we had good data on plant exploitation from this and the earlier culture periods, we might well be able to further subdivide this adaptation subtype.

Maize, previously believed to have been an important factor in some Middle Woodland societies, has been essentially debunked in other areas and has not been found in the meager flotation samples from sites of this period in the study area (nor, indeed, in somewhat later sites). The faunal data again indicate a broad-spectrum exploitation pattern.

Most of the research on this period has focused on mound sites, which are definitely common in most regions. However, their functions seem to have differed in that the Hopewellian and Fourche Maline mounds were apparently reserved for important, if not elite, individuals, whereas the Marksville culture mounds were used for burial of the general populace.

Toth's (1979:197) "hypothetical Marksville settlement model" included "unspecialized, self-sufficient" small nucleated settlements on the tribal level of social organization — apparently, not far from the "diffuse–redundant" Late Archaic model summarized above. Schambach (in Schambach and Early 1982:SW68) noted the presence of both small upland and large bottomland sites of the Fourche Maline culture at this time, but it is not known whether the larger sites represent real population aggregations or merely repeated occupations.

The Late Woodland-equivalent cultures generally appear to have seen the culmination of this adaptation type. The Barnes component at the Zebree site, despite flotation, did not yield maize (Morse and Morse 1983:186). However, two species documented elsewhere as native North American cultigens, sunflower and chenopodium, were present, along with a variety of wild plant and animal foods. Survey data indicated that the better agricultural soils were not necessarily associated with Barnes culture sites. Again, a seasonally dispersed populace was suggested (Morse and Morse 1983:192).

Only one Baytown culture site, DeRossitt, has been adequately sampled and analyzed for subsistence data. Here again, no maize was found, despite intensive flotation (Morse and Morse 1983:193). Instead, chenopodium, nuts, and other wild plant remains were recovered. Faunal remains included the usual variety of species. Survey data indicate that Baytown sites were spread over virtually all landforms, and that none of the sites were true villages or long term occupations, though DeRossitt may have been occupied for most of the year. A number of suspected Baytown mounds are known, but they remain essentially unexcavated and undocumented.

Troyville culture research has emphasized mound and burial sites. Only one habitation site, Powell Canal in extreme southeast Arkansas (and at the extreme northern tip of Troyville cultural distribution), has been excavated extensively and reported fully (House 1982b). Flotation of samples from nine pit features yielded no maize nor any other cultigens, and the bioarcheological analyses supported the inference of primary dependence on wild foods. The site itself appears to have functioned primarily as a late spring and early summer fishing camp, although there was a small fall/winter occupation as well. Unfortunately, given the bioarcheological significance of the Mt. Nebo site, no subsistence analyses have yet been published for this site. At the Troyville site itself, Winslow Walker (1936: 38–39) recovered burned plant remains and had them analyzed by specialists; maize was not present. At both Troyville and the Gold Mine site in northeast Louisiana, deer predominated, and a variety of other animal species, especially bottomland and aquatic species, were present. It should also be noted that the Troyville culture appears to have been the first in the study area to use the bow and arrow commonly, beginning perhaps around A.D. 600.

Belmont (1982c:88–89) suggested that a hierarchy of Troyville sites may have existed, including Troyville itself, several smaller multimound centers, sites with one or a few small mounds, habitation sites, and extractive sites. However, he also noted that the mortuary data do not support the interpretation of a hierarchical social organization.

Bioarcheology. It is essentially only in the Late Woodland equivalent time range (Baytown and Troyville cultures) that adequate samples are found. For the samples that are available, an average rate of 2.8 caries per person (Table 70) indicates a high carbohydrate diet and the likelihood of some form of agriculture. Examination of the site-specific rates suggest that reliance on an agricultural technology was variable across the study area. The Mt. Nebo site stands out with an exceptionally high rate of 8.1 caries per person, but at least some of these "Troyville" burials may belong to an early Coles Creek component.

The virtual absence of evidence for maize consumption suggests that these peoples cultivated and consumed native North American cultigens, especially starchy seeds. The absence of anemia (Table 71) indicates that there were no problems with iron intake. Until additional evidence is accumulated, we must assume that the diet was nutritionally adequate.

The infection rate of 19.6% (Table 72) signifies adequate adaptive efficiency. The major joint arthritis rate of 31.9% (Table 73) is relatively high and argues for a relatively arduous lifeway. This is further supported by a high spinal arthritis rate of 45.9% (Table 74) and a high trauma rate of 12.8% (Table 75).

In summary, these peoples practiced the cultivation of native North American domesticates, had a diverse and nutritionally adequate diet, and engaged in strenuous physical activities. There are no data from the Trans–Mississippi South, but within the Lower Mississippi Valley, adaptive efficiency was high.

Data Gaps. As has been seen repeatedly in the foregoing review, a major data gap for cultures included in this adaptation subtype is archeological data on subsistence, especially plant food subsistence. Other areas of the eastern U.S. have simply forged far ahead in modern archeobotany and left the study area, for the most part, in a 1930s–1950s "time warp" as far as this aspect of research is concerned.

It must be stressed that bioarcheological data are essentially absent for the earlier cultures included in this adaptation subtype and, as noted above, a subdivision on the basis on dependence on cultigens might eventually be feasible.

Internal settlement patterning is another serious data deficiency for this adaptation subtype. There are virtually no data on houses. There are a number of large sites relating to this adaptation subtype, but whether they represent aggregations of people or merely repeated reoccupations by small groups remains essentially unstudied. House's (1982b) work at Powell Canal represents a beginning. His hypothesis of "functional variability perpendicular to the stream vs. temporal variability parallel to the stream" should be tested more extensively at other appropriate sites.

LATE HOLOCENE SEMI-SEDENTARY ADAPTATIONS (COASTAL)

Definition. This adaptation type includes the traditional hunting, gathering, and fishing lifeway that characterized the economies of the inhabitants of coastal zone of Louisiana throughout prehistory. Evidence for the initial widespread adoption of this lifestyle is noted for the Late Archaic period which is the earliest period for which adequate subsistence/settlement data from the coast have been recovered. However, there are limited data from Avery Island in the salt dome region, suggesting that the late Paleo–Indian groups were also taking advantage of the rich coastal environment at least on a part time basis, and many researchers project the early roots of this traditional coastal lifeway as far back as the initial influx of Paleo–Indian or Archaic groups into this region. A variant coastal adaptation incorporating some level of horticulture into the basic hunting, gathering, and fishing subsistence economy persisted throughout the Woodland, Mississippi, and Protohistoric periods, and is also subsumed under this adaptation type. Despite differences temporally and geographically within the coastal zone that are related to cultural pulses emanating from outside sources, the cultures that occupy this ecological niche throughout prehistory reveal a basic adaptive continuity that is distinct from their counterparts in the inland areas.

Throughout much of prehistory, the efficiency and success of the coastal adaptation type and perhaps the isolation of groups in this area from outside forces appear to have buffered coastal cultures from the evolutionary changes occurring in the inland areas. As a rule, coastal adapted cultures are noted as being conservative and in the backwater of cultural development. However, at periodic intervals throughout prehistory, perturbations arising from economic and sociopolitical developments outside the coast introduced new elements such as interregional trade, more centralized social organization, and horticulture into the adaptive scheme. Such economic developments as incipient plant domestication as well as the elaboration in material culture, religion, and ceremony that occur at times during the prehistory of the coast are not construed as departures from the coastal adaptation pattern. Rather, this variation is regarded as part of the flexibility inherent to marine shorezone ecological systems and one of the interesting processual aspects of coastal adaptation to be examined more closely in future research. For our purposes, it is less important that the coastal adaptation type represent a homogeneous set of cultural manifestations than it is to make use of the adaptation paradigm as a vehicle to facilitate the study of why certain cultural forms arose, how they operated, and how they were transformed in succeeding periods.

Environment. The environmental context of this adaptation type is the dynamic zone of interaction between inland freshwater riverine systems and marine salt–brackish water estuarine systems. The 10 to 40 km wide coastal shorezone encompasses a diverse array of wetland and landform types including rivers, crevasse distributaries, marshes, lakes, bays, natural levees, beach ridges, dunes, salt domes, terraces, and islands. The biological productivity of the coast is one of the highest to be found in the world and includes various fish and shellfish species, amphibians, reptiles, birds, mammals, and plants. Perhaps the most significant coastal resource of the prehistoric groups in the area was the brackish-water *Rangia* clam habitat where could be found clams and clam predators such as the drum, sheepshead, and other fish. The *Rangia* habitat found throughout the estuaries of the Gulf coastal zone was the primary focus of prehistoric aquatic food procurement systems and remained a core component of the coastal prehistoric economy even after the introduction of horticulture in this region.

Subsistence and Settlement. A distinct technology is associated with this adaptation type geared to the procurement and maintenance requirements of life on the coast and the raw material constraints of this region. Though lithic tools are present, they occur in relatively low quantities compared to the inland regions, and are usually of smaller size as a result of the dependence on gravel chert resources. Late Archaic and Poverty Point culture sites have revealed the most varied lithic assemblage consisting of lapidary items, dart projectile points, microlithics, sandstone abraders, atlatl weights, plummets, hammerstones, celts, and ground stone tools. However, for most assemblages, bone and shell tools, as well as ceramic vessels, pipes, and clay objects, are the dominant artifacts recovered on coastal sites. Reflecting the emphasis on wetlands exploitation, extractive stations often include a complete fishing tool kit consisting of bone fish hooks, shell celts, gouges, and hoes, bone harpoons and gigs, cordage, fishline weights, wooden spools (for holding cordage), and wooden paddles (Duhe 1976; Shenkel 1984). Watercraft are assumed to have been important means of transportation in this wetland region during prehistory. Evidence of net impressions on baked clay objects suggest that netting and/or seining may have also been employed. Other bone tools include socketed bone points, awls, bone flakers, and various items of personal adornment such as hairpins, beads, and gorgets. There is good evidence for the Mobile Bay region of Alabama that Gulf coastal groups were also employing weirs or tidal traps to harvest animal food in the estuarine area. This might have also been available in coastal Louisiana, though no concrete evidence of such traps has been found. It should be emphasized that this account of the technology for the coastal adaptation type has generalized across cultural, temporal, and spatial boundaries, and does not reflect the total tool assemblage at any one time for any discrete culture group.

A degree of geomorphic and ecological variation exists between the river delta, salt dome, and chenier regions of this broad zone and these differences have affected the development of the cultures that occupied these regions. Whereas the important aquatic estuarine habitats are widely, although not uniformly, available throughout all three coastal subdivisions, the productivity of the terrestrial habitats varies in significant ways. The fertile well drained natural levees along the distributaries in the delta zone, which are renewed by periodic flooding, offered an ideal situation for the integration of horticulture into the traditional coastal economy. The salt dome region may also have satisfied the conditions for plant cultivation on the natural levees and high well drained domes. However, the chenier region, which is composed of low, narrow, sandy beach ridges subject to the effects of flooding and salt incursion, is not well situated for successful horticulture. The major environmental differences along the coastal shorezone basically pertain to the more optimum conditions for plant cultivation in the delta and salt dome regions compared to the chenier zone.

Incipient horticulture focused on the natural levee system of the major distributaries and trunk channel was probably a minor component of the subsistence economy during the Woodland and later cultural manifestations on the coast. Where present, it was probably an addition to the traditional estuarine plant and animal foodstuffs rather than a replacement, at least prior to the Coles Creek culture period (Gibson 1978).

The earliest evidence of domesticated plant remains is from the Tchefuncte culture Morton Shell Mound site in Iberia Parish (Byrd 1974) and consisted of squash and bottle gourd. The only evidence of maize in the coastal region comes from the Mississippi culture Fleming site in the Barataria Basin. Beavers (1982:112) argued that maize probably was not intensively cultivated, but rather functioned in some ceremonial role as a bonding element to the larger Mississippian interaction sphere. Beyond these generalizations, there are not enough data to accurately assess the role of horticulture in the prehistoric subsistence economies of the coastal inhabitants.

From years of research along the coast, clear patterns of preferred prehistoric site locations have emerged for the delta region. A settlement model derived by Coastal Environments, Inc. (1977) for the delta region shows the most frequent site locations relative to the kinds of microenvironmental zones present in this area. A number of different site location types were available in this region, ranging from various positions on the distributary drainage system to more aquatic focal points proximal to swamps, lakeshores, bayshores, and barrier islands. One important dimension of variability of sites situated on the distributary system are locations strategic to water transportation routes versus locations providing access to the backswamp and interdistributary basin environments where the rich and diverse fish and animal resources were situated. Site locations on the trunk channel would have afforded access to this major artery and the fertile natural levees along either side. The natural levees along the distributaries of the delta also provided the highest elevations above the reach of normal floods in the coastal zone for semipermanent habitation. The lesser distributaries in the more brackish water areas and other locations off the levees of the major distributaries were often better situated in relation to the major estuarine resource procurement area, but were in more flood-prone areas. Exploitation of these microenvironments often tended to be in the form of short term extractive stations associated with semipermanent base camps situated on the natural levees.

Although specific site locations shifted in response to the deltaic formation cycle and resulting changes in the distribution of resource-rich areas, utilization of a range of microenvironmental types was a common thread throughout the span of prehistory. However, the organization and interrelationships of site locations appear to have varied at times, depending on how the exploitation of these microenvironments was incorporated into or embedded in the sociopolitical systems of coastal groups. The Late Archaic, Tchefuncte, and Troyville cultures appear to be characterized by a fairly simple arrangement of relatively isolated seasonal base camps or hamlets and small temporary extractive stations focused on the *Rangia* habitats in the estuarine zone. There is little material evidence of intervillage ties, and it appears that residential groups during these periods were relatively self-sufficient economically and politically autonomous. There is a possibility that these scattered residential loci were tied together through mortuary ceremonialism, but aside from the Lafayette Phase Tchefuncte groups in the central coastal region, there is little evidence of special treatment such as mound burial or funerary offerings to confirm this.

During the Poverty Point, Marksville, Coles Creek, and Mississippi culture periods, a more complex system evolved consisting of semi-sedentary villages linked politically and ceremonially through the trunk channel transportation routes by larger villages, all supported by small outlying temporary extractive fishing and gathering stations. Many researchers have noted that a linear north–south site distribution pattern along the levees of the rivers and distributaries emerged during these periods (cf. Beavers 1978, 1982; Gibson 1978). In the Barataria Basin (Beavers 1982), the major residential sites of the Plaquemine and Mississippi cultures tended to be spaced regularly on the high levees at stream confluences to maximize access to a number of ecological zones and water communication routes. Each residential locus was also associated with a series of smaller special-function extractive stations focused at the highly productive estuarine habitats tangential to the main distributary. As Beavers (1982:105) noted, to maximize environmental diversity in the delta, it is necessary to exploit an area perpendicular to the trend of the north–south distributary drainage; parallel to the drainage pattern, there is biological redundancy, both along the natural levees and within the estuarine marsh zone.

Information concerning prehistoric settlement patterns in the salt dome and chenier regions west of the Mississippi River Delta is not as complete. Based on the content of shell midden sites in these areas, it appears that the groups in these areas were exploiting similar types of microenvironments. However, the nature of the site settlement strategy and mobility patterns is not clear. The environment of the salt dome region, which includes extensive tracts of estuarine marsh dissected by distributaries and other drainages providing natural levees for settlement, would appear to be analogous to the delta area and may have resulted in a settlement strategy similar to that discussed for the delta. The linear beach ridge topography of the chenier region may have resulted in a very different pattern of site distribution. Gibson (1984) has noted that sites are more numerous, larger, and closer together on the end of the chenier closest to the Mermentau River suggesting that, similar to the delta and salt dome region, access to and utilization of areas adjacent to major drainages was an important determinant of site location in the cheniers as well.

Though settlement pattern models have been developed for the delta region, and some limited information has been obtained for the salt dome and chenier regions, the scheduling of settlement mobility between these sites is unclear. Efforts to determine the season of occupation of sites has produced inconclusive results. Most analyses are only clear in demonstrating that the shell middens on the coast were utilized during the late spring/summer and fall (Byrd 1974; Duhe 1976; Goodwin 1986; Beavers, personal communication, 1987). The extent of coastal occupation during the winter and early spring has not been determined. Even Byrd's (1974) detailed faunal and floral analysis at the Morton Shell Mound produced only inconclusive evidence for winter and spring site occupation. Richard

Shenkel (personal communication, 1987) sees evidence for year-round occupation at the Little Oak Island village and seasonal summer/fall use of the associated seasonal camp at Big Oak Island. This hypothesis of year-round use of the coast is also endorsed by Ramenofsky (personal communication, 1987) who points out that there were sufficient resources to permit full sedentary occupation of the coastal zone. Shenkel also observed that permanent occupation of the coast persisted until agriculture became important in the interior, at which time the coast became a seasonal use area. Gibson (1984; personal communication, 1987) notes the lack of empirical data on seasonality, but points to the ethnographic data for the Attakapas in south western Louisiana, whose transhumant seasonal round consisted of dispersed settlement in the coastal zone during the summer and aggregation to larger sites in the interior 25 miles inland where they took advantage of acorn and terrestrial faunal resources. Based on excavations at site 16CM61 in Cameron Parish, Goodwin (1984) has suggested that the Attakapas pattern of seasonal transhumance can be extended back as far as the Coles Creek period in the chenier region. The question of seasonal occupation of the coast cannot be resolved from the scanty data base that now exists and is obviously a topic for further research.

There is evidence for considerable fluctuation in social organization, political complexity, and external social interaction through time on the coast of Louisiana. Gibson (1978) equates the apparent hierarchical settlement system and other cultural climax elements characteristic of the climax periods (Poverty Point, Marksville, Coles Creek, Plaquemine, Mississippi) with the attainment of the chiefdom level of sociopolitical organization. During the climax culture periods when the so-called chiefdom level of organization was reached, the basic coastal subsistence pattern was structured to fit the procurement and redistribution system of the more complex centralized society. The settlement system reflected the importance of the transportation network of water arteries as a means of linking villages with each other and to power bases outside the coast. Evidence of interaction outside the region is common during these climax periods and includes raw materials, finished trade items, design elements, domesticated plants, shared mortuary behavior, and other cultural items and conventions. As discussed in the earlier sections of this report, each of these periods of extraregional interaction manifest different sorts of shared culture originating out of different geographic regions. In most instances, the coastal manifestation of these paneastern cultural expressions represented a somewhat “watered-down” version of the original.

The more conservative Archaic-like settlement system of the Late Archaic, Tchefuncte, and Troyville cultures have been linked by Gibson (1978) with simple tribal or band levels of organization. With the collapse of the so-called climax chiefdom organizations discussed above, cultures reverted back to the traditional Archaic band level which had probably not been completely abandoned by coastal groups. This type of subsistence–settlement system based on patterns streamlined since the Archaic was a very successful adaptation and persisted throughout the coastal zone sometimes alongside the more complex chiefdom organizations. These cultures are characterized as isolated, autonomous groups marked by poorly developed intercommunity social and political ties. There is generally an absence of extraregional trade and interaction, although the ceramic styles, in particular, do indicate some influence or connection with pottery traditions outside the coast including the northern reaches of the Lower Mississippi Valley or coastal traditions in Texas or the Alabama/Florida Gulf coast.

There is of course the potential for some confusion in employing terms such as chiefdom and band which imply a whole range of cultural elements derived from ethnographic research that cannot always be determined purely on the basis of archeological data. Some researchers (cf. Brain 1979; Ford 1979) argue that chiefdom levels were not attained among groups during these periods and suggest that these complexly organized groups represented some intermediate form between bands and chiefdoms characterized by some social grading and the vestment in some individuals of political or religious authority. These terms are used here as a conceptual vehicle for purposes of comparing and contrasting the nature of coastal prehistoric development, and are not intended as a strict characterization of these groups in terms of ethnographic generalizations.

Bioarcheology. The low 0.4 caries rate (Table 70) indicates low carbohydrate consumption for the Late Holocene Coastal Semi-Sedentary adaptation subtype. As expected, there is no iron deficiency anemia among the coastal samples (Table 71). The infection rate of 20.8% (Table 72) is essentially the same as the comparable inland samples and implies a similar level of adaptive efficiency.

The 33.3% frequency of major joint arthritis is derived from a very small sample, although it does signify a moderate level of physical stress (Table 73). The spinal arthritis rate of 33.0% is the same (Table 75). The trauma rate is obtained from a meaningful sample size and, at 3.2%, hints at a relatively low level of physical stress. In summary, the diet was low in carbohydrates; no dietary deficiencies were present, and the people were subjected to the same pathogen contact as the inland populations. The overall level of adaptive efficiency appears to be adequate.

Data Gaps. There are a number of data gaps and critical research questions for the coastal adaptation type that should be highlighted. Major research issues pertaining to basic culture chronology, culture phase refinement, subsistence reconstruction, settlement pattern analysis, and bioarcheological assessment all represent topics in need of further investigation. The alarming rate of site destruction on the coast through development, erosion, and subsidence suggest both the need of concerted data recovery programs to mitigate the loss of sites as well as attention to the future needs of archeology through conservation efforts to protect threatened sites.

Specific archeological data needs have been identified by previous researchers on the coast in a number of publications cited in this volume. Most of the primary ones have been

TABLE 70

DENTAL CARIES PER PERSON IN THE LOUISIANA–ARKANSAS STUDY AREA BY ADAPTATION TYPE

ADAPTATION TYPE SITE	REFERENCE	N	CARIES/ PERSON
INLAND SEMI-SEDENTARY			
Helena Mounds (3PH11)	Ford 1963	13	1.5
Taylor Mound (3DR2)	UAO File	2	0.0
Little Cypress (3CT50)	Rose et al. 1985	3	2.7
Mangrum (3CG636)	Sperber 1982	1	2.0
Banks (3CT14)	Rose et al. 1985	7	0.9
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	0.5
Mount Nebo (16MA18)	Giardino 1977	40	8.1
Gold Mine (16RI13)	Walker 1980	89	1.1
St. Gabriel (16IV128)	Giardino 1980b	7	3.0
		(166)	(2.8)
COASTAL SEMI-SEDENTARY			
Bayou Sorrel (16IV4)	Hrdlicka 1913	16	0.8
Little Woods (16OR1–5)	Snow 1945	9	0.0
Lafayette (16SM17)	Snow 1945	3	0.0
Tchefuncte (16ST1)	Snow 1945	8	0.0
Big Oak (16OR6)	Snow 1945	1	0.0
		(37)	(0.4)
SEDENTARY DISPERSED MAJOR ALLUVIAL VALLEYS			
Zebree (3MS20)	Powell 1977a	13	2.4
Hyneman 2 (3PO54)	Rose et al. 1984	1	0.0
McArthur (3CH49)	UAO Files	3	0.3
Mount Nebo (16MA18)	Giardino 1977	46	8.1
Crenshaw (3MI6)	Powell 1977b	8	5.6
Hanna (16RR4)	Giardino 1980a	4	2.5
Belcher 1 (16CD13)	Webb 1959	5	8.0
Belcher 2–3 (16CD13)	Webb 1959	15	2.3
		(95)	(5.6)
SEDENTARY DISPERSED SMALL ALLUVIAL VALLEYS			
Shallow Lake (3UN52)	Powell 1981	2	2.0
Bangs Slough (3CA3)	UAO Files	1	2.0
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	0.0
Saline Bayou (3CL24)	UAO Files	1	2.0
Middle Meadow (3HS19)	UAO Files	2	4.0
Carpenter Mound (3CL56)	UAO Files	1	26.0
Albritton Bottom (3OU128)	UAO Files	3	3.0
Copeland (3CL195)	Burnett 1984	19	7.8
Hedges (3HS60)	UAO Files	14	7.5
Ferguson (3HE63)	UAO Files	7	4.4
Purtle (3HE70)	UAO Files	1	19.0
		(52)	(6.8)
SEDENTARY AGGREGATED			
Bay Village (3PO3)	Rose et al. 1984	1	9.0
Floodway (3PO46)	Rose et al. 1984	1	3.0
Burris II (3CG218)	Condon and Rose 1979	1	1.0
Zebree (3MS20)	Powell 1977	2	0.0
Hazel (3PO6)	Powell 1983	33	2.6
Hood (3HE54)	UAO Files	1	2.0
Jones Mill (3HS28)	Burnett and Marks 1982	1	10.0
		(40)	(2.8)
PARAMOUNT AGGREGATED			
Upper Nodena (3MS4)	Powell 1983	103	3.9
Wapanocca (3CT9)	Harmon 1984	13	3.9
Middle Nodena (3MS3)	Powell 1983	52	2.7
Pecan Point (3MS78)	Metha & Sensenig 1966	13	1.1
Rhodes Place (3CT3)	Metha & Sensenig 1966	4	1.1
		(185)	(3.3)
CONTACT			
Clay Hill (3LE11)	UAO Files	2	24.5
Parkin (3CS29)	Murray 1985	8	5.9
Gordon (3AS152)	UAO Files	14	5.6
Cedar Grove (3LA97)	Rose 1984	9	11.7
Lou Procello (16DS212)	Green 1983	4	1.0
		(37)	(7.6)

TABLE 71

PERCENTAGES OF ADULT POROTIC HYPEROSTOSIS IN THE LOUISIANA–ARKANSAS STUDY AREA BY ADAPTATION TYPE

ADAPTATION TYPE SITE	REFERENCE	P. HYPEROSTOSIS N	%
INLAND SEMI-SEDENTARY			
Banks Mound I (3CT14)	Rose et al. 1985	25	0.0
Little Cypress (3CT50)	Rose et al. 1985	2	0.0
Hyneman I (3PO52)	Rose et al. 1984	4	0.0
Mangrum (3CG636)	Sperber 1982	1	0.0
Mount Nebo F (16MA18)	Giardino 1977	30	0.0
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	0.0
St. Gabriel (16IV128)	Giardino 1980b	(?)	0.0
		(66)	(0.0)
COASTAL SEMI-SEDENTARY			
Big Oak (16OR6)	Helis 1986	8	0.0
Big Oak (16OR6)	Helis 1986	35	0.0
Lafayette Mound (16SM17)	Snow 1945	3	0.0
Little Woods (16OR1)	Snow 1945	9	0.0
Tchefuncte (16ST1)	Snow 1945	7	0.0
		(62)	(0.0)
SEDENTARY DISPERSED MAJOR ALLUVIAL VALLEYS			
Hyneman II (3PO54)	UAO Files	1	0.0
Zebree (3MS20)	Powell 1977	9	11.1
Mount Nebo A (16MA18)	Giardino 1977	24	0.0
Hanna (16RR4)	Giardino 1980	4	0.0
Crenshaw (3MI6)	Powell 1977	8	12.5
Haley Place (3MI1)	Hrdlicka 1912	2	0.0
McArthur (3CH49)	UAO Files	3	33.3
Myatt Landing (16OU17)	Hrdlicka 1909	18	0.0
		(70)	(4.3)
SMALL ALLUVIAL VALLEYS			
Boytt's Field (3UN13)	Hrdlicka 1909	25	4.0
Moore Mound (3CL56)	UAO File	2	0.0
Denham Mound (3HS15)	UAO Files	4	0.0
Copeland (3CL195)	Burnett 1984	2	0.0
Hedges (3HS60)	UAO Files	9	0.0
Bangs Slough (3CA3)	UAO Files	1	0.0
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	0.0
Hayes Field (3UN23)	UAO Files	1	0.0
Saline Bayou (3CL24)	UAO Files	1	0.0
Middle Meadow (3HS19)	UAO Files	1	0.0
Ferguson (3HE63)	UAO Files	3	0.0
N/A (3CL63)	UAO Files	1	0.0
		(51)	(2.0)
AGGREGATED SEDENTARY			
Zebree (3MS20)	Powell 1977a	1	0.0
Bay Village (3PO3)	Rose et al. 1984	1	0.0
Floodway (3PO46)	Rose et al. 1984	1	0.0
Burris II (3CG218)	Condon and Rose 1979	1	0.0
Ferguson (3HE63)	UAO Files	7	0.0
Hood (3HE54)	UAO Files	5	20.0
Jones Mill (3HS28)	Burnett and Marks 1982	1	100.0
		(17)	(11.8)
PARAMOUNT AGGREGATED			
Upper Nodena (3MS4)	Powell 1983	118	3.4
Middle Nodena (3MS3)	Powell 1983	53	1.9
Wapanocca (3CT9)	Harmon 1984	9	0.0
		(180)	(2.8)
CONTACT			
Parkin (3CS29)	Murray 1985	6	16.7
Greer (3JE50)	Hrdlicka 1908	8	12.5
Clay Hill (3LE11)	UAO Files	2	0.0
Menard (3AR4)	Hrdlicka 1908	4	0.0
Gordon (3AS152)	Rose et al. 1984	16	31.2
Ward Place (16MO12)	Hrdlicka 1909	87	8.0
Cedar Grove (3LA97)	Rose 1984	9	11.1
Spirit Lake (3LA83)	UAO File	1	0.0
Lou Procello (16DS212)	Green 1983	1	0.0
		(134)	(11.2)

mentioned in the culture history section of this report. In addition, the Comprehensive State Plan for Louisiana lists research and preservation goals, themes, data gaps, and discusses programs to address the priority needs. Some of the basic research problem areas for the coast should be underscored.

As with most areas, there is still room, on the coast of Louisiana, for refinement of the basic culture history framework. Although a good foundation has been laid with the current scheme, our understanding of the defined archeological units is uneven, and is often based on a limited repertoire of the artifact assemblage from small samples of a few sites. Such is the case for much of the preceramic cultures as well as for Marksville, Troyville, Plaquemine, and Mississippi cultures. There is a great need to fill in the geographic gaps for some culture periods, focus on a greater range of site types, and widen the aperture of site excavations to encompass a broader, more complete view of the diverse prehistoric activities present on a site. Although a prudent course of limited test excavations has served well in the past for providing samples of artifacts such as ceramics for integration into a relative temporal–spatial culture history scheme, such a program will not substitute for the kind and quantity of data required to progress on to other significant aspects of prehistoric development.

In many cases, phases or cultural associations are predicted on the sole basis of the often unclear covariation of a set of ceramic decorative elements. This problem is exemplified by the poor understanding of the Troyville–Coles Creek culture separation. Part of the problem has apparently been the adherence in the coastal zone to a cultural chronological scheme formulated in the Red River Mouth region that does not seem to fit areas such as the southwestern coastal zone. Some archeologists have concluded that the type–variety typological scheme, which has served as the basis for ceramic analysis and culture integration in the region, is technically inappropriate for some geographic areas and time periods. They point out that in many areas such as the southwestern section of the coast where the percentage of decorated Lower Mississippi Valley wares is extremely low, pottery characteristics such as paste may be better approached through some form of modal analysis.

An apparent similar lack of fit between analytic method and data is noted for the latter end of prehistory when ceramic stylistic traits become “fuzzy” as a result of the sociodemographic instability and increased interaction and sharing between culture groups (Davis and Giardino 1980; Davis 1981). Davis (1984:231) notes that a methodological change to systematize typological nomenclature is needed as well as a more comprehensive system developed specifically for the central Gulf coast which allows for the isolation and consideration of relevant stylistic traits, separate from basic technological features, that are the key to understanding cultural diffusion.

Other areas in need of treatment include studies to determine the role and relative importance of estuarine/terrestrial wild food resources and native cultigens over time in the coastal

TABLE 72

PERCENTAGES OF ADULT INFECTION IN THE LOUISIANA–ARKANSAS STUDY AREA BY ADAPTATION TYPE

ADAPTATION TYPE SITE	REFERENCE	ADULT INFECTION N	 %
INLAND SEMI-SEDENTARY			
Wampler 2 (3CS117)	UAO Files	1	100.0
Banks Mound I (3CT14)	Rose et al. 1985	25	24.0
Little Cypress (3CT50)	Rose et al. 1985	2	0.0
Mangrum (3CG636)	Sperber 1982	2	0.0
Mount Nebo F (16MA18)	Giardino 1977	30	3.3
Gold Mine (16RI13)	Walker 1980	31	25.8
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	25.0
St. Gabriel (16IV128)	Giardino 1980b	7	42.8
		(102)	(19.6)
COASTAL SEMI-SEDENTARY			
Lafayette Mound (16SM17)	Snow 1945	3	66.0
Morton Shell (16IB3)	Robbins 1976	201	20.0
Bowie (16LF17)	Smith 1983	3	33.3
		(207)	(20.8)
SEDENTARY DISPERSED MAJOR ALLUVIAL VALLEYS			
Hyneman 2 (3PO54)	Rose et al. 1984	1	100.0
Zebree (3MS20)	Powell 1977a	8	37.5
Myatt Landing (16OU17)	Hrdlicka 1909	18	11.1
Mount Nebo A (16MA18)	Giardino 1977	24	16.7
McArthur (3CH49)	UAO Files	3	66.7
Hanna (16RR4)	Giardino 1980a	4	0.0
Haley Place (3MI1)	Hrdlicka 1912	2	0.0
		(60)	(20.0)
SMALL ALLUVIAL VALLEYS			
Boytt’s Field (3UN13)	Hrdlicka 1909	25	36.0
Shallow Lake (3UN52)	Powell 1981	2	0.0
Bangs Slough (3CA3)	UAO Files	1	0.0
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	0.0
Ferguson (3HE63)	UAO Files	6	0.0
Ferguson (3HE63)	UAO Files	9	11.1
Saline Bayou (3CL24)	UAO Files	2	100.0
Middle Meadow (3HS19)	UAO Files	1	0.0
Denham Mound (3HS15)	UAO Files	1	100.0
Copeland (3CL195)	Burnett 1984	8	0.0
Hedges (3HS60)	UAO Files	8	75.0
		(64)	(29.7)
SEDENTARY AGGREGATED			
Zebree Farm (3MS20)	Powell 1977a	1	100.0
Burris II (3CG218)	Condon and Rose 1979	1	100.0
Bay Village (3PO3)	Rose et al. 1984	1	0.0
Floodway Mds (3PO46)	Rose et al. 1984	1	0.0
Hazel (3PO6)	Powell 1983	72	87.5
Jones Mill (3HS28)	Burnett and Marks 1982	1	100.0
		(77)	(85.7)
PARAMOUNT AGGREGATED			
Smith (3MS71)	UAO Files	1	100.0
Upper Nodena (3MS4)	Powell 1983	43	86.0
Middle Nodena (3MS3)	Powell 1983	16	56.2
Wapanocca (3CT9)	Harmon 1984	9	55.5
		(69)	(75.4)
CONTACT			
Parkin (3CS29)	Murray 1985	12	41.7
Greer (3JE50)	Hrdlicka 1908	8	25.0
Menard (3AR4)	Hrdlicka 1908	4	25.0
Clay Hill (3LE11)	UAO Files	2	0.0
Ward Place (16MO12)	Hrdlicka 1909	20	25.0
Gordon (3AS152)	Rose et al. 1984	16	18.7
Cedar Grove (3LA97)	Rose 1984	7	28.5
Lou Procello (16DS212)	Green 1983	4	25.0
		(73)	(26.0)

TABLE 73

PERCENTAGES OF ADULT OSTEOARTHRITIS IN THE LOUISIANA–ARKANSAS STUDY AREA BY ADAPTATION TYPE

ADAPTATION TYPE SITE	REFERENCE	OSTEOARTHRITIS N	%
INLAND SEMI-SEDENTARY			
Banks Mound I (3CT14)	Rose et al. 1985	25	12.0
Mount Nebo F (16MA18)	Giardino 1977	24	8.3
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	25.0
Gold Mine (16RI13)	Berg 1983; Walker 1980	31	74.2
St. Gabriel (16IV128)	Giardino 1980b	7	0.0
		(91)	(31.9)
COASTAL SEMI-SEDENTARY			
Bowie (16LF17)	Smith 1983	3	33.3
SEDENTARY DISPERSED			
MAJOR ALLUVIAL VALLEYS			
Hyneman II (3PO54)	UAO Files	3	0.0
Zebree (3MS20)	Powell 1977	12	25.0
Myatt Landing (16OU17)	Hrdlicka 1909	18	0.0
Mount Nebo A (16MA18)	Giardino 1977	30	0.0
McArthur (3CH49)	UAO Files	3	66.7
Hanna (16RR4)	Giardino 1980	4	0.0
Haley Place (3MI1)	Hrdlicka 1912	2	0.0
		(72)	(9.1)
SMALL ALLUVIAL VALLEYS			
Boytt's Field (3UN13)	Hrdlicka 1909	25	4.0
Bangs Slough (3CA3)	UAO Files	1	0.0
Saline Bayou (3CL24)	UAO Files	3	0.0
Carpenter Mound (3CL56)	UAO File	1	0.0
Denham Mound (3HS15)	UAO Files	1	0.0
Copeland (3CL195)	Burnett 1984	4	50.0
Hedges (3HS60)	UAO Files	7	42.9
Ferguson (3HE63)	UAO Files	2	0.0
Ferguson (3HE63)	UAO Files	8	0.0
		(52)	(11.5)
SEDENTARY AGGREGATED			
Zebree (3MS20)	Powell 1977	2	0.0
PARAMOUNT AGGREGATED			
Upper Nodena (3MS4)	Powell 1983	86	3.5
Middle Nodena (3MS3)	Powell 1983	7	0.0
		(93)	(3.2)
CONTACT			
Parkin (3CS29)	Murray 1985	12	16.7
Clay Hill (3LE11)	UAO Files	2	0.0
Gordon (3AS152)	Rose et al. 1984	16	18.7
Ward Place (16MO12)	Hrdlicka 1909	20	0.0
Cedar Grove (3LA97)	Rose 1984	9	55.6
Lou Procello (16DS212)	Green 1983	4	50.0
		(63)	(19.0)

zone. This needs to be addressed in relation to potential differences in economic focus geographically and temporally within the coastal zone and should be tied into an assessment of seasonal settlement mobility patterns, seasonal transhumance versus permanent year-round residence, etc. Related to studies of subsistence and settlement are questions concerning the relationships between population growth and the emergence of new economic strategies and forms of social organization. Accomplishing these tasks will require shifts in the focus of data recovery to include subsistence remains and implementation of techniques to insure adequate retrieval of faunal and floral remains and ecofacts.

The nature of the emergence of complex forms of organization during some "climax" periods and simple conservative "band-like" forms also deserves further treatment. What was the nature of this change and why did the traditional Archaic form persist for so long in some areas? How is social organization related to biological productivity and environmental constraints across the coastal zone? What are the internal and external cultural factors that come into play in the development and maintenance of these social forms and how were new elements integrated into the existing adaptive scheme of coastal societies? How can these social/political organizational forms best be characterized archeologically? What is the relationship between periods of extraregional interaction and trade and the emergence of new economic strategies and forms of social, political, and religious organization?

Late Holocene Sedentary–Dispersed Adaptations

Definition. This adaptation subtype includes a very "mixed bag" of cultures. The first of these is the unique, but classifiable in terms of adaptations, Poverty Point culture of ca 1700 to 600 B.C. Then there is a wide variety of stylistically defined late Prehistoric cultures ranging in time from about A.D. 500 to 1500 in various portions of the study area. The earlier cultures in this group were apparently agriculturalists who emphasized native North American cultigens rather than maize. From the A.D. 500 to 700 period, these include the Fourche Maline 6 culture of the Trans–Mississippi South (or at least, southwest Arkansas). From the A.D. 700 to 1000 period, they include the Emergent and Early Mississippian cultures of northeast Arkansas, the Plum Bayou culture of east-central Arkansas, and the classic "inland" Coles Creek culture of eastern Louisiana and adjacent regions.

Also joining this subtype around A.D. 900 were the Caddoan maize agriculturalists of the Trans–Mississippi South, who continued with a basically Sedentary–Dispersed settlement pattern through the Protohistoric and Historic periods.

Depending on one's definition of Plaquemine culture as distinct from the predecessor Coles Creek and perhaps Plum Bayou cultures, it also is included, beginning between A.D. 1000 and 1200. Once again, from all indications, Plaquemine culture and the succeeding Natchezan culture of the Historic period continued with a basically Sedentary–Dispersed settlement pattern throughout the rest of the cultural sequence.

Not included in this subtype are the Fourche Maline 7 culture of the Trans–Mississippi South, ca A.D. 700 to 900, and the Middle period Mississippian culture of northeast Arkansas, ca A.D. 1000 to 1350; Late Mississippian successors in the latter macroregion are also excluded. It now appears that aggregated village settlement patterns developed for these peoples, and maize agriculture became significant. However, for the moment at least, the Late Mississippian culture(s) of *southeast* Arkansas *are* included in this subtype. They appear to have had a dispersed, Plaquemine-like settlement pattern, which persisted well into the protohistoric period.

Environment. The Poverty Point environment was essentially modern (presettlement) in terms of climate and biological conditions, but it was drastically different with regard to riverine regimes. The Mississippi River flowed through the Yazoo Basin well to the east of its present meander belt for much if not all of the culture's existence. In the Deltaic zone, it debouched primarily in the vicinity of the present Louisiana–Mississippi state line. The Arkansas River was apparently in or near the Bayou Bartholomew meander belt, and the Poverty Point site itself commanded the divide between these two rivers. The Red River's paleogeography is not certain for this period, but it may have flowed to the Gulf on its own rather than joining the Mississippi.

For the later time span of the other cultures under consideration here, essentially modern presettlement climatic, paleogeographic (including riverine), and biological environmental conditions appear to have prevailed. There are a number of indications, however, that sociocultural "environments" were beginning to become important factors.

In northeast Arkansas the culture period immediately before the appearance of the Sedentary–Dispersed Emergent/Early Mississippian subsistence–settlement system has been characterized as one of "Woodland conflict" (Morse and Morse 1983:181ff). In the Trans–Mississippi South, or at least in southwest Arkansas, the Fourche Maline 7 culture of ca A.D. 700 to 900 appears to have developed an aggregated settlement pattern at some sites (Schambach 1982a:150), which was succeeded by the Sedentary–Dispersed Caddoan subsistence–settlement system.

Subsistence and Settlement. Poverty Point subsistence has long been a matter of debate, but great progress has been made with the acquisition of data from the Copes site and a critical review of the literature by its excavator (Jackson 1986). The Copes site, at least, had a year-round, floodplain oriented subsistence system dominated by fishing, deer hunting, and gathering of forest plant foods but also involving the hunting of small terrestrial and semiaquatic animals and the cultivation of squash. The effect of fish was interpreted as structurally equivalent to that of intensified horticulture in some other regions (Jackson 1986:528).

Poverty Point settlement research has been dominated by studies of the unique Poverty Point site itself. However, a number of regional site clusters have also been documented, with secondary centers generally identifiable in each cluster. Although Gibson (1973) argued that Poverty Point itself was a town of 4,000 to 5,000 people, Jackson (1986) stated that such concentrations could not have been sustained and that the type site was instead a periodic central meeting place. Following Jackson's interpretation, we have tentatively placed the Poverty Point system in the Sedentary–Dispersed adaptation subtype. Clearly, if Gibson's hypothesis is correct or even nearly correct, the classification should be changed to the "Paramount Aggregated" subtype.

The Fourche Maline 6 culture is undocumented in terms of subsistence and is only known in general terms with regard to settlement patterning (Schambach 1.982a). It is tentatively included here, more as a hypothesis than as a statement of

TABLE 74

PERCENTAGES OF ADULT OSTEOPHYTOSIS IN THE LOUISIANA–ARKANSAS STUDY AREA BY ADAPTATION TYPE

ADAPTATION TYPE / SITE	REFERENCE	OSTEOPHYTOSIS N	%
INLAND SEMI-SEDENTARY			
Banks Mound I (3CT14)	Rose et al. 1985	25	16.0
Little Cypress (3CT50)	Rose et al. 1985	2	50.0
Hyneman 1 (3PO52)	UAO Files	4	50.0
Powell Canal (3CH14)	Blaeuer and Rose 1982	2	50.0
Mount Nebo F (16MA18)	Giardino 1977	24	33.3
Gold Mine (16RI13)	Walker 1980	49	20.4
St. Gabriel (16IV128)	Giardino 1980b	4	50.0
		(61)	(45.9)
COASTAL SEMI-SEDENTARY			
Bowie (16LF17)	Smith 1983	3	33.0
SEDENTARY DISPERSED MAJOR ALLUVIAL VALLEYS			
Hyneman 2 (3PO54)	Rose et al. 1984	3	66.7
Zebree (3MS20)	Powell 1977a	12	33.3
Myatt Landing (16OU17)	Hrdlicka 1909	13	53.8
Greenhouse (16AV2)	Barnes and Frame 1981	24	33.0
Harrelson (16CA13)	Hrdlicka 1909	4	100.0
Mount Nebo A (16MA18)	Giardino 1977	30	0.0
McArthur (3CH49)	UAO Files	3	100.0
Hanna (16RR4)	Giardino 1980a	3	66.7
Haley Place (3MI1)	Hrdlicka 1912	2	0.0
		(94)	(31.9)
SMALL ALLUVIAL VALLEYS			
Boytt's Field (3UN13)	Hrdlicka 1909	15	47.0
Shallow Lake (3UN52)	Powell 1981	2	50.0
Ferguson (3HE63)	UAO Files	3	33.3
Sand and Gravel (3BR40)	UAO Files	2	50.0
Bangs Slough (3CA3)	UAO Files	1	0.0
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	100.0
Saline Bayou (3CL24)	UAO Files	3	0.0
Denham Mound (3HS15)	UAO Files	1	0.0
Carpenter Mound (3CL56)	UAO Files	1	0.0
Copeland (3CL195)	Burnett 1984	4	25.0
Hedges (3HS60)	UAO Files	5	60.0
		(40)	(37.5)
AGGREGATED SEDENTARY			
Zebree (3MS20)	Powell 1977a	2	0.0
Bay Village (3PO3)	Rose et al. 1984	1	100.0
		(3)	(33.3)
PARAMOUNT AGGREGATED			
Upper Nodena (3MS4)	Powell 1983	12	8.3
Middle Nodena (3MS3)	Powell 1983	2	50.0
		(14)	(14.3)
CONTACT			
Parkin (3CS29)	Murray 1985	9	44.0
Clay Hill (3LE11)	UAO Files	2	0.0
Bray Landing (16MO11)	Hrdlicka 1909	4	25.0
Gordon (3AS152)	Rose et al. 1984	15	26.7
Ward Place (16MO12)	Hrdlicka 1909	17	88.0
Saline Sand/Gravel (3BR40)	UAO Files	4	50.0
Cedar Grove (3LA97)	Rose 1984	9	33.3
Lou Procello (16DS212)	Green 1983	3	66.7
		(63)	(49.2)

TABLE 75

PERCENTAGES OF ADULT TRAUMA IN THE LOUISIANA–ARKANSAS STUDY AREA BY ADAPTATION TYPES

ADAPTATION TYPE SITE	REFERENCE	ADULT TRAUMA N	%
INLAND SEMI-SEDENTARY			
Banks Mound I (3CT14)	Rose et al. 1985	25	8.0
Mangrum (3CG636)	Sperber 1982	2	50.0
Wampler 2 (3CS117)	UAO Files	1	100.0
Mount Nebo F (16MA18)	Giardino 1977	20	15.0
Powell Canal (3CH14)	Blaeuer and Rose 1982	4	25.0
Greenhouse (16AV2)	Barnes & Frame 1981	19	11.0
St. Gabriel (16IV128)	Giardino 1980b	7	0.0
		(78)	(12.8)
COASTAL SEMI-SEDENTARY			
Big Oak (16OR86)	Hells 1986	17	0.0
Big Oak (16OR6)	Hells 1986	35	2.9
Bowie (16LF17)	Smith 1983	3	33.0
		(62)	(3.2)
SEDENTARY DISPERSED MAJOR ALLUVIAL VALLEYS			
Hyneman 2 (3PO54)	Rose et al. 1984	2	0.0
Zebree (3MS20)	Powell 1977a	16	6.2
Myatt Landing (16OU17)	Hrdlicka 1909	12	0.0
Harrelson Landing (16CA13)	Hrdlicka 1909	6	66.7
Mount Nebo A (16MA18)	Giardino 1977	28	3.5
McArthur (3CH49)	UAO Files	3	33.3
Hanna (16RR4)	Giardino 1980a	4	0.0
Haley Place (3MI1)	Hrdlicka 1912	2	0.0
Walnut Ridge (3MO61)	UAO Files	2	100.0
		(75)	(12.0)
SMALL ALLUVIAL VALLEYS			
Boytt's Field (3UN13)	Hrdlicka 1909	27	3.7
Shallow Lake (3UN52)	UAO Files	2	0.0
Little Mud Lake (3CA265)	Mires and Owsley 1984	1	0.0
Copeland (3CL195)	Burnett 1984	(?)	0.0
Hedges (3HS60)	UAO Files	(?)	0.0
		(30)	(3.3)
SEDENTARY AGGREGATED			
Zebree (3MS20)	Powell 1977	2	50.0
PARAMOUNT AGGREGATED			
Wapanocca (3CT9)	Harmon 1984	9	0.0
Middle Nodena (3MS3)	Powell 1983	2	0.0
Upper Nodena (3MS4)	Powell 1983	58	5.2
		(69)	(4.3)
CONTACT			
Parkin (3CS29)	Murray 1985	14	28.6
Clay Hill (3LE11)	UAO Files	1	100.0
Ward Place (16MO12)	Hrdlicka 1909	19	0.0
Bray Landing (16MO11)	Hrdlicka 1909	10	0.0
Gordon (3AS152)	Rose et al. 1984	16	12.5
Lou Procello (16DS212)	Green 1983	4	25.0
		(64)	(12.5)

fact, as a "transition" stage between previous Fourche Maline Semi-Sedentary adaptations and the Sedentary–Aggregated Fourche Maline 7 culture.

The Emergent Mississippian Big Lake phase appears to have involved maize agriculture, with early, multirowed varieties of maize; numerous wild foods were also present. However, carbon isotope analyses (Lynott et al. 1986) showed no evidence of significant maize consumption. Deer and bottomland/aquatic faunal resources were emphasized. This phase appears to have had a settlement pattern based on small, dispersed "villages" like the one at Zebree. Ceremonial (mound) centers are not known in Arkansas, but they may have existed in nearby southeast Missouri.

The Plum Bayou culture is best known from its major ceremonial center, Toltec Mounds, and other sites in central Arkansas outside the present study area. The subsistence data available so far indicate that maize was present, especially in the later sites of the culture, during the A.D. 900s, but it was not a significant part of the diet, which was probably based instead on the "native North American starchy seed complex." Deer again were the leading meat source, and both bottomland/aquatic and upland animals contributed to a varied diet. Settlement patterning may have been hierarchical with small "village" sites and farmsteads at the lower end.

Sites of the classic Coles Creek culture have also yielded some maize, but it is certainly not abundant and is apparently outnumbered by wild plant foods and native cultigens, although the sample is meager. The faunal data base is also poor, but it indicates the usual emphasis on deer, with a variety of other animals. The inadequate record for this important culture is at least partly due to the fact that past research has emphasized the major mound sites rather than habitation sites. At least in the Coles Creek heartland, there appears to have been a concentric hierarchy of mound centers similar to that postulated for Plum Bayou culture but with many more moderate sized mound centers and without the extremely dominant major center.

The Caddo I through Caddo IV cultures all appear to have been based on maize agriculture, with small farmsteads dispersed along the river valleys and in the uplands. Subsistence data are quite sparse due to the emphasis on excavation of mortuary ceramics, but modern recovery and analytical techniques have yielded evidence of maize and beans, along with a variety of wild plant foods.

Bioarcheology. No data are available for the Poverty Point or Fourche Maline 6 cultures, but the sample sizes for the other cultures of this adaptation subtype are sufficiently large to be interpreted by comparisons between two broad ecological zones: the major alluvial valleys and the small alluvial valleys.

In the major alluvial valley zones, the 5.6 caries per person rate (Table 70) indicates a high carbohydrate diet. Although there is considerable variation among the sites, all fell within the agricultural range. At present, there is bioarcheological evidence for significant maize consumption in the Caddoan area but not in the Lower Mississippi Valley. It is suggested here that native North American cultigens continued to supply the basic carbohydrates longer in the Lower Valley.

In contrast, the caries rate for the small alluvial valleys is higher, at 6.8 per person (Table 70). The implication is that, within at least some of these upland areas, agriculturally derived carbohydrates were much more important than in the major alluvial valleys of the Mississippi and Red rivers. A similar trend has also been documented along the Arkansas

River (see the bioarcheology sections of the Ozark, Arkansas and Ouachita study unit).

The anemia rates of 4.3% in the major alluvial valleys and 2.0% in the small alluvial valleys indicate adequate iron intake and the absence of major dietary deficiencies (Table 71). With a dispersed settlement pattern, access to red meat should have been sufficient to compensate for any iron deficiency which might result from a seed- or maize-dependent diet.

The 20.0% infection rate in the major alluvial valleys attests to an adequate level of adaptive efficiency, which is comparable to that of the semi-sedentary adaptive subtype (Table 72). However, the higher infection rate of 27.9% in the small alluvial valleys points to a decline in adaptive efficiency within this ecological zone. The suggestion that this higher infection rate is associated with higher carbohydrate consumption in the upland ecological zone must be given serious consideration. Again, this trend has been noted along the Arkansas River drainage and in northeast Texas (see the bioarcheology sections of the OAO and the EPGCP study units).

In the major alluvial valleys, the major joint arthritis rate is 9.1% (Table 73), the spinal arthritis rate is 31.9% (Table 74), and the trauma rate is 12.0% (Table 75). The major joint and spinal arthritis rates are slightly lower than in the semi-sedentary adaptive subtype, which suggests a decrease in physical stresses and work loads. Again, a contrast with the small valley population is observed. The major joint arthritis rate is 11.5%, the spinal arthritis rate is 37.5%, and the trauma rate is 3.3%. With the exception of the trauma rate, the indicators of physical stress intimate a higher stress load and a more arduous lifeway in the small valley zone. This contrast is consistent with the caries and infection rates.

In summary, the major alluvial valley peoples increased their consumption of agriculturally produced carbohydrates but experienced a decline in physical stress compared with that of the semi-sedentary adaptation subtypes. Overall, the level of adaptive efficiency was adequate. Within the small alluvial valley zone, the carbohydrate consumption increased even more, and there was a parallel rise in physical stress and work load. These differences are associated with a slight and possibly significant decline in adaptive efficiency.

Data Gaps. In the cases of the Poverty Point and Fourche Maline 6 cultures, much more is needed in the way of subsistence data. Mortuary/bioarcheological data are virtually nonexistent.

For the later cultures included here, subsistence data are generally inadequate, but they are somewhat better for the earlier members of this groups than for the later ones. In the latter cases, the "fatal attractions" of burials and major mound sites have distracted archeologists from obtaining much in the way of subsistence data and other information from and about habitation sites. This has, at least, had the effect of providing the bioarcheologists with a relatively large skeletal sample, though little of it has been adequately analyzed.

Plaquemine subsistence is one of the major data gaps in the Lower Mississippi Valley. Virtually nothing is known from direct evidence. Sites in various regions tend to be associated with the better agricultural soils. Most of the research on Plaquemine culture has, once again, been directed at major mound sites which were in some cases (especially in the Lower Yazoo Basin and Natchez Bluffs, outside of the present study area) quite large, but apparently of the "vacant ceremonial center" type. True village sites have not been documented; instead, dispersed small settlements seem to have been the rule.

Finally, the Late Mississippian phases of southeast Arkansas and adjacent northeast Louisiana (and the Yazoo Basin) are also essentially undocumented in terms of direct subsistence data. Once again, no villages have been found, and the settlement pattern seems to have emphasized dispersed farmsteads, integrated by mortuary ceremonialism.

Late Holocene Sedentary Aggregated Adaptations

Definition. This adaptation subtype combines two rather strange bedfellows, from the point of view of "archeological cultures" based largely on artifactual styles. These are the Fourche Maline 7 culture, ca A.D. 700 to 900, of the Trans–Mississippi South, or at least of southwest Arkansas, since no real documentation exists for northwest Louisiana, and the "Middle period" Mississippian, ca A.D. 1000 to 1350, of northeast Arkansas and some adjacent regions.

Despite the stylistic differences, both of these cultures appear to have featured aggregated populations in fairly large sites.

Environment. Essentially modern (presettlement) climatic, paleogeographic/riverine, and biological environmental conditions prevailed while these cultures were in existence.

Subsistence and Settlement. Subsistence data in the form of floral and faunal remains are essentially lacking for Fourche Maline 7 culture. However, Schambach (in Schambach and Early 1982:SW72) suggested that intensification of horticulture occurred in "late Fourche Maline or very early Caddo times." The major research on Fourche Maline 7 settlement has been at the Crenshaw site in the Red River Valley of southwest Arkansas. At this time, according to Schambach (1982a:150), it was "a major Fourche Maline village covering perhaps as much as 8 ha and containing at least three mounds and four cemeteries." Other moderate sized Late Fourche Maline "village" sites with rich midden deposits are known in several regions of southwest Arkansas (Schambach and Early 1982:SW76–SW78, SW85), but they have not been adequately investigated.

Middle period Mississippian phases or complexes in northeast Arkansas appear to have been in the process of intensifying their subsistence systems to emphasize maize cultivation and consolidating into a hierarchical settlement pattern and social structure by about A.D. 1150–1250. Sites dating to this time span and later have consistently yielded maize remains, sometimes even without flotation, and Mill Creek chert hoes and hoe chips are common finds. This is also the first period in northeast Arkansas and adjacent southeast Missouri for which isotopic analyses of skeletal samples have indicated truly significant levels of maize consumption (Lynott et al. 1986). Village sites have not been extensively excavated or even sampled very often, but the Hazel site appears to have had houses aggregated into rows ca A.D. 1150–1250, and the Wilson and Lawhorn phases, ca A.D. 1200–1300, each had several medium sized villages.

