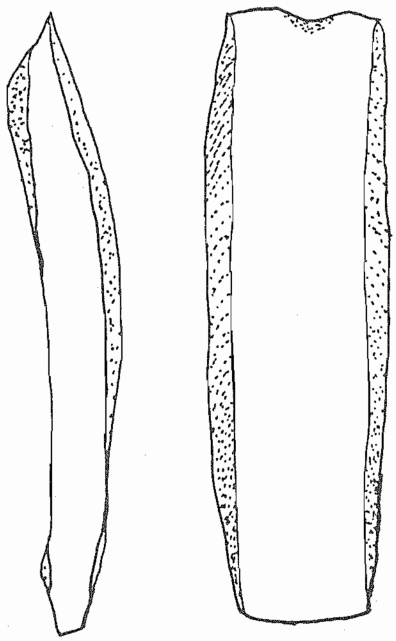
1992 Archaeological Test Excavations in Tensas Parish, Louisiana



by

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With Contributions by
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The Center For Archaeology

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Abstract

The Center For Archaeology undertook a two month-long project of research and National Register testing at three sites in Tensas Parish, Louisiana, during the summer of 1992. The goals of this project were to test known archaeological sites to determine if they were eligible for inclusion on the National Register of Historic Places. In addition we sought to acquire subsistence data from a number of non-mound sites in order to expand our sample of paleodietary information. Testing was undertaken at small "hamlets" or "villages" of the Coles Creek and Plaquemine cultures. Results of this research demonstrate that small, shallow sites can provide a wealth of data if archaeological techniques are modified to emphasize horizontal subsurface exposure. The three sites tested, Jolly, Blackwater, and Emerson, date respectively to the Balmoral, Preston, and Fitzhugh phases of the Mississippi period. Material remains from these sites help to reenforce the existing knowledge about these ceramic complexes, and in the case of the Preston phase occupation at Blackwater, we now have enough data to fully support the existence of this phase. Archaeological data indicate that there was a steady increase in the quantity of corn being produced through time, such that by the Fitzhugh phase (ca. A.D. 1400-1500), maize agriculture was likely to have been the most important aspect of plant food subsistence. Our test excavations have provided critical data on site management in an important archaeological region, and also allow us to scientifically address important questions concerning the evolution of subsistence practices and their relation to social change and development.

Acknowledgements

Funding for this project was provided by the National Park Service, Department of the Interior, through the Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archaeology, grant 92-A-06. Dr. Kathleen Byrd and Ms. Claudia Holland deserve considerable credit for insuring the successful completion of this project. The author would like to thank the following people for their support during the course of this project. Mr. Anon Trevillion, lessor of the Emerson site, and Mr. William (Billy) Guthrie, manager of the Panola Plantation provided access to their sites and aided us in many ways. Their kindness and hospitality are greatly appreciated. This project could not have been undertaken without the generous support and gracious kindness of Mr. Philip Watson and Mr. William Watson who provided us with housing and recreational opportunities. Mr. and Mrs. Estel Simpson made our very hot afternoons a little cooler by letting us swim at their dock on Lake Bruin.

A project of this kind cannot be undertaken or completed without the dedication of a number of field workers and laboratory personnel. It was my pleasure to work with a fine field crew consisting of Gayle J. Fritz, Bill Mitch, Megan Patterson, Chris Smith, Jean Stankey, and Doug Wells. Thanks also go to Reca Jones for her help and friendship, not to mention the delicious mayhaw jelly. Dr. Gayle Fritz has helped to make the Osceola project a success by her enthusiasm, hard work, and great humor. Dr. Fritz also provided help with the flotation system and has undertaken the analysis of the plant remains from the 1992 season. Dr. Roger T. Saucier has helped in numerous ways, including providing advice and encouragement, and helping to author Chapter Three. Laboratory work was provided by Paula Hartzell-Scott, Cathy Jones, Valentina Matte, Ann Smith, Doug Wells, and Chelley Woboldt.

My colleagues have also been a great source of encouragement. Thanks go to the faculty of the Department of Anthropology at Tulane University for their patience and encouragement. Computer equipment was partially provided by the Junior Faculty Research Fund of Tulane University, and I am indebted to Dr. William Cooper and Dr. James Kilroy for their enthusiastic support.

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CHAPTER ONE

INTRODUCTION

Introduction

The Center For Archaeology undertook a two month-long project of research and National Register testing at three sites in Tensas Parish, Louisiana (Figure 1). The goals of this project were to test known archaeological sites to determine if they were eligible for inclusion in the National Register of Historic Places. In addition this project sought to acquire subsistence data from a number of non-mound sites in order to expand our sample of paleodietary information. Testing was undertaken at small "hamlets" or "villages" dating to the Coles Creek and early Mississippi periods (Figure 2). Results of this research provide critical data on site management in an important archaeological region, and also allow us to scientifically address the crucial questions of the evolution of subsistence practices and their relation to social change and development.

Background and Theory

The Osceola Project has undertaken several years of investigations in the Tensas Basin of Louisiana with a focus on the understanding and explication of subsistence behavior and its relation to changes in settlement, social, and economic organization during the period ca. A.D. 200-1500 (Kidder 1990a; Kidder and Fritz 1993). The geographic focus of our research has been the Reno Brake (16TE93) and Osceola (16TE2) sites, near St. Joseph in Tensas Parish. These two important mound sites have yielded significant data on subsistence remains and by inference patterns of socio-cultural evolution. Between them the two sites have stratified deposits dating from the Issaquena to the late Coles Creek periods. Investigations at both sites has been limited to stratigraphic testing with an emphasis on recovering preserved subsistence remains (Kidder 1990a).

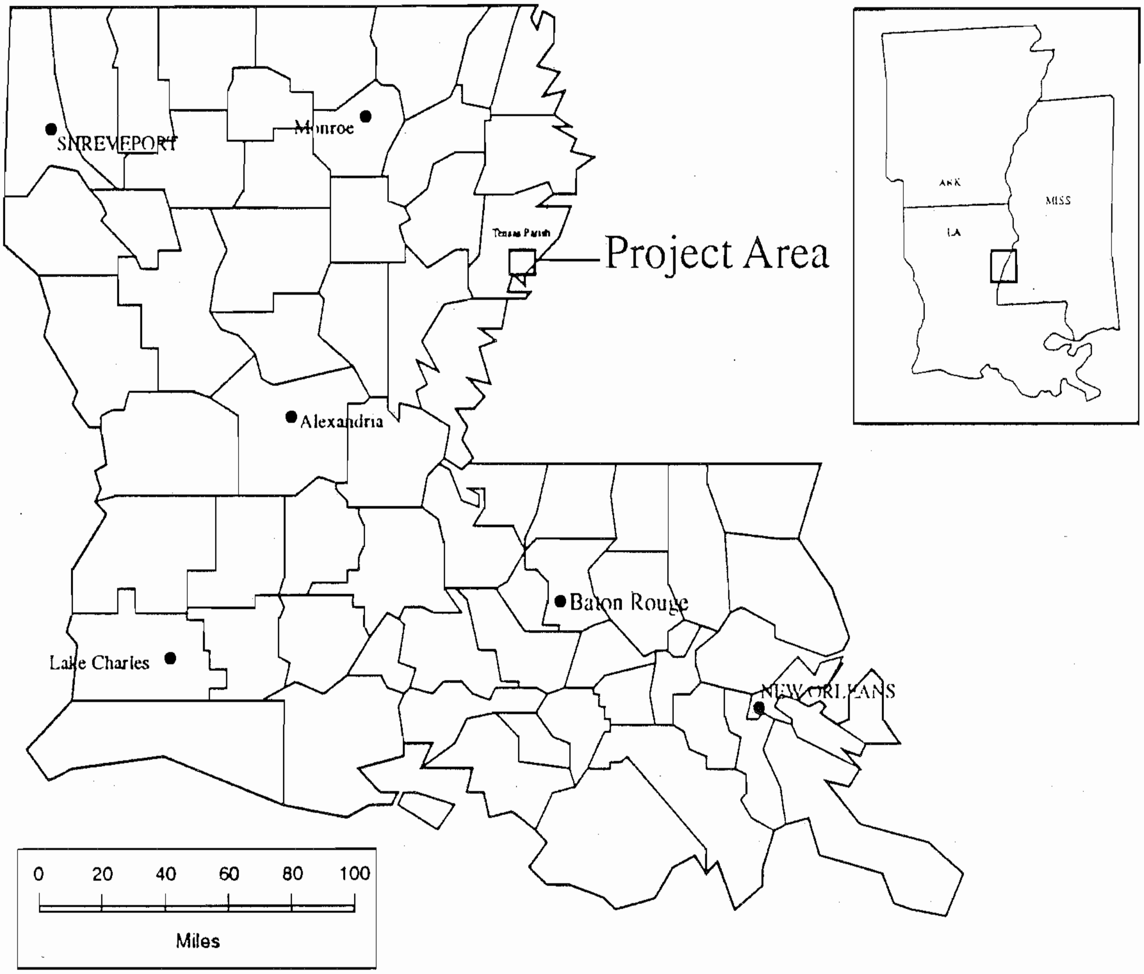

Figure 1: Osceola Project Area, Tensas Parish, NE Louisiana

<table>
<tr><th>Date</th><th>Stage</th><th>Period</th><th>Culture</th><th>Phase</th></tr>
<tr><td></td><td rowspan="9">Mississippian</td><td rowspan="9">Mississippi</td><td rowspan="5">Plaquemine</td><td>Fitzhugh</td></tr>
<tr><td>1400</td><td rowspan="4">Routh</td></tr>
<tr><td>1350</td></tr>
<tr><td>1300</td></tr>
<tr><td>1250</td></tr>
<tr><td>1200</td><td rowspan="10">Coles Creek</td><td rowspan="2">Preston</td></tr>
<tr><td>1150</td></tr>
<tr><td>1100</td><td rowspan="2">Balmoral</td></tr>
<tr><td>1050</td></tr>
<tr><td>1000</td><td rowspan="12">Late Woodland</td><td rowspan="6">Coles Creek</td><td rowspan="3">Saranac / Ballina</td></tr>
<tr><td>950</td></tr>
<tr><td>900</td></tr>
<tr><td>850</td><td rowspan="2">Sundown</td></tr>
<tr><td>800</td></tr>
<tr><td>750</td><td rowspan="2">Mount Nebo</td></tr>
<tr><td>700</td><td rowspan="6">Baytown</td><td rowspan="6">Troyville</td></tr>
<tr><td>650</td><td rowspan="2">Marsden</td></tr>
<tr><td>600</td></tr>
<tr><td>550</td><td rowspan="3">Indian Bayou</td></tr>
<tr><td>500</td></tr>
<tr><td>450</td></tr>
<tr><td>400</td><td rowspan="5">Middle Woodland</td><td rowspan="5">Late Marksville</td><td rowspan="5">Issaquena</td><td rowspan="5">Issaquena</td></tr>
<tr><td>350</td></tr>
<tr><td>300</td></tr>
<tr><td>250</td></tr>
<tr><td>200</td></tr>
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Figure 2: Chronological Chart Showing Periods, Cultures, and phases in the project Area

Osceola project personnel have been working under the broad guidance of several major hypotheses concerning our conceptualization of the patterns and processes of cultural developments in the Lower Mississippi Valley. Contrary to most previous researchers we have hypothesized that the plant food diet of the Native Americans in the Tensas Basin did not include domesticated tropical cultigens (notably corn) until after A.D. 1000 (Fritz and Kidder 1993; Kidder 1992a; Kidder and Fritz 1993). Thus, we initially envisioned a plant food diet focused on Native American domesticates (such as chenopod, iva, maygrass, knotweed, etc.). This dietary suite was assumed to have been supplemented by foraging and gathering wild foods, such as nuts, berries, and wild fruits. We anticipated that faunal procurement patterns would emphasize a broad range of animals, and focus on large mammals, notably deer, and would be supplemented by fish. Our expectation was that both plant and animal foods would be under pressure for intensification of exploitation as time progressed, leading eventually to the adoption of tropical cultigens (Kidder and Fritz 1993). As a backdrop to these basic subsistence changes we anticipated a broad trend towards increased socio-political complexity, especially as measured by mound construction and vertical social stratification (Kidder 1992b).

Our results to date have been highly encouraging and yet quite surprising. We have confirmed that at the two sites in question, and apparently in the Lower Mississippi Valley in general, corn agriculture was not practiced until after ca. A.D. 1000, and that it was probably not an important aspect of the diet until after A.D. 1200 (Fritz and Kidder 1993; Kidder 1992a; Kidder and Fritz 1993; see also Byrd and Neuman 1978; Rose et al. 1991). Moreover, we have no evidence at present to suggest that the occupants of Reno Brake or Osceola were cultivating Native American plants. Up to and possibly through A.D. 1200, according to our data, the populations of these sites were intensive hunter-gatherers, subsisting on wild plants and animals, possibly supplemented by the management of such foods as maygrass and acorn (Kidder and Fritz 1993: Table 3). The animal food diet demonstrated our anticipated trend, except that the focus of later exploitation was on fish, nearly to the exclusion of large mammal (especially deer) [Kidder and Fritz 1993: Tables 1-2]. At the same time, though, we have observed an increased emphasis on mound construction and attendant evidence for the development of chiefdom-level society (Kidder 1992b). Thus, contrary to expectations, we have evidence for an hierarchically organized (and possibly stratified?) society with extensive labor investment in mound construction, yet no evidence for a subsistence system geared to surplus production.

We have been hesitant to advance the idea that these Lower Valley societies are as complex or unique as we think they may be, however, for the simple reason that our data come from only two sites which can be considered specialized in function (i.e., they are mound sites presumably reflecting a particular function within the range of site types). Our proposal to the Division of Archaeology was geared specifically to remedying what we see as the most serious deficiency in our project to date: an insufficient sample of sites from a diverse range of functions and time periods. We proposed to undertake National Register testing at sites which can be considered hamlets or villages: that is, they are not mound centers. Our goals were to understand these sites in terms of their spatial extent, their vertical integrity, culture history, and potential for yielding intact and interpretable subsistence remains. We continue to be guided by our hypothesis that agricultural developments did not occur in this region until quite late and that as a result we will have to examine regional cultural evolution in the light of intensified hunting and gathering, possibly supplemented by crop management. This project has provided important data on an aspect of Louisiana archaeology not yet explored in detail, namely the small, non-complex settlement (Neuman 1984). Moreover, since our goal was specifically to test sites dating to the Baytown, Coles Creek, and Mississippi periods we were addressing a concern of Louisiana's Comprehensive Archaeological Plan (Smith et al. 1983: 43-60) and thus we tied an important scientific research goal into a significant management concern.

Research Design

The research design for this project focused on small-scale horizontal exposure of features and activity surfaces, and revolves around a detailed examination of the subsistence remains which we expect to recover. These remains can be compared to contemporary, multiple mound sites in order to explore variations in subsistence and settlement organization through time. These data can also be profitably compared to other regions, such as the Arkansas Valley, where contemporary and comparable data already exist (Nassaney 1987, 1991; Rolingson 1990). National Register eligibility determination was based on two primary criteria. First, the extent and degree to which these sites yielded intact features or deposits as extrapolated from our limited testing. Second, the potential of these sites to contribute to regional culture historical and archaeological research based on the information recovered from features and other contexts. If sites are both well preserved and yield high quality or high density data we consider them to be suitable for nomination to the National Register of Historic Places.

Our expectation was that these small communities were centered on the exploitation of localized plant and animal resources, with the distinct possibility of seasonal variation. Plant food procurement should be similar to that seen at the larger sites, and we did not anticipate finding evidence for tropical cultigens [1] until quite late. This is because we hypothesize that these domesticates, especially corn, appeared first in ritual context involving elite behaviors and revolving around mound top ceremonies of a community nature (Kidder and Fritz 1993; Rose et al. 1991). Plant foods should reflect a highly intensive exploitation of acorn, maygrass, chenopod, amaranth, and iva. These plants were not expected to show evidence of domestication, although they may have been selected for or deliberately encouraged by

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[1] Although squash has been commonly considered a tropical cultigen introduced from Mesoamerica (Ford 1985), recent evidence suggests that cucurbits found in archaeological contexts in Eastern North America may be wild variants of <u>curcurbita</u> <u>texana</u> (see Decker 1988; Fritz 1990; Smith 1989). It is also likely that cucurbits were independently domesticated in the eastern Woodlands (Decker-Walker 1990; Fritz 1990; Smith 1987; Smith et al. 1992; Watson 1989). We are thus excluding squash from our consideration of tropical domesticates, and consider only beans and corn to be appropriate to this category.

practices such as clearing and/or weeding. We expected a high diversity of plant foods reflecting the generalized hunter-forager trend previously observed at Reno Brake and Osceola (Kidder 1990a; Kidder and Fritz 1993). Faunal procurement revolved around the hunting of deer, although intensive fish exploitation was practiced. We expected to find evidence for a general shift to fish, turtle and small mammal through time as local communities gravitated towards second-line resources as population pressure and territorial circumscription became more notable (Kelley 1990; Kidder and Fritz 1993; Welch 1990).

We began by expecting to observe a sedentary or at least largely sedentary settlement and subsistence pattern, assuming that local resources would be sufficient for long-term habitation. We did not anticipate finding significant evidence of long distance contact or trade at these sites, and the material assemblages should be similar among and between these sites. We expected, however, to observe significant differences in material culture remains between the small, low intensity occupations, and the larger mound centers. If these small communities were in some manner subordinate to the mound centers, especially during the Coles Creek and Mississippi periods, we might expect to see a limited diversity of "exotic" or prestige-related material remains reflecting elite-level control of commodity flow. Ceramics should reflect general community patterns in decoration, and we would expect the vessel size and shape assemblage to reflect a high diversity of activities (storage, cooking, service). Similarly lithic artifacts reflect a generalized functional range, with multiple task artifacts being common. Primary lithic reduction activities were present at these sites, and evidence of intensive utilization and retouch was expected since raw material resources are rare in the region.

Site Selection

Several years of research in the Tensas Basin have provided us with a good deal of data on regional culture history and a reasonable understanding of site distributions and site types. Our goal of seeking sites dating to the Baytown, Coles Creek, and Mississippi periods guided our research and allowed us to focus our time and energy. We did not use a sampling procedure to obtain our site population, for the simple reason that we did not seek random sites. Rather we were interested in a specific type of site (the hamlet or village) dating to a limited (but still quite broad) time span. We began with seven potential sites which we anticipated would be amenable to further research in the form of National Register testing. These sites had been located by previous researchers through surface survey and random surface collections. A number were revisited in the summer of 1991 and were found suitable for our purpose. Our criteria for selection are listed below.

1) They must have yielded evidence of occupation (usually in the form of diagnostic pottery) dating to the Baytown, Coles Creek, or Mississippi periods.

2) They ideally have a limited span of occupation within the selected time range as witnessed by available (but usually random) surface collections.

3) They must be small in size and should not be associated with a major mound construction (i.e., more than one mound).

4) These sites should be within an approximately 20 kilometer radius of the Osceola and Reno Brake sites. This stipulation is made in order to be able to assume that all of these sites belong to the same social and political culture. Furthermore, the relative ceramic sequences established for Reno Brake and Osceola will be applicable to sites within a close proximity and will allow us to tie these excavations into a regional artifact-based chronology.

5) They should show some evidence of potential for yielding intact deposits, usually anticipated by the presence of "midden staining" visible on the surface (this is a less important criteria than those listed above).

6) They must be logistically accessible, and permission for archaeological testing can be reasonably anticipated.

Ultimately, four sites were selected for investigation, and three (Jolly (16TE103), Emerson (16TE104), and Blackwater (16TE101) were tested through subsurface excavations (Figure 3).

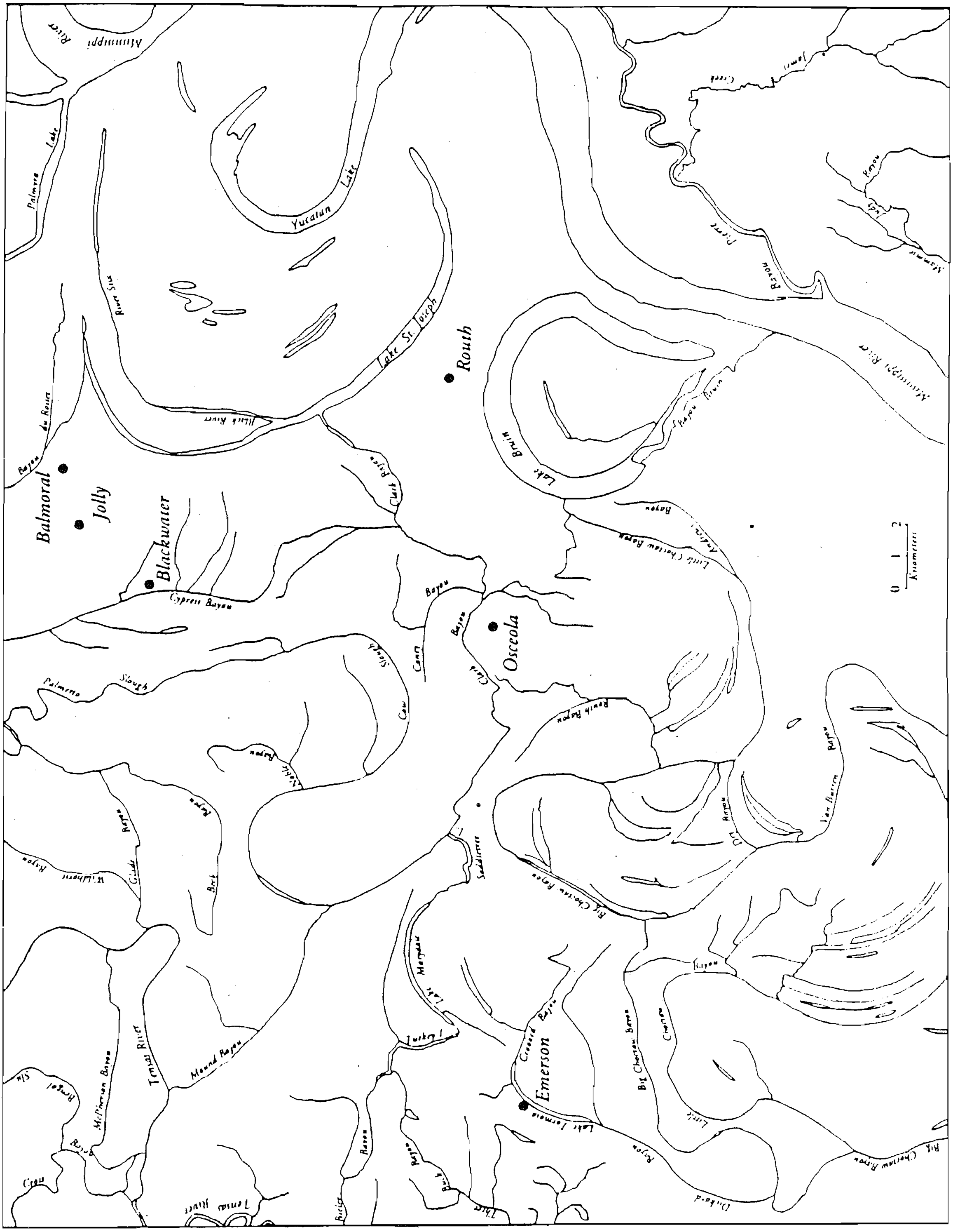

Figure 3: Location of the Three Sites Tested in 1992

The fourth site, Crimea (16TE107) was surface collected but could not be further explored due to our lack of time and adequate resources. The three sites subject to the most research span the time from the later part of the Coles Creek culture through the middle to later part of the Plaquemine, or from roughly A.D. 1000-1500.

Field Methods

We conducted similar research procedures at all sites. The initial stage of investigation consisted of mapping the sites with a transit. Contour maps were constructed using a standardized 20 cm contour interval and by using a ten m grid. This grid was used for several purposes. First it forced us to standardize our mapping procedure in terms of spatial coverage; second it allowed us to utilize computer aided mapping software (MacGridzo V 3.3) which works best with a standard grid; and lastly, creating a ten m grid provided us with a surface collecting universe of similar size and configuration at each site.

A uniform controlled surface collection was conducted at each site based on the ten m grid squares created for mapping. All artifacts larger than 6.4 mm were collected and bagged by specific provenience. The decision to use 6.44 mm as a minimum cutoff size was based largely on the fact that this was the smallest size artifact subject to analysis in excavated units (with the exception of flotation samples). Further, some size limitation rule was necessary and 6.44 mm was a reasonable size since objects (especially ceramics) smaller than this are generally not useful for surface collection analysis. Surface collection were conducted in two passes through the square, with each pass being undertaken perpendicular to the previous (or next) one. In order to accommodate our relatively small crew and our limited time, each square was collected in 12.5 minutes, regardless of the amount of material. This duration was generally adequate for all but the most dense squares, which were not fully collected. Thus each square was searched twice in order to gain the most complete collection, given our limited resources. Weather conditions were generally good, and surface exposures and collecting conditions were good throughout our field work. The principle aim of surface collecting was to insure a representative and consistent sample from site to site. The project director made all decisions concerning research procedure modification, and coordinated with field personnel to insure consistency.

Surface collected material was initially quantified by simple counting and weighing in the field. No attempt was made to do a complete analysis of materials in the field. Our procedures allowed us to rapidly process density maps showing the concentrations of artifacts by each surface collection unit. These plots guided further research. Our next step was to undertake shovel testing using the grid intersections as shovel test stations. Shovel testing was driven by a dual sampling strategy. Grids with high artifact densities were tested at two corners (on the diagonal) and we also used a random sample to draw additional intersections for investigation. Grid intersections not tested were assigned a number and at least ten shovel tests were then arbitrarily selected from the remaining sample. This procedure allowed us to maximize resources and to still maintain a reasonable sample. The decision as to the selection of target intersections based on density was made in the field by the project director.

Shovel testing will consisted of hand dug excavations which measured approximately 30 cm in diameter. Excavations were conducted to maximum depth of cultural deposits. Shovel test deposits were not screened since the high clay content of most area soils made such an effort unrewarding. Soil texture and color changes were noted and their depths measured from ground surface using a steel tape measure. Artifacts removed from shovel tests were bagged and labelled by strata if possible. Density measures of artifacts were undertaken to gauge the relative importance of subsurface deposits.

Shovel test data were used to guide further investigations in conjunction with density measures of surface collections. We did not expect to encounter substantial intact vertical deposits, however. This assumption was based on several observed facts and guided by familiarity with the region. Most sites of the kind we were interested in are small and have been subject to modern agricultural activities, notably extensive plowing. Since we were ideally seeking single, or at least limited multi-component sites, we did not expect significant midden deposits in the first place. Thus, what we anticipates was relatively diffuse surface remains reflecting low intensity cultural activities and limited occupation spans. In some cases small middens were associated with diffuse scatters. We therefore expected to undertake a testing procedure which departs from the normal stratigraphic test and which therefore requires some justification.

Since our assumption of low density remains was upheld by surface collections and shovel testing, at least in one instance, we do not feel that the sites should be automatically excluded from consideration for National Register eligibility nor should they be written off as scientifically unimportant. We believe that one of the best means of exploring these sites was to utilize a procedure which exposes reasonably large horizontal segments of a site. This procedure works from the growing knowledge that subsurface features are often preserved in sites with low densities of midden and which have been subject to extensive modern agricultural disturbance (see Bareis and Porter [1984:1-14] for a discussion of the results of surface stripping). Of course, the decision to utilize these techniques will depend on a number of factors and from site to site. Clearly each site needs to be evaluated on merits that are relevant to the site, and each site needs to be tested by methods that are suitable to rapidly determining the horizontal and vertical extent of the deposits. The question of what constitutes a reasonable horizontal sample is difficult to estimate, but we expected to open units of minimally 2 meters square, rather than the typical 1x1 or 1x2 m unit. Further, we expected that possibly opening contiguous units would prove more valuable than in wide spacing of individual units. The idea was to demonstrate that important and intact deposits may underlie these low density scatters. Naturally, our expectations and the reality departed and we were generally forced to use small units than we would have liked because larger units, as expected, take longer to excavate. In one instance, at the Blackwater site, were were fortunate enough to be able to use heavy machinery to help us excavate and were rewarded by an abundance of features not previously anticipated.

The efficacy and validity of large-scale horizontal exposure is unquestioned in some parts of the nation where such activities have become a routine part of archaeological testing and subsequent mitigation (Baries and Porter 1984). We argue as a result of our findings in 1992 that these kinds of excavation procedures be implemented at the testing stage, despite the fact that they seem to be unorthodox in a normal "testing" procedure. Archaeologists in the Lower Mississippi Valley need to realize that deep vertical testing is not always appropriate for excavating all sites. Moreover, we must acknowledge the possibility that sites without deep or "intact" midden deposits may in fact still be significant if we expose horizontal segments. This kind of procedure may be the only way we will be able to test small "hamlet" or "village" sites in the Tensas Basin since they are, almost by definition, low density activity loci. [2] It is obvious, however, that each site is unique and must be approached with a flexible methodology. What might be suitable for a prehistoric site might not work at a historic one, and what works at an Archaic site might not be appropriate at a Mississippi period mound center.

Horizontal excavation procedures followed from shovel test data. Initial goals were to strip the plowzone and to identify features present within the ground surface. At Jolly and Emerson this goal of exposing features was accomplished only after excavation of midden deposits overlying the subsoil. After clearing and isolating features they were mapped and excavated. Features were excavated by hand, using scoops and trowels. They were then drawn in both

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[2] In 1985 we excavated 75 shovel tests at the Book Shepard site (16MO103) site and did not find any intact midden or evidence of substantial subsurface deposits (Kidder 1986). Surface stripping as a result of pipeline construction revealed a large number of features, including a house, burials, and pits (Espenshade and Southerlin 1988). This is a good example of the differences which arise when low density sites are tested with an expectation of finding deep midden. We failed to recognize the importance of the site because our testing procedures were determined by inappropriate expectations and consequently our field methods were inadequate for the task.

plan and profile. All feature fill was removed for flotation in keeping with project standards. Midden deposits were excavated using natural stratigraphy where possible and standard archaeological controls were utilized in all cases (Kidder 1990a).

Laboratory Procedures

All feature fill was floated except in the case of extremely large contexts. Subsampling of excessively large features (greater than 30 liters) was occasionally necessary. Flotation procedures included the initial processing of material including its measurement by volume, and in most cases initial deflocculation with bicarbonate of soda to break up heavy clay soils. In some cases deposits were allowed to air dry with no further processing. Flotation was conducted in a modified SMAP machine (Watson 1976) utilizing an inner tub with 1.5 mm mesh and a fine screen of .5 mm nylon mesh (Kidder and Fritz 1993). Small samples (less than 5 liters) were hand floated using a bucket and scoop. Light fraction was allowed to air dry in the shade and then bagged and tagged separately. Heavy fraction required further processing using sugar flotation which increases the density of the water and provides for nearly 100% separation of charred material. These procedures have been implemented in the preceding Osceola Project excavations (Kidder and Fritz 1993) and resulted in excellent recovery (we have, for example, recovered tobacco seeds at Osceola, the first instance of such data recovery in the Lower Mississippi Valley [Kidder and Fritz 1993]).

Laboratory procedures for artifacts other than charred plant remains consisted of standard treatment in keeping with existing and well defined procedures (Kidder 1990a). Artifacts from features or other contexts were washed an labeled according to provenience, sorted into basic material categories, and subject to (at least initially) traditional typological and descriptive analyses. Hand sorting of heavy fraction will be undertaken at the Center For Archaeology since this is inevitably a long and arduous procedure. All heavy fraction samples were passed through a series of graduated wire mesh screens, and initially only 6.4 mm mesh samples have been analyzed. Faunal remains were recovered as a by product of the flotation procedure, and since the heavy mesh screen size is 1.5 mm we did not need to undertake special sampling for small size bone classes (e.g., fish, rodents, or birds).

The analysis of material classes was partitioned among project personnel based on expertise and familiarity. Paleobotanical remains were sent to Dr. Gayle Fritz at Washington University in St. Louis. Dr. Fritz has worked with the Osceola project since its inception and is a recognized authority in the field. Bone is being analyzed by the project director, and ceramics, stone, and other material classes have been analyzed by Tulane University students under the direction of the principal investigator. Artifact curation is at the Center For Archaeology at Tulane University, with the exception of paleobotanical remains which will be stored at the Paleobotanical Laboratory at Washington University in St. Louis.

Summary

Lower Mississippi Valley archaeology has long been dominated by the culture historical school of archaeology (Gibson 1985). This research focus has produced a remarkable wealth of data on ceramics and vertical cultural sequences. We lack, however, a particularly sound appreciation of cultural developments, especially subsistence, settlement, and social organization. Our project has sought to address the questions surrounding small site occupations. We believe that by moving away from large mound sites and by testing smaller communities we can develop a more complete picture of Native American lifeways and behavioral organization. Now that we have completed our initial investigations we are even more firmly committed to the contention that these sites, which have often been ignored, can tell us a great deal and that they represent a significant element of the cultural landscape. Comprehending these sites and appreciating their special nature will provide archaeologists with a more complete understanding of Southeastern prehistory and a better grasp of how to continue to preserve and manage these important resources.

CHAPTER TWO

ARCHAEOLOGICAL BACKGROUND

Introduction

The prehistoric culture history of northeast Louisiana is reasonably well known and has been discussed by a number of authors (Gibson 1977; Kidder 1990b; Neuman 1984) (Figure 2). There are of course, a number of areas and time periods which are not as well understood as others. In the project area of the southern Tensas Basin, for example, archaeologists have a very poor understanding of Archaic, Poverty Point, or Tchefuncte cultures (Gibson 1977; Phillips 1970; Williams et al. 1966). For that reason, and since our 1992 excavations did not specifically address these early cultures, the following discussion of the culture history begins at the Marksville period as this is the first culture for which new data exists. The culture history follows from Marksville through the Mississippi period. This discussion encompasses the periods of time and the cultures which are represented by previous investigations at the Reno Brake and Osceola sites, as well as our recent excavations in 1992. Further research in the immediate vicinity will no doubt allow us to speak more confidently about earlier and later cultures. For now, however, it is important to focus on information which is specifically germane to the research at hand.

Culture History

Marksville Culture

The Marksville period in Louisiana is divided into two distinct subperiods. The first represents the time of Hopewellian or Hopewell-related cultural contacts, and the second a period of local elaboration of existing early Marksville trends (Neuman 1984; Phillips 1970; Toth 1988; Williams and Brain 1983). Late Marksville is often considered to be synonymous with the Issaquena phase, defined first by Greengo (1964), and expanded later by Phillips (1970). Late Marksville sites are common throughout the Lower Mississippi Valley, especially in the Lower Yazoo and Tensas basins. Although the culture historical status of the Issaquena phase as a separate culture is questioned (see Gibson

1977: 20, Fig. 3), there is no doubt that the Issaquena phase is well represented in our study area.

Issaquena phase occupations are widespread in the Tensas Basin; however, most components are found near Tensas River. Issaquena sites are generally small midden occupations, but there are mounds associated with late Marksville culture sites throughout the Lower Mississippi Valley. It seems doubtful that there were elaborate political systems in place at this time, and it is speculated that Issaquena groups in the Yazoo practiced a system of seasonal or annual movements in pursuit of widely distributed food resources (Williams and Brain 1983: 401-403). The more spectacular burial patterns noted for both earlier and later cultures have not been associated with Issaquena. The phase is best known for its elaborate pottery which is distinctive for having complex designs utilizing stamped and incised decoration. Much is known about Issaquena pottery; and, at least in the Lower Yazoo Basin, a two part chronology has been proposed (Phillips 1970: Part II). However, no excavations in the Tensas Basin have been conducted which would allow this specific cultural sequence to be confirmed. Late Marksville (but not necessarily Issaquena phase) faunal subsistence has been tentatively investigated at several sites in the northern Tensas Basin. Findings of this analysis suggest a extensive utilization of fish and deer (Kidder and Fritz 1993), as well as the exploitation of small mammals (Byrd n.d.; Mariaca 1988). The faunal subsistence system has been identified as generalized and unfocused (Mariaca 1988: 112-120), and seasonality studies suggest that the sites were occupied for most of the year (Mariaca 1988: 116). Analysis of small paleoethnobotanical samples obtained at the Reno Brake site indicate that no tropical domesticates were utilized, and that plant food resources were exclusively wild, with no evidence of cultivation or domestication of plant known to be cultivated elsewhere in the eastern United States (Fritz 1990; Fritz and Kidder 1993; Kidder and Fritz 1993). Acorns were the predominant plant food resource, followed by fruits such as persimmon, palmetto, and grape; Starchy seeds were relatively rare.

Troyville Culture

The Troyville culture of the Baytown period has been conventionally subdivided into two phases (Belmont 1980, 1984; Belmont and Williams 1981; Bitgood 1989; Gibson 1984; Phillips 1970). The earlier of the two is called Indian Bayou, and it is succeeded by the Marsden phase (Williams et al. 1966). Bitgood (1989) has tentatively formulated a third phase, called the Insley phase which is a southern Tensas Basin contemporary to the Marsden phase. The Indian Bayou phase has close ties to the preceding Issaquena culture, while Marsden appears to foreshadow later events in the Coles Creek period (Belmont 1984; Bitgood 1989; Gibson 1977). Like so many cultures in the Lower Mississippi Valley, archaeologists know considerably more about Troyville ceramics than any other aspect of society.

The settlement pattern appears to have two components: small, probably highly dispersed hamlets or family dwellings, and larger, often mounded, communities of considerably larger size than other contemporary settlements. Mounds were constructed at this time, both as living platforms and for the interment of the dead (Belmont 1980, 1984: 81-83; Kidder and Wells 1992). The burial pattern consisted of group or mass secondary interment in bunches (Belmont 1980: 17-22, 1984: 83-86; Bitgood 1989). Grave goods were rare, though occasionally spectacular (Jones 1979), but do not seem to mark individuals as having a status apart from others (Belmont 1984: 90). Evidence from the mode of mass burials suggests that there was a focus on community-wide mortuary activities (Kidder 1992b; Kidder and Wells 1992). This speculation may be reinforced by the common presence of the so-called bathtub-shaped fire pits found at Troyville culture sites (Belmont 1980, 1984; Bitgood 1989; Ford 1951). These pits are hypothesized to have been the focal point of social interaction which integrated family-sized groups into the broader society (Belmont 1980; Kidder and Wells 1992). Presumably the pattern of interment in mass burials and associated (?) feasting would have been periodic events which brought populations living in smaller sites together, possibly on an annual or semi-annual basis (Belmont 1980). It is notable that Troyville culture groups maintained widespread contacts throughout the southeastern United States. They appear to have directed much of their attention to the south and east, especially along the Gulf Coast (Kidder and Wells 1992). There is considerable evidence of ties to Weeden Island cultures of Alabama and Florida (Belmont 1967).

The subsistence base of Troyville culture is poorly understood, but seems to have consisted of a broad spectrum hunter-collector pattern (Belmont 1980: 41, 1984: 90-91; Fritz and Kidder 1993; Kidder and Fritz 1993; Mariaca 1988). Both plant and animal food sources and acquisition practices seem to indicate a strong continuity from the preceding Late Marksville period. Deer often predominate faunal assemblages at excavated burial mound sites, and this information has been taken as further confirmation of the use of these sites as centers for community-wide feasting and ceremonialism (Kidder and Wells 1992). There is at present no evidence for horticulture or agriculture at this time (Fritz and Kidder 1993; Kidder and Fritz 1993; Rose et al. 1984); however, few focused attempts have been made to understand Troyville culture subsistence patterns in the Tensas Basin. Consequently scholars do not have a firm appreciation of the relationship between diet, health, and cultural complexity.

The late Baytown period in northeast Louisiana is poorly known and subject to considerable nomenclatural dispute and/or confusion. Jon Gibson (1987) has suggested that the name Sicily Island should be applied to the time and culture which falls between Troyville and Coles Creek (see also Bitgood 1989). Others (Kidder 1990b, 1992b) have not used the Sicily Island concept, but have opted to recognize a new phase at the end of the Baytown period. This new phase, the Mount Nebo phase, recognizes the presence of a ceramic complex with ties to both the preceding Marsden (or Marsden and Insley) and succeeding Sundown phases. Mount Nebo thus straddles the divide between the Baytown and Coles Creek periods, although it is presently placed at the end of the former. Mount Nebo phase deposits have been recognized at the types site and in the lowest levels of the Osceola site (Kidder 1990a; Kidder and Fritz 1993). The phase is similar in many ways to the Bayland phase in the Yazoo Basin (Williams and Brain 1983). Both Mount Nebo and Bayland phase sites are notable for the construction of flat-topped mounds which contain numerous interments, including some with suggestions of greater social and individual elaboration than in the preceding Troyville burials (Kidder 1992b; Kidder and Wells 1992).

Despite confusion or uncertainty over cultural attribution and assignment, the period between ca. A.D. 650-750 represents a time of notable shifts in local and regional behaviors on a number of different levels. Ceramics undergo a transition away from the emphasis on terminal-Marksville-like curvilinear designs and red filming, and polychrome painting, and emphasize rectilinear incising, especially in simple bands of lines around the necks of vessels. Cordmarking continues to be prevalent, but is combined with rectilinear incised designs to create vessels with distinctive decorative fields. Ceramic technology seems to become better, or perhaps just more standardized, and a wider variety of vessel shapes and sizes are found. Burial modes seem to change to indicate a greater emphasis on individuals and their achievements or accomplishments (?), and evidence for communal mortuary ritual ceases or is deemphasized. Long-distance contacts, especially with the eastern Gulf Coast, also disappear or become significantly less visible. Settlement patterns continue to represent a dichotomy between what are presumed to be settlements for single, or possibly extended families, and mound centers. Some non-mound communities appear to become larger, and may represent the evolution of larger group "villages." The extant data suggest a broad spectrum subsistence base exploiting the many varied and diverse environments in the Lower Mississippi Valley (Belmont 1983), although specific subsistence data are as yet unavailable or unstudied.

Coles Creek Culture

The Coles Creek culture marks a significant change in the culture history of the Lower Mississippi Valley. Population seems to increase dramatically, and there is now strong evidence of a growing cultural and political complexity. In the Tensas Basin the Coles Creek culture is subdivided into four successive phases based on ceramic chronology (Belmont 1984; Kidder 1990a, 1990b; Phillips 1970; Williams et al. 1966). The first recognized Coles Creek phase is named Sundown, after the type site, located in Tensas Parish. Following Sundown are the Ballina and Saranac phases, which are contemporary occupations of the southern and central portions of the Tensas Basin, respectively. The Balmoral phase traditionally is considered the apogee of Coles Creek culture in the Tensas, and is followed by the Preston phase which marks the end of Coles Creek and the advent of the succeeding Plaquemine culture. The Preston phase is only now becoming adequately recognized and defined.

Although there is some disagreement about the culture historical placement of the Sundown phase (Gibson 1987), most researchers recognize it as the earliest Coles Creek period phase in the Tensas

Basin (Bitgood 1989; Kidder and Fritz 1993; Phillips 1970; Williams et al. 1966). Sundown appears to evolve directly from the Mount Nebo and Marsden phases, and manifests some important Coles Creek period traits, especially as regards settlement patterns and site planning. Sundown is, as always, best known for its ceramic assemblage, which is dominated by a well made cord-marked pottery identified as Mulberry Creek Cordmarked, var. Smith Creek. As an additional mode, Smith Creek vessels are commonly found with one or more lines incised parallel to the lip, and also triangular or "tear-drop-shaped" punctations at the base of the incised lines. These typically Coles Creek ceramic characteristics are also found on non-cordmarked pottery (identified as Coles Creek Incised, var. Sorentz). Numerous variants of Coles Creek Incised pottery are found in this phase, along with stamping (Chevalier Stamped), and rarely French Fork Incised (Kidder 1990a). Vessel shapes emphasize large, open bowls, and tall jars with slightly restricted mouths (see Ford 1951: Figs. 25, 27, 29, 31).

As a result of excavations at the Osceola site, archaeologists now have a reasonably good picture of Sundown phase subsistence practices. At present there is no evidence for the use of domesticated or cultivated plants, although this is certainly possible given the presence of such crops elsewhere in the eastern United States (Fritz 1990; Fritz and Kidder 1993; Kidder and Fritz 1993). Acorns are the dominant plant food resource, followed by fleshy fruits (persimmon, palmetto, grape), and starchy seeds (especially maygrass). We hypothesize that the Sundown and later populations of the Tensas Basin may have encouraged or loosely "managed" certain plant food resources, especially acorns and maygrass, in order to promote better or more consistent yields (Fritz and Kidder 1993).

Sundown phase populations were heavily dependant on, or at least emphasized, fish in their diet. As a percentage of the total faunal sample (as measured by bone weight), fish comprised a remarkably high 76% of the diet (Kidder and Fritz 1993: Table 2). Of course this is only a vague approximation of the actual dietary contribution, but does serve to illustrate how important fish were at this time. With the high percentage of fish in the sample, deer and small mammal evidently contributed only a small amount to the diet, although deer was probably fairly important. Turtles, other reptiles and amphibians, and birds, constitute a small fraction of the faunal resources utilized by the Sundown phase peoples at Osceola.

The Sundown phase marks the beginning of the development of the typical Coles Creek site plan, consisting of at least two, and more commonly three, mounds arranged around a central plaza. This pattern is evident at the Sundown site in Tensas Parish, and is likely to have been the case at Osceola as well (Kidder 1992b). Similar site plans seem to emerge across much of the Lower Valley at this time (Williams and Brain 1983: Figs. 12.12-12.13), indicating perhaps the development of incipient elite populations. In some (most?) cases these Coles Creek period mounds are constructed over earlier platforms dating to the terminal Baytown period (Mount Nebo and Bayland phases). At both Mount Nebo and Lake George, and perhaps at Lake St. Agnes, these Coles Creek period mounds were erected over earlier mortuaries, leading several researchers to speculate that these events indicate that emerging elites were physically and symbolically coopting dead ancestors to emphasize and project their own authority (Kidder 1992b; Kidder and Wells 1992; Steponaitis 1986). Sundown phase settlements appear to be somewhat larger than their predecessors, although the settlement pattern remains one of relatively dispersed occupations exploiting a wide array of local and regional habitats.

The Ballina phase is distinguished from the preceding Sundown phase by subtle shifts in ceramics and settlement patterns (Belmont 1967: 32, 1982: 68). The similarity of the two phases underscores the slow and gradual pace of change in Lower Valley cultures at this time (Belmont 1967: 32; Neuman 1984). While the Ballina phase peoples apparently undertook a considerable amount of mound construction at least at a few sites, the evidence suggests that there was at best a minimal increase in site density. The settlement pattern is largely similar to the Sundown phase, consisting of village sites scattered about in favorable locations along major drainages. There appears to be a new pattern of one or more sites being significantly larger than the rest, suggesting that a new political order was coming into existence (Barker 1988). The larger sites often have three mounds forming a plaza (Williams and Brain 1983: figs. 12.12, 12.13). As in the Sundown phase, Ballina phase peoples demonstrate little evidence of external contacts. Unfortunately nothing is currently known about Ballina phase subsistence.

Research at Osceola and nearby sites in the study area has led us to suggest that the Ballina phase be restricted to the very southern Tensas Basin. The Saranac phase, named for the site of the same name (Price 1990), takes the place of Ballina in at least the central Tensas Basin; the full spatial dimensions of this phase are not known but we believe that it will be recognized to encompass the area from roughly Waterproof, Louisiana, on the south to Tallulah on the north, and from the Tensas River east to the present course of the Mississippi. Two radiocarbon dates for this phase have been obtained by Price (personal communication) from excavations at the Saranac site. The dates are 1,190 ± 80 B.P. (A.D. 760 [Tx-6791]) and 1,170 ± 80 B.P. (A.D. 780 [Tx-6792]). Based on the Stuiver and Pearson calibration (1986), this would yield dates of A.D. 830 or 859, and A.D. 883. Although the two samples come from the same test unit, the later date comes from a feature underlying the context for the earlier date (Price 1990). However, based on the calibrated age ranges both dates overlap at one standard deviation, and suggest a temporal range for the Saranac phase anywhere between ca. A.D. 750 to A.D. 950. The Saranac phase sites show different ceramic frequencies when compared to Ballina phase sites, especially a very low percentage of French Fork Incised and the absence of Mazique Incised, var. Mazique (John Belmont, personal communication 1990; Price 1990), and our analysis shows that at Osceola, Saranac peoples were heavily dependant on aquatic food resources and also non-domesticated plant foods (Kidder and Fritz 1993). We have recovered evidence for the use of squash (Cucurbita pepo) in Saranac phase deposits at Osceola, but we are still uncertain if these remains represent a domesticated tropical cultigen or if they are actually wild variants of native squashes (Fritz 1990; Fritz and Kidder 1993; Kidder and Fritz 1993).

The Balmoral phase follows Ballina and represents a significant change from preceding phases, though the change is still best viewed as evolutionary rather than revolutionary (Belmont 1967: 32-33). Site populations appear to increase dramatically, and sites become larger and more complex. Balmoral also represents a significant change (at least for the normally conservative Coles Creek potters) in ceramics, both in form and types.

The Balmoral phase settlement pattern appears to be an evolved form of that witnessed in the

Ballina or Saranac phases. Smaller centers of the kind first noted as early as Sundown appear to increase in number and also in size. The standard three mound Coles Creek site plan often increases to include up to three more mounds (Williams and Brain 1983: Fig. 12.13). Balmoral phase sites also expand out from the Tensas Basin in a dramatic fashion. Sites with Balmoral-like phase components are found in the Ouachita and Boeuf basins (Fuller 1985: 28-29; Kidder 1990b), and their assemblages are so close to those found in the Tensas that they strongly suggest physical contact between the regions (Kidder 1990b). Results from our work at Osceola site show that all five artificially constructed mounds were built during the Balmoral phase. Balmoral phase deposits were found on the flanks of most of the mounds, indicating extensive use of mound surfaces for habitation or ceremonial/ritual purposes.

The Balmoral phase also witnesses an increase in external contacts, with long distance trade goods being imported, albeit in small quantities (Belmont and Williams 1981). Based on a limited sample from the Osceola site, together with preliminary data from Jolly, it is evident that maize is first introduced into the local subsistence economy during the Balmoral phase. Small quantities of maize were recovered from mound-flank middens at Osceola and from features at Jolly. A single feature in Mound B at Osceola yielded a large quantity of maize in association with tobacco seeds. This feature, which also included a large amount of burned fish bone and unidentified burned bone, was placed in the northeast corner of the earliest recognized Balmoral mound stage. We have hypothesized elsewhere (Kidder and Fritz 1993) that this feature may be associated with ritual functions involving mound construction or possibly consecration. Other than a relatively small amount of maize, domesticated plants are not found in Balmoral phase contexts. Nuts, especially acorn, predominate, with fruits and non-domesticated starchy seeds complimenting the plant food diet. Faunal exploitation at Osceola was changing from previous periods (Kidder and Fritz 1993). Deer utilization actually seems to decrease, and small mammals, reptiles, and fish assume a greater significance. Surprisingly, deer remains were not found in mound-flank middens as was expected, although differential disposal practices, increased burning of bone, and other cultural factors may account for the differences in the observed faunal assemblages.

Following the Balmoral phase the initial Tensas sequence indicated a direct transition to the early Plaquemine Routh phase (Hally 1967, 1972; Williams et al. 1966). Subsequently an intervening Preston phase has been suggested, contemporary and analogous to Crippen Point phase in the Yazoo Basin (Belmont 1984: Fig. 3; Belmont and Williams 1981: Table 1; Fuller 1985: 29-30; Williams and Brain 1983: 373-374). Excavations at Osceola and Blackwater, as well as the Preston site (Hally 1972: 181-196) provide the data for the recognition of this phase. The Preston phase apparently reflects a gradual evolution from Coles Creek to Plaquemine culture, with ceramics and settlement presumably demonstrating this transition.

Preston phase ceramics are dominated by very late varieties of multi-line Coles Creek incised pottery. Especially diagnostic is Coles Creek Incised, var. Hilly Grove, which is essentially equivalent to var. Hardy, except it is not executed on an Addis paste but rather a late Coles Creek grit-grog tempered fabric. Other ceramic types and varieties include Beldeau Incised, var. Bell Bayou, Harrison Bayou Incised, var. Harrison Bayou, and Mazique Incised, var. Preston (Hally 1972: 310-312). At both Osceola and Blackwater we recovered brushed pottery which would be normally sorted as Plaquemine Brushed, var. Plaquemine, except that it was not on an Addis paste, and thus typologically seems to mirror or parallel Hilly Grove. Hally observed that at the Routh site some sherds of the "typically" Plaquemine ceramic varieties (notably Hardy and Plaquemine) were found on a non-Addis Coles Creek like paste (1972: 233-238). These data bear out the notion that the Preston phase was evolving directly out of Balmoral and into Routh. Preston is transitional, though, only because as archaeologists we are arbitrarily slicing up the continuum of time. It is evidently a significant interval in the Tensas Basin and should be accorded appropriate culture historical status.

Although Preston is defined by its ceramic assemblage, it is now possible to include some subsistence and settlement data to round out the phase. Testing at the Osceola site indicates that the last occupation of the site apparently dated to the Preston phase, and that these peoples may have lived on the mounds themselves. At the Routh site part of the occupation evidently dates to this phase, and mound construction probably was undertaken at this time (Hally 1972). Hally's excavation at the Preston site indicates that part of the settlement pattern included dispersed hamlets or house sites, and extended as far west as Bayou Macon. The Blackwater site, however, appears to represent a Preston phase village or multi-house community. Therefore we can hypothesize at least three different settlement types during the Preston phase, although none have been sufficiently excavated to provide an indication of what one of these communities might have looked like.

Subsistence data from Blackwater indicates that the Preston phase community there was undertaking a relatively greater amount of maize cultivation than seen in the Balmoral phase remains from Osceola, yet less than has been identified at the Plaquemine Emerson site (Fritz et al. 1992). Acorns still predominate, but corn has been identified in relatively large amounts in most of the analyzed features. Preliminary examination of flotation remains from Blackwater indicates that fish, reptiles, and small mammals were important in the diet. Large mammal remains are relatively poorly represented, although once again differential disposal practices may account for these differences. At the Preston site Hally (1972: 196) noted that considerable quantities of shell were found, although at this point they cannot be specifically associated with the Preston phase. Further analysis of the ceramics and subsistence remains from Blackwater will help to further shed light on this important yet elusive period of time in the Tensas Basin.

Mississippi Period

The Mississippi period in the Lower Mississippi Valley has been divided into two cultures, Plaquemine and Mississippian. Late Coles Creek *culture* also intrudes into the Mississippi period as normally defined in the Southeast. The Plaquemine culture is often identified as "Mississippianized" Coles Creek (Brain 1989; Weinstein 1987; Williams and Brain 1983). The implication of this designation is that local cultures (Coles Creek) received their impetus and stimulus for cultural evolution as a result of diffusion of Mississippian ideas and material traits from outside of the Mississippi Valley. Included in this "Mississippian" package are supposed to be ideas concerning site plans and architectural patterns, settlement organization, ceramic decorative techniques and styles, subsistence practices, and especially social and cultural values and ideals (Brain 1978, 1989; Williams and Brain 1983). Jeffrey Brain and Stephen Williams have advocated actual contact with or from Cahokia or Cahokian-related peoples as a potential causal agent in the advent of Plaquemine culture in the Lower Mississippi Valley (Brain 1978, 1989, 1991; Williams and Brain 1983).

While the notion of Mississippianization by diffusion has its advantages it in fact fails to explain any of the significant elements of Plaquemine culture. Furthermore, emerging analyses of the Coles Creek to Plaquemine transition in the Tensas Basin (some reported herin), indicates that there are clear evolutionary differences between the Yazoo Basin where Brain and Williams and Brain conducted the bulk of their research, and the Tensas, where Plaquemine is more fully entrenched. These differences appear to be especially notable in very basic cultural characteristics, notably subsistence and social organization. The same evidently applies to the Natchez Bluffs region, although the data are not fully published (Brain 1978; Brown 1985a). I take the position here that Plaquemine is the logical outgrowth of Coles Creek cultural evolution, which may have, in some cases, been influenced by Mississippian groups from outside of the Lower Mississippi Valley. There is, however, a clear trend towards the southern diffusion of certain Mississippian traits, especially ceramic technology (shell tempering), and perhaps domestic architecture (although the trend is equivocal at best [Brown 1985b]). The trait of shell tempering is thought to characterize the break between Plaquemine and Mississippian, although few have questioned the fundamental underpinnings of groups assigned to either culture. Since this trend is time transgressive, Mississippianization *per se* occurs earlier in the north than the south, appearing at sites such as Winterville and Lake George between ca. A.D. 1200-1400, and in the Tensas Basin by ca. A.D. 1500, or even later. The historically documented Taensa Indians may have been the last of the "Mississippian" peoples in the Tensas Basin, based solely on their ceramic assemblages (Hally 1972; Williams 1967). Typically, however, the probable Taensa ceramic assemblages demonstrate Natchezan (read Plaquemine) designs on Mississippian shell tempered wares. Thus they serve to emphasize the artificial dichotomy between Mississippian and Plaquemine cultures and gloss over some obvious similarities.

In the Tensas Basin the Mississippi period is divided into three phases which covers the period from ca. A.D. 1200 to 1600. The earliest is the Plaquemine culture Routh phase, which is followed by the Fitzhugh phase, which lasts, at least in the southern part of the basin, up to the historic Taensa (Hally 1972). In the northern portion of the basin the Fitzhugh phase is supplanted by the Transylvania phase by ca. A.D. 1500, and it too is thought to last up to, or near the historic period (Hally 1972; cf. Kidder 1988, 1992c). The Taensa phase marks the historically known Indians of the same name and is largely confined to the lake St. Joseph area. A very tentative Canebrake phase has been established for protohistoric populations in the Tensas Basin which are thought to perhaps represent successors to Fitzhugh or Transylvania (Kidder 1990c). Regrettably, Canebrake is at best a pigeonhole for some difficult-to-account-for ceramic assemblages and is best ignored at present.

The Routh and Fitzhugh phases are well known and are defined by a series of excavations at sites of the same name and others in the Tensas Basin (Hally 1972). The two phases clearly overlap in material culture traits, and it is not clear if they represent two successive phases, or possibly spatially discrete contemporary phases (Hally 1972). Hally believes that they are temporally distinct, with Routh preceding Fitzhugh; however, at no site has this succession of phases been stratigraphically demonstrated (Hally 1972). Differences in ceramic assemblage composition, diagnostic type frequencies, and other lines of evidence do tend to confirm temporal succession, even if they do not necessarily positively prove Hally's original culture historical scheme. Radiocarbon data are essentially lacking for the distinction of cultural phases in the Tensas Basin, but they do demonstrate that Plaquemine cultural associations all post-date A.D. 1200.

Routh and Fitzhugh phase ceramics are the best known aspect of the phases. Both phases are defined by the presence of a heterogeneous organic tempered plainware, identified as Addis Plain (Brain et al. n.d.; Hally 1972; Phillips 1970; Williams and Brain 1983). Shell and crushed bone, but especially shell, becomes the prevalent tempering agent through time and eventually dominates some of the late Mississippi period assemblages in the basin. Stylistically, Mississippi period ceramic assemblages show a trend away from an emphasis on rectilinear incising and towards more curvilinear motifs. However, early Mississippi period ceramics initially continue the Coles Creek tradition of rectilinear incised designs, especially Coles Creek Incised, var. Hardy, and Mazique Incised, var. Manchac. Unlike the simple designs of most Coles Creek pottery, early Mississippi period ceramics often include more complex designs, both in rectilinear and curvilinear styles. This trend is evident in the treatments seen in variants of Anna Incised, L'Eau Noire Incised, Coleman Incised, and Leland Incised (Hally 1972; Williams and Brain 1983). Plaquemine Brushed, var. Plaquemine, is common to both early and late Mississippi period ceramic assemblages.

Plaquemine ceramics are not only different in style, but in form and possibly function, as well. Vessel shapes are significantly more diverse than in preceding times, with bowls, jars, and bottles being present in numerous different forms. Rim modes also change, and there is a tendency for rims to have flaring profiles and elaborated rims (Hally 1972; Phillips 1970; Williams and Brain 1983). Vessel shape assemblages may also differ depending on the cultural context. The Mississippi period witnesses the evolution of mortuary practices which include interment of individuals with ceramic vessels. These mortuary inclusions often seem to differ in both style and shape from non-mortuary contexts (House 1992; Jones 1987), indicating, perhaps, specialized meanings associated with those forms or styles. To date, these functional and/or stylistic differences have not been consistently demonstrated in all contexts, but there does seem to be reason to suspect and dichotomy between mortuary (elite?) and non-mortuary ceramic assemblages.

Plaquemine differs from Coles Creek in more than ceramics. Settlement patterns evolve slowly, at least in the Tensas Basin. The most notable facet of Mississippi period settlement in the Lower Mississippi Valley is the rapid and often dramatic increase in mound building efforts at a relatively limited number of sites. During this period there appears to be a process of political centralization and consolidation, at least as reflected in the mound communities. Two seemingly opposite patterns can be detected in the settlement record, at least as are known in the Tensas Basin. On one hand large mound sites become larger, albeit fewer in number, but on the other hand non-mound settlements seem to become smaller, but more numerous (Brain 1978; Williams and Brain 1983). This pattern is evident in the Yazoo, Tensas, and Natchez Bluffs regions, although in different degrees. Clear evidence of community ranking emerges at this time, and based on the quantity and size of mounds at least two, and possibly three, tiers of mound communities can be recognized (Belmont 1985; Brain 1978). These data are generally interpreted to reflect the emergence of strongly ranked, centralized chiefdom level polities, with subchiefs and/or lesser nobles occupying smaller mound centers and with agricultural hamlets or communities distributed across the landscape.

In the Tensas Basin the number of large mound communities with more than one large mound decrease when compared to earlier periods (Kidder 1992a). Three exceptionally large mound centers, Raffman, Routh and Fitzhugh, emerge to dominate the political landscape. These sites consist of multiple mounds arranged around a central plaza and dominated at one end by the largest mound. The site plans of these three mound groups are remarkably similar (Hally 1972; unpublished data on Raffman from Harvard LMS). The next largest possible contemporary in the Tensas is the Somerset site in Tensas Parish, which consisted of possibly up to four mounds, but today only supports one large flat-topped earthen structure (Hally 1972). Most other contemporary mound sites consist of one low mound and associated habitation debris.

While the number of large mound communities appears to decrease, small house sites or hamlets emerge as the predominant non-mound settlement type during the Mississippi period. Little data exist for these small sites, although our excavations at Emerson provide us with a glimpse of Mississippi period community life. Occupations were very small, often consisting of midden patches of roughly 20-30 m diameter. Rarely are larger patches notes, although in some instances these later occupations cannot be adequately separated from earlier components. At Emerson two small midden patches have been recognized. These middens are hypothesized to represent two distinct houses, and the midden debris appears to be essentially contemporary. As will be discussed in greater detail below, Emerson can be reasonably thought of as a farming community, focusing on growing corn and collecting wild plants and animal foods. Emerson appears to have been occupied year-round, but we cannot be certain from the small faunal sample available.

Although our survey data are patchy in distribution, it seems that Mississippi period house sites and hamlets were clustered into what could be broadly termed communities— that is spatially concentrated settlements separated from other contemporary groups by as yet unknown amounts of unoccupied space. Presumably these "communities" were centered around a small, usually single mound, ceremonial center, which was in turn integrated into the large polity via the largest mound sites. Such a model is in keeping with ethnographically documented Mississippian chiefdoms elsewhere in the Southeast, but it is still not adequately proven here in the Tensas.

At some point in the later part of the Mississippi period, possibly after the initial European contacts in the early 1540s, the settlement system changed. The historic documents of the post-DeSoto European explorers indicate a significantly different settlement system than that noted archaeologically. The Taensa Indians, the evident inheritors of the Mississippi period legacy, were concentrated in one portion of the Tensas basin, presumably around Lake St. Joseph. Other native groups seem to have been found within the basin, although their occupations are few and seemingly ephemeral (Kidder 1988, 1990c). The Taensa, however, may provide an interesting model for prehistoric settlement, even though it differed from the late prehistoric period.

The early explorers noted in several instances (see Swanton 1911) that the Taensa were living in a very dispersed settlement on an oxbow lake off of the Mississippi River. They had between eight and nine "villages," and a central ceremonial and civic precinct. This central place was evidently the residence for the chief and his immediate retinue, as well as the location of the Taensa temple. In addition local "nobility" or leaders gathered here for consultation with the chief and to celebrate various festivals. Both the temple and the chiefs' residence were demarcated from the other communities by a palisade.

While none of the explorers noted the use of mounds for the temple or chiefs' house, the pattern observed seems to mirror that seen in the archaeological record, albeit in a spatially reduced fashion. Communities were widely dispersed along the lakeshore, while civic and ceremonial activities were concentrated in one locality. This locality was evidently well marked and clearly demarcated from other settlements. The Taensa pattern thus can be seen as an analogy for late prehistoric Plaquemine settlements and possibly social organization. Further research into the Taensa settlement and socio-political organization is clearly warranted.

The most remarkable aspect of the prehistory of the Tensas Basin is the degree of continuity seen in the archaeological record. There is a seemingly smooth and seamless evolutionary sequence from late Middle Woodland into the early historic/contact period. Changes do occur, of course, in many aspects of lifeways, behavior, political organization, and subsistence. These changes, however, are rarely rapid, and always occur in the framework of existing cultural and social systems. Ceramic and material organization changes more rapidly than most else, and the preoccupation of archaeologists with ceramics has often given us a false sense of variation between cultures. As archaeologists go beyond pottery and further explore elements of Native American life in the Tensas Basin, and elsewhere, I believe that we will gain a better appreciation for both continuity, and real change over the nearly 1500 year span witnessed by the archaeological record of the project area.

CHAPTER THREE

ENVIRONMENT AND GEOLOGY

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Regional Geomorphic Setting and Processes

The sites investigated in 1992 are situated in the Mississippi Embayment segment of the Gulf Coastal Plain province. More specifically, they lie near the eastern edge of the Mississippi Alluvial valley, a wide, shallow trough of Quaternary alluvium that extends from near Cairo, Illinois, to the Gulf of Mexico (Autin et al. 1991: Plate 6). At the latitude of St. Joseph, Louisiana, the approximate center of the study area, the valley is about 80 km wide and is bordered on both sides by 45- to 60-m-high bluffs that separate the valley from older, maturely dissected, Coastal Plain formations. These consist mostly of unconsolidated deposits of Tertiary age capped with Tertiary- and Quaternary-age fluvial sands, and gravels, and loess (Autin et al. 1991). Local relief in the uplands is typically on the order of 15 to 30 km.

The fluvial valley is a flat to slightly undulating plain generally lying at an elevation of 18 to 23 m above sea level (National Geodetic Vertical Datum), with local relief of 3.0 to 4.5 m at the latitude of St. Joseph. In general, two types of landscapes characterize the Quaternary alluvial valley. One consists of valley trains formed during the Pleistocene Epoch by braided streams that carried meltwater and outwash from waning continental glaciations. Macon Ridge, located roughly 25 km west of the study area, is the nearest manifestation of valley trains. The other landscape type consists of the Holocene floodplain of the Mississippi River, which includes the present and several abandoned meander belts of that river. The sites investigated in 1992 lie in the midst of this landscape type.

A meander belt is a broad, low alluvial ridge constructed by the lateral migration (meandering) and vertical accumulation of sediments from overbank flooding of a river that carries a moderate to heavy load of suspended sediments. The Mississippi River meander belts typically are 8 to 16 km wide and include materials laid down in several discrete environments of deposition. The point bar environment is the areally most widespread one and is manifest at the surface by distinctive, arcuate, parallel accretion ridges and intervening swales. These ridges and swales reflect the directions of movement of individual river bends and often exhibit truncated series caused by complex patterns of channel migration. Tracts of accretion topography frequently are interrupted by abandoned channels which, in an early stage of their life cycle, may contain oxbow lakes or, at a later stage, may be essentially filled with sediment and characterized by swamp or bottomland hardwood forests.

Abandoned channels average about 1600 m in width and may be more than 15 km long as measured around their arcuate shape from the point of cutoff. Sediments deposited in the natural levee environment typically flank former channels and form low, gently sloping ridges that often veneer and sometimes obscure underlying accretion ridges and swales. Natural levee ridges may occur in complex patterns as those that form along more recent channels and courses may merge with those found along older ones. Abandoned channels sometimes may be partially filled and obscured by natural levees when a younger course meanders into and partially truncates them.