Bioarcheology. This subtype has the smallest sample sizes for each of the osteological data categories of any of the adaptation subtypes with bioarcheological data. The 2.8 caries per person rate (Table 70) indicates a drop in carbohydrate consumption, but the evidence is clear that maize has become the primary Mississippian carbohydrate crop. The drop in the caries rate may suggest that aggregation was accomplished only after a nutritionally adequate and diversified diet had been adopted. This suggestion may seem to be compromised by the 11.8% anemia rate (Table 71), which is the highest for any of the adaptation types or subtypes. However, it should be noted that all the cases of porotic hyperostosis are found in the small valley ecological zone (i.e., the Hood and Jones Mill sites).

In contrast to the reduction in caries, the infection rate has increased to 85.7%. This is the first truly significant increase in the infection rate, but the data are, unfortunately, virtually all derived from a single poorly studied site (Hazel) in the northern part of the Lower Mississippi Valley.

There are two relevant mechanisms which will promote an infection rate. The first is that aggregated settlement results in an increased accumulation of garbage and human waste. This serves to accelerate the growth of bacterial populations and fosters the recontamination of the human population with their own parasites. The second effect of aggregation is the increased frequency of interpersonal contacts, which enhances the spread of pathogens between individuals and increases the probabilities of contracting a pathogen. Both of these mechanisms were probably important for these peoples.

Unfortunately, we do not have any data on joint arthritis, and the sample sizes for spinal arthritis and trauma are too small to interpret.

In summary, the carbohydrate consumption declines with the hypothesized adoption of a diversified agricultural food complex. However, aggregation has resulted in an increased infection rate, indicating a significant decline in adaptive efficiency.

Data Gaps. The lack of extensive, let alone intensive, modern excavations and analyses of Fourche Maline 7 sites is one of the major data gaps in the entire study area at any given time. This is clearly a critical period, perhaps involving an adaptive experiment that failed and resulted in the origins of the successfully adapted and long-lived Caddoan culture. Modern excavations and recovery techniques are needed to resolve the questions of the nature of intrasite settlement patterning and the subsistence base(s) that characterized this experiment.

The Middle period Mississippian data situation is somewhat better but nevertheless inadequate, especially with regard to habitation sites. This is especially the case for the earlier portions of this period, ca A.D.1000–1150 or 1200, for which the archeological literature is dominated by the Cherry Valley Mounds, but little is known about the rest of the cultural system (Morse and Morse 1983:241ff).

The scarcity of bioarcheological data for this adaptation subtype is another significant gap. As noted above, several of the major data categories are completely undocumented.

Late Holocene Sedentary–Paramount Aggregated Adaptations

Definition. This adaptation subtype is restricted to five terminal Prehistoric Mississippian phases in northeast Arkansas: Nodena, on the Mississippi River in extreme northeast Arkansas; Parkin, on the St. Francis and Tyronza rivers above and below their junction; Walls, on the Mississippi River south of Memphis in Tennessee, Mississippi, and barely into Arkansas; Kent, on the lower St. Francis and adjacent Mississippi rivers; and Old Town, on the Mississippi between the St. Francis and Arkansas rivers.

These phases began ca A.D. 1350 or 1400, and all persisted well into the Protohistoric period, i.e., after A.D. 1500. However, we have made our assignments on a site-by-site basis, placing any sites which appeared likely to belong mainly to the later portions of these phases in the Contact adaptation type. So the present discussion should be at least tentatively regarded as relating to Native American populations unaffected by Old World diseases and other effects of European contact.

All of these phases are noteworthy for the inclusion of very large, generally fortified, “paramount” settlements. These are in many cases characterized by the presence of multiple mounds and deep (actually, high) deposits of superimposed house ruins and middens, somewhat comparable to Middle Eastern “tells,” and have been called “St. Francis-type villages” (Phillips, Ford, and Griffin 1951:329) because of the common occurrence of such sites in that river valley.

Environment. These very late Prehistoric phases appear to have existed in an environment essentially similar to the modern (presettlement) environment of northeast Arkansas. It is noteworthy that they are concentrated in the Eastern Lowlands, along rivers (the Mississippi and St. Francis) which annually flood and renew the agricultural soils, and that the Western Lowlands, which were less desirable for aboriginal agriculture, were essentially abandoned by this time (Morse and Morse 1983:280ff).

Undoubtedly, these people themselves modified their environments in a number of ultimately significant ways, by intensive clearing of land for crops, use of fire in managing wild game, etc. It is also clear that they were impinging upon one another’s sociocultural environments in some very significant ways, as attested by the general use of palisades and the chronicles of warfare and rivalry among belligerent chieftains recorded in the narratives of the De Soto *entrada*.

Subsistence and Settlement. Surprisingly few data are available on plant and animal food remains from sites representing this subtype. Test excavations at the Upper Nodena site yielded maize cobs from the general village area and from a burned corn crib, with a moderate mean row number (Blake and Cutler 1979). Cultivated beans, which have a synergistic nutritional effect in combination with maize, were also common, and some wild plants were present. Nodena phase skeletal samples dating ca A.D. 1500 furnished the highest isotopic indices of maize consumption of any of the specimens reported by Lynott et al. (1986). Sites of the other phases have not been subjected to flotation but are associated with agricultural soils.

The Nodena and Kent settlement patterns also include some small unfortified farmstead sites, but such sites have not been found for the Parkin phase, despite intensive surveys. The Old Town and Walls phases are poorly known except for the major sites.

Bioarcheology. The caries rate for this adaptation subtype is 3.3 caries per person (Table 70). This represents a slight increase over the Sedentary–Aggregated subtype and most likely corresponds to an increased consumption of carbohydrates. This increased reliance on maize appears to be the result of larger settlement sizes in the northern portion of the Lower Mississippi Valley. This increase in caries is not associated with an increase in anemia (2.8%, Table 71), and thus there is no indication of increased nutritional deficiencies.

The infection rate is 75.4% (Table 72) and is essentially uniform for all sites. This high infection rate is attributed to a combination of factors. They include increased interpersonal contacts which enhance the possibility of contracting an infection; the accumulation of garbage and human waste, which encourages reinfection; a decline in disease resistance due to heightened social stress; and possibly a decline in protein consumption. All of these circumstances are clearly the result of increased population density.

Arthritis of the major joints occurs at 3.2% (Table 73). The spinal arthritis rate is 14.3% (Table 74), and the trauma rate is 4.3% (Table 75). Unfortunately, all of these rates are determined from small samples and may not be reliable. At present, it must be tentatively concluded that physical stress and work loads were relatively low.

In summary, the high infection rate has been maintained from the Sedentary–Aggregated subtype and is attributed to high population densities. The caries rate suggests an increase in maize consumption, which is supported by the stable carbon isotope values (Lynott et al. 1986). The increased requirement for maize is associated with increased population density and increased necessity for storable foods. There is no evidence of increased work loads associated with this agricultural intensification.

Data Gaps. Once again, the classic emphasis on burial excavations has produced a huge sample of pottery (though not approaching the hauls made by grave robbers) and a fairly large sample of skeletal material (most of it unanalyzed or inadequately analyzed by modern standards) but little in the way of archeobotanical or faunal subsistence data. Mound–plaza arrangements are fairly well documented, but data on intrasite settlement patterning in terms of habitation are essentially lacking.

Many of these sites are extremely complex, and virtually nothing is really known about their internal chronologies. Characterizing any of them in terms of pre-Contact and post-Contact deposits would be a major advance.

CONTACT PERIOD ADAPTATIONS

Definition. The previously defined adaptation types and subtypes cut across certain cultural or stylistic boundaries and periods; this one cuts across all other adaptation types/subtypes that were extant at that time. It includes cultures that would otherwise be included in the following adaptation subtypes: Paramount Aggregated Sedentary (the latest Mississippians of northeast Arkansas), Dispersed Sedentary (the Caddo IV–V peoples of the Trans–Mississippi South, plus the latest "rural Mississippians" and inland Plaquemine–Natchezan peoples of the southern Lower Mississippi Valley), and Semi-Sedentary Coastal ("Pensacola complex" and "Lower Valley outpost" Mississippians, "Delta Natchezans" and Attakapa).

The critical factor here is the disruption of the heretofore isolated sequences of New World cultural adaptations. Native American societies were decimated by Old World diseases for which they had essentially no resistance, generally if not invariably defeated by armies which were technologically superior (with horses, armor, and firearms), and played off against each other as pawns in geopolitical and colonial power struggles. They moved in some cases of their own volition (given the circumstances) to avoid unfavorable situations or to gain access to situations that were seemingly favorable at least in the short run. In other cases, they were moved against their will, generally to less favorable situations and eventually, in most cases but not all, out of their native regions and areas and out of this study area.

In the face of this onslaught, the first adaptation to perish was the seemingly strongest one, the Paramount Aggregated Sedentary subtype. Its societies were sought out by the De Soto *entrada*, operating by analogy with the Spanish experiences with complex societies in Mesoamerica and South America. Whether or not the diseases preceded De Soto's army, these aggregated societies were prime targets for Old World viral infections, and their northeast Arkansas homeland became essentially vacant by the time the French arrived some 130 years later.

Of the remnant Native American populations that the French observed in the present study area, those along the main artery of French activities, the Lower Mississippi River, were generally the first to be affected. Among these groups, the Quapaw, who apparently had developed or reestablished another Aggregated system, were soon decimated by diseases, especially a smallpox epidemic in 1698. Perhaps the best adaptations in terms of some vestiges of cultural survival were made by the Tunica, a Mississippian-derived group with a more dispersed settlement pattern, who were in a sense preadapted as active traders (Brain 1977, 1979, 1981). Less successful were the Plaquemine-derived Natchezans, who had apparently escaped direct contact by the *entrada* and who ultimately resisted and revolted against the French with disastrous results.

Yet another scenario was played out by the Caddoans, who had a long established Sedentary–Dispersed adaptation and a tradition as traders, occupying lands at the margins of French and Spanish colonial enterprises. Gregory (1973) argued that the Caddoans were active manipulators of the Europeans and developed peaceful and synergistic, rather than antagonistic, relationships with the newcomers. The Caddoans survived the Colonial period in their homelands and were only moved out after settlement by U.S. citizens had begun.

Finally, the shifting Semi-Sedentary adaptations of the various groups in the coastal zone also tended to persist. In general, the pattern of major impacts along the Mississippi River and lesser impacts away from the river was repeated.

Environment. Modern (presettlement) climatic, paleogeographic-riverine and native macrobiological conditions prevailed throughout the time span under consideration here. However, the microbiological and sociocultural environments changed drastically, disrupting, decimating, acculturating, assimilating, and removing the Native American cultures.

Subsistence and Settlement. Subsistence data are minimal for the Protohistoric and Historic periods, but maize and beans have been recovered from Upper Nodena. Isotopic analyses of skeletal materials indicate a high level of maize consumption for an individual from the Parkin phase, and the highest level of any sample for an individual from the Nodena phase (actually from the Campbell site in extreme southeast Missouri). In general, it appears that the study area lagged behind the areas to the north and east in the adoption of late (low row number) races of maize, perhaps adopting them only after 1500 or 1600.

The northeast Arkansas Mississippians continued their Paramount Aggregated settlement system at least until the time of first contact with the Spanish and perhaps into the A.D. 1600s. A similar system seems to have been established or perhaps reestablished along the Lower Arkansas River by the time of French contact in the late 1600s by the Quapaw, who may well have been mainly descended from one or more of the former northeast Arkansas phases, especially Nodena and Kent.

In addition to maize and other cultigens and the usual deer and varied small animal bones, bison bones have been identified (and perhaps misidentified through confusion with cow bones) from a few sites north of the Arkansas River. Bison are also mentioned in some ethnohistorical documents (e.g., Dickinson 1982) dealing with these regions.

The probably proto-Tunican Mississippians of southeast Arkansas (perhaps including a pre-Quapaw occupation along the Lower Arkansas River) maintained a dispersed settlement pattern; their subsistence practices are as yet undocumented. Their occupations along bayous rather than the Mississippi River may have been part of a widespread “flight response” which has been suggested also in the Yazoo Basin and northeast Louisiana for Mississippians and in the Natchez Bluffs for Plaquemine–Natchezans. The Protohistoric Jordan phase in northeast Louisiana appears to have involved at least a moderate population in a very remote and unlikely location. However, its (Tunican? Koroa?) peoples may have tried another strategy in terminal Protohistoric to early Historic times by moving to the strategic juncture of the Ouachita River and Bayou Bartholomew and participating in trade with Caddoans and Europeans. Again, no subsistence data are available as yet.

The Caddoans maintained their Sedentary–Dispersed adaptation successfully throughout the Contact and Colonial periods. Subsistence data are woefully inadequate, but maize, beans, and squash are documented, along with several wild plant foods and the usual animals. An ethnohistorically based dispersed compound settlement model (Schambach 1982b) has been supported by more recent archeological research (Trubowitz 1984). The compounds of local chieftains or *caddis* may be distinguishable from those of the general populace.

The Plaquemine–Natchezan culture(s) are almost totally without subsistence data in the study area. Some data are available from the Natchez Bluffs but are not necessarily applicable to the opposing lowlands of the study area. The Natchez vegetal materials include maize and beans. Two different faunal samples from the same site (Fatherland) produced very different results, with the later sample showing predominance of European animals, especially cow, over deer and other native animals. The settlement pattern appears to have been one of dispersed farmsteads with vacant ceremonial centers. The Natchez bolstered their society by adopting other remnant or refugee Native American groups and perhaps by devising their complex sociopolitical organization.

The coastal peoples remain virtually archeologically unknown, or at least unreported and underreported. Some, especially the Pensacola complex and other Mississippians, may have practiced shifting agriculture, perhaps emphasizing the soils of old crevasse splays. To the west along the Chenier Plains, though, the Attakapa seem to have maintained the long established nonagricultural Semi-Sedentary adaptation.

Bioarcheology. This adaptation type is distinguished by the possibility of contact with Old World diseases, which were widespread throughout the Caribbean by the early 1500s. At present there is no concrete evidence for Old World diseases prior to the actual arrival of Europeans, but the circumstantial evidence is compelling.

The first notable change is a significant increase in the caries rate to 7.6 caries per person (Table 70). This average is equal to the highest rate reported for any previous site-specific sample of adequate size. This increase suggests that the social disruption which would have been associated with frequent epidemics resulted in a greater reliance upon carbohydrate crops. This hypothesized reliance upon a high maize consumption is consistent with a fairly high frequency of anemia (11.2%, Table 71). The sample size is large enough to consider this rate reliable. Since high maize consumption can interfere with iron intake when supplementary iron sources such as red meat are not consistently available, this increase in porotic hyperostosis is attributable to dietary deficiency.

The Contact adaptation type differs from the pre-Contact Aggregated and Paramount Aggregated subtypes by displaying a much-reduced infection rate of 26.0% (Table 72). There are three testable hypotheses which might, individually or in combination, explain this reduction. First, it is hypothesized that contact resulted in increased adaptive efficiency, despite the evidence for drastically reduced populations. In effect, the epidemics removed the people with low disease resistance, leaving only the most resistant individuals. Second, it is hypothesized that the repeated epidemics reduced the population density and thus reduced the interpersonal contacts and waste accumulation which accounted for the previously high infection rates. Third, it is hypothesized that Old World diseases which do not leave marks on the bones killed the people before the chronic bacterial infections could spread to the bones.

The major joint arthritis rate is 19.0% (Table 73) and is exceeded only by that of the Semi-Sedentary adaptation subtype. This implies increased physical stress and work loads. The spinal arthritis rate is 49.2% (Table 74), which is just slightly ahead of the Semi-Sedentary rate. Again, increased physical stress and work loads are implicated. The trauma rate is 12.5% (Table 75), which is the third highest rate. Taken together, these three rates intimate that life became more arduous and stressful. The increased work loads may very well be associated with the increased consumption and production of maize.

In summary, the Contact adaptation type peoples were consuming more maize and experiencing increased physical stress but suffering a lower bacterial infection rate. The lowered bacterial infection rate may be the key hallmark to identify the presence of Old World infections, which are primarily viral and leave no bone lesions.

Data Gaps. Direct Historic and Protohistoric archeology are theoretically quite important in that they provide means for testing the probably quite variable correlations between ethnicity and material culture and in providing roots for Native American cultures. Among the fascinating problem areas involved here are the archeological identification of De Soto "provinces;" the study of Quapaw origins; identification of Tunican or proto-Tunican sites; further testing of the Caddoan settlement model; identification of the Taensa, proto-Taensa, and other "Natchezan" (Plaquemine?) peoples within the study area; and identification and characterization of the coastal peoples of various cultures.

Subsistence data are almost scandalously lacking for most of the cultures involved here. Perhaps the greatest gap in this category, as in several others, is for the Plaquemine–Natchezan peoples within the study area (i.e., in eastern Louisiana). The Tunican and proto-Tunican cultures are also essentially unknown in this regard. All of the other cultures should also be studied intensively through modern recovery techniques and analyses (including isotopic analyses) as well.

Finally, modern bioarcheological data in general and data on the impacts of Old World diseases in particular are quite inadequate. Analyses of epidemic cemeteries to test the model of lowered bacterial infection suggested above and to document other aspects of this situation are sorely needed.

INITIAL EUROPEAN EXPLORATION ADAPTATIONS

Due to the different detail available for historically documented groups, our presentation on these adaptation types will be somewhat different from the discussions on prehistoric types. In particular, we will not discuss the environment, which was essentially modern, although it did undergo considerable change as a result of such activities as deforestation. Similarly, there will be no section on settlement and subsistence.

Definition. The Initial European Exploration adaptation type represents the period of early Spanish and French exploration of the Mississippi River Valley and its major tributaries beginning with the De Soto expedition of the 1540s and extending up through the end of early French expeditions of the 1600s. This adaptation type encompasses the expeditionary period of initial contact with aboriginal groups before permanent European settlements were established on the Mississippi, Red, and Arkansas rivers during the early decades of the eighteenth century. In some localities, exploration of the Louisiana and Arkansas territory by the Americans after the Louisiana Purchase continued up through the early nineteenth century, so to a large extent the date range is not as significant a criteria of this type than is the fact of a clear expeditionary/ exploratory mode. An argument could be made for the division of the early European and the early American explorations into separate adaptation types, but since our goal is to devise a framework that crosscuts strict culture type definitions to encourage diachronic comparisons, we will keep this adaptation type atemporal and acultural. The dividing line between early exploration and the succeeding early settlement adaptation is also a gray area that is difficult to separate cleanly, and to some extent the two adaptations, both exploration and settlement, may be combined in some instances.

The key characteristics of the Initial European Exploration adaptation are those of an institutionally sponsored expedition to explore and map unknown territories and make contact with native cultures. The cultural and historical context of exploration has been an important factor in the makeup of these expeditions. They range from the large overtly military makeup of the Spanish expeditions to the smaller groups of the French and American surveys. The goals and motives of the expeditions, whether conquest and exploitation, two-way economic exchange with natives, or surveys for purposes of subsequent settlement, were also significant determinants of the makeup and tenor of the expeditions. The early contacts frequently represented the initial phase of acculturation of both the explorers and aboriginals and served as important references points for the development of subsequent intercultural social, political, and economic relations.

Data Gaps. Aside from the historical documentation available from the chroniclers of these expeditions, there is almost nothing known about this period of early European exploration. The De Soto expedition has received attention in the past few years, but the exact route of the entrada west of the Missisippi River remains uncertain. Documentation of the later French and American surveys is somewhat better, and the routes can be pinpointed with some certainty, but no archeological remains of any early Spanish, French, or American exploration sites have been located or excavated in Arkansas or Louisiana. Based on historical sources and the excavation of the De Soto winter camp in Florida, we can expect that sites of the De Soto expedition in Arkansas or Louisiana will be associated with Native American sites of the period and, considering the typically short length of stay at any one Native American village, they may be ephemeral. The presence of European trade goods exchanged with natives during the expeditions seems to be the most reliable indicator of contact. However, the likelihood that these goods were recycled through the native exchange systems suggests that incontrovertible proof of direct contact will require additional evidence such as early European burials, evidence of metal armament injuries on native burials acquired during hostilities, nontrade European artifacts, and subsistence remains including plant and animal domesticates.

Bioarcheology. There are currently no bioarcheological data on this adaptation type. Human remains from this type will be extremely rare, if any are found.

EARLY EUROPEAN SETTLEMENT ADAPTATIONS

Definition. The Early European Settlement adaptation type represents the Colonial period of initial settlement by the Spanish and French, predominantly in southern and northwestern Louisiana and southern Arkansas. These initial efforts were carefully planned experiments that generally took the form of centralized nucleated settlements associated with a military outpost for protection, such as found in Los Adaes, Natchitoches, Arkansas Post, and along the Ouachita River. At first, these settlements were dependent on much input from the mother country or established base in the New World, and many failed due to the unrealistic application of European technology and culture to an alien outback. They were generally neither profitable nor self-sufficient for many years after their initial founding. Only gradually did the European immigrants adapt to the difficulties of isolation from the support base and to the challenges of coping with a new environment. In the process, the settlements developed a solution that was a compromise between the European ideal and realities of the frontier.

It was during this period that, as some Europeans began learning from and mixing with the native groups in the region, there evolved hybrid groups of French/Native and Spanish/Native culture well adapted to life on the margins of two cultures. Often described as near savages, they lived a mobile existence on the outskirts of the settlements, engaging in hunting, fur trapping, and trading between Native Americans and the other Europeans, and eventually established other economic pursuits, including salt and lead mining, livestock raising, and farming. The social complexity during this period was probably highly stratified and would include governors, commandants, other administrators, and soldiers in addition to merchants, traders, farmers, miners, trappers and hunters, as well as slaves. These different livelihoods and ethnic/socio-economic levels could be considered to represent distinct varieties of the European Settlement adaptation type.

Data Gaps. Archeological investigations of early European settlements have largely been limited to Los Adaes, Natchitoches, and Arkansas Post. The research so far indicates that these settlements, though isolated from the mainstream European life, had access to a broad range of basic and luxury items available through the French and Spanish trade network. However, in addition, a process of acculturation to the frontier was at the same time progressively changing many aspects of the culture as Europeans adapted to the constraints and opportunities of life in the New World. As reported in Chapter 9, the research to date on sites of this type have only scratched the surface of the nucleated settlements that existed, and have not even begun to tap the many outlying settlements and farms that grew up on the margins of these early towns. Sites of this period have the potential to provide information on the adaptations made by the Europeans, the interactions between the French and Spanish, the nature of frontier trade with Native Americans and other European centers, and the process of acculturation occurring among the Native Americans and the Europeans. In general, the approximate locations of these settlements are available in various documentary sources.

EUROPEAN AND AMERICAN PIONEER SETTLEMENT ADAPTATIONS

Definition. Following the establishment of centralized settlements during the Colonial period, France, Spain, and (after 1803) the United States began to encourage additional immigration into the hinterlands of Louisiana and Arkansas. In a sense, this was a continuation of the growth of settlement begun on the outskirts of the posts founded during the Colonial era. It should be reemphasized that, because parts of Louisiana were settled so much earlier than Arkansas, the stages of frontier development in some locations lagged behind other parts of the study area. Thus, while urban life and a plantation economy were well established along the rivers of southern Louisiana, parts of northern Louisiana and Arkansas were only just being opened up for the initial stages of frontier settlement.

In Louisiana, frontier settlement grew up on the outskirts of the established communities in New Orleans, Natchitoches, Los Adaes, Arkansas Post, Ouachita Post, and elsewhere, in the eighteenth century. In the environs of New Orleans and other communities, settlement was made by such diverse groups as the French, Spanish, Islenos, Filipinos, Germans, Acadians, Italians, and Anglo–Americans. Many, such as the Acadians (Cajuns), evolved a distinct adaptation to the wetland environment, while the Filipinos adapted to the coastal zone and developed the important oyster and shrimp industry. In Arkansas and parts of Louisiana, pioneer settlement refers mainly to the influx of Upland South Anglo–Americans that migrated after the Louisiana Purchase in the second quarter of the nineteenth century.

There are no developmental models to adequately cover all of the diverse groups and industries that grew up in Louisiana such as have been formulated for the Upland South immigrants by Newton, Owsley, and Kniffen (see Chapter 9). However, at least four distinct adaptation types can be recognized for the Pioneer Settlement adaptation. These are the pioneer hunter/trader/trapper, the pioneer hunter/herder, the pioneer wetland hunter/trapper/fisherman, and the pioneer agriculturalist.

The pioneer hunter/trader/trapper represented a highly mobile adaptation to the exploitation of the natural resources of the forest. These groups generally worked out of a trading post or a base camp where they trapped fur bearing animals or traded with other settlers and Native Americans for furs that were then collected at the factories or trading posts before being sent to market in New Orleans. The socioeconomic status could vary greatly depending on whether they primarily hunted and trapped or traded for furs from other trappers. Many traders who collected furs from other trappers were quite wealthy entrepreneurs, while some individuals merely eked out a living by trading furs for the few necessities they could not produce from the woods. Considering the space requirements for trapping, this adaptation type was probably confined to the periods prior to intensive settlement before the middle of the nineteenth century for most of the study area.

The pioneer hunter/herders represented one of the initial stages of frontier development consisting of dispersed populations on the margins of developed settlements who engaged in hunting, some limited gardening, and herding. Hunter/herder adaptations ranged from small family operations, which supplemented broad spectrum hunting with limited herding, to large scale operations of wealthy ranchers in southern Louisiana involving the sale of livestock herds numbering in the thousands to urban markets and plantations around New Orleans. Since this lifestyle required large tracts of unsettled land for free range grazing, the era of the hunter/herder in the study area was confined to the period prior to intensive settlement by pioneer agriculturalists during the early to midnineteenth century.

The pioneer wetland hunter/trapper/fisherman represents the swampland adaptation of the French Acadians or Cajuns to the Atchafalaya Basin in southern Louisiana, but may also include other similar adaptations to other wetlands along the river valleys in the study area and along the coast of Louisiana. As noted in Chapter 9, the Cajuns started out as small farmers occupying the fertile land on the levees next to the river. However, during the influx of planters into Louisiana, the Cajuns sold their valuable fertile land next to the water transportation routes and fell back to the lower ground nearer the swamp. There they were forced by the lack of suitable land to abandon their small farming and turn to full-time extraction of swampland resources. In most parts of the study area, the wetland hunter/trapper/fisherman probably did not have to compete with herders or agriculturalists for space and thus would have survived longer than some of the other precursors of the agriculturalists. In fact, the Cajun culture, which maintains much of its distinctive ethnic identity, survives today in the Atchafalaya Basin.

The pioneer agriculturalists constituted a third wave of settlement following on and partly overlapping with the hunter/trapper/trader and hunter/herder migrations. Pioneer agriculturalists, also referred to as yeoman farmers, engaged in hunting and herding, but emphasized farming, including intensive production of a surplus to be sold at the market. Pioneer agriculturalists, who originated from the Upland South, often migrated as extended kin groups and developed tight-knit cooperative kin and social networks through which social, economic, religious, and political solidarity was maintained. It was the agriculturalists who are credited with laying the foundations of the rural dispersed community and county seat system which formed the modern cultural landscape that survives in the study area today.

Data Gaps. Our understanding of the nature of the Pioneer Settlement adaptation derives mainly from the historical accounts of travelers writing during the nineteenth century. The extent of archeological research on these adaptation types is limited largely to the pioneer agriculturalists. Considering the highly mobile, materially impoverished nature of their adaptation, the remains of hunter/trapper/traders and hunter/herders will be extremely ephemeral and difficult to recognize archeologically. The residential sites of the Cajun wetland hunter/fisherman should be easier to locate on the high ground of the swamps, but so far no program of archeological investigation has been undertaken. The wealth of ethnographic and historical research on the Cajuns does make this one of the best known adaptation varieties in the study area and one ripe for an interdisciplinary investigative approach.

The pioneer agriculturalist type constitutes one of the best documented early forms of historic adaptation in the study area. Much of this information derives from historical and geographical studies, as well as archeological research generally

generally confined to site settlement patterns. Despite this, sites of the yeoman farmers have been the subject of only limited site excavation. While the sum total of the limited research to date on sites of this era have provided information on some classes of cultural material, many aspects of organization developed by researchers (cf. Newton 1971) provide the basis for approaching rural settlement in terms of the hierarchical levels of social organization (the household, the hamlet, the community, and the rural town) and integrating archeological, geographical, and historical data.

Bioarcheology. There are numerous marked and (undoubtedly) many unmarked cemeteries with human skeletal remains from this adaptation type. To date no scientific studies have been performed, however, and with the exception of the valuable medical literature from the period, we have almost no direct information on areas such as infection rate, arthritis, trauma, or diseases. Investigations by Rose and Owsley in later populations have demonstrated the enormous amount of information on lifeways which may be obtained for this adaptation type if an opportunity were to arise for study.

DEVELOPED SETTLEMENT ADAPTATIONS

Definition. The Developed Settlement adaptations emerged after the close of the frontier period of development. This era represents the period of continued development, elaboration, and growth of the cultural landscape on a model established in some areas following the settlement of the pioneer agriculturalists. While some forms of adaptation discussed above continued to persist throughout the late nineteenth and twentieth centuries, this adaptation type is intended to encompass the more highly developed forms of rural society, urbanization, agriculture, and other industries that ultimately emerged by the middle to late nineteenth century. In parts of Louisiana, the Developed Settlement adaptations emerged much earlier on the settlement patterns and transportation network developed during the Spanish and French system. In some isolated rural parts of the two states, little change occured until the World War II period. As before, several varieties of adaptation can be recognized, including plantation agriculturalist, tenant agriculturalist, yeoman agriculturalist, and urban settlement.

The plantation agriculturalist adaptation emerged in parts of Louisiana in the eighteenth century where it was based on sugar, rice, and later cotton. In Arkansas, the plantation system grew up in the midnineteenth century when the market for cotton stimulated its cultivation on a large scale in the river valleys of south Arkansas. There was a wide range of both plantation operations and forms of slavery that emerged in the study area ranging from the multifaceted large sugar operations in Louisiana to the more modest forms associated with the cotton industry in Arkansas and Louisiana to the small family based operations employing few or no slaves in the marginally fertile areas of the study area. Obviously, some of the smaller agricultural operations hardly qualify as plantations. However, for purposes of examining the nature of this adaptation type, it is useful for comparative purposes not to overgeneralize from only one form of plantation operation, as is frequently done when inferences on slave life are drawn almost entirely from data on the larger plantations.

The plantation agriculturalist type can be examined in terms of the culture of at least three different social classes: the planter and his family, the plantation overseer or manager, and the laborer or slave. Each of these classes represent very distinct yet interrelated socio-economic positions in the plantation system that on some level can be considered separate adaptation types by themselves. The tendency to partition the plantation system further into smaller units has been resisted because it is clear that the three roles are so dependently intertwined that they cannot be adequately understood by themselves. Most historical and archeological plantation research acknowledges the importance of this symbiotic relationship as one important key to understanding both the plantation institution and the nature of each role.

There is some variability within these three socioeconomic classes that should be considered. For instance, many plantations did not employ an overseer per se, but instead supervision of work was by the plantation owner, a family member, or another slave. In addition, slaves might have occupied many different roles ranging from a driver, a midlevel supervisory position, a fieldhand, house servant, cook, or craftsman. These different positions would have carried different demands, stresses, and advantages which could be expressed in terms of an adaptation niche.

Another paradigmatic approach to plantation studies which has not received enough attention is the comparison of planter, overseer, and slave life across the range of plantation types occurring in the study area. The existence of many forms of slavery and plantation adaptation in Arkansas and Louisiana provides the opportunity for research into the range of forms that emerged in the antebellum and postbellum context of the development of the plantation and society.

Though slavery was officially abolished after the Civil War, the plantation system persisted under various forms of labor up through the twentieth century. The tenant agriculturalist variety of the Developed Settlement adaptation type emerged as a solution to the labor reorganization in the aftermath of the Civil War, and thus may be considered related to the plantation adaptation discussed above. As Orser has pointed out, there were several experiments in the arrangements of free labor developed after the Civil War, including the wage, the squad, the sharecropper, and the renter systems. With the development of mechanized cultivators, harvesters, and chemical herbicides, agriculture underwent many revolutions that decreased labor requirements, bringing about the decline of the tenant system.

The yeoman agriculturalist variety was one of the dominant forms of agricultural adaptation to emerge in the Developed Settlement adaptation. Most of the population in the rural areas not engaged in one of the forms of plantation agriculture were engaged in general or specialty farming. The yeoman farmers were in most cases directly descended from the populations of pioneer agriculturalists that settled the area during the pioneer period in Arkansas and Louisiana. The yeoman farmsteads had emerged along with a rural social and political system of clustered hamlets, dispersed service centers, and centrally located market centers/county seats.

Urban settlement represents the final component in the emergence of the Developed Settlement adaptation. Urban development in the study area arose in part from initial European settlement during the eighteenth century and from hamlets and community centers established during pioneer settlement of the nineteenth century. In addition, many towns such as sawmill communities emerged in response to more recent twentieth century economic developments. Urban areas arose and combined with other social and economic components of the landscape according to patterns in the development of settlement, trade, transportation, agriculture, and industry. The development, growth, and decline of urban areas and the nature of urban adaptations are very complex processes that can be addressed from an evolutionary perspective on the basis of documentary research and architectural and archeological data.

Data Gaps. As discussed previously, archeological research of components of the Developed Settlement adaptation have been limited in the study area. However, the examples of research cited in Chapter 9 concerning the plantation system, yeoman agriculturalists, tenant farming, and urban development have produced some important results and generated models and hypotheses that can be tested in further investigations. Large gaps exist for all of the varieties of this adaptation type. The plantation period in Louisiana has received considerable attention in documentary studies, surveys, and limited excavations. However, very few of these sites have been thoroughly excavated, and little is known of slave life and culture in either state. The archeological study of the plantation system in Arkansas has been neglected, but great potential exists for the comparative analysis of moderate and small scale cotton plantations in Arkansas with the extensive sugar, race, and cotton operations in Louisiana and throughout the South.

Yeoman farmer sites and tenant sites are widespread throughout both Louisiana and Arkansas, but extensive site level research has also been very limited. The successful examples cited in Chapter 9 indicate that such site level research benefits enormously from interdisciplinary approaches that incorporate documentary and oral history sources and include close attention to the kinship and community cultural context. While the instances of archeological excavation of such sites are rare, the range of data collected at survey and limited testing level investigations has improved over the past few years. Due to the increased efforts to systematically record such resources, a large number of sites are on record in the study area as part of computerized regional and statewide data bases which will make it possible to begin assessing the interaction of environmental and cultural factors in the development of yeoman farmer and tenant site settlement patterns in the study area.

Archeological research in the towns and cities of the study area has shown enormous possibilities for understanding the complex processes of urban development. Previous research has focused on the nature of ethnic patterns in settlement and subsistence, and the transition of urban farmsteads in the growth of the city. Further application of such research approaches to a broader geographic range within the study area and to many different types of urban areas is desirable. Again, such investigations benefit from an interdisciplinary approach that taps documentary, cartographic, and oral history sources as well as archeological data.

Bioarcheology. Though limited, much more substantial bioarcheological information is available for this adaptation type than for the preceeding types. Most nonbioarcheological data for the historic period are from the following ethnic groups: European immigrants, which include primarily the Spanish, French, and English; African immigrants, both slave and free; Native Americans who were indigenous to the area and immigrants from other parts of the continent; and other minor ethnic enclaves from various parts of the world. The social, economic, and political statuses of these macroethnic groups changed considerably over time. At present, there are no bioarcheological data for the European immigrants, indigenous Native Americans, and immigrant Native Americans. These groups represent major gaps in the bioarcheological data base. The only data available for this adaptation subtype pertain to African–Americans.

The earliest group of African–Americans were urban slaves residing in New Orleans and dying between 1721 and 1789. Analysis of the mortality records from this time period revealed that there was no significant demographic difference between the African–Americans and the Euramericans of New Orleans. The implication is that urban slaves did not suffer the same nutritional inadequacies, poor sanitation, and arduous work loads as the plantation slaves. The most frequent skeletal lesions are arthritis and hyperdevelopment of the muscle attachment areas. The distribution of these lesions indicate that some, but not all, of the urban African–Americans experienced the high physical stress associated with strenuous labor. Although these frequencies are below those reported for rural slave populations from outside the study area, the presence of two parry fractures indicates that life was not easy (Owsley et al. 1987). The frequencies of infection and anemia are well below those reported from other African–American skeletal series. Similarly, the frequency of growth arrest lines (i.e., a childhood stress indicator) in the long bones is relatively low and is clearly below the level found in rural slaves. In contrast to the low number of skeletal lesions, the frequency of dental caries is high and reflects the high sugar and carbohydrate diet of this seaport city located in a sugar producing region. The only conclusion which can be drawn from these data is that these early urban slaves were far better off than their rural counterparts (Owsley et al. 1987).

The next available data set represents rural African–Americans dying between 1890 and 1927, which provide information concerning life during the post-Reconstruction period in southwest Arkansas (Rose 1985). The paleodemographic profile indicates that this was a highly stressed population. There is abundant evidence for both iron deficiency anemia and vitamin D-deficient rickets among the children. The chronological distributions of age at death, infections, and markers of dietary deficiencies, which all peak at 18 months, clearly indicates the presence of weaning diarrhea (Rose 1985).

Adults also show abundant evidence of dietary deficiencies and high infection rates. A detailed analysis of histological sections taken from the femurs reveals that these people experienced a diet low in calcium, iron, and protein, in addition to chronic infectious disease, and a physically demanding way of life (Martin et al. 1987).

Both adult males and females display high frequencies of arthritis of the major joints, hands, and feet, as well as extensive spinal arthritis. Accidents resulting in fractures and violence (i.e., bullet wounds) are also common (Rose 1985). The incidence of these degenerative lesions and trauma indicates a hard physical lifeway which contrasts significantly with that of the urban slaves living in New Orleans.

The evidence from demography, paleopathology, and microscopic analysis of bone thin sections all indicate that life for African–Americans during the post-Reconstruction era was one of dietary deprivation, hard physical labor, and frequent disease.

Adams, William H., editor
1980 *Waverly Plantation: Ethnoarchaeology of a Tenant Farming Community*. Resource Analysts Inc., Bloomington, Indiana. Submitted to the Heritage Conservation and Recreation Service, Atlanta.

Adovasio, James M., Joel D. Gunn, J. Donahue, and Robert Stuckenrath
1978 Meadowcroft Rockshelter, 1977: An Overview. *American Antiquity* 43:632–651.

Ahler, Stanley A.
1971 *Projectile Point Form and Function at Rodgers Shelter, Missouri*. Missouri Archaeological Society Research Series No. 8.

1976 Sedimentary Processes at Rodgers Shelter. In *Prehistoric Man and His Environments: A Case Study in the Ozark Highland*, edited by W. Raymond Wood and R. Bruce McMillan, pp. 123–139. Academic Press, New York.

Ahler, Stanley A., and R. Bruce McMillan
1976 Material Culture at Rodgers Shelter: A Reflection of Past Human Activities. In *Prehistoric Man and His Environments: A Case Study in the Ozark Highland*, edited by W. Raymond Wood and R. Bruce McMillan, pp. 163–199. Academic Press, New York.

Aiken, Charles S.
1978 The Decline of Sharecropping in the Lower Mississippi River Valley. *Geoscience and Man* 19:151–172.

Alford, J. J., and J. C. Holmes
1985 Meander Scars as Evidence of Major Climatic Changes in Southwest Louisiana. *Annals of the Association of American Geographers* 75:395–403.

Altschul, Jeffrey H.
1978 *Cultural Resources Impact Assessment. Houma–Terrebonne Regional Sewerage Plan*. Report No. 10, New World Research, Inc. Pollock, LA.

Anderson, David G., J. W. Joseph, and Mary Beth Reed
1988 *Technical Synthesis of Cultural Resource Investigations, Fort Polk Louisiana*. Garrow & Associates, Inc., Atlanta. Submitted to U.S. Army 5th Infantry Division, Fort Polk, LA, and National Park Service, Atlanta.

Anonymous
1847 Indian Mounds in Louisiana. *DeBow's Review* 3(4): 351–352. New Orleans.

1851a Historical and Statistical Collections of Louisiana. *DeBow's Review*, New Series, 1(6):601–602. New Orleans.

1851b Statistical and Historical Sketches of Louisiana. *DeBow's Review*, New Series, 1(6):611. New Orleans.

Asch, David L., and Nancy B. Asch
1985 Prehistoric Plant Cultivation in West-Central Illinois. In *Prehistoric Food Production in North America*, edited by Richard I. Ford, pp. 149-203. University of Michigan Museum of Anthropology, Anthropological Papers, No. 75.

Aten, Lawrence E.
1981 Determining Seasonality of *Rangia cuneata* from Gulf Coast Middens. *Texas Archaeological Society Bulletin* 52:179–200.

1983 *Indians of the Upper Texas Coast*. Academic Press, New York.

1984 Woodland Cultures of the Texas Coast. In *Perspectives on Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 72–93. University Presses of Florida, Gainesville, FL.

Aten, Lawrence E., and Charles N. Bolich
1969 A Preliminary Report on the Development of a Ceramic Chronology for the Sabine Lake Area of Texas and Louisiana. *Bulletin of the Texas Archaeological Society* 40:241–258.

Autin, Whitney J. (editor)
n.d. Lower Mississippi Valley. In Quaternary Non-Glacial Geology of the Coterminous United States, edited by Roger B. Morrison, Chapter 13. Manuscript in preparation, to be published in a special "Decade of North American Geology" volume, by the Geological Society of America.

Baker, Charles M.
1974 *A Study of Aboriginal Novaculite Exploitation in the Ouachita Mountains of South Central Arkansas*. M.A. thesis, University of Arkansas, Fayetteville.

1982 A Brief Study of the Arkansas Novaculite Quarries. In *Fancy Hill*, edited by Ann M. Early and W. Fredrick Limp, pp. 307–334. Arkansas Archeological Survey Research Series No. 16.

Bareis, Charles J., and James W. Porter (editors)
1984 *American Bottom Archaeology: A Summary of the FAI–270 Project Contribution to the Culture History of the Mississippi River Valley*. University of Illinois Press, Urbana.

Barnes, P., and E. Frame
1981 Osteological Investigation of the Greenhouse Skeletal Material. Ms. on file, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

Bartlett, Charles S., Jr.
1963 The Tom's Brook Site — 3JO1: A Preliminary Report. In *Arkansas Archeology 1962*, edited by Charles R. McGimsey III, pp. 15–65. Arkansas Archeological Society, Fayetteville.

Bascle, Donald L., and R. Christopher Goodwin
1986 *Level II Cultural Resources Survey of the Planned Fleming Park Road Water Line Crossing Right-of-Way, Jefferson, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the Department of Public Utilities, Jefferson Parish Government.

Bass, Sandra Ann
1981 *A Closer Examination of Local Lithic Sources for Poverty Point*. M.A. thesis, Louisiana State University, Baton Rouge.

Bass, William M.
1964 The Variation in Physical Types of the Prehistoric Plains Indians. *Plains Anthropologist* 9:65–145.

Bearss, Edwin C.
1971 *Montgomery's Tavern and Johnston and Armstrong's Store*. Historic Structure Report, Historical Data. Office of History and Historic Architecture, Eastern Service Center, National Park Service.

1980 *Hardluck Ironclad, the Sinking and Salvage of the Cairo*. Louisiana State University Press, Baton Rouge.

Beavers, Richard C.
1977 *The Archaeological Significance of the Barataria Basin, Southeastern Louisiana*. Report on file at the Division of Archaeology, Baton Rouge.

Beavers, Richard C., and Teresia R. Lamb
1980 *A Level II Archaeological Field Survey and Assessment Program of Pier 4 Location, Greater New Orleans Mississippi River Bridge*. Archaeological and Cultural Research Program Research Report No. 4.

1978 *An Archaeological Reconnaissance and Assessment of the Sabine River, North Shore of Sabine Lake to the Gulf Intracoastal Waterway: Cameron, Calcasieu Parishes, Louisiana and Orange County, Texas*. University of New Orleans Archaeological and Cultural Research Program Research Program Research Reports, No. 1.

1982 *Archaeological Site Inventory, Barataria Basin Marsh Unit–Core Area, Jean Lafitte National Historical Park, Jefferson Parish, Louisiana*. Submitted to National Park Service, Jean Lafitte National Historical Park, New Orleans. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Beavers, Richard C., Teresia R. Lamb, and Gary B. De Marcay
1982 *Determination of Degree of Adverse Impact on Known Cultural Resources by Proposed Public Access Facilities at the Barataria Basin Marsh Unit–Core Area*. Submitted to the National Park Service, Jean Lafitte National Historical Park, New Orleans. Report on file at the Division of Archaeology, Baton Rouge.

Beavers, Richard C., Malcolm C. Webb, Teresia R. Lamb, and John R. Greene
1984 *Preliminary Archaeological Survey of the Lower West Pearl River, Saint Tammany Parish, Louisiana*. Archaeological and Cultural Research Program, University of New Orleans, Research Reports, No. 9.

1985a *Archaeological Survey of the Bogue Chitto River Drainage, Washington Parish, Louisiana*. Archaeological and Cultural Research Program, University of New Orleans, Research Reports, No. 10.

1985b *Archaeological Survey of the Upper Tangipahoa River, Tangipahoa Parish, Louisiana*. Archaeological and Cultural Research Program, University of New Orleans, Research Reports, No. 11.

Bell, Robert E.
1980 Fourche Maline: An Archaeological Manifestation in Eastern Oklahoma. In Caddoan and Poverty Point Archaeology: Essays in Honor of Clarence Hungerford Webb, edited by Jon L. Gibson. *Louisiana Archaeology* 6:83–125.

Bell, Robert E., and Roland S. Hall
1953 Selected Projectile Point Types of the United States. *Bulletin of the Oklahoma Anthropological Society* 1:1–16.

Belmont, John S.
1967a The Development of Agriculture in the Lower Valley. *Southeastern Archaeological Conference Bulletin* 5:16–18.

19676 The Culture Sequence at the Greenhouse Site, Louisiana. *Southeastern Archaeological Conference Bulletin* 6:27–34.

1982a Toltec and Coles Creek: A View from the Southern Lower Mississippi Valley. In *Emerging Patterns of Plum Bayou Culture: Preliminary Investigations of the Toltec Mounds Research Project*, edited by Martha Ann Rolingson, pp. 64–70. Arkansas Archeological Survey Research Series No. 18.

1982b Peer Review. In *Powell Canal: Baytown Period Occupation on Bayou Macon in Southeast Arkansas*, by John H. House, Appendix D, pp. 104–107. Arkansas Archeological Survey Research Series No. 19.

1982c The Troyville Concept and the Gold Mine Site. *Louisiana Archaeology* 9:65–98.

1983 A Reconnaissance of the Boeuf Basin, Louisiana. *Louisiana Archaeology* 10:271–284.

Belmont, John S., and Stephen Williams
1981 Painted Pottery Horizons in the Southern Mississippi Valley. In Traces of Prehistory: Papers in Honor of William G. Haag, edited by Fredrick H. West and Robert W. Neuman. *Geoscience and Man* 22:19–42.

Bennett, Kenneth A.
1961 Artificial Cranial Deformation Among the Caddo Indians. *Texas Journal of Science* 13(4):377–390.

Bennett, W. J., Jr.
1982 *Cultural Resources Survey on the Vernon Ranger District, Kisatchie National Forest, Vernon Parish, Louisiana*. Archaeological Assessments, Inc., Nashville, AR. Submitted to USDA Forest Service, Pineville, LA. (AAI Report No. 13).

Berg, Richard
1984 *Osteological Analysis of Selected Long Bones from the Gold Mine Site, (16RI13), Richland Parish, Louisiana*. M.A. thesis, University of Arkansas, Fayetteville.

Beyer, George Eugene
1896 The Mounds of Louisiana. *Publications of the Louisiana Historical Society* 1(4):12–32.

1898 The Mounds of Louisiana. *Publications of the Louisiana Historical Society* 2(1):7–27.

1899a Investigations of Some Shell Mounds in Calcasieu Parish. *Publications of the Louisiana Historical Society* 2(2):16–23.

1899b Ancient Basket Work from Avery's Island. *Publications of the Louisiana Historical Society* 2(2):23–26.

1900 Mound Investigation at Lemar, Louisiana. *Publications of the Louisiana Historical Society for 1899–1900*, 2(3):28–33.

Binford, Lewis R.
1962 Archaeology as Anthropology. *American Antiquity* 28:217–225.

1965 Archaeological Systematics and the Study of Cultural Process. *American Antiquity* 31:203–210.

Binford, Lewis R., and Sally R. Binford (editors)
1968 *New Perspectives in Archeology*. Aldine, Chicago.

Bitgood, Mark J.
1987 *An Evaluation of the Indian Bayou and Marsden Phases as Baytown Period Phases in the Upper Tensas Basin, Louisiana*. B.A. senior honors thesis, Department of Anthropology, Harvard University, Cambridge.

Black, Thomas K. III
1979 *The Biological and Social Analyses of a Mississippian Cemetery from Southeast Missouri: The Turner Site, 23BU21A*. Anthropological Papers, Museum of Anthropology, University of Michigan.

Blaeuer, Mark W., and Jerome C. Rose
1982 Bioarcheology of the Powell Canal Site. In *Powell Canal: Baytown Period Occupation on Bayou Macon in Southeast Arkansas*, by John H. House, pp. 72–84. Arkansas Archeological Survey Research Series, No. 19.

Blake, Leonard W.
1986 Corn and Other Plants from Prehistory into History in Eastern United States. In *The Protohistoric Period in the Mid–South: 1500–1700*, edited by David H. Dye and Ronald C. Brister, pp. 313. Mississippi Department of Archives and History Archaeological Reports, No. 18.

Blake, Leonard W., and Hugh C. Cutler
1979 Plant Remains from the Upper Nodena Site (3MS4). *ArkansasArcheologist* 20:53–58.

Bohannon, Charles F.
1973 *Excavations at the Mineral Springs Site, Howard County, Arkansas*. Arkansas Archeological Survey Research Series No. 5.

Bolton, Henry E.
1914 *Anthanse De Mezieres and the Louisiana–Texas Frontier, 1768–1780*. 2 vols. Arthur C. Clark, Cleveland.

Bonnin, Jack Charles
1972 *Pimple Mound Occupation in Southwest Louisiana*. Privately printed. Welsh, La. Bonnin, Jack Charles, and Richard A. Weinstein.

1975 The Strohe Site. *Louisiana Archaeological Society Newsletter* 2:8.

1978 The Strohe Site (16JD10), Jefferson Davis Parish, Louisiana. Paper presented at the 4th Annual Meeting of the Louisiana Archaeological Society, Baton Rouge.

Bourne, Edward G. (editor)
1904 *Narratives of the Career of Hernando De Soto in the Conquest of Florida*. A. S. Barnes, New York.

Bradley, Bruce A.
1982 Flaked Stone Technology and Typology. In *The Agate Basin Site: A Record of the Paleo–Indian Occupation of the Northwestern High Plains*, by George C. Frison and Dennis J. Stanford, pp. 181–208. Academic Press, New York.

Bragg, Marion
1977 *Historic Names and Places on the Lower Mississippi River*. Mississippi River Commission, Vicksburg.

Brain, Jeffrey P.
1969 *Winterville: A Case Study of Prehistoric Culture Contact in the Lower Mississippi Valley*. Ph.D. dissertation, Yale University.

1970 *The Tunica Treasure*. Peabody Museum, Harvard University, Cambridge, Lower Mississippi Survey Bulletin No. 2.

1971 The Lower Mississippi Valley in North American Prehistory. Ms. on file, Arkansas Archaeological Survey, Fayetteville.

1973 *Trudeau: An 18th Century Tunica Village*. Peabody Museum, Harvard University, Cambridge, Lower Mississippi Survey Bulletin No. 3.

1977 *On the Tunica Trail*. Louisiana Archaeological Survey and Antiquities Commission, Anthropological Study No. 1.

1978 Late Prehistoric Settlement Patterning in the Yazoo Basin and Natchez Bluffs Regions of the Lower Mississippi Valley. In *Mississippian Settlement Patterns*, edited by Bruce D. Smith, pp. 331–368. Academic Press, New York.

1979 *Tunica Treasure*. Papers of the Peabody Museum, Harvard University, Cambridge, Vol. 71.

1981 Tunica Archaeology. In Traces of Prehistory: Papers in Honor of William G. Haag, edited by Frederick Hadleigh West and Robert W. Neuman. *Geoscience and Man* 22:43–50.

1982 La Salle at the Natchez: An Archaeological and Historical Perspective. In *La Salle and His Legacy: Frenchmen and Indians in the Lower Mississippi Valley*, edited by Patricia Kay Galloway, pp. 49–59. University Press of Mississippi, Jackson.

1985a Introduction: Update of De Soto Studies Since the United States De Soto Expedition Commission Report. John R. Swanton, Smithsonian Institution Press, Washington, DC. *Classics of Smithsonian Anthropology*, reprint of Final Report of the United States DeSoto Expedition Commission.

1985b The Archaeology of the Hernando De Soto Expedition. In *Alabama and the Borderlands: From Prehistory to Statehood*, edited by R. Reid Badger and Lawrence A. Clayton, pp. 96-107. University of Alabama Press, University.

n.d. Tunica Archaeology. Papers of the Peabody Museum, Harvard University, Cambridge, in preparation.

Brain, Jeffrey P., and Drexel Peterson
1971 Palmetto Tempered Pottery. *Southeastern Archaeological Conference Bulletin* 13:70–76.

Brain, Jeffrey P., and Philip Phillips
1979 *Archaeological and Historical Bibliography of the Lower Mississippi Valley* (index cards and booklet). Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge.

Brain, Jeffrey P., Alan Toth, and Antonio Rodriguez Buckingham
1974 Ethnohistoric Archaeology and the DeSoto Entrada into the Lower Mississippi Valley. *Conference on Historic Site Archaeology Papers* 7:232–289.

Brain, Jeffrey P., Ian W. Brown, and Vincas P. Steponaitis
n.d. *Archaeology of the Natchez Bluffs*. Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge.

Brookes, Samuel O.
1976 *The Grand Gulf Mound (22CB522): Salvage Excavations of an Early Marksville Burial Mound*. Mississippi Department of Archives and History Archaeological Reports, No. 1.

Brookes, Samuel O., and Cheryl Taylor

1986 Tchula Period Ceramics in the Upper Sunflower Region. In *The Tchula Period in the Mid–South and Lower Mississippi Valley*, edited by David H. Dye and Ronald C. Brister, pp. 23–27. Mississippi Department of Archives and History Archaeological Reports, No. 17.

Brose, David S.

1979 A Speculative Model of the Role of Exchange in the Prehistory of the Eastern Woodands. In *Hopewell Archaeology: the Chillicothe Conference*, edited by David S. Brose and N'omi Greber, pp. 3–8. Kent State University Press, Kent, Ohio.

1980 How Capt. Riggs Hunts for Mound–Builders' Relics: An Historical Investigation of Some Influences on C. B. Moore. *Southeastern Archaeological Conference Bulletin* 22:145–152.

Brose, David S., and N'omi Greber (editors)

1979 *Hopewell Archaeology: the Chillicothe Conference*. Kent State University Press, Kent, Ohio.

Brown, Calvin

1926 *Archeology of Mississippi*. Mississippi Geological Survey, University, Mississippi.

Brown, Clair A.

1936 The Vegetation of the Indian Mounds, Middens and Marshes in Plaquemines and St. Bernard Parishes in the Lower Mississippi River Delta. In *Reports on Geology of Plaquemines and St. Bernard Parishes*, pp. 423–440. Louisiana Department of Conservation, New Orleans.

Brown, Ian W.

1976 A Reexamination of the Houses of the Bayou Goula Site, lberville Parish, Louisiana. *Louisiana Archaeology* 3:193–205.

1978a Archaeological Investigations of Avery Island, Louisiana, 1977–1978. Paper presented at the 35th Annual Meeting of the Southeastern Archaeological Conference, Knoxville.

1978b Archaeology on Avery Island, 1978. *Louisiana Archaeological Society Newsletter* 5(4):9–11.

1978e *Decorated Pottery of the Lower Mississippi Valley: A Sorting Manual*. Avery Island Conference Document, Lower Mississippi Survey. Peabody Museum, Harvard University, Cambridge.

1978d *James Alfred Ford: The Man and His Works*. Southeastern Archeological Conference Special Publications No. 4.

1979a *Archaeological Investigations at Salt Mine Valley (35–I–5)*. Lower Mississippi Survey, Petite Anse Project Research Notes 8. Peabody Museum. Harvard University, Cambridge.

1979b Certain Coastal Settlement Pattern Changes in the Petite Anse Region of Southwest Louisiana. Paper presented at the 36th Annual Meeting of the Southeastern Archaeological Conference, Atlanta.

1979c A Late Mississippian Component in Southwest Louisiana: Ceramics from the Salt Mine Valley Site. Paper presented at the 36th Annual Meeting of the Southeastern Archaeological Conference, Atlanta.

1979d *Early Eighteenth Century French–Indian Culture Contact in the Yazoo Bluffs Region of the Lower Mississippi Valley*. Ph.D. dissertation. Brown University, Providence, Rhode Island.