Most abandoned meander belts still contain evidence of the relict course which formed them and was deprived of flow when the river diverted upstream to a new course. Abandoned courses may resemble abandoned channels except that they are much longer, and have multiple bends. More typically, however, they contain a much narrower, grossly underfit stream. The smaller stream exists rather than a broad, sediment- or water-filled depression of the width of the Mississippi River because the process of course abandonment was relatively slow and progressive. During the period of abandonment, channel filling, point bar development, and natural levee growth continued as stream discharge declined (over a period of time measured in decades) and the channel became narrower and shallower. The surviving streams (recognized as broadly sinuous bayous) are important elements in the present local drainage network that serves to remove local precipitation and runoff.

Another major depositional environment and landscape type is the backswamp (or flood basin).

Backswamp areas are low-lying, very flat and poorly drained tracts of land situated between meander belts and sometimes between meander belts and the valley wall. They lack accretion topography and natural levees since they have always been marginal to active stream meandering.

The Quaternary deposits of the Mississippi Alluvial Valley are more than 30 m thick (Autin et al. 1991: Plate 7; Saucier 1967). Sands and gravels predominate in the lower two-thirds to three-fourths of this vertical distance while fine sands, silts, and clays characterize the upper part. Within 3 m of the present ground surface throughout most of the study area, silts and fine sands are restricted primarily to point bar ridges. Silty and sandy loams are found on natural levee ridges. Clays and silts are widespread in the area, occurring in point bar swales, abandoned channels and courses, and backswamp areas.

Because total relief in the Alluvial Valley is so low in relation to the magnitude of seasonal flooding from the Mississippi River, slow, incremental aggradation through the deposition of clays and silts is widespread and affects all environments and landforms. Consequently, the older a meander belt, the greater the degree of veneering by clays and silts and the finer parent material on which soils are formed. For example, younger natural levees of the present Mississippi meander belt contain loamy soils of the Commerce-Bruin-Robinsonville association, while those of the older meander belts contain more clayey soils of the Tensas-Dundee-Alligator and Dundee-Tensas-Goldman associations (Weems et al. 1968). Soils formed on the flat, poorly drained clays of abandoned channels and in backswamp areas belong to the Sharkey-Alligator-Tunica association. Due to the effect of veneering from seasonal flooding present-day soil characteristics cannot necessarily be used to infer prehistoric environmental conditions (Kidder and Fritz 1993).

Site and Landform Relationships

The project area is located in the eastern part of the Tensas Basin segment of the Mississippi Alluvial Valley (Figure 3). The Tensas Basin is a broad lowland area in east-central and northeastern Louisiana that lies between the present meander belt ridge of the Mississippi River on the east and Macon Ridge on the west. The basin is named after the Tensas River which flows southward through the center of the basin, and joins the Ouachita River to form Black River, which, in turn, flows into the Red and Atchafalaya rivers and finally debouches into the Gulf of Mexico. No interior drainage becomes tributary to the Mississippi River in the basin area.

It has been known for a considerable time (Fisk 1944; Saucier 1974) that the Mississippi River has occupied three former courses through the Tensas Basin; however, detailed mapping of individual landforms (Saucier 1967) and their assignment to specific meander belts is more recent (Autin et al. 1991). Figure 4 portrays the latest interpretation of general meander belt trends and their relative ages (Saucier 1990: Fig. 1).

The Mississippi River has been progressively shifting eastward during the Holocene by abandoning older meander belts and adopting newer ones towards the eastern valley wall. In the process, each succeeding younger meander belt has truncated and destroyed portions of earlier ones. For example, surviving segments of meander belts 3 and 4 occur only in the northwestern portion of the study area (Figure 4), These trends were obliterated by the next to youngest meander belt (no. 2) in the southern part of the study area. In turn, parts of meander belt 2 have been reworked by migration of the river within its present (no. 1) meander belt.

Figure 4 does not portray individual abandoned channels (cutoffs); however, the positions of the abandoned courses are shown for each meander belt. These positions represent the location and configuration of the river at the beginning of the process of meander belt abandonment. They do not reflect subsequent slight meandering by the underfit stream that was receiving progressively less discharge as abandonment was proceeding and the channel was getting smaller. In some cases, subsequent meandering remained within the confines of the larger full-flow channel whereas in other cases, the meandering exceeded those limits.

In some instances, meandering by the underfit stream and further filling of the relict Mississippi River course may have continued well beyond the period of progressive abandonment by the parent stream. Under a particular set of circumstances (which actually might have happened rather often), stream flow and sediment movement in an underfit stream may have taken place when its course was intercepted by a migrating bend of the Mississippi River flowing in a different and younger meander

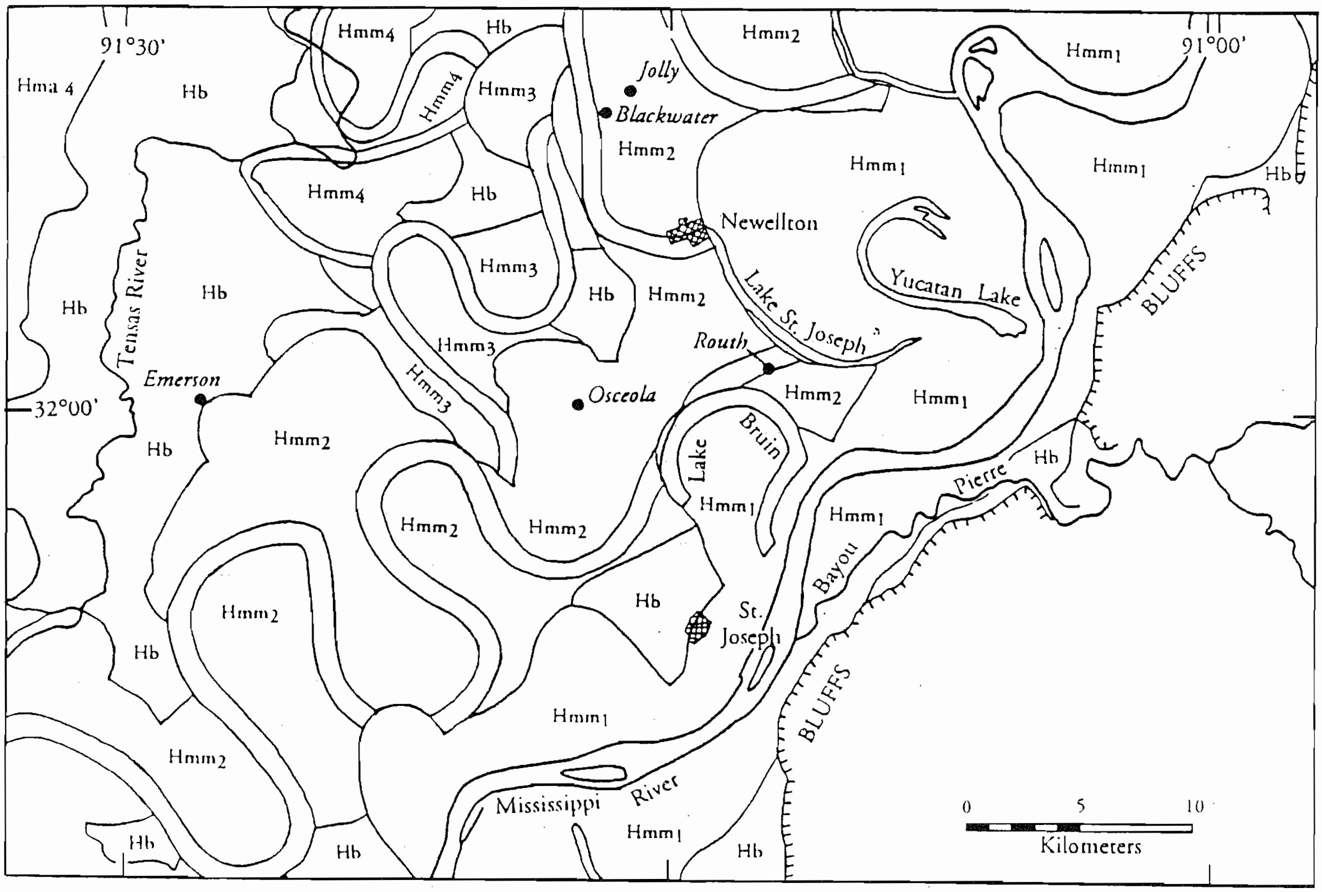

Figure 4: Holocene Geology of the Eastern Tensas Basin. Hb = Holocene Backswamp; Hmm_1-Hmm_4 = Holocene Mississippi River Meander Belts 1 through 4; Hma $_4$= Holocene Arkansas River Meander Belt 4 (From Saucier 1990: Figure 1).

belt. In essence, this would constitute a reoccupation or rejuvenation of an underfit channel. The long, linear depressions of an underfit stream channel would have been ideal, natural routes for floodwaters to move from an active meander belt into an inactive one. Otherwise, floodwaters would have been confined to the backswamp areas between meander belts and only during exceptional floods would natural levee ridges of older meander belts been overtopped and inundated.

Regional Drainage Network

Despite the dynamic nature of the physical environment in the Tensas Basin during the Holocene, human relationships with the environment in the study area were much more heavily influenced by changes in the regional interior drainage pattern than by shifts in the Mississippi River meander belts *per se*. However, the two cannot be separated because the regional drainage pattern was created and heavily influenced by meander belt shifts. Because of the timing of the occupation of the Jolly, Blackwater, and Emerson sites, drainage changes due to abandonment of meander belt 2 and initiation of meander belt 1 and especially the formation of particular cutoffs within meander belt 1 are of primary concern. Figure 3 is a delineation of the streams that constitute the present drainage system of the central Tensas Basin between the Tensas River on the west and the Mississippi River on the east. Many of the streams shown have been modified during the past century to improve drainage for agriculture. These changes are included in Figure 3; however, totally artificial canals and ditches have been omitted.

Virtually all present basin drainage is controlled in whole or in part by abandoned Mississippi River courses and channels. For example, the Tensas River in part occupies the abandoned Mississippi River course in meander belt 4. Cow Slough is the relict underfit stream in the course of meander belt 3, and the Little Choctaw Bayou-Van Buren Bayou-Big Choctaw Bayou system represents the underfit streams in meander belt 2. Streams like Bieler Bayou and Clark Bayou mostly drain backswamp areas between meander belts, but short segments are controlled by both abandoned courses and channels of Mississippi River origin.

Geomorphic History and Dating of Abandoned Channels/Courses

In 1944 H.N. Fisk attempted to develop the first comprehensive chronology of Mississippi River courses, including a detailed reconstruction of the sequence of cutoff channels along the present meander belt. The latter involved estimating cutoff channel ages to the nearest 100 years. This extraordinary work has been widely used by archaeologists to estimate archaeological site ages and to help define particular site/landform relationships.

Later investigations in the Alluvial Valley and general advances in knowledge concerning the sequence and timing of continental glaciations eventually revealed that Fisk's 1944 chronology was essentially invalid except for the *relative* sequence of major events (Autin et al. 1991; Saucier 1974, 1981). It is now known with certainty that portions of the present Mississippi River meander belts are more than 9,000 years-old rather than just 2,000 years-old as originally envisioned. It is also recognized that the rates of meandering within meander belts have not been constant; therefore, ages of abandoned channels cannot be estimated by simple linear projection from historically known cutoffs.

Unfortunately, there are insufficient geological data with which to develop a revised chronology in other than general terms. A small number of apparently valid radiocarbon dates exist for several individual cutoffs and especially channels; however, these are insufficient for use in establishing regional chronologies. Many, if not most, of the organic remains from abandoned channels and courses apparently are not indicative of the ages of the features because of contamination problems and post-abandonment deposition (Saucier 1983).

Consequently, the state-of-the-art of Mississippi Alluvial Valley chronology can be described as a crude second-generation model wherein most age estimations are derived indirectly from archaeological site associations and extrapolated from a few key, dated, regionally significant events such as the termination of Late Wisconsin outwash deposition in the Alluvial Valley. Archaeological site assemblages provide minimum ages for landforms they are associated with; however, in many instances, the ages of the assemblages are only inferred from other locations or situations rather than being directly dated radiometrically at the site under consideration. Therefore, the correctness of cultural affiliation determinations of artifacts, with recognized limitations imposed by such factors as size and representativeness of collections, becomes a limitation to be recognized.

The basic configuration of the Alluvial Valley, as defined by the valley walls and the entrenched surface formed in Tertiary formations beneath the Quaternary alluvium, was established during the early Pleistocene and was essentially in its present form by about 100,000 years ago (Autin et al. 1991). Between ca. 100,000 and ca. 12-11,000 years ago, the Alluvial Valley underwent a series of episodes of floodplain degradation and alluviation, correlated with the waxing and waning of continental glaciations. The last pre-Holocene episode of outwash deposition by a braided Mississippi River lasted from ca. 18-11,000 years before present. Large volumes of sand and gravel were transported in pulses through the valley into the Gulf of Mexico by a Mississippi River whose meltwater-augmented discharge periodically may have been 10 times that of present. Some floodplain aggradation took place in the Tensas Basin area; however, the surface remained 18 to 21 m below present level throughout this interval.

Despite a significantly cooler and wetter climate during most of this ca. 7,000 year period in the area of northeastern Louisiana, it was also a time of loess deposition (because of seasonal silt deflation from valley trains [Autin et al. 1991]). Most of the loess was deposited east of the valley on the uplands, but a thin layer was also deposited on Macon Ridge and other remnant Pleistocene terrace segments.

The very last pulse of outwash deposition into the Mississippi Alluvial Valley probably began about 11,600 years ago, and very likely terminated by about 11,000 years before present (Autin et al. 1991). Very quickly thereafter, and definitely by about 9,000 B.P. (Guccione et al. 1988), the Mississippi River is known to have changed from a braided to a meandering regime in the northern end of the Alluvial Valley. The transformation may have occurred earlier farther south in the Alluvial Valley, but not before ca. 11,000 B.P. in the Tensas Basin.

Between 11,000 and 7,500 B.P., the Tensas Basin area experienced appreciable alluviation and aggradation through the deposition of clays, silts, and sands by both lateral and vertical accretion. It is estimated that the floodplain surface aggraded by 12 m or more during this time (Autin et al. 1991). Most deposition would have taken place in backswamp and point bar environments. The location of the meander belt or belts of the Mississippi River during this period is not known since they are buried and have no present surface expression. Based on locations of later meander belts, there is a suggestion that the one or ones dating to the 11,000- to 7,500-year-ago period were located near the present (modern) meander belt. Discharge of the Mississippi River during that 3,500-year period was evidently comparable to that of the present, as were its general morphology and behavior.

Meander belt 4, the oldest discernible one in the Tensas Basin (Figure 4), is estimated to be between 7,500 and 5,800 years old (Autin et al. 1991). The next youngest, meander belt 3, is estimated to have been active between about 6,000 and 3,800 years B.P. While the former was active, much of the study area consisted of a broad backswamp, and the floodplain surface was no more than 3 m lower than at present. Sedimentation rates were low to moderate, although possibly higher along the western edge of the area (the eastern edge of meander belt 4). When meander belt 3 was active, the rates of sedimentation were moderate to high, and the average floodplain level aggraded to its approximate present level.

The period from 7,500 to 3,800 years B.P., essentially coincident with the Altithermal, was characterized in the Lower Mississippi Valley area by a climate slightly warmer and drier than at present; however, there was probably no significant change in Alluvial Valley vegetation assemblages in the area of the Tensas Basin. Swamp and open water resources may have been reduced somewhat in areal extent and may have experienced greater seasonal variations, but did not disappear from the landscape. There are some suggestions that the regime of the Mississippi River responded in a modest way to the Altithermal, but the data are ambiguous and other explanations for observable changes are equally viable (Saucier 1985).

Meander belt 2 is estimated to have begun forming about 4,800 years B.P., probably experienced full-flow discharge conditions within several hundred years, continued as the main channel until about 3,000 years B.P., and then slowly was abandoned (Autin et al. 1991). Final discharge was probably realized by about 2,600 years B.P.

The formation of Mississippi River meander belt 1 probably began about 2,800 years B.P. (Autin et al. 1991), with full-flow discharge conditions being achieved by 2,600 years B.P. At the Osceola site, in the center of the study area, this event initially resulted in little or minimal environmental change (Kidder and Fritz 1993; Saucier 1990). Seasonal flooding caused by Mississippi River overflow may have decreased somewhat, but there were no major landform or basin drainage changes involved.

The next events which affected the landscape in the study area were ones associated with the formation of the cutoff channels in meander belt 1 that are now occupied by Lake Bruin and Lake St. Joseph (see Figures 3 and 4). As bends of the Mississippi River meandered westward immediately prior to these cutoffs taking place, flooding intensity and frequency must have increased markedly across much of the study area. This was certainly the case at the Osceola site (Saucier 1990). Before cutoff, the flooding would have originated from sheet flow or crevasses in the developing natural levees around the river bends. After cutoff, flooding apparently was more channelized and funneled into relict courses intercepted by these oxbow lakes. Sediments from Lake St. Joseph would have flowed via Bayou Du Rosset into Cypress Bayou and via the Clark Bayou channel into the relict channels and cutoffs of the no. 2 meander belt south and east of Lake St. Joseph. Lake Bruin floodwaters would have been discharged into the Andrews Bayou-Little Choctaw Bayou-Big Choctaw Bayou-Van Buren Bayou system. Seasonal flooding into these bayous would have had a secondary affect on local drainages and would have likely exacerbated backwater flooding in watercourses, such as Lake Formosa and Dickard Bayou, discharging into these local drainage systems.

Bayou Du Rosset and Cypress Bayou, as well as the Andrews Bayou-Little Choctaw Bayou-Big Choctaw Bayou-Van Buren Bayou system, are underfit streams generally within the confines of relict courses in meander belt 2 (Figure 4). When the bends of lakes Bruin and St. Joseph intercepted these relict channels they were probably linear depressions the width of the Mississippi River, and hence a natural route for floodwater channelization into a lower area. However, sediments from meander belt 1 soon filled and narrowed the abandoned channels to their approximate extent wherein only small, underfit, bayous remain. Thus, the bayous only briefly functioned as distributary channels to transport sediments from meander belt 1 into meander belt 2.

Flooding before, during, and after the formation of the Lake Bruin and Lake St. Joseph cutoffs was accompanied by the introduction of large quantities of clays and silts that were deposited overbank in backswamp areas and in abandoned channels. Most aggradation took place in the topographically lowest areas such as the abandoned channels; however, flooding evidently was occasionally extensive and severe enough to also result in a thin veneer of backswamp clays on the natural levees and point bar areas across the eastern portion of the study area.

Evidence from the Osceola site indicates that the formation of the Lake Bruin and Lake St. Joseph cutoffs was associated with significant landscape and regional environmental changes, possibly leading to the abandonment of the site (Kidder and Fritz 1993; Saucier 1990). These events can be assumed to have had an important impact on sites throughout the study area, even if only due to secondary consequences (e.g., increased backwater flooding). Accordingly, it is necessary to focus attention on the chronology of the Lake Bruin-Lake St. Joseph development.

Fisk (1944: Plate 22) postulated that the Lake Bruin cutoff took place about 500-600 years B.P. (stage 15), and the Lake St. Joseph cutoff occurred about 400-500 years B.P. (stage 16). As in most cases in his work, Fisk's age estimates are too young. No definitive geological evidence exists to date them more accurately, although archaeological evidence provides some important help.

The Routh site, located about half way between lakes Bruin and St. Joseph, has components dating to the later Coles Creek and especially the early Mississippi periods (Hally 1972). These components are generally dated to ca. 950-550 years B.P. (Hally 1972; Kidder and Fritz 1993; Phillips 1970; Williams and Brain 1983), although few radiocarbon dates from sites in the area are available to confirm this age span. Hally (1972: Table 24) also identified an early Coles Creek Sundown phase occupation based on the presence of a small number of diagnostic sherds in what appear to be stratigraphically early context beneath mound C. Confirmation of the chronology of this component could theoretically push the initial occupation of the Routh site back to ca. 1,500-1,050 years B.P. Archaeological sites on Lake St. Joseph generally date to the late prehistoric Fitzhugh phase (ca. A.D. 1400-1550), or slightly later (Williams 1967). Hally (1972: 691-692) identified a Fitzhugh phase occupation at the Elk Ridge site (16TE119) on a point bar on the inside bend of Lake St. Joseph.

Although the precise landform association of the Routh site is not known, it is situated on a natural levee that could have been developed by either of the cutoff channels. Assuming with only minimal evidence (Fisk 1944: Plate 22) that Lake Bruin is slightly older than Lake St. Joseph, we can assume that the site was founded on the natural levee ridge of the former and was influenced but not buried by the levee that developed around the latter. Therefore, the age of the Lake Bruin cutoff can be postulated to have occurred no more recently than ca. 1,000 years B.P., and possibly considerably earlier. We can further hypothesize that the Lake St. Joseph cutoff must have formed before ca. 600 years B.P., and may have been a factor in the termination of habitation at the Routh site by ca. 1400-1500 A.D. Hally's research at Routh indirectly indicates that much of the site area may have been covered with a veneer of clay and silt, possibly associated with overbank flooding during the formation of the Lake St. Joseph cutoff (Hally 1972).

According to this model, increased flooding and overbank sedimentation in the eastern study area would have begun prior to or around 1,000 years B.P. These events would not have precluded prehistoric habitation in the study area, and in fact, may have enhanced some aspects of the natural environment. In some areas, especially topographically lower sections west of the cutoff channels, flooding and landscape changes may have diminished the overall productivity of the local environment considerably. There was evidently no uniform change in the region, but rather each site area may have been affected in different ways. In the Jolly and Blackwater site localities, for example, increased channelization of floodwaters into the Bayou Du Rosset and Cypress Bayou systems may have lead to the formation of productive linear watercourses, with only minimal flooding due to the relatively high levee ridges in the area. At Emerson, however, located in a relatively low area at the margin of meander belt 2, increased backwater flooding may have occurred during seasonal inundation. This fact is reflected by the soils around Emerson, which are classified as Alligator and Alligator-Tensas clays (Weems et al. 1968: Sheet 30). Still, since the site was relatively far removed from the main channel of the river, the extent of sedimentation may have been minimal and does not seem to have prevented occupation in this locality.

Fauna and Flora

The Tensas Basin can be characterized as sustaining an abundance of plant and animal resources (Gulf South Research 1974; Jackson 1986; St. Amant 1959). These resources are generally widely distributed when viewed from a basin-wide perspective. A closer examination of plant and animal distributions suggests that, in fact, they are more patchily arranged than is often appreciated. At least three major variables appear affect the spatial arrangement of wild food resources.

First, seasonal (and temporal) variation is present although not especially marked due to the general absence of significant climatic variation (Thompson et al. 1983). Still, variations in the maturation of plant food resources is likely to have had a significant impact on how these resources were acquired, stored, and used. This may be especially true of mast foods, notably acorn and pecan (Jackson 1986). Wild starchy seeds, including maygrass and chenopod, would also be temporally sensitive in their availability; the same would apply to a number of other plant foods, including tubers. The distribution of animal foods would be less seasonally sensitive (St. Amant 1959), although some variations could be expected, at least in the ability of humans to get access to certain animals (notably fish and turtles).

The second variable of note is the spatial distribution of resources which is largely a correlate of the geomorphic history of a given section of the basin. Variation is most noticeable when viewed perpendicular to stream and river courses. Elevation determines the species composition of both major and minor plant community resources (Gulf South Research 1974; Jackson 1986; Weinstein et al. 1978), and this variable is most accentuated on an east to west transect. Broadly speaking resources will differ most significantly across elevations than along the same elevation. This means that a levee section will generally support a similar community compared to higher or lower areas on either side. The implication of this distribution is that greater resource heterogeneity can be expected for human groups that can exercise control over or gain access to territories that encompass terrain of different elevations. This elevation-based resource patchiness may be moderated in some areas by the close proximity of levees and backswamps in many parts of the basin.

The last variable of significance is the distribution of water resources, especially large, open bodies of water. Since fish evidently comprised a significant resource for most Native Americans in the Lower Mississippi Valley through time (Jackson 1986; Kidder and Fritz 1993; Springer 1980), the distribution and availability of these resources no doubt played an important role in the organization of subsistence activities in the Tensas Basin. The bayous, rivers, and lakes of the Tensas Basin support a high biomass of fish (Lambou 1959, 1960; Lambou and Geagan 1961; Lantz 1970). These resources were both readily available and generally self-sustaining. The biomass, however, was not uniformly distributed, but rather tends to be especially concentrated seasonally (in the spring) and also in the larger bodies of water (notably oxbow lakes and seasonally inundated water courses). Once again these resources are abundant but not evenly distributed.

The ecological organization of available food resources in the Tensas Basin suggests that human exploitation would involve an active attempt to position sites (or people) to exploit different communities across space and through time. Collecting strategies emphasizing territories crossing water courses and encompassing as many large bodies of water as possible can be predicted. Sedentism is likely under these conditions since it is the most logical strategy for exploiting the plant and animal food resources. The presence of abundant and self-sustaining fish resources in bayous and lakes may have served as an anchor for human populations, although seasonal exploitation of surrounding areas may have been dictated depending on year-to-year conditions. The data being accumulated form archaeological sites suggests that floodplain resources were sufficient for relatively large, sedentary populations to develop at a relatively early stage in the prehistory of the Southeast (Jackson 1986). Furthermore, even though resources were patchily distributed, human subsistence organization seems to have been developed to the point where domesticated foods were not a prerequisite or necessity for large-scale population nucleation (Fritz and Kidder 1993; Kidder and Fritz 1993). The introduction of domesticated food resources in the later Coles Creek period does not seem to be occasioned by an absolute need for calories or energy. Rather the explanation may lie beyond necessity in the realm of social organization and economy.

All of the sites excavated in 1992 are currently in cleared agricultural fields. The current primary forest type in the study area is oak-hackberry-gum, but there is also a considerable amount of scrub vegetation, including palmetto, particularly in lower lying areas. Cottonwood, cypress, and tupelo were found in former channels and courses of the Mississippi River. Stands of cane could also be expected, particularly along the edge of the levee overlooking the former channels. Primary wild plant foods in the area available for humans include nuts (especially acorn and pecan), fruits (persimmon, palmetto, grape, and blackberry, dewberry), seeds (maygrass, sumpweed, chenopod, amaranth, purslane), and roots and tubers (possibly groundnut and big root morning glory). All of these plant foods have been recovered or have been tentatively identified in archaeobotanical samples from sites in the study area (Fritz et al. 1992; Kidder and Fritz 1993).

The faunal environment during prehistoric times was probably not dramatically different that today in actual composition, although animal distributions would not necessarily be the same (Kidder and Fritz 1993; St. Amant 1959). Deer were the predominant large mammal, with wolf, fox, bobcat, and probably bear also present in the region. Smaller mammals such as raccoon, opossum, squirrel, and rabbit would have been common. The avian fauna would have included wild turkey, possibly some of the local wading birds, and also migratory birds. Fish would have been abundant in local streams, sloughs, and oxbows. Catfish, gar, and bowfin were probably most common, but numerous other fish could have been taken. Freshwater mussels were evidently utilized by the prehistoric occupants of the study area, although they were not recovered at all of the sites excavated..

CHAPTER FOUR

JOLLY (16TE103)

Introduction

The Jolly site is situated on a low knoll or ridge east of Cypress Bayou, roughly six km NNW of Newellton (Figure 5). The site consists of a relatively small midden stain and an associated scatter of artifacts concentrated on the crest of the knoll and its immediate slope. Jolly is only 3 km west of the Balmoral site, and it appears to have been a small hamlet or farmstead, contemporary with, and presumably related to, the mound occupants at Balmoral. Jolly, which is currently farmed for cotton, was first recorded by John Belmont and Reca Jones who were informed about the site by Alvin Jolly, a Panola Plantation Ltd., foreman. Belmont and Jones visited the site in 1989 and made a relatively small surface collection, noting that the site appeared to date exclusively to the late Coles Creek Balmoral phase. This chronology, and the proximity of Jolly to the Balmoral site, made it a logical target for our explorations in 1992. Jolly represents a late Coles Creek non-mound occupation, which would provide us with comparative data to check against the information from Osceola, a partially contemporary mound site. Further, excavations at Balmoral had been undertaken in the early 1960s by the Harvard LMS crews, and we had partial access to that data, including stratigraphic profiles and the single radiocarbon date.

Jolly was the first site investigated in the summer of 1992, and as such it was the locality where we worked out our research strategies in a "real world" setting. Work at Jolly provided us with a number of methodological insights and allowed us to modify our field tactics to better suit the actual site conditions. For example, our original research design called for five-m grids across the entire site. We made this decision in order to provide what we thought would be fine-grained spatial detail and variation. At Jolly it became immediately apparent that such a small grid would be impossible to utilize and still maintain a reasonable work schedule. Even though Jolly

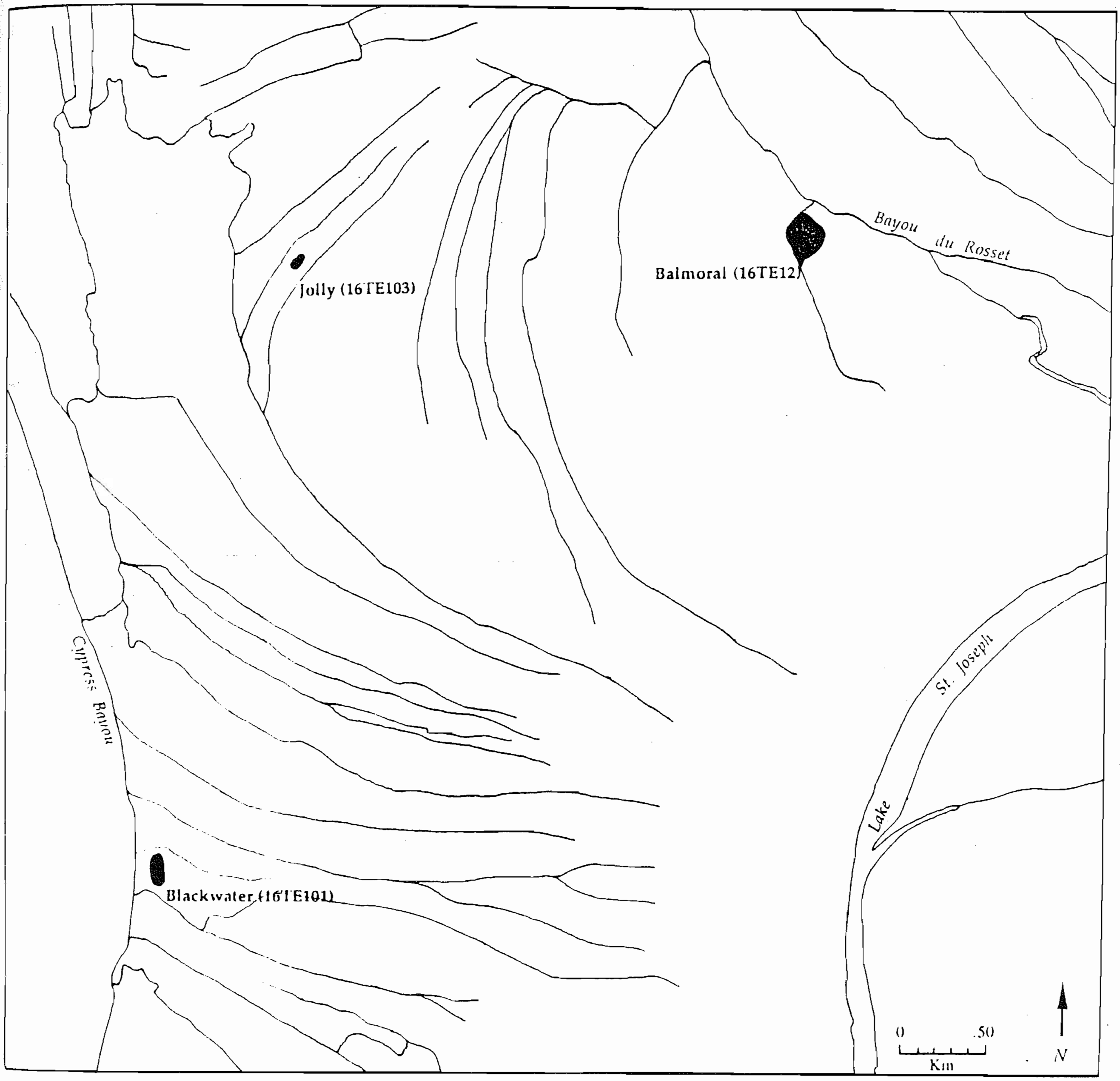

Figure 5: Location of the Jolly and Blackwater Sites, Tensas Parish

was small, at least relatively, a five-m grid would require an inordinately large effort to layout and collect. We modified our procedures to utilize a 10 m grid, based both on considerations of time and effort allocation, and because we had found that this grid size "worked" well at Reno Brake. Further, on reflection, we realized that keeping a consistent 10 m grid for all project controlled surface collections allowed us to maintain a uniform and thus comparable data base. Another example of how we altered our tactics was that at Jolly we began by actually staking out the grid, using wooden stakes. As any archaeologists knows, wooden stakes require a fair amount of effort to lay out, hammer in, and keep in line. They are also bulky and awkward to handle and transport. After Jolly we switched to a procedure of using pin flags to mark grid intersections. This allowed us to lay out grids very rapidly, and with almost no sacrifice of accuracy. Of course, in all situations, datum stakes and temporary datum stakes, were actually staked out from a fixed location.

The Site and Its Setting

The Jolly site is structurally very simple, consisting of a relatively small midden stain, roughly 35 m in diameter, at the crest of a low but prominent knoll on an elongated ridge trending generally north to south (Figure 6). The site has no special features to mark its presence, and would only have been found by controlled survey or due to an informant pointing it out. At the north end of the site is a recently constructed gravel road. No artifact were noted north of this gravel road, although the scatter came near the south side of the road. A small gully near the south end of the ridge marks the approximate end of the artifact scatter. The artifact scatter associated with the Jolly site is considerably larger than the midden patch, covering an area of roughly 100 m north to south, and approximately 65 m east to west. According to Billy Guthrie, the plantation manager, up to several feet of the surface of parts of the Jolly site has been removed by dirt bucket to fill in low spots along the crest of the ridge to the south, so much of the present-day scatter must be considered to be the result of this and other modern agricultural practices.

Jolly is situated on one of a number of generally north to south trending, slightly arcuate ridges

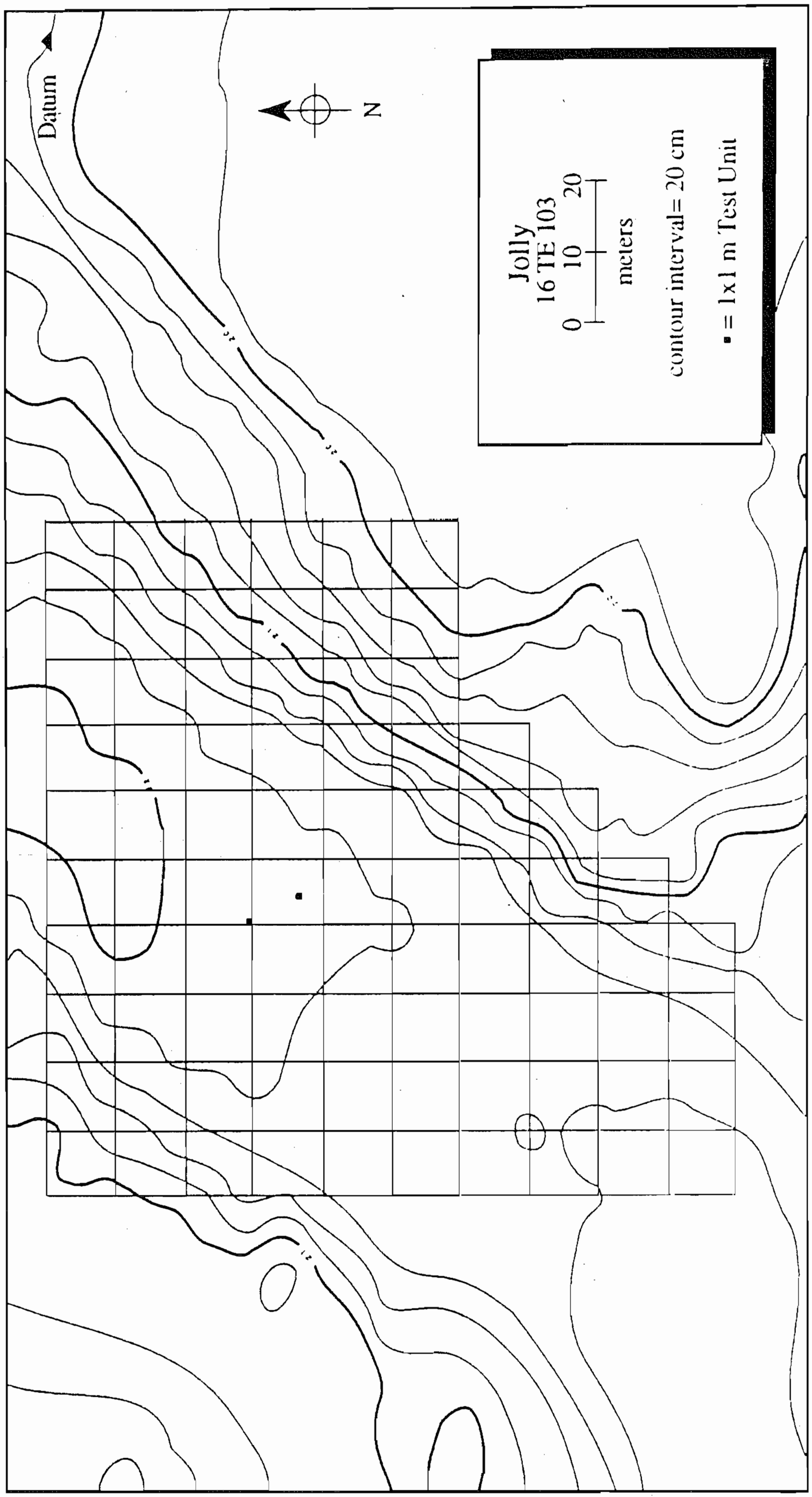

Figure 6: Contour Map of the Jolly Site (16TE103), Showing Surface Collection Grid and Location of Test Units

which lie east of Cypress Bayou. This terrain is part of the point bar ridge and swale topography that developed during the formation of relict channels of Mississippi River meander belt No. 2 (Saucier 1967). From the position and trend of these ridges, and from the manner in which they appear to be truncated by the Cypress Bayou channel (Fisk's Stage 10), it seems likely that these features predate the final configuration of the Cypress Bayou channel segment. The ridges are separated by low swales which hold water much of the year, even today. The soils on these ridges consist of relatively dark brown, thick, tenacious clays on the surface, underlain by a relatively light colored, slightly sandy, clay. Evidently the surface veneer of clay is due to periodic, but perhaps relatively rare flooding events, most likely related to backing up of local drainages. The terrain between Cypress Bayou and the levee of Lake St. Joseph is potentially subject to inundation due to its location between these two relatively high levees. How often floodwaters would have topped the ridges cannot be gauged, but it must have happened a number of times to deposit the clays along the surface.

1992 Investigations

Surface Collections

Following the establishment of the site datum we set out a grid of 10-m squares, oriented to the cardinal directions. The initial base line began at 69.8 m west of datum and extended 100 m further west. The westernmost base line was turned south and extended for 100 m. The southern extent of the grid is not uniform because we staggered the grid to take in the ridge top and because initial reconnaissance indicated that the scatter did not follow the slope at the southern end of the site. The final configuration of the grid is shown in Figure 6.

The distribution of artifacts, particularly pottery, demonstrates that the bulk of the scatter is concentrated in an area encompassing roughly 40 m^2 (Figures 7-8, Appendix A). The greatest quantity of pottery was found in grid 119.8 W 30 S. This grid was in the approximate middle of the dark midden stain which was visible on the surface. The scatter outside of the midden stain was largely found to be more dense to the south and along the eastern edge of the ridge and its

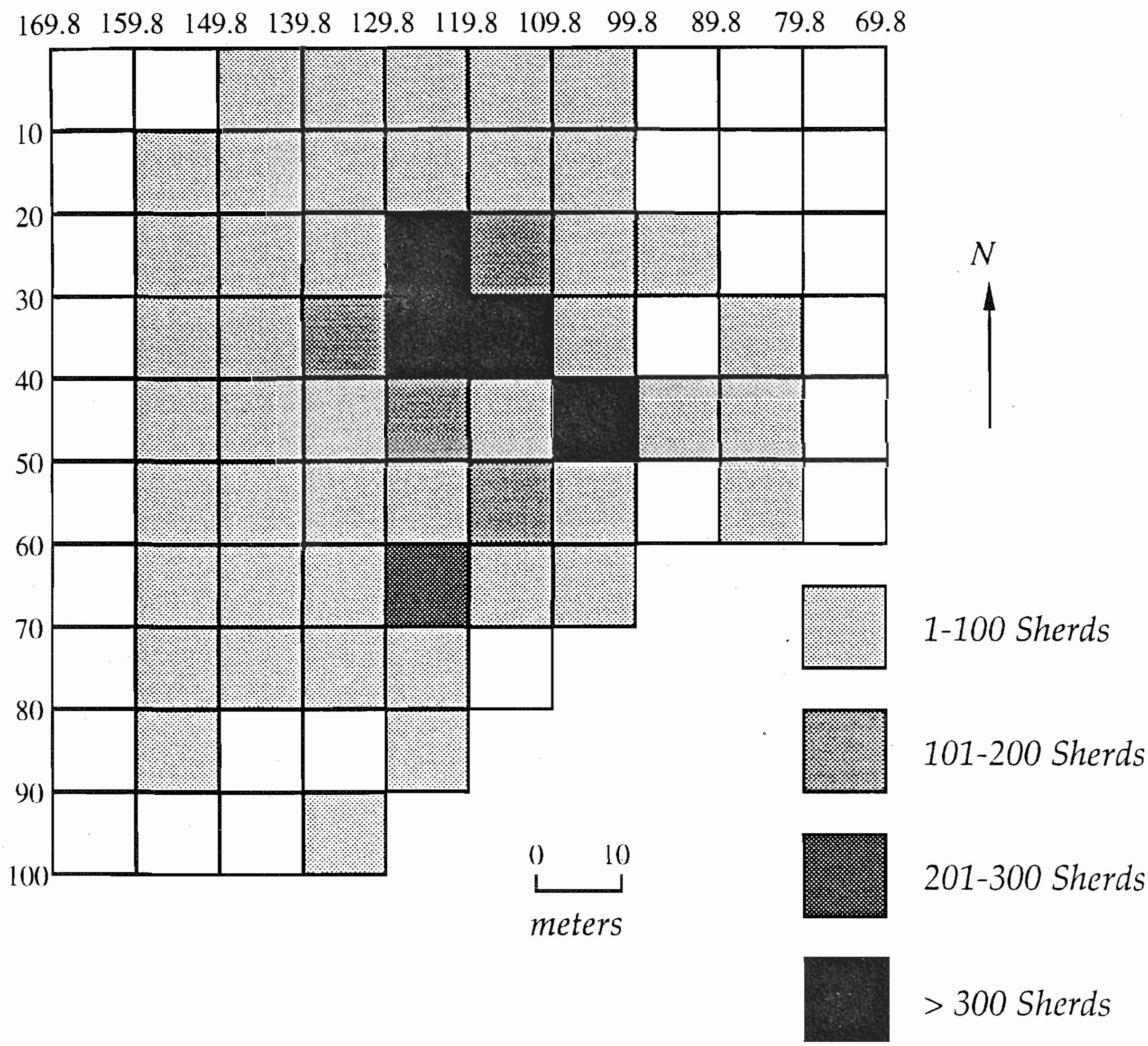

Figure 7: Surface Distribution of Ceramics at the Jolly Site

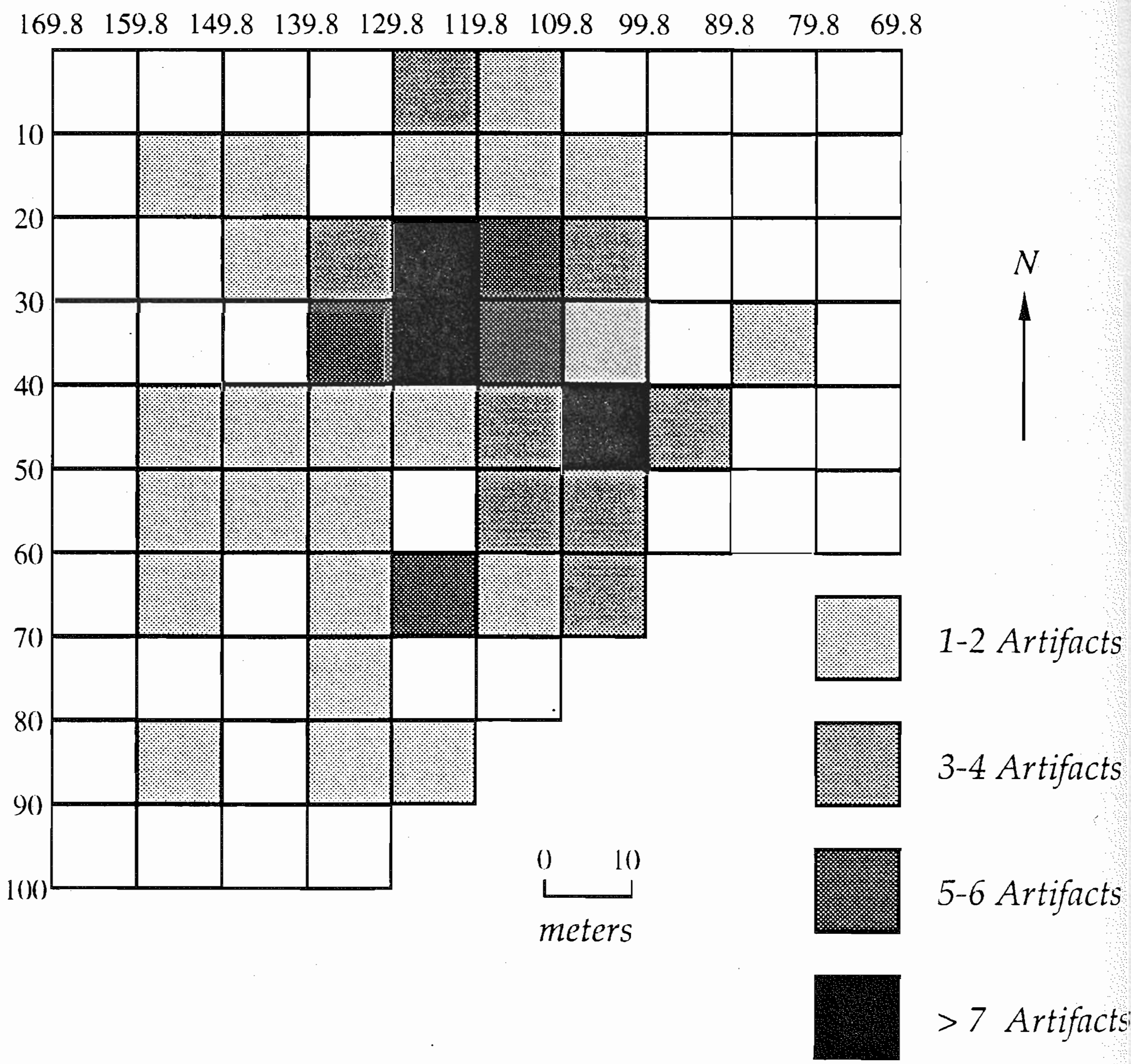

Figure 8: Surface Distribution of Lithics at the Jolly Site

immediate slope. The portions of the grided area west of the 139.8 W line contained few, if any artifacts. The same is true of the area east of the 99.8 W grid, which covers much of the lower parts of the eastern slope of the ridge. Ceramics were relatively abundant, especially in the center of the site. The sherds, though, were relatively to very small, and few were decorated (Table 1). Lithics were scarce across the entire site, even in the grid units with the most pottery (Figure 8, Table 2). However, the stone artifacts were found to be most common in the central portion of the site. Many of the units, especially those near the northern edge of the site contained small, unmodified pebbles. These are likely to have come from the gravel road at the north end of the site, and do not appear to reflect aboriginal behavior. Bone was not recovered on the surface, although we did recover some from the excavations.

Shovel Tests

In keeping with our research design we undertook to shovel test at a number of grid intersections. The focus of our shovel testing was on delimiting the extent of the midden, and in assessing subsurface stratigraphy and integrity. The grid intersections near the center of the site were all tested, as were a random number drawn from the remaining pool of grid intersections (Figure 9). Our basic suspicion about the dimensions of the site were ratified by the shovel testing, although we also learned a good deal about the relative stratigraphy. Shovel tests conducted on the eastern edge of the ridge showed that there was very little midden in this locality, especially where the elevation began to drop off. We cannot be certain if this pattern was caused by erosion of the absence of occupation in this area. As we moved upslope onto the ridge crest and towards the site center midden deposits became thicker and richer. A three part stratigraphy was observed, consisting of topsoil, midden, and sterile subsoil. No internal stratification could be discerned in the shovel tests, although given the small size of the tests this was not surprising. Random shovel tests excavated to the south and west of the center of the site showed that no intact midden was left in these areas. Here topsoil gave way to the subsoil with no intervening layers, and no artifacts were recovered.

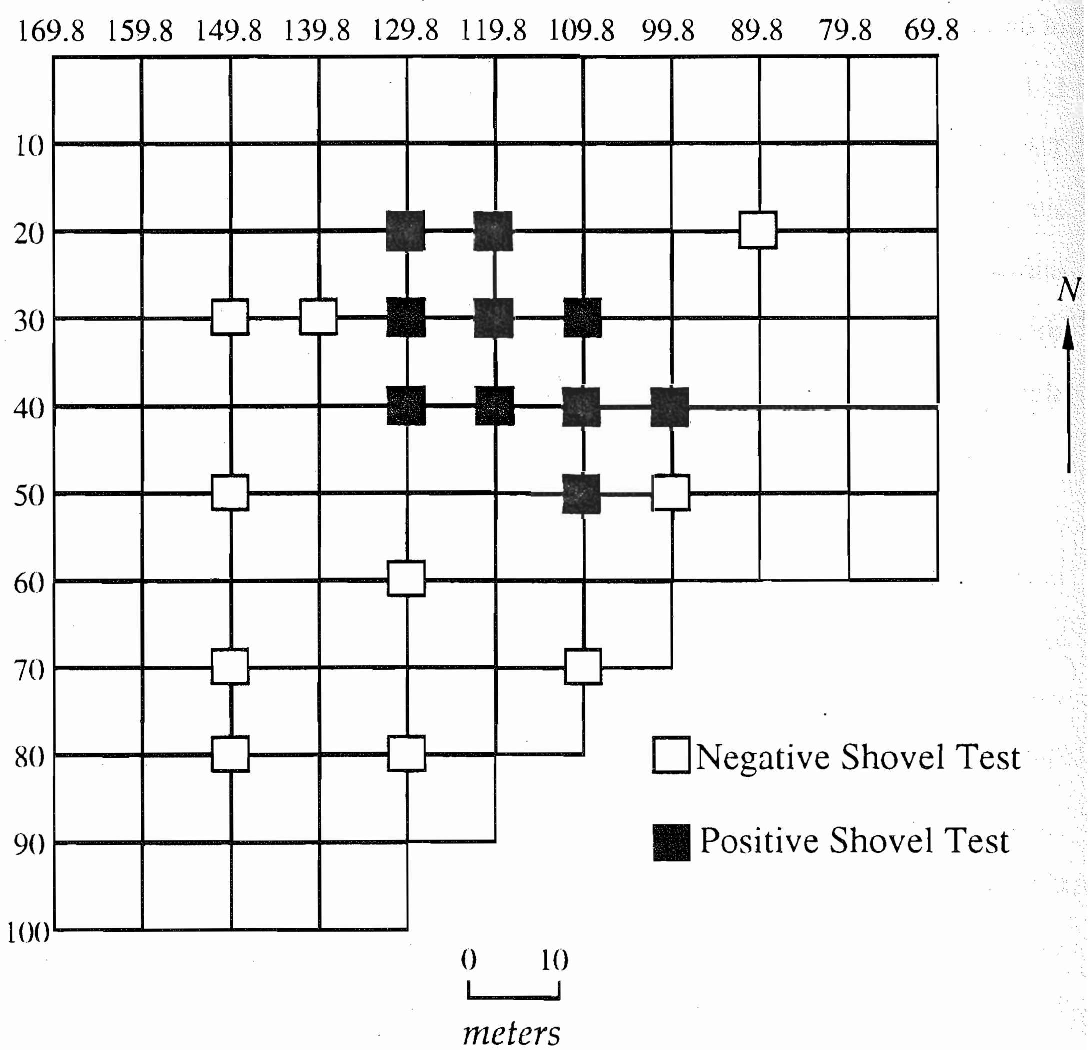

Figure 9: Location of Shovel Tests at the Jolly Site

Table 1: Surface Collected Ceramics From Jolly

Type	Collection Tier / *variety*	*0S*	*10S*	*20S*	*30S*	*40S*	*50S*	*60S*	*70S*	*80S*	*90S*	*100S*	***TOTAL***
Coles Creek Incised,	*var. Coles Creek*		1	5	1	3							***10***
Coles Creek Incised,	*var. Greenhouse*					2							***2***
Coles Creek Incised,	*var. Hilly Grove*				3	1							***4***
Coles Creek Incised,	*var. Mott*			3	13	4							***20***
Coles Creek Incised,	*var. unspecified*		1	2	7	7	1	2	1				***21***
Evansville Punctated,	*var. unspecified*				1								***1***
French Fork Incised,	*var. McNutt*			1		2							***3***
Mazique Incised,	*var. Kings Point*				1								***1***
Mazique Incised,	*var. Preston*		1										***1***
Mazique Incised,	*var. unspecified*							1					***1***
Unclassified Incised	*on Baytown Plain*			3	7	5	1	7					***23***
Unclassified Interior Incised					2	1	1						***4***
Total Decorated Ceramics		**0**	**3**	**14**	**35**	**25**	**3**	**10**	**1**	**0**	**0**	**0**	***91***
Baytown Plain,	*var. unspecified*	16	88	786	1526	951	293	357	36	4	1	5	***4063***
Bowls													
Simple, Round			1	5	9	5	2	3					***25***
Simple, Flat				3	6	3	1	2					***15***
Warped, Flat					1								***1***
Warped, Round				1	1	1							***3***
Tapered				1		2							***3***
Thickened, Round					1	1							***2***
Interior Bevel					4	1							***5***
Total Bowl Rims		0	1	10	22	13	3	5	0	0	0	0	***54***
Jars													
Simple, Round				1									***1***
Simple, Flat			6	13	21	13	4	4					***61***
Flaring, Round					2	3							***5***
Exterior Bevel						2							***2***
Exterior Bevel, Restricted					1	1							***2***
Tapered					1								***1***
Total Jar Rims		0	6	14	25	19	4	4	0	0	0	0	***72***
Beakers													
"Vicksburg"			1		4	2							***7***
Tapered				4	7	2			1		1		***15***
Total Beaker Rims		0	1	4	11	4	0	0	1	0	1	0	***22***
Indeterminate Rims													
Simple, Round				4	13	3	3	4					***27***
Simple, Flat				2	7	2	1	2					***14***
Total Indeterminate Rims		0	0	6	20	5	4	6	0	0	0	0	***41***
Total Plain Rims		0	8	34	78	41	11	15	1	0	1	0	***189***
Bases													
Indeterminate				4			1						***5***
Total Bases		0	0	4	0	0	1	0	0	0	0	0	***5***
Total Plain Ceramics		16	96	824	1604	992	305	372	37	4	2	5	***4257***
Total Ceramics		***16***	***99***	***838***	***1639***	***1017***	***308***	***382***	***38***	***4***	***2***	***5***	***4348***

Table 2: Surface Collected Lithics From Jolly

	Collection Tier	*0S*	*10S*	*20S*	*30S*	*40S*	*50S*	*60S*	*TOTAL*
Chipped Stone									
Retouched Flake							1		*1*
Hammerstone		1		3		1	1		*6*
Hammerstone/Abraider						1			*1*
Flake Cores		2		3	2	2			*9*
Tested Pebbles		1	1		1				*3*
Battered Cobble					1				*1*
Utilized flakes			1	1	2				*4*
Unutilized flakes									
	Local Pebble Chert			4	10	6	3	7	*30*
	Thermally Altered Chert				2	2			*4*
	Non-Local Chert				1	1		1	*3*
Shatter									
	Local Chert		1	4	4	1	2		*12*
	Quartz Pebble							1	*1*
	Burned Debitage			8	3	1	1		*13*
Groundstone									
Quartzite Celt (?) Fragment			1						*1*
Round Pallette Fragment					1	1	1		*3*
Sandstone Pieces					1	1			*2*
Hematite				1					*1*
Unmodified Pebbles		2	3	5	6	3	1	3	*23*
Total Lithics		***6***	***7***	***29***	***34***	***20***	***10***	***12***	***118***

Test Excavations

As a result of our surface collections and shovel tests we decided to place two small excavation units near the center of the artifact scatter (Figure 6). The shovel tests indicated that moderately deep midden could be expected, and that large-scale horizontal excavations might not be useful in this situation given time and personnel constraints. We felt that small, 1-by-1 m units, would provide us with adequate stratigraphy, and allow us to explore the possibility of recovering intact subsurface features. The two 10-by-10 m grids with the largest surface collections and richest, deepest shovel tests, were targeted for investigation. Each 10-by-10 m grid was divided into 100 1-by-1 m squares, and a single 1-by-1 m unit was selected randomly. One m square units were chosen because they could be excavated rapidly and would not tax our limited crew. The two units were staked out, the cotton was uprooted, and the surfaces cleared prior to excavation. Our excavation strategy was to utilize arbitrary 10 cm levels unless natural stratification could be determined.

Unit 128.8W 29S

The first unit that we excavated had its northeast corner stake at 128.8W 29S, and was located near the western edge of the midden scatter. Shovel tests just SE of the nearby corner stake of grid 129.8W 30S showed a relatively thin band of midden overlying a light orange to tan slightly sandy clay. Excavations at this locality revealed a four part stratification (Figure 10), with a relatively thin plowzone (averaging approximately 10 cm thick), a roughly 10-15 cm band of midden comprised of a very dark brown to black dense clay, a layer of midden stained grey-brown clay, and then the underlying mottled orange slightly sandy subsoil. Eight features were found to penetrate into the underlying subsoil (Figure 11), although there point of origin could not always be determined. It appears that t least some of them originated in the midden, or possibly at the contact between the midden and the grey-brown clay.

The plowzone in this unit was very shallow, a result of the method of cultivation practiced at the Jolly site and referred to as "stale ground" cultivation. Essentially they do not practice deep soil

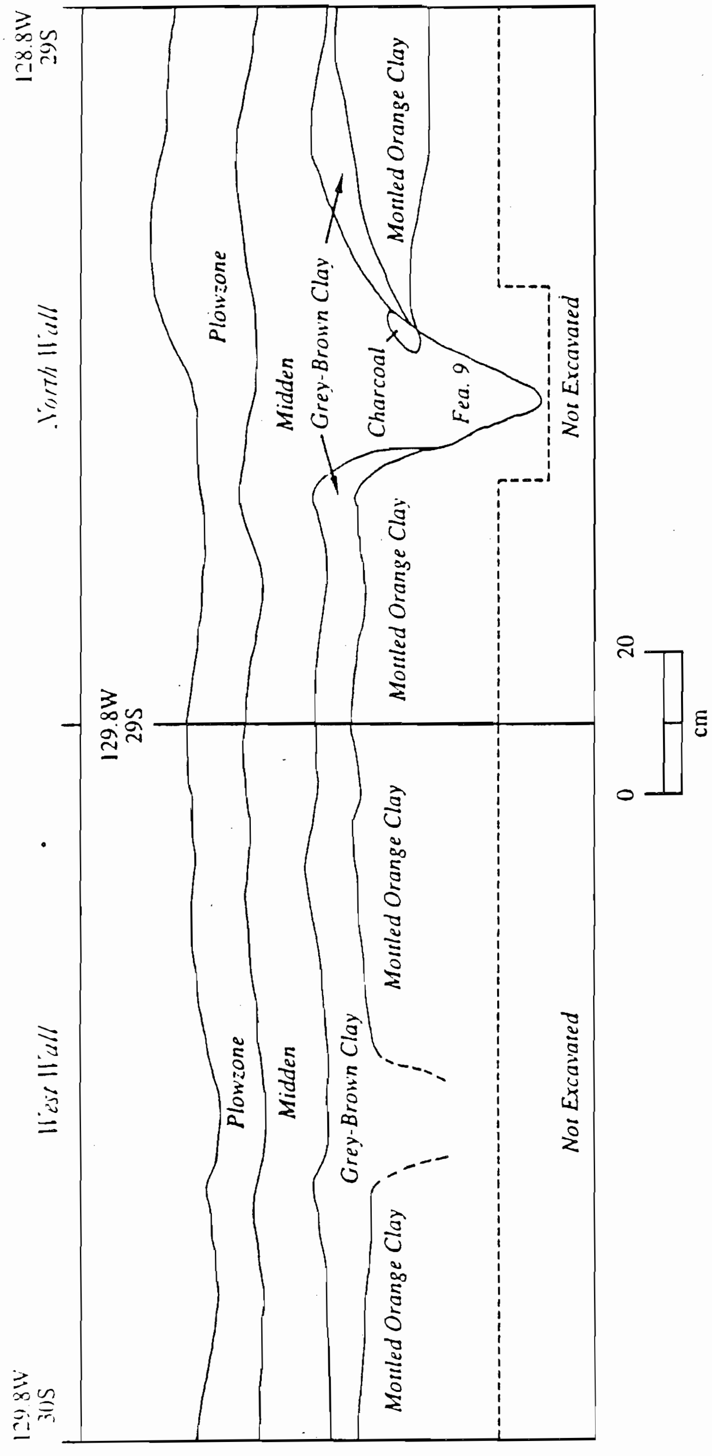

Figure 10: North and West Wall Profiles of Test Unit 128.8W 29S at the Jolly Site

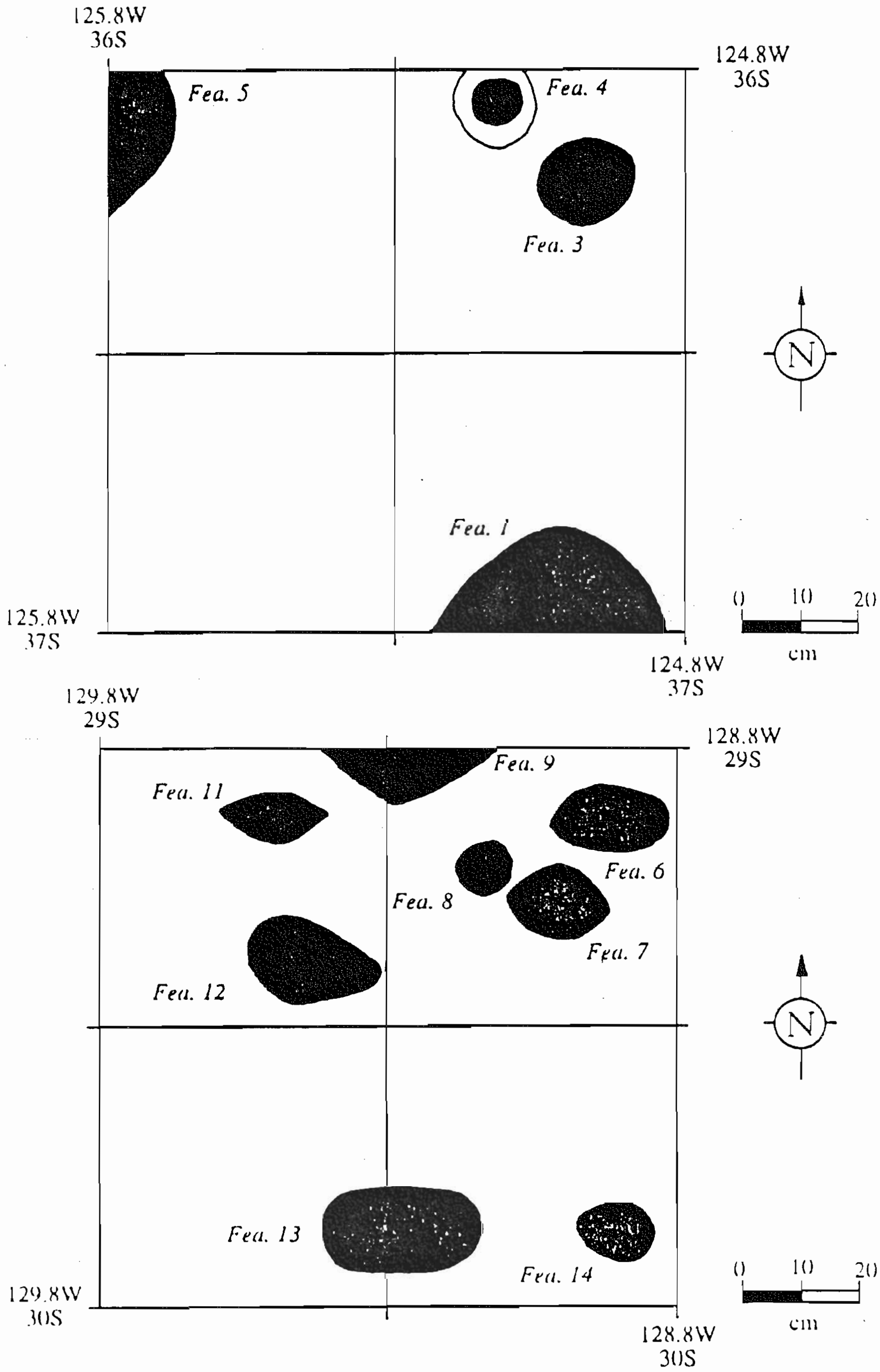

Figure 11: Plan of Features From Test Excavations at the Jolly Site

turning or subsoiling here because the underlying clay is too dense and unproductive. This has had the effect of preserving much of the relatively shallow midden at the locality of this test unit. Artifacts were rare in this midden (Table 3). Immediately below the plowzone in the east wall of the unit we encountered a deer ulna, evidently lying *in situ* in the midden. Although this bone was well preserved in the midden context, it quickly broke into many fragments as the hard clay dried around it. This characterized much of the recovery of bone and even pottery. The very dense clay of the midden was difficult to excavate and tended to break apart in large clumps, regardless of the care taken in excavation. Bone and pottery tended to crumble readily, at even the slightest touch. As the clay dried it became intractable and required constant soaking to insure that it could be removed without too much damage to the contents. Screening of these deposits was not possible given our resources, and in retrospect it seems unlikely that it would have been beneficial even if we had the time and personnel. Flotation samples were taken at regular and systematic intervals, and all features were 100% floated. At roughly 20-21 cm below the surface a circular concentration of charcoal and decomposed pottery was observed in the midden. A roughly oval feature (No. 13) was found in the subsoil (at 29 cm below the NE corner) beneath this concentration and appears to be the continuation of the materials found in the feature. Feature 13 was an irregular, relatively straight-sided pit with fired clay, charcoal, and decomposed pottery in its upper portion. Tentatively we believe that this may have been a hearth due to the amount of charcoal found, but there was no evidence of burning or preparation of the soil surrounding the charcoal. It does not resemble any hearth features previously noted, however.

Excavations were initially stopped at at roughly 28-30 cm blow the NE corner of the unit where we encountered the grey-brown clay and the entire floor was cleared and inspected. The features were plotted and their depths recorded. One feature was recorded (No. 10) but turned out to be a midden pocket in the grey-brown clay. Most of the features were relatively shallow, round-bottomed pits filled with midden rich dark brown-black clay. Feature 9, located partially in the north wall (Figures 10-11) was a relatively deep pit with contracting sides and a pointed base.

This feature contained abundant charcoal, and some bone and pottery. No function specifically can be ascribed to this, or any other features in this unit, although we suspect that they are refuse pits; based on their vertical profile none appear to be postholes.