1980a Archaeological Investigations on Avery Island, Louisiana, 1977–78. *Southeastern Archaeological Conference Bulletin* 22:110–118.

1980b *Archaeological Investigations at the Morgan Site (34–G–2). A Coles Creek Mound Complex on Pecan Island, Vermilion Parish, Louisiana, 1977–78*. Lower Mississippi Survey, Petite Anse Project Research Notes 12, Peabody Museum, Harvard University, Cambridge.

1981a The Morgan Site: An Important Coles Creek Mound Complex on the Chenier Plain of Southwest Louisiana. *North American Archaeologist* 2:207–237.

1981b *A Preliminary Investigation of Check Stamped Pottery in the Petite Anse Region*. Lower Mississippi Survey, Petite Anse Project Research Notes 9. Peabody Museum, Harvard University, Cambridge.

1982a *The Southeastern Cheek Stamped Pottery Tradition: A View from Louisiana*. Mid–Continental Journal of Archaeology Special Papers, No. 4.

1982b An Archaeological Study of Culture Contact and Change in the Natchez Bluffs Region. In *La Salle and His Legacy: Frenchmen and Indians in the Lower Mississippi Valley*, edited by Patricia K. Galloway, pp. 176–193. University Press of Mississippi, Jackson.

1984 Late Prehistory in Coastal Louisiana: The Coles Creek Period. In *Perspectives on Gulf Coast Prehistory*, edited by David D. Davis, pp. 94-124. University Presses of Florida, Gainsville.

1985 *Natchez Indian Archaeology: Culture Change and Stability in the Lower Mississippi Valley*. Department of Archives and History Archaeological Reports, No. 15.

Brown, Ian W., and Jeffrey P. Brain
1976 Hypothesized Cultural and Environmental Factors Influencing Local Population Movements in the Natchez Bluffs Region. Paper presented at 33rd Annual Meeting of the Southeastern Archaeological Conference.

Brown, Ian W., Richard S. Fuller, and Nancy Lambert–Brown
1979 *Site Survey in the Petite Anse Region, Southwest Coast, Louisiana*. Lower Mississippi Survey, Petite Anse Project Research Notes 11. Peabody Museum, Harvard University, Cambridge.

Brown, Ian W., and Nancy Lambert–Brown
1978 *Archaeological Investigations at the Banana Bayou Mound (33–I–6)*. Lower Mississippi Survey, Petite Anse Project Research Notes 5. Peabody Museum, Harvard University, Cambridge.

1979 *The Mississippian Ceramics from Salt Mine Valley (33–I–5)*. Lower Mississippi Survey, Petite Anse Project Research Notes 10. Peabody Museum, Harvard University, Cambridge.

Broyles, Bettye J., and Clarence H. Webb (editors)
1970 *The Poverty Point Culture*. Southeastern Archaeological Conference Bulletin, No. 12.

Bryan, Alan Lyle (editor)
1978 *Early Man in America*. University of Alberta Department of Anthropology Occasional Papers, No. 1.

Bryant, Douglas Donne
1985 *A Cultural Resources Survey of Beaver Bayou, East Baton Rouge Parish, Louisiana*. Coastal Environments, Inc., Baton Rouge. Submitted to Department of Public Works, East Baton Rouge Parish.

Bryson, Reid, and Wayne M. Wendland
1967 Tentative Climatic Patterns for Some Late Glacial and Post Glacial Episodes in Central North America. In *Life, Land and Water*, edited by W. J. Mayer–Oakes, pp. 271–298. University of Manitoba Press, Winnipeg.

Buikstra, Jane
1979 Contributions of Physical Anthropologists to the Concept of Hopewell: A Historical Perspective. In *Hopewell Archeology: the Chillicothe Conference*, edited by D. S. Brose and N. Greber, P. 220–223. Kent State University Press, Kent.

Bullen, Ripley P., and James B. Stoltman
1972 Fiber-Tempered Pottery in Southeastern United States and Northern Columbia: Its Origins, Context and Significance. *Florida Anthropologist* 25(2), Part 2.

Burden, Eileen K., and Sherwood M. Gagliano
1977 *Archaeological Excavations at Magnolia Mound: A Search for the 1830 Kitchen*. Coastal Environments, Inc., Baton Rouge. Submitted to the Magnolia Mound Board of Trustees.

Burden, Eileen K., Diane E. Wiseman, Richard A. Weinstein, and Sherwood M. Gagliano
1978 *Cultural Resources Survey of the Lacussine National Wildlife Refuge, Cameron Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District U.S. Army Corps of Engineers.

Burnett, B. A.
1984 The Bioarcheology of the Standridge Site (3MN53) and Mid–Ouachita Caddo. Ms. on file, Arkansas Archeological Survey, Fayetteville.

Burnett, B. A., and M. K. Marks
1982 Bioarcheology of the Jones Mill Site (3HS28). Ms. on file, Department of Anthropology, Osteology Laboratory, University of Arkansas, Fayetteville.

Butzer, Karl W.
1971 *Environment and Archaeology*. Aldine, Chicago.

Byrd, Kathleen Mary
1972 *An Archaeological Assessment of the Bayous Boeuf, Blak and Chene Project Area*. Report on file at the New Orleans District Office, U.S. Army Corps of Engineers.

1974 *Tchefuncte Subsistence Patterns, Morton Shell Mound, Iberia Parish, Louisiana*. M.A. thesis, Louisiana State University, Baton Rouge.

1976a The Brackish Water Clam (*Rangia cuneata*): Prehistoric "Staff of Life" or a Minor Food Resource? *Louisiana Archaeology* 3:23–31.

1976b Tchefuncte Subsistence: Information Obtained from the Excavation of the Morton Shell Mound, Iberia Parish, Louisiana. *Southeastern Archaeological Conference Bulletin* 19:70–75.

1978 Zooarchaeological Remains. In *The Peripheries of Poverty Point*, by Prentice M. Thomas, Jr. and L. Janice Campbell, pp. 238–244. New World Research Reports of Investigations, No. 12.

1980 Zooarchaeological Analysis of the Hanna Site: An Alto Focus Occupation in Louisiana. In *The Hanna Site: An Alto Village in Red River Parish*, by Prentice M. Thomas et al. Louisiana Archaeology 5:235–265.

1983 Faunal Remains from the Werner Mound Site, Appendix to The Bossier Focus Revisited, by Clarence H. Webb. In *Southeastern Natives and Their Pasts*, edited by Don G. Wyckoff and Jack L. Hofman, pp. 183–240. Oklahoma Archeological Survey Studies in Oklahoma's Past, No. 11.

Byrd, Kathleen Mary, and R. W. Neuman
1978 Archaeological Data Relative to Prehistoric Subsistence in the Lower Mississippi Alluvial Valley. *Geoscience and Man* 19:9–21.

Byrd, Kathleen M., and R. W. Neuman (editors)
n.d. *Papers from the 1986 Conference on Poverty Point Archaeology*. Report on file at Louisiana Division of Archaeology, Baton Rouge.

Byrne, J. V., D. O. LeRoy, and C. M. Riley
1959 The Chenier Plain and Its Stratigraphy, Southwestern Louisiana. *Gulf Coastal Association Geological Society Transactions* 9:237–260.

Caldwell, Joseph R.
1958 *Trend and Tradition in the Prehistory of the Eastern United States*. American Anthropological Association Memoir No. 88.

Campbell, L. Janice, and Carol S. Weed
1986 *Cultural Resources Investigations in the Proposed Multipurpose Range Complex Area, Fort Polk, Vernon Parish, Louisiana*. New World Research, Inc., Pollock, LA. Submitted to National Park Service, Atlanta (NWR Reports of Investigations, No. 85–6).

Campbell, L. Janice, Carol S. Weed, Mark T. Swanson, and John E. Keller
1983 *Background and Literature Review for Three Proposed Alternatives: Bossier, Caddo, De Soto, and Webster Parishes, Louisiana; Harrison and Marion Counties, Texas; Lafayette County, Arkansas*. New World Research, Inc., Pollock, LA. Submitted to Vicksburg District, U.S. Army Corps of Engineers.

Cantley, Charles E., and John R. Kern (Assemblers)
1984 *Cultural Resources Evaluations at Fort Polk, Louisiana*. Commonwealth Associates, Inc., Report #R–2639, Jackson, Michigan. Submitted to Atlanta Archeological Services Branch, National Park Service, Atlanta, GA, under Contract #CX5000–3–1094.

Carr, Holly Ann
1982 Preliminary Analysis of the Faunal Remains. In *Powell Canal: Baytown Period Occupation on Bayou Macon in Southeast Arkansas*, by John H. House, pp. 66–71. Arkansas Archeological Survey Research Series, No. 19.

Castille, George J.
1979a *A Test of Two Methods of Archaeological Analysis: The Welcome Plantation Artifact Pattern*. M.A. thesis, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

1979b *Survey and Evaluation of the St. Alice Revetment, St. James Parish, Louisiana*. Coastal Environments, Inc., Baton Rouge. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

1982a *Archaeological Investigations at Fort Pike (160R57): The 1978 Excavation*. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

1982b *Cultural Resources Assessment of the Proposed Missouri Pacific Railroad Yard, Pointe Coupee Parish, Louisiana*. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Castille, George J., and Kathleen G. McCloskey
1981 *A Cultural Resources Reconnaissance of Tezcuco, Monroe, and Bruslie Plantations, Ascension Parish, Louisiana*. Coastal Environments, Inc., Baton Rouge. Submitted to Ebasco Services.

Castille, George J., Thurston H. G. Hahn, and Douglas D. Bryant (Coastal Environments, Inc.)
1985 *Archaeological Investigation of the Joseph Peti–Pierre Land Grant, East Baton Rouge Parish, Louisiana*. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Castille, George J., and Richard Weinstein (Coastal Environments, Inc.)
1986 *A Cultural Resources Evaluation of Plantation Landing*. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Castille, George J., Sally Evans Reeves, and Charles E. Pearson
1981 *Cultural Resources Evaluation of New Orleans General Hospital Property (16 OR 69) Lower Garden District, New Orleans, Louisiana*. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Castille, George J., David B. Kelley, Sally K. E. Reeves, and Charles E. Pearson

1982 *Archaeological Excavations at Esplanade Avenue and North Rampart Street, New Orleans, Louisiana*. Coastal Environments, Inc., Baton Rouge.

Cathey, Clyde Winfred

1936 *Slavery in Arkansas*. M.A. thesis, University of Arkansas, Fayetteville.

Chambers, Henry E.

1925 *A History of Louisiana*. The American Historical Society, Inc., Chicago and New York.

Chapman, Carl H.

1948 A Preliminary Survey of Missouri Archaeology, Part IV, Ancient Cultures and Sequence. *Missouri Archaeologist* 10(4).

1975 *The Archaeology of Missouri*, Vol. 1. University of Missouri Press, Columbia.

1980 *The Archaeology of Missouri*, Vol. 2. University of Missouri Press, Columbia.

Chapman, Carl H., and Leo O. Anderson

1955 The Campbell Site: A Late Mississippian Town Site and Cemetery in Southeast Missouri. *Missouri Archaeologist* 17(2–3):1–119.

Chapman, Carl H., John W. Cottier, David Denman, David R. Evans, Dennis E. Harvey, Michael D. Reagan, Bradford L. Rope, Michael D. Southard, and Gregory A. Waselkov

1977 Investigation and Comparison of Two Fortified Mississippi Tradition Archaeological Sites in Southeastern Missouri: A Preliminary Comparison. *The Missouri Archaeologist*, Vol. 38.

Chapman, Jefferson

1976 The Archaic Period in the Lower Little Tennessee River Valley: the Radiocarbon Dates. *Tennessee Anthropologist* 1:1–12.

1977 *Archaic Period Research in the Lower Little Tennessee River Valley*. University of Tennessee Department of Anthropology Reports of Investigations, No. 18.

Charles, Frank N. III

1980 Malacological Analysis — Hanna Site, Louisiana. In The Hanna Site: An Alto Village in Red River Parish, by Prentice M. Thomas et al. *Louisiana Archaeology* 5:267–272.

Clausen, Carl J., A. D. Cohen, C. Emiliani, J. A. Holman, and J. J. Stipp

1979 Little Salt Spring, Florida: A Unique Underwater Site. *Science* 203:609–614.

Cleland, Charles E., Jr.

1965 Analysis of the Faunal Remains of the Fatherland Site. In *Archeology of the Fatherland Site: The Grand Village of the Natchez*, by Robert S. Neitzel, pp. 96–101. Anthropological Papers of the American Museum of Natural History.

Coastal Environments, Inc.

1977 *Cultural Resources Evaluation of the North Gulf of Mexico Continental Shelf*, Vols. 1–3. Report for Interagency Archaeological Services, Office of Historic Preservation, National Park Services, U.S. Department of the Interior, Washington, DC.

1983 *A Cultural Resources Evaluation of Fort Proctor, St. Bernard Parish, Louisiana*. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Cobb, Tom, Henry Miller, Barbara Musholt, and Donna Pyles

1971 A Plantation Survey in the Vicinity of Arkansas Post. Ms. on file, Arkansas Archeological Survey, Fayetteville.

Coe, Joffre L.

1964 *The Formative Cultures of the Carolina Piedmont*. Transactions of the American Philosophical Society, New Series, Vol. 54, Part 5.

Cohen, Mark N., and G. J. Armelagos

1984 *Paleopathology at the Origins of Agriculture*. Academic Press, Orlando.

Colburn, Mona L., and Bonnie W. Styles

n.d. Faunal Remains from Bangs Slough (3CA3), Calhoun County, Arkansas. In *A Preliminary Report on Bangs Slough Data Recovery Excavation, Calhoun County, Arkansas*, edited by Frank F. Schambach. Arkansas Archeological Survey, Fayetteville. Submitted to U.S. Army Corps of Engineers, Vicksburg.

Coleman, J. M., and S. M. Gagliano

1964 Cyclic Sedimentation in the Mississippi River Deltaic Plain. *Transactions of the Gulf Coast Association of Geological Societies* 14:67–80.

Colinvaux, Paul A.

1987 The Changing Forests: Ephemeral Communities, Climate and Refugia. *Quarterly Review of Archaeology* 8:1, 4–7.

Colinvaux, Paul A., and Frederick Hadleigh West

1984 The Beringian Ecosystem. *Quarterly Review of Archaeology* 5(3):10–16.

Collins, Henry B., Jr.
1927 Archeological Work in Louisiana and Mississippi: Explorations and Field-Work of the Smithsonian Institution in 1926. *Smithsonian Miscellaneous Collections* 78(7):200–207.

1932 Excavations at a Prehistoric Indian Village Site in Mississippi. *United States National Museum Proceedings* 79:1–22.

1941 Relationships of an Early Indian Cranial Series from Louisiana. *Journal of the Washington Academy of Sciences* 31(4):145–155.

Colquitt, W. T., and C. H. Webb
1940 Dental Diseases in an Aboriginal Group. *Tri–State Medical Journal* 12(4):2414–2417.

Comeaux, Malcolm L.
1972 Atchafalaya Swamp Life, Settlement and Folk Occupations. *Geoscience and Man* 2.

Conard, Nicholas, David L. Asch, Nancy B. Asch, David Elmore, Harry Gove, Meyer Rubin, James A. Brown, Michael D. Wiant, Kenneth B. Farnsworth, and Thomas G. Cook
1984 Accelerator Radiocarbon Dating of Evidence for Prehistoric Horticulture in Illinois. *Nature* 308:443–446.

Condon, Keith, and Jerome C. Rose
1987 Human Osteology. In *The Texas Eastern Archeological Project, Northeast Arkansas*, edited by Marvin D. Jeter, pp. 203–205. Arkansas Archeological Survey, Fayetteville. Submitted to Texas Eastern Transmission Corporation, Houston.

Conn, Thomas L.
1978 *The Utilization of Chert at the Poverty Point Site*. M.A. thesis, Louisiana State University, Baton Rouge.

Connaway, John M.
1982 The Sturdivant Fishweir, Amite County, Mississippi. *Southeastern Archaeology* 1:138–163.

Connaway, John M., and Samuel O. McGahey
1971 *Archaeological Excavation at the Boyd Site, Tunica County, Mississippi*. Mississippi Department of Archives and History Technical Reports, No. 1.

Connaway, John M., Samuel O. McGahey, and Clarence H. Webb
1977 *Teoc Creek: A Poverty Point Site in Carroll County, Mississippi*. Mississippi Department of Archives and History Archaeological Reports, No. 3.

Corruccini, Robert S., Jerome S. Handler, Robert J. Mutaw, and Frederick W. Lange
1982 Osteology of a Slave Burial Population from Barbados, West Indies. *American Journal of Physical Anthropology* 59:443–459.

Cotter, John L.
1951 Stratigraphic and Area Tests at the Emerald and Anna Mound Sites. *American Antiquity* 17:18–32.

1952 The Gordon Site in Southern Mississippi. *American Antiquity* 18:110–126.

Cowdrey, Albert E.
1977 *Land's End, A History of the New Orleans District, U.S. Army Corps of Engineers and Its Lifelong Battle with the Lower Mississippi and Other Rivers Wending Their Way to the Sea*. New Orleans District, U.S. Army Corps of Engineers.

Cry, George W.
1978 Surface Waters of the Lower Mississippi Valley Region. *Geoscience and Man* 19:65–73.

Curren, C. B., Jr.
1978 The Zooarchaeology of the D'Olive Creek Site (1BA196), Baldwin County, Alabama. *Journal of Alabama Archaeology* 24(1):33–51.

Curtin, Philip D., and Jan Vansina
1968 Sources of Atlantic Slave Trade. In *Problems in African History*, edited by P. O. Collins, pp. 352-364. Prentice–Hall, Englewood Cliffs, New Jersey.

Czajkowski, J. Richard
1934 Preliminary Report of Archaeological Excavation in Orleans Parish. *Louisiana Conservation Review* 4(3): 12–18.

Dale, Edward E., Jr.
1986 The Vegetation of Arkansas. *The Arkansas Naturalist* 4(5):6–19, 22–24, 26–27, plus map.

Dalton, S. P.
1960 Experiences of an Amateur. *Central States Archaeological Journal* 7:106–110.

Darby, William
1816 *A Geographical Description of the State of Louisiana*. John Melish, Philadelphia.

Davis, Dave D.
1981 Ceramic Classification and Temporal Discrimination: A Consideration of Later Prehistoric Ceramic Change in the Mississippi River Delta. *Mid–Continental Journal of Archaeology* 6:55–89.

1984 Protohistoric Cultural Interaction Along the Northern Gulf Coast. In *Perspectives on Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 216–231, University Presses of Florida, Gainesville.

Davis, Dave D., John D. Harley, and Ruth Wiens Henderson
1979 *An Archeological and Historic Survey of the Lowermost Mississippi River*. Department of Anthropology, Tulane University. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

Davis, Dave D., and Marco J. Giardino
1980 Some Notes Concerning Mississippian Period Ceramics in the Mississippi River Delta. *Louisiana Archaeology* 7:53–66.

Davis, Dave D., Marco J. Giardino, Vicki Carpenter, and Kenneth Jones
1982 *Archaeological Survey of Grand Bayou, St. Charles Parish, Louisiana*. Report on file at Department of Anthropology, Tulane University, New Orleans, and Louisiana Division of Archaeology, Baton Rouge.

Davis, E. Mott
1953 Recent Data from Two Paleo–Indian Sites on Medicine Creek, Nebraska. *American Antiquity* 18:380–386.

1970 Archeological and Historical Assessment of the Red River Basin in Texas. In *Archeological and Historical Resources of the Red River Basin*, edited by Hester A. Davis, pp. 27–65. Arkansas Archeological Research Series No. 1.

Davis, E. Mott (editor)
1961a Symposium: Relationships between the Caddoan Area and Neighboring Groups. *Texas Archaeological Society Bulletin* 31:3–73.

1961b Proceedings of the Fifth Conference on Caddoan Archaeology. *Texas Archaeological Society Bulletin* 31:77–143.

Davis, Edwin Adams
1959 *Louisiana: The Pelican State*. Louisiana State University Press, Baton Rouge.

Davis, Hester A.
1966 An Introduction to Parkin Prehistory. *Arkansas Archeologist* 7:1–40.

1973 The Hazel Site: Historical Background. *Arkansas Archeologist* 14:21–31.

Davis, Hester A. (editor)
1970 *Archeological and Historical Resources of the Red River Basin*. Arkansas Archeological Survey Research Series No. 1.

1982 *A State Plan for the Conservation of Archeological Resources in Arkansas*. Arkansas Archeological Survey Research Series No. 21.

Day, D. William, and Jane Laurens–Day (Epsey, Huston & Associates, Inc.)
1982 *Dolet Hills Power Plant: An Archaeological Survey of a Proposed Railroad Spur Corridor and Alternate State Route 510 Right-of-Way, DeSoto and Red River Parishes, Louisiana*. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Dean, Jeffrey S., Robert C. Euler, George J. Gumerman, Fred Plog, Richard H. Hevly, and Thor N. V. Karlstrom
1985 Human Behavior, Demography, and Paleoenvironment on the Colorado Plateaus. *American Antiquity* 50:537–554.

Dean, Jeffrey S., and William J. Robinson
1978 *Expanded Tree-Ring Chronologies for the Southwestern United States*. Laboratory of Tree-Ring Research, University of Arizona, Tucson.

deFrance, Susan
1983 Big Oak Faunal Analysis, 1982. Paper presented at the 9th Annual Meeting of the Louisiana Archaeological Society. Baton Rouge, Louisiana.

DeJarnette, David L., Edward B. Kurjack, and James W. Cambron
1962 Stanfield–Worley Bluff Shelter Excavations. *Journal of Alabama Archaeology* VIII(1–2):1–111.

DeVorsey, Louis, Jr.
1982 The Impact of the La Salle Expedition of 1682 on European Cartography. In *La Salle and His Legacy*, edited by Patricia Kay Galloway, pp. 60–78. University of Mississippi Press, Jackson.

Delcourt, Hazel R.
1975 *Reconstructing the Forest Primeval, West Feliciana Parish, Louisiana*. Louisiana State University Museum of Geoscience Melanges No. 10.

1976 Presettlement Vegetation of the North of Red River Land District, Louisiana. *Castanea* 41:122–139.

Delcourt, Hazel R., Paul R. Delcourt, and Thompson Webb III
1983 Dynamic Plant Ecology: The Spectrum of Vegetational Change in Space and Time. *Quaternary Science Reviews* 1:153–175.

Delcourt, Paul A., and Hazel R. Delcourt
1977 The Tunica Hills, Louisiana–Mississippi: Late Glacial Locality for Spruce and Deciduous Forest Species. *Quaternary Research* 7:218–237.

1979 *Late Pleistocene and Holocene Distributional History of the Deciduous Forest in the Southeastem United States*. Veroffentlichungen des Geobotanischen Institutes der ETH, Stiftung Rubel, Zurich, 68:79–107.

1981 Vegetation Maps for Eastern North America: 40,000 Yr B.P. to the Present. In *Geobotany II*, edited by Robert C. Roman, pp. 123–165. Plenum Press, New York.

1984 Late Quaternary Paleoclimates and Biotic Responses in Eastern North America and the Western North Atlantic Ocean. *Palaeogeography, Palaeoclimatology, Palaeoecology* 48:263–284.

1987 *Long-term Forest Dynamics of the Temperate Zone: A Case Study of Late-Quatemary Forests in Eastern North America*. Ecological studies, Vol. 63. Springer–Verlag, New York and Berlin.

Delcourt, Paul A., Hazel R. Delcourt, Ronald C. Brister, and Laurence E. Lackey

1980 Quaternary Vegetation History of the Mississippi Embayment. *Quaternary Research* 13:111–132.

Dellinger, S. C., and S. D. Dickinson

1940 Possible Antecedents of the Middle Mississippian Ceramic Complex in Northeastern Arkansas. *American Antiquity* 6:133–147.

Dickinson, S. D.

1936 Ceramic Relationships of the Pre-Caddo Pottery from the Crenshaw Site. *Bulletin of the Texas Archeological and Paleontological Society* 8:56–69.

1980 Historic Tribes of the Ouachita Drainage System in Arkansas. *Arkansas Archeologist* 21:1–11.

1982 *New Travels in North America, by Jean–Bernard Bossu,1770–1771*. Northwestern State University Press, Natchitoches, Louisiana.

1986 The River of Cayas, the Ouachita or the Arkansas River? *Arkansas Archeological Society Field Notes* 209:5–11.

Dickinson, S. D., and S. C. Dellinger

1940 A Survey of the Historic Earthenware of the Lower Arkansas Valley. *Texas Archeological and Paleontological Society Bulletin* 12:76–96.

Dickinson, S. D., and Harry J. Lemley

1939 Evidences of the Marksville and Coles Creek Complexes at the Kirkham Place, Clark County, Arkansas. *Texas Archeological and Paleontological Society Bulletin* 11:139–189.

Dincauze, Dena F.

1981 The Meadowcroft Papers. *Quarterly Review of Archaeology* 2(1):3–4.

Dolan, Robert, Bruce Hayden, and Harry Lins

1980 Barrier Islands. *American Scientist* 68:16–25.

Drake, Daniel

1850 *A Systematic Treatise, Historical, Etiological and Practical, on the Principal Diseases of the Interior Valley of North America, As They Appear in the Caucasian, African, Indian and Esquimaux Varieties of its Population*. 2 Vols. Cincinnati.

Drucker, Lesley M.

1982 A Case for the Small Business Archaeologist. *Southeastern Archaeology* 1:167–171.

DuCote, Gregory

1983 *Archaeological Investigations at the Fontenot Borrow Pit Site, 16EV58*. In-house report, Louisiana Department of Transportation and Development, Baton Rouge. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Duffield, Lathel

1963 The Wolfshead Site: An Archaic–Neo-American Site in San Augustine County, Texas. *Bulletin of the Texas Archeological Society* 34:83–141.

Duhe, Brian J.

1976 Preliminary Evidence of a Seasonal Fishing Activity at Bayou Jasmine. *Louisiana Archaeology* 3:33–74.

1978 Salvage Archaeology at Bonner Creek, a Mixed Occupation Site in the Bogue Chitto Watershed. Paper presented at the Annual Meeting of the Louisiana Archaeological Society. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Dye, David H.

1986 Introduction. In *The Protohistoric Period in the Mid–South: 1500–1700*, edited by David H. Dye and Ronald C. Brister, pp. xi–xiv. Mississippi Department of Archives and History Archaeological Reports, No. 18.

Dye, David H., and Ronald C. Brister (editors)

1986a *The Tchula Period in the Mid–South and Lower Mississippi Valley*. Mississippi Department of Archives and History Archaeological Reports, No. 17.

1986b *The Protohistoric Period in the Mid–South: 1500–1700*. Mississippi Department of Archives and History Archaeological Reports, No. 18.

Early, Ann M.

1983 A Brief History of Archaeological Work in the Ouachita River Valley, Arkansas. *Louisiana Archaeology* 10:1–24.

1988 *Standridge: Caddoan Settlement in a Mountain Environment*. Arkansas Archeological Survey Research Series No. 29.

Early, Ann M., and W. Fredrick Limp (editors)
1982 *Fancy Hill: Archeological Studies in the Southern Ouachita Mountains*. Arkansas Archeological Survey Research Series No. 16.

Edwards, Thomas J.
1913 The Tenant System and Some Changes Since Emancipation. *Annals of the American Academy of Political and Social Science* 49:38–46.

Egnatz, Dennis G.
1983 Analysis of Human Skeletal Materials from Mound C. In *Excavations at the Lake George Site, Yazoo County, Mississippi, 1958–1960*, by Stephen Williams and Jeffrey P. Brain, Appendix A, pp. 421–441. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. 74.

Ericson, Jonathon E., R. E. Taylor, and Rainer Berger (editors)
1982 *Peopling of the New World*. Ballena Press Anthropological Papers, No. 23, Los Altos, CA. Espey, Huston & Associates, Inc.

1980 *A Cultural Resource Inventory and Assessment of the Zachary–Ft. Lauderdale Pipeline Construction and Conversion Project: Alternative 11, Southeastern Louisiana*, Document 80225, EH&A Job No. 0910. Espey, Huston & Associates, Inc., Austin, TX.

1982a *Dolet Hills Power Plant: An Archaeological Survey of a Proposed Railroad Spur Corridor and Alternate State Route 510 Right-of-way, De Soto and Red River Parishes, Louisiana*, Document 82060, EH&A Job No. 1731. Submitted to Southwestern Electric Power Company, Shreveport.

1982b *Dolet Hills Power Plant: An Archaeological Survey of the Proposed Make-up Water Pond and Eastern Portions of the Proposed Ash Pond, De Soto Parish, Louisiana*, Document 82096, EH&A Job No. 1731. Submitted to Southwestern Electric Power Company, Shreveport.

Espey, Huston, and Associates
1983 *The Archaeological Investigation of the Louis Porcello site, 16DS212, DeSoto Parish, Louisiana*, Document 82360, EH&A Job No. 1731. Submitted to Southwestern Electric Power Company, Shreveport.

Exnicios, John M.
1981 The 1981 Excavations at Poverty Point: A Preliminary Report. Paper presented at 36th Annual Meeting of the Southeastern Archaeological Conference, Asheville, NC.

Farnsworth, Kenneth B., and Thomas E. Emerson (editors)
1986 *Early Woodland Archeology*. Center for American Archeology Press, Kampsville, IL.

Featherman, Americus
1871 Report of a Botanical Survey of Southern and Central Louisiana. *Annual Report of the Board of Supervisors of the Louisiana State University for 1870*, pp. 3–131.

Featherstonhaugh, George W.
1835 *Geological Report of an Examination Made in 1834 of the Elevated Country Between the Missouri and Red Rivers*. U.S. House of Representatives, 23rd Congress, Second Session, House Document 151.

1844 *Excursion Through the Slave States, from Washington on the Potomac to the Frontier of Mexico; with Sketches of Popular Manners and Geological Notices*. Harper and Brothers, New York.

Fehon, Jacqueline R.
1975 Environmental Setting. In *The Cache River Archeological Project: An Experiment in Contract Archeology*, assembled by Michael B. Schiffer and John H. House, pp. 17–27. Arkansas Archeological Survey Research Series No. 8.

Fehon, Jacqueline R., and Alfred D. Viscito
1974 *Archeological and Historic Investigation and Preliminary Field Reconnaissance of Village Creek, Jackson and Lawrence Counties, Arkansas*. Arkansas Archeological Survey Research Report No. 2.

Fenneman, Nevin M.
1938 *Physiography of Eastern United States*. McGraw–Hill, New York.

Ferguson, Leland
1978 Looking for the “Afro” in Colono–Indian Pottery. *The Conference on Historic Site Archaeology Papers* 12:68–86.

Fertel, Mark
1985 *Big Oak Island (1R6): A Demographic and Pathological Profile*. M.A. thesis, Louisiana State University, Baton Rouge.

Fisk, Harold N.
1944 *Geological Investigation of the Alluvial Valley of the Lower Mississippi River*. U.S. Army Corps of Engineers, Mississippi River Commission, Vicksburg.

1947 *Fine-grained Alluvial Deposits and Their Effects on Mississippi River Activity*. U.S. Army Corps of Engineers, Mississippi River Commission, Vicksburg.

1948 *Geology of the Lower Mermantau River Basin and Control Structure Sites*. U.S. Army Corps of Engineers, Mississippi River Commission, Vicksburg.

Fisk, Harold N., C. R. Kolb, and L. J. Wilbert
1952 *Geological Investigation of the Atchafalaya Basin and the Problem of Mississippi River Diversion*. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg.

Fisk, H. N., and E. McFarlan, Jr.
1955 Late Quaternary Deltaic Deposits of the Mississippi River. *Special Paper of the Geological Society of America* 62:279–302.

Fleetwood, Arthur N.
1969 *Geological Investigation of the Ouachita River Area Lower Mississippi Valley*. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg.

Folmer, Henry
1953 *Franco–Spanish Rivalry in North America 1524–1763*. Glendale, CA.

Fontaine, Rev. Edward
1884 *How the World Was Peopled: Ethnological Lectures*. D. Appleton and Co., New York.

Fontenot, Mary Alice, and Paul B. Freeland
1976 *Acadia Parish, Louisiana, a History to 1900*. Claitors Publishing Division, Baton Rouge.

Ford, James A.
1935a An Introduction to Louisiana Archeology. *Louisiana Conservation Review* 4(5):8–11.

1935b Outline of Louisiana and Mississippi Pottery Horizons. *Louisiana Conservation Review* 4(6):33–38.

1935c *Ceramic Decoration Sequence at an Old Indian Village Site near Sicily Island Louisiana*. Louisiana Geological Survey Anthropological Study No. 1.

1936a Archaeological Methods Applicable to Louisiana. *Proceedings of the Louisiana Academy of Sciences* 3(1):102–105.

1936b *Analysis of Indian Village Site Collections from Louisiana and Mississippi*. Louisiana Geological Survey Anthropological Study No. 2.

1938 A Chronological Method Applicable to the Southeast. *American Antiquity* 3:260–264.

1951 *Greenhouse: A Troyville–Coles Creek Period Site in Avoyelles Parish, Louisiana*. Anthropological Papers of the American Museum of Natural History 44, Part 1.

1952 *Measurements of Some Prehistoric Design Developments in the Southeastern States*. Anthropological Papers of the American Museum of Natural History 44, Part 3.

1954 Comments on Spaulding's Review of Ford (1952). *American Anthropologist* 56:109–112.

1961a Discussion of "Relationships Between the Caddoan and Central Louisiana Culture Sequences" by Clarence H. Webb. *Texas Archeological Society Bulletin* 32:24–25.

1961b In Favor of Simple Typology. *American Antiquity* 27:113–114.

1961c *Menard Site: the Quapaw Village of Osotouy on the Arkansas River*. Anthropological Papers of the American Museum of Natural History 48:155–156, Part 2.

1963 *Hopewell Culture Burial Mounds near Helena, Arkansas*. Anthropological Papers of the American Museum of Natural History 50, Part 1.

1969 *A Comparison of Formative Cultures in the Americas*. Smithsonian Contributions to Anthropology, Vol. 2.

Ford, James A., Philip Phillips, and William G. Haag
1955 *The Jaketown Site in West-Central Mississippi*. Anthropological Papers of the American Museum of Natural History 45, Part 1.

Ford, James A., and George I. Quimby, Jr.
1945 *The Tchefuncte Culture: An Early Occupation of the Lower Mississippi Valley*. Society for American Archaeology Memoir No. 2.

Ford, James A., and Clarence H. Webb
1956 *Poverty Point, a Late Archaic Site in Louisiana*. Anthropological Papers of the American Museum of Natural History 46, Part 1.

Ford, James A., and Gordon R. Willey
1940 *Crooks Site, a Marksville Period Burial Mound in LaSalle Parish, Louisiana*. Louisiana Geological Survey Anthropological Study No. 3.

1941 An Interpretation of the Prehistory of the Eastern United States. *American Anthropologist* 43:325–363.

Ford, Janet L., and Martha Ann Rolingson
1972 *Site Destruction Due to Agricultural Practices in Southeast Arkansas*. Arkansas Archeological Survey Research Series No. 3.

Ford, R. I.

1979 Gathering and Gardening: Trends and Consequences of Hopewell Subsistence Strategies. In *Hopewell Archeology: the Chillicothe Conference*, edited by D. S. Brose and N. Greber, Chapter 29. Kent State University Press, Kent.

Fortier, Alcee

1904 *A History of Louisiana*. 4 vols. Manzi, Joyant, and Company, New York.

Foster, John Wells

1867 On the Antiquity of Man in North America. *Transactions of the Chicago Academy of Sciences* 1:227–257.

1873 *Prehistoric Races of the United States of America*, 2nd ed. S. C. Griggs and Co., Chicago.

Fowke, Gerard

1927 *Archaeological Work in Louisiana*. Smithsonian Miscellaneous Collections 78, No. 7.

1928 *Archaeological lnvestigations — II*. Forty-fourth Annual Report of the Bureau of American Ethnology, pp. 399–540.

Fowler, Melvin L.

1959 *Summary Report on Modoc Rockshelter, 1952, 1953, 1955, 1956*. Illinois State Museum Reports of Investigations, No. 8.

Frank, Joseph

1976 The Bel Site (6CU127): Urban Archeology in Lake Charles, Louisiana. *Louisiana Archaeology* 3:75–121.

Franks, H. A., J. K. Yakubik, J. E. Treffinger, R. C. Goodwin, P. C. Armstrong

1986 *Cultural Resources Inventory of the Montz Freshwater Diversion Project Corridor, St. Charles Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to New Orleans District, U.S. Army Corps of Engineers.

Frazier, David E.

1967 Recent Deltaic Deposits of the Mississippi River: Their Development and Chronology. *Transactions — Gulf Coast Association of Geological Societies* 17:287–315.

Fredlund, Glen G.

1982 *Where Did the Bayogoula Dance? Why Do They Sing No More? A Reexamination of the Archaeology of the Bayou Goula Area, Iberville Parish, Louisiana*. MA. thesis, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

1983 Occupational Variability at 16VN18: A Multiple Component Site in the Bayou Zourie Area. In *University of Southwestern Louisiana Fort Polk Archaeological Survey and Cultural Resources Management Program*, assembled by A. Frank Servello, pp. 771–858. University of Southwestern Louisiana, Lafayette. Submitted to Fort Worth District U.S. Army Corps of Engineers.

Frison, George C.

1978 *Prehistoric Hunters of the High Plains*. Academic Press, New York.

Frison, George C., and Dennis J. Stanford

1982 *The Agate Basin Site: A Record of the Paleoindian Occupation of the Northwestern High Plains*. Academic Press, New York.

Fuller, Richard S.

1985 *Archaeological Survey of the Southern Boeuf Basin, Louisiana, 1984*. Lower Mississippi Survey, Peabody Museum, Harvard University.

Fuller, Richard S., and Diane Silvia Fuller

1986 *Morgan (34–G–2), Mound 1 Excavation Project, Progress Report No. 4*. Lower Mississippi Survey, Peabody Museum, Harvard University.

1987 *Archaeology at the Morgan Site Mound Complex in Southwest Louisiana, 1986*. Management Summary Report, State of Louisiana Grant No. 86A–6. Lower Mississippi Survey, Peabody Museum, Harvard University.

Fuller, Richard S., and Stephen Williams

1985 *Management Summary: Archaeological Survey in the Southern Boeuf Basin, Louisiana, 1984*. Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge. Submitted to Louisiana Division of Archaeology, Baton Rouge.

Fulton, Robert, and Clarence H. Webb

1953 The Bellevue Mound: A Pre-Caddoan Site in Bossier Parish, Louisiana. *Texas Archaeological Society Bulletin* 24:18–42.

Futch, Robin S.

1980 Human Ecology at the Morton Shell Mound Site (16IB3), Iberia Parish, Louisiana. *Louisiana Archaeology* 7:31–51.

Gagliano, Sherwood M.

1963 A Survey of Preceramic Occupations in Portions of South Louisiana and South Mississippi. *Florida Anthropologist* 16(4):105–132.

1964 *An Archaeological Survey of Avery Island*. Louisiana State University Coastal Studies Institute, Baton Rouge.

1967a *Occupation Sequence at Avery Island*. Louisiana State University Press, Coastal Studies Series No. 22.

19676 Late Archaic — Early Formative Relationships in South Louisiana. *Southeastern Archaeological Conference Bulletin* 6:9–22.

1967c Kirk Serrated: An Early Archaic Index Point in Louisiana. *Florida Anthropologist* 20:3–9.

1970a *Archaeological and Geological Studies at Avery Island, 1968–1970*. Progress Report submitted to the International Salt Company, Baton Rouge.

1970b *Progress Report, Archaeological and Geological Studies at Avery Island 1968–1970*. Louisiana State University, Baton Rouge.

1980 *Cultural Resources Studies in the Pearl River Mouth Area, Louisiana Mississippi: Chef Menteur and Rigolets Passes Hurricane Control Structures, Orleans and St. Tammany Parishes, Louisiana*. Coastal Environments, Inc., Baton Rouge. Submitted to New Orleans District, U.S. Army Corps of Engineers.

1984 Geoarchaeology of the Northern Gulf Shore. In *Perspectives on Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 1–40. University Presses of Florida, Gainesville.

Gagliano, Sherwood M., Castille, George J., Charles E. Pearson, and Kathleen G. McCloskey
1979 *Cultural Resources Survey and Testing at Esplanade Avenue and Rampart Street, New Orleans, Orleans Parish, Louisiana*. Heritage Conservation and Recreation Service, Interagency Archaeological Services, Atlanta, Georgia.

Gagliano, Sherwood M., S. Fulgham, Bert Rader, and Diane E. Wiseman
1979 *Cultural Resources Studies in the Pearl River Mouth Area, Louisiana–Mississippi*. Coastal Environments, Inc., Baton Rouge, LA. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

Gagliano, Sherwood M., and Hiram F. Gregory
1965 A Preliminary Study of Paleo–Indian Points from Louisiana. *Louisiana Studies* 4:62–77.

Gagliano, Sherwood M., Charles E. Pearson, Richard A. Weinstein, Diane E. Wiseman, and C. M. McClendon
1982 *Sedimentary Studies of Prehistoric Archaeological Sites: Criteria for Identification of Submerged Archaeological Sites of the Northern Gulf of Mexico Continental Shelf*. Submitted to Preservation Planning Series, U.S. Department of the Interior, National Park Service, Division of State Plans and Grants.

Gagliano, Sherwood M., and Roger T. Saucier
1963 Poverty Point Sites in Southeastern Louisiana. *American Antiquity* 28:320–327.

Gagliano, Sherwood M., and Bruce G. Thom
1967 *Deweyville Terrace, Gulf and Atlantic Coasts*. Louisiana State University Coastal Studies Institute Technical Reports, No. 39.

Gagliano, Sherwood M., and Clarence H. Webb
1970 Archaic–Poverty Point Transition at the Pearl River Mouth. In The Poverty Point Culture, edited by Bettye J. Broyles and Clarence H. Webb. *Southeastern Archaeological Conference Bulletin* 12:47–72.

Gagliano, Sherwood M., Richard A. Weinstein, and Eileen K. Burden
1975 *Investigations Along the Gulf Intracoastal Waterway. Coastal Louisiana Area*. Submitted to New Orleans District, U.S. Army Corps of Engineers.

Gagliano, S. M., R. A. Weinstein, E. K. Burden, K. L. Brooks, and W. P. Glander
1978 *Cultural Resources Survey of the Barataria, Segnette and Rigaud Waterways, Jefferson Parish, Louisiana*. Coastal Environments, Inc., Baton Rouge.

Gagliano, Sherwood M., Richard A. Weinstein, Eileen K. Burden, Katherine L. Brooks, and Wayne P. Glander
1979 *Cultural Resources Survey of the Barataria, Segnette and Riguad Waterways, Jefferson Parish, Louisiana*, Contract No. DACW29–77–C–0272. Coastal Environments, Inc., Baton Rouge. Submitted to the U.S. Army Corps of Engineers, New Orleans.

Gagliano, Sherwood M., Richard A. Weinstein, Eileen K. Burden, Wayne P. Glander, and K. L. Brooks
1980 *Cultural Resources Survey of the Barataria, Segnette, and Riguad Waterways, Jefferson Parish, Louisiana*, 2 vols. Coastal Environments, Inc., Baton Rouge. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

Galloway, Patricia Kay
1982a (editor) *La Salle and His Legacy: Frenchmen and Indians in the Lower Mississippi Valley*. University Press of Mississippi, Jackson.

1982b Sources for the La Salle Expedition of 1682. In *La Salle and His Legacy: Frenchmen and Indians in the Lower Mississippi Valley*, edited by Patricia Kay Galloway, pp. 11–40. University Press of Mississippi, Jackson.

1984 (editor) *Mississippi Provincial Archives*, Vols. IV and V. Louisiana State University Press, Baton Rouge.

1986 The Direct Historical Approach and Early Historical Documents: the Ethnohistorian's View. In *The Protohistoric Period in the Mid–South: 1500–1700*, edited by David H. Dye and Ronald C. Brister, pp. 14–23. Mississippi Department of Archives and History Archaeological Reports, No. 18.

Garrett, Susan E.
1983 *Coastal Erosion and Archaeological Resources on National Wildlife Refuges in the Southeast.* Submitted to the U.S. Fish and Wildlife Service, National Park Service, Washington, D.C.

Garrow, Patrick H.
1982 Response to: The "Small Business Act" and Archaeological Research. *Southeastern Archaeology* 1:171.

Gertjejansen, Doyle J., J. Richard Shenkel, and Jesse O. Snowden
1983 Laboratory Simulation of Tchefuncte Period Ceramic Vessels from the Pontchartrain Basin, with Discussions Regarding Clay Chemistry and Mineralogy. *Southeastern Archaeology* 2:37–63.

Giardino, Marco J.
1977 *An Osteological Analysis of the Human Population from the Mount Nebo Site, Madison Parish, Louisiana*. MA. thesis, Tulane University, New Orleans.

1979 *Cultural Resources Survey and Evaluation of the Cane Creek RC & D Measure, Lincoln County, Arkansas*. New World Research Reports of Investigations, No. 16. New World Research, Inc. Submitted to Interagency Archeological Services, Atlanta, GA, for USDA Soil Conservation Service.

1980a Report on the Skeletal Population from the St. Gabriel Site, 16IV128, Louisiana. In *Excavating at the St. Gabdel Site, Iberville Parish, Louisiana*, by D. K. Woodiel, pp. 110–138. Ms. on file, Louisiana Division of Archeology and Historic Preservation, Baton Rouge.

1980b Skeletal Remains. *Louisiana Archeology* 5:287–300.

1982 Temporal Frameworks, Archaeological Components and Burial Styles: the Human Osteology of the Mt. Nebo Site in Northern Louisiana. In The Troyville–Baytown Period in Lower Mississippi Valley Prehistory: A Memorial to Robert Stuart Neitzel. *Louisiana Archaeology* 9:97–124.

1984a Documentary Evidence for the Location of Historic Indian Villages in the Mississippi Delta. In *Perspectives on Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 232–257. University Presses of Florida, Gainesville.

1984b *Report on the Ceramic Materials from the Coquille site (16JE37) Barataria Unit, Jean Lafitte National Historical Park*. Department of Anthropology, University of New Orleans. Submitted to National Park Service.

Gibson, Jon L.
1966 A Preliminary Survey of Indian Occupation in La Salle Parish, Louisiana. *Louisiana Studies* 5:193–237.

1968a Cad Mound: A Stone Bead Locus in East Central Louisiana. *Texas Archeological Society Bulletin* 38:1–17.

1968b *Russell Landing. A North Louisiana Phase of the Tchefuncte Period*. M.A. thesis, Louisiana State University, Baton Rouge.

1968c Evaluation of the Geographical Pottery of the Lower Ouachita Valley with Regard to the De Soto–Moscoso Expedition. *Louisiana Studies* 7(3):203–212.

1970 Intrasite Variability at Poverty Point: Some Preliminary Considerations on Lapidary. In The Poverty Point Culture, edited by Bettye J. Broyles and Clarence H. Webb. *Southeastern Archaeological Conference Bulletin* 12:13–20.

1973 *Social Systems at Poverty Point: An Analysis of Intersite and Intrasite Variability*. Ph.D. dissertation. Southern Methodist University, Dallas.

1974a The Tchefuncte Culture in the Bayou Vermilion Basin, South Central Louisiana: A Developmental Case Study. *Texas Archeological Society Bulletin* 45:67–95.

1974b Poverty Point, the First North American Chiefdom. *Archaeology* 17(2):96–105.

1974c The Rise and Decline of Poverty Point. Louisiana *Archaeology* 1:8–36.

1975 *Archeological Survey of Bayou Teche, Vermillion River, and Freshwater Bayou, South Central Louisiana*. University of Southwestern Louisiana, Lafayette. Submitted to New Orleans District, U.S. Army Corps of Engineers.

1976a *Archaeological Survey of the Mermentau River and Bayous Nezpique and Des Cannes, Southwest Louisiana*. University of Southwestern Louisiana Center for Archaeological Studies Reports, No. 1.

1976b *Archaeological Survey of Bayou Teche, Vermillion River, and Freshwater Bayou, South Central Louisiana*. University of Southwestern Louisiana Center for Archaeological Studies Reports, No. 2.

1976c Archaeological Survey of a Proposed Borrow Area Along Bayous Portage and Alexandria, St. Martin Parish, Louisiana. Letter on file with the U.S. Army Corps of Engineers, Lafayette Office.

1977 *Archaeological Survey of Portions of Little River, Boeuf River, and Big Creek, East Central and Northeastern Louisiana*. University of Southwestern Louisiana Center for Archaeological Studies Reports, No. 3.

1978 *Archaeological Survey of the Lower Atchafalaya Region, South Central Louisiana*. University of Southwestern Louisiana Center for Archaeological Studies Reports, No. 5.

1979a Review of Archaeology and Ceramics at the Marksville Site by Alan Toth. *Louisiana Archaeology* 4:127–137.

1979b Poverty Point Trade in South Central Louisiana: An Illustration from Beau Rivage. *Louisiana Archaeology* 4:91–116.

1980a (editor) *Caddoan and Poverty Point Archaeology: Essays in Honor of Clarence H. Webb*. Louisiana Archaeology 6.

1980b Clarence Hungerford Webb and Poverty Point Archaeology. In Caddoan and Poverty Point Archaeology: Essays in Honor of Clarence H. Webb, edited by Jon L. Gibson. *Louisiana Archaeology* 6:29–50.

1980c Archaeological Bibliography of Clarence Hungerford Webb, 1939–1979. In Caddoan and Poverty Point Archaeology: Essays in Honor of Clarence H. Webb, edited by Jon L. Gibson. *Louisiana Archaeology* 6:51–60.

1980d Speculations on the Origin and Development of Poverty Point. In Caddoan and Poverty Point Archaeology: Essays in Honor of Clarence Hungerford Webb, edited by Jon L. Gibson. *Louisiana Archaeology* 40 6:319–348.

1981 *Archaeological Survey of an Overland Corridor along the Lower Ouachita River, Catahoula Parish, Louisiana*. Archaeology, Inc., Lafayette, Louisiana. Submitted to the Vicksburg District, U.S. Army Corps of Engineers.

1982a (editor) The Troyville–Baytown Period in Lower Mississippi Valley Prehistory: A Memorial to Robert Stuart Neitzel. *Louisiana Archaeology* 9.

1982b The Troyville–Baytown Issue. *Louisiana Archaeology* 9:31–64.

1982c *Archaeology and Ethnology on the Edges of the Atchafalaya Basin: A Cultural Resources Survey of the Atchfalaya Protection Levees*. The Center for Archaeological Studies, University of Southwestern Louisiana, Lafayette. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

1983a (editor) Prehistory of the Ouachita River Valley, Louisiana and Arkansas. *Louisiana Archaeology* 10.

1983b An Evaluatory History of Archaeology in the Ouachita Valley of Louisiana. *Louisiana Archaeology* 10:25–101.

1983c Mounds on the Ouachita. *Louisiana Archaeology* 10:171–270.

1983d Ouachita Prehistory. *Louisiana Archaeology* 10:319–335.

1983e *Statistical Probabilities for Archaeological Sites in the Upper Vermillion Bayou Watershed, South Central Louisiana*. Archaeology, Inc., Lafayette. Submitted to the U.S. Department of Agriculture, Soil Conservation Service. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

1984a *The Earthen Face of Civilization: Mapping and Testing at Poverty Point, 1983*. University of Southwestern Louisiana, Lafayette. Submitted to U.S. Department of the Interior and Louisiana Division of Archaeology, Baton Rouge.

1984b *Archaeological Survey of Little Chenier, Chenier Perdue, Indian Point Island and Grand Chenier*. Archaeology, Inc. Research Report No. 7. Submitted to Lonnie Harper and Associates, Inc.

n.d.a Earth Sitting: Architectural Masses at Poverty Point, Northeastern Louisiana. Paper presented at the 1986 Conference on Poverty Point.

n.d.b Catahoula. Paper presented at the 1986 Conference on Poverty Point.

Gibson, Jon L., and Layton J. Miller

1973 *The Trappey Mastodon*. University of Southwestern Louisiana Department of Anthropology Research Series No. 27.

Gibson, Jon L., and Frank Servello

n.d. Vatican: A Late Paleo–Indian Site in St. Landry Parish, Louisiana. Ms. on file, University of Southwestern Louisiana, Lafayette.

Ginn, Mildred K.

1940 A History of Rice Production in Louisiana to 1896. *Louisiana Historical Quarterly* 23:544–588.

Giraud, Marcel

1974 *A History of French Louisiana, Volume 1: the Reign of Louis XIV*. Louisiana State University Press, Baton Rouge.

Gladfelter, Bruce G.

1977 Geoarchaeology: The Geomorphologist and Archaeology. *American Antiquity* 42:519–538.

Glassie, Henry

1975 *Folk Housing in Middle Virginia: A Structural Analysis of Historic Artifacts*. University of Tennessee Press, Knoxville.

Goad, Sharon I.

1980 Recent Excavations at Poverty Point, Louisiana. Paper presented at the Southeastern Archaeological Conference Annual Meeting, New Orleans.

Goodman, A. H., D. L. Martin, G. Armelagos, and G. Clark

1984 Indications of Stress from Bone and Teeth. In *Paleopathology at the Origins of Agriculture*, edited by M. N. Cohen and G. J. Armelagos, pp. 13–50. Academic Press, New York.

Goodwin, R. Christopher

1986 *Archeological Testing at 16CM61, A Prehistoric Shell Midden in Cameron Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

Goodwin, R. Christopher, C. J. Utermohle and M. Lethbridge

1980 Physical Anthropology of the Tillar Site, A Late Mississippi Cemetery in Southeast Arkansas. Paper presented at the 37th Southeastern Archeological Conference, New Orleans.

Goodwin, R. Christopher, Jill–Karen Yakubik, and Cyd Heymann Goodwin

1983 *The Historic Archaeology of Elmwood Plantation*. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

1984 *Elmwood: the Historic Archeology of a Southeastern Louisiana Plantation*. Jefferson Parish Historical Commission, Metairie, LA.

Goodwin, R. Christopher, Jill–Karen Yakubik, Galloway W. Selby, Kenneth R. Jones, Debra Stayner, and Janice Cooper

1985 The Chitimacha People of the Bayou Teche Region. In *An Archaeological and Historic Sites Inventory of Bayou Teche between Franklin and Jeanerette, Louisiana*, pp. 201–223. R. Christopher Goodwin & Associates, Inc., New Orleans. Submitted to the Louisiana Division of Archaeology, Baton Rouge.

Goodwin, R. Christopher, Jill–Karen Yakubik, Debra Stayner, and Kenneth Jones

1984 *Cultural Resources Survey of Five Mississippi River Revetments Items*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District, U.S. Army Corps of Engineers, under Contract No. DACW29– 84–D–0029.

1985 *Cultural Resources Survey of the Angelina Revetment Item, St. James Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District, U.S. Army Corps of Engineers, under Contract No. DACW29–85–D–0013.

Goodwin, R. Christopher, Peter A. Gendel and Jill–Karen Yakubik

1983a *Archeological Survey of the New House Site, Harlem Plantation, Plaquemines Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District U.S. Army Corps of Engineers, under Contract No. DACW29–83–M–0977.

1983b *Historic Archeology at the Old Courthouse Site, Convent, St. James Parish, Louisiana, 16SJ35*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the Division of Archeology, Department of Culture, Recreation, and Tourism, State of Louisiana, Baton Rouge.

1983c *Historic Archeology at Star and Bourbon Plantations*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District, U.S. Army Corps of Engineers, under Contract No. DACW29–83–M–0521.

1983d *Archeological Assessment of Two Sites on the Mississippi River: 16PC33 and 16EBR46*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District, U.S. Army Corps of Engineers, under Contract No. DACW29–83–M–0186.

1984 *Archeological Data Recovery at Algiers Point*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District, U.S. Army Corps of Engineers, under Contract Nos. DACW29–83–D–0029 and LMNPD–84–31.

Goodwin, R. Christopher, Peter A. Gendel, Jill–Karen Yakubik, and Herschel A. Franks
1985a *Cultural Resources Survey of the Burnside Revetment Item, Ascension and St. James Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District U.S. Army Corps of Engineers, under Contract No. DACW29–85–D–0013.

1985b *Cultural Resources Survey of the White Castle Revetment Item, Iberville Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the New Orleans District, U.S. Army Corps of Engineers, under Contract No. DACW–85–D–0013.

Goodwin, R. Christopher, and Jill–Karen Yakubik
1982a *Data Recovery at the New Orleans General Hospital Site, 16OR69*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the Division of Archeology, Department of Culture, Recreation, and Tourism, Baton Rouge.

1982b *Report on the Level II Archeological Survey of Magnolia Plantation, Plaquemines Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to the Division of Archeology, Department of Culture, Recreation, and Tourism, Baton Rouge.

1983 *Analysis of Historic Remains from Two Archeological Test Units at Chalmette National Historic Park*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to Jean Lafitte National Historic Park, New Orleans, under Order No. PX7530–3–0104.

Goodwin, R. Christopher, Jill–Karen Yakubik, Peter A. Gendel, Kenneth Jones, Debra Stayner, Cyd H. Goodwin, Galloway W. Selby, and Janice Cooper
1985 *Preserving the Past for the Future: A Comprehensive Archaeological and Historical Sites Inventory of Jefferson Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to Jefferson Parish Historical Commission.

Goodyear, Albert C. III
1974 *The Brand Site: A Techno–Functional Study of a Dalton Site in Northeast Arkansas*. Arkansas Archeological Survey Research Series, No. 7.