Unit 124.8W 36S

The second excavation at Jolly was located slightly to the east and south of the previously described excavation. This unit was also a 1-by-1 m square, although it was deeper than the previous excavation. The basic stratification of this excavation was similar to the preceding unit, with a relatively shallow plowzone overlying a dark brown to black dense clay midden. The midden rested directly on a mottled (midden stained) orangish slightly sandy clay; there was no level of grey-brown clay between the midden and subsoil (Figure 12). Generally the midden was homogeneous in content, although several tan clay mottles were found along the western wall. These may represent insect or rodent disturbances, but they did not form any obvious pattern. The midden contained moderate quantities of pottery and an occasional flake of stone (Table 4). Bone was rare in the excavated sample, and charcoal was frequently noted but not recovered. Bright orange flecks of fired clay were scattered throughout the midden matrix but could rarely be recovered because they were small and tended to crumble on contact. The midden was removed in three levels, the uppermost one encompassing the plowzone and a portion of the top of the midden. No internal stratification was observed.

At the base of the midden the orange clay was heavily mottled and stained, presumably due to the overlying midden. Five stains were initially recorded at 33-35 cm below the NE corner of the unit, but one turned out to be a midden pocket in the subsoil. Four features were excavated (Figure 11). All appear to have originated in the midden, or, more likely, at the base of the midden or top of the orange clay level (Figure 12). Several features appear to represent postholes, at least based on their vertical profiles. Feature 1 was a large pit in the south wall. Although it was large in horizontal extent, it was relatively shallow except in its center where it narrowed to a thin, tapering, round bottomed hole. Similarly, Feature 4 was larger at the top and tapered to a narrow

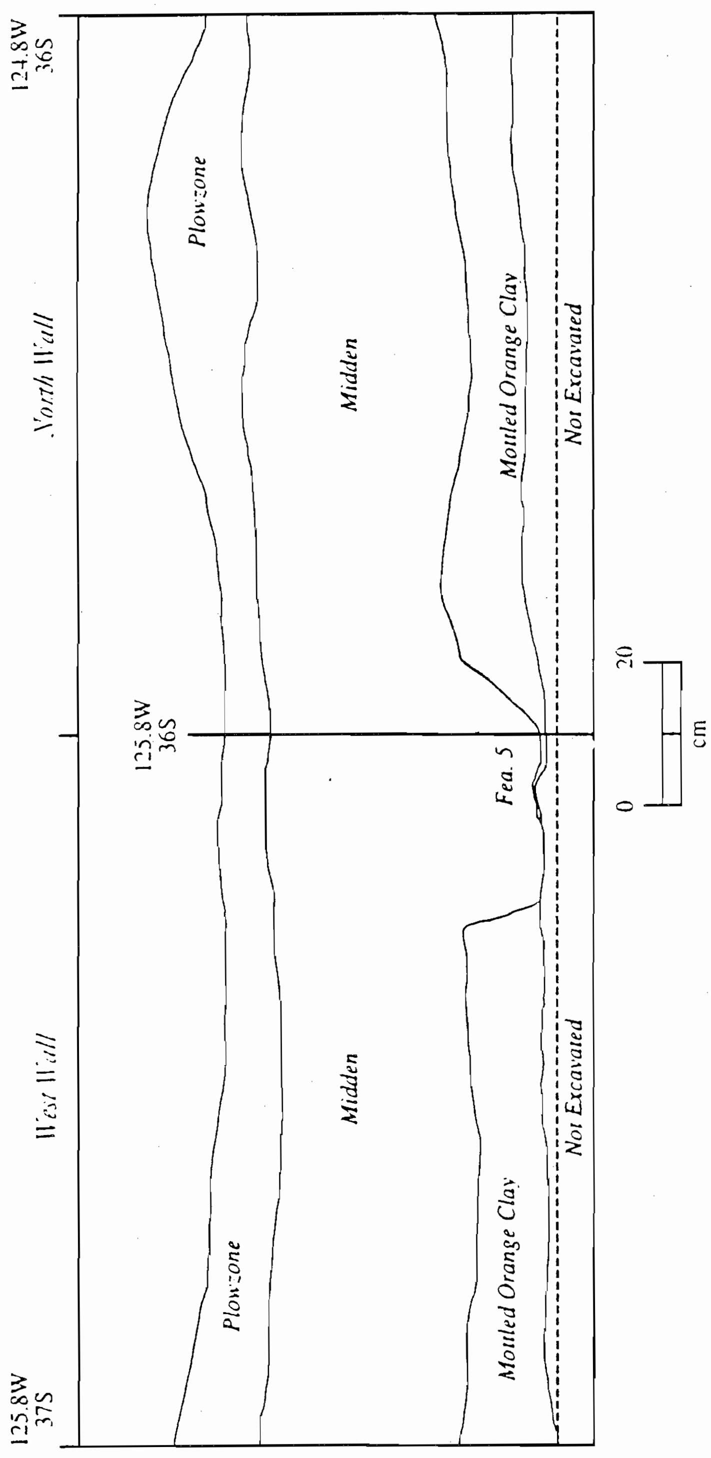

Figure 12: North and West Wall Profiles of Test Unit 124.8W 36S at the Jolly Site

hole. Both of these features may represent postholes with wide apertures, although we are at a loss to explain their rather peculiar shape. Feature 1 is especially unusual in having such a wide mouth relative to its narrow "body." Features 3 and 5 were more "conventional" round bottomed pits. Feature 5 appears to have a yellowish clay cap of some sort over its western extent, but we cannot determine if this was a deliberate attempt to cover the feature. Although all of the features contained dark brown to black midden-like clay, none were found to contain any unusual artifacts or artifact concentrations (Table 4).

Artifacts

The bulk of the collection of artifacts from Jolly were recovered on the surface (Tables 1-2, Appendix A). Excavations yielded relatively small quantities of pottery (Tables 3-4), and most of what was found was small and fragmented. Partially this may be due to our hand excavation procedures which did not include screening. However, systematic flotation of the midden and all the features did not produce larger amounts of material. Although the midden at Jolly is very dark and appears to be rich, artifacts did not preserve well in the acidic clay matrix. Artifact preservation was uniformly poor, even for pottery. Bone was recovered from hand excavations on a few occasions, but most of the faunal remains come from the flotation samples, and even then the quantity is quite low. Lithic materials were relatively scarce at the site, both on the surface and in the excavations. Floral remains were recovered in the flotation samples, and charcoal flecks were found throughout the midden. However, the dense clay matrix made flotation separation difficult and the samples required extensive pretreatment. Clearly artifact recovery was not optimal for any category of material culture.

Ceramics

The ceramic assemblage at jolly is notable homogeneous and limited in stylistic diversity. The plain pottery can all be classified as Baytown Plain, with two opposite ends of variability, and the entire spectrum in between. The best pottery at Jolly is made on a hard, thin, finely crafted ware, readily identifiable as Baytown Plain, var. Vicksburg. Almost all of the defining characteristics of

Table 3: Artifacts From Test Unit 128.8W 29S at Jolly

	Level/Feature	A			B			Fea. 6			Fea. 7			Fea. 9			Fea. 13			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Baytown Plain,	*var. unspecified*		101	101		90	90			0		1	1		5	5		11	11	208
Bowls:	*"Simple, Round"*			0	1		1			0			0			0			0	1
Jars:	*"Simple, Flat"*	3			1		1			0			0			0			0	1
Indeterminate:	*"Simple, Round"*			0			0			0			0			0	1		1	1
Bases:	*"Flat, Round"*		2	2			0			0			0			0			0	2
Coles Creek Incised,	*var. Coles Creek*		1	1			0			0			0			0			0	1
Coles Creek Incised,	*var. Greenhouse*			0	1		1			0			0			0			0	1
Coles Creek Incised,	*var. Mott*	1	3	4			0			0			0			0			0	4
Coles Creek Incised,	*var. unspecified*			0	1		1			0			0			0			0	1
Mazique Incised,	*var. unspecified*			0		1	1			0			0			0			0	1
Unclassified Incised				0		3	3			0			0			0			0	3
Total Ceramics		**4**	**107**	**108**	**4**	**91**	**95**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**5**	**0**	**1**	**11**	**12**	221
Fired Clay (gm)							14.5									9.4			3.9	27.8
Lithics																				
Unmodified Pebble							1													1
Total Lithics				**0**			**1**			**0**			**0**			**0**			**0**	1
Fauna																				
Deer				2			1													3
Rabbit				1																1
Unidentified Small Mammal				2																2
Unidentified Mammal							1													1
Unidentified Turtle							4			3										7
Unidentified Fish							4												3	7
Unidentified Bird							1													1
Unidentified Bone				1																1
Total Fauna				**6**			**11**			**3**			**0**			**0**			**3**	23
< 6.4 mm Sample (gm)							77.2			8.3			3.4			47.2			38	174.1

Table 4: Artifacts From Test Unit 124.8W 36S at Jolly

Level/Feature		A			B			C			D			Fea. 1			Fea. 3			Fea. 4			Fea. 5			*TOTAL*
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Baytown Plain,	*var. unspecified*		30	30		163	163		125	125		109	109		4	4		3	3		16	16		2	2	***452***
Bowls:	*"Simple, Round"*			0	2		2	1		1	2		2			0			0			0			0	***5***
	"Simple, Flat"			0			0	2		2	1		1			0			0			0			0	***3***
Jars:	*"Simple, Flat"*			0	4		4	5		5	2		2			0			0			0			0	***11***
	"Exterior Flange, Flat"			0			0	1		1			0			0			0			0			0	***1***
Beakers:	*"Tapered"*	1		1	2		2			0			0			0			0			0			0	***3***
Indeterminate:	*"Simple, Round"*			0			0	4		4			0			0			0			0			0	***4***
	"Simple, Flat"			0	2		2			0			0			0			0			0			0	***2***
Bases:	*"Flat, Round"*		1	1			0		1	1			0			0			0			0			0	***2***
Beldeau Incised,	*var. unspecified*			0	2		2			0			0			0			0			0			0	***2***
Coles Creek Incised,	*var. Coles Creek*		1	1			0			0		1	1			0			0			0			0	***2***
Coles Creek Incised,	*var. Hilly Grove*			0			0	1		1			0			0			0			0			0	***1***
Coles Creek Incised,	*var. Mott*			0		2	2	1		1		1	1			0			0			0			0	***4***
Coles Creek Incised,	*var. unspecified*			0			0			0		2	2			0			0			0			0	***2***
Unclassified Incised				0		1	1	1		1			0			0			0			0			0	***2***
Total Ceramics		**1**	**32**	**33**	**12**	**166**	**178**	**16**	**126**	**142**	**5**	**113**	**118**	**0**	**4**	**4**	**0**	**3**	**3**	**0**	**16**	**16**	**0**	**2**	**2**	***496***
Fired Clay (gm)				**2.5**			**35.2**			**29.1**			**15.4**			**0.5**			**3**			**1.6**			**5.5**	***92.8***
Lithics																										
Flake Cores							1																			***1***
Unmodified Flakes							1			1																***2***
Debitage										1			1													***2***
Total Lithics				**0**			**2**			**2**			**1**			**0**			**0**			**0**			**0**	***5***
Fauna																										
Rabbit													1													***1***
Unidentified Small Mammal													3													***3***
Unidentified Turtle													1													***1***
Unidentified Fish													2						1							***3***
Total Fauna				**0**			**0**			**0**			**7**			**0**			**1**			**0**			**0**	***8***
< 6.4 mm Sample (gm)										112			143			19.3			12.8			37.9			8.5	***333.5***

Vicksburg are present (Phillips 1970: 56-57; Williams and Brain 1983: 103-105), including dark colors, fire clouding, surface polish, and the finely tapered "Vicksburg" rim (Figure 13n). A relatively small amount of the material can be classified as Vicksburg, however. At the opposite end of the plainware variation is a small quantity of very badly made, crude, thick pottery with large, poorly sorted angular inclusions. Most of the pottery is slightly better made, and is moderately thick, with large, poorly sorted inclusions, and has a dull brown to orange, matte finish. Neither of the non-Vicksburg plainware falls within any defined variety, although some of the plain pottery could probably be sorted as baytown Plain, var. Percy Creek (Phillips 1970: 51-52).

As best as can be determined from the relatively small sherds from Jolly, vessel shapes tend to emphasize straight-walled beakers or slightly unrestricted jars, and simple, relatively deep bowls (Figure 13). A single example of a sharply restricted "barrel-shaped" jar (Ford 1951: Fig. 29d-e) was found (with a Coles Creek Incised, var. Greenhouse, design) (Figure 13g). The "Vicksburg" rim appears to be associated with straight-walled to slightly flaring rim beakers here at Jolly. Most bowl rims are simple, and especially emphasize slightly thinned, flat or round lips (Figure 13a-f). The most common jar form is a slightly restricted form with a simple, flat lip (Figure 13h-k). This is referred to as the "Clark Bayou" jar.

The most common decorated variety at Jolly is Coles Creek Incised, var. Mott. After this in popularity is Coles Creek Incised, var. Coles Creek. Rare examples of Coles creek Incised, vars. Hilly Grove, and Greenhouse, Evansville Punctated, var. Unspecified, French Fork Incised, var. McNutt, and Mazique Incised, vars. Kings Point and Preston have also been noted. Several sherds have been found with a single line encircling the vessel roughly 1 cm below the lip. Although it is possible to classify these as Coles Creek Incised, var. Phillips, these sherds do not match the type description except for the single line. At present I would prefer to leave these unclassified, or as seems warranted, to view these as a mode associated with Baytown Plain pottery (cf. Belmont n.d.). Decorated pottery is not common in the assemblage, either in the

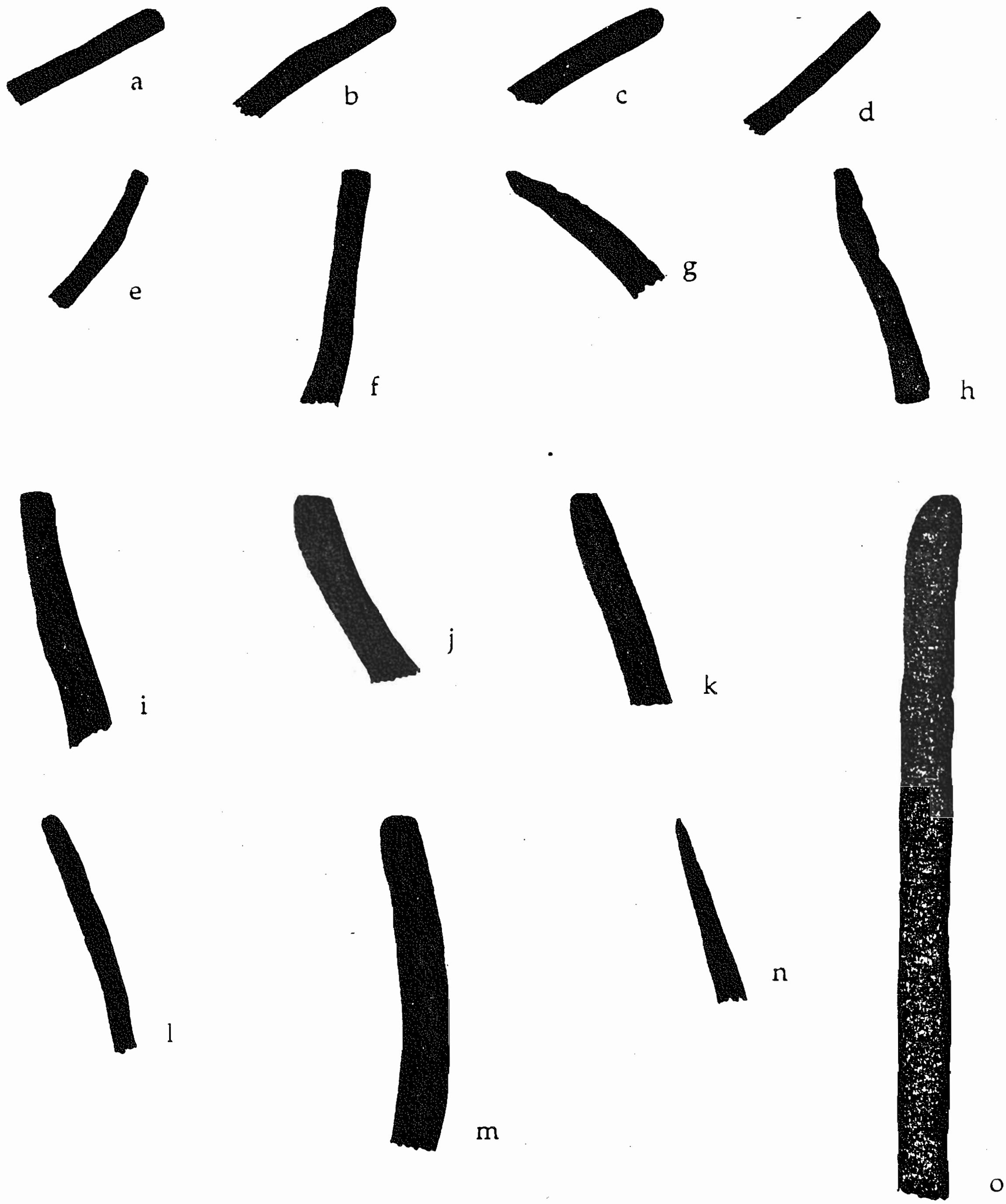

Figure 13: Selected Rim Profiles From Jolly. a-c, Bowls with Simple, Round lips; d-f Bowls with Simple, Flat lips; g, Restricted Jar with Interior Bevel lip; h-k, Jars with Simple, Flat lips ["Clark Bayou" Jar form]; l-m, Barrel-shaped Jars with Simple, Round lips; n, Beaker with "Vicksburg" rim; o, Jar with Simple, Round lip

surface collections or from excavations, and the total repertoire is obviously limited.

Despite the absence of large numbers of diagnostic sherds, it is still possible to assign the Jolly site component to the Balmoral phase based on the ceramic assemblage. The presence of Vicksburg pottery, especially associated with the "Vicksburg" rim, is a good indicator in this regard, as is the presence of Mott, often executed on a Vicksburg paste. The small amount of Hilly Grove, along with the occasional sherd of Greenhouse, McNutt, Kings Point, and Preston is further proof of the general chronology. The limited stylistic repertoire at Jolly is perhaps an indication that there are spatial and/or functional variations among contemporary pottery assemblages. The Balmoral site, which can be seen from Jolly, has all of the diagnostics present at this site, plus a large number more. If Jolly is, as we presume, a hamlet or farmstead associated with Balmoral, it might be expected not to have the range and diversity of the ceramics found at the structurally and probably functionally more diverse and elaborate "ceremonial" mound center. The Jolly excavations point to the fact that we should be aware of our assumptions about the uniformity of assemblage composition from site to site without respect to site function or location.

Lithics

The lithic assemblage at Jolly is exceedingly meager and unimpressive (Table 2). The only finished tools consist of a small number of hammerstones, and a single retouched flake; the rest of the chipped stone collection consists of free-hand flake cores, flakes, and shatter. The cores are generally local pebble chert, although a few have been thermally altered. Almost all exhibit multiple platforms, and no specific pattern of reduction has been observed. Flakes include primary decortification, secondary, and biface thinning and/or rejuvenation stages. Evidently lithic reduction was undertaken at the site and all aspects of tool making were accomplished in this one locality. Several evidently non-local flakes were recovered. These were made from a very fine-grained, milky white chert. Thermal alteration occurred in the cores and flakes, but we cannot determine at present if this occurred prior to or after reduction.

A fragment of a possible quartzite celt was recovered, along with three artifacts identified as round palette fragments. These are round objects with well ground, smoothed edges and one flat surface. Although they have been identified as palettes, their exact function is unknown. Two from different collection units were found to join (Appendix A). They differ from most illustrated examples of this kind of artifact (Williams and Brain 1983: Fig. 7.41) in that they lack any incising, notching, or grooving, and no trace of pigment has been found on any surface. Several sandstone pieces and a chunk of hematite make up the rest of the non-chipped stone tool assemblage at Jolly. The absence of a significant tool industry at Jolly contrasts sharply with the nearby and evidently slightly later Blackwater site. The explanation for these differences in lithic assemblage composition is not certain, but might relate to the proximity of Jolly to Balmoral (both spatially and, perhaps, temporally as well). If late Coles Creek sites were indeed arranged in a hierarchical fashion, with mound centers commanding social and economic power, then Balmoral may have either siphoned off the finished tools from Jolly, or, possibly not allowed the site occupants' to produce tools beyond immediate subsistence needs. Clearly such speculation cannot be taken too far since the data are inadequate, but further research into lithic procurement, manufacture, and distribution is clearly warranted across the entire spectrum of space, time, and site function.

Fauna and Flora

The faunal remains from Jolly were neither as abundant nor as well preserved as we had anticipated. The faunal assemblage appears to demonstrate a limited diversity of prey, with an expected focus on deer, small mammal, and fish. The poor bone preservation in excavated contexts precludes anything other than gross statements of species choice; body part selection or distribution, taxonomic diversity and richness, and other measures of faunal procurement strategies simply cannot be addressed with this sample.

Deer were clearly an important animal and were represented in all samples from both hand sorting and flotation. Limb bone fragments and pieces predominated, although at least one foot bone was recovered. No cranial fragments or antler were found. Small mammals were also common, especially rabbit. These remains were found almost exclusively in flotation samples, except for one as yet unidentified small mammal long bone shaft from one of the hand sorted contexts in unit 128.8 W 36S. To no surprise fish bones were also common and were found exclusively in the flotation samples. They were recovered from all contexts except for some of the features where no identifiable bone was seen. Fish were more scarce here than at other sites, such as Osceola, or Emerson. Gar, catfish, bowfin, and at least one very small fish (a darter?) were found, with catfish and gar roughly equally well represented. Vertebrae and cranial fragments were found, suggesting that the entire fish was brought to the site for cleaning. It is possible that the fish were found in the sloughs adjacent to the site, but they could also have been taken from the nearby number 10 stage channel of the relict Mississippi River now occupied by either Cypress Bayou to the west or Bayou Du Rosset to the north and east. Turtle bone was identified in several samples, a rarity that is unmatched at any other site with a comparable faunal assemblage. Relatively few of the bones were burned or calcined, which is again a seemingly important difference compared to contemporary or later sites.

The floral remains from Jolly are still being studied. The dense clays from the site required significant pretreatment in order to defloculate them for flotation. It is likely that compared to similar samples from Blackwater or Emerson, that the Jolly samples may yield fewer remains for this reason. As can now be predicted with some certainty, acorn was the predominant nut crop and the most common food source at Jolly. Acorn was recovered from virtually every context at the site. Persimmon, palmetto, and grape were the major fleshy fruits recovered, and maygrass, though not especially common, was the only significant starchy seed crop. None of these so-called native starchy seed complex species could be recognized as cultivated or domesticated. Corn was also found in relatively small quantities at Jolly. The amount of corn recovered at Jolly is in keeping with its relative abundance in the Balmoral phase deposits at Osceola, but is less than was recovered from Blackwater or Emerson (based on a comparison of the quantity of corn recovered per unit of soil floated).

Conclusion

Excavations at the Jolly site have provided us with a welcome window into a late Coles Creek non-mound site occupation. This site appears to have supported only one significant component dating to the Balmoral phase. This evidently brief occupation span coincides with the major component at the nearby Balmoral site, a three mound occupation located just to the north and east of Jolly. It seems that Jolly can reasonably be inferred to represent an immediate "outlier" community related to the Balmoral site occupation. The ceramic and lithic assemblages at Jolly, though significant in their own right, are relatively limited and considerably less diverse than those found at the Balmoral site, or at nearby contemporary and slightly later sites. This suggests the possibility that the Jolly site was dependant on Balmoral for both social and perhaps economic direction. Jolly, however, can be considered a self-sufficient hamlet or farmstead. We have no evidence, either pro or con, to indicate that the Jolly site population was paying tribute to, or depended on, the Balmoral peoples. Nor is their obvious evidence that the Jolly site population was the same as that which (periodically) spent time at Balmoral, a scenario possible under the vacant ceremonial center hypothesis (Williams and Brain 1983: 369-376).

Our excavations at Jolly have also demonstrated that the site has a reasonable quantity of midden still intact, despite decades of plowing and limited land levelling. Features seem to be abundant in the subsoil beneath the midden. In two 1-by-1 m units we exposed 12 features of various sizes and shapes. Based on a simple extrapolation from this figure to the entire roughly 30 m diameter midden area, we find that there exists the possibility of ultimately finding some 5400 features! Obviously our mathematics are speculative and based on a series of no doubt flawed assumptions, but it is still a noteworthy finding to consider how much archaeological potential underlies such an otherwise unimpressive site. Of course the presence of rich midden, in some instances up to ca. 50 cm thick, overlying the subsoil poses a number of problems for future consideration. How much of this midden could be sacrificed to expose the features which we know lie in the subsoil? Can we sacrifice the midden, which could be expected to yield important, but essentially redundant, information for the features, which could provide us with a wealth of detail on community organization and function? Regrettably the logical and obvious solution, to sacrifice neither, is unlikely to be reasonable given that the site faces continued agricultural disturbance and ultimate destruction. Jolly is an example of the problems and potential of large-scale horizontal exposure. The data we retrieve, however, will not be gotten at a low cost. Rather important decisions concerning resources and information return will have to be faced if we are to do anything but watch the archaeological heritage of Louisiana continue to be obliterated by modern land use activities.

CHAPTER FIVE

BLACKWATER (16TE101)

Introduction

The Blackwater site is located on the east bank of Cypress Bayou, approximately 5 km NNW of Newellton (Figure 5). The site consists of a scatter of artifacts located in a cotton field on the crest and slope of the levee of the relict No. 10 channel of the Mississippi River. In addition to the artifact scatter there are three distinct patches of dark brown-black soil on the slope and near the base of the levee. There are no mounds at the Blackwater site, and other than the midden patches, no visible features.

Blackwater was first recorded in 1989 by John Belmont and Reca Jones who were taken to the site by William Guthrie, manager of Panola Plantation. Belmont noted that the site was relatively large, and contained significant evidence for a very late Coles Creek and/or early Plaquemine occupation. He further considered this site to have the potential for revealing information about the putative but poorly understood Preston phase (Belmont and Williams 1981: Table 1). In the summer of 1991 the author and Dr. Gayle Fritz visited the site and discussed the possibility of further research with Mr. Guthrie. We were particularly impressed with the extent of the surface scatter and the extant chronology. The Blackwater ceramics indicated an occupation post-dating the Balmoral phase occupation at Osceola, but predating the full-blown Plaquemine Routh phase. Our research hypothesis, based on our available data, was that it would be during this interval, identified with the Preston phase, that we would see evidence for initial intensification of maize cultivation (see Chapter One). Because Blackwater was a non-mound (i.e., a "village") site we felt that our view of subsistence change would be clearer than if we were to undertake work at a larger, structurally more complex mound (i.e., "ceremonial") center. Limited quantities of bone on the surface further encouraged us to believe that subsistence remains might be preserved, as did the presence of distinct midden patches.

Intensive and extensive plowing over the decades, had, however, seemingly destroyed any intact midden across most of the site. It appeared that with the possible exceptions of the midden stained patches, we were not likely to encounter significant buried midden deposits. In essence we felt that there were two contexts available for analysis: the plow zone and the features extant in the subsoil. Blackwater seemed to us to represent a perfect site in which to explore the possibility of recovering archaeological contexts by large-scale horizontal clearing. The lack of intact overlying cultural deposits meant that we could open up large areas without fear of destroying otherwise important contexts. Therefore, in 1992 we undertook to map the site, make a controlled surface collection, shovel test, and open up an area measuring 27 m long by 2.8 m wide on the north end of the site. As we will detail below, Blackwater met and exceeded our initial expectations and has demonstrated conclusively the validity of our exploratory subsurface testing procedures.

The Site and Its Setting

Blackwater is a physically unspectacular site, having no mounds or other notable cultural features. The prehistoric occupation is marked by an extensive scatter of artifact, mostly pottery and lithics, on the crest and slope of the levee of a relict channel of the Mississippi River now occupied by Cypress Bayou (Figure 14). Although the levee slope is relatively gentle as it rises from the present channel of Cypress Bayou, the grade increases relatively rapidly as it approaches the crest. Just below the crest on the west edge of the levee modern plowing has resulted in extensive erosion, exposing the underlying light tan to yellow levee subsoil. From the crest eastward the slope is once again minimal until it begins to fall away on the backslope of the levee well beyond the site boundary. The northern and southern ends of the site area are marked by tree lines and low depressions or gullies. These low areas evidently form natural drainages and are found along the length of this stretch of natural levee. The western edge of the site is marked by a low depression and a tree line; Cypress Bayou lies roughly 40 m west of the tree line. A small, evidently natural, rise was found near the NE corner of the mapped area. This rise yielded no

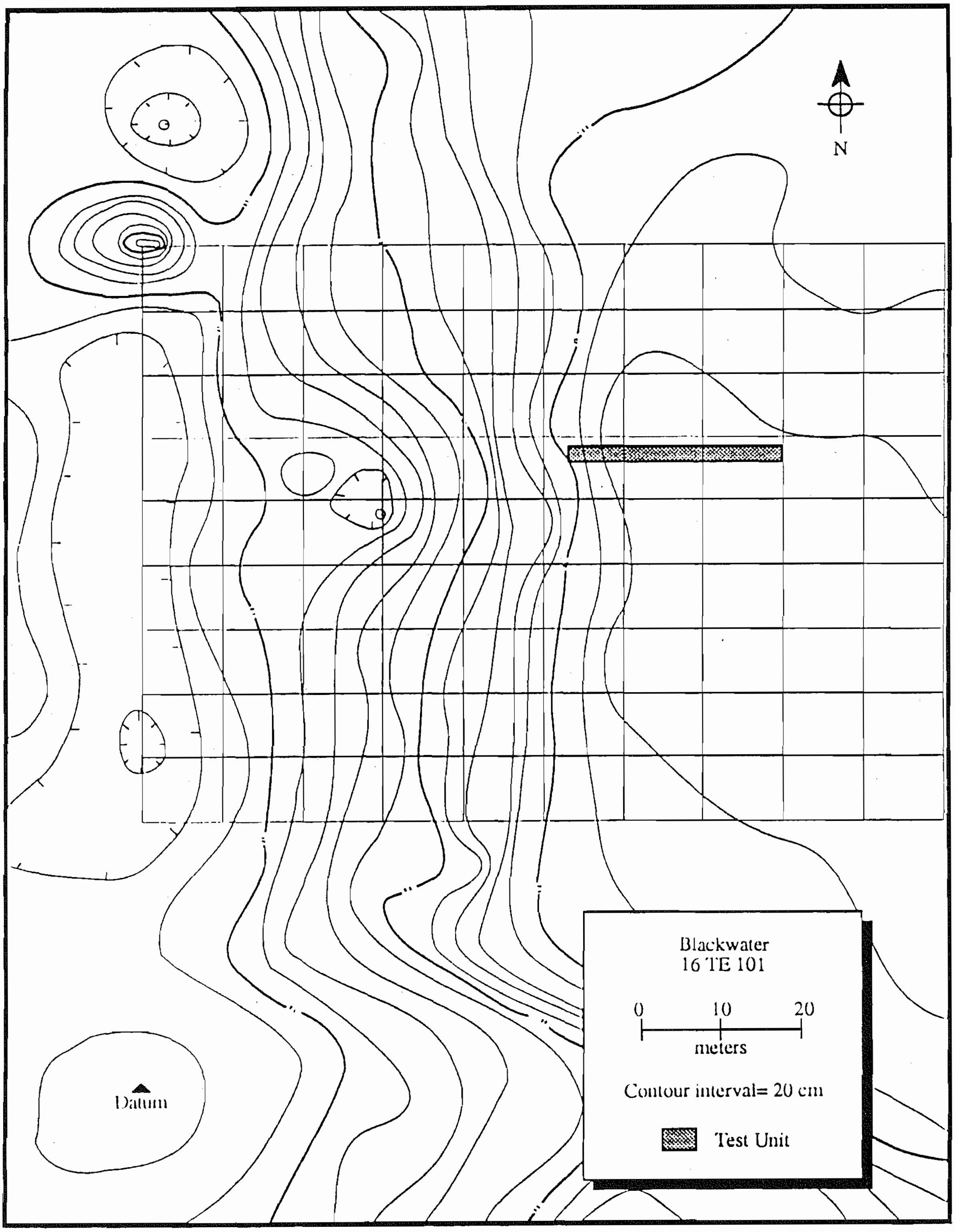

Figure 14: Contour Map of Blackwater (16TE101), Showing Collection Grid and Excavation Unit

artifactual material and it is evidently not a cultural feature. Blackwater is farmed for cotton today and has been cleared for at least the past 15 years.

As can be seen in Figures 15 and 16 (see also Appendix B), the bulk of the artifacts at Blackwater are found along the crest and immediate slope of the levee. Although our collection grid covered an area 90 m by 100 m (Figure 14), we believe that the scatter is slightly larger. This appears to be especially true along the levee in the southern part of our collection area. The greatest concentration of artifacts occurred in the central part of the site, between tiers 61N and 91N and 40E and 80E. The only major concentration of artifacts not located on the levee crest or slope was found around a small depression located in collection areas 30E-40E and 91N-101N. We suspect that this cluster of artifacts was the result of erosion and the downward movement of artifacts from the levee crest into the slight depression. The distribution of ceramic artifacts was relatively smooth (Figure 15), with concentrations along the levee crest and in low spots due to erosion. The distribution of lithics, however, was more spotty (Figure 16), perhaps due to taphonomic factors associated with both erosion and modern agricultural activities.

The concentrations of material on the surface, along with the presence of three patches of soil discoloration on the downslope portions of the levee leads us to suspect the presence of at least three houses, and possibly many more. Based on the surface distribution of artifacts we hypothesize that houses would have been located on or near the crest of the levee, especially in the areas between tiers 61N and 91N, and that some trash disposal practices involved discarding materials down the slope of the levee. Although artifacts were relatively abundant on the slope portion of the levee, the angle of the slope would have precluded occupation there. Further, we find it difficult to believe that occupation would have been found in the low-lying portions of the site to the west of the levee crest. We believe it more likely that occupation would have extended eastward from the crest of the levee, and this is indeed what we feel is represented by the surface and subsurface evidence.