1979 *A Hypothesis for the Use of Cryptocrystalline Raw Materials among Paleo–Indian Groups of North America*. University of South Carolina Institute of Archeology and Anthropology Research Manuscript Series, No. 156.

1982 The Chronological Position of the Dalton Horizon in the Southeastern United States. *American Antiquity* 47:382–395.

Goodyear, Albert C. III, John H. House, and Neal Ackerly
1979 *Laurens–Anderson: An Archeological Study of the South Carolina Inter-Riverine Piedmont*. University of South Carolina Institute of Archeology and Anthropology Anthropological Studies, No. 4.

Gould, H. R., and E. McFarlan, Jr.
1959 Geological History of the Chenier Plain Southwestern Louisiana. *Gulf Coast Association Geological Society Transactions* 9:261–270.

Graham, Russell, C. Vance Haynes, Donald Johnson, and Marvin Kay
1981 Kimmswick: A Clovis–Mastodon Association in Eastern Missouri. *Science* 213:1115–1117.

Grambling, Robert B.
1978 Perspectives on Culture History in the Lower Sabine River Valley. In *An Archeological Reconnaissance of the Lower Sabine River Valley, Toledo Bend Dam to Gulf Intracoastal Waterway, Louisiana and Texas*, by Jon Gibson. The University of Southwestern Louisiana Center for Archeological Studies 4.

Green, Dee F.
1986 1964 Investigations in DeGray Reservoir. *Arkansas Archeologist* 23/24:45–65.

Greene, Glen S.
1985 *The Deep Six Paleosol: the Incipient Poverty Point Occupation, 1983 Excavations*. Northeast Louisiana University, Monroe. Submitted to Louisiana Division of Archaeology, Baton Rouge.

Greene, Glen S., Ernest Russ Williams, Lorraine Heartfield, Mitchell Hillman, and John R. Humble
1975 *Excavations at the Site of Historic Fort Miro (16OU3) in Monroe, Louisiana*. The Research Institute, College of Pure and Applied Sciences, Northeast Louisiana University, Monroe. Archeological Series 1.

Greene, Jerome A., A. Berle Clemenson, John C. Paige, David R. Stuart, and Lawrence F. Van Horn
1983 *Mississippi River Cultural Resources Survey, A Comprehensive Study, Phase 1, Component A: Thematic Historical Overview*. Southeast/Southwest Team, Denver Service Center, National Park Service. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

Greengo, Robert E.
1957 *Prehistory in the Lower Mississippi Valley: The Issaquena Phase*. Ph.D. dissertation. Harvard University, Cambridge.

1964 *Issaquena: An Archaeological Phase in the Yazoo Basin of the Lower Mississippi Valley*. Memoirs of the Society for American Archaeology, No. 18.

Gregory, Hiram F.
1963 Scottsbluff Points: Trademarks of Texas Tourists. *Louisiana Studies* 2:176–177.

1965 Maximum Forest Efficiency: Swamp and Upland Potentials. *Southeastern Archaeological Conference Bulletin* 3:70–74.

1969 Plaquemine Period Sites in the Catahoula Basin, a Cultural Microcosm in East–Central Louisiana. *Louisiana Studies* 8:111–134.

1973 *Eighteenth-Century Caddoan Archaeology: A Study in Models and Interpretation*. Ph.D. dissertation, Southern Methodist University, Dallas.

1980a A Continuity Model for Caddoan Adaptation on the Red River in Louisiana. In The Hanna Site: An Alto Village in Red River Parish, by Prentice M. Thomas et al. *Louisiana Archaeology* 5:347–360.

1980b The Doctor and Caddology: Dr. Clarence H. Webb's Contributions to Caddo Archaeology. In Caddoan and Poverty Point Archaeology: Essays in Honor of Clarence H. Webb, edited by Jon L. Gibson. *Louisiana Archaeology* 6:1928.

Gregory, Hiram F., Jay C. Blaine, and Sheila Morrison
1982 *Excavations 1981–82: Presidio de Nuestra Senora del Pilar de Los Adaes*. Williamson Museum, Northwestern State University, Natchitoches, LA. Submitted to the Louisiana Office of State Parks, Baton Rouge.

Gregory, Hiram F., Jay C. Blaine, Dayna Seale, and Kenneth Hart
1985 *Excavations: Unit 227, Presidio de Nuestra Senora del Pilar de los Adaes (16NA16)*. Williamson Museum, Northwestern State University, Natchitoches, LA. Submitted to the Louisiana Office of State Parks, Baton Rouge.

Gregory, Hiram F., and H. K. Curry
1972 *An Archaeological Survey of the Diamond Ore Test Area, Peason Ridge, Vernon Parish, LA*. Northwestern State University, Natchitoches, LA. Submitted to Fort Polk Military Museum, Fort Polk, LA.

1976 *Archeological Reconnaissance, Lower Bushley Bayou Project*. Northwestern State University, Natchitoches, LA. Submitted to the Vicksburg District, U.S. Army Corps of Engineers.

1978 *Natchitoches Parish Cultural and Historical Resources — Prehistory*. Natchitoches Parish Planning Commission. Submitted to the Natchitoches Parish Policy Jury. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Gregory, Hiram F., H. K. Curry, and James L. McCorkle, Jr.
1979 *Natchitoches Parish Cultural and Historical Resources: History*. Natchitoches Parish Planning Commission. Submitted to the Natchitoches Parish Policy Jury. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Gregory, Hiram F., H. K. Curry, Clint Pine, and G. A. Stokes
1980 *An Assessment of the Cultural and Historical Impact of the Projected Sewerline for City of Provencal, Natchitoches Parish, Louisiana*. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Gregory, Hiram F., L. C. Davis, and Donald G. Hunter
1970 The Terral Lewis Site: A Poverty Point Activity Facies in Madison Parish, Louisiana. In *The Poverty Point Culture*, edited by Bettye J. Broyles and Clarence H. Webb, pp. 35–46. Southeastern Archaeological Conference Bulletin 12.

Gregory, Hiram F., David T. Eschenfelder, Connie B. Eschenfelder, James L. McCorkle, Jr., George A. Stokes, Nancy Bernstein, and Jay C. Blaine
1984 *A Civil War Military Site Survey: Natchitoches Parish and Environs*. Williamson Museum, Northwestern State University, Natchitoches, LA. Submitted to the Louisiana Division of Archaeology, Baton Rouge.

Gregory, Hiram F., Aubra Lee, Jay C. Blaine, David Eschenfelder, and Douglas Raymond
1984 *Excavations: Presidio de Nuestra Senora del Pilar de los Adaes*. Williamson Museum, Northwestern State University, Natchitoches, LA. Submitted to the Louisiana Office of State Parks, Baton Rouge.

Gregory, Hiram F., James Matthews, Pamela Matthews, and Abigayle Robbins
1980 *Excavations, 1979: Presidio de Nuestra Senora del Pilar de los Adaes*. Williamson Museum, Northwestern State University, Natchitoches, LA. Submitted to the Louisiana Division of Archaeology, Baton Rouge.

Gregory, Hiram F., Clint Pine, William S. Baker, Jr., Aubra Lee, Reinaldo Barnes, and George A. Stokes
1987 *A Survey of Catahoula Basin, 1987*. Department of History and Social Science, Northwestern State University, Natchitoches, LA. Submitted to the Louisiana Division of Archaeology and U.S. Department of the Interior.

Gregory, Hiram F., George A. Stokes, Sheila Morrison, Melissa Green, and Abigayle Robbins
1982 *The Archaeology of the Badin–Roque House: A 19th Century Poteau-en-terre House, Natchitoches Parish, Louisiana*. Williamson Museum, Northwestern State University, Natchitoches. Submitted to St. Augustine Historical Society, Melrose.

Gregory, Hiram F., and Clarence H. Webb
1965 European Trade Beads from Six Sites in Natchitoches Parish, Louisiana. *Florida Anthropologist* 18:15–44.

Greiser, Sally Thompson
1985 Predictive Models of Hunter–Gatherer Subsistence and Settlement Strategies on the Central High Plains. *Plains Anthropologist* 30(110), Part 2.

Griffin, James B.
1946 Cultural Change and Continuity in Eastern United States Archaeology. In *Man in Northeastem North America*, edited by Frederick Johnson, pp. 37–95. Papers of the Robert F. Peabody Foundation for Archaeology 3.

1952 (editor) *Archeology of Eastern United States*. University of Chicago Press.

1967 Eastern North American Archaeology: A Summary. *Science* 156:175–191.

1976 A Commentary on Some Archaeological Activities in the Mid–Continent, 1925–1975. *Mid–Continental Journal of Archaeology* 1:5–38.

1979 An Overview of the Chillicothe Hopewell Conference. In *Hopewell Archaeology: the Chillicothe Conference*, edited by David S. Brose and N'omi Greber, pp. 266–270. Kent State University Press, Kent, Ohio.

1985 Changing Concepts of the Prehistoric Mississippian Cultures of the Eastern United States. In *Alabama and the Borderlands: from Prehistory to Statehood*, edited by R. Reid Badger and Lawrence A. Clayton, pp. 40–63. University of Alabama Press, University, AL.

1986 The Tchula Period in the Mississippi Valley. In *The Tchula Period in the Mid–South and Lower Mississippi Valley*, edited by David H. Dye and Ronald C. Brister, pp. 40–42. Mississippi Department of Archives and History Archaeological Reports, No. 17.

Griffin, James B., and Albert C. Spaulding
1952 The Central Mississippi Valley Archaeological Survey, Season 1950: A Preliminary Report. In *Prehistoric Pottery of the Eastern United States*, edited by James B. Griffin. University of Michigan Museum of Anthropology, Ann Arbor.

1961 *Relationships Between the Caddoan Area and the Mississippi Valley*. Texas Archeological Society Bulletin 31.

1981 The Acquisition of a Little-Known Pottery Haul from the Lower Mississippi Valley. *Geoscience and Man* 22:51–55.

Gruber, J. W.
1981 American Archeology and Physical Anthropology in Historical Perspective. *American Journal of Physical Anthropology* 56(4):473–482.

Guccione, Margaret J.
1984 Variations of the Red River Channel in Southwest Arkansas. In *Cedar Grove: An Interdisciplinary Investigation of a Late Caddo Fannstead in the Red River Valley*, edited by Neal L. Trubowitz, pp. 17–25. Arkansas Archeological Survey Research Series No. 23.

Guderjan, Thomas H., and James R. Morehead
1980 Big Brushy: A Stratified Multiple Component Site at Fort Polk, Louisiana. *Louisiana Archaeology* 7:1–30.

1983 16VN24: A Stratified Multiple Component Site on Big Brushy Creek. In *University of Southwestern Louisiana Fort Polk Archaeological Survey and Cultural Resources Management Program*, assembled by A. Frank Servello, pp. 859–935. University of Southwestern Louisiana, Lafayette. Submitted to Fort Worth District U.S. Army Corps of Engineers.

Guevin, Bryan L.
1983 *The Ethno–archaeology of the Houma Indians*. M.A. thesis, Louisiana State University, Baton Rouge.

1987 Grand Houmas Village: An Historic Houma Indian Site (16AN35), Ascension Parish, Louisiana. *Louisiana Archaeology* 11:89–110.

Guevin, Bryan L., and Charles E. Pearson
1983 *Archaeological Evaluation of the Flint Plantation Site (16RA79), Rapides Parish, Louisiana*. Coastal Environments, Inc., Baton Rouge. Submitted to the Vicksburg District U S. Army Corps of Engineers.

Gunn, Joel D., and David O. Brown
1982 *Eagle Hill: A Late Quaternary Upland Site in Western Louisiana*. University of Texas at San Antonio Center for Archaeological Research Special Reports, No. 12.

Gunn, Joel D., and Anne C. Kerr
1984 *Occupation and Settlement in the Uplands of Western Louisiana*. University of Texas at San Antonio Center for Archaeological Research Special Reports, No. 17.

Guy, Jan, and Joel D. Gunn
1983 Settlement Patterns in the Fort Polk Region. *Louisiana Studies* 4:279–323.

Haag, William G.
1971 *Louisiana in North American Prehistory*. Louisiana State University Museum of Geoscience, Melanges No. 1.

Hally, David J.
1967 Post-Coles Creek Development in the Upper Tensas Basin of Louisiana. *Southeastern Archaeological Conference Bulletin* 6:36–40.

1972 *The Plaquemine and Mississippian Occupations of the Upper Tensas Basin, Louisiana*. Ph.D. dissertation, Harvard University, Cambridge.

Handler, Jerome S., and Frederick W. Lange
1978 *Plantation Slavery in Barbados: An Archaeological and Historical Investigation*. Harvard University Press, Cambridge.

1979 Plantation Slavery on Barbados, West Indies. *Archaeology* (July/August), pp. 45–52.

Handler, Jerome S., and Robert S. Corruccini
1983 Plantation Slave Life in Barbados: A Physical Anthropological Analysis. *Journal of Interdisciplinary History* 14:65–90.

Handler, Jerome S., Robert S. Corruccini, and Robert J. Mutaw
1982 Tooth Mutilation in the Caribbean: Evidence from a Slave Burial Population in Barbados. *Journal of Human Evolution* 11:297–313.

Hansen, Harry (editor)
1971 *Louisiana: A Guide to the State*. American Guide Series, Heritage House, New York.

Harmon, Anna
1984 Bioarcheology of the Wapanocca Site (3CT9), Crittenden County, Arkansas. Ms. on file, Department of Anthropology, Osteology Laboratory, University of Arkansas, Fayetteville.

Harrington, Mark R.
1920 *Certain Caddo Sites in Arkansas*. Museum of the American Indian, Heye Foundation, Indian Notes and Monographs, No. 10.

Harris, Suzanne E.
1982 Preliminary Ethnobotanical Analysis. In *Mangrum: Mitigation Through Excavation and Protection*, by Timothy C. Klinger, pp. 101–107. Arkansas Archeological Survey Research Series No 20.

Hathcock, Roy
1976 *Ancient Pottery of the Mississippi River Valley*. Hurley Press, Inc., Camden, Arkansas.

Haynes, C. Vance
1980 Paleoindian Charcoal from Meadowcroft Rockshelter: Is Contamination a Problem? *American Antiquity* 45:582–587.

1987 Clovis Origin Update. *The Kiva* 52:83–93.

Heartfield, Lorraine
1977 *A Cultural Resources Survey and Evaluation of the Opelousas to Shreveport Portion of the Proposed North–South Expressway: Phases I and II*. The Research Institute, College of Pure and Applied Sciences, Northeast Louisiana University, Monroe. Submitted to Howard, Needles, Tammen & Bergendoff, Baton Rouge.

Heartfield, Lorraine, Kay Hudson, G. R. Dennis Price, Samuel W. Mitcham, Jr., and Glen S. Greene
1976 *Archeological Assessment of the Ouachita River Basin, Arkansas and Louisiana*. Geosciences Department of Research Institute, Northeast Louisiana University. Submitted to the Soil Conservation Service.

1978 *A Cultural Resource Survey and Evaluation of the 165 Portion of the Proposed North–South Expressway*. Heartfield, Price, and Greene, Inc., Monroe, Louisiana. Submitted to Louisiana Division of Archaeology, Baton Rouge.

Heartfield, Lorraine, and G. R. Dennis Price
1975 *Archeological Survey of Bayou Bonne Idee Watershed Morehouse Parish, Louisiana*. Heartfield, Price, and Greene, Inc., Monroe Louisiana. Submitted to U.S. Soil Conservation Service, Alexandria, Louisiana.

Heartfield, Price, and Greene, Inc.
1980 *A Cultural Resources Reconnaissance of the Felsenthal National Wildlife Refuge, Arkansas*. Heartfield, Price, and Greene, Inc., Monroe, Louisiana. Submitted to Interagency Archaeological Services, Atlanta.

1981 *A Cultural Resources Inventory of the Pearl River Basin, Louisiana and Mississippi*. Heartfield, Price and Greene, Inc., Monroe. Submitted to New Orleans District, U.S. Army Corps of Engineers.

1985 *Data Recovery at Archeological Site 16NA37 (Montrose Site), Natchitoches Parish, Louisiana*. Heartfield, Price and Greene, Inc., Monroe. Submitted to Louisiana Department of Transportation and Development.

1987 *Testing at Archeological Sites 16NA177, 16NA182, and 16NA236, Nachitoches Parish, Louisiana*. Heartfield, Price and Greene, Inc., Monroe. Submitted to New Orleans District, U.S. Army Corps of Engineers.

Helis, Mary K.
1986 *A Prehistoric Burial Population from Eastern Orleans Parish*. Honors thesis, Department of Anthropology, University of New Orleans.

Hemmings, E. Thomas
1982a *Human Adaptation in the Grand Marais Lowland: Intensive Archeological Survey and Testing in the Felsenthal Navigation Pool, Ouachita and Saline Rivers, Southern Arkansas*. Arkansas Archeological Survey Research Series No. 17.

1982b Spirit Lake (3LA83): Test Excavation in a Late Caddo Site on the Red River. In *Contributions to the Archeology of the Great Bend Region of the Red River Valley, Southwest Arkansas*, edited by Frank F. Schambach and Frank Rackerby, pp. 55–89. Arkansas Archeological Survey Research Series No. 22.

1982c Vertebrate Fossils from Recent Red River Point Bar and Channel Bar Deposits in the Great Bend Region. In *Contributions to the Archeology of the Great Bend Region*, edited by Frank F. Schambach and Frank Rackerby, pp. 30–38. Arkansas Archeological Survey Research Series No. 22.

1985 Analysis of Materials. In *The Alexander Site, Conway County, Arkansas*, edited by E. Thomas Hemmings and John H. House, pp. 27–48. Arkansas Archeological Survey Research Series No. 24.

Hemmings, E. Thomas, and John H. House (editors)
1985 *The Alexander Site, Conway County, Arkansas*. Arkansas Archeological Survey Research Series No. 24.

Highsmith, William E.
1955 Landholding During War and Reconstruction. *Louisiana Historical Quarterly* 38(1):39–54.

Hilgard, Eugene Woldemar
1872 *On the Geology of the Lower Louisiana Salt Deposit on Petite Anse Island*. Smithsonian Contributions to Knowledge, Vol. 23, No. 248. Washington, D.C.

1873 *Supplementary and Final Report of a Geological Reconnaissance of the State of Louisiana*. Picayune Steam Job Press, New Orleans.

Hodges, Charlotte (Mrs. T. L.)
1963 The Cahinnio–Caddo: A Contact Unit in the Eastern Margin of the “Caddo Area.” *Arkansas Archeologist* 4(1):3–8. Originally published 1957, *Texas Archeological Society Bulletin* 28:190–197.

Hodges, Paul L.
1978 The 1969 Excavations at Myatt’s Landing. *Louisiana Archaeological Society Newsletter* 5(3):11–14.

Hodges, Thomas L., and Charlotte (Mrs. T. L.) Hodges
1943 Possibilities for the Archeologist and Historian in Eastern Arkansas. *Bulletin of the Texas Archeological and Paleontological Society* 15:66-79. Reprinted in *Arkansas Historical Quarterly* 2:141–163.

1945 The Watermelon Island Site in Arkansas. *Texas Archeological and Paleontological Society* Bulletin 16:98–116. Reprinted in *Arkansas Archeologist* 3(3):9–16.

1963 Suggestion for Identification of Certain Mid-Ouachita Pottery as Cahinnio Caddo. *Arkansas Archeologist* 4(8)1–12. Originally published 1945, *Texas Archeological and Paleontological Bulletin* 16:98–116.

Hoffman, Michael P.
1970a Archeological and Historical Assessment of the Red River Basin in Arkansas. In *Archaeological and Historical Resources of the Red River Basin*, edited by Hester A. Davis, pp. 135–194. Arkansas Archeological Survey Research Series No. 1.

1970b *Three Sites in the Millwood Reservoir: the Hutt Site, the Stark Site, and the Beard Lake Site*. Arkansas Archeological Survey Research Series No. 2.

1971 *A Partial Archaeological Sequence for the Little River Region, Arkansas*. Ph.D. dissertation. Harvard University, Cambridge.

1977 The Kinkead–Mainard Site, 3PU2: A Late Prehistoric Quapaw Phase Site near Little Rock, Arkansas. *Arkansas Archeologist* 16/18:1–41.

1983 Changing Mortuary Patterns in the Little River Region, Arkansas. In *Southeastern Natives and Their Pasts: Papers Honoring Dr. Robert E. Bell*, edited by Don G. Wyckoff and Jack L. Hofman, pp. 163–182. Oklahoma Archeological Survey Studies in Oklahoma's Past No. 11.

1986 The Protohistoric Period in the Lower and Central Arkansas River Valley in Arkansas. In *The Protohistoric Period in the Mid–South: 1500–1700*, edited by David H. Dye and Ronald C. Brister, pp. 24–37. Mississippi Department of Archives and History Archaeological Reports, No. 18.

1987 Who's Wearing the White Hats? The Arkansas Act to Prohibit Burial Desecration and Its Implications for Caddoan Archaeology. *Southeastern Archaeological Conference Newsletter* 29(2):22–28.

Hoffman, Robert W.
1982 *Animal Resource Exploitation Pattems at the Toltec Site: A Zooarcheological Study of the Mound D Sample*. M.A. thesis. University of Arkansas, Fayetteville.

Hoffman, Teresa L.
1982 Lithic Technology at Toltec: Preliminary Results from Mound D. In *Emerging Patterns of Plum Bayou Culture*, edited by Martha Ann Rolingson, pp. 54–59. Arkansas Archeological Survey Research Series No. 18.

Holder, Preston
1957a *Archeological Field Research on the Problem of the Locations of Arkansas Post, Arkansas, 1686–1803: A Preliminary Report*. Submitted to National Park Service, Region One, Richmond, Virginia.

1957b *Archeological Field Research on the Problem of the Locations of Arkansas Post: 1686–1803*. Submitted to National Park Service, Region One, Richmond, Virginia.

Holder, Trusten
1970 *Disappearing Wetlands in Eastern Arkansas*. Arkansas Planning Commission, Little Rock.

Holland, Claudia C.
1986 *Investigating Plantation Tenancy Through Ethnoarchaeology: An Example from Central Louisiana*. M.A. thesis, Louisiana State University.

Holland, Claudia C., and Charles E. Orser, Jr.
1984 *A Preliminary Archaeological Investigation of Oakley Plantation, Audubon State Commemorative Area, West Feliciana Parish, Louisiana*. Report on file at Louisiana Division of Archaeology, Baton Rouge.

Holley, George R., Gary B. DeMarcay, and N. H. Lopinot
1977 Preliminary Report on the Prehistory of Barataria. Paper presented at the 3rd Annual Meeting of the Louisiana Archaeological Society, New Orleans.

Holliday, Vance T.
1985 New Data on the Stratigraphy and Pedology of the Clovis and Plainview Sites, Southern High Plains. *Quaternary Research* 23:388–402.

Holliday, Vance T., and Eileen Johnson
1981 An Update on the Plainview Occupation at the Lubbock Lake Site. *Plains Anthropologist* 26:251–253.

Holmes, Jack T.
1967 Indigo in Colonial Louisiana and the Floridas. *Louisiana History* 8:329–349.

Holmes, William Henry
1891 Aboriginal Novaculite Quarries in Garland County, Arkansas. *American Anthropologist* (Old Series) 3: 224–225.

1896 Prehistoric Textile Art of Eastern United States. *Thirteenth Annual Report of the Bureau of Ethnology*, pp. 7–46. Washington, D.C.

1903 Aboriginal Pottery of the Eastern United States. *Twentieth Annual Report of the Bureau of American Ethnology*, pp. 1–237. Washington, D.C.

1919 *Handbook of Aboriginal American Antiquities, Part I, Introductory: The Lithic Industries*. Bureau of American Ethnology Bulletin 60.

Hotchkiss, T. P.
1873 Indian Remains Found 32 Feet Below the Surface, Near Wallace Lake, in Caddo Parish, Louisiana. *Annual Report of the Smithsonian Institution for 1872*, pp. 428–429.

House, John H.
1973 *Archeological Salvage in the Basin of Lake Rodemacher, Rapides Parish, Louisiana, 1972*. Gulf South Research Institute, Baton Rouge. Submitted to Central Louisiana Electric Company, Alexandria.

1975a Prehistoric Lithic Utilization in the Cache Basin: Crowley's Ridge Chert and Quartzite and Pitkin Chert. In *The Cache River Archeological Project: An Experiment in Contract Archeology*, assembled by Michael B. Schiffer and John H. House, pp. 81–91. Arkansas Archeological Survey Research Series No. 8.

1975b Summary of Archeological Knowledge, Updated with Newly Acquired Data. In *The Cache River Archeological Project: An Experiment in Contract Archeology*, by Michael B. Schiffer and John H. House, pp. 153–162. Arkansas Archeological Survey Research Series No. 8.

1980 Archaic Occupation in the Arkansas River Lowland. *Arkansas Archeological Society Field Notes*.

1982a Evolution of Complex Societies in East-Central Arkansas: an Overview of Environments and Regional Data Bases. In *Arkansas Archeology in Review*, edited by Neal L. Trubowitz and Marvin D. Jeter, pp. 37–47. Arkansas Archeological Survey Research Series No. 15.

1982b *Powell Canal: Baytown Period Occupation on Bayou Macon in Southeast Arkansas*. Arkansas Archeological Survey Research Series, No. 19.

1982c Southeast Arkansas Study Units 1, 2, and 9: Paleo–Indian, Archaic, and Kent–Old Town Phases. In *A State Plan for the Conservation of Archeological Resources in Arkansas*, edited by Hester A. Davis, pp. SE5–SE12, SE34–SE41. Arkansas Archeological Survey Research Series, No. 21.

1983 Emergency Salvage at Barrett Mound A, Lee County, Arkansas. *Arkansas Archeological Society Field Notes* 192:3–10.

1985 Summary and Conclusions. In *The Alexander Site, Conway County, Arkansas*, edited by E. Thomas Hemmings and John H. House, pp. 99–110. Arkansas Archeological Survey Research Series No. 24.

1987 Kent Phase Investigations in Eastern Arkansas 1978–1984. *Mississippi Archaeology* 22:46–60.

House, John H., and Marvin D. Jeter (editors)
n.d. Boydell: A Late Prehistoric Mound and Community in Southeast Arkansas. *Arkansas Archeologist*, in press.

House, John H., Timothy C. Klinger, and Michael B. Schiffer
1975 A Test of the Dalton Settlement Pattern Hypothesis Using Cache Project Survey Data. In *The Cache River Archeological Project: an Experiment in Contract Archeology*, assembled by Michael B. Schiffer and John H. House, pp. 93–101. Arkansas Archeological Survey Research Series, No. 8.

House, John H., and Henry S. McKelway
1982 Mississippian and Ouapaw on the Lower Arkansas. In *A State Plan for the Conservation of Archeological Resources in Arkansas*, edited by Hester A. Davis, pp. SE41–SE47. Arkansas Archeological Survey Research Series No. 21.

Howe, Henry V., Richard J. Russell, and James H. McGuirt
1935 Submergence of Indian Mounds. In Reports on the Geology of Cameron and Vermilion Parishes. Department of Conservation, Louisiana Geological Survey, *Geological Bulletin* 6:64–68.

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

1985 De Soto in Arkansas: A Brief Synopsis. *Arkansas Archeological Society Field Notes* 205:3–12.

Humphreys, Andrew Atkinson, and Henry L. Abbot
1861 *Report Upon the Physics and Hydraulics of the Mississippi River*. U.S. Army Corps of Topographical Engineers, Professional Paper No. 4. J. B. Lippincott and Co., Philadelphia.

Hunter, Donald G.
1970 The Catahoula Phase of the Poverty Point Complex in East-Central Louisiana. In The Poverty Point Culture, edited by Clarence H. Webb and Bettye Broyles, pp. 73–89. *Southeastern Archaeological Conference Bulletin* 12:73–89.

Hunter, Donald G., and William S. Baker, Jr.
1979 Excavations in the Atkins Midden at the Troyville Site, Catahoula Parish, Louisiana. *Louisiana Archaeology* 4:21–52.

Hrdlicka, A.
1907 *Skeletal Remains Suggesting or Attributed to Early Man in North America*. Bureau of American Ethnology Bulletin 33.

1908 Report on a Collection of Crania from Arkansas. *Journal of the Academy of Natural Sciences of Philadelphia* 13:558–563.

1909 Report on an Additional Collection of Skeletal Remains from Arkansas and Louisiana. *Journal of the Academy of Natural Sciences of Philadelphia* 14:171–249.

1912 Report on Skeletal Remains from a Mound on Haley Place, Near Red River, Miller County, Arkansas. *Journal of the Academy of Natural Sciences of Philadelphia* 14:639–640.

1913 A Report on a Collection of Crania and Bones from Sorrel Bayou, Iberville Parish, Louisiana. *Journal of the Academy of Natural Sciences of Philadelphia* 16:95–99.

1940 Catalogue of Human Crania in the United States National Museum: Indians of the Gulf States. *United States National Museum Proceedings* 87:315–464.

Jackson, H. Edwin

1986 *Sedentism and Hunter–Gatherer Adaptations in the Lower Mississippi Valley: Subsistence Strategies During the Poverty Point Period*. Ph.D. dissertation, University of Michigan, Ann Arbor.

1987 The Ables Creek Site, Southeast Arkansas. Paper presented at the Southeastern Archaeological Conference, Charlotte, N.C.

n.d. The J. W. Copes Site and Poverty Point Archeology. Paper to be included in a volume on Poverty Point Archeology, edited by Kathleen M. Byrd.

Jeane, David R.

1981 The Cache River and Other Side-Notch Points in Northwest Louisiana. *Louisiana Archaeological Society Newsletter* 8(4):5–6.

Jefferies, Richard W., and B. Mark Lynch

1983 Dimensions of Middle Archaic Cultural Adaptation at the Black Earth Site, Saline County, Illinois. In *Archaic Hunters and Gatherers in the American Midwest*, edited by James L. Phillips and James A. Brown, pp. 299–322. Academic Press, New York.

Jelks, Edward B.

1961a Relationships Between the Caddoan Area and Texas. *Texas Archeological Society Bulletin* 31:63–73.

1961b *Excavations at Texarkana Reservoir, Sulpher River, Texas*. Bureau of American Ethnology Bulletin 179.

Jenkins, Ned J., David H. Dye, and John A. Walthall

1986 Early Ceramic Development in the Gulf Coastal Plain. In *Early Woodland Archeology*, edited by Kenneth B. Farnsworth and Thomas E. Emerson, pp. 546–563. Center for American Archeology Press, Kampsville, IL.

Jenkins, Ned J., and Richard A. Krause

1986 *The Tombigbee Watershed in Southeastern Prehistory*. University of Alabama Press, University.

Jenney, W. P.

1891 Ancient Novaculite Mines near Magnet Cove, Hot Spring County, Arkansas. *American Anthropologist* 4:316–318.

Jennings, Jesse D.

1952 Prehistory of the Lower Mississippi Valley. In *Archaeology of Eastern United States*, edited by James B. Griffin, pp. 256–271. University of Chicago Press.

Jeter, Marvin D.

1979 George P. Kelley and the Development of Archeology in Southeast Arkansas. *Arkansas Archeological Society Field Notes* 169:12–16.

1981 Edward Palmer's 1882 Excavation at the Tillar Site (3DR1), Southeast Arkansas. *Southeastern Archaeological Conference Bulletin* 24:57–59.

1982a The Archeology of Southeast Arkansas: An Overview for the 1980s. In *Arkansas Archeology in Review*, edited by Neal L. Trubowitz and Marvin D. Jeter, pp. 76–131. Arkansas Archeological Survey Research Series No. 15.

1982b Southeast Arkansas Study Units 7 and 8: the Bartholomew, Wilmot, and Bellaire Phases. In *A State Plan for the Conservation of Archeological Resources in Arkansas*, edited by Hester A. Davis, pp. SE24–SE34. Arkansas Archeological Survey Research Series No. 21.

1986a Tunicans West of the Mississippi: A Summary of Early Historic and Archaeological Evidence. In *The Protohistoric Period in the Mid–South: 1500–1700*, edited by David H. Dye and Ronald C. Brister, pp. 38–63. Mississippi Department of Archives and History Archaeological Reports, No. 18.

1986b Review of Classics of Smithsonian Anthropology Reprint of Report on the Mound Explorations of the Bureau of Ethnology, by Cyrus Thomas. *Southeastern Archaeology* 5:148–150.

1987 (editor) *The Texas Eastern Archeological Project Northeast Arkansas: Archeological Survey and Testing along a Pipeline Corridor, and Mitigation Excavations at a Mississippian Village*. Arkansas Archeological Survey, Fayetteville. Submitted to Texas Eastern Transmission Corporation, Houston.

1988 (editor) *The Burris Site and Beyond: Archeological Survey and Testing along a Pipeline Corridor and Excavations at a Mississippi Village, Northeast Arkansas*. Arkansas Archeological Survey Research Series No. 27.

1989 Methods of Relating Historical Collections of Artifacts and Related Records to Known Sites and Current Research. In *Explaining Archaeology's Past*, edited by Andrew L. Christenson. Southern Illinois University Press, Carbondale.

n.d. (editor) Edward Palmer's "Arkansaw Mounds" Investigations, 1881–1884. University of Arkansas Press, in press.

Jeter, Marvin D., R. Christopher Goodwin, Herschel A. Franks, Eric Poplin, Carol A. Poplin, Jill–Karen Yakubik, Peter A. Gendel, Jeffrey Treffinger, Jack Hill, and Wayne Grip
1986 *Archeological Research to Locate and Identify the French "Fort on the Mississippi" 16PL27 (1700-1707), Plaquemines Parish, Louisiana*. R. Christopher Goodwin and Associates, Inc. Submitted to the New Orleans District, U.S. Army Corps of Engineers, under Contract No. DACW29–85–D–0113.

Jeter, Marvin D., David B. Kelley, and George P. Kelley
1979 The Kelley–Grimes Site: A Mississippi Period Burial Mound, Southeast Arkansas, Excavated in 1936. *The Arkansas Archeologist* 20:1–51.

Jeter, Marvin D., Martha Ann Rolingson, John H. House, Henry S. McKelway, and Michael J. Kaczor
1982 Southeast Arkansas. In *A State Plan for the Conservation of Archeological Resources in Arkansas*, edited by Hester A. Davis, pp. SEl–SE57. Arkansas Archeological Survey Research Series No. 21.

Jeter, Marvin D., and G. Ishmael Williams, Jr.
1988 Overviewing Louisiana — and the Best Parts of Arkansas. Paper presented at the 53rd Annual Meeting of the Society for American Archaeology, Phoenix.

Johannessen, Sissel
1984 Paleoethnobotany. In *American Bottom Archaeology: a Summary of the FAI–270 Project Contribution to the Culture History of the Mississippi River Valley*, edited by Charles J. Bareis and James W. Porter, pp. 197–214. University of Illinois Press, Urbana.

Johnson, Boyd W.
1957 The Arkansas Frontier. Ms. on file, Mullins Library, University of Arkansas, Fayetteville.

Johnson, David M.
1983 *Report on the Preliminary Test Excavations at 16VN481, a Ceramic Period Site on the Vernon Ranger District of the Kisatchie National Forest, Louisiana*. USDA Forest Service, Pineville, LA.

Johnson, Eileen, and Vance Holliday
1980 A Plainview Kill/Butchering Locale on the Llano Estacado — the Lubbock Lake Site. *Plains Anthropologist* 25:89–111.

Johnson, Jay K., and John T. Sparks
1982 The Three Faces of Gordon: Ceramic Site Sampling at the Gordon Mounds Site in Jefferson County, Mississippi. *Southeastem Archaeology* 1:103–114.

Jolly, Kevin, and Joel Gunn
1981 *Terrain Analysis and Settlement Pattern Survey: Upper Bayou Zourie, Fort Polk, Louisiana*. Environmental and Cultural Services, Inc., San Antonio.

Jones, Charles Colcock, Jr.
1873 *Antiquities of the Southern Indians*. D. Appleton & Co., New York.

Jones, Reca B.
1979 Human Effigy Vessels from Gold Mine Plantation. *Louisiana Archaeology* 4:117–121.

1983 Archaeological Investigations in the Ouachita River Valley, Bayou Bartholomew to Riverton, Louisiana. *Louisiana Archaeology* 10:103–169.

Joor, Joseph F., M.D.
1895 Notes on a Collection of Archaeological and Geological Specimens Collected in a Trip to Avery's Island (Petite Anse), Feb. 1st, 1890. *American Naturalist* 29:394–398.

Joyce, Jane Sally
1981 *A Settlement Pattern Study of the War Eagle Creek Region, Madison County, Arkansas, During the Pioneer Period*. M.A. thesis, University of Arkansas, Little Rock.

Kaczor, Michael J.
1982 Preliminary Report on the Soils and Geology at the Toltec Mounds Site. In *Emerging Patterns of Plum Bayou Culture*, edited by Martha A. Rolingson, pp. 17–29. Arkansas Archeological Survey Research Series No. 18.

Kaczorowski, Raymond T.
1979 The Louisiana Chenier System. Paper presented at the Estuarine Research Federation Fifth Biennial International Conference, Jekyll Island, Ga.

Kaczorowski, Raymond T., and Robert E. Gernant
1980 *Stratigraphy and Coastal Processes of the Louisiana Chenier Plain and Louisiana Chenier Plain Microfossil Associates*. Department of Geological Sciences, University of Wisconsin, Milwaukee.

Keller, John E.
1982 Lithic Scatters and Longleaf Pine: Limited Activity Areas in Pyrogenic Environments. *Southeastem Archaeology* 1:40–51.

1983 *Kisatchie National Forest: Cultural Resources Review*. USDA Forest Service, Kisatchie National Forest, Pineville, LA.

Keller, John E., et al.
1983 *The Clear Creek Bay Site*. New World Research, Inc., Pollock, Louisiana. Submitted to Grant Parish Policy Jury.

Kelley, David B.
1986 *A Research Design for Archaeological Survey and Testing within Bayou Bodcau Reservoir, Bossier and Webster Parishes, Louisiana, and Lafayette County, Arkansas*. Coastal Environments, Inc., Baton Route, LA. Submitted to Vicksburg District, U.S. Army Corps of Engineers.

Kelley, J. Charles, Thomas N. Campbell, and Donald J. Lehmer
1940 *The Association of Archaeological Materials with Geological Deposits in the Big Bend Region of Texas*. West Texas Historical and Scientific Society Publication No. 10 and Sul Ross State Teachers College Bulletin 21(3), Alpine, Texas.

Kidder, Alfred V., Jesse D. Jennings, and E. M. Shook
1946 *Excavations at Kaminaljuyu, Guatemala*. Carnegie Institute of Washington Publications, No. 561.

Kidder, Tristram R.
1986a *Final Report on Archaeological Test Excavations in the Central Boeuf Basin, Louisiana, 1985*. Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge, LMS Bulletin No. 10.

1986b Protohistoric and Early Historic Culture Dynamics in Southeast Arkansas and Northeast Louisiana, AD 1500–1700. Paper presented at the Southeast Archaeological Conference, Nashville, TN.

1987 *Final Report on Archaeological and Geomorphic Testing in the Jordan Site Area, Morehouse Parish, Louisiana, 1986*. Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge. Report on file at the Louisiana Division of Archaeology, Baton Rouge, and U.S. Department of the Interior.

1988 The Koroa Indians of the Lower Mississippi Valley. *Mississippi Archaeology* 23(2):1–42.

Kidder, Tristram R., and Stephen Williams
1984 Archaeological Survey of the Northern Boeuf Basin, Louisiana: A Preliminary Report. Paper presented at the annual meeting of the Louisiana Archaeological Society, Lafayette.

King, Frances B.
1982a Vegetational Reconstruction Around the Powell Canal Site. In *Powell Canal: Baytown Period Occupation on Bayou Macon in Southeast Arkansas*, by John H. House, pp. 10–15. Arkansas Archeological Survey Research Series No. 19.

1982b Archeobotanical Remains. In *Powell Canal: Baytown Period Occupation on Bayou Macon in Southeast Arkansas*, by John H. House, pp. 63–65. Arkansas Archeological Survey Research Series No. 19.

n.d. Archeobotany: Presettlement Environment and Evidence of Aboriginal Plant Use from the Bangs Slough Site. In The Bangs Slough Site Report, edited by Frank F. Schambach. Arkansas Archeological Survey Research Series, in press.

King, James E., and W. H. Allen, Jr.
1977 A Holocene Vegetation Record from the Mississippi River Valley, Southeast Missouri. *Quaternary Research* 87:307–323.

Kisatchie Regional Environmental Management Group, Inc.
1984 *CRMP Level II Cultural Resources Investigations Along Route La. 16 between Watson and Amite*. KREMG, Anacoco, LA. Submitted to Louisiana Department of Transportation and Development.

Klinger, Timothy C.
1974 Report on the 1974 Test Excavations at the Knappenberger Site, Mississippi County, Arkansas. *Arkansas Archeologist* 15:45–72.

1977 Parkin Archeology: A Report on the 1966 Field School Test Excavations at the Parkin Site. *Arkansas Archeologist* 16–18:45–80.

1978 Lowland Environmental Variability and Prehistoric Settlement Behavior in the Lower Mississippi Valley. *Mid–Continental Journal of Archaeology* 3:285–331.

1979 (assembler) *Hampton: An Archeological and Historical Overview of a Proposed Strip Mine Tract in South Central Arkansas*. Arkansas Archeological Survey Research Report No. 19.

1982 *The Mangrum Site: Mitigation through Excavation and Preservation*. Arkansas Archeological Survey Research Series No. 20.

1986 *Village Creek: An Explicitly Regional Approach to the Study of Cultural Resources*. Arkansas Archeological Survey Research Reports, No. 26.

Klinger, Timothy C., and Mark A. Mathis (assemblers)
1978 *St. Francis II: An Archeological Assessment of the COE-Sponsored Channelization Projects in the St. Francis Basin, Arkansas*. Arkansas Archeological Survey Research Report No. 14.

Klinger, Timothy C., S. M. Imhoff, and R. J. Cochran, Jr.
1983 *Brougham Lake: Archeological Mitigation of 3CT98 along the Big Creek Enlargement and Diversion, Item 1, Crittenden County, Arkansas*. Historic Preservation Associates, Fayetteville. Submitted to the Memphis District, U.S. Army Corps of Engineers.

Klippel, Walter E.
1971 *Graham Cave Revisited*. Memoirs of the Missouri Archaeological Society, No. 9.

Kniffen, Fred B.
1935 A Preliminary Report on the Mounds and Middens of Plaquemines and St. Bernard Parishes, Lower Mississippi River Delta. *Louisiana Geological Survey Bulletin* 8:407–422.

1938 The Indian Mounds of Iberville Parish. Department of Conservation. *Louisiana Geological Survey Bulletin* 13:189–267.

1963 The Physiognomy of Rural Louisiana. *Louisiana History* 4(4):291–299.

1965 Folk Housing: Key to Diffusion. *Annals of the Association Geographers* 55:549–577.

1968 *Louisiana and Its Land and People*. Louisiana State University Press, Baton Rouge.

1971 *The Lower Mississippi Valley: European Settlement, Utilization, and Modification*. Louisiana State University, Baton Rouge. Submitted to the National Park Service.

Kniffen, Fred, and Henry Glassie
1966 Building in Wood in the Eastern United States, A Time–Place Perspective. *Geographical Review* 56: 40–66.

Kniffen, Fred B., Hiram F. Gregory, and George A. Stokes
1987 *The Historic Indian Tribes of Louisiana: from 1542 to the Present*. Louisiana State University Press, Baton Rouge.

Knight, Vernon J. Jr.
1984 Late Prehistoric Adaptation in the Mobile Bay Region. In *Perspectives on Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 185–215. University Presses of Florida, Gainesville.

Koch, Joan K.
1980 *Archaeological Investigations at Port Hudson Battlefield, Port Hudson State Commemorative Area*. Louisiana Division of Archaeology, Baton Rouge. Submitted to Louisiana Department of Culture, Recreation and Tourism Office of State Parks.

Kolb, C. R., and G. G. Fredlund
1981 *Palynological Studies, Vacherie and Rayburn's Domes, North Louisiana Salt Dome Basin*. Institute of Environmental Sciences Topical Report E530–02200–T–2, pp. 1–50. Louisiana State University, Baton Rouge.

Kolb, C. R., and J. R. van Lopik
1958 *Geology of the Mississippi River Deltaic Plain, Southeastern Louisiana*, 2 vol. U.S. Army Waterways Experiment Station, Technical Reports 3–483 and 3–484.

1966 Depositional Environments of the Mississippi River Deltaic Plain, Southeast Louisiana. In *Deltas*, edited by M. L. Shirley and J. A. Ragsdale, pp. 17–62. Geological Society, Houston.

Koonce, W. A.
n.d. Autobiography of W. A. Koonce. Photocopy on file at Vernon Parish Library, Leesville, Louisiana.

Krieger, Alex D.
1944 Archaeological Horizons in the Caddo Area. In *El Norte de Mexico y El Sur de Estados Unidos: Tercera Reunion de Mesa Redonda sobre Problemas Antropologicos de Mexico y Centro America*, pp. 154–156. Sociedad Mexicana de Antropologia, Mexico City.

1946 *Culture Complexes and Chronology in Northern Texas, with Extension of Puebloan Datings to the Mississippi Valley*. University of Texas Publications, No. 4640.

1947 The Eastward Extension of Puebloan Datings Toward Cultures of the Mississippi Valley. *American Antiquity* 12:141–148.

1952 Review of Greenhouse: A Troyville–Coles Creek Period Site in Avoyelles Parish, Louisiana, by James A. Ford. *American Antiquity* 18:175–179.

1961 Discussion. In *Symposium: Relationships Between the Caddoan Area and Neighboring Areas*, edited by E. Mott Davis, pp. 21–24. Texas Archeological Society Bulletin 31.

1964 Early Man in the New World. In *Prehistoric Man in the New World*, edited by Jesse D. Jennings and Edward Norbeck, pp. 23–81. University of Chicago Press.

Krinitsky, Ellis L., and Fred L. Smith
1969 *Geology of Backswamp Deposits in the Atchafalaya Basin, Louisiana*. U.S. Army Corps of Engineers, Waterways Experiment Station, Technical Report S–69–8, Vicksburg.

Kuttruff, Carl

1975 The Poverty Point Site: North Sector Test Excavations. *Louisiana Archaeology* 2:129–151.

Kwas, Mary L.

1981 Bannerstones as Chronological Markers in the Southeastern United States. *Tennessee Anthropologist* 6:144–171.

Lafferty, Robert H., III

1987 *Testing of Three Sites at the Independence Steam Electric Station, Northeast Arkansas*. Arkansas Archeological Survey, Fayetteville. Submitted to Arkansas Power and Light Company, Little Rock.

Lafferty, Robert H., III, and John H. House (editors)

1986 *Model Validation in Sparta*. Arkansas Archeological Survey Research Report No. 25.

Lafferty, Robert, Jeffry Otinger, Sandra Scholtz, W. Fredrick Limp, Beverly Watkins and Robert Jones

1981 *Settlement Predictions in Sparta*. Arkansas Archeological Survey Research Series No. 14.

Lamb, Teresia R.

1982 Preliminary Report on Excavations at the Boudreaux Site, 16JE53. Paper presented to the 8th Annual Meeting, Louisiana Archaeological Society, Thibodaux.

Lamb, Teresia R., Richard C. Beavers, Kathryn W. Kemp, Gary B. Demarcay, John R. Grune

1983 *Preliminary Archaeological Reconnaissance and Assessment of Destrehan Plantation, St. Charles Parish, Louisiana*. Archaelogical and Cultural Resource Program, Department of Anthropology and Geography, University of New Orleans, Research Report No. 5.

Lane, Sheri Dixon

1980 An Archaeological Study of the Magnolia Mound Plantation House. Ms. on file, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

Larson, Lewis H.

1980 *Aboriginal Subsistence Technology on the Southeastern Coastal Plain During the Late Prehistoric Period*. Riply P. Bullen Monographs in Anthropology and History 2. University Presses of Florida, Gainesville.

LaTourrette, John

1845 *Reference Map of the State of Louisiana from the Original Surveys of the United States*. John LaTourrette, New Orleans.

Lauro, James, and Geoffrey R. Lehmann

1982 *The Slate Site: A Poverty Point Lapidary Industry in the Southern Yazoo Basin, Mississippi*. Mississippi Department of Archives and History Archaeological Reports, No. 7.

Lee, Chan

1960 *A Culture History of Rice with Special Reference to Louisiana*. Ph.D. dissertation, Louisiana State University, Baton Rouge.

Lehmann, Geoffey R.

1982 *The Jaketown Site: Surface Collections from a Poverty Point Regional Center in the Yazoo Basin, Mississippi*. Mississippi Department of Archives and History Archaeological Reports, No. 9.

Lehmer, Donald J.

1971 *Introduction to Middle Missouri Archaeology*. Anthropological Papers of the National Park Service, No. 1. Washington, D. C.

Leidy, Joseph

1866 Remarks. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 109. Philadelphia.

1889 Notice of Some Mammalian Remains from the Salt Mines of Petite Anse, Louisiana. *Transactions of the Wagner Free Institute of Science of Philadelphia* 2:33–40.

Lemley, Harry J.

1936 Discoveries Indicating a Pre-Caddo Culture on the Red River in Arkansas. *Bulletin of the Texas Archeological and Paleontological Society* 8:25–55.

1942 Prehistoric Novaculite Quarries of Arkansas. *Bulletin of the Texas Archeological and Paleontological Society* 14:32–37.

Lemley, Harry J., and Samuel D. Dickinson

1937 Archeological Investigations on Bayou Macon in Arkansas. *Bulletin of the Texas Archeological and Paleontological Society* 9:11–47.

Lewis, Thomas M. N., and Madeline Kneberg Lewis

1961 *Eva: An Archaic Site*. University of Tennessee Press, Knoxville.

Lieth, Helmut, and Robert H. Whittaker (editors)

1975 *Primary Productivity of the Biosphere*. Springer–Verlag, New York.

Lischka, Joseph J.

1973 Preliminary Report on Test Excavations of the Prehistoric Sites in the Felsenthal National Wildlife Refuge, 1972. Ms. on file, Arkansas Archeological Survey, Fayetteville.

Lockett, Samuel H.

1873 Mounds in Louisiana. *Annual Report of the Board of Regents for 1872*, pp. 429–430. Smithsonian Institution, Washington, D. C.

Logan, Wilfred D.
1952 *Graham Cave, an Archaic Site in Montgomery County, Missouri*. Memoirs of the Missouri Archaeological Society, No. 2.

Lowery, George H., Jr.
1974 *The Mammals of Louisiana and its Adjacent Waters*. Louisiana State University Press, Baton Rouge.

Ludwickson, J. D., D. Blakeslee, and J. O'Shea
1981 *Missouri National River*. Native American Cultural Resources. Heritage Conservation and Recreation Service, Interagency Archeological Services, Denver.

Lyell, Charles
1849 *A Second Visit to the United State of North America*. Harper and Brothers, New York.

Lynch, William O.
1943 The Westward Flow of Southern Colonists Before 1861. *Journal of Southern History* 9:303–327.

Lynott, Mark J., Thomas W. Boutton, James E. Price, and Dwight E. Nelson
1986 Stable Carbon Isotopic Evidence for Maize Agriculture in Southeast Missouri and Northeast Arkansas. *American Antiquity* 51:51–65.

Lyon, Edwin
1976 The Louisiana WPA Archaeological Project. *Southeastern Archaeological Conference Bulletin* 19:50–52.

1982 *New Deal Archaeology in the Southeast: WPA, TVA, NPS, 1934–42*. Ph.D. dissertation, Louisiana State University, Baton Rouge.

McCartney, Nancy G.
1982 Presettlement Vegetation of the Toltec Mounds Site. In *Emerging Patterns of Plum Bayou Culture*, edited by Martha Ann Rolingson, pp. 11–16. Arkansas Archeological Survey Research Series, No. 18.

McClurkan, Burney B.
1969 Culture History of Southeast Arkansas. *Arkansas Archeologist* 10:30–35.

1971 The Search for Fort Desha. *Arkansas Archeological Society Field Notes* 77:5–6.

1972 Fort Desha: the Location of Arkansas Post, ca. 1735–1750. *The Conference of Historic Site Archeology Papers, 1971* 6:32–39.

McCorkle, James L., Jr.
1979 The Economic Development of Colonial Natchitoches: A Historical Survey. In *Natchitoches Parish Cultural and Historical Resources: History, Part II*, by Hiram F. Gregory et al. Nachitoches Parish Planning Commission. Submitted to Natchitoches Parish Policy jury. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

McFarlan, E., Jr.
1961 Radiocarbon Dating of Late Quaternary Deposits, South Louisiana. *Geological Society of American Bulletin* 72:129–158.

McFarlane, Suzanne B.
1975 *The Ethnoarchaeology of a Slave Community: The Couper Plantation Site*. M.A. thesis, University of Florida.

McGahey, Samuel O.
1987 Paleo–Indian Lithic Material: Implications of Distributions in Mississippi. *Mississippi Archaeology* 22(2):1–13.

n.d. Implications of the Chronological and Geographical Distributions of Exotic Lithic Raw Materials in the Paleo–Indian Period in Mississippi. *Mississippi Archaeology* 22(2), in press, 1987.

McGimsey, Charles R., III
1972 *Public Archeology*. Seminar Press, New York.

1982a The "Small Business Act" and Archaeological Research. *Southeastern Archaeology* 1:166.

1982b Reply (to Drucker 1982 and Garrow 1982). *Southeastern Archaeology* 1:172.

McGimsey, Charles R., III (editor)
1969 A Review of Arkansas Prehistory. *Arkansas Archeologist* 10(1–3).

McGimsey, Charles R., III, Hester A. Davis, and James B. Griffin
1968 A Preliminary Evaluation of the Status of Archeology in the Mississippi Alluvial Valley. Ms. on file, Arkansas Archeological Survey, Fayetteville.

McGinty, Garnie W.
1951 *A History of Louisiana*. Exposition Press, New York.

McIntire, William G.
1954 *Correlation of Prehistoric Settlement and Delta Development*. Coastal Research Institute Technical Report 5. Louisiana State University, Baton Rouge.

1958 *Prehistoric Indian Settlements of the Changing Mississippi River Delta*. Coastal Studies Series 1. Louisiana State University Press, Baton Rouge.

1959 Methods of Correlating Cultural Remains with States of Coastal Development. In *Coastal Geography Conference,* edited by R. J. Russell, pp. 341–359. Coastal Studies Institute, Louisiana State University.

McKelway, Henry S.
1987 *The McClendon Site (3DR144)*. M.A. thesis, University of Arkansas, Fayetteville.

McKern, Will C.
1939 The Midwestern Taxonomic Method as an Aid to Archaeological Culture Study. *American Antiquity* 4:301–313.

McMillan, R. Bruce
1976 Rodgers Shelter: A Record of Cultural and Environmental Change. In *Prehistoric Man and His Environments: A Case Study in the Ozark Highland*, edited by W. Raymond Wood and R. Bruce McMillan, pp. 111–122. Academic Press, New York.

MacNeish, Richard S.
1947 A Preliminary Report on Coastal Tamaulipas, Mexico. *American Antiquity* 13:1–15.

McWilliams, Richebourg Gaillard (translator–editor)
1953 *Fleur de Lys and Calumet: Being the Penicaut Narrative of French Adventure in Louisiana*. Louisiana State University Press, Baton Rouge.

1981 *Iberville's Gulf Journals*. University of Alabama Press, University.

Manhein, Mary
1985 *Louisiana's Human Skeleton Material — A Case Study of our Responsibility to the Past*. M.A. thesis, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

Manhein, M. H., A. M. Whitmer, D. W. Owsley, and M. K. Marks
1986 Archaeology of the Norton Family Cemetery. Ms. on file, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

Manhein, M. H., and D. W. Owsley
1987 In Search of a Civil War Confederate Cemetery: Port Hudson, Louisiana. Ms. on file, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

1987 Jackson Digs Up Its Past. *LSU Magazine* 63(2):32–42.

Manuel, Joseph O., Jr.
1979 A Radiocarbon Date from the Hornsby Site 16SH21. *Louisiana Archaeological Society Newsletter* 6(1): 18–19.

Maples, William R.
1962 *A Morphological Comparison of Skeletal Material from Sanders Focus and from Fulton Aspect*. M.A. thesis, University of Texas, Austin.

Margry, Pierre (compiler–editor)
1879–88 *Decouverres et Etablissements des Francais dans l'Ouest et dans le Sud de 1'Amerique Septentrional (1614–1754)*, 6 vols. Imprimerie D. Jouaust, Paris.

Marshall, Richard A.
1965 *An Archaeological Investigation of Interstate Route 55 Through New Madrid and Pemiscot Counties, Missouri, 1964*. University of Missouri Highway Archaeology Reports, No. 1.

Martin, D. L., A. L. Magennis, and J. C. Rose
1987 Cortical Bone Maintenance in an Historic Afro–American Cemetery Sample from Cedar Grove, Arkansas. *American Journal of Physical Anthropology* 74:255–264.

Martin, Patrick E.
1975 *An Inquiry into the Locations and Characteristics of Jacob Bright's Trading House and William Montgomery's Tavern*. M.A. thesis. University of Arkansas, Fayetteville.

1978 *An Inquiry into the Locations and Characteristics of Jacob Bright's Trading House and William Montgomery's Tavern*. Arkansas Archeological Survey Research Series No. 11.

Martin, Paul S., and Richard G. Klein (editors)
1984 *Quaternary Extinctions: A Prehistoric Revolution*. University of Arizona Press, Tucson.

Martin, William A.
1982 An Intensive Archeological Survey of a Barite Mining District in Montgomery County, Arkansas. In *Fancy Hill. Archeological Studies in the Southern Ouachita Mountains*, edited by Ann M. Early and W. Fredrick Limp, pp. 1–182. Arkansas Archeological Survey Research Series, No. 16.

Mason, Ronald J.
1962 The Paleo–Indian Tradition in Eastern North America. *Current Anthropology* 3:227–246.

Mattison, Ray H.
1957 *Report on the Historical Investigations of Arkansas Post, Arkansas*. National Park Service, Region Two, Omaha.

Medford, Larry D.
1972 *Agricultural Destruction of Archeological Sites in Northeast Arkansas*. Arkansas Archeological Survey Research Series No. 3.

Mehta, Jim D., and E. C. Sensenig
1966 Some Observations on Arkansas Indian Skulls. *Australian Dental Journal* 11:410–414.

Meltzer, David J., and Jim I. Mead
1983 The Timing of Late Pleistocene Mammalian Extinctions in North America. *Quaternary Research* 19: 130–135.

Mercer, Henry Chapman
1895 The Antiquity of Man on Petite Anse (Avery's Island), Louisiana. *American Naturalist* 29:393–394.

Meserve, F. G., and Erwin H. Barbour
1932 Association of an Arrow Point with *Bison occidentalis* in Nebraska. *Bulletin of the Nebraska State Museum* 1:239–242.

Milanich, Jerald T., and Charles H. Fairbanks
1980 *Florida Archaeology*. Academic Press, New York.

Miller, B. J.
n.d. Pedology. Ms. for Chapter 13 in Lower Mississippi Valley, edited by W. J. Autin. In Quaternary Non-Glacial Geology of the Conterminous United States, edited by Roger B. Morrison, to be published as a special "Decade of North American Geology" volume, by the Geological Society of America.

Miller, Henry M., and Lynne G. Lewis
1978 Zoocultural Resource Utilization at a Low Country South Carolina Plantation. *The Conference on Historic Site Archaeology Papers* 12:250–265.

Miller, John E., III
1982 Construction of Site Features: Tests of Mounds C, D, E, B, and the Embankment. In *Emerging Pattems of Plum Bayou Culture*, edited by Martha Ann Rolingson, pp. 30–43. Arkansas Archeological Survey Research Series No. 18.

1986 The Myers Mound: Salvage Excavations at a Caddo II Site in Southwest Arkansas. *Arkansas Archeologist* 23–24:67–127.

Mires, A. M.
1982 *A Bioarchaeological Study of the Regional Adaptive Efficiency of the Caddo*. M.A. thesis, University of Arkansas, Fayetteville.

1984 Osteology. In *The Archeology of Cowpen Slough (16CT147)*, by A. F. Ramenofsky and A. M. Mires, Contract Number 84 A–2, pp. 187–225. Submitted to the Division of Archeology, Office of Cultural Development, Department of Culture, Recreation and Tourism, State of Louisiana.

Mires, A. M., and D. W. Owsley
1984 An Analysis of Human Skeletal Remains from the Little Mud Lake Site (3CA265). In *Archaeology and Paleogeography of the Upper Felsenthal Region: Cultural Resources Investigation in the Calion Navigation Pool, South-Central Arkansas*, by R. A. Weinstein and D. B. Kelley, Contract DACW 38–83–C–0118, Appendix A, pp. 555–574. Coastal Environments Inc., Baton Rouge. Submitted to the Vicks burg District U.S. Army Corps of Engineers, Vicksburg District.

Mitchell, Jennie O'K., and Robert D. Calhoun
1937 The Marquis de Maison Rouge, the Baron de Bastrop, and Colonel Abraham Morehouse — Three Ouachita Valley Soldiers of Fortune. The Maison Rouge and Bastrop Land "Grants." *Louisiana Historical Quarterly* 20.

Moore, Clarence B.
1908 Certain Mounds of Arkansas and of Mississippi. *Joumal of the Academy of Natural Sciences of Philadelphia* 13(2):279–297.

1909 Antiquities of the Ouachita Valley. *Journal of the Academy of Natural Sciences of Philadelphia* 14:7–170.

1910 Antiquities of the St. Francis, White and Black Rivers, Arkansas. *Journal of the Academy of Natural Sciences of Philadelphia*, Second Series, 14:255–364.

1911 Some Aboriginal Sites on Mississippi River. *Journal of the Academy of Natural Sciences of Philadelphia* 14:367–480.

1912 Some Aboriginal Sites on Red River. *Journal of the Academy of Natural Sciences of Philadelphia* 14: 482–644.

1913 Some Aboriginal Sites in Louisiana and Arkansas. *Journal of the Academy of Natural Sciences of Philadelphia* 16:7–99.

1916 Additional Investigations on Mississippi River. *Journal of the Academy of Natural Sciences of Philadelphia* 16:498–508.

Moore, Sue Mullins
1980 *The Antebellum Barrier Island Plantation: In Search of an Archaeological Pattern*. Ph.D. dissertation. University Microfilms, University of Florida, Ann Arbor.

Morse, Dan F.
1969 Introducing Northeast Arkansas Prehistory. *The Arkansas Archeologist* 10:12–28.

1971a The Hawkins Cache: A Significant Dalton Find in Northeast Arkansas. *The Arkansas Archeologist* 12(1):9–20.

1971b Recent Indications of Dalton Settlement Pattern in Northeast Arkansas. *Southeastern Archaeological Conference Bulletin* 13:5–10.

1973a Dalton Culture in Northeast Arkansas. *Florida Anthropologist* 26:23–38.

1973b (editor) *Nodena: An Account of 75 Years of Archeological Investigation in Southeast Mississippi County, Arkansas*. Arkansas Archeological Survey Research Series No. 4.

1975a *Report of Excavations at the Zebree Site, 1969*. Arkansas Archeological Survey Research Report No. 4.

19756 Reply to Schiffer. In *The Cache River Archeological Project: An Experiment in Contract Archeology*, assembled by Michael B. Schiffer and John H. House, pp. 113–119. Arkansas Archeological Survey Research Series No. 8.

1975c Paleo–Indian in the Land of Opportunity: Preliminary Report on the Excavations at the Sloan Site (3GE94). In *The Cache River Archeological Project: An Experiment in Contract Archeology*, assembled by Michael B. Schiffer and John H. House, pp. 135–143. Arkansas Archeological Survey Research Series No. 8.

1975d Research Potential in Terms of Regional Prehistory. In *The Cache River Archeological Project: An Experiment in Contract Archeology*, assembled by Michael B. Schiffer and John H. House, pp. 187–198. Arkansas Archeological Survey Research Series No. 8.

1977 Dalton Settlement Systems: Reply to Schiffer (2). *Plains Anthropologist* 18:316–322.

1978 An Archaic Hiatus in Northeastern Arkansas? Paper presented at the 35th Southeastern Archaeological Conference, Knoxville, TN.

1982 A Paleo–Indian/Early Archaic Cemetery Possibility in Arkansas. In *Peopling of the New World*, edited by Jonathon E. Ericson, R. E. Taylor, and Rainer Berger, pp. 147–162. Ballena Press Anthropological Papers, No. 23, Los Altos, CA.

1986 McCarty (3P0467): A Tchula Period Site near Marked Tree, Arkansas. In *The Tchula Period in the Mid–South and Lower Mississippi Valley*, edited by David H. Dye and Ronald C. Brister, pp. 70–92. Mississippi Department of Archives and History Archaeological Reports, No. 17.

n.d.a The Sloan Site: A Dalton Cemetery in Northeast Arkansas. Unpublished ms., Smithsonian Institution Press, Washington, D.C.

n.d.b (editor) Nodena, 2nd ed. Arkansas Archeological Survey Research Series, in press.

Morse, Dan F., and Albert C. Goodyear III

1973 The Significance of the Dalton Adz in Northeast Arkansas. *Plains Anthropologist* 18:316–322.

Morse, Dan F., and Phyllis A. Morse

1976 (editors) *A Preliminary Report of the Zebree Project: New Approaches in Contract Archeology, in Arkansas*. Arkansas Archeological Survey Research Report No. 8.

1977 (editors) *Zebree 1977. Excavation, Data Interpretation, and Report on the Zebree Homestead Site, Mississippi County, Arkansas*. Arkansas Archeological Survey, Fayetteville. Submitted to the Memphis District U.S. Army Corps of Engineers.

1980 (editors) *Zebree Archeological Project*. Arkansas Archeological Survey, Fayetteville. Submitted to the Memphis District, U.S. Army Corps of Engineers.

1983 *Archaeology of the Central Mississippi Valley*. Academic Press, New York.

Morse, Dan F., and Sam Smith

1973 Archeological Salvage During the Construction of Route 308. *Arkansas Archeologist* 14:36–78.

Morse, Phyllis A.

1981 *Parkin: the 1978–1979 Archeological Investigations of a Cross County, Arkansas Site*. Arkansas Archeological Survey Research Series No. 13.

Morton, Samuel George

1838 *Crania Americana: or, A Comparative View of the Skulls of Various Aboriginal Nations of North and South America*. John Fuller, Philadelphia.

Moselage, John

1962 *The Lawhorn Site*. The Missouri Archaeologist 24.

Muller, Robert A., and James B. Willis

1978 Climatic Variability in the Lower Mississippi Valley. In Man and Environment in the Lower Mississippi Valley, edited by Sam B. Hilliard. *Geoscience and Man* 19:55–6.

Murray, Katherine A.

1985 *Bioarcheology of the Parkin Site*. M.A. thesis, Department of Anthropology, University of Arkansas, Fayetteville.

Myers, Thomas P., and Ray Lambert

1983 Meserve Points: Evidence of a Plains-ward Extension of the Dalton Horizon. *Plains Anthropologist* 28:109–114.

Nardini, L. R.

1961 *No Man's Land*. Pelican Publishers, New Orleans.

Nash, Charles H.

1972 *Chucalissa: Excavations and Burials Through 1963*. Memphis State University Anthropological Research Center Occasional Papers, No. 6.

Neitzel, Robert S.

1965 *Archaeology of the Fatherland Site: The Grand Village of the Natchez*. Anthropological Papers of the American Museum of Natural History, Vol. 51, Part 1.

1977 *Archeological and Historical Resources of the Pearl River Basin, Louisiana and Mississippi*. Submitted to USDI National Park Service. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

1980 I Wonder about the World of Clarence Hungerford Webb, the Man Who Really Does Know; or, Would John Wayne Have Been an Improvement at Gahagan? In Caddoan and Poverty Point Archaeology: Essays in Honor of Clarence H. Webb, edited by Jon L. Gibson. *Louisiana Archaeology* 6:1–17.

1983 *The Grand Village of the Natchez Revisited: Excavations at the Fatherland Site, Adams County, Mississippi, 1972*. Mississippi Department of Archives and History Archaeological Reports, No. 12.

Neitzel, Robert S., and J. Stephen Perry

1977 *A Prehistory of Central and North Louisiana*. Southern Archaeological Research, Inc., Baton Rouge. Submitted to The Research Institute, Northeast Louisiana University. Report on file at the Louisiana Division of Archaeology, Baton Rouge.

Neuman, Robert W.

1969 Short Note of Excavation of Morton Shell Mound. *Southeastern Archeological Conference Newsletter* 13:13–15.

1970 Archeological and Historical Assessment of the Red River Basin in Louisiana. In *Archeological and Historical Resources of the Red River Basin*, edited by Hester A. Davis, pp. 1–24. Arkansas Archeological Survey Research Series No. 1.

1972 *Archaeological Investigations at the Morton Shell Mound, Weeks Island, Iberia Parish, Louisiana*. Report submitted to the National Science Foundation, Washington.

1974 Historic Locations of Certain Caddoan Tribes. In *Caddoan Indians II*, by Robert W. Neuman, pp. 9–147. Garland Publishing Inc., New York and London.

1976 Archaeological Techniques in the Louisiana Coastal Region. *Louisiana Archaeology* 3:1–21.

1977 *An Archaeological Assessment of Coastal Louisiana*. Louisiana State University Museum of Geoscience, Melanges No. 11.

1981 Complicated Stamped Pottery in Louisiana: Its Spatial Distribution and Chronology. *Geoscience and Man* 22:71–76.

1984a *An Introduction to Louisiana Archaeology*. Louisiana State University Press, Baton Rouge.

1984b Archaeology of the Louisiana Coastal Zone, 1970 to the Present. In *Perspectives on Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 156–164. University Presses of Florida, Gainesville.

1985 *Report on the Soil Core Borings Conducted at the Campus Mounds Site (16EBR6), East Baton Rouge Parish, Louisiana*. Report in possession of the author, Museum of Geoscience, Louisiana State University, Baton Rouge, and on file at the Louisiana Division of Archaeology, Baton Rouge.

Neumann, G. K.

1952 Archeology and Race in the American Indian. In *Archeology of the Eastern United States*, edited by James B. Griffin, pp. 13–34. University of Chicago Press.

New World Research, Inc.

1981 *A Cultural Resources Survey of Pre-Selected Portions of the Upper Ouachita National Wildlife Refuge, Union and Morehouse Parishes, Louisiana*. New World Research Reports of Investigations, No. 39.

1983 *Cultural Resources Survey of Terrestrial and Offshore Locations, Lake Pontchartrain and Vicinity, Hurricane Protection Project, Louisiana*. New World Research, Inc., Pollock, Louisiana. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

Newcomb, W. W., Jr.

1961 *The Indians of Texas, from Prehistoric to Modern Times*. University of Texas, Austin.

Newell, H. Perry, and Alex D. Krieger

1949 *The George C. Davis Site, Cherokee County, Texas*. Society for American Archaeology Memoirs, No. 5.

Newkirk, Judith A.

1981 *A Cultural Resources Survey of the Red River Waterway from Shreveport, Louisiana to the Mississippi River*. Commonwealth Associates, Inc., Jackson, Michigan. Submitted to the New Orleans District U.S. Army Corps of Engineers.

Newton, Milton B.

1967 *The Peasant Farm of St. Helena Parish, Louisiana: A Cultural Geography*. Ph.D. dissertation, Louisiana State University, Baton Rouge.

1971 *Louisiana House Types: A Field Guide*. Louisiana State University, Museum of Geoscience Melanges No. 2.

1972 *Atlas of Louisiana*. School of Geoscience, Louisiana State University, Miscellaneous Publication 72–1.

1974 Cultural Preadaptation and the Upland South. In *Man and Cultural Heritage*. Louisiana State University, School of Geoscience, Baton Rouge.

Norman, B. M.

1858 *Normans Chart of the Lower Mississippi River*. B. M. Norman, New Orleans.

Nuttall, Thomas

1821 *Journal of Travels into the Arkansas Territory During the Year 1819*. Thomas A. Palmer, Philadelphia. Reprinted in March of America Facsimile Series, No. 23, by University Microfilms, Ann Arbor, Michigan.

O'Brien, Michael J., and Robert E. Warren

1983 An Archaic Projectile Point Sequence from the Southern Prairie Peninsula: the Pigeon Roost Creek Site. In *Archaic Hunters and Gatherers in the American Midwest*, edited by James L. Phillips and James A. Brown, pp. 71–98. Academic Press, New York.

Ogg, Frederic A.

1968 *The Opening of the Mississippi: A Struggle for Supremacy in the American Intetior*. Cooper Square Publishers, Inc., New York.

Orr, Kenneth G.

1952 Survey of Caddoan Area Archaeology. In *Archaeology of Eastern United States*, edited by James B. Griffin, pp. 239–255. University of Chicago Press.

Orser, Charles E., Jr.

1984 The Past Ten Years of Plantation Archaeology in the Southeastern United States. *Southeastem Archaeology* 3:1–12.

1986 The Archaeological Recognition of the Squad System on Postbellum Cotton Plantations. *Southeastern Archaeology* 5(1):11–20.

Orser, Charles E., Jr., and Claudia Holland

1984 *A Preliminary Archaeological Investigation of Oakley Plantation, Audubon State Commemorative Area, West Feliciana Parish, Louisiana*.

Orser, Charles E., Jr., Annette M. Nekola, and James L. Roark

1983 *Exploring the Rustic Life: Multidisciplinary Research at Millwood Plantation, A Large Piedmont Plantation in Abbeville County, South Carolina and Elbert County, Georgia*. Submitted to the Archaeological Services Branch, National Park Service, Atlanta.

Orser, Charles E., Jr., and Annette M. Nekola

1985 Plantation Settlement from Slavery to Tenancy: An Example from a Piedmont Plantation in South Carolina. In *Archaeological Studies of the Plantation System*, edited by Theresa A. Singleton, pp. 67–94. Academic Press, New York.

1979 A New Look at Slave Life. *Natural History* 88(1):8, 16, 20, 22, 24, 30.

1980 Slavery in the Mountains: Yell County, Arkansas, 1840–1860. *Arkansas Historical Quarterly* 39:35–52.

Owen, Richard

1868 On the Deposit of Rock Salt at New Iberia, La. *Transactions of the St. Louis Academy of Science* 2:47, 250–252.

Owsley, Douglas W., M. K. Manhein, and M. K. Marks

1987 *Burial Archaeology and Osteology of the Charity Hospital/Cypress Grove II Cemetery, New Orleans: Report of Investigations, Progress Report I*. Submitted to the City of New Orleans.

Owsley, Douglas W., Charles E. Orser, Jr., Robert Montgomery, and Claudia C. Holland

1986 *An Archaeological and Physical Anthropological Study of the First Cemetery in New Orleans, Louisiana*. Department of Geography and Anthropology, Louisiana State University, Baton Rouge. Submitted to the Louisiana Division of Archaeology, Baton Rouge.

Owsley, Frank L.

1945 The Pattern of Migration and Settlement on the Southern Frontier. *Journal of Southem History* 11:147–176.

1949 *Plain Folk of the Old South*. Louisiana State University Press, Baton Rouge.

1971 The Darling Creek Peasant Settlements of St. Helena Parish, Louisiana. In *The Not So Solid South*, edited by J. Kenneth Morland, pp. 38-48. Southern Anthropological Society Proceedings, No. 4.

Palmer, Edward
1917 Arkansas Mounds. *Publications of the Arkansas Historical Association* 4:390–448.

Patterson, L. W.
1975 The Poverty Point Culture, as Seen from Southeastern Texas. *Louisiana Archaeology* 2:153–162.

Pearson, Charles E.
1982 Geomorphology and Prehistoric Settlement Patterns in the Great Bend Region. In *Contributions to the Archeology of the Great Bend Region*, edited by Frank F. Schambach and Frank Rackerby, pp. 12–29. Arkansas Archeological Survey Research Series No. 22.

1986 Dating the Course of the Lower Red River in Louisiana: the Archaeological Evidence. *Geoarchaeology* 1:39–43.

Pearson, Charles E., E. K. Burden, S. M. Gagliano, P. F. Hoffman, A. R. Saltus, and W. H. Spencer
1981 *El Nuevo Constante: Investigations of an 18th Century Spanish Shipwreck of the Louisiana Coast*. Baton Rouge: Department of Culture, Recreation and Tourism, State of Louisiana.

Pearson, Charles E., and Bryan L. Guevin
1984 *Archaeological Investigations at the White Castle Gap Revetment (m–196–R) Iberville Parish, Louisiana*. Coastal Environments, Inc., Baton Rouge. Submitted to New Orleans District, U.S. Army Corps of Engineers.

Pearson, Charles E., and Gregory J. DuCote
1979 *Cultural Resources Survey of Four Proposed Construction Projects Along the Red River in Southwestern Arkansas*. Coastal Environments, Inc., Baton Rouge, Louisiana. Submitted to the New Orleans District U.S. Army Corps of Engineers.

Pearson, Charles E., David B. Kelley, Richard A. Weinstein, and Sherwood M. Gagliano
1986 *Archaeological Investigations on the Outer Continental Shelf. A Study Within the Sabine River Valley, Offshore Louisiana and Texas*. Coastal Environments, Inc., Baton Rouge.

Peebles, Christopher S.
1987 The Rise and Fall of the Mississippian in Western Alabama: The Moundville and Summerville Phases, A.D. 1000 to 1600. *Mississippi Archaeology* 22:1–31.

Pell, William F.
1984 Plant Communities. In *Arkansas's Natural Heritage*, edited by Bill Shepard, pp. 71–96. August House, Little Rock.

Penman, John T.
1983 Faunal Remains. In *The Grand Village of the Natchez Revisited: Excavations at the Fatherland Site, Adams County, Mississippi, 1972*, by Robert S. Neitzel, pp. 146–165. Mississippi Department of Archives and History Archaeological Reports, No. 12.

Perino, Gregory
1958 Notes on Excavations Near Cherry Valley, Arkansas. *Oklahoma Anthropological Society Newsletter* 7(4): 8–10.

1959a The Cherry Valley Mound Group. *Central States Archeological Journal* 6(2).

1959b Perino Excavations at Cherry Valley, Arkansas. *Oklahoma Anthropological Society Newsletter* 7(7):4–5.

1966 *The Banks Village Site, Crittenden County, Arkansas*. Missouri Archaeological Society Memoirs, No. 4.

1967 *The Cherry Valley Mounds and Banks Mound 3*. Central States Archaeological Society, Inc., Memoir No. 1.

Phillips, James L., and James A. Brown (editors)
1975 *Pre-Columbian Shell Engravings from the Craig Mound at Spiro, Oklahoma*. Peabody Museum Press, Cambridge.

Phillips, Philip
1939 *Introduction to the Archaeology of the Mississippi Valley*. Ph.D. dissertation. Harvard University, Cambridge.

1958 Application of the Wheat–Gifford–Wasley Taxonomy to Eastern Ceramics. *American Antiquity* 24:117–125.

1970 *Archaeological Survey in the Lower Yazoo Basin, Mississippi, 1949–1955*. Papers of the Peabody Museum, Harvard University, Vol. 60.

Phillips, Philip, and James A. Brown
1983 *Archaic Hunters and Gatherers in the American Midwest*. Academic Press, New York.

Phillips, Philip, James A. Ford, and James B. Griffin
1951 *Archaeological Survey in the Lower Mississippi Alluvial Valley, 1940–1947*. Papers of the Peabody Museum, Harvard University, Vol. 25.

Phillips, Philip, and Gordon R. Willey
1953 Method and Theory in American Archaeology: An Operational Basis for Culture–Historical Integration. *American Anthropologist* 55:615–633.

Plog, Fred T.
1974 *The Study of Prehistoric Change*. Academic Press, New York.

1978 The Keresan Bridge: An Ecological and Archeological Account. In *Social Archeology: Beyond Subsistence and Dating*, edited by Charles L. Redman et al., pp. 349–372. Academic Press, New York.

Pool, Cris
1983 Infracranial Discrete Traits on Skeletal Material from Two Orleans Parish Sites. Ms. on file, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

1962 Some Notes on the Attakapas Indians of Southwest Louisiana. *Louisiana History* 3:221–242.

Porter, Stephen C. (editor)
1983 *Late-Quaternary Environments of the United States, Volume 1: the Late Pleistocene*. University of Minnesota Press, Minneapolis.

Powell, Mary Lucas
1977a *Bioarcheological Research Potential of Human Skeletal Material: A Case Study from Northeast Arkansas*. M.A. thesis, University of Arkansas, Fayetteville.

1977b Prehistoric Ritual Skull Burials at the Crenshaw Site, (3MI16), Southwest Arkansas. *Bulletin of the Texas Archeological Society* 48:111–118.

1981 Burials. In *The Shallow Lake Site*, by M. A. Rolingson and F. F. Schambach, pp. 48–52. Arkansas Archeological Survey Research Series, No. 12.

1983 *The People of Nodena*. Contract report submitted to Arkansas Archeological Survey, Fayetteville.

1985 The Analysis of Dental Wear and Caries for Dietary Reconstruction. In *The Analysis of Prehistoric Diets*, edited by R. I. Gilbert and J. H. Mielke, pp. 307–388. Academic Press, Orlando.

Price, G. R. Dennis
1979 Cultural Resources Survey Report, Appendix to *Design Memorandum No. 58, Nine-Foot Navigation Channel, Jonesville and Columbia Pools*. Heartfield, Price, and Greene, Monroe. Submitted to the Vicksburg District, U.S. Army Corps of Engineers.

1980 Cultural Resources Survey Report. Appendix to *Design Memorandum No. 58, Nine-Foot Navigation Channel, Jonesville and Columbia Pools*. Heartfield, Price, and Greene, Inc., Monroe, Louisiana. Submitted to the Vicksburg District, U.S. Army Corps of Engineers.

1983 Excavations at the Crane Lake Site (16MO41), Morehouse Parish, Louisiana. *Louisiana Archaeology* 10:285–318

Price, G. R. Dennis, Glen S. Greene, and Lorraine Heartfield
1975 *Excavations at the Site of Historic Fort Miro (16OU3) in Monroe, Louisiana*. Research Institute, Northeast Louisiana University, Archaeological Series, No. 1.

Price, G. R. Dennis, and Lorraine Heartfield
1977 *Archeological Test Excavation of Site 16OU15, Located on the Monroe to Sandy Bayou Levee, Ouachita River Levees, Ouachita Parish, Louisiana*. Research Institute, College of Pure and Applied Sciences, Northeast Louisiana University, Monroe. Submitted to the Vicksburg District, U.S. Army Corps of Engineers.

Price, James E.
1978 The Settlement Pattern of the Powers Phase. In *Mississippian Settlement Patterns*, edited by Bruce D. Smith, pp. 201–231. Academic Press, New York.

Price, James E., and James B. Griffin
1979 *The Snodgrass Site of the Powers Phase of Southeast Missouri*. University of Michigan Museum of Anthropology, Anthropological Papers, No. 66.

Price, W. A.
1955 Environment and Formation of the Chenier Plain. *Quaternaria* 2:75–86.

Prichard, Walter, Fred B. Kniffen, and Clair A. Brown (editors)
1945 Southern Louisiana and Southern Alabama in 1819. *Louisiana Historical Quarterly* 28:735–921.

Prunty, M. C.
1962 Deltapine, Field Laboratory for the Neoplantation. In *Festschrift*, edited by C. F. Jones and M. C. Prunty, pp. 151–172. Studies in Geography No. 6.

Putnam, Frederic Ward
1880 Report of the Curator, 1879. *Thirteenth Annual Report of the Peabody Museum, Harvard University* 2(1):715–751.

1881 Report of the Curator, 1880. *Fourteenth Annual Report of the Peabody Museum, Harvard University* 3(1):7–38.

Quimby, George I., Jr.

1951 *The Medora Site, West Baton Rouge Parish, Louisiana*. Field Museum of Natural History Anthropological Series, Vol. 24, No. 2.

1957 The Bayou Goula Site, lberville Parish, Louisiana. *Fieldiana: Anthropology* 47, No. 2.

Rackerby, Frank

1982 The Future Is Now: An Update on the Contract Archeology Program. In *Arkansas Archeology in Review*, edited by Neal L. Trubowitz and Marvin D. Jeter, pp. 327–349. Arkansas Archeological Survey Research Series No. 15.

Ramenofsky, Ann F.

1986 The Persistence of Late Archaic Subsistence–Settlement in Louisiana. In *Foraging, Collecting and Harvesting. Archaic Period Subsistence and Settlement in the Eastern Woodlands*, edited by Sarah W. Neusius, pp. 289–312. Southern Illinois University Center for Archaeological Investigations, Occasional Papers, No. 6.

n.d. Investigating Settlement Strategies at Cowpen Slough, a Late Archaic–Poverty Point Site in Louisiana. To be published in a volume on Poverty Point archeology, edited by K. M. Byrd.

Ramenofsky, Ann F., and Ann Marie Mires

1985 *The Archaeology of Cowpen Slough, (16CT147)*, Contract No. 84 A–2. Department of Geography and Anthropology, Louisiana State University, Baton Rouge. Submitted to the Louisiana Division of Archaeology, Baton Rouge.

Rands, Robert L.

1956 Southern Cult Motifs on Walls–Pecan Point Pottery. *American Antiquity* 22:183–186.

Ray, Robert H., L. Mark Raab, and Roy J. Cochran

1976 *An Archeological Sample Survey of the Caddo Planning Unit*. Arkansas Archeological Survey, Fayetteville. Submitted to the USDA Forest Service, Ouachita National Forest, Hot Springs, Akansas.

Redfield, Alden

1962 The Dalton Project. Unpublished ms., Arkansas Archeological Survey, Fayetteville.

1971 Dalton Project Notes, Vol. 1. Ms. on file, Museum of Anthropology, University of Missouri, Columbia.

Redfield, Alden, and John H. Moselage

1970 The Lace Place: A Dalton Project Site in the Western Lowlands in Eastern Arkansas. *The Arkansas Archeologist* 11:21–44.

Reeves, S. K., and W. D. Reeves

1982 Interim Report: Archival Evaluation of Floodwall Alignments. Ms. on file, New Orleans District, U.S. Army Corps of Engineers.

Rehder, John B.

1971 *Sugar Plantation Settlements of Southern Louisiana, A Cultural Geography*. Ph.D. dissertation, Louisiana State University, Baton Rouge.

1978 Diagnostic Landscape Traits of Sugar Plantations in Southern Louisiana. *Geoscience and Man* 19:135–150.

Reitz, Elizabeth J., Tyson Gibbs, and Ted A. Rathbun

1983 *Archaeological Evidence of Subsistence and Diet on Coastal Plantations*. Manuscript prepared for Archaeological Studies of the Plantation System, edited by T. A. Singleton. Academic Press, New York.

Ries, Maurice

1936 The Mississippi Fort, Called Fort de la Boulaye. *Louisiana Historical Quarterly* 19:829–899.

Ring, Diane M.

1986 *Evaluation of the Hegwood Bayou Phase as a Late Marksville Period Phase in the Northern Boeuf Basin, Louisiana*. Senior honors thesis, Harvard University, Cambridge.

Ripley, H.C.

1876 Report of the Chief of Engineers. In *House Executive Documents, 44th Congress, 1st Session* 2(1):889–93.

Rivet, Philip George

1973 *Tchefuncte Ceramic Typology: A Reappraisal*. M.A. thesis, Louisiana State University, Baton Rouge.

Robbins, Louise M.

1976 Analysis of Human Skeletal Material from Morton Shell Mound (16IB3), Iberia Parish, Louisiana. Unpublished ms., Department of Geography and Anthropology, Louisana State University, Baton Rouge.

1978 Yawslike Disease Processes in a Louisiana Shell Mound Population. *Medical College of Virginia Quarterly* 14:24–31.

Robin, Claude C.

1966 *Voyage to Louisiana 1803–1805*. Pelican Publishing Company, New Orleans.

Robinson, Michael C.

1985 *Gunboats, Low Water, and Yankee Ingenuity: A History of Bailey's Dam*.

Rolingson, Martha Ann
1971a The Ashley Point. *The Arkansas Archeologist* 12:50–52.

1971b Lakeport: Initial Exploration of a Late Prehistoric Ceremonial Center in Southeastern Arkansas. *The Arkansas Archeologist* 12:61–80.

1972 Report on the Preliminary Site Survey of the Felsenthal National Wildlife Refuge, 1971. Ms. on file, Arkansas Archeological Survey.

1974 The Bayou Bartholomew Survey and Excavations. Ms. on file, Arkansas Archeological Survey.

1976 The Bartholomew Phase: A Plaquemine Adaptation in the Mississippi Valley. In *Cultural Change and Continuity: Essays in Honor of James Bennett Griffin*, edited by C. E. Cleland, pp. 99–119. Academic Press, New York.

1982 (editor) *Emerging Patterns of Plum Bayou Culture: Preliminary Investigations of the Toltec Mounds Research Project*. Arkansas Archeological Survey Research Series No. 18.

Rolingson, Martha Ann, and Marvin D. Jeter
1986 An Assessment of Archaeological Data for the Tchula Period in Southeastern Arkansas. In *The Tchula Period in the Mid–South and Lower Mississippi Valley*, edited by David H. Dye and Ronald C. Brister, pp. 93–101. Mississippi Department of Archives and History Archaeological Reports, No. 17.

Rolingson, Martha Ann, and Frank F. Schambach
1981 *The Shallow Lake Site (3UN9/52) and Its Place in Regional Prehistory*. Arkansas Archeological Survey Research Series, No. 12.

Rose, Jerome C.
1984 Bioarcheology of the Cedar Grove Site. In *Cedar Grove: the Red River Valley*, edited by Neal L. Trubowitz. Arkansas Archeological Survey Research Series No. 23.

1985 *Gone to a Better Land: A Biohistory of a Rural Black Cemetery in the Post-Reconstruction South*. Arkansas Archeological Survey Research Series No. 25.

Rose, Jerome C.
1985 Bioarcheology of the Alexander Site. In *The Alexander Site, Conway County, Arkansas*, edited by E. Thomas Hemmings and John H. House, pp. 75–98. Arkansas Archeological Survey Research Series, No. 24.

Rose, Jerome C., and Anna M. Harmon
1987 *Bioarchaeology of 41H574*. On file at Heartfield, Price, and Greene, Inc., Monroe.

Rose, Jerome C., M. K. Marks, and L. L. Tieszen
1985 Bioarcheology of the Little Cypress Bayou Site. In *Archaeological Investigations of the Little Cypress Bayou Site, (3CT50), Crittenden County, Arkansas, Vol. II, Appendix IV*. New World Research Report of Investigations, No. 82–21. Polock, LA.

Rushton, William F.
1979 *The Cajuns: From Acadia to Louisiana*. Farrar, Straus, Giroux, New York.

Russell, Richard J.
1936 Lower Mississippi River Delta. In Reports on the Geology of Plaquemines and St. Bernard Parishes. *Louisiana Department of Conservation Geological Survey Bulletin* 8:3–199.

1940 Quaternary History of Louisiana. *Geological Society of America Bulletin* 51:1211.

1967 *River Plains and Sea Coasts*. University of California Press, Berkeley and Los Angeles.

Russell, Richard J., and Henry V. Howe
1935 Cheniers of Southwestern Louisiana. *The Geographical Review* 25(3):449–461. New York.

Ryan, Thomas M.
1975 Semisubterranean Structures and Their Spatial Distributions at the Marksville Site (16AV1). *Southeastern Archaeological Conference Bulletin* 18:215–225.

Sabo, George III, Ann M. Early, Barbara A. Burnett, James P. Harcourt, Jerome Rose, and W. Fredrick Limp
1988 *Human Adaptation in the Ozark and Ouachita Mountains. Arkansas Archeological Survey, Fayetteville*. Submitted to the U.S. Army Corps of Engineers, Southwestern Division, Dallas.

Saltus, Allen R., Jr.
1974 *Archeological Work on the Mermentau River, Jefferson Davis, Vermilion, and Acadia Parishes, Louisiana*. Gulf South Research Institute, Baton Rouge. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

Sargent, Forest V.
1966 Indian Sites along the Ouachita River. *The Record* (Garland County, Arkansas, Historical Society Year Book, Hot Springs) 7:7–11.

Saucier, Roger T.
1963 *Recent Geomorphic History of the Pontchartrain Basin*. Louisiana State University Coastal Studies Series, No. 9.

1964 *Quarternary Geology of the Lower Mississippi Valley*. Arkansas Archeological Survey Research Series No. 6.

1969 *Geological Investigation of the Mississippi River Area, Artonish to Donaldsonville, Louisiana*. U.S. Army Corps of Engineers Waterways Experiment Station, Technical Report S–69–4, Vicksburg.

1970 Origin of the St. Francis Sunk Lands, Arkansas and Missouri. *Geological Society of America Bulletin* 81:2847–2854.

1974 *Quaternary Geology of the Lower Mississippi Valley*. Arkansas Archaeological Survey Research Series No. 6.

1978 Sand Dunes and Related Eolian Features of the Lower Mississippi Alluvial Valley. *Geoscience and Man* 19:23–40.

1981 Current Thinking on Riverine Processes and Geologic History as Related to Human Settlement in the Southeast. In *Traces of Prehistory: Papers in Honor of William G. Haag*, edited by F. H. West and R. W. Neuman, pp. 7–18. *Geoscience and Man* 22.

n.d. Geomorphology, Stratigraphy, and Chronology. Ms. to be included in Quaternary Non-Glacial Geology of the Conterminous United States, edited by Whitney J. Autin.

Saucier, Roger T., and Arthur R. Fleetwood

1970 Origin and Chronologic Significance of Late Quaternary Terraces, Ouachita River, Arkansas and Louisiana. *Geological Society of America Bulletin* 81: 869–890.

Schambach, Frank F.

1970 *Pre-Caddoan Cultures in the Trans–Mississippi South: a Beginning Sequence*. Ph.D. dissertation, Department of Anthropology, Harvard University.

1971 The Trans–Mississippi South: The Case for a New Natural Area West of the Lower Mississippi Valley and East of the Plains. Paper presented at the Thirteenth Caddo Conference, Austin, Texas.

1972 Preliminary Report on the 1972 Excavations at the Ferguson Site (3HE63). *The Arkansas Archeologist* 13:1–15.

1974 A Unique Engraved Steatite Bowl from Southwest Arkansas. *The Arkansas Archeologist* 15:40–44.

1979 Summary of Local and Regional Archeology. In *Hampton: an Archeological and Historical Overview of a Proposed Strip Mine Tract in South-Central Arkansas*, assembled by Timothy C. Klinger, pp. 21–30. Arkansas Archeological Survey Research Report No. 19.

1981 A Description and Analysis of the Ceramics. In *The Shallow Lake Site (3UN9/52) and Its Place in Regional Prehistory*, by Martha Ann Rolingson and Frank F. Schambach, pp. 101–176. Arkansas Archeological Survey Research Series No. 12.

1982a An Outline of Fourche Maline Culture in Southwest Arkansas. In *Arkansas Archeology in Review*, edited by Neal L. Trubowitz and Marvin D. Jeter, pp. 132–197. Arkansas Archeological Survey Research Series, No. 15.

1982b The Archaeology of the Great Bend Region in Arkansas. In *Contributions to the Archeology of the Great Bend Region*, edited by Frank F. Schambach and Frank Rackerby, pp. 1–11. Arkansas Archeological Survey Research Series No. 22.

n.d. (editor) The Bangs Slough Site (3CA3): A Multidisciplinary Investigation of a Multicomponent Prehistoric Site in the Ouachita River Valley of South-Central Arkansas. Arkansas Archeological Survey Research Series, in press.

Schambach, Frank F., and Ann M. Early

1982 Southwest Arkansas. In *A State Plan for the Conservation of Archeological Resources in Arkansas*, edited by Hester A. Davis, pp. SW1–SW149. Arkansas Archeological Survey Research Series No. 21.

Schambach, Frank F., and John E. Miller III

1984 A Description and Analysis of the Ceramics. In *Cedar Grove: An Interdisciplinary Investigation of a Late Caddo Farmstead in the Red River Valley*, edited by Neal L. Trubowitz, pp. 109–170. Arkansas Archeological Survey Research Series No. 23.

Schambach, Frank F., and Frank Rackerby (editors)

1982 *Contributions to the Archeology of the Great Bend Region*. Arkansas Archeological Survey Research Series No. 22.

Schambach, Frank F., and Martha Ann Rolinson

1981 Conclusions. In *The Shallow Lake Site (3UN9/52) and Its Place in Regional Prehistory*, by Martha Ann Rolingson and Frank F. Schambach, pp. 177–203. Arkansas Archeological Survey Research Series No. 12.

Schambach, Frank F., Neal L. Trubowitz, Frank Rackerby, E. Thomas Hemmings, W. Fredrick Limp, and John E. Miller III

1982 Test Excavations at the Cedar Grove Site (3LA97): A Late Caddo Farmstead in the Great Bend Region. In *Contributions to the Archeology of the Great Bend Region*, edited by Frank F. Schambach and Frank Rackerby, pp. 90–127. Arkansas Archeological Survey Research Series, No. 22.

Scheibel, Russell G., and Ann M. Early

1982 The Productive Partnership: Amateur and Professional in Arkansas Archeology. In *Arkansas Archeology in Review*, edited by Neal L. Trubowitz and Marvin D. Jeter, pp. 310–315. Arkansas Archeological Survey Research Series No. 15.

Schiffer, Michael B.

1975a Some Further Comments on the Dalton Settlement Pattern Hypothesis. In *The Cache River Archeological Project: An Experiment in Contract Archeology*, assembled by Michael B. Schiffer and John H. House, pp. 103–112. Arkansas Archeological Survey Research Series, No. 8.

1975b An Alternative to Morse's Dalton Settlement Pattern Hypothesis. *Plains Anthropologist* 20:253–266.

Schiffer, Michael B., and John H. House (assemblers)

1975 *The Cache River Archeological Project: An Experiment in Contract Archeology*. Arkansas Archeological Survey Research Series, No. 8.

1977 Cultural Resource Management and Archaeological Research: The Cache Project. *Current Anthropology* 18:43–67.

Schmitz, Mark

1974 *Economic Analysis of Ante-bellum Sugar Plantations in Louisiana*. Ph.D. dissertation, University of North Carolina, Chapel Hill.

1977 *Economic Analysis of Antebellum Sugar Plantations in Louisiana*. Arno Press, New York.

Scholtz, James A.

1965 *Summary Report on Archeological Phase II Project at the DeRossitt Site (3SF49)*. University of Arkansas Museum, Fayetteville. Submitted to the Arkansas Highway Commission, Little Rock.

1968 The Dumond Site (3AR40), Arkansas County, Arkansas. *Arkansas Archeologist* 9:10–27.

Schoolcraft, Henry R.

1819 *A View of the Lead Mines of Missouri*. C. Wiley, New York.

1955 *Journal of a Tour into the Interior of Missouri and Arkansas in 1818 and 1819*. Reprinted. Press Argus Printers, Van Buren. Originally published 1821, Sir R. Philips, London.

Sealander, John M.

1979 *A Guide to the Mammals of Arkansas*. River Road Press, Conway, AR.

Sears, Joan Niles

1979 *The First One Hundred Years of Town Planning in Georgia*. Cherokee Publishing Company, Atlanta.

Sears, William H.

1964 The Southeastern United States. In *Prehistoric Man in the New World*, edited by Jesse D. Jennings and Edward Norbeck, pp. 259–287. University of Chicago Press.

Servello, A. Frank (assembler)

1983 *University of Southwestern Louisiana Fort Polk Archaeological Survey and Cultural Resources Management Program*. (2 vols.) University of Southwestern Louisiana, Lafayette. Submitted to Fort Worth District, U.S. Army Corps of Engineers.

Servello, A. Frank, and Thomas H. Bianchi

1983 Geomorphology and Cultural Stratigraphy of the Eagle Hill Area of Peason Ridge. In *University of Southwestern Louisiana Fort Polk Archaeological Survey and Cultural Resources Management Program*, assembled by A. Frank Servello, pp. 377–566. University of Southwestern Louisiana, Lafayette. Submitted to Fort Worth District, U.S. Army Corps of Engineers.

Setzler, Frank M.

1933a Hopewell Type Pottery from Louisiana. *Journal of the Washington Academy of Sciences* 23(3):149–153.

1933b Pottery of the Hopewell Type from Louisiana. *Proceedings of the United States National Museum* 82(22):1–21.

1934 A Phase of Hopewell Mound-Builders in Louisiana. *Explorations and Field-work of the Smithsonian Institution in 1933*, pp. 38–40.

Shea, Andrea Brewer

1978 Botanical Remains. In *The Peripheries of Poverty Point*, by Prentice M. Thomas, Jr. and L. Janice Campbell, pp. 245–260. New World Research Reports of Investigations, No. 12.

1980 Analysis of Plant Remains from the Hanna Site. In *The Hanna Site: An Alto Village in Red River Parish*, by Prentice M. Thomas et al., pp. 273-285. Louisiana Archaeology, Vol. 5.

Shelley, Phillip H., and George Agogino
1983 Agate Basin Technology: An Insight. *Plains Anthropologist* 28:115–118.

Shelley, Steven D.
1980 *An Analysis of the Coles Creek Settlement System of Louisiana's Chenier Coastal Plain*. M.A. thesis, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

1981 The Coles Creek Period Settlement System of Louisiana's Chenier Coastal Plain. *Southeastern Archaeological Conference Bulletin* 24:41–43.

Shenkel, J. Richard
1974a Big Oak and Little Oak Islands: Excavations and Interpretation. *Louisiana Archaeology* 1:37–65.

1974b Archaeological Survey of Five Proposed Airport Sites in Southeast Louisiana. In *Environmental Evaluation Report, Volume 2: Airport Environmental and Site Evaluation Study for Southeast Louisiana*. Unpublished report on file at the Department of Transportation, Federal Energy Administration, Houston. Photocopy.

1977 *Archaeological Investigations at the Hermann–Grima House*. Submitted to the Christian Woman's Exchange. Report on file at the Division of Archaeology.

1979 Tchefuncte Site Specialization. Paper presented at the 36th Annual Meeting of the Southeastern Archaeological Conference, Atlanta.

1980 *Oak Island Archaeology: Prehistoric Estuarine Adaptations in the Mississippi River Delta*. Archaeological and Cultural Research Program, University of New Orleans, New Orleans. Submitted to National Park Service, Contract No. PXJ7530–0–0112. Copies available from Jean Lafitte National Historical Landmark, New Orleans.

1981 Pontchartrain Tchefuncte Site Differentiation. *Louisiana Archaeology* 8:21–36.

1984a Early Woodland in Coastal Louisiana. In *Perspectives on Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 41–71. University Presses of Florida, Gainesville.

1984b An Early Marksville Burial Componment in Southeastern Louisiana. *Mid–Continental Journal of Archaeology* 9:105–134.

Shenkel, J. Richard, and Jon Gibson
1974 Big Oak Island: An Historical Perspective of Changing Site Function. *Louisiana Studies* 13(2):173–186.

Shenkel, J. Richard, and George Holley
1975 A Tchefuncte House. *Southeastern Archaeological Conference Bulletin* 18:226–242.

Shenkel, J. Richard, Robert Sauder and E. R. Chatelain
1980 *Archaeology of the Jazz Complex and Beauregard (Congo) Square, Louis Armstrong Park, New Orleans, Orleans Parish, Louisiana*. Unpublished report on file at the Division of Archaeology and Historic Preservation, Department of Culture, Recreation and Tourism, Baton Rouge.

Shepherd, Bill (editor)
1984 *Arkansas's Natural Heritage*. August House, Little Rock.

Sherrod, P. Clay, and Martha Ann Rolingson
1987 *Surveyors of the Ancient Mississippi Valley: Modules and Alignments in Prehistoric Mound Sites*. Arkansas Archeological Survey Research Series No. 28.

Shlomowitz, Ralph
1979 The Origins of Southern Sharecropping. *Agricultural History* 53:557–575.

Shuman, Malcolm K., and Charles E. Orser, Jr.
1984 *Historical and Archaeological Investigation of the Ruins of a Nineteenth Century Sugar Mill (16WF36) in West Feliciana Parish, Louisiana*. Report submitted to Gulf States Utilities Co., Beaumont, TX, and on file at Louisiana Division of Archaeology, Baton Rouge.

Singleton, Theresa A.
1980 *The Archaeology of Afro–American Slavery in Coastal Georgia: A Regional Perception of Slave Household and Community Patterns*. Ph.D. dissertation, University of Florida, Gainesville. University Microfilms, Ann Arbor.

Smith, Ann E.
1983 Description of Four Burials from the Bowie Site. LaFourche Parish, Louisiana. Ms. on file, Department of Anthropology, Tulane University, New Orleans.

Smith, Brent W.
1975 Prehistoric Settlement Patterns of the Young's Bayou Drainage, Natchitoches Parish, Louisiana. *Louisiana Archaeology* 2:163–200.

1976 The Late Archaic–Poverty Point Steatite Trade Network in the Lower Mississippi Valley: A Preliminary Report. *Louisiana Archaeological Society Newsletter* 3(4):6–10. Lafayette.

Smith, Bruce D.
1978a *Prehistoric Patterns of Human Behavior. A Case Study in the Mississippi Valley*. Academic Press, New York.

1978b (editor) *Mississippian Settlement Patterns*. Academic Press, New York.

1978c Variation in Mississippian Settlement Patterns. In *Mississippian Settlement Patterns,* edited by Bruce D. Smith, pp. 479–503. Academic Press, New York.

1984 Mississippian Expansion: Tracing the Historical Development of an Explanatory Model. *Southeastern Archaeology* 3:13–32.

1985 Mississippian Patterns of Subsistence and Settlement. In *Alabama and the Borderlands: from Prehistory to Statehood*, edited by R. R. Reid Badger and Lawrence A. Clayton, pp. 64–79. University of Alabama Press, University.

1986 The Archaeology of the Southeastern United State: From Dalton to De Soto, 10,500–500 B.P. *Advances in World Archaeology* 5:1–92. Academic Press, New York.

1987 The Independent Domestication of Indigenous Seed-Bearing Plants in Eastern North America. In *Emergent Horticultural Economies of the Eastern Woodlands*, edited by William F. Keegan, pp. 3–47. Southern Illinois University Center for Archaeological Investigations Occasional Papers, No. 7.

Smith, Fred L., and D. P. Russ
1974 *Geological Investigation of the Lower Red–Atchafalaya Basin Area*. U.S. Army Corps of Engineers Waterways Experiment Station Technical Report S–74–5. Vicksburg.

Smith, Fred L., and Roger T. Saucier
1971 *Geological Investigation of the Western Lowlands Area, Lower Mississippi Valley*. U.S. Army Corps of Engineers Waterways Experiment Station Technical Report S–71–5. Vicksburg.

Smith, Kenneth
1986 *Sawmill*. University of Arkansas Press, Fayetteville.

Smith, Robert E., Gordon R. Willey, and James C. Gifford
1960 The Type–Variety Concept as a Basis for the Analysis of Maya Pottery. *American Antiquity* 25:330–340.

Smith, Steven D., Philip G. Rivet, Kathleen M. Byrd, and Nancy W. Hawkins
1983 *Louisiana's Comprehensive Archaeological Plan*. Division of Archaeology, Office of Cultural Development, Department of Culture, Recreation and Tourism, State of Louisiana, Baton Rouge.

Snead, John I., and Richard P. McColloh (compilers)
1984 *Geologic Map of Louisiana*. Louisiana Geological Survey, Baton Rouge.

Snow, C.E.
1945 The Skeletal Remains. In *The Tchefuncte Culture, An Early Occupation of the Lower Mississippi Valley*. Memoir of the Society for American Archaeology, No. 2.

Southall, James Cocke
1875 *The Recent Origin of Man: As Illustrated by Geology and the Modem Science of Prehistoric Archaeology*. J.B. Lippincot, Philadelphia.

Spaulding, Albert C.
1953 Statistical Techniques for the Discovery of Artifact Types. *American Antiquity* 18:305–313.

1954 Reply to Ford. *American Antiquity* 19:391–393.

1957 Review of "Method and Theory in American Archaeology," articles by Philip Phillips and Gordon R. Willey. *American Antiquity* 23:85–87.

Spears, Carol
1978 *The DeRossitt Site (3SF49): Applications of Behavioral Archeology to a Museum Collection*. M.A. thesis, University of Arkansas, Fayetteville.

Spicer, J. M.
1964 *Beginnings of the Rice Industry in Arkansas*. Arkansas Rice Promotion Association and Rice Council, Stuttgart, Arkansas.

Springer, James W.
1973 *The Prehistory and Cultural Geography of Coastal Louisiana*. Ph.D. dissertation, Yale University.

1974 The Bruly St. Martin Site and its Implications for Coastal Settlement in Louisiana. *Louisiana Archaeology* 1:75–82.

1976 A Ceramic Sequence from Southern Louisiana and its Implications for Type Frequency Seriation. *Louisiana Archaeology* 3:123–191.

1979 Excavations at the Pierre Clement Site, Cameron Parish, Louisiana. *Louisiana Archaeology* 4:53–90.

1980 An Analysis of Prehistoric Food Remains from the Bruly St. Martin Site, Louisiana, with a Comparative Discussion of Mississippi Valley Faunal Studies. *Mid–Continental Joumal of Archaeology* 5:193–223.

Spitzer, Nicholas R. (editor)
1979 Mississippi Delta Ethnographic Overview. Ms. on file, National Park Service.

Squier, Ephraim G., and E. H. Davis
1848 *Ancient Monuments of the Mississippi Valley*. Smithsonian Contributions to Knowledge, vol. 1. Washington, D.C.

Stahle, David W., Malcolm K. Cleaveland, and J. G. Hehr
1985 A 450-Year Drought Reconstruction for Arkansas, United States. *Nature* 316:530–532.

Stahle, David W., Edward R. Cook, and James W. C. White
1985 Tree-Ring Dating of Baldcypress and the Potential for Millenia-Long Chronologies in the Southeast. *American Antiquity* 50:796–802.

Stahle, David W., and John G. Hehr
1984 Dendroclimatic Relationships of Post Oak across a Precipitation Gradient in the Southcentral United States. *Annals of the Association of American Geographers* 74:561–573.

Stark, Marilyn
1973 *The Osteological Analysis of the Skeletal Remains of the Old Martin Place*. B.A. honors thesis, University of Arkansas, Fayetteville.

Steele, D. Gentry, and Thomas W. McKern
1969 A Method for Assessment of Maximum Long Bone Length and Living Stature from Fragmentary Long Bones. *American Journal of Physical Anthropology* 31(2):215–228.

Steponaitis, Vincas P.
1981 Plaquemine Ceramic Chronology in the Natchez Region. *Mississippi Archaeology* 16(2):6–19.

1986 Prehistoric Archaeology in the Southeastern United States, 1970–1985. *Annual Review of Anthropology* 15:363–404.

Steponaitis, Vincas P., Jeffrey P. Brain, and Ian W. Brown
1983 Glossary of Ceramic Types and Varieties. In *Grand Village of the Natchez Revisited: Excavations at the Fatherland Site, Adams County, Mississippi, 1972*, by R. S. Neitzel, pp. 139–145. Mississippi Department of Archives and History Archaeological Reports, No. 12.

Stern, Harriet
1980 *The Germans in New Orleans*. Jean Lafitte National Historical Park, New Orleans.

Stewart–Abernathy, Judith C.
1982 Ceramic Studies at the Toltec Mounds Site: Basis for a Tentative Cultural Sequence. In *Emerging Patterns of Plum Bayou Culture*, edited by Martha Ann Rolingson, pp. 44–53. Arkansas Archeological Survey Research Series No. 18.

Stewart–Abernathy, Leslie C.
1986 Urban Farmsteads: Household Responsibilities in the City. *Historical Archaeology* 20:5–15.

1984 *The Best House in the Country: An Oral History of the Bunyard–Rice House and Farmstead*. Arkansas Archeological Survey and Arkansas Endowment for the Humanities. Submitted to Jefferson County Historical Museum.

Stoltman, James B.
1978 Temporal Models in Prehistory: An Example from Eastern North America. *Current Anthropology* 19: 703–746.

Stopp, Harry G., Jr.
1976 CM–84: An In-Transit Settlement in Prehistoric Louisiana. Ms. on file, Louisiana Division of Archaeology, Baton Rouge.

Styles, Bonnie W., and James R. Purdue
1984 Faunal Exploitation at the Cedar Grove Site. In *Cedar Grove: An Interdisciplinary Investigation of a Late Caddo Farmstead in the Red River Valley*, edited by Neal L. Trubowitz, pp. 207–226. Arkansas Archeological Survey Research Series No. 23.

Styles, Bonnie W., James R. Purdue, and Mona L. Colburn
1985 Analysis of Faunal Remains. In *The Alexander Site, Conway County, Arkansas*, edited by E. T. Hemmings and J. H. House, pp. 58–74. Arkansas Archeological Survey Research Series No. 24.

Suhm, Dee Ann, and Edward B. Jelks
1962 *Handbook of Texas Archaeoloy: Type Descriptions*. Texas Archaeological Society Special Publications, No. 1.

Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks
1954 *An Introductory Handbook of Texas Archeology*. Texas Archeological Society Bulletin 25.

Surrey, Nancy C. Miller
1916 *The Commerce of Louisiana During the French Regime, 1699–1763*. McGraw–Hill, New York.

Swanda, Michael J.
1982 *Cultural Resources Survey of 680 Acres on the Vernon Ranger District, Kisatchie National Forest, Vernon Parish, Louisiana*. Report No. 18, Archaeological Assessments, Inc., Nashville, AR. Submitted to USDA Forest Service, Pineville, LA.

Swanton, John R.
1911 *Indian Tribes of the Lower Mississippi Valley and Adjacent Coast of the Gulf of Mexico*. Bureau of American Ethnology Bulletin 43.

1939 *Final Report of the United States De Soto Expedition Commission. House Document 71, 76th Congress, 1st Session*. Washington. Reprinted in 1985 by Smithsonian Institution Press.

1942 *Source Material in the History and Ethnology of the Caddo Indians*. Bureau of American Ethnology Bulletin 132.

1946 *The Indians of the Southeastern United States*. Bureau of American Ethnology Bulletin No. 137. Smithsonian Institution, Washington, D. C.

1952 Hernando De Soto's Route Through Arkansas. *American Antiquity* 18(2):156–162.

Taylor, Orville W.
1958 *Negro Slavery in Arkansas*. Duke University Press, Durham, North Carolina.

Taylor, Robert A.
1972 The Cryer Manifestation: Definition and Tentative Placement in the Caddoan Sequence. *Arkansas Archeologist* 13(3–4):41–66.