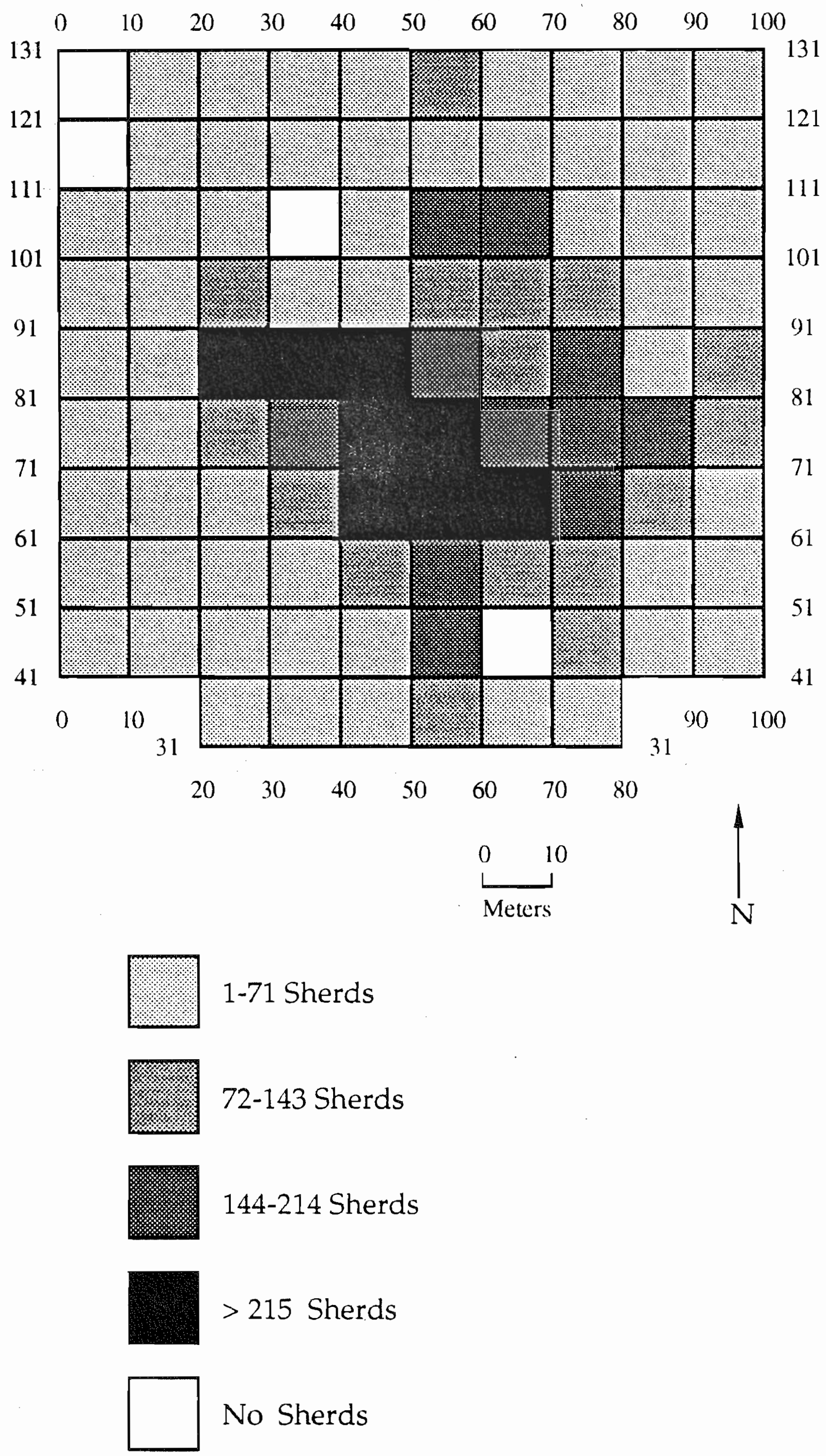

Figure 15: Surface Distribution of Ceramics at the Blackwater Site

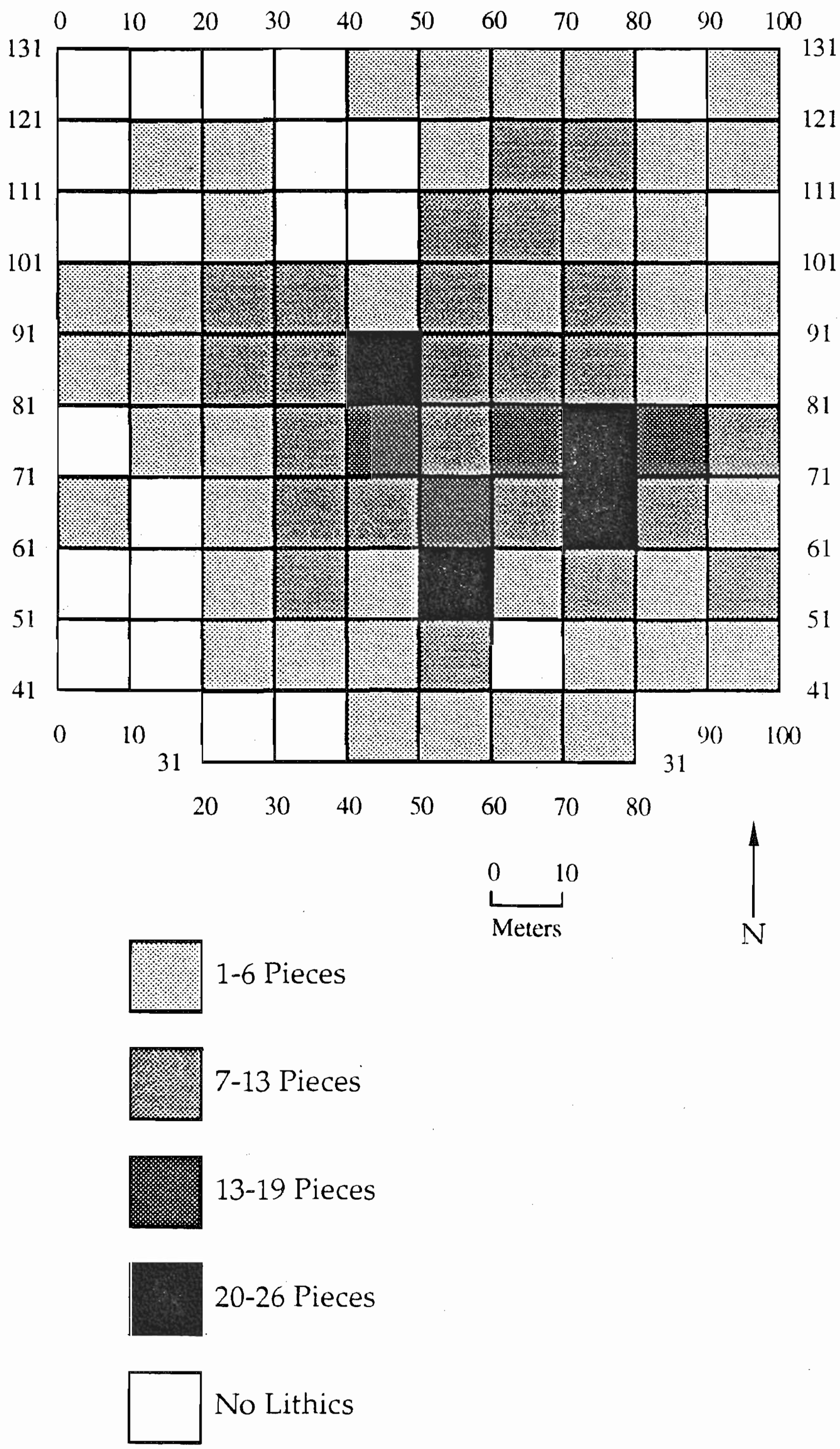

Figure 16: Surface Distribution of Lithics at the Blackwater Site

Subsurface Excavations

Shovel Tests

Following the mapping and surface collecting at Blackwater we initiated a series of shovel tests at grid intersections (Figure 17). The bulk of our work focused on the levee crest and eastern portion of the site. Randomly chosen grid intersections west of the levee slope were also tested, as were the soil stains identified as midden patches. The tests in the low lying areas of the site were unproductive and encountered dense clays to ca. 50 cm, at which point we stopped testing. These clays were undifferentiated and showed no evidence of midden or of containing artifacts. We believe that these deposits represent parent materials eroded off of the levee crest, perhaps combined with alluvial deposits from periodic flooding of Cypress Bayou. Shovel tests in the soil discolorations showed that these patches, which are found in the sandy levee soils on the slope and near the base of the slope, are superficial stains. Their location on the slope of the levee suggests, though, that they may represent house dumps or middens. Whether these were ever more than superficial stains is not known.

The bulk of the shovel testing focused on the levee crest and portions of the site to the east (Figure 17). A relatively consistent stratigraphy emerged from these tests. The plow zone ranged from 10 to 20 cm thick in most cases, although it was not always possible to distinguish its exact depth. Artifacts were commonly found in this level, although never in any abundance. Beneath the plowzone was usually a layer of relatively dense, often dark-colored clay, up to 5 cm thick, which lay directly on the slightly sandy levee deposits. The levee was easily distinguished in shovel tests by its yellowish color and sandy texture. In some instances we detected what we believed to be features beneath the clay and lying on or in the levee soils. Generally, the plow zone was thickest near the levee crest, and thinned out to the east. Where the levee sloped down towards Cypress Bayou there was no plow zone, and instead the sandy levee soils were directly on the surface. True midden deposits were rare or could not be detected given our testing methods. Although the plow zone frequently contained artifacts they were not associated with soil

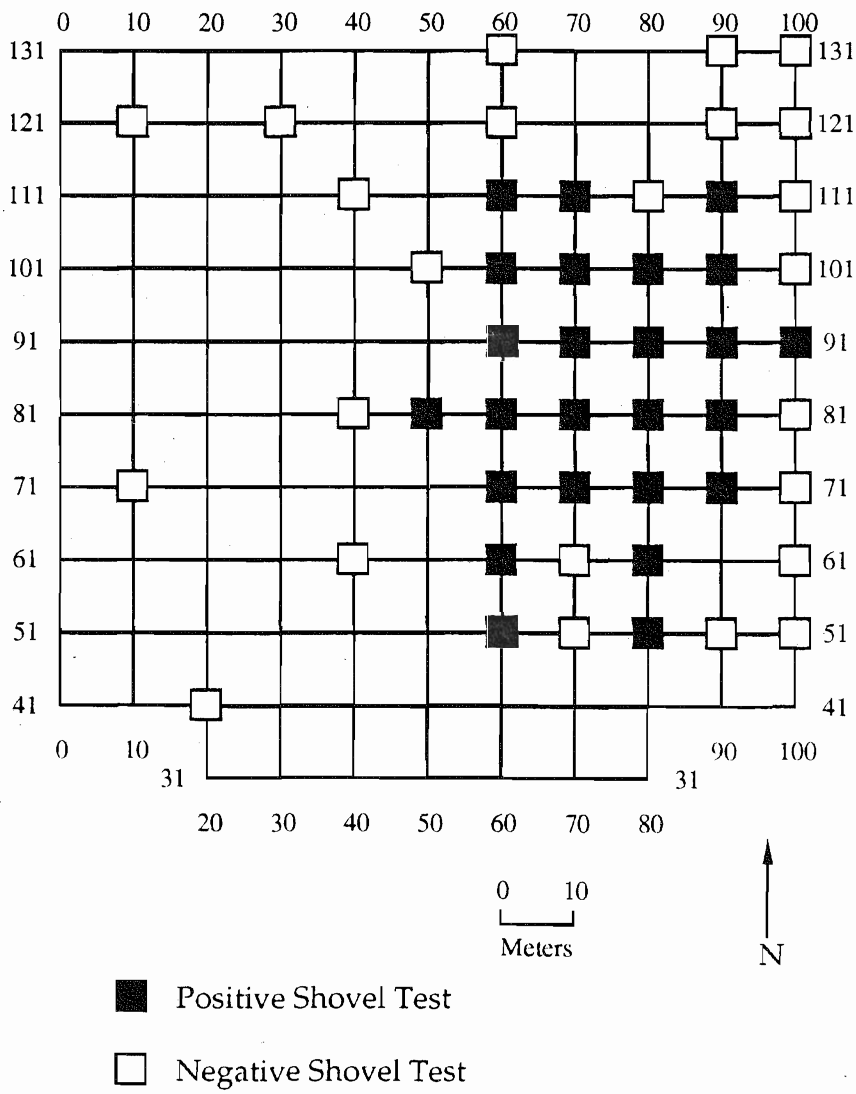

Figure 17: Location of Shovel Tests at the Blackwater Site

discoloration or any other sign traditionally taken to indicate midden formation. We concluded then, that our initial assumption about the lack of midden at the site was correct, and that our only hope of obtaining adequate information from the site was to proceed with large-scale horizontal clearing. We were, however, cheered by two facts that emerged from the shovel tests. One, we had reason to believe that features were present in the subsoil of the levee surface; and two, that the levee soils could be easily distinguished, allowing us to rapidly remove the overlying plow zone without fear of cutting through our target level.

Grader Cut

Having determined that the plow zone was expendable, and recognizing our need to move a relatively large amount of overburden in a short time, we decided to utilize heavy machinery to expose the levee deposits. The Panola Plantation Ltd. provided us with a road grader and an operator, and when we were able to return to the site we immediately commenced our horizontal clearing. In order to minimize any damage that our choice of excavation techniques might cause we decided to open up an area on the northern edge of the site, believing that here we would do less damage than if we excavated farther south where the cultural deposits were denser (Figures 15-16).

The excavation unit was oriented with its long axis running west to east, because we didn't want to damage the levee crest any more than necessary, and also because we wanted to see how far to the west the subsurface deposits might go. This decision was also practical because the crop rows ran in this same direction and the road grader could more easily make its cuts this way. Using our existing collection unit grid as a guide, the operation commenced by first clearing a large swath of cotton plants from the immediate area of where we would excavate. Following this the grader began excavating from west to east, depositing the backdirt to the east and north of the exposure. We aligned the cut along the cardinal directions, but did not try to have the grader cut along any particular line; later we would trim the grader cut to a precise position within our grid (Figure 14). Each grader pass took off approximately five cm worth of dirt, although no pass was exactly even due to problems with traction, blade angle, and the nature of the underlying soils. During each pass the crew followed behind the grader with pin flags to mark any suspicious stain or discoloration, and any such sign was examined before the next pass was made.

After the third and fourth passes we began to find a number of discolorations in the grader cut. These were initially identified by relatively amorphous stains (usually dark brown to black) in the clay layer underlying the plowzone. One large patch of reddish fired soil, ash, charcoal, glass, and nails was found in the plowzone. However, its content and location indicated that it was a historic feature (identified as Feature 1). After completing our excavations Feature 1 was found to extend into the levee subsoil. By the time the features began to emerge the grader cut had an uneven surface, with the edges being lower than the center. Further, despite the relatively thin layer of soil removed from the cut, a seemingly vast amount of backdirt was accumulating both along the northern edge of the cut and at the eastern end. We decided to halt the grader activities at this point, because we believed that we had gotten down to an appropriate level. Also, because we were worried that the grader might do further damage with its tires, we left the backdirt along the northern edge of the cut. In retrospect we were wrong to halt the grader activity at that point, and even worse, we should have used it to move our backdirt (a fact that the crew repeatedly noted to me in the days to come as we shifted this large pile of heavy clay farther to the north in order to expand the unit). Although the backdirt was a physically taxing problem, worse was our failure to get below the clay overlying the levee deposits. As it turned out, we had to remove this level by hand anyway, in order to expose the features, which really lay in the levee. As the temperature increased and the clay began to bake out on the floor of the grader cut, this job became more difficult and led to far more damage to the features than would have occurred if we had completed even one more grader pass.

After we completed the grader operations the crew undertook to clear the rough and uneven floor of the cut. The grader tires had left numerous ruts and bumps, and although we had identified stains in the overlying clay, we had no real idea of how many features might lie below the cut. Further, we decided to place an arbitrary limit on the eastern extent of our hand excavations. This was prompted by two factors. One was the remarkable amount of work necessary to conduct the excavations, even in a limited area, and two by the fact that feature stains seemed to thin out towards the east. Eventually the grader cut was hand excavated for only the first 27 m, even though it continued for another 15 m. In order to fit the cut into our grid we expanded it southward to match the 97N line, and northward to an even numbered 99.8N. This peculiar 2.8 m wide swath was dictated by the fact that we simply did not have the human resources to move the backdirt another 20 cm (really minimally 70 cm) farther north. The cut was further expanded to the west so that it took in the beginning of the downslope portion of the levee, and thus all of the levee crest. In the end we had a cut 27 m long by 2.8 m wide, with a surface exposure of 75.6 m^2 (Figures 14, 18). After being expanded the surface of the grader cut was shovel skimmed to a level where features were readily evident. This was a time consuming and physically demanding task, especially as the floor of the unit hardened from heat and exposure to the sun. We covered all parts of the unit when we were not working on them, and eventually erected a makeshift shelter to cover the entire extent of the grader cut. The crew undertook most excavations in 10 m-long blocks, concentrating our effort at any one time in one locality to minimize the exposure of the grader cut.

After the initial clearing of the grader cut floor, we identified each stain as a numbered feature, generally moving from the west to the east. All the stains were numbered, although not all of these numbered stains were found to be features. After the cut was cleared a map was made of the location and shape of all of the stains, and an elevation was taken at the midpoint of the stain (Appendix C). We began with 147 numbered stains, of which 32 could not be excavated or investigated for reasons discussed below (see Figure 18). As a result of excavation 13 stains that were investigated were found not to warrant status as a feature. In most cases these were pockets of dark colored clay in low spots or depressions on the levee surface.

During the course of excavations the project area received repeated brief but intense thunder

Blackwater (16TE101)

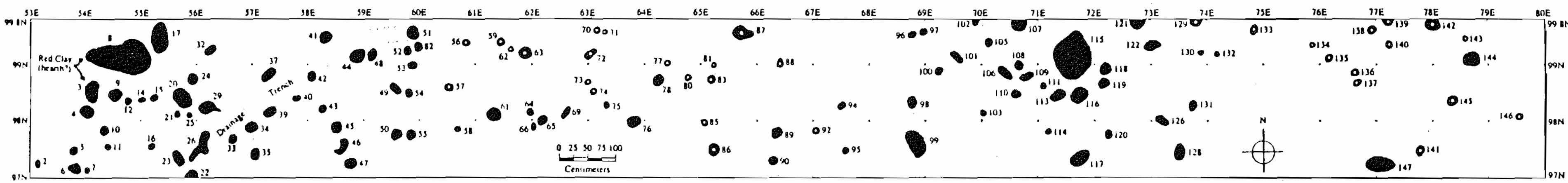

Figure 18: Blackwater, Plan of Features in Excavation Unit. Features with white dots were not excavated due to flooding or lack of time.

showers which had the effect of flooding low lying portions of the grader cut. Although in most cases these flooded portions could be drained, we had a persistent problem along the northern wall from approximately 60 E to 66 E. Towards the end of our work we excavated a drainage ditch, roughly 10-20 cm wide, from the low area along the north wall across the grader cut to the slope of the levee (Figure 18). Another consequence of flooding was that we were repeatedly forced to skim the surface of the unit to clear off mud and thin layers of water lain soil. This had the effect of cutting down some of the features, and there is no doubt that we negatively impacted some of these features due to our excavation methods and techniques. Regrettably most of the features which could not be excavated were in the flooded area because they were inaccessible. Excavations proceeded from west to east, and the remaining bulk of the unexcavated features were confined to the far eastern end of the unit because we ran out of time.

We excavated 88 features at Blackwater. As can be seen in Figure 18 these tend to cluster in three groups, although these clusters are not absolute or clear cut. The densest concentration was found at the western end of the grader cut at the crest of the levee, from roughly 54 to 60 E. A relatively diffuse pattern of features was identified in the area from approximately 60 to 68 E, although many of these could not be excavated for the reasons outlined above. The second cluster occupied the area from roughly 69 to 74 E, and seemed to focus on a large, very shallow pit (Feature 115). Another possible cluster was found at the far eastern end of the cut, from 76 to 79 E. Many of the features in this area were not excavated due to time constraints.

The Blackwater features are extremely variable in size, shape, and depth (Figure 18). Generally speaking, however, three types of pits can be identified. The first consists of small, generally round to slightly oval, relatively shallow pits, often with a rounded to slightly pointed base. Artifacts were rare in these features, and they were not noted for having abundant charcoal or other evidence of floral preservation. These are interpreted to be postholes, based on their size and content. However, we have not been able to link these features together into any obvious architectural feature. A second category consists of medium sized, generally round, often quite deep pits. Frequently these pits had a high organic content and contained modest quantities of artifacts, including burned and fragmented bone. Although these do not appear to be hearths, they often contained quantities of burned organic material. They are possibly refuse pits, or perhaps atypical smudge pits. The third feature type consist of relatively large and deep, usually oval, pits with abundant artifacts. As with the second type of feature, these could be variously interpreted as smudge or refuse pits, but their precise function is unclear. A single example of a large, generally round and shallow pit was found (Feature 115), and two fired red clay patches were identified in the west end of the grader cut (Figure 18) and which tentatively interpreted as the remains of hearths or localities where fires were located.

Although the features can be seen to cluster there is no obvious pattern to the distribution. No structures or architectural remains can be positively identified, and alternate interpretations exist for every possible combination of feature alignments (Figure 18). A number of possible alignments are evident, but none are continuous enough to demonstrate a structure. The data from the features themselves are interesting but not conclusive in any way. Most features contained few, or no artifacts (Table 7). The larger features had moderate quantities of artifacts, but no special function features could be identified. Some of the features contained abundant floral remains, and a few had some fragmented and burned animal bone, but there does not, at this time, seem to be any special pattern. The overall impression is that there were probably one or more structures in the immediate vicinity, and we may have even exposed parts of them, but most of the features are associated with general disposal activities or perhaps with activity area surfaces. Only with further exposure of the surface will we be able to better determine the function and pattern of the features that we have identified.

Artifacts

The bulk of the artifacts from Blackwater consist of ceramics collected from controlled surface grid (Appendix B). Although we excavated a large number of features, in no case did any one feature yield a significant number of artifacts (Table 7). Lithics were relatively abundant in the surface collections, but bone was almost non-existent, and what was found is likely to be recent or modern. Flotation processing of a number of features has allowed us to recover a relatively abundant paleobotanical sample, but this is not yet completely analyzed.

Ceramics

We could not create a ceramic assemblage more "transitional" in feel and composition than is found at the Blackwater site (Table 5). The characteristics of this assemblage are the use of both Addis Plain and late Baytown Plain wares, large quantities of Coles Creek Incised, var. Hilly Grove (Fuller and Kelley 1993), and small amounts of typically early Plaquemine pottery on Addis Plain and late Baytown wares. Because of the difficulty of identifying paste characteristics among surface collected plainwares we have only attempted to separate Addis from Baytown plain in the excavated contexts (Table 7). The surface collected plain pottery was lumped together as "Unclassified Plain" (Table 5, Appendix B).

The bulk of the plain pottery at Blackwater is clearly within the Baytown Plain pottery tradition. It is moderately thin, hard, and ranges in colors from gray to light black. Paste inclusions are readily evident, and consist of angular grog, sand, and unidentified grit. Compared to earlier Coles Creek plain pottery the inclusions are not as large, and they are better sorted and similarly sized. This plain pottery does not fall into the range of Baytown Plain, var. Vicksburg, although a small proportion might be sorted as such. A modest proportion of the undecorated pottery can be sorted as Addis Plain, var. Addis, and some of decorated varieties occur on this type of ware. Most of this Addis Plain has well sorted inclusions, although in some instances they were relatively large; this pottery is also especially notable for being softer and its tendency to crumble easily. Obvious organic inclusions were rare, and generally appeared to consist of angular chunks of bone; no shell was observed in the Addis ware.

Vessel shapes and rim modes also show that the Preston assemblage is unique, although clearly related to preceding and succeeding groups. A number of bowl forms have been identified, but most can be considered simple in profile; complex and carinated forms are rare. The most

Table 5: Surface Collected Ceramics From Blackwater

Type	variety	13IN	12IN	11IN	10IN	9IN	8IN	7IN	6IN	5IN	4IN	TOTAL
Anna Incised	*var. Anna*						1		2			*3*
Avoyelles Punctated	*var. Kearney*					1	2					*3*
Avoyelles Punctated	*var. unspecified*						1	1	1			*3*
Beldeau Incised,	*var. Beldeau*						1					*1*
Beldeau Incised,	*var. Bell Bayou*		1	1		5	2	5				*14*
Carter Engraved,	*var. unspecified*			1		1						*2*
Chevalier Stamped,	*var. unspecified*				1							*1*
Coles Creek Incised.	*var. Blakely*				1	1	2					*4*
Coles Creek Incised.	*var. Coles Creek*	1	1				2	1				*5*
Coles Creek Incised.	*var. Hardy*		1	1	2	3	6	3		2		*18*
Coles Creek Incised.	*var. Hilly Grove*	1	4	3	14	28	43	36	17	7	1	*154*
Coles Creek Incised.	*var. Mott*				2		3	3				*8*
Coles Creek Incised.	*var. unspecified*	1		2	2	3	4	11	4	6		*33*
Evansville Punctate(	*var. unspecified*			1		7	2	2	3			*15*
French Fork Incised.	*var. Iberville*					1						*1*
Harrison Bayou Inc.	*var. Harrison Bayou*			1		3	4	2	1	2	2	*15*
Hollyknowe Pinche(	*var. Patmos*			1			2		1			*4*
Hollyknowe Pinche(	*var. unspecified*					2		1			1	*4*
Leland Incised,	*var. unspecified*					2						*2*
Mazique Incised,	*var. Kings Point*		1			2		1	1			*5*
Mazique Incised,	*var. Manchac*			1		2	2		1			*6*
Mazique Incised,	*var. Preston*			1	1	2	6	5	4		2	*21*
Mazique Incised,	*var. unspecified*		2	5	3	5	4	4	1	1	1	*26*
Plaquemine Brushed	*var. Plaquemine*	2	2	1	3	18	11	24	5		1	*67*
Unclassified Incised	*on Addis Plain*	1	1	1	6	3	2	3	5	1		*23*
Unclassified Incised	*on Baytown Plain*	1	1	1	4	3	8	5	1	1	2	*27*
Unclassified Incised	*on Unclass. Plain*	3	2	1	2	15	2	1	2		1	*29*
Unclassified Interior Incised (on Addis Pl.)					1		2					*3*
Unclassified Incised/Punctated		1				2	2	3		1	1	*10*
Total Decorated Ceramics		**11**	**16**	**22**	**42**	**109**	**114**	**111**	**49**	**21**	**12**	***507***
Unclassified Plain		206	220	416	564	1254	1278	1196	671	391	131	*6327*
Bowls												
Simple, Round		2	9	4	9	15	13	12	3	5	1	*73*
Simple, Flat		2		4	3	14	10	9	5	2	1	*50*
Complex Bowl, Round				3								*3*
Warped, Round						1		2				*3*
Interior Strap				1				1	2	1		*5*
Tapered					1	3		3				*7*
Exterior Strap, Round					1		1	1	1	1		*5*
Exterior Thickened, Flat								1				*1*
Interior Bevel				1			1			1		*3*
Thin, Simple, Flat		1						4	1			*6*
Thin, Simple, Round						1		3				*4*
Total Bowl Rims		**5**	**9**	**13**	**14**	**34**	**25**	**36**	**12**	**10**	**2**	***160***
Jars												
Simple, Round				1	1	3	4	1			1	*11*
Simple, Flat		1	1	1	5	14	21	22	11	4		*80*
Thickened Strap, Round				1								*1*
Flaring Rim, Flat								1	2	1		*4*
"Seed" Jar							1		2			*3*
Exterior Bevel							1			1		*2*
Exterior Bevel, Restricted							1					*1*
Tapered					1	1						*2*
Exterior Flange, Flat						1						*1*
Total Jar Rims		**1**	**1**	**3**	**7**	**19**	**28**	**24**	**15**	**6**	**1**	***105***
Beakers												
"Vicksburg"					2		1					*3*
Tapered					2	3	3	9	7	1		*25*
Total Beaker Rims		**0**	**0**	**0**	**4**	**3**	**4**	**9**	**7**	**1**	**0**	***28***
Indeterminate Rims												
Simple, Round		3	4	4	1	8	8	4	3	1	1	*37*
Simple, Flat		2	2	2	8	6	4	12	4	2	1	*43*
Total Indeterminate Rims		**5**	**6**	**6**	**9**	**14**	**12**	**16**	**7**	**3**	**2**	***80***
Total Plain Rims		**11**	**16**	**22**	**34**	**70**	**69**	**85**	**41**	**20**	**5**	***373***
Bases												
Flat, Round						1		1	1	2		*5*
Indeterminate		2		3	5	10	11	1	5	1		*38*
Total Bases		**2**	**0**	**3**	**5**	**11**	**11**	**2**	**6**	**3**	**0**	***43***
Total Plain Ceramics		**219**	**236**	**441**	**603**	**1335**	**1358**	**1283**	**718**	**414**	**136**	***6743***
Total Ceramics		***230***	***252***	***463***	***645***	***###***	***###***	***###***	***767***	***435***	***148***	***7250***

Table 6: Surface Collected Lithics From Blackwater

	Collection Tier	*131N*	*121N*	*111N*	*101N*	*91N*	*81N*	*71N*	*61N*	*51N*	*41N*	*General*	*TOTAL*
Chipped Stone													
Alba Stemmed,	*var. Alba*								1				***1***
Alba Stemmed,	*var. Catahoula*						1						***1***
Bayogoula Fishtailed					1			1					***2***
Stemmed Biface Fragment									1				***1***
Bifacial Tool/Preform		1		1	1		1					1	***5***
Biface Fragment								1					***1***
Hammerstone			1	1	2	2	3	1					***10***
Anvil/Abraider		1			1	1	4						***7***
Flake Cores		4	3	7	9	15	27	18	10	3	1		***97***
Tested Pebbles								3	2				***5***
Tested Cobble									1				***1***
Battered Cobble					3	1		2					***6***
Utilized flakes		1					6	2	1		1		***11***
Unutilized flakes													
	Local Pebble Chert	3	5	7	14	20	20	24	11	5	4		***113***
	Thermally Altered Chert		1	2	1	3	13	4	6	2			***32***
	Non-Local Chert	1								1			***2***
Shatter													
	Local Chert	1	5	4	12	23	7	15	10	2	3		***82***
	Burned Debitage	2	5	4	3	10	6	7	8	4	1		***50***
Groundstone													
Greenstone Celt Fragments					2								***2***
Adz												1	***1***
Chunkey Stone Fragment									2				***2***
Nutting Stone			1										***1***
Sandstone Abraider		1	1		1								***3***
Ground Quartzite Piece						1							***1***
Sandstone Pieces		1	1	3	3	6	5	5	6	3	1		***34***
Pumice						2			1				***3***
Hematite						1	1						***2***
Unmodified Petrified Wood Piece				1									***1***
Unmodified Pebbles			3	2	3	3	5	4	2				***22***
Total Lithics		***16***	***26***	***32***	***56***	***88***	***99***	***87***	***62***	***20***	***11***	***2***	***497***

characteristic form is a shallow bowl with unmodified round or flat lips (Figure 19a-d). Another form consists of a deeper bowl, also with a simple profile. None of the bowl shapes or rims show the elaboration seen in later Routh or Fitzhugh phase assemblages (Hally 1972). The only significant rim form shared with the Routh phase is the "Interior Strap Bowl" (Hally 1972: Fig. 59a), which is only rarely found at Blackwater (Figure 19f). This lack of bowl rim elaboration applies to both the Baytown Plain and Addis Plain vessels. Jars are common, and several characteristic shapes have been identified. One is similar to the "Clark Bayou" jar identified at the Osceola site and elsewhere (Ford 1951: Figs. 17a, b, d, 25g, 29e)[see Figure 19j-m]. This form has a slightly restricted orifice and gently expanded body. The second most common form is similar to that noted for the Emerson site: a short, squat jar with an flaring, open mouth and a restricted neck. Baytown Plain jar rims do not flare outward as significantly as in the later Plaquemine assemblages, and simple flat lips predominate (Figure 19g-p). Several sharply restricted jars have been identified and appear to be similar to "seed jars" identified elsewhere (Ford 1951: Figs. 25g, 29d). Beakers are rare, as is the characteristic Balmoral phase "Vicksburg" rim. The few "Vicksburg"-like rims in the Blackwater assemblage show a slight exterior curve or flare, suggesting a beaker with a slightly open, unrestricted orifice. This form is subtly different from the preceding Balmoral phase classic "Vicksburg" beaker shape where vessel walls are usually vertical. Round, flat bases are the only forms noted, although square bases are also likely but cannot be defined with certainty given the present sample.

The most common decorated pottery at Blackwater consists of poorly executed multiple lines incised parallel to the rim of open-mouth jars. This variation is typical of Coles Creek Incised, var. Hardy, but because it does not occur on an Addis paste it has been elevated it to its own variety status and named Coles Creek Incised, var. Hilly Grove (Fuller and Kelley 1993). This variety is generally quite sloppy, and is executed on a relatively to very wet paste. The design is confined to a band around the neck of the vessel, and a number of instances of punctations bordering the lines have been noted for the Hilly Grove from this part of the Tensas Basin. The companion to Hilly

Table 7: Artifacts From Features in Excavation Unit at Blackwater

Type	***Feature No.*** *variety*	6	9	10	14	16	17	20	21	23	24	29/30	32	37	39	40	41	42
Beldeau Incised,	*var. Beldeau*																	
Coles Creek Incised,	*var. Blakely*																	
Coles Creek Incised,	*var. Coles Creek*																	
Coles Creek Incised,	*var. Hardy*																	
Coles Creek Incised,	*var. Hilly Grove*																	
Harrison Bayou Inc.,	*var. Harrison Bayou*													1				
Mazique Incised,	*var. Kings Point*																	
Mazique Incised,	*var. Manchac*																	
Plaquemine Brushed,	*var. Plaquemine*																	
Unclass. Incised on	*Addis Plain*																	
Unclass. Incised on	*Baytown Plain*																	
Addis Plain,	*var. unspecified*		1		3		16	1	1	1			2	4		1	2	2
Baytown Plain,	*var. unspecified*	1		1		3	13	3	2		2	1	5	6		2	1	
Unclass. Plain		1					11	5				3	2		1		5	
Total		***2***	***1***	***1***	***3***	***3***	***40***	***9***	***3***	***1***	***2***	***4***	***9***	***11***	***1***	***3***	***8***	***2***
Fired Clay (gms.)			1.5	1.2		3.3	27	7.5	0.5			2	2				2.3	
Cores																		
Flakes							1				1			1				
Shatter							2											
Ochre																		
Bone (gms)						0.9	0.4											
< 1/4" Sample (gms.)			11				21				10		16	24				

Table 7: Artifacts From Features in Excavation Unit at Blackwater (Cont.)

Type	*Feature No.* / *variety*	44	45	47	49	50	51	52	53	54	58	61	65	66	69	76	89	90
Beldeau Incised,	*var. Beldeau*						1											
Coles Creek Incised,	*var. Blakely*				1													
Coles Creek Incised,	*var. Coles Creek*																	
Coles Creek Incised,	*var. Hardy*																	
Coles Creek Incised,	*var. Hilly Grove*			1														
Harrison Bayou Inc.,	*var. Harrison Bayou*					11												
Maziqu Incised,	*var. Kings Point*																	
Maziqu Incised,	*var. Manchac*																	
Plaquemine Brushed,	*var. Plaquemine*															1		
Unclass. Incised on	*Addis Plain*																	
Unclass. Incised on	*Baytown Plain*																	
Addis Plain,	*var. unspecified*	3	3	18	6	7	4	1	8	1		3	1		1		2	1
Baytown Plain,	*var. unspecified*	4	3	12	9		3	1	1	1		4	2		1	2		2
Unclass. Plain			1	15	8			1			2	1		1		1	1	2
Total		***7***	***7***	***46***	***24***	***18***	***7***	***3***	***9***	***2***	***2***	***8***	***3***	***1***	***2***	***4***	***3***	***5***
Fired Clay (gms.)			0.8	4.3	5.8	5.2	2.2	3	1.6	1.7	0.5		1.4			1.1		
Cores							1											
Flakes						1												
Shatter																		
Ochre					2													
Bone (gms)				1.4														
< 1/4" Sample (gms.)		11	18	53	54	35	43	9.1	22			23	9					

Table 7: Artifacts From Features in Excavation Unit at Blackwater (Cont.)

Type	*Feature No.* / *variety*	96	97	98	99	100	101	102	103	105	106	107	109	111	113	114	115	116
Beldeau Incised,	*var. Beldeau*																	
Coles Creek Incised,	*var. Blakely*																	
Coles Creek Incised,	*var. Coles Creek*																	
Coles Creek Incised,	*var. Hardy*		1															
Coles Creek Incised,	*var. Hilly Grove*															1		
Harrison Bayou Inc.,	*var. Harrison Bayou*																	
Maziqu Incised,	*var. Kings Point*																	
Maziqu Incised,	*var. Manchac*																	
Plaquemine Brushed,	*var. Plaquemine*																	
Unclass. Incised on	*Addis Plain*				1						1							
Unclass. Incised on	*Baytown Plain*																1	
Addis Plain,	*var. unspecified*	2	1	1	3	1	4	1	2									
Baytown Plain,	*var. unspecified*	2	1		4		3		1	2	1		3		1	1	2	1
Unclass. Plain			1				1			1						7	1	
Total		***4***	***4***	***1***	***8***	***1***	***8***	***1***	***3***	***3***	***2***	***0***	***3***	***0***	***1***	***9***	***4***	***1***
Fired Clay (gms.)					0.5		1.5	0.5			0.8	0.6	2.2	2.6			1.5	1.1
Cores																		
Flakes																		
Shatter																		
Ochre																		
Bone (gms)																		
< 1/4" Sample (gms.)			9				12		8.6		11						26	

Table 7: Artifacts From Features in Excavation Unit at Blackwater (Cont.)

Type	variety	117	118	119	121	122	128	131	144	147	***Total***
	Feature No.										
Beldeau Incised,	*var. Beldeau*										***1***
Coles Creek Incised,	*var. Blakely*										***1***
Coles Creek Incised,	*var. Coles Creek*								1		***1***
Coles Creek Incised,	*var. Hardy*								1		***2***
Coles Creek Incised,	*var. Hilly Grove*				1						***3***
Harrison Bayou Inc.,	*var. Harrison Bayou*										***12***
Maziqu Incised,	*var. Kings Point*									1	***1***
Maziqu Incised,	*var. Manchac*						1				***1***
Plaquemine Brushed,	*var. Plaquemine*								1		***2***
Unclass. Incised on	*Addis Plain*						1				***3***
Unclass. Incised on	*Baytown Plain*										***1***
Addis Plain,	*var. unspecified*	2	7				6	4	15	6	***148***
Baytown Plain,	*var. unspecified*	1	2	2		1	6	1	11	2	***133***
Unclass. Plain		1	10				6		29	11	***129***
Total		***4***	***19***	***2***	***1***	***1***	***20***	***5***	***58***	***20***	***437***
Fired Clay (gms.)		0.4	5.2	3.4	4				35	8.5	
Cores											***1***
Flakes			2						4		***10***
Shatter										1	***3***
Ochre											***2***
Bone (gms)									0.6		
< 1/4" Sample (gms.)			33				38	8	210		

Grove is Coles Creek Incised, var. Hardy, which is also present but not as common in the Blackwater collections. In almost every regard Hilly Grove and Hardy are indistinguishable; the only difference is their paste constituents. The only other varieties present in any quantity are Beldeau Incised, var. Bell Bayou, Harrison Bayou Incised, var. Harrison Bayou, Mazique Incised, var. Preston, and Plaquemine Brushed, var. Plaquemine. With Plaquemine we have not been typologically consistent and have not set up a variety to accommodate brushing on Baytown Plain pastes. Only a few instances of this crossover have been noted at Blackwater, but Hally also observed several sherds of this kind from the Preston phase deposits at the Routh site (1972). Punctations zoning the bottom of designs have been found associated with Hardy, Hilly Grove, Harrison Bayou, and Plaquemine.

Minor elements of the Blackwater ceramic assemblage include Anna Incised, var. Anna, Avoyelles Punctated, vars. Kearney and Unspecified, Coles Creek Incised, vars. Blakely, Coles Creek, and Mott, Evansville Punctated, var. Unspecified, Hollyknowe Pinched, var. Patmos, and Mazique Incised, vars. Kings Point and Mazique. Single examples of Beldeau Incised, var. Beldeau, Carter Engraved, var. Unspecified, Chevalier Stamped, var. Unspecified, and French Fork Incised, var. Iberville were also recovered. Two sherds of Leland Incised, var. Unspecified, were also identified. One of these was executed on a paste heavily tempered with crushed bone.

This assemblage of decorated pottery exemplifies the "transitional" nature of the Preston phase ceramics, showing both Coles Creek and Plaquemine characteristics. While the presence and absence of certain diagnostic varieties helps to confirm the general chronology, the total assemblage composition allows us to see the Preston phase as a valid ceramic entity. Thus, although Plaquemine is present, it is significantly less common than in the Routh phase and later (Hally 1972: Table 25), while Hilly Grove, Hardy, and Harrison Bayou are more common at Blackwater than are found in any known Routh phase component (Hally 1972: Table 25). The presence of Bell Bayou rather than Beldeau, and the virtual absence of Chevalier Stamped and French Fork Incised, var. McNutt help to set Preston off from Balmoral, as does the low incidence

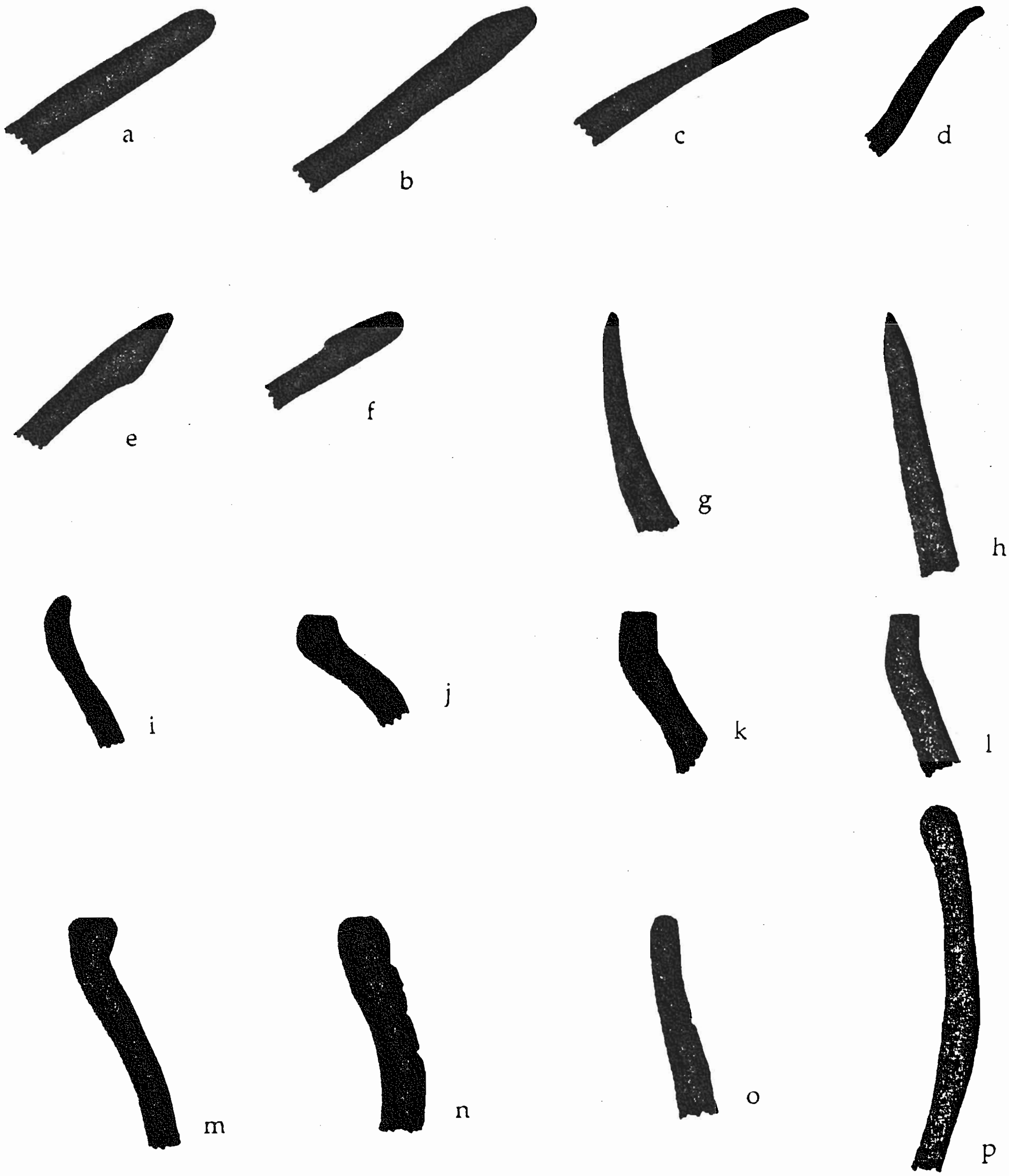

Figure 19: Selected Rim Profiles From Blackwater. a-c, Bowls with Simple, Round lips; d, Bowls with Tapered lip; e, Bowl with Exterior Strap; f, "Interior Strap" Bowl; g, i, Jar with Simple, Round lip; h, Beaker with Tapered lip; j-m, Jars with Simple, Flat lips; n-p, Barrel-shaped Jars with Simple, Flat lips

of Coles Creek Incised, vars. Blakely, Coles Creek, and Mott. Similarly, Balmoral phase components at Osceola and Balmoral have a very low frequency of Mazique Incised, var. Kings Point, and no examples of Mazique or Preston.

Lithics

Blackwater is rare among late prehistoric sites in the Tensas Basin in that there was a relatively large quantity of lithic debris on the surface (Table 6, Appendix B). Similar to most sites, however, there were very few formal tools of any kind (Table 6). The bulk of the collection consisted of free-hand flake cores, unmodified flakes, and shatter. Almost universally these cores were locally available chert pebbles. Many were thermally altered, but whether this was done before or after chipping has not yet been investigated. Numerous cores had been battered, either during flaking or because they were used as hammerstones. Exhausted cores were common. Flakes were not especially common, probably due to our collecting strategies. All forms of flakes were represented, and demonstrate a complete reduction sequence from primary decortification to biface thinning and/or rejuvenation. Few of the flakes had been modified by subsequent retouch or utilization. Almost all of the flakes were from locally available chert pebble sources.

The few finished chipped stone tools consisted primarily of crude bifaces or preforms (Figure 20f-g). Several points were recovered. Two were Bayogoula points, and one was a well made Catahoùla point (Figure 20b-d). An Alba Stemmed, var. Alba point was also found in the surface collections (Figure 20a). One of the Bayogoula points was made on a banded purple chert which was certainly of non-local origin. The other Bayogoula point had been thermally altered, but appears to have been made on local chert. The Alba point had also been thermally altered to a deep red color. The site has been "hunted" for a number of years so the lack of formal tools is not especially unusual. The absence of retouched or utilized flakes or other forms is surprising given the expedient nature of the technology. Significant lithic reduction occurred at the site, as measured by the number of flake cores, yet what was being made is still uncertain. It seems unlikely that any kind of large scale lithic production was being practiced, but we still lack the end

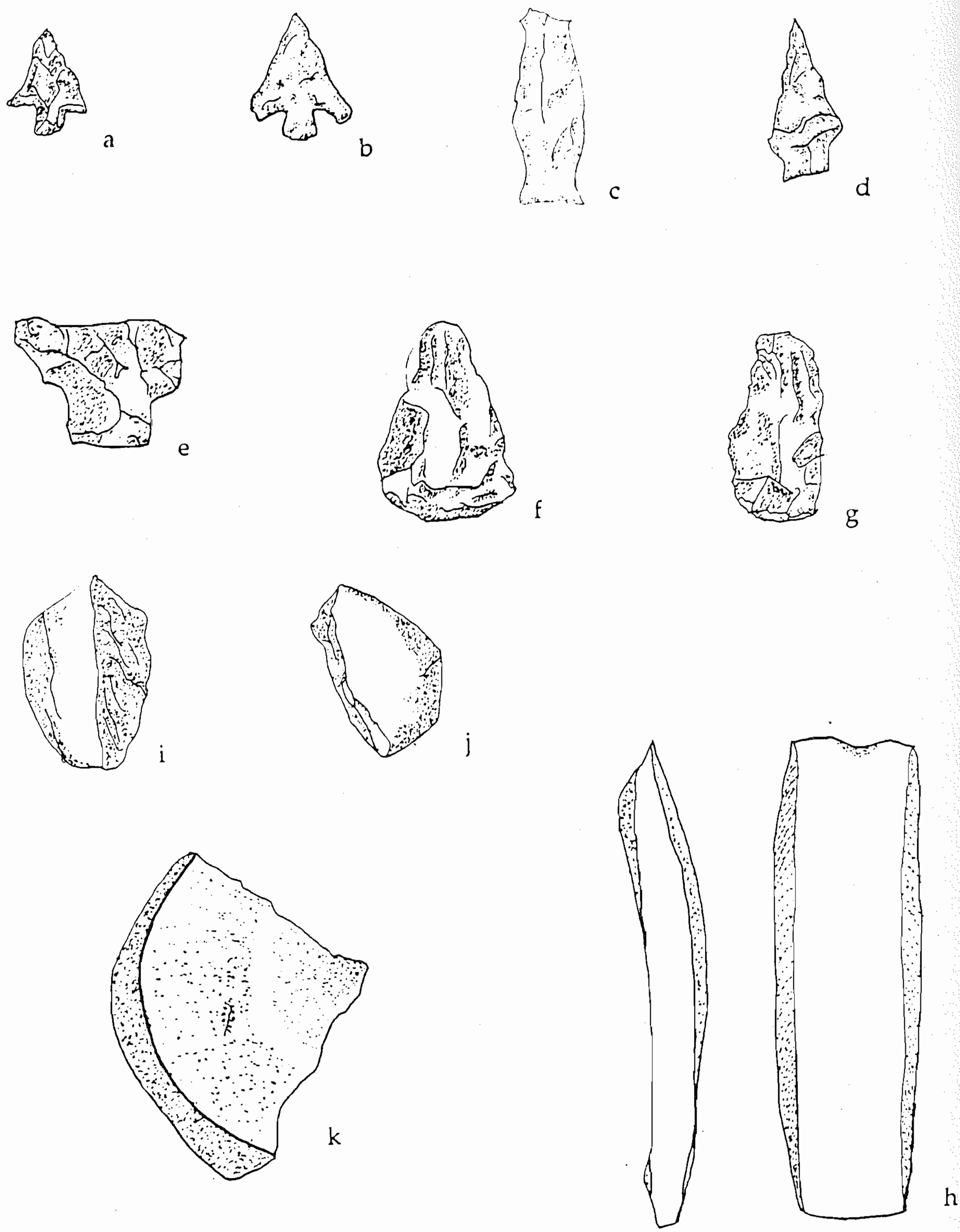

Figure 20: Selected Lithics From Blackwater. a, Alba Stemmed, var. Alba; b, Catahoula point; c-d, Bayogoula Fishtailed points; e, Stemmed biface fragment; f-g, Crude bifaces/preforms; h, Blackstone adze; i-j, Greenstone celt fragments (bit and pole ends, respectively); k, Chunkey stone fragment

products for all of the reduction. Ground stone tools were also relatively rare, consisting principally of a small blackstone adze, a couple of celt fragments, and a fragment of a chunkey stone (Figure 20h-k, Table 6). All of these objects were made on non-local stone. The adze was made on a fine-grained, very dense black stone, the celt fragments were a coarse-grained green metamorphic stone, and the chunkey stone was made of a hard, milky white quartzite-like material. Other than the chunkey stone these ground stone tools are not especially diagnostic. Chunkey stones are usually associated with Mississippian or Plaquemine culture occupations, and have not been recorded, to the best of our knowledge, from purely Coles Creek components. Sandstone pieces, some probably abraiders, were relatively common; only a few showed certain evidence of use. The sandstone pieces ranged from coarse-grained to fine-grained, and from white to rusty red.

The overwhelming bulk of the lithic artifacts were formed from locally available chert resources. The Bayogoula point on banded purple chert, and two non-local chert flakes, were the only chipped stone artifacts made of non-local lithic material. The groundstone tools were all made on non-local stone, but some of the sandstone may have been acquired from sources in the bluffs to the east. Some, however, was locally not common, especially the coarse-grained white Catahoula sandstone, which was most common.

Fauna and Flora

One of the most disappointing results of our research at Blackwater was the virtual absence of well preserved bone, either on the surface or in the features. Surface collected bone was almost invariably badly weathered, and frequently could be identified as belonging to recently introduced species such as cow or horse. Bone from the features was relatively rare, and frequently burned or fragmented beyond identifiable condition. Small amounts of unidentified fish, turtle, and small mammal were observed. No large mammal bone was specifically noted, but the bone had generally been so completely fragmented that the only reason we could identify any classes was if the bone was already small enough to avoid further fragmentation.

Floral remains have yet to be fully analyzed by Dr. Gayle Fritz. However, initial scans of light fractions from some of the features suggests that acorn was abundant, as was palmetto, persimmon, and grape. As with other earlier and later occupations in the tensas basin we have not yet identified any significant evidence for Native North American cultigens. Corn was more common than at Jolly or Osceola, but not as prevalent as at Emerson. So far only corn fragments, cupules, and glumes have been noted. No cob pieces have been identified. This appears to be a consistent trend at all sites yielding corn remains in the project area and suggests that cooking processes utilized shelled maize. such data might imply that storage technology also exploited dried and shelled corn, rather than the more bulky dried cob method of preservation and storage. Cobs were not evidently being utilized as fuel for fires or smudge-pits.

Conclusion

The results from Blackwater are exciting for a number of reasons. The site has demonstrated the validity of large-scale horizontal clearing as a technique in the Lower Mississippi Valley. The abundance of features in our limited exposure argues that entire community patterns could be derived by careful clearing procedures. Although our experience was not wholly positive in that we found that horizontal stripping requires considerably more effort than had been anticipated, the results seem to speak for themselves. In terms of culture history, Blackwater is also a valuable site. We could not ask for a better example of a "transitional" ceramic assemblage. Although it is possible that a series of occupations is actually being documented, we believe that the site represents an example of an evolutionary pattern being captured in a relatively brief event. Further investigation of the Blackwater community is clearly warranted to explore the culture historical and cultural implications of the 1992 research. Blackwater, we hope, will be at the vanguard of a new kind of excavation strategy in the Lower Valley, one that focuses on the community and the behaviors of the occupants rather than on the pottery and the chronology.

We believe that the ceramic and lithic assemblage at the Blackwater site is representative of a period of time only dimly perceived by archaeologists. Identified as the Preston phase, this culture historical entity has existed in name only. Since the Preston phase is a potentially important unit in Lower Valley culture history it deserves some further discussion. Most critically, it is necessary to demonstrate the validity of the Preston phase concept. To do so we need to try to falsify the proposition that the Preston phase is, from an archaeological point of view, a real entity. Thus, we will set out to prove that Preston doesn't exist in anything but our own minds.

We can begin by setting forth the competing possibilities which could explain the Blackwater site artifact assemblage. Our null hypothesis is that Preston is real, and that it marks the interval between roughly ca. A.D. 1100-1200. The alternatives, given the artifacts from the Blackwater site, are that a) Blackwater actually has two components, one a late Coles Creek Balmoral phase occupation , and a slightly later Routh phase one (this is the conventional scenario); b) what we call Preston is really just the end of the Balmoral phase occupation in the area; or c) that what we identify as Preston is really just the early part of the Routh phase in the Tensas Basin. Although we believe in our own hypothesis, we would be more inclined to see option c as the next most likely possibility.

The first alternative, that there are two components, and the second, that Preston is really part of the Balmoral phase, can be discussed together, at least in part. The Balmoral phase is traditionally (although informally) defined based on the presence of certain key ceramic markers. More importantly, it is not just their presence or absence, but there overall frequency in a given component. At Osceola, Routh, and Balmoral, for example, <u>Mott</u> is the most common decorated type, usually followed by <u>Hilly Grove</u>, <u>Blakely</u>, <u>Greenhouse</u>, <u>Coles Creek</u>, <u>Beldeau</u>, <u>Chevalier</u>, and <u>McNutt</u> (Hally 1972: Table 24; Kidder 1990: Tables 4-7; unpublished data, Harvard LMS). Mazique Incised is rare, as is Evansville Punctated. The mode of punctations arranged at the bottom of the decorative field is also uncommon; when punctations are found at the base of the decorative field they are prominent and triangular. The common plainware of the Balmoral phase is Baytown Plain, <u>var. Vicksburg</u>, and shallow bowls, and large tubby "Clark Bayou" jars predominate. The only diagnostic lithic artifact is the <u>Alba</u> point, although the Bayogoula point may also be associated with this time period (Hally 1972: 326). Vessel bases are generally rounded, but flat, square bases are also common. Based on this characterization of the Balmoral phase it seems that it is difficult to identify such an occupation at Blackwater. Elements of Balmoral are present, but not in appropriate quantity or frequency.

Similarly, the Blackwater site does not seem to support a Routh phase occupation as defined by Hally (1972). The plain pottery of the Routh phase is overwhelmingly Addis Plain, var. Addis. Baytown plain is virtually never found, and Mississippi Plain is rare, but present. The vessel shape repertoire is considerable in the Routh phase, especially as regards carinated and complex bowls with turned out rims (the "Walnut Bayou," "Preston," and "Delta City" bowls, and the "Tunica" and "Haynes Bluff" rims), jars, and even bottles. Decorated ceramics are also relatively elaborate, and include Anna Incised, var. Anna, Coleman Incised, var. Coleman, Evansville Punctated, var. Sharkey, Harrison Bayou, Hollyknowe Pinched, var. Patmos, L'Eau Noire Incised, var. L'Eau Noire, Leland incised, var. Leland, Mazique Incised, var. Manchac, Mound Place Incised, var. Mound Place, and Plaquemine Brushed. Once again it is likely that presence and absence is insufficient to identify a specific component.

For example, at the Routh site, located roughly 15 km ESE from Blackwater, the Routh phase component consisted of 1496 sherds (328 sherds were decorated) (Hally 1972: Table 25). Anna Incised, var. Anna made up 1.9% of the total ceramic assemblage (8.84% of the decorated pottery); var. Plaquemine comprised 9% of the total assemblage (41% of the decorated pottery). Similarly, Leland represented 2% of the assemblage and 9% of the decorated pottery, while Harrison Bayou made up less than one half of one percent of the total assemblage, and just over 2% of the decorated pottery. Compare these frequencies with those found in Table 5. Hally (1972: 326) indicates that no chipped stone projectile points can be "definitely associated" with the Routh phase. He does illustrate a Bayogoula-like point from a "definite Balmoral phase context" (1972: 326, Plate IVa), but Hally argues strongly that the manufacture of bifacial chipped stone tools, especially projectile points, was a rare aspect of later Mississippi period Plaquemine culture (Hally 1972: 330-336).

What these data suggest is that in comparison to the Blackwater assemblage the Routh phase component at the Routh site is appreciably different (Table 5). At Blackwater there is substantially less Anna, Leland, Manchac, and Plaquemine, and more Harrison Bayou, Hardy/Hilly Grove (a distinction not tabulated by Hally), and Preston. Blackwater is also missing Coleman, L'Eau Noire, Mississippi Plain, and Mound Place. Blackwater also does not have any appreciable numbers of complex bowls, although both sites do have interior strap bowls (far fewer are found at Blackwater, however). Moreover, excavation of features at Blackwater reveals that most of them contained both Addis and Baytown plain pottery in roughly equal amounts (Table 7). We feel then, that we can falsify the hypothesis that Blackwater supported a Routh phase component, at least as the Routh phase is currently defined. We thus can suggest that of our alternatives none seems to fit the circumstances as well as the one we believe most strongly, namely, the Preston phase is real. Blackwater is neither a Balmoral, nor a Routh phase site, although we must confess that either might be present in a pure form and simply obscured by the weight of the rest of the data. Blackwater might be seen as an early Routh phase site, but we do not feel that this explanation fits either.

The chronology of the Blackwater occupation is still up in the air because we lack absolute dates. Furthermore, the ceramic assemblage is not especially precise because we have yet to date late Coles Creek or early Plaquemine very well. One of the most convincing pieces of evidence for a relative chronology actually comes from the points found at the site, most notably the two Bayogoula points and the single Catahoula point. The Bayogoula point was initially thought to be associated with the late prehistoric or even early historic component at the Bayou Goula site (Quimby 1957: 128-129), but as numerous scholars have noted this attribution is probably incorrect, at least in part, and this point in fact most likely dates to the period ca. A.D. 1000-1200 (Hally 1972: 334, Webb 1981; Williams and Brain 1983: 222). Some of the best evidence comes from the Gordon site (Cotter 1952), where four "fishtail" points were recovered from submound or early mound fill contexts (Cotter 1952: Fig. 59). Elsewhere, Webb and Dodd (1939: Plate 28 no. 1; Baker and Webb 1976: Fig. 3s; Webb 1981) reported finding Bayogoula points at the Gahagan site in association with Catahoula points. The Catahoula point has been dated to roughly the same interval, both by cross dating (such as at Gahagan and elsewhere [Baker and Webb 1976]), and by radiometric dating, such as at Mounds Plantation (Webb and McKinney 1975: 72), where they dated to ca. Cal. A.D. 1170. Catahoula-like points were found together in a cache in the primary mound (72Sub1) in Mound 72 at Cahokia (Fowler 1991: Fig. 1.15; Webb 1981). Radiocarbon dates from a feature associated with this primary mound had a calibrated date range at one standard deviation of A.D. 977-1153, with midpoints clustered around Cal. A.D. 1020 (Fowler 1991: Table 1.1). These data provide more convincing evidence for the placement of the Blackwater site assemblage in the period ca. A.D. 1000-1200 than do the ceramic data, which point to the same time frame. Based on the scanty radiocarbon data from elsewhere in the Tensas Basin (notably a single date from the Balmoral site of 970 ± 85 B.P. (Gx-485; A.D. 980, Cal. A.D. 1027 [Krueger and Weeks 1966: 148]), we feel that the Preston phase most comfortably fits into the period between roughly A.D. 1100-1200, although we would not be surprised to see earlier dates associated with this phase.

Some of the reality of Preston will depend on one's stance: lumpers on one side, splitters on the other. We believe, however, that Preston has its own reality as a chronological unit in the southern part of the Tensas Basin. The ceramic content of Blackwater indicates that Preston assemblages differ from earlier and later defined ceramic phases, and that these assemblages can be readily recognized in appropriate contexts. Examination of data from Hally's (1972) excavations in the Tensas leads us to believe that Preston phase assemblages are actually widespread in parts of the basin, and also that they stratigraphically overlay Balmoral, and underlie Routh. Research at Osceola further allows us to see Preston as distinct from Balmoral, and by inference, must predate Routh. Further, a growing body of calibrated radiocarbon dates indicates that Plaquemine culture assemblages are not found predating the thirteenth century. The Preston phase thus, if nothing else, provides a place to put the hundred years between Balmoral and Routh. It is, we admit, once again, a typological nicety, loved by its parents, but perhaps spurned by others. Clearly time will tell.

The definition of the Preston phase assemblage will prove to be an important contribution of our research. We have previously identified similar ceramic phases at sites such as Preston (16FR247), New Hope (16MA223), Mount Nebo (16MA17), Du Rosset (16TE28), Osceola (16TE2), and Routh (16TE8), but none of these were as pure components as we see at Blackwater. The occupation at Blackwater is important because it may document more than the transition from one ceramic pattern to another. There are hints that more fundamental changes are occurring at this interval, and that we are only seeing the proverbial tip of the iceberg. One fact clearly seen from our excavations is that maize is becoming an increasingly important aspect of the plant food diet and obviously the overall subsistence system. We hypothesize that it is during this interval that maize based economies begin to emerge in the Lower Mississippi Valley (Kidder 1992a), and that some of the changes associated with the Coles Creek to Plaquemine transition revolve around this fundamental change. One aspect that seems notable is that the Blackwater site is significantly larger than most communities recorded for the late Coles Creek and late Mississippi periods. We suspect that an important settlement shift occurs at this period and that it is associated with broader regional trends.

At the end of the Balmoral phase there were a series of changes in regional settlement, probably associated, at least in part, with shifts in the course of the Mississippi River. The Osceola site, which we believe was once the socio-political center (capitol?) of this part of the Tensas Basin was abandoned (although there were later Preston phase occupations on the mound tops), and in time the Routh site emerged as the dominant occupation. In between the demise of Osceola and the emergence of Routh there may have been a relatively brief period of socio-political instability related to these social and geographic upheavals. Community nucleation may have been one of the settlement strategies adopted during this time to combat the absence of politically stable social, political, and economic polities. Certainly Blackwater is larger than other earlier and later communities, and the same may be true of the other Preston phase sites (except, perhaps Osceola and Mount Nebo, where the occupation was clearly ephemeral). This scenario is largely hypothetical and the changes we see at Blackwater may be less real than we imagine. It would be interesting to observe, for example, if sites such as Blackwater were enclosed (wholly or partially) by a palisade. It is also possible that shifts associated with the emergence of agricultural economies were in part responsible for the nucleation seen at Blackwater.

This latter transformation may have a great deal of significance in combination with area-wide ecological changes associated with the formation of the Lake Bruin and Lake St. Joseph channels of the Mississippi River. Evolving dependency on maize agriculture, especially in its early stages, may have provided further impetus for village nucleation on stable relict levee segments. Coupled with possible political instability associated with the development of strong vertical ranking, new agricultural techniques and subsistence changes may be implicated in the settlement alterations witnessed during the Preston phase.

There is tentative evidence that the period between ca. A.D. 1000-1200 was crucial in the formation of Mississippi period social, economic, and political patterns in the Tensas Basin. Shifting environmental conditions may have been at the root of some of these changes, although we suspect that these conditions would have exacerbated already existing tensions. Settlement changes occurred during this interval suggesting several possible causal factors, none of which were necessarily mutually exclusive. The Blackwater site appears to be an outcome of some of these changes, notably village nucleation and shifting subsistence strategies. The relationship between this site and other contemporary communities can only be guessed at, but there is a suggestion in the artifacts that the site was not wholly self-sufficient, especially in regards to lithic resources. We suspect further that Blackwater was not politically independent either, but would have been under the sway of the polity evolving at the relatively nearby Routh site. By the end of the Preston phase further shifts in subsistence and probably region wide social organization dictated a highly dispersed settlement pattern which appears to have brought the occupation of the site to an end. Further changes in the local drainage system associated with the emergence and maturation of the Lake St. Joseph channel may ultimately be implicated in the termination of large-scale village settlement on Cypress Bayou. It is obvious, however, that only further regional and site specific research will allow us to move beyond these speculations.

CHAPTER SIX

EMERSON (16TE104)

Tristram R. Kidder, Gayle J. Fritz, and Christopher J. Smith

Introduction

The Emerson site is located on the west side of Lake Formosa in the western part of Tensas Parish, roughly 3 km east of the Tensas River (Figure 21). The site consists of two small midden patches, an apparently contemporary lithic scatter, and a low mound (Figure 22). Research at Emerson has demonstrated that it can be classified as a house site, or possibly a small farmstead/hamlet, dating to the mid- to late Mississippi period. Emerson is so far unique in that it is the only reasonably well investigated site of this kind and of this period, and therefore it has yielded results that are disproportionately significant given its relatively small size.