Techstaff, Inc./Heartfield, Price and Greene, Inc.
1982 *On-the-Ground Cultural Resources Survey of a Proposed 500 KV Transmission Line in Southeast Louisiana*. Report submitted to Gulf States Utilities, Beaumont, TX.

Texas Archaeological Research Laboratory Files
n.d. Osteology Inventory and Data Files, Texas Archaeological Research Laboratory, University of Texas, Austin.

Thomas, Cyrus
1891 *Catalogue of Prehistoric Works East of the Rocky Mountains*. Bureau of American Ethnology Bulletin 12.

1894 *Report on the Mound Explorations of the Bureau of Ethnography*. Twelfth Annual Report of the Bureau of American Ethnography, pp. 17–742. Smithsonian Institution, Washington D.C.

Thomas, Prentice M.
1982 Archaeological Investigations at the Linsley Site (16OR40). Ms. on file, Division of Archeology, Baton Rouge.

Thomas, Prentice M., Jr., and L. Janice Campbell
1978a *A Multicomponent Site on the Happyville Bend of Little River. 16LA37 — the Whatley Site*. New World Research Reports of Investigations, No. 11.

1978b *The Peripheries of Poverty Point*. New World Research Reports of Investigations, No. 12.

Thomas, Prentice M., Jr., L. Janice Campbell, and Thomas D. Montaigne
1978 *Sabine National Wildlife Refuge: A Cultural Resources Survey*. New World Research, Report of Investigations No. 4.

Thomas, Prentice M., Jr., L. Janice Campbell, and Steven R. Ahler
1980 *The Hanna Site: An Alto Village in Red River Parish*. Louisiana Archaeology, 5.

Thomas, Prentice M., Steven D. Shelley, L. Janice Campbell, Mark T. Swanson, Carol S. Weed, and John P. Lenzer
1982 *Cultural Resources Investigations at the Fort Polk Military Reservation, Vernon, Sabine, and Natchitoches Parishes, Louisiana*. New World Research, Inc., Report of Investigations No. 69.

Thomassy, Raymond
1860 *Geologie Practique de la Louisiane*. New Orleans and Paris.

Thorpe, T. B.
1853 Sugar and the Sugar Region of Louisiana. *Harper's New Monthly Magazine* 7:746–767.

Toth, Edwin Alan
1974 *Archaeology and Ceramics at the Marksville Site*. University of Michigan Museum of Anthropology, Anthropological Papers No. 56.

1977 *Early Marksville Phases in the Lower Mississippi Valley: A Study of Culture Contact Dynamics*. Ph.D. dissertation, Harvard University.

1979a *The Lake St. Agnes Site: A Multi-Component Occupation of Avoyelles Parish, Louisiana*. Louisiana State University Museum of Geoscience, Melanges No. 13.

1979b The Marksville Connection. In *Hopewell Archaeology: the Chillicothe Conference*, edited by David S. Brose and N'omi Greber, pp. 188–199. Kent State University Press, Kent, Ohio.

1988 *Early Marksville Phases in the Lower Mississippi Valley: A Study of Culture Contact Dynamics*. Mississippi Department of Archives and History Archaeological Reports No. 21.

Tottenham, Karen Ann
1974 Archaeology and History of the Fort Polk–Vernon Parish Area. Ms. on file in the Louisiana Section, Louisiana State Library, Baton Rouge. Photocopy.

Trubowitz, Neal L. (editor)
1984 *Cedar Grove: An Interdisciplinary Investigation of a Late Caddo Farmstead in the Red River Valley*. Arkansas Archeological Survey Research Series No. 23.

Trubowitz, Neal L., and Marvin D. Jeter (editors)
1982 *Arkansas Archeology in Review*. Arkansas Archeological Survey Research Series No. 15.

Trubowitz, Neal L., Frank F. Schambach, and John E. Miller III
1982 Text Excavations at 3LA128: An Early Caddo Occupation on the Red River Valley. In *Contributions to the Archaeology of the Great Bend Region*, edited by Frank F. Schambach and Frank Rackerby, pp. 39–54. Arkansas Archeological Survey Research Series No. 22.

Turner, Christy G. II
1985 The Modern Human Dispersal Event: the Eastern Frontier. *Quarterly Review of Archaeology* 6(4):8–10.

University of Arkansas Osteology Files
n.d. Osteology Laboratory Files. Department of Anthropology, University of Arkansas, Fayetteville.

University of Texas Osteology Files
n.d. Osteology Laboratory Skeletal Analysis Files. Department of Anthropology, University of Texas, Austin.

Usner, D. H., Jr.
1981 *Frontier Exchange in the Lower Mississippi Valley: Race Relations and Economic Life in Colonial Louisiana, 1699–1783*. Ph.D. dissertation, Duke University, Durham, North Carolina.

1983 A Cycle of Lowland Forest Efficiency: the Late Archaic–Woodland Economy of the Lower Mississippi Valley. *Journal of Anthropological Research* 39:433–444.

Van Lopik, Jack R.
1955 *Recent Geology and Geomorphic History of Central Coastal Louisiana*. Coastal Studies Institute, Louisiana State University, Technical Report 7.

Veatch, Arthur Clifford
1899 The Five Islands. In *A Preliminary Report on the Geology of Louisiana*, by Gilbert D. Harris and A.C. Veatch, pp. 213–262. Special Report No. 3, Baton Rouge.

1902a The Salines of North Louisiana. In *A Report on the Geology of Louisiana*, Special Report No. 2. Baton Rouge.

1902b Notes on the Geology along the Ouachita. In *A Report on the Geology of Louisiana*, Special Report No. 4. Baton Rouge.

Vescelius, Gary S.
1957 Mound 2 at Marksville. *American Antiquity* 22:416–420.

Waddell, David B., and Sandra Blaylock
1982 *An Intensive Cultural Resource Survey of Six Revetments and a Channel Realignment/Cutoff along the Red River in Southwestern Arkansas*. Arkansas Archeological Survey, Fayetteville. Submitted to the New Orleans District, U.S. Army Corps of Engineers.

Wakefield, E. G., and S. C. Dellinger
1937 *A Study of the Osseous Remains of the "Mound Builders" of Eastern Arkansas*. University of Arkansas Research Series No. 413. Originally published in *American Journal of Medical Sciences* 193(4):488–496.

1940 Diseases of Prehistoric Americans of South Central United States. *Ciba Symposium* 2:453–462.

1984 *Cultural Resources Survey of the Proposed Bierne, Arkansas to Perryville, Louisiana ARKLA Pipeline Project Right-of-Way*. Arkansas Archeological Survey, Fayetteville. Submitted to Canter Associates, Norman, Oklahoma.

Walker, John M.
1971 *Excavation of the Arkansas Post Branch of the Bank of the State of Arkansas, Arkansas Post National Memorial, Arkansas*. National Park Service, Southeast Archeological Center, Macon.

Walker, Robert
1980 *Dental Pathologies, Wear, and Sexual Dimorphism at the Gold Mine Site*. B.A. honors thesis, Department of Anthropology, University of Arkansas, Fayetteville.

Walker, Winslow M.
1932a A Reconnaissance of Northern Louisiana Mounds. In *Explorations and Field-Work of the Smithsonian Institution in 1931*, pp. 169–174. Smithsonian Institution, Washington, D.C.

1932b Pre-Historic Cultures of Louisiana. In *Conference on Southern Pre-History*, pp. 42–48. Document of the National Research Council, Washington, D.C.

1933 Trailing the Mound Builders of the Mississippi Valley. In *Explorations and Field-Work of the Smithsonian Institution in 1932*, pp. 77–80. Smithsonian Institution, Washington, D.C.

1934 A Variety of Caddo Pottery from Louisiana. *Journal of the Washington Academy of Sciences* 24(2):99–104.

1935 *A Caddo Burial Site at Natchitoches, Louisiana*. Smithsonian Miscellaneous Collections 94, No. 14.

1936 *The Troyville Mounds, Catahoula Parish, Louisiana*. Bureau of American Ethnology Bulletin 113.

Walthall, John A., Clarence H. Webb, Stephen H. Stow, and Sharon I. Goad
1982 Galena Analysis and Poverty Point Trade. *Mid–Continental Journal of Archaeology* 7:133–148.

Walz, Robert B.
1953 Arkansas Slaveholdings and Slaveholders in 1850. *Arkansas Historical Quarterly* 12:38–74.

Wauchope, Robert
1947 Notes on Little Pecan Island, Louisiana. *American Antiquity* 12:186–188.

Weaver, David C., and James F. Doster
1982 *Historical Geography of the Upper Tombigbee Valley*. Center for the Study of Southern History and Culture, University of Alabama, University, Alabama.

Webb, Clarence H.
1940 House Types Among the Caddo Indians. *Texas Archeological and Paleontological Society Bulletin* 12:49–75.

1944a Stone Vessels from a Northeast Louisiana Site. *American Antiquity* 9(4):386–394.

1944b Dental Abnormalities as Found in the American Indian. *American Journal of Orthodontics and Oral Surgery* 30(9):474–486.

1945 A Second Historic Caddo Site at Natchitoches, Louisiana. *Bulletin of the Texas Archeological and Paleontological Society* 16:52–83.

1946 Two Unusual Types of Chipped Stone Artifacts from Northwest Louisiana. *Bulletin of the Texas Archeological and Paleontological Society* 17:9–17.

1948a Caddoan Prehistory: the Bossier Focus. *Bulletin of the Texas Archeological and Paleontological Society* 19:100–143.

1948b Evidences of Pre-Pottery Cultures in Louisiana. *American Antiquity* 13:227–232.

1959 *The Belcher Mound: A Stratified Caddoan Site in Caddo Parish, Louisiana*. Memoirs of the Society for American Archaeology, No. 16.

1961 Relationships Between the Caddoan and Central Louisiana Sequences. In *Symposium: Relationships Between the Caddoan Area and Neighboring Groups*, edited by E. Mott Davis, pp. 11–25. Texas Archeological Society Bulletin 31.

1963 The Smithport Landing Site: An Alto Focus Component in De Soto Parish, Louisiana. *Bulletin of the Texas Archeological and Paleontological Society* 34:143–187.

1968 The Extent and Content of Poverty Point Culture. *American Antiquity* 33:297–321.

1970a Settlement Patterns in the Poverty Point Culture Complex. In *The Poverty Point Culture*, edited by Bettye J. Broyles and Clarence H. Webb, pp. 3–12. Southeastern Archaeological Conference Bulletin 12.

1970b Intrasite Distribution of Artifacts at the Poverty Point Site, with Special Reference to Women's and Men's Activities. In *The Poverty Point Culture*, edited by Bettye J. Broyles and Clarence H. Webb, pp. 21–34. Southeastern Archaeological Conference Bulletin 12.

1971 Archaic and Poverty Point Zoomorphic Locust Beads. *American Antiquity* 36:105–114.

1977 The Poverty Point Culture. *Geoscience and Man*, Vol. 17.

1981 *Stone Points and Tools of Northwestern Louisiana*. Special Publications of the Louisiana Archaeological Society, No. 1.

1982a The Bellevue Focus: A Marksville–Troyville Manifestation in Northwest Louisiana. In *The Troyville–Baytown Period in Lower Mississippi Valley Prehistory: A Memorial to Robert Stuart Neitzel*, edited by Jon L. Gibson, pp. 251–274. Louisiana Archaeology, Volume 9.

1982b Peer Review. In *Arkansas Archeology in Review*, edited by Neal L. Trubowitz and Marvin D. Jeter, pp. 361–366. Arkansas Archeological Survey Research Series No. 15.

1983 The Bossier Focus Revisited: Montgomery I, Werner, and Other Unicomponent Sites. In *Southeastern Natives and Their Pasts: Papers Honoring Dr. Robert E. Bell*, edited by Don G. Wyckoff and Jack L. Hofman, pp. 183–240. Oklahoma Archeological Survey Studies In Oklahoma's Past, No. 11.

Webb, Clarence H., and Monroe Dodd, Jr.
1939a Bone "Gorget" from a Caddoan Mound Burial. *American Antiquity* 4:265–268.

1939b Further Excavations of the Gahagan Mound: Connections with the Florida Culture. *Bulletin of the Texas Archeological and Paleontological Society* 11:92–127.

1941 Pottery Types from the Belcher Mound Site. *Bulletin of the Texas Archeological and Paleontological Society* 13:88–116.

Webb, Clarence H., and Hiram F. Gregory
1978 *The Caddo Indians of Louisiana*. Louisiana Archaeological Survey and Antiquities Commission Anthropological Studies No. 2.

Webb, Clarence H., James A. Ford, and Sherwood M. Gagliano
n.d. *Poverty Point Culture and the American Formative*. Published ms., Children's Clinic, Shreveport, Louisiana.

Webb, Clarence H., and Ralph R. McKinney
1975 Mounds Plantation (16CD12), Caddo Parish, Louisiana. *Louisiana Archaeology* 2:39–127.

Webb, Clarence H., Forrest E. Murphrey, Wesley G. Ellis, and H. Roland Green
1969 The Resch Site (41HS16), Harrison County, Texas. *Bulletin of the Texas Archaeological Society* 40:3–106.

Webb, Clarence H., Joel L. Shiner, and E. Wayne Roberts
1971 The John Pearce Site (16CD56): A San Patrice Site in Caddo Parish, Louisiana. *Bulletin of the Texas Archaeological Society* 42:1–49.

Webb, Malcolm C.
1982 Preliminary Report on Excavations at an Early Troyville Period Site (16ST6) on the West Pearl River, Louisiana. *Louisiana Archaeology* 9:205–250.

Weber, J. Cynthia
1973a *The Hays Mound 3CL6, Clark County, South-Central Arkansas*. Arkansas Archeological Survey, Fayetteville. Submitted to the National Park Service, Atlanta.

1973b The Paw Paw Site (3OU22): A Report on Excavations in Area Four. Ms. on file, Arkansas Archeological Survey, Fayetteville.

Weinstein, Richard Alan
n.d. Gunboat Landing: A Late Marksville Period Phase in Southeastern Louisiana. Ms. on file, Coastal Environments, Inc., Baton Rouge.

1974 *An Archaeological Survey of the Lower Amite River, Louisiana*. M.A. thesis, Louisiana State University, Baton Rouge.

1981 Meandering Rivers and Shifting Villages: A Prehistoric Settlement Model in the Upper Steele Bayou Basin. *Southeastern Archaeological Conference Bulletin* 24:34–37.

1985 Development and Regional Variation of Plaquemine Culture in South Louisiana. Paper presented at the 6th Mid–South Archaeological Conference, Starkville, Mississippi. Expanded version to be published in a volume edited by Richard Marshall, Mississippi State University.

1986 Tchefuncte Occupation in the Lower Mississippi Delta and Adjacent Coastal Zone. In *The Tchula Period in the Mid–South and Lower Mississippi Valley*, edited by David H. Dye and Ronald C. Brister, pp. 102–127. Mississippi Department of Archives and History Archaeological Reports, No. 17.

Weinstein, Richard A., Eileen K. Burden, Katherine L. Brooks, and Sherwood M. Gagliano
1978 *Cultural Resource Survey of the Proposed Relocation Route of U.S. 90 (LA3052) Assumption, St. Mary, and Terrebonne Parishes, Louisiana*. Coastal Environments, Inc., Baton Rouge. Submitted to Louisiana Office of Highways, Baton Rouge.

Weinstein, Richard A.; Eileen K. Burden, and Sherwood M. Gagliano
1977 Archaeological Phases — Coastal Louisiana. Paper presented at the 3rd Annual Meeting of the Louisiana Archaeological Society, New Orleans.

Weinstein, Richard A., and Sherwood M. Gagliano
1985 The Shifting Deltaic Coast of the Lafourche Country and Its Prehistoric Settlement. In *The Lafourche Country: The People and the Land*, edited by Philip D. Uzee, pp. 122–149. Center for Louisiana Studies, University of Southwestern Louisiana, Lafayette.

Weinstein, Richard A., and David B. Kelley
1984 *Archaeology and Paleogeography of the Upper Felsenthal Region: Cultural Resources Investigations in the Calion Navigation Pool, South-Central Arkansas*. Coastal Environments, Inc., Baton Rouge. Submitted to Vicksburg District U.S. Army Corps of Engineers.

Weinstein, Richard A., and Philip 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 No. 1.

Weinstein, Richard A., Diane E. Wiseman, Laura A. Landry, and Wayne P. Glander
1979 *Environment and Settlement on the Southwestern Louisiana Prairies: A Cultural Resources Survey in the Bayou Mallet Watershed*. Coastal Environments, Inc., Baton Rouge. Submitted to U.S. Soil Conservation Service, Alexandria, LA, and Interagency Archeological Services, Atlanta.

Wesolowsky, Al B.
1974 Investigations at Two Sites in Southeastern Arkansas. *The Arkansas Archeologist* 15:20–26.

West, Frederick Hadleigh
1986 American Antiquity: the Long View. *Quarterly Review of Archaeology* 7(1):11–13.

1987 Migrationism and New World Origins. *Quarterly Review of Archaeology* 8(1):11–14.

Westbury, William A.
1975 *Investigations at Arkansas Post, National Memorial, Arkansas*. Archeology Research Program, Southern Methodist University, Dallas. Submitted to National Park Service, Southwest Division, Santa Fe.

1976 *Archeological Assessment of Arkansas Post*. Archaeology Research Program Report 96, Southern Methodist University, Dallas. Submitted to National Park Service.

Wheat, Joe Ben
1972 *The Olsen–Chubbuck Site: A Paleo–Indian Bison Kill*. Memoirs of the Society for American Archaeology, No. 26.

Wheat, Joe Ben, James C. Gifford, and William W. Wasley
1958 Ceramic Variety, Type Cluster, and Ceramic system in Southwestern Pottery Analysis. *American Antiquity* 24:34–47.

Wheaton, Thomas R., Amy Friedlander, and Patrick W. Garrow
1983 *Yaughan and Cuniboo Plantations: Studies in Afro–American Archaeology*. Soils Systems, Inc., Marietta, Georgia. Submitted to the Southeast Regional Office, Archeological Services Branch, National Park Service, Atlanta.

Whelan, James Patrick, Jr.
1983 *Longfellow–Evangeline State Commemorative Area*. Submitted to Louisiana Office of State Parks. Report on file at the Division of Archaeology.

1986 *A Cultural Resources Survey of the Teacle Cemetery, I–49 – LA–3132 Interchange Project, Caddo Parish, Louisiana*. Coastal Environments, Inc., Baton Rouge. Submitted to Louisiana Department of Transportation and Development.

Whelan, James Patrick, Jr., and Charles E. Pearson
1983 *Longfellow–Evangeline State Commemorative Area*. Coastal Environments, Inc., Baton Rouge. Submitted to Louisiana Office of State Parks.

White, H. F.
1931 *Social and Economic Development in Arkansas Prior to 1836*. Ph.D. dissertation, University of Texas, Austin.

White, Patsy
1970 Investigation of the Cemetery at the Gee's Landing Site. *Arkansas Archeologist* 11:1–20.

1987 The Gordon Site: A Middle Coles Creek to Late Mississippi Period Occupation in Ashley County, Southeast Arkansas. *The Arkansas Archeologist* 25–26: 1–51.

Willey, Gordon R.
1949 *Archaeology of the Florida Gulf Coast*. Smithsonian Miscellaneous Collections, Vol. 113.

Willey, Gordon R., and Philip Phillips
1955 Method and Theory in American Archaeology II: Historical–Developmental Interpretation. *American Anthropologist* 57:723–819.

1958 *Method and Theory in American Archaeology*. University of Chicago Press.

Willey, Gordon R., and Jeremy A. Sabloff
1974 *A History of American Archaeology*. W. H. Freeman & Co., San Francisco.

Willey, P.
n.d. Analysis of Human Bones from Site, (16SB12). Ms. on file, Department of Anthropology, University of Tennessee, Knoxville.

Williams, Stephen
1954 *An Archaeological Study of the Mississippian Culture in Southeast Missouri*. Ph.D. dissertation. Yale University, New Haven.

1956 Settlement Patterns in the Lower Mississippi Valley. In *Prehistoric Settlement Patterns in the New World*, edited by Gordon R. Willey, pp. 52–62. Vicking Fund Publications in Anthropology, No. 23.

1960 Review of "The Belcher Mound" by Clarence H. Webb. *Journal of Archaeology* 64:304–305.

1963 The Eastern United States. In *Early Indian Farmers and Villages and Communities*, edited by William G. Haag, pp. 267–325. Report submitted to National Park Service, Washington, DC.

1964 Interim Statement of Upper Tensas Research 1963–64. Ms. on file, Lower Mississippi Survey, Peabody Museum, Harvard University.

1967 On the Historic Taensa Villages. *Conference on Historic Site Archaeology Papers* 1:2–13.

1978 *Phases of the Lower Mississippi Valley*. Avery Island Conference Document, Lower Mississippi Survey, Peabody Museum, Harvard University.

1979 *Research Resources for Lower Mississippi Valley Archaeology*. Lower Mississippi Survey, Peabody Museum, Harvard University.

1983 *Management Summary: Archaeological Survey of the Northern Boeuf Basin, Louisiana, 1983*. Lower Mississippi Survey, Peabody Museum, Harvard University. Submitted to Louisiana Division of Archaeology, Baton Rouge.

Williams, Stephen, and Jeffrey P. Brain
1983 *Excavations at the Lake George Site, Yazoo County, Mississippi, 1958–1960*. Papers of the Peabody Museum, Harvard University, Vol. 74.

Williams, Stephen, and James B. Stoltman
1965 An Outline of Southeastern United States Prehistory, with Particular Emphasis on the Paleo–Indian Era. In *The Quaternary of the United States*, edited by Herbert E. Wright, Jr. and David G. Fry, pp. 669–683. Princeton University Press.

Williams, Stephen, W. Kean, and E. Alan Toth
1966 *The Archaeology of the Upper Tensas Basin*. Lower Mississippi Survey Bulletin 1. Peabody Museum, Harvard University.

Willingham, Charles G., and Timothy P. Phillips
1987 *Cultural Resources Surveys on the Kisatchie National Forest Louisiana, 1985*. Kisatchie National Forest Reports of Investigations, No. 2.

Wilmsen, Edwin N.
1961 A Suggested Developmental Sequence for House Forms in the Caddoan Area. *Texas Archeological Society Bulletin* 30:35–50.

Wilson, Rex L.
1966 *Archeological Explorations at Arkansas Post, 1966*. Southwest Archeological Center, National Park Service, Globe, Arizona.

Wilson, Thomas
1890 *Ancient Indian Matting — From Petit Anse Island, Louisiana*. Annual Report of the Board of Regents of the Smithsonian Institution for the Year Ending June 30, 1888, pp. 673–75. Washington, D.C.

Wimberly, Steve B.
1953 Bayou La Batre Tchfuncte Pottery Series. In *Prehistoric Pottery of the Eastern United States*, edited by James B. Griffin. Museum of Anthropology, University of Michigan, Ann Arbor.

Winters, John D.
1963 *The Civil War in Louisiana*. Louisiana State University Press, Baton Rouge.

Wiseman, Diane E., and Kathleen G. McCloskey
1979 *Cultural Resources Survey of the Catahoula National Wildlife Regue, LaSalle Parish, Louisiana*. Coastal Environments, Inc., Baton Rouge. Submitted to Interagency Archeological Services, Atlanta.

Wiseman, Diane E., Richard A. Weinstein, and Kathleen G. McCloskey
1979 *Cultural Resources Survey of the Mississippi River–Gulf Outlet, Orleans and St. Bernard Parishes, Louisiana*. Coastal Environments, Inc., Baton Rouge.

Wolf, David J.
1976 *A History of American Archeology*. W. H. Freeman and Company, San Francisco.

1977 Middle Mississippian: A Prehistoric Cultural System Viewed from a Biological Perspective. In *Biocultural Adaptation in Prehistoric America*, edited by Robert L. Blakely, pp. 27–44. Southern Anthropological Society Proceedings 11. University of Georgia, Athens.

Wolfman, Daniel
1982 Archeomagnetic Dating in Arkansas and the Border Areas of Adjacent States. In *Arkansas Archeology in Review*, edited by Neal L. Trubowitz and Marvin D. Jeter, pp. 277–300. Arkansas Archeological Survey Research Series No. 15.

1984 Geomagnetic Dating Methods in Archaeology. In *Advances in Archaeological Method and Theory*, Vol. 7, edited by Michael B. Schiffer, pp. 363–458. Academic Press, New York.

Wood, W. Raymond
1963 The Crenshaw Site: A Coles Creek and Caddoan Mound Group in Miller County, Arkansas. In *Arkansas Archeology 1962*, edited by Charles R. McGimsey III, pp. 1–14. Arkansas Archeological Society, Fayetteville.

1963a A Preliminary Report on the 1962 Excavations at the Crenshaw Site, 3MI6. In *Arkansas Archeology 1962*, edited by C. R. McGimsey III, pp. 114. Arkansas Archeological Survey, Fayetteville.

1963b The Poole Site: Component of the Fourche Maline and Mid–Ouachita Foci in Garland County, Arkansas. Ms. on file, University of Arkansas Museum, Fayetteville.

1963c Two New Projectile Points: Homan and Agee Points. *Arkansas Archeologist* 4(2):1–7.

Woodiel, Deborah Kay
1980a *Excavations at the St. Gabriel Site, Iberville Parish, Louisiana*. Report on file at Louisiana Division of Archaeology, Baton Rouge.

1980b *St. Gabriel. Prehistoric Life on the Mississippi*. M.A. thesis, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

Wright, Herbert E., Jr.
1976 The Dynamic Nature of Holocene Vegetation: A Problem in Paleoclimatology, Biogeography and Stratigraphic Nomenclature. *Quaternary Research* 6: 581–596.

1983 (editor) *Late-Quaternary Environments of the United States, Volume 2: the Holocene*. University of Minnesota Press, Minneapolis.

Wyckoff, Don G.
1984 The Foragers: Eastern Oklahoma. In *Prehistory of Oklahoma*, edited by Robert E. Bell, pp. 119–160. Academic Press, Orlando, FL.

1985 The Packard Complex: Early Archaic, Pre-Dalton Occupations on the Prairie–Woodlands Border. *Southeastern Archaeology* 4:1–26.

Yakubik, Jill–Karen, H. A. Franks, R. C. Goodwin, and C. J. Poplin
1986 *Cultural Resources Inventory of the Bonnet Carre Spillway, St. Charles Parish, Louisiana*. Contract No. DACW29–84–D–0029. R. C. Goodwin and Associates, Inc., New Orleans. Submitted to New Orleans District, U.S. Army Corps of Engineers.

Yakubik, Jill–Karen, Galloway W. Selby, Kenneth R. Jones, Debra Stayner, and Janice Cooper
1985 *An Archaeological and Historic Sites Inventory of Bayou Teche between Franklin and Jeanerette, Louisiana*. R. Christopher Goodwin & Associates, Inc., New Orleans. Submitted to New Orleans District, U.S. Army Corps of Engineers.

Young, D.
1985 An Analysis of the Human Infant Bones Recovered from Coquille, (16JE37), Barataria Unit, Louisiana. Ms. on file, Department of Anthropology, Texas A & M University, College Station.

Zahn, Ellen
1985 *A Social Analysis of the Mortuary Behavior of the Central Caddo in the Great Bend Region: A Regional Approach*. M.A. thesis, University of Arkansas, Fayetteville.

Zinke, Marjorie
1975 *An Analysis of Mississippian Burial Components from the Hazel Site, Poinsett County, Arkansas*. M.A. thesis. University of Arkansas, Fayetteville.

PHASE DATA FOR THE ARKANSAS–LOUISIANA REGION

PHASE	CULTURE	REGION	LOCATION	BC	BC/AD	AD
ADAIS	ADAIS (ADAES) (CADDOANS)	MIDDLE RED	C LA			1720-1835
ADAMS	MISSISSIPPIAN	W. LOWLANDS	NE AR			900-1150
ALLIGATOR BAYOU	SAN PATRICE	CATAHOULA	E LA	7500-7000		
ALLIGATOR POINT	HOPEWELLIAN? "PLAINWARE"?	BARTHOLOMEW-MACON	SE AR		100-400?	
ALMA BROWN	"PLAINWARE"?	BARTHOLOMEW-MACON	SE AR			200-400?
ALTO (ALTO-GAHAGAN)	CADDO I	NECHES VALLEY, MIDDLE RED, GREAT BEND	NE TX, NW LA, SW AR			700-1200?
AMITE RIVER	LATE ARCHAIC	FLORIDA PARISHES	SE LA, S MS	3500-1500?		
ATKINS[1]	TROYVILLE (LATE?)	LOWER OUACHITA	NE LA			750-900?
BALLINA	COLES CREEK	UPPER TENSAS	NE LA			750-900?
BALMORAL	COLES CREEK	UPPER TENSAS, NATCHEZ	NE LA, W MS			900-1050
BAPTISTE (HUDSON)	ISSAQUENA	LOWER RED	E LA			200-400?
BARATARIA	PLAQUEMINE	E. DELTA	SE LA			1220-1500
BARNES (SEE DUNKLIN)	UNCERTAIN	E. LOWLANDS	NE AR, SE MO			400-700
BARTHOLOMEW	PLAQUEMINE	BARTHOLOMEW-MACON	SE AR			1100-1400
BAYOU CHENE	UNDEFINED (ATTAKAPA?)	CHENIER PLAIN	SW LA			1200-1700
BAYOU CUTLER	COASTAL COLES CREEK	PONTCHARTRAIN-E. DELTA	SE LA			700-850
BAYOU JASMINE (CF. GARCIA)	POVERTY POINT (EARLY)	PONTCHARTRAIN	SE LA	1500-1000?		
BAYOU LUCE	MIDDLE ARCHAIC (EARLY?)	MIDDLE RED RIVER	C LA	6000-4000?		
BAYOU PETRE	MISSISSIPPIAN (PENSACOLA) (ETHNICITY?)	PONTCHARTRAIN-GULF COAST	SE LA			1200-1700
BAYOU RAMOS	COASTAL COLES CREEK	E. DELTA	SE LA			850-1000
BAYTOWN	BAYTOWN	WHITE RIVER LOW-LAND, LOWER WHITE, E. LOWLANDS	E AR			400-700
BEAU MIRE (LATE?)	INLAND TCHEFUNCTE	E. DELTA	SE LA		250-0?	
BELCHER	CADDO IV	GREAT BEND	NW LA, SW AR			1500-1700

PHASE	CULTURE	REGION	LOCATION	BC	BC/AD	AD
BELLAIRE	PLAQUEMINE	BARTHOLOMEW-MACON	SE AR			1100-1400
BELLEVUE	FOURCHE MALINE 3-4	GREAT BEND	NW LA, SW AR		100-400	
BENNETT LANDING[2]	PLAQUEMINE	LOWER RED	E LA			1350-1500
BIG CREEK	LATE ARCHAIC (EARLY)	NE ARKANSAS	NE AR	3000-2000		
BIG LAKE	MISSISSIPPIAN	EASTERN	NE AR, SE MO			800-1000
BLACK CAMP[3]	PLAQUEMINE	CATAHOULA BASIN	E LA			1200-1300
BLACK LAKE	TROYVILLE ("DEASONVILLE?")	MIDDLE RED	C LA			400-600?
BLACK RIVER	TROYVILLE	LOWER RED	E LA			300-450
BODCAW	INLAND TCHEFUNCTE (LATE?) (WITH FOURCHE MALINE INFLUENCE)	CATAHOULA BASIN	E LA		200-0?	
BOOTHE	INLAND TCHEFUNCTE	LOWER OUACHITA	NE LA	600-200?		
BORDELON	COLES CREEK	LOWER RED	E LA			700-900
BOSSIER	CADDO III	GREAT BEND	NW LA, SW AR			1400-1500
BOTSFORD	LATE ARCHAIC (AND POVERTY POINT?)	BARTHOLOMEW-MACON	SE AR	3000-500		
BOWMAN 1	FOURCHE MALINE 7	GREAT BEND	SW AR			700-900
BOWMAN 2	CADDO I	GREAT BEND	SW AR			900-1200
BRIAR BEND	MARKSVILLE (EARLY)	MIDDLE RED	C LA		100-100?	
BUCKSKULL	LATE WOODLAND (EMERGENT MISSISSIPPIAN?)	W LOWLANDS, OZARKS	SE MO, NO AR			700-800?
BURK HILL	PLAQUEMINE	PETITE ANSE	SC LA			1200-1600
BURKETT	"BURKETT"?	E. LOWLANDS	SE MO, NE AR		500-0	
CALION	POVERTY POINT	FELSENTHAL	SC AR	1500-500		
CAMPUS	COLES CREEK	MIDDLE RED	C LA			900-1000
CANEBRAKE	MISSISSIPPIAN? (ETHNICITY?)	TENSAS BASIN	NE LA			1500-1700
CANEY	POVERTY POINT	CATAHOULA BASIN	E LA	1500-500		
CANEY BAYOU	UNCERTAIN (KOROA?)	FELSENTHAL	SC AR			1500-1700
CATAHOULA[4]	LATE ARCHAIC	CATAHOULA-LOWER RED	E LA	3500-1500		
CHAKANINA	CADDO V (KADOHADACHO)	GREAT BEND	SW AR			1700-1800
CHERRY VALLEY	MISSISSIPPIAN	W. LOWLANDS	NE AR			1050-1150
CHEVALIER	COLES CREEK	CATAHOULA	E LA			900-1000
COON ISLAND	INLAND TCHEFUNCTE	FELSENTHAL	SE AR		500-0	
COPELL	LATE ARCHAIC	CHENIER PLAIN	SW LA	3000-1000		
CORAL SNAKE	MARKSVILLE?	SABINE VALLEY	W LA		100-100	
COW MOUND	HOPEWELLIAN? "PLAINWARE"?	WHITE RIVER-W. LOWLANDS	NE AR			0-400?

PHASE	CULTURE	REGION	LOCATION	BC	BC/AD	AD
CRAWFORD	COLES CREEK (EARLY?)	LOWER OUACHITA	NE LA			900-1000
CRENSHAW	FOURCHE MALINE 7	GREAT BEND	SW AR			700-900
CROOKS (CF. MARKSVILLE)	MARKSVILLE	CATAHOULA BASIN	E LA		200-200?	
CROSS BAYOU	INLAND TCHEFUNCTE	CATAHOULA BASIN	E LA	600-300		
CRYER	CADDO II OR CADDO III?	GREAT BEND	SW AR			1200-1500
CRYSTAL MOUNTAIN	MIDDLE ARCHAIC	OUACHITA MOUNTAINS, MIDDLE OUACHITA	SC AR	4000-3000?		
CYPRESS SWAMP	UNCERTAIN (COLES CREEK?)	FELSENTHAL	SC AR			900-1000
DELTA NATCHEZAN	PLAQUEMINE-BAYOGOULA-CHITIMACHA	E. DELTA	SE LA			1500-1750
DEYAMPERT	PLUM BAYOU	BARTHOLOMEW-MACON	SE AR			700-1000
DOOLEY BEND	PLUM BAYOU	ARKANSAS RIVER LOWLAND	C AR			500-600
DORCHEAT	BIG CREEK	FELSENTHAL, MIDDLE OUACHITA, OUACHITA MOUNTAINS	SC AR	3000-2000?		
DORTCH BEND	PLUM BAYOU	ARKANSAS RIVER LOWLAND	C AR			600-750
DRY BAYOU	BAYTOWN?	BARTHOLOMEW-MACON	SE AR			400-700
DUCK SLOUGH	PALEO-INDIAN	CATAHOULA BASIN	E LA	10,000-8500		
DUNKLIN (BARNES)	UNCERTAIN (LATE WOODLAND?)	E. LOWLANDS	NE AR, SE MO			400-700
DUTCHMAN'S GARDEN	FOURCHE MALINE 6	MIDDLE OUACHITA	SC AR			500-700
FIELD BAYOU	FOURCHE MALINE 2	GREAT BEND	SW AR	500-100		
FITZHUGH	PLAQUEMINE	UPPER TENSAS	NE LA			1400-1500
FORT ADAMS	TROYVILLE	LOWER RED	E LA			450-600
FOURCHE DE MAS	MISSISSIPPIAN	W. LOWLANDS, OZARKS	NE AR SE MO	3000-1500		
FREDERICKS	ISSAQUENA	MIDDLE RED	C LA			100-400?
FRIERSON	LATE ARCHAIC	W. LOWLANDS, ADJACENT UPLANDS	NE AR	3000-1500		
GARCIA	POVERTY POINT (LATE)	PONTCHARTRAIN	SE LA	1000-500?		
GLENDORA	UNCERTAIN (MISSISSIP-PIAN AND/OR CADDOAN ETHNIC GROUPS	OUACHITA-BARTHOLOMEW	NE LA			1500-1750
GORUM	MIDDLE & LATE ARCHAIC	MIDDLE RED	C LA	4000-2000?		
GORUM-CHEVALIER (CF. CHEVALIER)	COLES CREEK	CATAHOULA BASIN	E LA			900-1000
GRAMPUS	LAKE CORMORANT?	BARTHOLOMEW-MACON	SE AR	500-100?		
GRAN MARAIS	UNCERTAIN (PLAQUEMINE?)	FELSENTHAL	SC AR			1200-1400

PHASE	CULTURE	REGION	LOCATION	BC	BC/AD	AD
GRAND COTE	COLES CREEK? (EARLY?)	LOWER RED	E LA			600-750?
GRAND LAKE	COASTAL TCHEFUNCTE	CHENIER PLAIN	SW LA	500-0		
GRAVES CHAPEL	CADDO II	LITTLE RIVER	SW AR			1200-1400
GREENBRIER	MISSISSIPPIAN	WHITE RIVER LOWLAND	NE AR			1350-1650
GREENHOUSE	COLES CREEK	LOWER RED	E LA			900-1100
GUNBOAT LANDING	COASTAL MARKSVILLE OR ISSAQUENA?	E. DELTA	SE LA			200-400?
HALEY	CADDO II	GREAT BEND	SW AR			1200-1500
HANNA	CADDO I	MIDDLE RED	C LA			1000-1150
HARRELSON LANDING	TROYVILLE (EARLY?)	LOWER OUACHITA	NE LA			600-750?
HAYTI	MISSISSIPPIAN	E. LOWLANDS	NE AR, SE MO			800-1000
(HEAD)	(SEE JOHNSON)					
HEGWOOD	“PLAINWARE”	BOEUF BASIN	NE LA			200-400?
HELENA	HOPEWELLIAN	E. LOWLANDS-ST. FRANCIS, ETC.	E AR, NW MS		100-200?	
HOG LAKE	MISSISSIPPIAN (TUNICAN?)	BARTHOLOMEW-MACON	SE AR			1400-1650
HOGBACK RIDGE	EARLY ARCHAIC	CATAHOULA BASIN	E LA	C. 6000?		
HOLLY BEACH	UNCERTAIN (COLES CREEK-PLAQUEMINE?)	CHENIER PLAIN	SW LA			1000-1200
HUGO	POVERTY POINT?	LOWER WHITE RIVER	E AR	1500-500		
HYNEMAN	MISSISSIPPIAN	E. LOWLANDS	NE AR			900-1150
INDIAN BAYOU	TROYVILLE	UPPER TENSAS	NE LA			300-450
iSSAQUENA	ISSAQUENA	UPPER TENSAS, CATAHOULA BASIN NATCHEZ-YAZOO	NE LA, E LA, W MS			150-300?
JEFF DAVIS	UNCERTAIN (COASTAL COLES CREEK?)	CHENIER PLAIN	SW LA			850-1000
JEFFERSON ISLAND	UNCERTAIN (COASTAL MARKSVILLE?)	PETITE ANSE	SC LA			1-200
JOHNSON (HEAD)	“PLAINWARE”	UPPER TENSAS	NE LA			200-400?
JORDON	MISSISSIPPIAN (KOROA?)	BOEUF BASIN, OUACHITA-BARTHOLOMEW	NE LA			1550-1675
KENT	MISSISSIPPIAN	E. LOWLANDS-ST. FRANCIS	NE AR			1350-1600
KING	MARKSVILLE	LOWER OUACHITA	NE LA		100-200?	
KINNAIRD	UNCERTAIN	BOEUF BASIN	NE LA			1400-1550
LABRANCHE	UNCERTAIN (COASTAL MARKSVILLE?)	PONTCHARTRAIN	SE LA		100-200?	
LACASSINE	UNCERTAIN (COASTAL MARKSVILLE?)	CHENIER PLAIN	SW LA			1-200?
LAFAYETTE	INLAND TCHEFUNCTE	TECHE-MISSISSIPPI	SC LA	500-0		

PHASE	CULTURE	REGION	LOCATION	BC	BC/AD	AD
LAKE ARTHUR	UNCERTAIN (COASTAL ISSAQUENA?)	CHENIER PLAIN	SW LA			200-400?
L'ANGUILLE	DALTON	E. LOWLANDS, W. LOWLANDS	NE AR, SE MO	8500-7500		
LAWHORN	MISSISSIPPIAN	E. LOWLANDS	NE AR, SE MO			1250-1350
LAWTON	CADDOAN GROUPS	MIDDLE RED	C LA			1690-1835
LEMOINE	COLES CREEK? (EARLY?)	MIDDLE RED	C LA			700-800?
LENA	INLAND TCHEFUNCTE	MIDDLE RED	C LA	500-100		
LITTLE PECAN	VARIOUS TRIBES (ATTAKAPA?)	CHENIER PLAIN	SW LA			1700-1800
LOST BAYOU	FOURCHE MALINE 2	MIDDLE OUACHITA	SC AR	500-100		
LOST PRAIRIE	CADDO I	GREAT BEND	SW AR			900-1100
MACON RIDGE	DALTON	MACON RIDGE	NE LA, SE AR	8500-7500		
MAGNOLIA	UNCERTAIN (COASTAL ISSAQUENA?)	E. DELTA	SE LA			200-400
MALDEN PLAIN	MISSISSIPPIAN	E. LOWLANDS (WEST MARGIN)	SE MO, NE AR			900-1100
MANDALAY	UNCERTAIN (COASTAL MARKSVILLE-ISSAQUENA)	TECHE-MISSISSIPPI	SC LA			0-400?
MANNON[1]	TROYVILLE OR ISSAQENA?	CATAHOULA BASIN	E LA			500-700?
MARSDEN	TROYVILLE	UPPER TENSAS	NE LA			450-600
MARKSVILLE	MARKSVILLE	LOWER RED-CATAHOULA BASIN	E LA		100-150?	
MASSEY	HOPEWELLIAN?	LOWER WHITE RIVER	EAR		100-400?	
MAYES[5]	PLAQUEMINE	LOWER RED-(CATAHOULA BASIN)	E LA			1200-1400?
MCGUFFEE	PLAQUEMINE	LOWER OUACHITA	NE LA			1200-1300
MCNEELY	COLES CREEK	MIDDLE RED	C LA			800-900?
MEDORA	PLAQUEMINE	EASTERN DELTA	SE LA			1200-1500
MID-OUACHITA	CADDO (II-III?)	MIDDLE OUACHITA	SC AR			1200-1450?
MILLER'S CROSSING	CADDO I	LITTLE RIVER	SW AR			900-1200
MINERAL SPRINGS	CADDO II	LITTLE RIVER	SW AR			1200-1400
MORGAN	COASTAL COLES CREEK	PETITE ANSE	SC LA			900-1000
MOUNT BAYOU	PALEO-INDIAN	CATAHOULA BASIN	E LA	C. 8000?		
MYATT'S LANDING	PLAQUEMINE	OUACHITA	NE LA			1400-1500
NODENA	MISSISSIPPIAN	E. LOWLANDS-MISSISSIPPI RIVER	NE AR			1400-1600
OAK GROVE	FOURCHE MALINE 4	MIDDLE OUACHITA	SC AR			200-400
O'BRYAN RIDGE (WEONA)	UNCERTAIN (POVERTY POINT?)	E. LOWLANDS-CAIRO LOWLAND	NE AR, SE MO	1500-500		
OLD CREEK	TROYVILLE (LATE?)	LOWER OUACHITA	NE LA			600-700?

PHASE	CULTURE	REGION	LOCATION	BC	BC/AD	AD
OLD MARTIN	FOURCHE MALINE 7	LITTLE RIVER	SW AR			700-900
OLD RIVER	COLES CREEK (MIDDLE?)	CATAHOULA BASIN	E LA			1000-1100
OLD TOWN	MISSISSIPPIAN	LOWER WHITE	E AR			1400-1600
OPEN BRAKE	COLES CREEK (LATE?)	CATAHOULA BASIN	E LA			1000-1100
PANTHER LAKE	TCHEFUNCTE	UPPER TENSAS	NE LA	300-100		
PARGOUD	PLAQUEMINE	OUACHITA	NE LA			1300-1400
PARKIN	MISSISSIPPIAN	E. LOWLANDS-ST. FRANCIS	NE AR			1350-1600
PASCOLA	“BURKETT”?	E. LOWLANDS	NE AR, SE MO	500-100?		
PATTESON	PALEO-INDIAN	W. LOWLANDS AND ADJACENT UPLANDS	NE AR	10,000-8,500		
PEARL RIVER	LATE ARCHAIC	E. DELTA-PONTCHARTRAIN	SE LA, S MS	3000-1500		
PEMISCOT BAYOU	MISSISSIPPIAN	E. LOWLANDS	SE MO, NE AR			1150-1400
PETE GREEN	TROYVILLE-COLES CREEK?	CATAHOULA	E LA			500-800?
PETITE ANSE	MISSISSIPPIAN (ETHNICITY?)	PETITE ANSE	SC LA			1600-1700
(PLUM MOUNDS)	(SEE WILEY)					
POINT LAKE	MARKSVILLE	UPPER TENSAS	NE LA		100-200?	
PONTCHARTRAIN	COASTAL TCHEFUNCTE	E. DELTA-PONTCHARTRAIN	SE LA	500-250		
POVERTY POINT	POVERTY POINT	UPPER TENSAS-BAYOU MACON	NE LA	1500-500		
POWERS	MISSISSIPPIAN	W. LOWLANDS-BLACK RIVER	SE MO, NE AR			1250-1400
PRESTON	COLES CREEK (TRANSITIONAL)	UPPER TENSAS	NE LA			1050-1200
PRITCHARD LANDING	COLES CREEK	LOWER OUACHITA	NE LA			1000-1100
QUAPAW	MISSISSIPPIAN-QUAPAW	ARKANSAS RIVER LOWLAND	E AR			1600-1750
RABBIT ISLAND	POVERTY POINT	TECHE-MISSISSIPPI	SC LA	1500-500		
RHINEHART	ISSAQUENA	CATAHOULA BASIN	E LA			200-500
RISON	BIG CREEK (EARLY LATE ARCHAIC)	FELSENTHAL	SC AR	3000-1500		
ROANOKE	UNDEFINED	CHENIER PLAIN	SW LA			400-700
ROUTH	PLAQUEMINE	UPPER TENSAS	NE LA			1100-1400
ROUTON	COLES CREEK (LATE?)	LOWER OUACHITA	NE LA			1100-1200?
RUSSELL LANDING	INLAND TCHEFUNCTE	LOWER TENSAS-OUACHITA-RED	NE LA, E LA	500-100?		
SABINE LAKE	COASTAL TCHEFUNCTE	CHENIER PLAIN	SW LA	400-100?		
ST. GABRIEL	UNCERTAIN (COLES CREEK-PLAQUEMINE?)	E. DELTA	SE LA			1000-1200
SANDY BAYOU[5]	TROYVILLE?	LOWER OUACHITA	NE LA			600-700?

PHASE	CULTURE	REGION	LOCATION	BC	BC/AD	AD
SANSON	PLAQUEMINE	LOWER RED-CATAHOULA BASIN	E LA			1350-1450
SCATTERS	MISSISSIPPIAN	W. LOWLANDS, OZARKS	NE AR, SE MO			800-900?
SMALL SLOUGH	UNCERTAIN (COLES CREEK?)	FELSENTHAL	SC AR			800-900
SMITHFIELD	COASTAL MARKSVILLE?	E. DELTA	SE LA			1-200?
SPOON BEND	TOM'S BROOK (MIDDLE ARCHAIC)	FELSENTHAL	SC AR	5000-4000?		
SPRING BAYOU	COLES CREEK (TRANSITIONAL)	LOWER RED	E LA			1050-1200
STEELE BEND	PLUM BAYOU	ARKANSAS RIVER LOWLAND	C AR			750-900
STRICKLAND	ISSAQUENA	LOWER OUACHITA	NE LA			200-400
SUNDOWN	COLES CREEK	UPPER TENSAS, NATCHEZ	NE LA, SW MS			600-750
TAENSA	TAENSA (AND OTHER GROUPS?)	UPPER TENSAS	NE LA			1500-1750
TAPALCAT (CF. ALTO)	CADDO I	UPLANDS ADJACENT TO MIDDLE RED RIVER	C LA			1000-1100
TEXARKANA	CADDO IV	GREAT BEND	SW AR, NE TX			1500-1700
THREE BAYOU	UNDEFINED (COLES CREEK-PLAQUEMINE?)	PETITE ANSE	SC LA			1000-1200
TILLAR	MISSISSIPPIAN (TUNICAN?)	BARTHOLOMEW-MACON	SE AR			1400-1650
TOLTEC	PLUM BAYOU	ARKANSAS RIVER LOWLAND	C AR			500-1000
TRANSYLVANIA	MISSISSIPPIAN	UPPER TENSAS	NE LA			1500-1650
TRICHEL	ISSAQUENA	MIDDLE RED	C LA			100-400
TROYVILLE[7]	TROYVILLE	CATAHOULA BASIN	E LA			400-700
TURNAGE	UNCERTAIN (SAND TEMPERED)	E. LOWLANDS-LITTLE RIVER	NE AR		100-100?	
VEAZEY	UNCERTAIN (COASTAL ISSAQUENA?)	PETITE ANSE	SC LA		200-400	
WALLS	MISSISSIPPIAN	MISSISSIPPI RIVER	NW MS, MEMPHIS, NE AR			1400-1550
WALNUT BEND	UNCERTAIN	E. LOWLANDS-ST. FRANCIS	NE AR			700-1000?
WALTERS	LATE ARCHAIC	LOWER OUACHITA	NE LA	3500-1500		
WELLS	NON-CADDOAN	MIDDLE RED	C LA			1790-1840
WELSH	COASTAL COLES CREEK?	CHENIER PLAIN	SW LA			700-850?
(WEONA)	(SEE O'BRYAN RIDGE)					
WHITE LAKE	COASTAL COLES CREEK?	PETITE ANSE	SC LA			700-900
WHITE OAK	MIDDLE-LATE ARCHAIC	OUACHITA MOUNTAINS, MIDDLE OUACHITA	SC AR	3500-2500		

PHASE	CULTURE	REGION	LOCATION	BC	BC/AD	AD
WHITEHALL	UNDEFINED (COASTAL TROYVILLE?)	E. DELTA PONTCHARTRAIN	SE LA			400-700
WHITEY'S RIDGE	MIDDLE ARCHAIC	CATAHOULA BASIN	E LA	C. 5000		
WILD HOG	COLES CREEK-PLAQUEMINE	CATAHOULA BASIN	E LA			1150-1250
WILEY (PLUM MOUNDS)	COLES CREEK	CATAHOULA BASIN	E LA			800-1000?
WILMOT	MISSISSIPPIAN	BARTHOLOMEW-MACON	SE AR, NE LA			1400-1600?
WILSON	MISSISSIPPIAN	W. LOWLANDS-CACHE RIVER	NE AR			1150-1350?
YOUNG'S BAYOU	LATE ARCHAIC (CF. POVERTY POINT)	MIDDLE RED	C LA	2000-750?		

[1]Gregory et al. 1987:91 suggest lumping into Pete Green phase.

[2]Gregory et al. 1987:90 suggest early Plaquemine immediately post-Coles Creek.

[3]Gregory et al. 1987:90 suggest lumping under Bennett Landing phase.

[4]Formerly defined as the Poverty Point phase for this region; replaced by Caney phase.

[5]Gregory et al. 1987:90 suggest this as a complex within Sanson phase.

[6]0nly seen on Tommy Birchett's chart(?).

[7]Gregory et al. 1987:92 suggest it as a late phase of Marksville,

PREHISTORIC ARCHEOLOGICAL COMPONENTS OF LOUISIANA

Parishes	Paleo Indian	Arch	Pov Point	Tche-functe	Mark	Troyvl Col Crk	Plaq-mine	Miss	Caddo	Hist Cont	Tot Com
Acadia	1	6			1	2					10
Allen		3			1	2					6
Ascension				1		1				1	3
Assumption					2	15	6	1			24
Avoyelles		3	1	1	10	13	11	3		4	46
Beauregard	4					1				1	6
Bienville	1	10				3			18		32
Bossier	12	34			6	3			61		116
Caddo	19	52			2	10			35		118
Calcasieu		1		4	9	43				1	58
Caldwell						3		2	4		9
Cameron		1		11	4	23	5	3			47
Catahoula	1	18	3	7	30	48	8	3	1	4	123
Claiborne		2				1			5		8
Concordia			1	1	4	12	2	2			22
DeSoto	5	11			1	3		1	17	4	42
E. Baton R.	1	2		1	2	2	1	1			10
E. Carroll		1	3		3	9	1	3			20
E. Feliciana	1	5				2		1			9
Evangeline	1	6									7
Franklin	10	3			9	12					34
Grant	1	5		1	1	5				2	15
Iberia	1	4	7	4	6	27	17	7			51
Iberville			2	1	2	7					12
Jackson		1									1
Jefferson				7	8	36	8	16		1	76
Jeff. Davis		2			l	12	5				20
Lafayette		6	4	4	3	4	3				24
Lafourche				1	1	16	6	8			32
LaSalle	2	12	2	2	12	17	15		7	1	70
Lincoln											0
Livingston		4	1	1	3	1		1			11
Madison			2	1	9	21	7	5			45
Morehouse		6	3			4					13
Natchitoches	3	30			2	11			25	12	83
Orleans			1	10	4	8		5		1	29
Ouachita	1	24	7		3	24	13	14	11	3	100
Plaquemines						2	1				3
Pt. Coupee						7	8				15
Rapides	4	35				4	1	1	4	4	53

Parishes	Paleo Indian	Arch	Pov Point	Tche-functe	Mark	Troyvl Col Crk	Plaq-mine	Miss	Caddo	Hist Cont	Tot Com
Red River		13			3	4			14		34
Richland	3	72	2	5	2	32	3		1	1	121
Sabine	4	1									5
St. Bernard					1	5	5	7			18
St. Charles				1	2	4	4	7			18
St. Helena		13				1					14
St. James											0
St. John Bap			1	1		1				2	5
St. Landry	1	6	1	3	2	18	12			2	45
St. Martin			1	2	1	8	3	2			18
St. Mary			2	5	3	33	15	2			60
St. Tammany		3	1	5		4				1	14
Tangipahoa		7	1			3	1				12
Tenses					7	13	8	2		1	31
Terrebonne					3	10	12	1		1	27
Union		1			1	2			3	1	8
Vermilion		1		4	7	23	16	3			54
Vernon		11									11
Washington		33		3	2	4		1			43
Webster	2	14			2	3		1	7		29
W. Baton R.											0
W. Carroll	6	15	13	1	4	8					47
W. Feliciana		1		1	1	4	1			4	12
Winn		1			1	1		1	1		5
TOTAL	70	490	62	89	181	595	217	108	214	55	2034

Archeological sites current to 1983

CULTURAL RESOURCES AND NATIONAL REGISTER SITES FOR THE HISTORIC PERIOD IN LOUISIANA

Parishes	Explor Colonz	Ante-Bellum	War & Afterm	Induszn & Moderniz	Total Hist Components	Total Sites	National Register
Acadia		1	2	5	8	33	2
Allen					0	15	1
Ascension		1	8	10	19	33	8
Assumption		3	3	4	10	43	4
Avoyelles	2	1	3	17	23	78	10
Beauregard			1	1	2	47	1
Bienville		8	7	15	30	74	2
Bossier		1	3	14	18	106	2
Caddo		1	3	34	38	137	16
Calcasieu			2	2	4	117	4
Caldwell		3	1	22	26	51	3
Cameron	2	2	2	2	8	86	1
Catahoula		7	9	32	48	287	4
Claiborne				5	5	27	2
Concordia		3	6	24	33	127	5
DeSoto		4	6	141	151	215	7
E. Baton R.	1	4	10	2	17	50	28
E. Carroll		4	5	42	51	117	3
E. Feliciana		7	9	13	29	56	16
Evangeline				2	2	48	1
Franklin		2		3	5	84	5
Grant				13	13	80	1
Iberia		5	4	3	12	82	10
Iberville	1	2	5	5	13	33	9
Jackson				1	1	6	0
Jefferson	3	9	8	17	37	124	6
Jeff. Davis					0	35	2
Lafayette	2	3	2	1	8	26	8
Lafourche	1	3	3		7	72	8
LaSalle				2	2	98	2
Lincoln		1			1	7	4
Livingston		1	1	5	7	49	2
Madison		2	1	32	35	149	2
Morehouse				4	4	56	2
Natchitoches	7	9	10	21	47	154	12
Orleans	6	20	22	6	54	76	81
Ouachita	2	8	4	30	44	168	9
Plaquemines	5	10	13	28	56	80	4
Pt. Coupee		6	8	12	26	49	13
Rapides	1	4	11	31	47	262	24
Red River		3	11	88	102	217	1
Richland		1	3	2	6	119	0
Sabine					0	30	3

Parishes	Explor Colonz	Ante-Bellum	War & Afterm	Induszn & Moderniz	Total Hist Components	Total Sites	National Register
St. Bernard	8	13	6	15	42	117	3
St. Charles	5	7	7	3	22	41	2
St. Helena		4	9	16	29	78	2
St. James	1	9	17	12	39	28	4
St. John Bap		2	6	9	17	20	2
St. Landry		1	3	6	10	56	20
St. Martin				1	1	42	9
St. Mary		1	2	3	6	119	15
St. Tammany		2	2	1	5	74	9
Tangipahoa				1	1	49	17
Tensas		1	5	9	15	88	7
Terrebonne		2	4	26	32	147	5
Union				9	9	41	2
Vermilion					0	52	1
Vernon				30	30	228	1
Washington		1	2	2	5	101	9
Webster				2	2	45	3
W. Baton R			1		1	7	1
W. Carroll					0	59	1
W. Feliciana		3	2	4	9	34	18
Winn				7	7	24	2
TOTAL	47	185	252	847	1331	5253	461

Archeological sites current to 1983

National Register Sites current 1984

PREHISTORIC ARCHEOLOGICAL COMPONENTS OF ARKANSAS (Raw Data)

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	E WOODLAND	M WOODLAND	BAYTOWN	COLES CR	E CADDO	M CADDO	HIST CADDO	PLAQU	E MISSISSIPPIAN	MISSISSIPPIAN	PROTOHIS	Row totals
Arkansas	1	2	9	0	0	0	6	15	6	0	0	0	0	10	25	4	78
Ashley	0	1	38	6	0	9	7	35	29	2	0	0	25	4	18	0	174
Baxter	0	1	41	0	0	1	0	0	0	0	0	0	0	0	16	0	59
Benton	3	10	97	0	0	12	1	1	0	5	1	0	0	0	33	1	164
Boone	4	10	93	0	0	2	0	0	0	0	0	0	0	0	36	0	145
Bradley	1	3	37	6	2	6	5	7	18	1	3	0	17	3	14	0	123
Calhoun	2	1	39	7	6	7	8	5	9	11	1	0	1	12	19	0	128
Carroll	3	4	47	0	0	1	0	0	0	3	0	0	0	0	11	0	69
Chicot	0	4	16	1	0	4	2	4	4	0	0	0	1	2	11	0	49
Clark	0	5	100	0	41	3	7	0	4	87	3	1	1	1	6	1	260
Clay	4	28	202	2	0	5	3	31	0	0	0	0	0	8	84	2	369
Cleburne	1	1	19	0	0	0	0	0	1	0	0	0	0	0	22	0	44
Cleveland	1	2	23	4	0	0	1	1	2	6	1	0	0	1	4	0	46
Columbia	2	0	32	3	9	0	1	0	2	21	1	0	0	0	5	1	77
Conway	2	1	49	0	0	8	6	6	2	0	0	0	0	0	36	0	110
Craighead	11	16	323	0	0	3	6	77	0	0	0	0	0	19	137	1	593
Crawford	3	1	102	0	4	4	0	7	0	2	0	0	0	0	33	1	157
Crittenden	0	0	24	12	0	27	4	39	2	0	0	0	0	50	56	0	214
Cross	4	2	30	0	0	6	3	15	0	0	0	0	0	5	10	0	75
Dallas	0	1	8	0	6	0	0	0	0	11	0	0	0	0	7	0	33
Desha	0	0	8	2	0	2	6	10	5	1	0	0	2	2	10	1	49
Drew	0	3	72	1	0	9	11	21	10	1	0	0	29	8	36	2	203
Faulkner	0	2	20	0	0	0	1	2	2	0	0	0	0	0	9	0	36
Franklin	0	1	32	0	1	1	0	0	0	0	0	0	0	0	15	0	50
Fulton	0	0	25	0	0	0	0	0	0	0	0	0	0	0	3	0	28
Garland	1	2	35	0	4	0	0	0	0	22	1	0	0	1	3	0	69
Grant	0	5	6	0	6	0	1	0	1	8	0	0	0	0	3	0	30
Greene	1	8	175	2	0	1	1	13	0	0	0	0	0	7	47	5	260
Hempstead	3	2	69	0	29	0	2	1	1	69	2	0	0	0	0	0	178
Hot Spring	3	4	60	0	22	1	3	0	0	48	5	0	0	0	8	0	154
Howard	3	1	62	0	2	1	1	0	1	14	1	0	0	0	0	0	86
Independence	1	0	105	1	0	1	0	5	0	0	0	0	0	1	47	0	161
Izard	0	0	19	0	0	0	0	0	0	0	0	0	0	2	10	1	32
Jackson	3	11	147	0	0	5	2	27	0	0	0	0	0	16	39	0	250
Jefferson	0	9	59	1	0	3	13	12	15	3	0	0	2	1	8	2	128
Johnson	0	0	39	0	1	1	0	0	0	1	0	0	0	0	9	0	51
Lafayette	3	2	121	1	60	4	1	0	2	70	14	9	0	0	0	2	289

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	E WOODLAND	M WOODLAND	BAYTOWN	COLES CR	E CADDO	M CADDO	HIST CADDO	PLAQU	E MISSISSIPPIAN	MISSISSIPPIAN	PROTOHIS	Row totals
Lawrence	3	15	232	0	0	2	2	14	0	0	0	0	0	14	80	1	363
Lee	0	1	11	0	0	1	3	23	3	0	0	0	0	2	27	3	74
Lincoln	1	5	35	4	0	3	5	4	9	0	0	0	1	0	8	3	78
Little River	0	0	8	0	6	0	0	0	1	13	1	0	0	0	0	0	29
Logan	0	2	36	0	0	0	0	1	0	1	0	0	0	0	17	0	57
Lonoke	0	4	137	2	0	7	1	6	24	1	0	0	0	0	15	0	197
Madison	1	4	43	0	0	7	3	15	0	4	0	0	0	0	34	1	112
Marion	1	2	56	0	0	0	0	1	0	0	0	0	0	0	29	0	89
Miller	6	3	163	0	66	0	0	0	1	45	4	1	1	0	1	5	296
Mississippi	1	0	20	0	0	4	4	54	0	0	0	0	0	32	110	1	226
Monroe	0	3	12	0	0	0	1	19	3	0	0	0	0	1	10	1	50
Montgomery	3	2	73	0	10	1	0	0	0	13	3	0	1	0	2	0	108
Nevada	1	1	12	0	4	0	5	2	3	33	1	0	0	0	0	0	62
Newton	7	1	182	0	0	8	0	1	0	1	0	0	0	1	69	0	270
Ouachita	4	3	64	4	23	0	6	4	10	71	9	0	5	4	9	0	216
Perry	0	0	30	0	2	0	0	1	0	6	0	0	0	1	0	0	40
Phillips	2	8	8	1	0	0	2	26	4	0	0	0	0	10	14	0	75
Pike	0	2	20	0	3	0	0	0	0	9	0	0	0	0	0	0	34
Poinsett	3	10	107	0	0	3	1	28	0	0	0	0	0	8	95	1	256
Polk	0	0	27	0	3	1	0	0	0	6	1	0	0	0	1	0	39
Pope	0	0	40	0	1	1	0	0	0	0	0	0	0	1	16	0	59
Prairie	0	6	18	2	0	4	4	21	11	0	0	0	0	1	15	0	82
Pulaski	2	27	97	0	9	5	3	6	26	1	2	0	0	0	29	8	215
Randolph	0	4	122	0	0	6	4	6	0	0	0	0	0	7	46	1	196
St. Francis	0	0	24	0	0	4	3	16	2	0	0	0	0	8	17	1	75
Saline	0	6	49	0	12	2	0	0	1	19	2	0	0	0	3	1	95
Scott	0	0	9	0	2	1	0	0	0	0	0	0	0	0	2	0	14
Searcy	0	3	53	0	0	1	0	0	0	0	0	0	0	0	26	0	83
Sebastian	0	1	22	0	0	1	0	1	0	4	0	0	0	0	6	1	36
Sevier	15	3	110	0	30	4	1	0	0	68	5	1	0	0	0	1	238
Sharp	1	1	36	0	0	0	0	0	0	0	0	0	0	0	8	0	46
Stone	1	2	38	0	0	1	0	0	0	0	0	0	0	0	20	2	64
Union	7	4	44	8	8	8	6	14	34	20	8	0	10	7	25	1	204
Van Buren	1	0	19	0	0	0	0	0	0	0	0	0	0	5	6	2	33
Washington	1	10	199	0	0	5	1	4	0	12	0	0	0	1	61	3	297
White	0	7	60	0	0	2	3	16	1	1	0	0	0	1	15	1	107
Woodruff	0	0	34	0	0	0	0	11	1	0	0	0	0	0	23	0	69
Yell	0	1	72	0	6	2	0	1	0	12	0	0	0	2	21	0	117
Col totals	121	284	4705	70	378	211	160	629	250	726	69	12	96	259	1690	62	9722

PREHISTORIC ARCHEOLOGICAL COMPONENTS OF ARKANSAS (Rows as Percentages of Column Totals)

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	EWOODLAND	MWOODLAND	BAYTOWN	COLES CR	ECADDO	MCADDO	HISTCADDO	PLAQU	EMISSISSIPPIAN	MISSIPPIAN	PROTOHIS	Row %
Arkansas	.8	.7	.2	0.0	0.0	0.0	3.8	2.4	2.4	0.0	0.0	0.0	0.0	3.9	1.5	6.5	.8
Ashley	0.0	.4	.8	8.6	0.0	4.3	4.4	5.6	11.6	.3	0.0	0.0	26.0	1.5	1.1	0.0	1.8
Baxter	0.0	.4	.9	0.0	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	0.0	.6
Benton	2.5	3.5	2.1	0.0	0.0	5.7	.6	.2	0.0	.7	1.4	0.0	0.0	0.0	2.0	1.6	1.7
Boone	3.3	3.5	2.0	0.0	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	1.5
Bradley	.8	1.1	.8	8.6	.5	2.8	3.1	1.1	7.2	.1	4.3	0.0	17.7	1.2	.8	0.0	1.3
Calhoun	1.7	.4	.8	10.0	1.6	3.3	5.0	.8	3.6	1.5	1.4	0.0	1.0	4.6	1.1	0.0	1.3
Carroll	2.5	1.4	1.0	0.0	0.0	.5	0.0	0.0	0.0	.4	0.0	0.0	0.0	0.0	.7	0.0	.7
Chicot	0.0	1.4	.3	1.4	0.0	1.9	1.2	.6	1.6	0.0	0.0	0.0	1.0	.8	.7	0.0	.5
Clark	0.0	1.8	2.1	0.0	10.8	1.4	4.4	0.0	1.6	12.0	4.3	8.3	1.0	.4	.4	1.6	2.7
Clay	3.3	9.9	4.3	2.9	0.0	2.4	1.9	4.9	0.0	0.0	0.0	0.0	0.0	3.1	5.0	3.2	3.8
Cleburne	.8	.4	.4	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0	1.3	0.0	.5
Cleveland	.8	.7	.5	5.7	0.0	0.0	.6	.2	.8	.8	1.4	0.0	0.0	.4	.2	0.0	.5
Columbia	1.7	0.0	.7	4.3	2.4	0.0	.6	0.0	.8	2.9	1.4	0.0	0.0	0.0	.3	1.6	.8
Conway	1.7	.4	1.0	0.0	0.0	3.8	3.8	1.0	.8	0.0	0.0	0.0	0.0	0.0	2.1	0.0	1.1
Craighead	9.1	5.6	6.9	0.0	0.0	1.4	3.8	12.2	0.0	0.0	0.0	0.0	0.0	7.3	8.1	1.6	6.1
Crawford	2.5	.4	2.2	0.0	1.1	1.9	0.0	1.1	0.0	.3	0.0	0.0	0.0	0.0	2.0	1.6	1.6
Crittenden	0.0	0.0	.5	17.1	0.0	12.8	2.5	6.2	.8	0.0	0.0	0.0	0.0	19.3	3.3	0.0	2.2
Cross	3.3	.7	.6	0.0	0.0	2.8	1.9	2.4	0.0	0.0	0.0	0.0	0.0	1.9	.6	0.0	.8
Dallas	0.0	.4	.2	0.0	1.6	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	.4	0.0	.3
Desha	0.0	0.0	.2	2.9	0.0	.9	3.8	1.6	2.0	.1	0.0	0.0	2.1	.8	.6	1.6	.5
Drew	0.0	1.1	1.5	1.4	0.0	4.3	6.9	3.3	4.0	.1	0.0	0.0	30.2	3.1	2.1	3.2	2.1
Faulkner	0.0	.7	.4	0.0	0.0	0.0	.6	.3	.8	0.0	0.0	0.0	0.0	0.0	.5	0.0	.4
Franklin	0.0	.4	.7	0.0	.3	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	0.0	.5
Fulton	0.0	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	0.0	.3
Garland	.8	.7	.7	0.0	1.1	0.0	0.0	0.0	0.0	3.0	1.4	0.0	0.0	.4	.2	0.0	.7
Grant	0.0	1.8	.1	0.0	1.6	0.0	.6	0.0	.4	1.1	0.0	0.0	0.0	0.0	.2	0.0	.3
Greene	.8	2.8	3.7	2.9	0.0	.5	.6	2.1	0.0	0.0	0.0	0.0	0.0	2.7	2.8	8.1	2.7
Hempstead	2.5	.7	1.5	0.0	7.7	0.0	1.2	.2	.4	9.5	2.9	0.0	0.0	0.0	0.0	0.0	1.8
Hot Spring	2.5	1.4	1.3	0.0	5.8	.5	1.9	0.0	0.0	6.6	7.2	0.0	0.0	0.0	.5	0.0	1.6
Howard	2.5	.4	1.3	0.0	.5	.5	.6	0.0	.4	1.9	1.4	0.0	0.0	0.0	0.0	0.0	.9
Independence	.8	0.0	2.2	1.4	0.0	.5	0.0	.8	0.0	0.0	0.0	0.0	0.0	.4	2.8	0.0	1.7
Izard	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.6	1.6	.3
Jackson	2.5	3.9	3.1	0.0	0.0	2.4	1.2	4.3	0.0	0.0	0.0	0.0	0.0	6.2	2.3	0.0	2.6
Jefferson	0.0	3.2	1.3	1.4	0.0	1.4	8.1	1.9	6.0	.4	0.0	0.0	2.1	.4	.5	3.2	1.3
Johnson	0.0	0.0	.8	0.0	.3	.5	0.0	0.0	0.0	.1	0.0	0.0	0.0	0.0	.5	0.0	.5

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	EWOODLAND	MWOODLAND	BAYTOWN	COLES CR	ECADDO	MCADDO	HISTCADDO	PLAQU	EMISSIPPIAN	MISSIPPIAN	PROTOHIS	Row %
Lafayette	2.5	.7	2.6	1.4	15.9	1.9	.6	0.0	.8	9.6	20.3	75.0	0.0	0.0	0.0	3.2	3.0
Lawrence	2.5	5.3	4.9	0.0	0.0	.9	1.2	2.2	0.0	0.0	0.0	0.0	0.0	5.4	4.7	1.6	3.7
Lee	0.0	.4	.2	0.0	0.0	.5	1.9	3.7	1.2	0.0	0.0	0.0	0.0	.8	1.6	4.8	.8
Lincoln	.8	1.8	.7	5.7	0.0	1.4	3.1	.6	3.6	0.0	0.0	0.0	1.0	0.0	.5	4.8	.8
Little River	0.0	0.0	.2	0.0	1.6	0.0	0.0	0.0	.4	1.8	1.4	0.0	0.0	0.0	0.0	0.0	.3
Logan	0.0	.7	.8	0.0	0.0	0.0	0.0	.2	0.0	.1	0.0	0.0	0.0	0.0	1.0	0.0	.6
Lonoke	0.0	1.4	2.9	2.9	0.0	3.3	.6	1.0	9.6	.1	0.0	0.0	0.0	0.0	.9	0.0	2.0
Madison	.8	1.4	.9	0.0	0.0	3.3	1.9	2.4	0.0	.6	0.0	0.0	0.0	0.0	2.0	1.6	1.2
Marion	.8	.7	1.2	0.0	0.0	0.0	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	.9
Miller	5.0	1.1	3.5	0.0	17.5	0.0	0.0	0.0	.4	6.2	5.8	8.3	1.0	0.0	.1	8.1	3.0
Mississippi	.8	0.0	.4	0.0	0.0	1.9	2.5	8.6	0.0	0.0	0.0	0.0	0.0	12.4	6.5	1.6	2.3
Monroe	0.0	1.1	.3	0.0	0.0	0.0	.6	3.0	1.2	0.0	0.0	0.0	0.0	.4	.6	1.6	.5
Montgomery	2.5	.7	1.6	0.0	2.6	.5	0.0	0.0	0.0	1.8	4.3	0.0	1.0	0.0	.1	0.0	1.1
Nevada	.8	.4	.3	0.0	1.1	0.0	3.1	.3	1.2	4.5	1.4	0.0	0.0	0.0	0.0	0.0	.6
Newton	5.8	.4	3.9	0.0	0.0	3.8	0.0	.2	0.0	.1	0.0	0.0	0.0	.4	4.1	0.0	2.8
Ouachita	3.3	1.1	1.4	5.7	6.1	0.0	3.8	.6	4.0	9.8	13.0	0.0	5.2	1.5	.5	0.0	2.2
Perry	0.0	0.0	.6	0.0	.5	0.0	0.0	.2	0.0	.8	0.0	0.0	0.0	.4	0.0	0.0	.4
Phillips	1.7	2.8	.2	1.4	0.0	0.0	1.2	4.1	1.6	0.0	0.0	0.0	0.0	3.9	.8	0.0	.8
Pike	0.0	.7	.4	0.0	.8	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	.3
Poinsett	2.5	3.5	2.3	0.0	0.0	1.4	.6	4.5	0.0	0.0	0.0	0.0	0.0	3.1	5.6	1.6	2.6
Polk	0.0	0.0	.6	0.0	.8	.5	0.0	0.0	0.0	.8	1.4	0.0	0.0	0.0	.1	0.0	.4
Pope	0.0	0.0	.9	0.0	.3	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.9	0.0	.6
Prairie	0.0	2.1	.4	2.9	0.0	1.9	2.5	3.3	4.4	0.0	0.0	0.0	0.0	.4	.9	0.0	.8
Pulaski	1.7	9.5	2.1	0.0	2.4	2.4	1.9	1.0	10.4	.1	2.9	0.0	0.0	0.0	1.7	12.9	2.2
Randolph	0.0	1.4	2.6	0.0	0.0	2.8	2.5	1.0	0.0	0.0	0.0	0.0	0.0	2.7	2.7	1.6	2.0
St. Francis	0.0	0.0	.5	0.0	0.0	1.9	1.9	2.5	.8	0.0	0.0	0.0	0.0	3.1	1.0	1.6	.8
Saline	0.0	2.1	1.0	0.0	3.2	.9	0.0	0.0	.4	2.6	2.9	0.0	0.0	0.0	.2	1.6	1.0
Scott	0.0	0.0	.2	0.0	.5	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	.1
Searcy	0.0	1.1	1.1	0.0	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	.9
Sebastian	0.0	.4	.5	0.0	0.0	.5	0.0	.2	0.0	.6	0.0	0.0	0.0	0.0	.4	1.6	.4
Sevier	12.4	1.1	2.3	0.0	7.9	1.9	.6	0.0	0.0	9.4	7.2	8.3	0.0	0.0	0.0	1.6	2.4
Sharp	.8	.4	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	0.0	.5
Stone	.8	.7	.8	0.0	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	3.2	.7
Union	5.8	1.4	.9	11.4	2.1	3.8	3.8	2.2	13.6	2.8	11.6	0.0	10.4	2.7	1.5	1.6	2.1
Van Buren	.8	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	.4	3.2	.3
Washington	.8	3.5	4.2	0.0	0.0	2.4	.6	.6	0.0	1.7	0.0	0.0	0.0	.4	3.6	4.8	3.1
White	0.0	2.5	1.3	0.0	0.0	.9	1.9	2.5	.4	.1	0.0	0.0	0.0	.4	.9	1.6	1.1
Woodruff	0.0	0.0	.7	0.0	0.0	0.0	0.0	1.7	.4	0.0	0.0	0.0	0.0	0.0	1.4	0.0	.7
Yell	0.0	.4	1.5	0.0	1.6	.9	0.0	.2	0.0	1.7	0.0	0.0	0.0	.8	1.2	0.0	1.2
Col totals	121	284	4705	70	378	211	160	629	250	726	69	12	96	259	1690	62	

PREHISTORIC ARCHEOLOGICAL COMPONENTS OF ARKANSAS (Columns as Percentages of Row Totals)

Columns as % of row total

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	EWOODLAND	MWOODLAND	BAYTOWN	COLES CR	ECADDO	MCADDO	HISTCADDO	PLAQU	EMISSISSIPPIAN	MISSISSIPPIAN	PROTOHIS	Row totals
Arkansas	1.3	2.6	11.5	0.0	0.0	0.0	7.7	19.2	7.7	0.0	0.0	0.0	0.0	12.8	32.1	5.1	78
Ashley	0.0	.6	21.8	3.4	0.0	5.2	4.0	20.1	16.7	1.1	0.0	0.0	14.4	2.3	10.3	0.0	174
Baxter	0.0	1.7	69.5	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.1	0.0	59
Benton	1.8	6.1	59.1	0.0	0.0	7.3	.6	.6	0.0	3.0	.6	0.0	0.0	0.0	20.1	.6	164
Boone	2.8	6.9	64.1	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.8	0.0	145
Bradley	.8	2.4	30.1	4.9	1.6	4.9	4.1	5.7	14.6	.8	2.4	0.0	13.8	2.4	11.4	0.0	123
Calhoun	1.6	.8	30.5	5.5	4.7	5.5	6.3	3.9	7.0	8.6	.8	0.0	.8	9.4	14.8	0.0	128
Carroll	4.3	5.8	68.1	0.0	0.0	1.4	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	15.9	0.0	69
Chicot	0.0	8.2	32.7	2.0	0.0	8.2	4.1	8.2	8.2	0.0	0.0	0.0	2.0	4.1	22.4	0.0	49
Clark	0.0	1.9	38.5	0.0	15.8	1.2	2.7	0.0	1.5	33.5	1.2	.4	.4	.4	2.3	.4	260
Clay	1.1	7.6	54.7	.5	0.0	1.4	.8	8.4	0.0	0.0	0.0	0.0	0.0	2.2	22.8	.5	369
Cleburne	2.3	2.3	43.2	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	50.0	0.0	44
Cleveland	2.2	4.3	50.0	8.7	0.0	0.0	2.2	2.2	4.3	13.0	2.2	0.0	0.0	2.2	8.7	0.0	46
Columbia	2.6	0.0	41.6	3.9	11.7	0.0	1.3	0.0	2.6	27.3	1.3	0.0	0.0	0.0	6.5	1.3	77
Conway	1.8	.9	44.5	0.0	0.0	7.3	5.5	5.5	1.8	0.0	0.0	0.0	0.0	0.0	32.7	0.0	110
Craighead	1.9	2.7	54.5	0.0	0.0	.5	1.0	13.0	0.0	0.0	0.0	0.0	0.0	3.2	23.1	.2	593
Crawford	1.9	.6	65.0	0.0	2.5	2.5	0.0	4.5	0.0	1.3	0.0	0.0	0.0	0.0	21.0	.6	157
Crittenden	0.0	0.0	11.2	5.6	0.0	12.6	1.9	18.2	.9	0.0	0.0	0.0	0.0	23.4	26.2	0.0	214
Cross	5.3	2.7	40.0	0.0	0.0	8.0	4.0	20.0	0.0	0.0	0.0	0.0	0.0	6.7	13.3	0.0	75
Dallas	0.0	3.0	24.2	0.0	18.2	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	21.2	0.0	33
Desha	0.0	0.0	16.3	4.1	0.0	4.1	12.2	20.4	10.2	2.0	0.0	0.0	4.1	4.1	20.4	2.0	49
Drew	0.0	1.5	35.5	.5	0.0	4.4	5.4	10.3	4.9	.5	0.0	0.0	14.3	3.9	17.7	1.0	203
Faulkner	0.0	5.6	55.6	0.0	0.0	0.0	2.8	5.6	5.6	0.0	0.0	0.0	0.0	0.0	25.0	0.0	36
Franklin	0.0	2.0	64.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	50
Fulton	0.0	0.0	89.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7	0.0	28
Garland	1.4	2.9	50.7	0.0	5.8	0.0	0.0	0.0	0.0	31.9	1.4	0.0	0.0	1.4	4.3	0.0	69
Grant	0.0	16.7	20.0	0.0	20.0	0.0	3.3	0.0	3.3	26.7	0.0	0.0	0.0	0.0	10.0	0.0	30
Greene	.4	3.1	67.3	.8	0.0	.4	.4	5.0	0.0	0.0	0.0	0.0	0.0	2.7	18.1	1.9	260
Hempstead	1.7	1.1	38.8	0.0	16.3	0.0	1.1	.6	.6	38.8	1.1	0.0	0.0	0.0	0.0	0.0	178
Hot Spring	1.9	2.6	39.0	0.0	14.3	.6	1.9	0.0	0.0	31.2	3.2	0.0	0.0	0.0	5.2	0.0	154
Howard	3.5	1.2	72.1	0.0	2.3	1.2	1.2	0.0	1.2	16.3	1.2	0.0	0.0	0.0	0.0	0.0	86
Independence	.6	0.0	65.2	.6	0.0	.6	0.0	3.1	0.0	0.0	0.0	0.0	0.0	.6	29.2	0.0	161
Izard	0.0	0.0	59.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	31.3	3.1	32
Jackson	1.2	4.4	58.8	0.0	0.0	2.0	.8	10.8	0.0	0.0	0.0	0.0	0.0	6.4	15.6	0.0	250
Jefferson	0.0	7.0	46.1	.8	0.0	2.3	10.2	9.4	11.7	2.3	0.0	0.0	1.6	.8	6.3	1.6	128
Johnson	0.0	0.0	76.5	0.0	2.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	17.6	0.0	51

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	EWOODLAND	MWOODLAND	BAYTOWN	COLES CR	ECADDO	MCADDO	HISTCADDO	PLAQU	EMISSIPPIAN	MISSIPPIAN	PROTOHIS	Row totals
Lafayette	1.0	.7	41.9	.3	20.8	1.4	.3	0.0	.7	24.2	4.8	3.1	0.0	0.0	0.0	.7	289
Lawrence	.8	4.1	63.9	0.0	0.0	.6	.6	3.9	0.0	0.0	0.0	0.0	0.0	3.9	22.0	.3	363
Lee	0.0	1.4	14.9	0.0	0.0	1.4	4.1	31.1	4.1	0.0	0.0	0.0	0.0	2.7	36.5	4.1	74
Lincoln	1.3	6.4	44.9	5.1	0.0	3.8	6.4	5.1	11.5	0.0	0.0	0.0	1.3	0.0	10.3	3.8	78
Little River	0.0	0.0	27.6	0.0	20.7	0.0	0.0	0.0	3.4	44.8	3.4	0.0	0.0	0.0	0.0	0.0	29
Logan	0.0	3.5	63.2	0.0	0.0	0.0	0.0	1.8	0.0	1.8	0.0	0.0	0.0	0.0	29.8	0.0	57
Lonoke	0.0	2.0	69.5	1.0	0.0	3.6	.5	3.0	12.2	.5	0.0	0.0	0.0	0.0	7.6	0.0	197
Madison	.9	3.6	38.4	0.0	0.0	6.3	2.7	13.4	0.0	3.6	0.0	0.0	0.0	0.0	30.4	.9	112
Marion	1.1	2.2	62.9	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	32.6	0.0	89
Miller	2.0	1.0	55.1	0.0	22.3	0.0	0.0	0.0	.3	15.2	1.4	.3	.3	0.0	.3	1.7	296
Mississippi	.4	0.0	8.8	0.0	0.0	1.8	1.8	23.9	0.0	0.0	0.0	0.0	0.0	14.2	48.7	.4	226
Monroe	0.0	6.0	24.0	0.0	0.0	0.0	2.0	38.0	6.0	0.0	0.0	0.0	0.0	2.0	20.0	2.0	50
Montgomery	2.8	1.9	67.6	0.0	9.3	.9	0.0	0.0	0.0	12.0	2.8	0.0	.9	0.0	1.9	0.0	108
Nevada	1.6	1.6	19.4	0.0	6.5	0.0	8.1	3.2	4.8	53.2	1.6	0.0	0.0	0.0	0.0	0.0	62
Newton	2.6	.4	67.4	0.0	0.0	3.0	0.0	.4	0.0	.4	0.0	0.0	0.0	.4	25.6	0.0	270
Ouachita	1.9	1.4	29.6	1.9	10.6	0.0	2.8	1.9	4.6	32.9	4.2	0.0	2.3	1.9	4.2	0.0	216
Perry	0.0	0.0	75.0	0.0	5.0	0.0	0.0	2.5	0.0	15.0	0.0	0.0	0.0	2.5	0.0	0.0	40
Phillips	2.7	10.7	10.7	1.3	0.0	0.0	2.7	34.7	5.3	0.0	0.0	0.0	0.0	13.3	18.7	0.0	75
Pike	0.0	5.9	58.8	0.0	8.8	0.0	0.0	0.0	0.0	26.5	0.0	0.0	0.0	0.0	0.0	0.0	34
Poinsett	1.2	3.9	41.8	0.0	0.0	1.2	.4	10.9	0.0	0.0	0.0	0.0	0.0	3.1	37.1	.4	256
Polk	0.0	0.0	69.2	0.0	7.7	2.6	0.0	0.0	0.0	15.4	2.6	0.0	0.0	0.0	2.6	0.0	39
Pope	0.0	0.0	67.8	0.0	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	27.1	0.0	59
Prairie	0.0	7.3	22.0	2.4	0.0	4.9	4.9	25.6	13.4	0.0	0.0	0.0	0.0	1.2	18.3	0.0	82
Pulaski	.9	12.6	45.1	0.0	4.2	2.3	1.4	2.8	12.1	.5	.9	0.0	0.0	0.0	13.5	3.7	215
Randolph	0.0	2.0	62.2	0.0	0.0	3.1	2.0	3.1	0.0	0.0	0.0	0.0	0.0	3.6	23.5	.5	196
St. Francis	0.0	0.0	32.0	0.0	0.0	5.3	4.0	21.3	2.7	0.0	0.0	0.0	0.0	10.7	22.7	1.3	75
Saline	0.0	6.3	51.6	0.0	12.6	2.1	0.0	.0.0	1.1	20.0	2.1	0.0	0.0	0.0	3.2	1.1	95
Scott	0.0	0.0	64.3	0.0	14.3	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	14
Searcy	0.0	3.6	63.9	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.3	0.0	83
Sebastian	0.0	2.8	61.1	0.0	0.0	2.8	0.0	2.8	0.0	11.1	0.0	0.0	0.0	0.0	16.7	2.8	36
Sevier	6.3	1.3	46.2	0.0	12.6	1.7	.4	0.0	0.0	28.6	2.1	.4	0.0	0.0	0.0	.4	238
Sharp	2.2	2.2	78.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.4	0.0	46
Stone	1.6	3.1	59.4	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.3	3.1	64
Union	3.4	2.0	21.6	3.9	3.9	3.9	2.9	6.9	16.7	9.8	3.9	0.0	4.9	3.4	12.3	.5	204
Van Buren	3.0	0.0	57.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.2	18.2	6.1	33
Washington	.3	3.4	67.0	0.0	0.0	1.7	.3	1.3	0.0	4.0	0.0	0.0	0.0	.3	20.5	1.0	297
White	0.0	6.5	56.1	0.0	0.0	1.9	2.8	15.0	.9	.9	0.0	0.0	0.0	.9	14.0	.9	107
Woodruff	0.0	0.0	49.3	0.0	0.0	0.0	0.0	15.9	1.4	0.0	0.0	0.0	0.0	0.0	33.3	0.0	69
Yell	0.0	.9	61.5	0.0	5.1	1.7	0.0	.9	0.0	10.3	0.0	0.0	0.0	1.7	17.9	0.0	117
Col percent	1.2	2.9	48.4	.7	3.9	2.2	1.6	6.5	2.6	7.5	.7	.1	1.0	2.7	17.4	.6	

PREHISTORIC ARCHEOLOGICAL COMPONENTS OF ARKANSAS ON THE NATIONAL REGISTRY (Raw Data)

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	EWOODLAND	MWOODLAND	BAYTOWN	COLES CR	ECADDO	MCADDO	HISTCADDO	PLAQU	EMISSISSIPPIAN	MISSIPPIAN	PROTOHIS	Row totals
Lawrence	3	15	232	0	0	2	2	14	0	0	0	0	0	14	80	1	363
Arkansas	0	0	0	0	0	0	1	2	1	0	0	0	0	2	1	1	8
Ashley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baxter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Benton	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Boone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bradley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Calhoun	0	0	0	0	1	0	0	0	2	1	0	0	0	1	3	0	8
Carroll	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ch i cot	0	0	0	0	0	0	1	2	1	0	0	0	0	1	0	0	5
Clark	0	0	0	0	1	0	0	0	0	3	1	0	0	0	0	1	6
Clay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cleburne	0	0	0	0	0	0	0	0	D	0	0	0	0	0	0	0	0
Cleveland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Conway	0	0	3	0	0	0	0	0	0	0	0	0	0	0	11	0	14
Craighead	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Crawford	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	4
Crittenden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cross	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dallas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Desha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drew	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Faulkner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Franklin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fulton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Garland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hempstead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot Spring	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	4
Howard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Independence	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Izard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jackson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jefferson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	EWOODLAND	MWOODLAND	BAYTOWN	COLES CR	ECADDO	MCADDO	HISTCADDO	PLAQU	EMISSISSIPPIAN	MISSISSIPPIAN	PROTOHIS	Row totals
Johnson	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Lafayette	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lawrence	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lincoln	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little River	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
Logan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lonoke	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	3
Madison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Miller	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mississippi	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3
Monroe	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	2
Montgomery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ouachita	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phillips	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pike	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poinsett	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pope	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prairie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pulaski	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Randolph	0	0	2	0	0	1	0	0	0	0	0	0	0	0	2	0	5
St. Francis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saline	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Scott	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Searcy	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	3
Sebastian	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	3
Sevier	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sharp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Union	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Van Buren	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	5
Washington	0	0	2	0	0	0	0	0	0	1	0	0	0	0	2	1	6
White	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woodruff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yell	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Col totals	1	1	17	0	5	1	2	6	5	8	2	0	0	6	33	5	92

PREHISTORIC ARCHEOLOGICAL COMPONENTS OF ARKANSAS ELIGIBLE FOR OR ON THE NATIONAL REGISTER (Raw Data)

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	EWOODLAND	MWOODLAND	BAYTOWN	COLES CR	ECADDO	MCADDO	HISTCADDO	PLAQU	EMISSISSIPPIAN	MISSISSIPPIAN	PROTOHIS	Row totals
Arkansas	0	0	0	0	0	0	2	3	2	0	0	0	0	2	5	3	17
Ashley	0	0	2	2	0	3	2	6	5	1	0	0	2	1	5	0	29
Baxter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Benton	0	1	5	0	0	0	0	0	0	1	0	0	0	0	2	0	9
Boone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bradley	0	1	6	3	0	1	1	2	6	0	1	0	2	0	7	0	30
Calhoun	0	0	8	1	1	0	1	0	3	1	0	0	0	4	9	0	28
Carroll	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Chicot	0	0	1	0	0	1	1	2	1	0	0	0	0	1	1	0	8
Clark	0	0	0	0	1	0	0	0	0	9	1	0	0	0	0	1	12
Clay	0	0	3	0	0	0	0	1	0	0	0	0	0	1	1	0	6
Cleburne	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Cleveland	0	1	2	0	0	0	0	0	0	1	0	0	0	0	1	0	5
Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Conway	0	0	9	0	0	0	1	0	2	0	0	0	0	0	27	0	39
Craighead	0	0	4	0	0	0	1	3	0	0	0	0	0	4	1	0	13
Crawford	0	0	23	0	2	2	0	6	0	1	0	0	0	0	17	1	52
Crittenden	0	0	2	1	0	1	2	7	1	0	0	0	0	3	7	0	24
Cross	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Dallas	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Desha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drew	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Faulkner	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Franklin	0	0	5	0	0	0	0	0	0	0	0	0	0	0	2	0	7
Fulton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Garland	0	1	3	0	0	0	0	0	0	2	0	0	0	0	2	0	8
Grant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greene	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Hempstead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot Spring	0	1	3	0	1	0	0	0	0	1	0	0	0	0	0	0	6
Howard	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Independence	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	3
Izard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jackson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Jefferson	0	0	0	0	0	1	1	1	3	0	0	0	0	0	1	1	8

	PALEO	DALTON	ARCHAIC	POVERTY PT	FOURCHE	EWOODLAND	MWOODLAND	BAYTOWN	COLES CR	ECADDO	MCADDO	HISTCADDO	PLAQU	EMISSISSIPPIAN	MISSISSIPPIAN	PROTOHIS	Row totals
Johnson	0	0	6	0	0	0	0	0	0	0	0	0	0	0	2	0	8
Lafayette	0	0	1	0	3	0	0	0	0	4	0	0	0	0	0	0	8
Lawrence	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	4
Lee	0	0	0	0	0	0	1	7	1	0	0	0	0	0	10	3	22
Lincoln	0	0	1	0	0	0	1	0	1	0	0	0	0	0	2	0	5
Little River	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
Logan	0	1	3	0	1	0	0	1	0	0	0	0	0	0	1	0	7
Lonoke	0	0	19	0	0	1	0	4	7	0	0	0	0	0	6	0	37
Madison	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	4
Marion	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4	0	8
Miller	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	4
Mississippi	1	0	1	0	0	1	0	15	0	0	0	0	0	15	11	0	44
Monroe	0	0	0	0	0	0	0	3	2	0	0	0	0	0	4	1	10
Montgomery	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	3
Nevada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newton	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	5
Ouachita	0	0	2	0	3	0	0	0	1	3	1	0	0	0	3	0	13
Perry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phillips	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3	0	5
Pike	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poinsett	0	0	2	0	0	0	0	2	0	0	0	0	0	1	5	0	10
Polk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pope	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Prairie	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	3
Pulaski	2	10	12	0	0	0	0	0	1	1	0	0	0	0	4	3	33
Randolph	0	0	24	0	0	5	4	1	0	0	0	0	0	0	6	1	41
St. Francis	0	0	2	0	0	0	0	1	0	0	0	0	0	0	3	0	6
Saline	0	0	1	0	1	0	0	0	0	2	1	0	0	0	0	0	5
Scott	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Searcy	0	2	4	0	0	0	0	0	0	0	0	0	0	0	2	0	8
Sebastian	0	0	1	0	0	0	0	0	0	1	0	0	0	0	2	0	4
Sevier	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Sharp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stone	0	0	4	0	0	0	0	0	0	0	0	0	0	0	3	1	8
Union	0	3	8	0	1	3	3	4	9	0	0	0	0	5	7	0	43
Van Buren	1	0	4	0	0	0	0	0	0	0	0	0	0	4	4	2	15
Washington	0	0	6	0	0	0	0	0	0	2	0	0	0	0	7	1	16
White	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woodruff	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Yell	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Col totals	5	23	213	7	17	20	21	74	46	33	4	0	5	42	190	18	718

BIOARCHEOLOGICAL DATA BASE ARRANGED BY SITE NUMBER FOR THE LOUISIANA–ARKANSAS REGION

SITE NUMBER	PERIOD AND CULTURE		DRAINAGE	ADAPTATION	BURIALS	ANALYSES
ARKANSAS						
03AR0000	PREHISTORIC UNKNOWN		WHITE	XX	0012	N
03AR0004	LATE MISSISSIPPI	LATE MISSISSIPPI	ARKANSAS	F	0185	D
03AR0014	LATE MISSISSIPPI	LATE MISSISSIPPI	ARKANSAS	E3	0064	N
03AR0030	BAYTOWN	BAYTOWN	WHITE	D1	0001	N
03AR0040	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	WHITE	E2	0001	N
03AR0046	MISSISSIPPI	UNKNOWN	WHITE	E0	0002	N
03AS0000	PREHISTORIC	UNKNOWN	BAYOU BARTHOLOMEW	XX	0005	N
03AS0058	COLES CREEK PLUM BAYOU		BAYOU BARTHOLOMEW	E1	0001	N
03AS0058	MIDDLE MISSISSIPPI	PLAQUEMINE	BAYOU BARTHOLOMEW	E1	0015	D
03AS0152	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	F	0018	C
03AS0154	MIDDLE MISSISSIPPI	PLAQUEMINE	BAYOU BARTHOLOMEW	E1	0001	N
03AS0159	BAYTOWN	BAYTOWN	OUACHITA	D1	0002	C
03BR0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0001	D
03BR0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0007	N
03BR0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0020	N
03BR0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0001	N
03BR0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0002	N
03BR0001	COLES CREEK	COLES CREEK	OUACHITA	E1	0002	N
03BR0002	MARKSVILLE		OUACHITA	D1	0005	N
03BR0005	PREHISTORIC UNKNOWN		OUACHITA	XX	0001	N
03BR0008	PREHISTORIC UNKNOWN		OUACHITA	XX	0006	N
03BR0010	LATE MARKSVILLE	PLAINWARE	OUACHITA	D1	0001	N
03BR0028	UNKNOWN		OUACHITA	XX	0002	D
03BR0040	COLES CREEK	COLES CREEK	OUACHITA	E1	0007	C
03BR0040	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	F	0006	C
03CA0001	ARCHAIC	LATE F. MALINE 1	OUACHITA	D1	0001	N
03CA0003	EARLY MISSISSIPPI	LATE COLES CREEK	OUACHITA	E1	0001	C
03CA0013	EARLY MISSISSIPPI	LATE COLES CREEK	OUACHITA	E1	0052	N
03CA0265	EARLY MISSISSIPPI	LATE COLES CREEK	OUACHITA	E1	0003	C
03CG0001	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCIS	E2	0035	N
03CG0021	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0001	N
03CG0037	PREHISTORIC UNKNOWN	MULTICOMPONENT	ST. FRANCIS	XX	0004	N
03CG0041	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCS	E2	0001	N
03CG0041	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0001	N
03CG0054	ARCHAIC	LATE	WHITE	D1	0007	D
03CG0078	ARCHAIC	LATE	WHITE	D1	0001	N
03CG0079	PREHISTORIC UNKNOWN		WHITE	XX	0001	N
03CG0218	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	WHITE	E2	0001	C
03CG0636	BAYTOWN	BAYTOWN	ST. FRANCIS	D1	0003	C
03CH0005	MISSISSIPPI	UNKNOWN	MISSISSIPPI	E1	0007	N
03CH0005	BAYTOWN	BAYTOWN	MISSISSIPPI	D1	0001	N
03CH0005	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E1	0022	N
03CH0005	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E1	0061	N
03CH0014	BAYTOWN	TROYVILLE	MISSISSIPPI	D1	0006	N
03CH0018	PREHISTORIC UNKNOWN		MISSISSIPPI	XX	0001	N
03CH0046	PREHISTORIC UNKNOWN		MISSISSIPPI	XX	0001	N
03CH0049	MIDDLE MISSISSIPPI	PLAQUEMINE	MISSISSIPPI	E1	0008	C
03CH0063	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E1	0007	N

SITE NUMBER	PERIOD AND CULTURE		DRAINAGE	ADAPTATION	BURIALS	ANALYSES
03CL0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0005	N
03CL0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0004	N
03CL0008	PREHISTORIC UNKNOWN		OUACHITA	XX	0002	N
03CL0024	LATE MISSISSIPPI	CADDO 3	OUACHITA	E1	0003	C
03CL0027	LATE MISSISSIPPI	CADDO 3	OUACHITA	E1	0001	D
03CL0029	MISSISSIPPI UNKNOWN	CADDO	OUACHITA	E1	0010	N
03CL0040	PREHISTORIC UNKNOWN	MULTICOMPONENT	OUACHITA	XX	0013	N
03CL0056	LATE MISSISSIPPI	CADDO 3	OUACHITA	E1	0002	C
03CL0063	MISSISSIPPI UNKNOWN	CADDO	OUACHITA	E1	0001	C
03CL0195	LATE MISSISSIPPI	CADDO 4	OUACHITA	E1	0033	C
03CO0003	COLES CREEK	FOURCHE MALINE 7	OUACHITA	E2	0001	N
03CS0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0003	N
03CS0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0002	D
03CS0024	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0086	D
03CS0025	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0127	D
03CS0027	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0003	N
03CS0029	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	F	0033	C
03CS0040	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCIS	E2	0467	N
03CS0071	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0001	N
03CS0090	BAYTOWN	BAYTOWN	ST. FRANCIS	D1	0001	N
03CS0092	BAYTOWN	BAYTOWN	ST. FRANCIS	D1	0001	N
03CS0117	BAYTOWN	BAYTOWN	ST. FRANCIS	D1	0004	C
03CS0120	BAYTOWN	BAYTOWN	ST. FRANCIS	D1	0002	N
03CS0138	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0033	N
03CT0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0002	N
03CT0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0001	N
03CT0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0001	N
03CT0003	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0008	C
03CT0007	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0111	D
03CT0009	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E3	0036	C
03CT0013	MISSISSIPPI UNKNOWN		MISSISSIPPI	E2	0539	N
03CT0014	BAYTOWN	BAYTOWN	MISSISSIPPI	D1	0027	C
03CT0018	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E3	0083	N
03CT0019	EARLY MISSISSIPPI	EARLY MISSISSIPPI	MISSISSIPPI	E1	0067	D
03CT0035	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0001	N
03CT0044	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0061	N
03CT0050	BAYTOWN	BAYTOWN	ST. FRANCIS	D1	0004	C
03CT0098	BAYTOWN	BAYTOWN	ST. FRANCIS	D1	0002	D
03CV0109	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	E3	0002	N
03CY0042	BAYTOWN	BARNES	WHITE	D1	0003	N
03CY0088	BAYTOWN	BARNES	WHITE	D1	0001	N
03DA0403	PREHISTORIC UNKNOWN	MULTICOMPONENT	OUACHITA	XX	0001	N
03DE0000	PREHISTORIC UNKNOWN		ARKANSAS	XX	0007	N
03DE0002	BAYTOWN	BAYTOWN	MISSISSIPPI	D1	0006	N
03DE0003	PREHISTORIC UNKNOWN	MULTICOMPONENT	MISSISSIPPI	XX	0003	N
03DE0024	BAYTOWN	BAYTOWN	MISSISSIPPI	D1	0018	N
03DE0074	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E1	0051	N
03DR0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0002	N
03DR0001	LATE MISSISSIPPI	LATE MISSISSIPPI	BAYOU BARTHOLOMEW	F	0058	N
03DR0002	LATE MARKSVILLE	PLAINWARE	BAYOU BARTHOLOMEW	D1	0002	C
03DR0017	LATE MISSISSIPPI	LATE MISSISSIPPI	BAYOU BARTHOLOMEW	E1	0034	N
03DR0049	LATE MISSISSIPPI	LATE MISSISSIPPI	BAYOU BARTHOLOMEW	F	0005	D
03DR0050	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	F	0004	N
03DR0055	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E1	0008	N
03DR0144	LATE MISSISSIPPI	LATE MISSISSIPPI	BAYOU BARTHOLOMEW	F	0020	D

SITE NUMBER	PERIODANDCULTURE		DRAINAGE	ADAPTATION	BURIALS	ANALYSES
03DR0184	COLES CREEK	PLUM BAYOU	BAYOU BARTHOLOMEW	E1	0001	N
03DR0190	LATE MISSISSIPPI	LATE MISSISSIPPI	BAYOU BARTHOLOMEW	E1	0020	N
03GE0002	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCIS	E2	0002	D
03GE0094	DALTON	DALTON	WHITE	B	0012	C
03HE0000	PREHISTORIC UNKNOWN		RED	XX	0003	N
03HE0000	PREHISTORIC UNKNOWN		RED	XX	0003	N
03HE0001	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0010	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0002	N
03HE0012	PREHISTORIC UNKNOWN		RED	XX	0001	N
03HE0014	PREHISTORIC UNKNOWN		RED	XX	0001	N
03HE0018	PREHISTORIC UNKNOWN		RED	XX	0001	N
03HE0027	COLES CREEK	FOURCHE MALINE 7	RED	E2	0001	N
03HE0029	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0032	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0035	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0035	MIDDLE MISSISSIPPI	CADDO 2	RED	E1	0001	N
03HE0038	EURAMERICAN		RED	G	0001	N
03HE0038	PREHISTORIC UNKNOWN		RED	XX	0001	N
03HE0040	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0042	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0044	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0048	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0050	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0054	COLES CREEK	FOURCHE MALINE 7	OUACHITA	E2	0009	C
03HE0063	MIDDLE MISSISSIPPI	CADDO 2	OUACHITA	E1	0009	C
03HE0063	COLES CREEK	FOURCHE MALINE 7	OUACHITA	E2	0008	C
03HE0070	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	C
03HE0080	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0081	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0040	N
03HE0088	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0092	EARLY MISSISSIPPI	CADDO 1	RED	E1	0005	N
03HE0095	PREHISTORIC UNKNOWN		RED	XX	0007	N
03HE0099	PREHISTORIC UNKNOWN		RED	XX	0001	N
03HE0113	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HE0133	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0002	N
03HE0152	PREHISTORIC UNKNOWN		RED	XX	0001	N
03HE0264	AFRO-AMERICAN		RED	G	0001	N
03HE0271	EURAMERICAN		RED	G	0001	N
03HE0271	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03HS0001	LATE MARKSVILLE	FOURCHE MALINE 4	OUACHITA	D1	0028	D
03HS0003	COLES CREEK	FOURCHE MALINE 7	OUACHITA	E2	0014	D
03HS0015	LATE MISSISSIPPI	CADDO 3	OUACHITA	E1	0007	C
03HS0019	MISSISSIPPI UNKNOWN	CADDO	OUACHITA	E1	0002	C
03HS0028	COLES CREEK	FOURCHE MALINE 7	OUACHITA	E2	0004	C
03HS0060	LATE MISSISSIPPI	CADDO 4	OUACHITA	E1	0007	C
03HS0099	MISSISSIPPI UNKNOWN	CADDO	OUACHITA	E1	0001	N
03JE0050	LATE MISSISSIPPI	LATE MISSISSIPPI	ARKANSAS	F	0080	D
03LA0000	PREHISTORIC UNKNOWN		RED	XX	0001	N
03LA0001	LATE MISSISSIPPI	CADDO 4	RED	E1	0044	N
03LA0005	TCHULA	FOURCHE MALINE 2	RED	D1	0015	N
03LA0006	BAYTOWN	FOURCHE MALINE 5-6	RED	D1	0001	N
03LA0007	TCHULA	FOURCHE MALINE 2	RED	D1	0001	N
03LA0009	COLES CREEK	FOURCHE MALINE 7	RED	E2	0001	N
03LA0023	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0001	N
03LA0027	LATE MISSISSIPPI	CADDO 4	RED	E1	0012	N

SITE NUMBER	PERIOD AND CULTURE		DRAINAGE	ADAPTATION	BURIALS	ANALYSES
03LA0028	LATE MISSISSIPPI	CADDO 4	RED	E1	0012	N
03LA0075	BAYTOWN	FOURCHE MALINE 5	RED	D1	0021	N
03LA0083	LATE MISSISSIPPI	CADDO 5	RED	F	0001	D
03LA0097	AFRO-AMERICAN		RED	G	0089	C
03LA0097	LATE MISSISSIPPI	CADDO 5	RED	F		
03LE0000	PREHISTORIC UNKNOWN		MISSISSIPPI	XX	0006	N
03LE0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0001	N
03LE0008	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0046	N
03LE0011	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	F	0003	C
03LE0029	MISSISSIPPI UNKNOWN	CADDO	ST. FRANCIS	E1	0009	D
03LI0019	LATE MISSISSIPPI	LATE MISSISSIPPI	ARKANSAS	F	0032	N
03MI0001	MIDDLE MISSISSIPPI	CADDO 2	RED	E1	0097	C
03MI0003	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0003	N
03MI0006	EARLY MISSISSIPPI	CADDO 1	RED	E1	0350	C
03MI0006	COLES CREEK	FOURCHE MALINE 7	RED	E2	0001	N
03MI0029	MISSISSIPPI UNKNOWN	CADDO	RED	E1	0004	N
03MO0061	LATE MISSISSIPPI	LATE MISSISSIPPI	WHITE	E1	0002	C
03MS0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0002	N
03MS0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0003	N
03MS0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0003	N
03MS0002	MISSISSIPPI UNKNOWN		ST. FRANCIS	E0	0030	D
03MS0003	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E3	0090	C
03MS0004	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E3	0096	C
03MS0005	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0001	N
03MS0010	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	F	0001	N
03MS0011	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0017	D
03MS0013	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	E3	0003	N
03MS0015	MISSISSIPPI UNKNOWN		MISSISSIPPI	E0	0001	N
03MS0018	UNKNOWN		MISSISSIPPI	XX	0001	N
03MS0020	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCIS	E2	0004	C
03MS0020	EARLY MISSISSIPPI	EARLY MISSISSIPPI	ST. FRANCIS	E1	0027	C
03MS0022	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0001	N
03MS0023	LATE MISSISSIPPI	LATE MISSISSIPPI	MISSISSIPPI	F	0001	N
03MS0024	MISSISSIPPI UNKNOWN		ST. FRANCIS	E0	0002	N
03MS0025	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0002	N
03MS0060	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0045	N
03MS0065	MISSISSIPPI UNKNOWN		MISSISSIPPI	E0	0002	N
03MS0071	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0001	C
03MS0073	MISSISSIPPI UNKNOWN		ST. FRANCIS	E0	0001	N
03MS0078	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0349	C
03MS0106	MISSISSIPPI UNKNOWN		ST. FRANCIS	E0	0007	N
03OU0005	MISSISSIPPI UNKNOWN	CADDO	OUACHITA	E1	0001	N
03OU0006	PREHISTORIC UNKNOWN	MULTICOMPONENT	OUACHITA	XX	0044	N
03OU0022	ARCHAIC MID	TOM'S BROOK	OUACHITA	D1	0002	N
03OU0023	PREHISTORIC UNKNOWN	MULTICOMPONENT	OUACHITA	XX	0001	N
03OU0128	LATE MISSISSIPPI	CADDO 3	OUACHITA	E1	0017	C
03PH0000	PREHISTORIC UNKNOWN		WHITE	XX	0001	N
03PH0000	PREHISTORIC UNKNOWN		WHITE	XX	0002	N
03PH0011	EARLY MARKSVILLE	HOPEWELLIAN	MISSISSIPPI	D1	0019	C
03PO0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0004	N
03PO0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0001	N
03PO0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0005	N
03PO0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0001	N
03PO0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0004	N
03PO0001	EARLY MISSISSIPPI	EARLY MISSISSIPPI	ST. FRANCIS	E1	0005	N

SITE NUMBER	PERIOD ANDCULTURE		DRAINAGE	ADAPTATION	BURIALS	ANALYSES
03PO0002	MISSISSIPPI UNKNOWN		ST. FRANCIS	E0	0005	N
03PO0003	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCIS	E2	0004	C
03PO0005	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0036	N
03PO0006	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCIS	E2	0509	C
03PO0006	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E2	0001	C
03P00024	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0001	N
03PO0026	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0002	N
03PO0046	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCIS	E2	0025	C
03PO0052	BAYTOWN	BAYTOWN	ST. FRANCIS	D1	0002	C
03PO0052	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCIS	E2	0002	C
03PO0054	EARLY MISSISSIPPI	EARLY MISSISSIPPI	ST. FRANCIS	E1	0001	C
03PO0146	COLES CREEK	LATE WOODLAND	ST. FRANCIS	E1	0001	N
03PO0158	EARLY MARKSVILLE	HOPEWELLIAN	ST. FRANCIS	D1	0002	N
03PO0192	MIDDLE MISSISSIPPI	MIDDLE MISSISSIPPI	ST. FRANCIS	E2	0002	N
03PR0000	PREHISTORIC UNKNOWN		WHITE	XX	0001	N
03PR0000	PREHISTORIC UNKNOWN		WHITE	XX	0003	N
03PR0067	LATE MISSISSIPPI	LATE MISSISSIPPI	WHITE	E1	0001	D
03SF0000	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0002	N
03SF0000	UNKNOWN		ST. FRANCIS	XX	0001	N
03SF0009	LATE MISSISSIPPI	LATE MISSISSIPPI	ST. FRANCIS	E3	0026	D
03SF0049	BAYTOWN	BAYTOWN	ST. FRANCIS	D1	0003	N
03SF0222	PREHISTORIC UNKNOWN		ST. FRANCIS	XX	0003	N
03UN0000	MISSISSIPPI UNKNOWN	CADDO	OUACHITA	E1	0001	N
03UN0008	PREHISTORIC UNKNOWN	MULTICOMPONENT	OUACHITA	XX	0004	N
03UN0011	PREHISTORIC UNKNOWN		OUACHITA	XX	0003	N
03UN0013	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	E1	0058	C
03UN0018	COLES CREEK	COLES CREEK	OUACHITA	E1	0001	D
03UN0023	EARLY MISSISSIPPI	LATE COLES CREEK	OUACHITA	E1	0001	C
03UN0052	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	E1	0036	D
03UN0052	COLES CREEK	COLES CREEK	OUACHITA	E1	0004	C
03UN0063	MISSISSIPPI UNKNOWN		OUACHITA	E0	0001	N
03UN0099	PREHISTORIC UNKNOWN	MULTICOMPONENT	OUACHITA	XX	0003	D
03WO0000	PREHISTORIC UNKNOWN		WHITE	XX	0002	N
03WO0000	PREHISTORIC UNKNOWN		WHITE	XX	0002	N
LOUISIANA						
16AN0016	LATE MARKSVILLE	ISSAQUENA COAST	PONTCHARTRAIN	D2	0001	N
16AN0016	EARLY MISSISSIPPI	COLES CREEK COAST	PONTCHARTRAIN	D2	0001	N
16AS0000	PREHISTORIC UNKNOWN		ATCHAFALAYA	XX	0002	N
16AS0000	PREHISTORIC UNKNOWN		ATCHAFALAYA	XX	0001	N
16AV0000	PREHISTORIC UNKNOWN		LOWER RED	XX	0030	N
16AV0000	PREHISTORIC UNKNOWN		LOWER RED	XX	0001	N
16AV0000	PREHISTORIC UNKNOWN		LOWER RED	XX	0091	N
16AV0001	EARLY MARKSVILLE	MARKSVILLE	LOWER RED	D1	0017	N
16AV0002	BAYTOWN	TROYVILLE	LOWER RED	D1	0106	C
16AV0002	COLES CREEK	COLES CREEK	LOWER RED	E1	0001	C
16AV0004	NATIVE AMERICAN	NATCHEZ	LOWER RED	F	0001	N
16AV0011	COLES CREEK	COLES CREEK	LOWER RED	E1	0001	N
16AV0011	EARLY MISSISSIPPI	COLES CREEK	LOWER RED	E1	0001	N
16AV0014	MARKSVILLE		LOWER RED	D1	0005	N
16AV0025	BAYTOWN	TROYVILLE	LOWER RED	D1	0007	C
16AV0026	MIDDLE MISSISSIPPI	PLAQUEMINE	LOWER RED	E1	0010	N
16AV0026	LATE MARKSVILLE	ISSAQUENA	LOWER RED	D1	0005	N
16BE0048	MISSISSIPPI UNKNOWN	CADDO	WEST GULF	E1	0001	N
16BE0054	UNKNOWN		WEST GULF	XX	0001	N
16BI0001	COLES CREEK	FOURCHE MALINE 7	RED	E1	0001	N

SITE NUMBER	PERIOD AND CULTURE		DRAINAGE	ADAPTATION	BURIALS	ANALYSES
16BI0019	ARCHAIC	LATE	RED	D1	0002	N
16BO0000	PREHISTORIC UNKNOWN		RED	XX	0026	N
16BO0000	EARLY MARKSVILLE	FOURCHE MALINE 3	RED	D1	0003	N
16BO0000	PREHISTORIC UNKNOWN		RED	XX	0001	N
16BO0002	LATE MISSISSIPPI	CADDO 3-4	RED	E1	0001	N
16CA0002	MARKSVILLE		OUACHITA	D1	0001	N
16CA0004	PREHISTORIC UNKNOWN	MULTICOMPONENT	BOEUF	XX	0001	N
16CA0013	COLES CREEK	COLES CREEK	OUACHITA	E1	0020	C
16CA0014	EURAMERICAN		OUACHITA	G	0001	N
16CA0017	PREHISTORIC UNKNOWN	MULTICOMPONENT	OUACHITA	XX	0001	N
16CA0050	EURAMERICAN		OUACHITA	G	0001	N
16CA0053	EURAMERICAN		OUACHITA	G	0001	N
16CA0054	HISTORIC AMERICAN		OUACHITA	G	0001	N
16CA0056	HISTORIC AMERICAN		OUACHITA	G	0005	N
16CA0061	MARKSVILLE		OUACHITA	D1	0001	N
16CA0062	MIDDLE MISSISSIPPI	PLAQUEMINE	OUACHITA	E1	0001	N
16CD0000	PREHISTORIC UNKNOWN		RED	XX	0001	N
16CD0000	NATIVE AMERICAN	CADDO 5	RED	F	0001	N
16CD0000	LATE MISSISSIPPI	CADDO 5	RED	E1	0001	N
16CD0012	EARLY MISSISSIPPI	CADDO 1	RED	E1	0055	N
16CD0013	LATE MISSISSIPPI	CADDO 3-4	RED	E1	0036	D
16CD0013	MIDDLE MISSISSIPPI	CADDO 2	RED	E1	0010	D
16CD0013	PREHISTORIC UNKNOWN		RED	XX	0002	D
16CD0025	MIDDLE MISSISSIPPI	CADDO 2	RED	E1	0003	N
16CD0033	PREHISTORIC UNKNOWN		RED	XX	0001	N
16CD0052	EARLY MARKSVILLE	FOURCHE MALINE 3	RED	D1	0001	N
16CM0000	PREHISTORIC UNKNOWN		WEST GULF	XX	0001	N
16CM0047	COLES CREEK	COLES CREEK COAST	WEST GULF	D2	0003	N
16CM0109	UNKNOWN		WEST GULF	XX	0001	N
16CO0000	NATIVE AMERICAN	CHOCTAW	MISSISSIPPI	F	0001	N
16CO0000	COLES CREEK	COLES CREEK	LOWER RED	E1	0001	N
16CO0005	AFRO-AMERICAN		LOWER RED	G	0001	N
16CO0025	MISSISSIPPI UNKNOWN	PLAQUEMINE	LOWER RED	E1	0001	N
16CO0098	COLES CREEK	COLES CREEK	LOWER RED	E1	0001	N
16CT0000	PREHISTORIC UNKNOWN		LOWER RED	XX	0004	N
16CT0001	NATIVE AMERICAN	NATCHEZ	LOWER RED	F	0001	N
16CT0002	PREHISTORIC UNKNOWN	MULTICOMPONENT	LOWER RED	XX	0005	N
16CT0003	PREHISTORIC UNKNOWN	MULTICOMPONENT	OUACHITA	XX	0002	N
16CT0005	PREHISTORIC UNKNOWN	MULTICOMPONENT	LOWER RED	XX	0001	N
16CT0007	BAYTOWN	TROYVILLE	LOWER RED	D1	0012	D
16CT0009	PREHISTORIC UNKNOWN	MULTICOMPONENT	LOWER RED	XX	0001	N
16CT0010	LATE MISSISSIPPI	PLAQUEMINE	LOWER RED	E1	0150	N
16CT0014	COLES CREEK	COLES CREEK	OUACHITA	E1	0074	N
16CT0019	COLES CREEK	COLES CREEK	TENSAS	E1	0001	N
16CT0024	TCHULA	TCHEFUNCTE	OUACHITA	D1	0012	N
16CT0031	TCHULA	TCHEFUNCTE	OUACHITA	D1	0008	N
16CT0063	MULTICOMPONENT		TENSAS	XX	0001	N
16CT0084	EURAMERICAN		OUACHITA	G	0001	N
16CT0147	ARCHAIC	LATE	LOWER RED	D1	0028	C
16CT0148	EURAMERICAN		LOWER RED	G	0001	N
16CT0155	PREHISTORIC UNKNOWN		LOWER RED	XX	0001	N
16CT0315	HISTORIC AMERICAN		OUACHITA	G	0001	N
16DS0212	NATIVE AMERICAN	CADDO	RED	F	0001	C
16DS0212	LATE MISSISSIPPI	CADDO 5-4	RED	E1	0004	C

SITE NUMBER	PERIODANDCULTURE		DRAINAGE	ADAPTATION	BURIALS	ANALYSES
16EBR000	EURAMERICAN		MISSISSIPPI	G	0001	C
16EBR000	PREHISTORIC UNKNOWN		MISSISSIPPI	XX	0001	N
16EC0008	AFRO-AMERICAN		MISSISSIPPI	G	0001	N
16EF0066	EURAMERICAN		MISSISSIPPI	G	0001	D
16EF0068	AFRO-AMERICAN		MISSISSIPPI	G	0027	C
16FR0010	LATE MISSISSIPPI	PLAQUEMINE	TENSAS	E1	0036	N
16FR0011	COLES CREEK	COLES CREEK	TENSAS	E1	0075	N
16FR0013	MISSISSIPPI UNKNOWN	PLAQUEMINE	TENSAS	E1	0053	N
16FR0039	COLES CREEK	COLES CREEK	TENSAS	E1	0005	N
16FR0138	PREHISTORIC UNKNOWN		OUACHITA	XX	0001	N
16FR0141	MISSISSIPPI UNKNOWN	PLAQUEMINE	BOEUF	E1	0010	N
16FR0161	MISSISSIPPI UNKNOWN	PLAQUEMINE	BOEUF	E1	0001	N
16FR0161	COLES CREEK	COLES CREEK	BOEUF	E1	0001	N
16FR0165	HISTORIC AMERICAN		BOEUF	G	0001	N
16FR0181	PREHISTORIC UNKNOWN	MULTICOMPONENT	BOEUF	XX	0001	N
16FR0189	PREHISTORIC UNKNOWN		BOEUF	XX	0001	N
16FR0215	HISTORIC AMERICAN		BOEUF	G	0001	N
16FR0220	MISSISSIPPI UNKNOWN	PLAQUEMINE	BOEUF	E1	0002	C
16FR0234	PREHISTORIC UNKNOWN		TENSAS	XX	0002	N
16GR0020	PREHISTORIC UNKNOWN		RED	XX	0011	N
16IB0003	EARLY MISSISSIPPI	COLES CREEK COAST	WEST GULF	D2	0247	C
16IV0000	PREHISTORIC UNKNOWN		ATCHAFALAYA	XX	0001	N
16IV0004	TCHULA	TCHEFUNCTE COAST	ATCHAFALAYA	D2	0019	C
16IV0006	COLES CREEK/TROYVILLE COAST		ATCHAFALAYA	D2	0002	N
16IV0011	NATIVE AMERICAN	BAYOUGOULA	MISSISSIPPI	F	0019	N
16IV0128	EARLY MISSISSIPPI	COLES CREEK	MISSISSIPPI	D1	0016	C
16IV0128	HISTORIC AMERICAN		MISSISSIPPI	G	0002	C
16JE0003	COLES CREEK/TROYVILLE COAST		MISSISSIPPI	D2	0001	N
16JE0037	LATE MARKSVILLE	ISSAQUENA COAST	MISSISSIPPI	D2	0002	C
16LA0000	BAYTOWN	TROYVILLE	MISSISSIPPI	D1	0041	N
16LA0003	EARLY MARKSVILLE	MARKSVILLE	LOWER RED	D1	1175	N
16LF0000	EARLY MISSISSIPPI	COLES CREEK COAST	BAYOU LAFOURCHE	D2	0001	N
16LF0003	NATIVE AMERICAN	BAYOUGOULA	BAYOU LAFOURCHE	F	0001	N
16LF0017	LATE MISSISSIPPI	PLAQUEMINE	BAYOU LAFOURCHE	E1	0003	D
16LF0017	EARLY MISSISSIPPI	COLES CREEK COAST	BAYOU LAFOURCHE	D2	0001	D
16LVO013	COLES CREEK/TROYVILLE		PONTCHARTRAIN	E0	0002	N
16LY0001	PREHISTORIC UNKNOWN	MULTICOMPONENT	WEST GULF	XX	0001	N
16LY0005	PREHISTORIC UNKNOWN	MULTICOMPONENT	WEST GULF	XX	0001	N
16MA0000	TCHULA	TCHEFUNCTE	TENSAS	D1	0095	N
16MA0000	BAYTOWN	TROYVILLE	TENSAS	D1	0066	N
16MA0000	LATE MISSISSIPPI	PLAQUEMINE	TENSAS	E1	0017	N
16MA0000	LATE MARKSVILLE	ISSAQUENA	TENSAS	D1	0041	N
16MA0000	PREHISTORIC UNKNOWN		MISSISSIPPI	XX	0002	N
16MA0000	PREHISTORIC UNKNOWN		MISSISSIPPI	XX	0008	N
16MA0001	LATE MISSISSIPPI	PLAQUEMINE	MISSISSIPPI	E1	0001	N
16MA0009	BAYTOWN	TROYVILLE	TENSAS	D1	0044	N
16MA0018	EARLY MISSISSIPPI	COLES CREEK	MISSISSIPPI	E1	0046	C
16MA0018	BAYTOWN	TROYVILLE	MISSISSIPPI	D1	0040	C
16MA0027	PREHISTORIC UNKNOWN		MISSISSIPPI	XX	0001	N
16MA0147	COLES CREEK	COLES CREEK	TENSAS	E1	0001	N
16MO0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0001	N
16MO0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0043	C
16MO0000	PREHISTORIC UNKNOWN		BAYOU BARTHOLOMEW	XX	0001	N
16MO0000	LATE MISSISSIPPI	PROTOHIST. KOROA	OUACHITA	F	0042	N
16MO0000	PREHISTORIC UNKNOWN		BAYOU BARTHOLOMEW	XX	0001	N

SITE NUMBER	PERIOD AND CULTURE		DRAINAGE	ADAPTATION	BURIALS	ANALYSES
16MO0011	LATE MISSISSIPPI	PROTOHIST. KOROA	BAYOU BARTHOLOMEW	F	0017	C
16MO0012	LATE MISSISSIPPI	PROTOHIST. KOROA	BAYOU BARTHOLOMEW	F	0031	C
16MO0030	LATE MISSISSIPPI	PROTOHIST. KOROA	OUACHITA	F	0038	N
16MO0031	LATE MISSISSIPPI	LATE MISSISSIPPI	BAYOU BARTHOLOMEW	E1	0001	N
16MO0031	NATIVE AMERICAN	REFUGEES	BAYOU BARTHOLOMEW	F	0255	N
16MO0041	MISSISSIPPI UNKNOWN	PLAQUEMINE	BOEUF	E1	0005	N
16NA0000	NATIVE AMERICAN	CADDO	RED	F	0003	N
16NA0000	UNKNOWN		RED	XX	0001	N
16NA0000	LATE MARKSVILLE	ISSAQUENA	RED	D1	0001	N
16NA0003	NATIVE AMERICAN	CADDO	RED	F	0001	N
16NA0004	NATIVE AMERICAN	CADDO	RED	F	0001	N
16NA0009	NATIVE AMERICAN	CADDO	RED	F	0100	N
16NA0013	NATIVE AMERICAN	CADDO	RED	F	0010	N
16NA0014	NATIVE AMERICAN	CADDO	RED	F	0004	N
16NA0018	NATIVE AMERICAN	CHOCTAW	RED	F	0001	N
16NA0037	BAYTOWN	FOURCHE MALINE 5-6	RED	D1	0004	N
16NA0067	HISTORIC AMERICAN	FRENCH-INDIAN	RED	G	0001	N
16OR0000	HISTORIC AMERICAN		MISSISSIPPI	G	0016	C
16OR0001	TCHULA	TCHEFUNCTE COAST	PONTCHARTRAIN	D2	0030	C
16OR0006	TCHULA	TCHEFUNCTE COAST	PONTCHARTRAIN	D2	0025	C
16OR0006	EARLY MARKSVILLE	MARKSVILLE COAST	PONTCHARTRAIN	D2	0048	C
16OR0007	TCHULA	TCHEFUNCTE COAST	PONTCHARTRAIN	D2	0007	N
16OR0092	HISTORIC AMERICAN		MISSISSIPPI	G	0029	C
16OR0095	HISTORIC AMERICAN		MISSISSIPPI	G	0001	C
16OR0108	HISTORIC AMERICAN		MISSISSIPPI	G	0255	C
16OU0000	UNKNOWN		OUACHITA	XX	0003	D
16OU0000	PREHISTORIC UNKNOWN		OUACHITA	XX	0001	N
16OU0001	MIDDLE MISSISSIPPI	PLAQUEMINE	OUACHITA	E1	0014	N
16OU0002	LATE MISSISSIPPI	PROTOHIST. KOROA	OUACHITA	F	0001	N
16OU0002	MISSISSIPPI UNKNOWN		OUACHITA	E0	0025	N
16OU0002	MIDDLE MISSISSIPPI	PLAQUEMINE	OUACHITA	E1	0001	N
16OU0005	PREHISTORIC UNKNOWN	MULTICOMPONENT	OUACHITA	XX	0001	N
16OU0006	PREHISTORIC UNKNOWN		OUACHITA	XX	0002	N
16OU0015	MISSISSIPPI UNKNOWN	PLAQUEMINE	OUACHITA	E1	0001	N
16OU0017	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	E1	0038	C
16OU0018	NATIVE AMERICAN	REFUGEES	BAYOU BARTHOLOMEW	F	0121	N
16OU0018	LATE MISSISSIPPI	CADDO 4	BAYOU BARTHOLOMEW	E1	0001	N
16OU0031	PREHISTORIC UNKNOWN		OUACHITA	XX	0004	N
16OU0032	MIDDLE MISSISSIPPI	PLAQUEMINE	OUACHITA	E1	0011	N
16OU0032	LATE MISSISSIPPI	PROTOHIST. KOROA	OUACHITA	F	0001	N
16OU0132	MIDDLE. MISSISSIPPI	PLAQUEMINE	OUACHITA	E1	0014	N
16OU0161	LATE MISSISSIPPI	CAD00 5	BAYOU BARTHOLOMEW	E1	0001	N
16OU0162	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	E1	0016	N
16OU0165	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	E1	0001	N
16OU0165	MIDDLE MISSISSIPPI	PLAQUEMINE	OUACHITA	E1	0019	N
16OU0174	LATE MISSISSIPPI	PLAQUEMINE	OUACHITA	E1	0001	N
16OU0181	LATE MISSISSIPPI	PROTOHIST. KOROA	OUACHITA	F	0010	N
16PC0000	PREHISTORIC UNKNOWN		LOWER RED	XX	0107	N
16PL0000	PREHISTORIC UNKNOWN		MISSISSIPPI	XX	0001	N
16RA0000	PREHISTORIC UNKNOWN		LOWER RED	XX	0001	N
16RA0000	PREHISTORIC UNKNOWN		LOWER RED	XX	0001	N
16RA0001	LATE MISSISSIPPI	PLAQUEMINE	LOWER RED	E1	0001	N
16RA0003	MISSISSIPPI UNKNOWN		LOWER RED	E1	0001	N
16RA0005	LATE MISSISSIPPI	PLAQUEMINE	LOWER RED	E1	0056	N
16RA0021	LATE MISSISSIPPI	CADDO 3-4	LOWER RED	E1	0001	N

SITE NUMBER	PERIOD AND CULTURE		DRAINAGE	ADAPTATION	BURIALS	ANALYSES
16RI0000	PREHISTORIC UNKNOWN		BOEUF	XX	0004	N
16RI0000	UNKNOWN		BOEUF	XX	0004	N
16RI0013	BAYTOWN	TROYVILLE	BOEUF	D1	0150	D
16RI0185	LATE MISSISSIPPI	LATE MISSISSIPPI	OUACHITA	E1	0001	N
16RR0000	MULTICOMPONENT		RED	XX	0001	N
16RR0000	PREHISTORIC UNKNOWN		RED	XX	0019	N
16RR0001	LATE MISSISSIPPI	CADDO 5	RED	E1	0015	D
16RR0001	EARLY MISSISSIPPI	CADDO 1	RED	E1	0015	
16RR0002	EARLY MISSISSIPPI	CADDO 1	RED	E1	0004	N
ISRR0004	EARLY MISSISSIPPI	CADDO 1	RED	E1	0006	C
16SB0012	EARLY MISSISSIPPI	COLES CREEK COAST	PONTCHARTRAIN	D2	0008	D
16SC0000	AFRO-AMERICAN		MISSISSIPPI	G	0280	N
16SC0002	MISSISSIPPI UNKNOWN		MISSISSIPPI	D1	0005	N
16SC0011	EARLY MARKSVILLE	MARKSVILLE COAST	PONTCHARTRAIN	D2	0001	N
16SC0023	HISTORIC AMERICAN		MISSISSIPPI	G	0001	N
16SC0050	HISTORIC AMERICAN		MISSISSIPPI	G	0005	N
16SC0051	HISTORIC AMERICAN		MISSISSIPPI	G	0014	N
16SJ0002	MULTICOMPONENT		MISSISSIPPI	XX	0001	N
16SJB002	TCHULA	TCHEFUNCTE COAST	MISSISSIPPI	D2	0002	N
16SJB003	HISTORIC AMERICAN		MISSISSIPPI	G	0001	N
16SJB016	HISTORIC AMERICAN		MISSISSIPPI	G	0001	N
16SL0000	MISSISSIPPI UNKNOWN		ATCHAFALAYA	E1	0001	N
16SM0017	TCHULA	TCHEFUNCTE COAST	ATCHAFALAYA	D1	0057	C
16SMY000	TCHULA	TCHEFUNCTE COAST	ATCHAFALAYA	D2	0001	N
16SMY000	UNKNOWN		ATCHAFALAYA	XX	0001	N
16SMY000	PREHISTORIC UNKNOWN		ATCHAFALAYA	XX	0001	N
16SMY002	COLES CREEK/TROYVILLE COAST		ATCHAFALAYA	D2	0003	N
16ST0001	TCHULA	TCHEFUNCTE COAST	PONTCHARTRAIN	D2	0043	C
16TA0000	PREHISTORIC UNKNOWN		PONTCHARTRAIN	XX	0001	N
16TA0000	PREHISTORIC UNKNOWN		PONTCHARTRAIN	XX	0005	N
16TE0000	PREHISTORIC UNKNOWN		TENSAS	XX	0036	D
16TE0000	PREHISTORIC UNKNOWN		MISSISSIPPI	XX	0001	N
16TR0000	UNKNOWN		BAYOU LAFOURCHE	XX	0001	N
16TR0005	LATE MARKSVILLE	ISSAQUENA COAST	BAYOU LAFOURCHE	D2	0006	N
16VM0007	COLES CREEK	COLES CREEK COAST	WEST GULF	D2	0003	D
16VM0009	COLES CREEK	COLES CREEK COAST	WEST GULF	D2	0010	D
16VM0102	ARCHAIC	LATE COAST	WEST GULF	D2	0055	C
16WF0002	NATIVE AMERICAN	TUNICA	MISSISSIPPI	F	0010	N
16WF0003	MULTICOMPONENT		MISSISSIPPI	XX	0001	N
16WF0021	NATIVE AMERICAN	TUNICA	MISSISSIPPI	F	0004	N
16WF0025	NATIVE AMERICAN	TUNICA	MISSISSIPPI	F	0100	N
16WN0001	EARLY MISSISSIPPI	CADDO 1	RED	E1	0005	N

ADAPTATION CODES FOR ADAPTATION TYPES

B - Early Holocene
C - Middle Holocene
D1 - Late Holocene Semisedentary Inland
D2 - Late Holocene Semisedentary Coastal
E0 - Late Holocene Sedentary
E1 - Late Holocene Sedentary Dispersed
E2 - Late Holocene Sedentary Aggregated
E3 - Late Holocene Sedentary Paramount Aggregated
F - Native Americans at time of contact
G - Old World Immigrants
XX - Unknown Adaptation Type

SITE NUMBER	PERIOD AND CULTURE	DRAINAGE	ADAPTATION	BURIALS	ANALYSES

ANALYSIS CODES

C - comparative, more than age and sex
D - demographic, only sex and/or age
N - none

NOTE: The numbers of individuals noted in the Burials category represents the number of burials reported to have been excavated and not necessarily the number in curation or analyzed.

APPENDIX C2

MORTUARY SITE NAMES AND NUMBERS FOR THE LOUISIANA–ARKANSAS REGION

SITE NAME	SITE NO.
ARKANSAS	
ALBRITTON BOTTOMLAND	03OU0128
ALMA BROWN	03DE0003
ARMOREL	03MS0023
ARTHUR MANN PLACE	03SF0000
AUSTIN	03DR0050
BANGS SLOUGH	03CA0003
BANKS PLACE MOUND 1	03CT0014
BANKS VILLAGE	03CT0013
BARBER FIELD	03DR0017
BARROT FIND	03MS0000
BARTON RANCH	03CT0018
BASSET	03MS0000
BATTLE MOUND	03LA000I
BAY VILLAGE MOUND	03PO0003
BAYOU SEL (OLD SALT)	03CL0027
BEE RANCH	03OU0005
BELL GIN LANDING	03UN0099
BELLAIRE	03CH0046
BIG EDDY	03SF0009
BIG LAKE BRIDGE	03MS0024
BLEVINS MOUND	03HE0271
BLOCK	03CS0090
BOWHUNTER	03HE0088
BOYDELL MOUND	03AS0058
BOYTT'S FIELD	03UN0013
BRADFORD FIND	03SF0000
BRADLEY PLACE	03CT0007
BROUGHAM LAKE	03CT0098
BROWNFIELD	03CY0042
BURNS	03CG0079
BURRIS II	03CG0218
CARNES	03LE0029
CARPENTER MOUND	03CL0056
CARSON LAKE	03MS0013
CARYVILLE LANDING	03UN0011
CAZER	03PR0067
CEDAR GROVE	03LA0097
CHERRY	03DR0190
CHERRY VALLEY	03CS0040
CHICKASAWBA MOUND	03MS0005
CICERO YOUNG	03LA0007
CLARK	03AS0154
CLAY HILL	03LE0011
CLYDE HODGES FARM	03HS0099
COLUMBUS MOUNDS CEM.	03HE0038
COOKS LAKE #2	03CA000I
COON ISLAND	03BR0010
COOPER PLACE, HOT-1	03HS0001
COPELAND RIDGE	03CL0195
CRAFTON NO. 1	03CY0088
CRENSHAW MOUNDS	03MI0006
CROSSNO, (HODGE)	03MS0018
CUMMINGS PLACE	03PO0005
CURTIS COLLECTION	03PO0000
CURTIS FIND	03AR0000
DANNER PLACE	03CT0035
DE ROSSITT	03SF0049
DE SOTO PLANTATION	03DE0024
DEER RUN	03DA0403
DICKSON FARM	03MS0000
DISTURBED MOUND	03UN0063
DON MC CARTY FIND	03DR0000
DOUGLAS MOUND	03LI0019
DUMOND	03AR0040
DUPREE PLANTATION	03PH0000
E. C. CALHOUN	03HE0081
E. H. CATO PLACE	03HE0099
EARL KEELS-SCHUGTOWN	03GE0002
EDWARDS	03CS0120
EGYPT	03LA0023
FERGUSON	03HE0063
FIFTEEN MILE BAYOU	03SF0222
FLOODWAY MOUNDS	03PO0046
FLOODWAY, WALNUT MDS	03MS0002
FORREST PLACE	03LE0000
FORTUNE MOUND	03CS0071
FOSTER LAKE	03LA0009
FOSTER PLACE	03LA0027
FREEMAN FARM	03CL0040
FRIDAY PLACE	03LA0028
FRIERSON NO. 2	03CG0054
GANT	03MS0011
GIBSON MOUND	03CH0063
GODFREY'S LANDING	03BR0002
GOLDEN LAKE	03MS0060
GOLIGHTLY	03CT0019
GORDON	03AS0152
GOULETT LANDING	03BR0008
GREEN ISLAND MOUND	03BR0001
GREER MOUND	03JE0050
HALEY PLACE	03MI0001
HAMPTON LANDING	03BR0000
HANES PLACE	03WO0000
HARDCASTLE DONATION	03UN0000
HARRELL BEND	03DR0055
HAYES FIELD	03UN0023
HAYNES	03LA0000
HAZEL	03PO0006
HEDGES, SAM	03HS0060
HELENA MOUNDS	03PH0011
HENDRICKS FIELD 1	03HE0050
HENLEY #1	03HE0042
HIGGINBOTHAM PLACE	03MI0003
HODGES DONATION	03CL0000
HOG LAKE (JONES)	03CH0005
HOG LAKE (MEDLEY)	03CH0005
HOG LAKE (PARNELL)	03CH0005
HOOD	03HE0054
HUBBARD 2	03PO0146
HUDDLESTON FIND	03CL0000
HUGHES MOUND	03HE0040
HUNT PLACE	03HE0014
HYNEMAN (PAYNEWAY)	03PO0192
HYNEMAN I	03PO0052
HYNEMAN II	03PO0054
ISAIAH HENRY PLACE	03HE0010
JOHNNY FORD	03LA0005
JONES MILL	03HS0028
JONES PLACE	03HE0000
KELLER	03PO0158
KELLER PLACE	03CA0013
KELLEY-GRIMES	03DE0074
KELLY SEARS	03CO0003
KENT	03OU0006
KENT PLACE	03LE0008
KINGS LANDING	03PR0000
LAND'S END	03DR0184
LAWHORN	03CG0001
LES JOHNSON	03AS0159
LIDDON PLACE, BRANCH	03MS0073
LITTLE CYPRESS BAYOU	03CT0050
LITTLE MUD LAKE	03CA0265
LITTLE RIVER	03PO0000
LOCUST RIDGE CEM.	03UN0008
LOUIS BECKER PLACE	03HE0113
LOWRIE LANDING	03BR0005
LYLE HOUSE	03BR0028
MAC DUFFEE PLACE	03CG0021
MANGRUM	03CG0636
MANILA SCHOOL DIST.	03MS0025
MANLEY	03MS0106
MARTIN FARM	03HE0092
MAUCK FIND	03CT0000
MAY MOUND	03CL0029
MC ARTHUR	03CH0049
MC BROOM	03AR0046
MC CLENDON	03DR0144
MC CLURE PLACE	03MI0029
MENARD MOUND	03AR0004
MIDDLE MEADOW	03HS0019
MIDDLE NODENA	03MS0003
MILLER MOUNDS	03PO0024
MISSISSIPPI RIVER	03CT0000
MODIN WALKER	03HE0018
MOORE COLLECTION	03PO0000
MOORE FIND	03LE0000
MOORE PLACE	03HE0000
MOORE'S FIND	03PO0000
MOORE'S MILL	03BR0000

SITE NAME	SITE NO.
MORSE FIND	03CS0000
NEELY'S FERRY	03CS0024
NICK WHEATLY PLACE	03CL0008
OLD BEMIS PLACE	03HE0080
OLD RIVER LANDING	03AR0014
OLD TOWN RIDGE	03CG0041
P. C. CITY PLACE	03HE0095
P.M. NOTGRASS PLACE	03MS0015
PARKIN	03CS0029
PAW PAW MOUND	03OU0022
PEARSON	03CH0018
PECAN POINT	03MS0078
PIECEMEAL COLLECTION	03CS0000
PIERRE CACHE	03CG0078
PIPELINE	03HE0027
PLANK GATE SITE	03HE0133
POTTER MOUND	03PO0002
POWELL CANAL	03CH0014
PURTLE	03HE0070
RED LAKE MOUND	03HE0012
RHODES PLACE	03CT0003
RICHARDSON	03MS0022
RIVER FIELD	03OU0023
ROLAND MOUND	03AR0030
ROSE MOUND	03CS0027
SALINE BAYOU	03CL0024
SALINE SAND & GRAVEL	03BR0040
SANDERS PLACE	03CT0000
SAWYER'S LANDING	03DE0000
SHALLOW LAKE	03UN0052
SHANE'S VILLAGE	03LA0075
SHANES MOUND	03LA0006
SHERRER PLACE	03AS0000
SLOAN	03GE0094
SMITH (GOEBLE)	03MS0071
SPIRIT LAKE	03LA0083
STOTTS PLACE	03PO0026
TAYLOR MOUNDS	03DR0002
TAYLOR'S BAYOU	03WO0000
TCHUNDY LUMBER CO.	03PO0001
TERRY #2	03MS0065
TILLAR	03DR0001
TILLAR FARMS	03DR0049
TITTERINGTON	03PO0000
UPPER NODENA	03MS0004
VERNON PAUL	03CS0025
WALLACE DENHAM MOUND	03HS0015
WALNUT RIDGE	03MO0061
WAMPLER #2	03CS0117
WAPANOCCA	03CT0009
WARNER SMITH	03CT0044
WASH	03HE0044
WASHINGTON, COX	03HE0035
WATERMELON ISLAND	03HS0003
WATTS FIELD	03UN0018
WEIST	03CG0037
WESTLAKE PLACE	03DE0002
WHERRY LANDING	03BR0000
WHITE RIVER	03PR0000
WHITTEN'S ISLAND	03HE0048
WILDY PLACE	03MS0010
WILSON	03CV0109
WIRE FENCE LANDING	03BR0000
WITTSBURG	03CS0138
WOODLAWN PLANTATION	03PH0000
WYATT	03HE0003
ZEBREE HOMESTEAD	03MS0020

LOUISIANA

SITE NAME	SITE NO.
ACME BAPTIST MOUND	16CO0098
ALABAMA LANDING	16RI0000
ALLEN GILBERT GRAVE	16CA0050
ALLEN PLACE CEMETERY	16NA0004
ALPHENIA PLANTATION	16TE0000
AMERICAN CEMETERY	16NA0067
ANGOLA FARM	16WF0002
ANGOLA PRISON GATE	16WF0003
ARCH GREER FARM	16BI0001
BATCHELOR	16MA0027
BAYOU BARTHOLOMEW	16MO0000
BAYOU CHENE BLANC	16LV0013
BAYOU CUTLER 1	16JE0003
BAYOU DU LARGE	16TR0000
BAYOU GOULA	16IV0011
BAYOU JASMINE	16SJB002
BAYOU L'EAU NOIRE	16AV0011
BAYOU LABRANCHE MO.	16SC0011
BAYOU MATHERN	16LF0003
BAYOU SORREL	161VO004
BAYOU VACHERIE	16SJO002
BEAU RIVAGE	16LY0005
BELCHER MOUND	16CD0013
BELLE ISLE	16SMY000
BELLEVUE MOUND	16BO0000
BIG OAK ISLAND	16OR0006
BILL CONLY	16BI0019
BILLOT	16CM0109
BLOODHOUND HILL	16WF0021
BOEUF RIVER	16CA0004
BOIS D'ARC CREEK	16RR0000
BONNET BAYOU	16AS0000
BOOTH LANDING	16CT0031
BOWIE	16LF0017
BRAY LANDING	16MO0011
BRIAR BEND	16RR0000
BRULY ST. MARTIN	16IV0006
BUSH'S PLACE	16TA0000
C. FORET'S FARM	16SMY000
CANEBRAKE MOUNDS	16MA0000
CANEY MOUNDS	16CT0005
CEDAR BLUFF	16WN0001
CHARENTON	16SMY002
CHARITY HOSPITAL	16OR0108
CHASE CEMETERY	16FR0215
CHOCTAW CEREMONIAL	16NA0018
CHURUPA PLANTATION	16CO0005
CLEAR CREEK (NUGENT)	16GR0020
COLES POINT	16OU0132
COOLEY TB SANITARIUM	16OU0031
COPELL: PECAN ISLAND	16VM0102
COQUILLE	16JE0037
COTTINGHAM LANDING	16CA0017
COTY	16BE0048
COWPEN SLOUGH	16CT0147
CRANE LAKE	16MO0041
CROOKS	16LA0003
CUTOFF LANDING	16OU0005
DAILEY LANDING	16FR0141
DEAN LAKE MOUND	16FR0013
DIVERSION CANAL	16AN0016
FAULK CEMETERY	16OU0174
FILHOIL MOUND	16OU0002
FISH HATCHERY	16NA0009
FITZHUGH	16MA0001
FLOWERY MOUND	16CO0000
FOOL RIVER	16MA0000
FRAZIER PLACE	16CT0000
FREDRICKS PLACE	16NA0000
FRENCH FORK TWO	16CT0155
GAHAGAN MOUND	16RR0001
GASTON STEELE SITE	16CO0025
GERARD ST. CEMETERY	16OR0000
GERSON	16OU0002
GIBSON	16TR0005
GLENDORA PLANTATION	16OU0018
GOLD MINE	16RI0013
GRANGES COULEE	16LY0001
GREENHOUSE	16AV0002
HAMPTON PLACE	16NA0000
HANNA	16RR0004
HARRELSON LANDING	16CA0013
HARRIS	16FR0234
HARTMAN BRANCH	16CD0025
HEDGELAND PLACE	16CT0019
HOGAN LANDING	16CA0014
HORSESHOE LAKE	16CA0061
NORTON FAMILY CEM.	16EF0066
HUDSON MOUNDS	16CT0009
INDIAN BAYOU	16MA0009
JOHNSON	16MO0000
JOHNSON'S PLACE	16AV0014
JONES LANDING	16FR0220
KELLER PLACE	16PC0000
KENNER CEMETERY	16SC0050
KENO PLACE	16MO0031
KUGLER CEMETERY	16SC0051
LABORDE	16AV0000
LACROIX	16RA0000
LAFAYETTE MND. GROUP	16SM0017
LAKE LOUIS	16CT0024
LAKE ST. AGNES	16AV0026
LAWTON GIN SITE	16NA0013
LINN GROVE LANDING	16MO0000
LITTLE LARTO BAYOU	16CT0148
LITTLE OAK	16OR0007
LITTLE RED CHURCH	16SCO023
LITTLE WOODS	16OR0001
LIVELY CEMETERY	16CA0053
LOGTOWN MOUNDS	16OU0006
LOUIS PROCELLO	16DS0212
M-B-P-CEMETERY	16CA0056
MADISON A	16MA0000
MADISON B	16MA0000
MARKSVILLE	16AV0001
MARSHALL LANDING	16CA0002
MARSTON PLANTATION	16RR0002
MARTIN BAPTISTE PL..	16AV0025

SITE NAME	SITE NO.	SITE NAME	SITE NO.	SITE NAME	SITE NO.
MAYES MOUND	16CT0010	PICKET ISLAND	16CT0003	ST. GABRIEL	16IV0128
MC HENRY	16OU0165	PIERRE CLEMENT	16CM0047	ST. LOUIS II	16OR0095
MILLER PLACE	16AS0000	POINT A LA HACHE	16PL0000	ST. PETERS/ 1 ST CEM.	16OR0092
MONROE	16OU0000	POOL LAKE BAYOU MD.	16CT0063	STORMY POINT 1	16CD0000
MONTGOMERY PLACE	16MA0000	PORT HUDSON CONF. CEM	16EF0068	STORMY POINT 2	16CD0000
MONTROSE	16NA0037	PRITCHARD'S LANDING	16CT0014	SYCAMORE LANDING	16MO0030
MONTZ CEMETERY	16SC0000	RAGLAND	16OU0032	TAUNTON-COLEMAN	16CT0315
MOON LAKE	16OU0161	RAYVILLE	16RI0000	TAYLORTOWN	16BO0000
MORGAN: PECAN ISLAND	16VM0009	RHYMES	16RI0018	TCHEFUNCTE	16ST0001
MORTON SHELL MOUND	16IB0003	5 ROCK ROW LANDING	16OU0181	TRANSYLVANIA	16EC0008
MOTT PLACE	16FR0011	RODRIQUEZ	16RA0000	TROYVILLE	16CT0007
MOUND LANDING	16MO0000	ROUGEAU MOUNDS	16RA0005	TRUDEAU LANDING	16WF0025
MOUNDS PLANTATION	16CD0012	ROYAL LAKE	16FR0181	TURKEY POINT LANDING	16FR0010
MT. NEBO	16MA0018	SALINE POINT	16AV0000	VEAZEY: PECAN ISLAND	16VM0007
MULATTO BAYOU	16SB0012	SALSBURY	16OU0015	W. H. WALDRUM FIND	16CD0000
MYATT'S LANDING	16OU0017	SANDY HILL	16BE0054	WARD PLACE	16MO0012
NATCHITOCHES C. CLUB	16NA0000	SANSON PLACE	16RA0001	WHITE OAK LANDING	16FR0161
NICKS PLANTATION	16AV0004	SCHLOSSER CEMETERY	16SJB003	WILDWOOD MOUND	16CT0084
NORMAN LANDING	16AV0000	SCHWING PLACE	16IV0000	WILKINSON	16NA0003
OLD CREEK	16LA0000	SEVEN PINES LANDING	16MO0000	WOODS SITE	16CA0062
PARGOUD LANDING	16OU0001	SIMS PLACE	16SC0002	WOODSON PLACE	16RA0003
PEASE PLACE	16BO0002	SMITH CEMETERY	16FR0165	WOODVILLE CEMETERY	16SJB016
PECK MOUNDS	16CT0001	SNYDER	16FR0189	WYANT CEMETERY	16CA0054
PECK PLACE	16CT0002	SOUTHERN C & O MILL	16NA0014	YFC CEMETERY	16EBR000
				ZEIGEN POINT	16OU0162

APPENDIX C3

MORTUARY SITE NAMES BY NUMBER FOR THE LOUISIANA–ARKANSAS REGION

SITE NO.	SITE NAME
ARKANSAS	
03AR0000	CURTIS FIND
03AR0004	MENARD MOUND
03AR0014	OLD RIVER LANDING
03AR0030	ROLAND MOUND
03AR0040	DUMOND
03AR0046	MC BROOM
03AS0000	SHERRER PLACE
03AS0058	BOYDELL MOUND
03AS0058	BOYDELL MOUND
03AS0152	GORDON
03AS0154	CLARK
03AS0159	LES JOHNSON
03BR0000	MOORE'S MILL
03BR0000	WHERRY LANDING
03BR0000	HAMPTON LANDING
03BR0000	WIRE FENCE LANDING
03BR0001	GREEN ISLAND MOUND
03BR0002	GODFREY'S LANDING
03BR0005	LOWRIE LANDING
03BR0008	GOULETT LANDING
03BR0010	COON ISLAND
03BR0028	LYLE HOUSE
03BR0040	SALINE SAND & GRAVEL
03CA0001	COOKS LAKE #2
03CA0003	BANGS SLOUGH
03CA0013	KELLER PLACE
03CA0265	LITTLE MUD LAKE
03CG0001	LAWHORN
03CG0021	MAC DUFFEE PLACE
03CG0037	WEIST
03CG0041	OLD TOWN RIDGE
03CG0054	FRIERSON NO. 2
03CG0078	PIERRE CACHE
03CG0079	BURNS
03CG0636	MANGRUM
03CH0005	HOG LAKE (PARNELL)
03CH0005	HOG LAKE
03CH0005	HOG LAKE (JONES)
03CH0005	HOG LAKE (MEDLEY)
03CH0014	POWELL CANAL
03CH0018	PEARSON
03CH0049	MC ARTHUR
03CH0063	GIBSON MOUND
03CL0000	HUDDLESTON FIND
03CL0000	HODGES DONATION
03CL0008	NICK WHEATLY PLACE
03CL0024	SALINE BAYOU
03CL0027	BAYOU SEL (OLD SALT)
03CL0029	MAY MOUND
03CL0040	FREEMAN FARM
03CL0056	CARPENTER MOUND
03CL0195	COPELAND RIDGE
03CO0003	KELLY SEARS
03CS0000	PIECEMEAL COLLECTION
03CS0000	MORSE FIND
03CS0024	NEELY'S FERRY
03CS0025	VERNON PAUL
03CS0027	ROSE MOUND
03CS0029	PARKIN
03CS0040	CHERRY VALLEY
03CS0071	FORTUNE MOUND
03CS0090	BLOCK
03CS0117	WAMPLER #2
03CS0120	EDWARDS
03CS0138	WITTSBURG
03CT0000	MISSISSIPPI RIVER
03CT0000	SANDERS PLACE
03CT0000	MAUCK FIND
03CT0003	RHODES PLACE
03CT0007	BRADLEY PLACE
03CT0009	WAPANOCCA
03CT0013	BANKS VILLAGE
03CT0014	BANKS PLACE MOUND 1
03CT0018	BARTON RANCH
03CT0019	GOLIGHTLY
03CT0035	DANNER PLACE
03CT0044	WARNER SMITH
03CT0050	LITTLE CYPRESS BAYOU
03CT0098	BROUGHAM LAKE
03CV0109	WILSON
03CY0042	BROWNFIELD
03CY0088	CRAFTON NO. 1
03DA0403	DEER RUN
03DE0000	SAWYER'S LANDING
03DE0002	WESTLAKE PLACE
03DE0003	ALMA BROWN
03DE0024	DE SOTO PLANTATION
03DE0074	KELLEY-GRIMES
03DR0000	DON MC CARTY FIND
03DR0001	TILLAR
03DR0002	TAYLOR MOUNDS
03DR0017	BARBER FIELD
03DR0049	TILLAR FARMS
03DR0050	AUSTIN
03DR0055	HARRELL BEND
03DR0144	MC CLENDON
03DR0184	LAND'S END
03DR0190	CHERRY
03GE0002	EARL KEELS-SCHUGTOWN
03GE0094	SLOAN
03HE0000	JONES PLACE
03HE0000	MOORE PLACE
03HE0010	ISAIAH HENRY PLACE
03HE0012	RED LAKE MOUND
03HE0014	HUNT PLACE
03HE0018	MODIN WALKER
03HE0027	PIPELINE
03HE0032	WYATT
03HE0035	WASHINGTON, COX
03HE0038	COLUMBUS MOUNDS CEM.
03HE0040	HUGHES MOUND
03HE0042	HENLEY #1
03HE0044	WASH
03HE0048	WHITTEN'S ISLAND
03HE0050	HENDRICKS FIELD 1
03HE0054	HOOD
03HE0063	FERGUSON
03HE0080	OLD BEMIS PLACE
03HE0081	E. C. CALHOUN
03HE0088	BOWHUNTER
03HE0092	MARTIN FARM
03HE0095	P. C. CITY PLACE
03HE0099	E. H. CATO PLACE
03HE0113	LOUIS BECKER PLACE
03HE0133	PLANK GATE SITE
03HE0271	BLEVINS MOUND
03HS0001	COOPER PLACE, HOT-1
03HS0003	WATERMELON ISLAND
03HS0015	WALLACE DENHAM MOUND
03HS0019	MIDDLE MEADOW
03HS0028	JONES MILL
03HS0060	HEDGES, SAM
03HS0099	CLYDE HODGES FARM
03JE0050	GREER MOUND
03LA0000	HAYNES
03LA0001	BATTLE MOUND
03LA0005	JOHNNY FORD
03LA0006	SHANES MOUND
03LA0007	CICERO YOUNG
03LA0009	FOSTER LAKE
03LA0023	EGYPT
03LA0027	FOSTER PLACE
03LA0028	FRIDAY PLACE
03LA0075	SHANE'S VILLAGE
03LA0083	SPIRIT LAKE
03LA0097	CEDAR GROVE
03LE0000	FORREST PLACE
03LE0000	MOORE FIND
03LE0008	KENT PLACE
03LE0011	CLAY HILL
03LE0029	CARNES
03LI0019	DOUGLAS MOUND
03MI0001	HALEY PLACE
03MI0003	HIGGINBOTHAM PLACE
03MI0006	CRENSHAW MOUNDS
03MI0029	MC CLURE PLACE
03MO0061	WALNUT RIDGE
03MS0000	BARROT FIND
03MS0000	DICKSON FARM
03MS0000	BASSET
03MS0002	FLOODWAY, WALNUT MDS
03MS0003	MIDDLE NODENA
03MS0004	UPPER NODENA
03MS0005	CHICKASAWBA MOUND
03MS0010	WILDY PLACE
03MS0011	GANT
03MS0013	CARSON LAKE
03MS0015	P. M. NOTGRASS PLACE
03MS0018	CROSSNO, (HODGE)
03MS0020	ZEBREE FARMSTEAD
03MS0022	RICHARDSON
03MS0023	ARMOREL
03MS0024	BIG LAKE BRIDGE
03MS0025	MANILA SCHOOL DIST.
03MS0060	GOLDEN LAKE
03MS0065	TERRY #2
03MS0071	SMITH (GOEBLE)
03MS0073	LIDDON PLACE, BRANCH
03MS0078	PECAN POINT
03MS0106	MANLEY
03OU0005	BEE RANCH
03OU0006	KENT
03OU0022	PAW PAW MOUND
03OU0023	RIVER FIELD
03OU0128	ALBRITTON BOTTOMLAND
03PH0000	DUPREE PLANTATION
03PH0000	WOODLAWN PLANTATION
03PH0011	HELENA MOUNDS
03PO0000	TITTERINGTON
03PO0000	MOORE'S FIND
03PO0000	CURTIS COLLECTION
03PO0000	MOORE COLLECTION
03PO0000	LITTLE RIVER
03PO0001	TCHUNDY LUMBER CO.
03PO0002	POTTER MOUND
03PO0003	BAY VILLAGE MOUND
03PO0005	CUMMINGS PLACE
03PO0006	HAZEL
03PO0024	MILLER MOUNDS
03PO0026	STOTTS PLACE
03PO0046	FLOODWAY MOUNDS
03PO0052	HYNEMAN I
03PO0054	HYNEMAN II
03PO0146	HUBBARD 2
03PO0158	KELLER
03PO0192	HYNEMAN (PAYNEWAY)

SITE NO.	SITE NAME
03PR0000	KINGS LANDING
03PR0000	WHITE RIVER
03PR0067	CAZER
03SF0000	BRADFORD FIND
03SF0000	ARTHUR MANN PLACE
03SF0009	BIG EDDY
03SF0049	DE ROSSITT
03SF0222	FIFTEEN MILE BAYOU
03UN0000	HARDCASTLE DONATION
03UN0008	LOCUST RIDGE CEM.
03UN0011	CARYVILLE LANDING
03UN0013	BOYTT'S FIELD
03UN0018	WATTS FIELD
03UN0023	HAYES FIELD
03UN0052	SHALLOW LAKE
03UN0063	DISTURBED MOUND
03UND099	BELL GIN LANDING
03WO0000	TAYLOR'S BAYOU
03WO0000	HANES PLACE

LOUISIANA

SITE NO.	SITE NAME
16AN0016	DIVERSION CANAL
16AS0000	MILLER PLACE
16AS0000	BONNET BAYOU
16AV0000	SALINE POINT
16AV0000	NORMAN LANDING
16AV0000	LABORDE
16AV0001	MARKSVILLE
16AV0002	GREENHOUSE
16AV0004	NICKS PLANTATION
16AV0011	BAYOU L'EAU NOIRE
16AV0014	JOHNSON'S PLACE
16AV0025	MARTIN BAPTISTE PL.
16AV0026	LAKE ST. AGNES
16BE0048	COTY
16BE0054	SANDY HILL
16BI0001	ARCH GREER FARM
16BI0019	BILL CONLY
16BO0000	TAYLORTOWN
16BO0000	BELLEVUE MOUND
16BO0002	PEASE PLACE
16CA0002	MARSHALL LANDING
16CA0004	BOEUF RIVER
16CA0013	HARRELSON LANDING
16CA0014	HOGAN LANDING
16CA0017	COTTINGHAM LANDING
16CA0050	ALLEN GILBERT GRAVE
16CA0053	LIVELY CEMETERY
16CA0054	WYANT CEMETERY
16CA0056	M-B-P-CEMETERY
16CA0061	HORSESHOE LAKE
16CA0062	WOODS SITE
16CD0000	W. H. WALDRUM FIND
16CD0000	STORMY POINT 2
16CD0000	STORMY POINT 1
16CD0012	MOUNDS PLANTATION
16CD0013	BELCHER MOUND
16CD0025	HARTMAN BRANCH
16CM0047	PIERRE CLEMENT
16CM0109	BILLOT
16CO0000	FLOWERY MOUND
16CO0005	CHURUPA PLANTATION
16CO0025	GASTON STEELE SITE
16CO0098	ACME BAPTIST MOUND
16CT0000	FRAZIER PLACE
16CT0001	PECK MOUNDS
16CT0002	PECK PLACE
16CT0003	PICKET ISLAND
16CT0005	CANEY MOUNDS
16CT0007	TROYVILLE
16CT0009	HUDSON MOUNDS

SITE NO.	SITE NAME
16CT0010	MAYES MOUND
16CT0014	PRITCHARD'S LANDING
16CT0019	HEDGELAND PLACE
16CT0024	LAKE LOUIS
16CT0031	BOOTH LANDING
16CT0063	POOL LAKE BAYOU MD.
16CT0084	WILDWOOD MOUND
16CT0147	COWPEN SLOUGH
16CT0148	LITTLE LARTO BAYOU
16CT0155	FRENCH FORK TWO
16CT0315	TAUNTON-COLEMAN
16DS0212	LOUIS PROCELLO
16EBR000	YFC CEMETERY
16EC0008	TRANSYLVANIA
16EF0066	NORTON FAMILY CEM.
16EF0068	PORT HUDSON CONF. CEM
16FR0010	TURKEY POINT LANDING
16FR0011	MOTT PLACE
16FR0013	DEAN LAKE MOUND
16FR0039	CUTOFF LANDING
16FR0141	DAILEY LANDING
16FR0161	WHITE OAK LANDING
16FR0165	SMITH CEMETERY
16FR0181	ROYAL LAKE
16FR0189	SNYDER
16FR0215	CHASE CEMETERY
16FR0220	JONES LANDING
16FR0234	HARRIS
16GR0020	CLEAR CREEK (NUGENT)
16IB0003	MORTON SHELL MOUND
16IV0000	SCHWING PLACE
16IV0004	BAYOU SORREL
16IV0006	BRULY ST. MARTIN
16IV0011	BAYOU GOULA
16IV0128	ST. GABRIEL
16JE0003	BAYOU CUTLER 1
16JE0037	COQUILLE
16LA0000	OLD CREEK
16LA0003	CROOKS
16LF0003	BAYOU MATHERN
16LF0017	BOWIE
16LVO013	BAYOU CHENE BLANC
16LY0001	GRANGES COULEE
16LY0005	BEAU RIVAGE
16MA0000	MONTGOMERY PLACE
16MA0000	FOOL RIVER
16MA0000	CANEBRAKE MOUNDS
16MA0000	MADISON A
16MA0000	MADISON B
16MA0001	FITZHUGH
16MA0009	INDIAN BAYOU
16MA0018	MT. NEBO
16MA0027	BATCHELOR
16MO0000	LINN GROVE LANDING
16MO0000	MOUND LANDING
16MO0000	JOHNSON
16MO0000	SEVEN PINES LANDING
16MO0000	BAYOU BARTHOLOMEW
16MO0011	BRAY LANDING
16MO0012	WARD PLACE
16MO0030	SYCAMORE LANDING
16MO0031	KENO PLACE
16MO0041	CRANE LAKE
16NA0000	HAMPTON PLACE
16NA0000	NATCHITOCHES C. CLUB
16NA0000	FREDRICKS PLACE
16NA0003	WILKINSON
16NA0004	ALLEN PLACE CEMETERY
16NA0009	FISH HATCHERY
16NA0013	LAWTON GIN SITE
16NA0014	SOUTHERN C & O MILL
16NA0018	CHOCTAW CEREMONIAL

SITE NO.	SITE NAME
16NA0037	MONTROSE
16NA0067	AMERICAN CEMETERY
16OR0000	GERARD ST. CEMETERY
16OR0001	LITTLE WOODS
16OR0006	BIG OAK ISLAND
16OR0007	LITTLE OAK
16OR0092	ST. PETERS/ 1 ST CEM.
16OR0095	ST. LOUIS II
16OR0108	CHARITY HOSPITAL
16OU0000	MONROE
16OU0001	PARGOUD LANDING
16OU0002	GERSON
16OU0002	FILHOIL MOUND
16OU0002	GERSON
16OU0005	CUTOFF LANDING
16OU0006	LOGTOWN MOUNDS
16OU0015	SALSBURY
16OU0017	MYATT'S LANDING
16OU0018	GLENDORA PLANTATION
16OU0031	COOLEY TB SANITARIUM
16OU0032	RAGLAND
16OU0132	COLES POINT
16OU0161	MOON LAKE
16OU0162	ZEIGEN POINT
16OU0165	MC HENRY
16OU0174	FAULK CEMETERY
16OU0181	ROCK ROW LANDING
16PC0000	KELLER PLACE
16PL0000	POINT A LA HACHE
16RA0000	RODRIQUEZ
16RA0000	LACROIX
16RA0001	SANSON PLACE
16RA0003	WOODSON PLACE
16RA0005	ROUGEAU MOUNDS
16RI0000	ALABAMA LANDING
16RI0000	RAYVILLE
16RI0013	GOLD MINE
16RI0185	RHYMES
16RR0000	BOIS D'ARC CREEK
16RR0000	BRIAR BEND
16RR0001	GAHAGAN MOUND
16RR0002	MARSTON PLANTATION
16RR0004	HANNA
16SB0012	MULATTO BAYOU
16SC0000	MONTZ CEMETERY
16SC0002	SIMS PLACE
16SC0011	BAYOU LABRANCHE M0.
16SC0023	LITTLE RED CHURCH
16SC0050	KENNER CEMETERY
16SC0051	KUGLER CEMETERY
16SJ0002	BAYOU VACHERIE
16SJB002	BAYOU JASMINE
16SJB003	SCHLOSSER CEMETERY
16SJB016	WOODVILLE CEMETERY
16SM0017	LAFAYETTE MND. GROUP
16SMY000	BELLE ISLE
16SMY000	C. FORET'S FARM
16SMY002	CHARENTON
16ST0001	TCHEFUNCTE
16TA0000	BUSH'S PLACE
16TE0000	ALPHENIA PLANTATION
16TR0000	BAYOU DU LARGE
16TR0005	GIBSON
16VM0007	VEAZEY: PECAN ISLAND
16VM0009	MORGAN: PECAN ISLAND
16VM0102	COPELL: PECAN ISLAND
16WF0002	ANGOLA FARM
16WF0003	ANGOLA PRISON GATE
16WF0021	BLOODHOUND HILL
16WF0025	TRUDEAU LANDING
16WN0001	CEDAR BLUFF