Emerson was first recorded in 1989 when John Belmont and Reca Jones were shown the site during a parish-wide survey and reconnaissance associated with the Osceola Project research then focused at the Osceola and Reno Brake sites. At the time of their visit the Emerson site consisted of two small midden patches and a low mound to the north. Belmont labelled the midden patches "A" and "B" (Figure 22) and assumed that the mound was associated with these middens. He further dated the site to the Mississippi period Plaquemine culture, and observed that the midden patches were relatively recently exposed. Belmont also noted that the midden patches evidently contained abundant charred material and well preserved bone and shell. These findings prompted the author, with the help of Dr. Gayle J. Fritz, to further explore the site in the summer of 1991. At that time additional surface collections were obtained, both from the middens and around the mound, and limited shovel testing and a single 1-by-1 m excavation unit was placed in Belmont's midden "A." The findings from this research are detailed below, along with our 1992

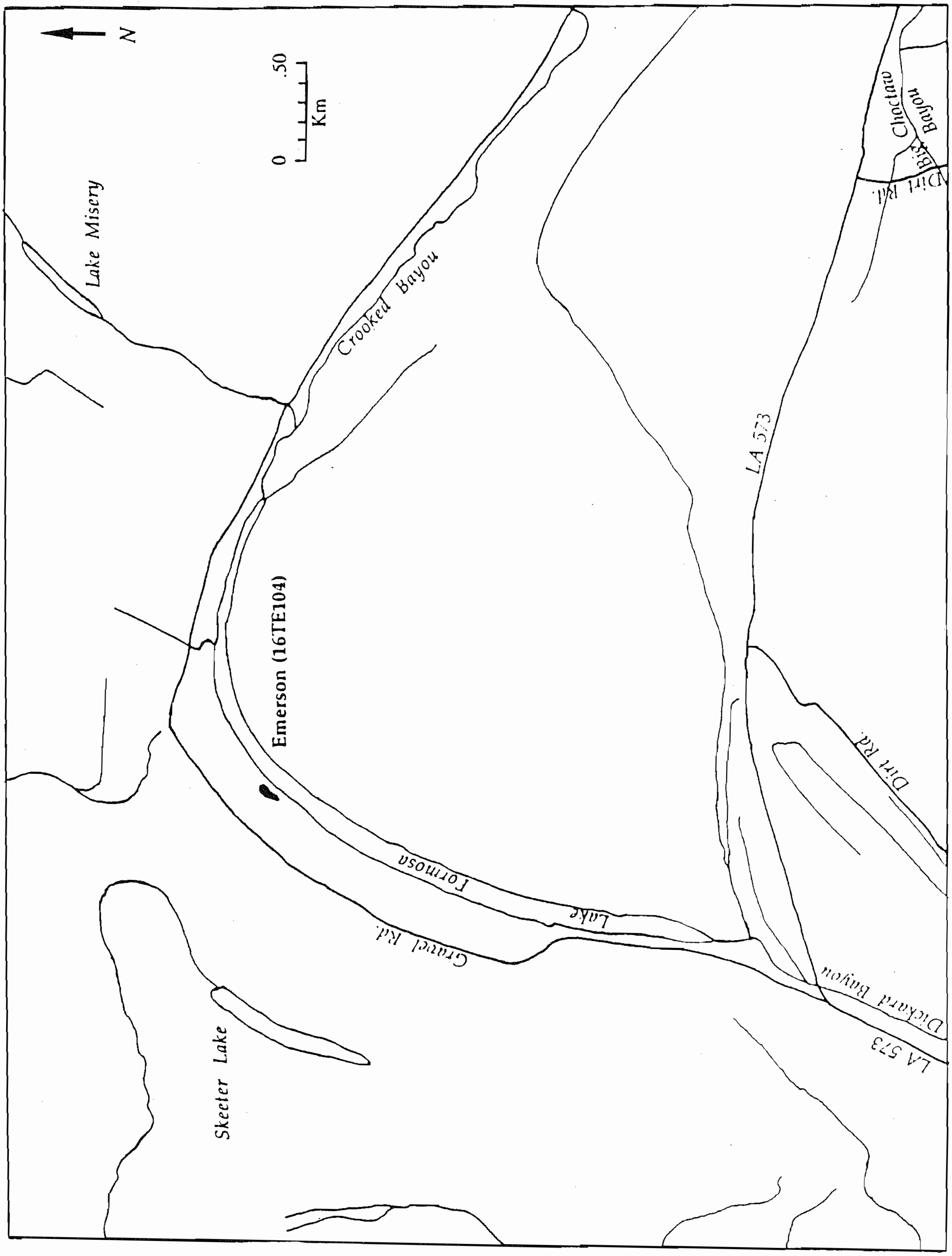

Figure 21: Location of the Emerson Site (16TE104).

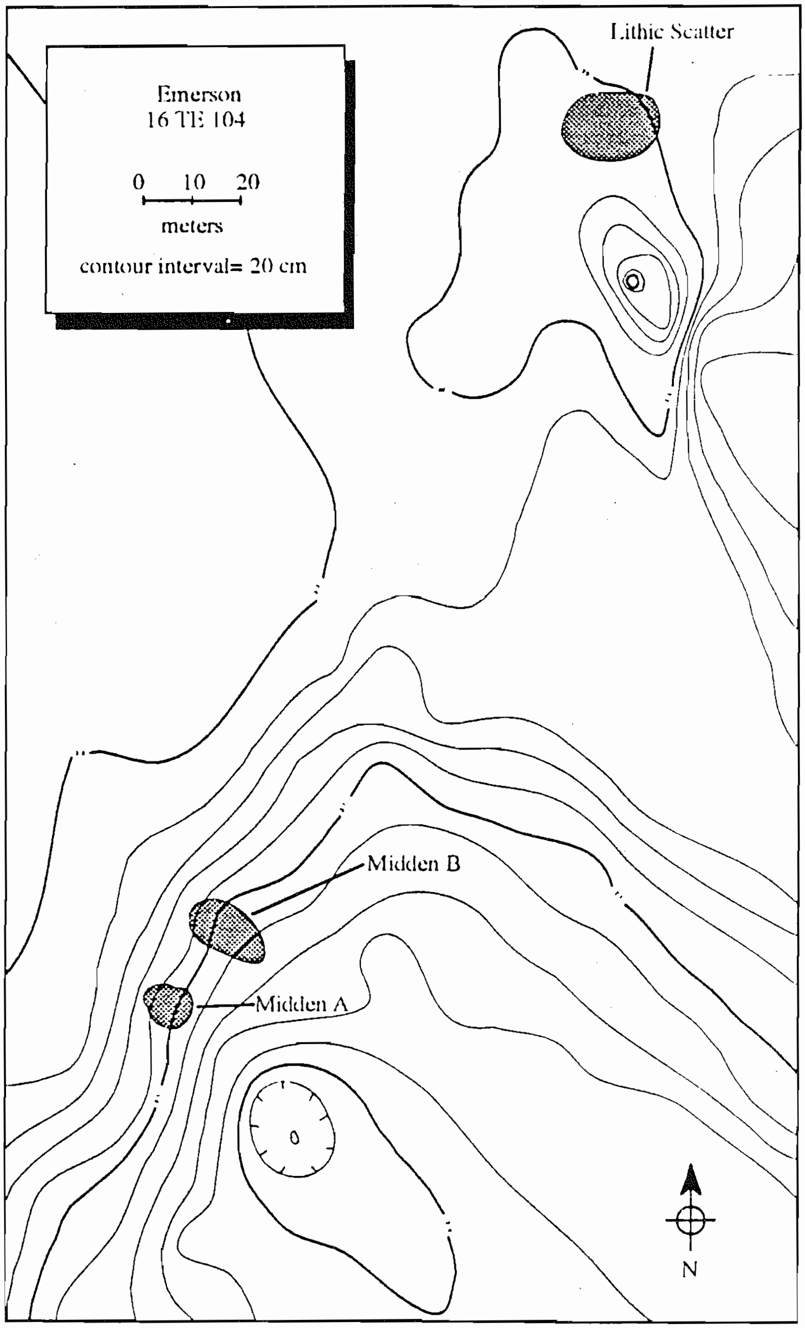

Figure 22: Contour Map of the Emerson Site Showing Location of Cultural Features

investigations, in order to provide a comprehensive view of the Emerson site.

The limited research at Emerson prior to 1992 provided us with several tantalizing glimpses of Plaquemine life in the project area. We had confirmed that the site was small, and principally focused on the two midden patches. Further, our chronological control was firm, and indicated that the site was essentially, if not wholly, a single component occupation of the Fitzhugh phase (Hally 1972). Moreover, the limited test pit excavated in 1991 demonstrated conclusively that Emerson contained abundant and well preserved paleobiological remains. In addition, the site was accessible, and it was located in an area where we had not previously explored. Therefore the site was slated for further investigation in the summer of 1992.

Because of the limited extent of the surface remains at Emerson we expended the bulk of our limited time at the site mapping and excavating test units. We did not attempt any controlled surface collections. The mapping included the area around the middens and extended north to encompass the mound and its immediate surroundings. Test excavations were undertaken in midden "A," since we had previously investigated midden "B" in 1991. Two intersecting trenches were staked out (Figure 24) and in the end a total of 4.5 m^2 were excavated. Excavations consisted of one 1-by-1 m unit and a trench 3.5-by-1 m. These trenches were located in the approximate center of the surface scatter defining midden "A." All excavations were conducted by hand and any artifacts exposed were saved; soil was not screened in the field but floatation samples were taken regularly and all features were floated in their entirety.

The Site and Its Setting

Emerson is situated on the banks of Lake Formosa in western Tensas Parish. Lake Formosa is a relict channel of the Mississippi River, and is now drained by Dickard Bayou, which in turn flows into Big Choctaw Bayou (Figure 3). According to Fisk (1944) Lake Formosa is part of the relict No. 6 channel of the Mississippi, and undoubtedly predates the site occupation by a considerable period of time. Even earlier channels of the former course of the Mississippi River lie immediately north and east of of the site and may have contributed to the relatively high, well drained levee system along Lake Formosa.

The site is situated on the west side of the lake and is essentially at the very western margin of Mississippi River meander belt 2. West of Emerson is an extensive backswamp located between the number 2 meander belt and the Tensas River, which occupies an even earlier course of the Mississippi. Skeeter Lake, an apparent relict channel, lies slightly more than a kilometer due west of Emerson. North and east of the site is the ridge and swale topography of the number 10 channel of the Mississippi River, now occupied, in this section of the basin, by Big Choctaw Bayou.

Lake Formosa is a relatively narrow body of water, demonstrating the classic slightly arcuate shape of a former channel of the Mississippi River. The levee of the lake today has an elevation of 19.8 m and slopes gently towards the lake itself. Most of the lake edge is cleared for agriculture, and informants indicate that the site area has been cultivated for at least forty years. The aerial photographs of the area dating to the early 1960s show the site to be clear and evidently in cultivation. Today the site area is under cultivation for soybeans. The soils along the lake are classified in the Alligator Clay and Dundee silty clay loam series (Weems et al. 1968: Sheet 30), which indicate a slightly to very dense clay. The surface soils at Emerson are indeed quite clayey and dense. However, excavations suggest that when the site was first occupied they soils consisted of relatively sandy clays associated with the original levee. Evidently alluviation, perhaps during, and certainly after, the site occupation, draped part of the site surface with a veneer of dense clay. These deposits may be associated with backwater flooding events caused by the formation of the modern meander belts system of the Mississippi River. The site owes its preservation to these overlying alluvial deposits, which evidently protected it from exposure by agriculture until very recently.

Emerson is comprised of four separate cultural features stung out along the levee of the lake (Figure 19). At the northern end of the site area is a small scatter of lithic debris; no ceramics have been recovered from this locality. Nearby is a low mound located in a stand of woods, roughly 2.5 m high and 30 m diameter, and generally oval in shape. This mound is slightly flat topped and may have had square sides. The remains of a brick chimney are found on the northern side of the mound and brick is scattered across the surface of the rest of this structure. Shovel tests in the mound encountered brick in all localities, and no aboriginal materials have been found on the mound. A tree line marks a cultural boundary between the mound and the middens to the south. Because it has not been plowed this tree line is slightly elevated above the surrounding fields. Roughly 100 m south of the mound are two small midden patches separated from one another by roughly 20 m. These middens are on the crest and slope of the levee, and are distinctly visible as patches of dark brown to black earth, cultural debris, and shell. Prehistoric cultural remains are not found between the mound and the middens, except in one case where a small amount of prehistoric and historic pottery was found roughly 15-30 m south and slightly east of the mound.

The two midden patches were designated "A" and "B" by Belmont and we have maintained his terms. Midden A is the southernmost, and occupies a slight rise on the levee crest and extends downslope towards the tree line marking the edge of the lake. The general dimensions of midden a are approximately 20-25 m long by roughly 10-15 m wide, although artifacts are spread beyond the surface discoloration of the midden. Surface remains are not especially abundant on the surface of this midden, but a dark, oval stain is evident. Midden B lies to the north and slightly to the west of A, and it is especially notable for a relative abundance of shell on the surface. Artifacts are more plentiful here than on midden a, but the scatter is slightly smaller, being roughly 15-20 m long by 10-15 m wide. In both midden areas artifacts are found to extend down the slope of the levee, undoubtedly due to natural erosion and plowing which has displaced materials on the surface. To the south of these middens is a slightly higher knoll on the levee crest which was shovel tested but did not yield artifacts. Our informant indicated that a tree stood here until recently, and this, along with the tree line to the north of the middens, provides us with an appreciation for the former elevation of the entire levee crest prior to extensive cultivation.

1991 and 1992 Investigations

Research at Emerson was conducted over a two year span, but has not involved any extensive excavation. In 1991 Gayle Fritz and the author excavated a 1-by-1 m unit in midden B, and in 1992 our excavations in midden A only encompassed 4.5 m^2. In addition, site mapping, surface collecting, and very limited shovel testing were undertaken in 1992. Mapping was undertaken to provide an accurate topographic representation of the site and encompassed a very large area in order to include the middens and the mound, which has been assumed to relate to the midden occupation. No controlled surface collections were undertaken since the extent of surface remains is quite limited. Although not part of our investigations in 1992, the single test pit excavated in 1991 is relevant to the overall results of our investigations and will be detailed first.

The test pit in midden B was excavated with several goals in mind. First, we wished to investigate the site chronology and determine, if possible, whether these small midden patches were house remains. Further, we wanted to test the possibility of recovering well preserved paleobiological remains, a possibility hinted at by Belmont's original findings in 1989. To this end we visited Emerson in the early summer of 1991 and undertook to obtain a representative surface collection and to excavate a single, randomly placed test unit.

Our initial action was to make a reconnaissance of the site and its environs in order to determine the extent of cultural deposits. Surface collections of prehistoric remains were segregated by collection area, and we investigated both the midden areas and the exposed surfaces around the mound. The results of our investigations largely confirmed Belmont's observations, although we did find a small lithic scatter north and west of the mound (Table 8), and a small amount of material from the field south of the mound (Table 9). Surface collections from the midden patches were also made and showed that the site was indeed essentially a single component occupation (Table 9). In 1991 midden patch B showed a distinctive black discoloration and was covered with broken and crushed mussel shell. Midden A, on the other hand, while distinctly visible as a dark surface stain, was not covered with shell. Based on the density of shell and preserved bone on midden B, we opted to place a single test excavation in the approximate mid-point of the scatter where surface remains were most abundant.

This test unit was initially staked out as a 1-by-2 m trench, oriented with the long axis running

Table 8: Surface Collections From Lithic Scatter NE of Mound at Emerson

Lithics		1991	1992	***TOTAL***
Alba Stemmed,	var. Scallorn		1	*1*
Crude Biface/scraper			1	*1*
Biface Fragment		1	1	*2*
Hammerstone	Chert	1		*1*
	Quartzite	1		*1*
Free-Hand Flake Cores		12	4	*16*
Utilized Flakes		7	4	*11*
Unmodified Flakes	Local Chert	19	8	*27*
	Thermally Altered Chert	6	2	*8*
Debitage		11	3	*14*
Fire-Cracked Rock		8	2	*10*
Tested Pebbles		5	3	*8*
Sandstone Abrader			1	*1*
Unmodified Chert Pebbles		13		*13*
TOTAL		***84***	***30***	***114***

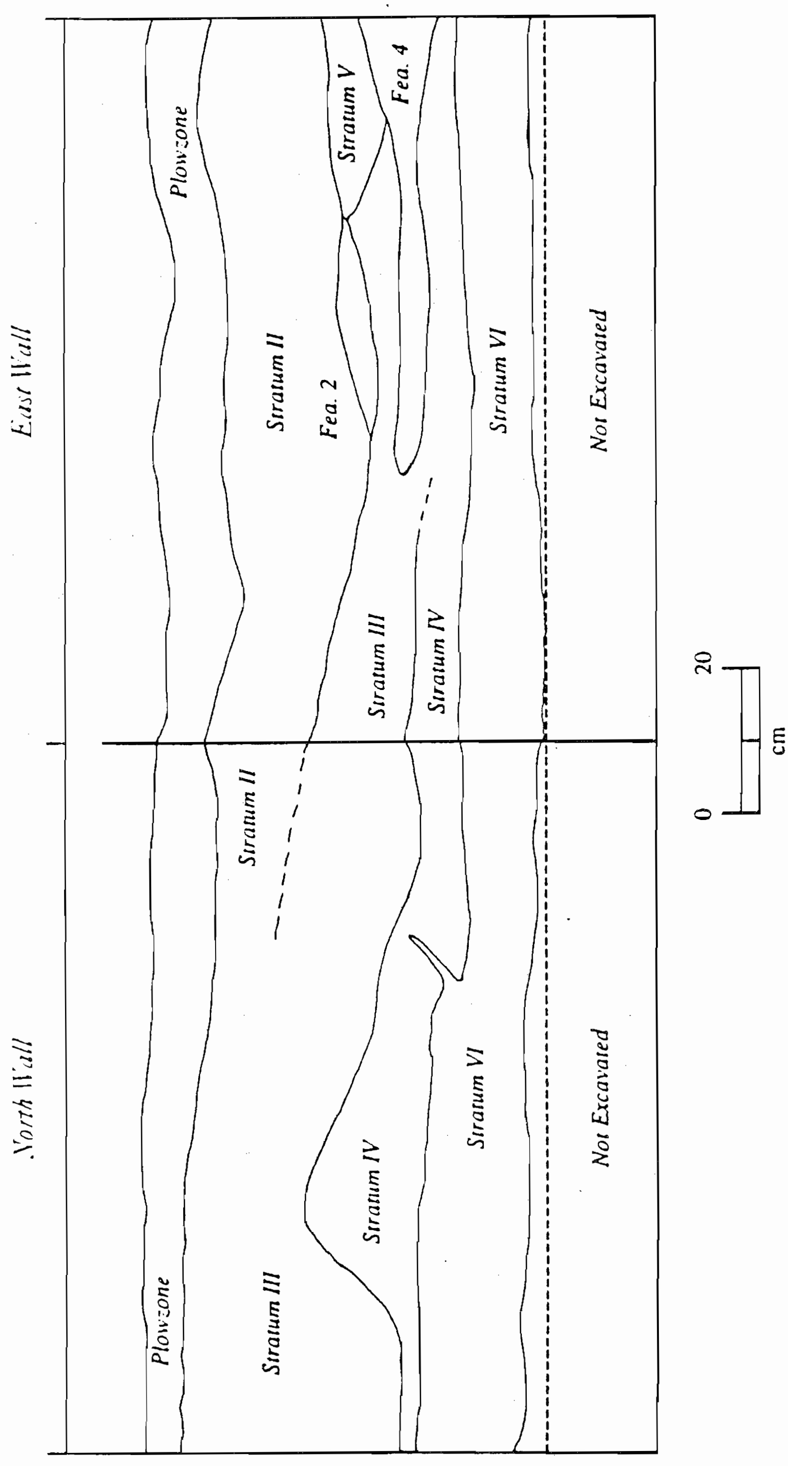

Figure 23: North and East Wall Profile of the Test Pit in Midden B at Emerson

north-south. Since no horizontal control had been established at that time we did not have any coordinates for the pit, and we have since been unable to relocate its exact position. While we excavated the top 10 cm level of the 1-by-2 m unit, below 10 cm we restricted our investigations to a 1-by-1 m square in order to expedite our research (Figure 23). Prior to excavation we had decided to screen all soil through 6.4 mm mesh screen, but time limitations and the dense, clayey soil matrix precluded such a procedure. Instead 10 liter flotation samples were obtained at regular vertical intervals (minimally one per level), while hand troweling and excavation allowed us to recover most large artifacts. All features were removed and bagged as separate flotation samples, with 100% of the fill being taken for the sample.

To our surprise the stratification in the test unit turned out to be more complex than we had envisioned, and cultural deposits deeper than we expected (Figure 23, Table 10). The basic stratigraphy consisted of four parts; topsoil, two levels of midden which could be separated by feel and quantity of ash more than any other criteria, and sterile subsoil. Within the two midden levels were four features, two relatively amorphous pits, a hearth or burned clay patch, and one "feature" which may have been a natural deposit of levee soil. Several patches of ash rich soil were detected and isolated, but do not appear to relate to separate strata other than those noted above.

Below the plow zone, which contained abundant cultural debris, were two midden layers. Both consisted of a dense dark brown to black clayey soil with abundant shell, bone, and aboriginal artifacts. The upper midden was designated stratum II, while the lower one was labelled stratum III. In the east wall these two strata were relatively distinct, but in the north wall the profiles merged together to create essentially one thick midden level (Figure 23). At the base of Stratum II in the east wall was small patch of bright orange fired clay (Feature 2) overlain by abundant charcoal filled with large pot sherds and a portion of a small Plaquemine Brushed jar. Immediately south of this feature was a pocket or deposit of gray ashy midden, which may represent materials cleaned out of the feature and deposited adjacent to the hearth (Figure 23). Beneath strata II and III was another layer of very ashy gray to gray-brown midden designated

Table 9: 1991-1992 Surface Collections From Emerson

Ceramics		Midden A			Midden B			S. of Mound			***TOTAL***
Type	*variety*	Rim	Body	**Total**	Rim	Body	**Total**	Rim	Body	**Total**	
Addis Plain,	*var. Addis*		123	**123**		206	**206**		7	**7**	*336*
Bowls:	"Simple, Round"	3		**3**	5		**5**			**0**	*8*
Jars:	"Simple, Round"	2		**2**	1		**1**			**0**	*3*
	"Simple, Flat"	2		**2**			**0**			**0**	*2*
	"Interior Bevel"			**0**	2		**2**			**0**	*2*
	"Round, Exterior Strap"			**0**	1		**1**			**0**	*1*
Indeterminate:	"Simple, Round"			**0**	4		**4**			**0**	*4*
Bases:	"Round, Flat"			**0**		1	**1**		1	**1**	*2*
Mississippi Plain,	*var. Pocahontas*	1	1	**2**	1		**1**			**0**	*3*
Anna Incised,	*var. Anna*		2	**2**		2	**2**			**0**	*4*
Avoyelles Punctated,	*var. unspecified*		2	**2**			**0**			**0**	*2*
Coleman Incised,	*var. Coleman*			**0**		1	**1**			**0**	*1*
Evansville Punctated,	*var. unspecified*			**0**	1		**1**			**0**	*1*
Grace Brushed,	*var. Grace*			**0**		1	**1**			**0**	*1*
Leland Incised	*var. unspecified*			**0**		1	**1**			**0**	*1*
Maddox Engraved,	*var. Maddox*		1	**1**			**0**		1	**1**	*2*
Mazique Incised,	*var. Manchac*		1	**1**		4	**4**			**0**	*5*
Plaquemine Brushed,	*var. Plaquemine*	1	8	**9**	7	17	**24**			**0**	*33*
Unclassified Incised			3	**3**	2	1	**3**			**0**	*6*
Unclassified Interior Incised				**0**		3	**3**			**0**	*3*
Total Ceramics		***9***	***141***	***150***	***24***	***237***	***261***	***0***	***9***	***9***	***420***
Lithics											
Chipped Pebble Celt				**1**							*1*
Unifacially Chipped Pebble Scraper				**1**			**0**				*1*
Flake Cores				**8**			**5**				*13*
Flake Core Fragments				**2**			**1**				*3*
Hammerstone				**1**							*1*
Utilized Flake (drill?)							**1**				*1*
Unmodified Flakes				**2**							*2*
Debitage				**2**							*2*
Tested Pebbles				**2**							*2*
Biconcave Nut Stone				**1**							*1*
Ground Stone Celt Fragment							**1**				*1*
Abraders				**1**			**2**				*3*
Sandstone Pieces				**3**							*3*
Total Lithics				***23***			***10***			***0***	***33***

stratum IV. This layer was relatively distinct in the north wall but became more difficult to trace into the east wall profile. Sterile subsoil was marked by a distinctive soil color change. This deposit consisted of a light brown to tan slightly sandy clay and marks the original levee surface on which the middens were first deposited. A notable concentration of pottery, and especially shell and charcoal, marked the interface between the sterile levee deposits and the overlying midden (or middens). No features were found to intrude into the sterile levee.

During the excavations an expanse of light brown to tan slightly sandy clay was found beneath Feature 2 and in or above the strata III-IV deposits. this was designated feature 4, but it was sterile and made up of soils similar to those found in the underlying subsoil. Although it overlay a portion of the midden we suspect that this layer may have been brought up from below by an unidentified agent of bioturbation (possibly worms?). Two additional features (numbers 1 and 3) were found in the midden, both being recognized in strata II-III. These were generally round in plan and slightly amorphous to oval in plan. Both were recognized during excavation, although they were difficult to follow or distinguish as we proceeded to excavate them. Of these two, only Feature 1, located near the north wall, yielded any significant remains (Table 10).

Excavations in 1992 were focused exclusively in midden A, and consisted of two intersecting trenches (Figure 24). We began by staking out a trench four m long with its northeast corner at 1.2E 64N. This was broken into four separate 1-by-1 m units which we anticipated excavating separately. This trench extended down the slope of the levee and was placed to cross what appeared to be the most dense concentrations of surface material. Two 1-by-1 units were opened up at the same time at opposite ends of the trench. It became immediately apparent that the southernmost unit, 1.2E 61N, was virtually sterile, with no significant subsurface remains below the plowzone. A number of potential features were identified in plan and ultimately in profile, but these appear to represent root casts or animal burrows in the natural levee. Excavations in unit 1.2E 64N, however, immediately yielded what appeared to be significant, albeit difficult to interpret, midden deposits. Since we did not think that further work in the remaining units of the

Table 10: Artifacts From the Test Pit in Midden B at Emerson

Ceramics	Level/Feature	A			B			C			D			E			F			Fea. 1			Fea. 2			Fea. 3			TOTAL
Type	*variety*	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Addis Plain,	*var. Addis*		78	78		26	26		36	36		37	37		30	30		83	83		13	13		19	19		3	3	*325*
Bowls:	"Simple, Round"			0			0	2		2	1		1	1		1	2		2	1		1			0			0	*7*
	"Tapered"	1		1	1		1			0			0	2		2			0			0			0			0	*4*
	"Early Tunica"			0			0			0			0			0	1		1			0			0			0	*1*
	"Delta City"			0			0			0			0			0	1		1			0			0			0	*1*
	"Preston"-like			0			0			0			0			0	1		1			0			0			0	*1*
	"Tunica"-like			0			0			0			0			0	1		1			0			0			0	*1*
Jars:	"Simple, Round"	3		3			0			0			0	2		2	3		3			0	1		1			0	*9*
Indeterminate:	"Simple, Round"	4		4	1		1	1		1	1		1			0	4		4			0			0			0	*11*
Bases:	"Round, Flat"		2	2			0			0		1	1	2		2	1	2	3			0			0			0	*8*
Mississippi Plain,	*var. Pocahontas*		6	6			0			0		1	1			0			0			0			0			0	*7*
Belcher Ridged (?),	*var. unspecified*			0			0			0			0			0		2	2			0			0			0	*2*
Harrison Bayou Incised,	*var. unspecified*			0			0			0			0			0			0			0		1	1			0	*1*
Leland Incised	*var. Bethlehem*			0			0			0			0		1	1		1	1			0			0			0	*2*
Leland Incised	*var. unspecified*		1	1			0			0		1	1			0			0			0			0			0	*2*
Maddox Engraved,	*var. Maddox*			0			0			0			0	1		1			0			0			0			0	*1*
Mazique Incised,	*var. Manchac*			0			0			0		4	4		1	1		2	2			0		2	2			0	*9*
Mazique Incised,	*var. unspecified*		2	2			0			0			0			0			0			0			0		2	2	*4*
Plaquemine Brushed,	*var. Plaquemine*	2	8	10	1	3	4	1	1	2	3	2	5		2	2	1	1	2		1	1	2	5	7		2	2	*35*
Unclassified Interior Incised				0			0			0		2	2		2	2		1	1			0			0			0	*5*
Total Ceramics		***10***	***97***	***107***	***3***	***29***	***32***	***4***	***37***	***41***	***5***	***48***	***53***	***8***	***36***	***14***	***15***	***92***	***107***	***1***	***14***	***15***	***3***	***27***	***30***	***0***	***7***	***7***	***436***
Lithics																													
Flake Cores				2						1			1						1			1							*6*
Flake Core Fragments				1																									*1*
Unmodified Flakes				1									2																*3*
Debitage																			1			1							*2*
Total Lithics				**4**			**0**			**1**			**3**			**0**			**2**			**2**			**0**			**0**	***12***
Fauna																													
Unidentified Mammal				33			23			16			38			30			47										*187*
Unidentified Turtle				5			1			1			1			4													*12*
Unidentified Fish				6			1						5			10			62										*84*
Unidentified Bird													4																*4*
Unidentified Bone				27																									*27*
Shell Hoe																1									1				*2*
Shell (grams)				35.8			18.1			19.7			163			67.7			506										*809.5*

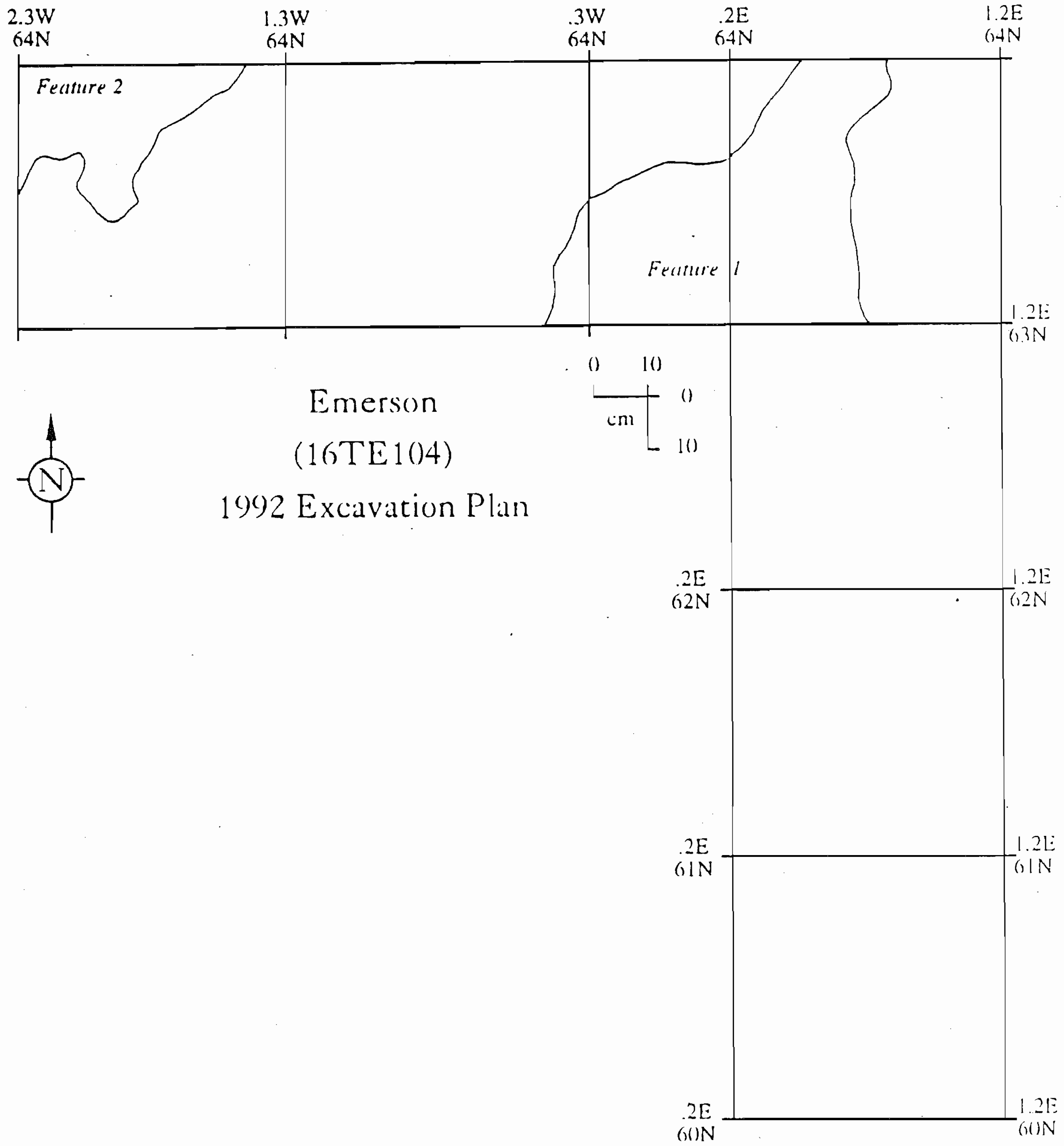

Figure 24: Plan of Excavations in Midden A at Emerson

existing trench would yield appropriate results were established a second trench perpendicular to the first at the same N-S line as unit 1.2E 64N (Figure 24). Once again we began work on this trench by excavating the 1-by-1 m unit on the western end, and ultimately joined the two units together by expanding our excavations across the trench. Regrettably, our work did not yield midden deposits similar to those found in midden B, but we did uncover two large features with relatively abundant material remains (Figure 25).

The excavations in 1.2E 64N indicated a midden layer near the surface and in the plowzone. As we penetrated the plowzone, however, we recognized that the cultural deposits were restricted to a roughly trapezoidal feature within the underlying levee, with its wide end on the north, and tapering to the south where it ran partially into the wall of the then unexcavated portion of the trench. The trench to the west was expanded and the feature was found to extend across another roughly 50 cm of horizontal expanse before it ended (Figures 24-25). Excavations within this feature, designated Feature 1, showed it to be slightly rounded at the base, with several poorly defined ash concentrations scattered throughout the fill (Figure 25, Table 11). Feature 1 may have been a natural depression in the levee which filled with sheet midden, although we cannot be certain of this interpretation. Its shape in both plan and profile indicate that it is not a house trench or other recognizable construction feature, but it may have been a large pit dug to contain trash.

Excavation at the opposite end of the trench uncovered Feature 2, an irregular sided, probably generally round trash filled depression (Figures 24-25, Table 11). This feature was readily recognizable in plan and profile, and contained abundant cultural debris. Between the two features we we able to trace out a thin plowzone and/or midden level, underlain by a gray to gray-bown zone which appears to represent stained levee soils (Figure 25). Beneath all of the cultural deposits was a light brown to tan slightly sandy clay similar to that underlying midden B and no doubt representing the original levee surface. No further excavations were undertaken in 1992.

Ceramics

Tables 8-11 list the artifacts found during our investigations at the Emerson site. A glance at

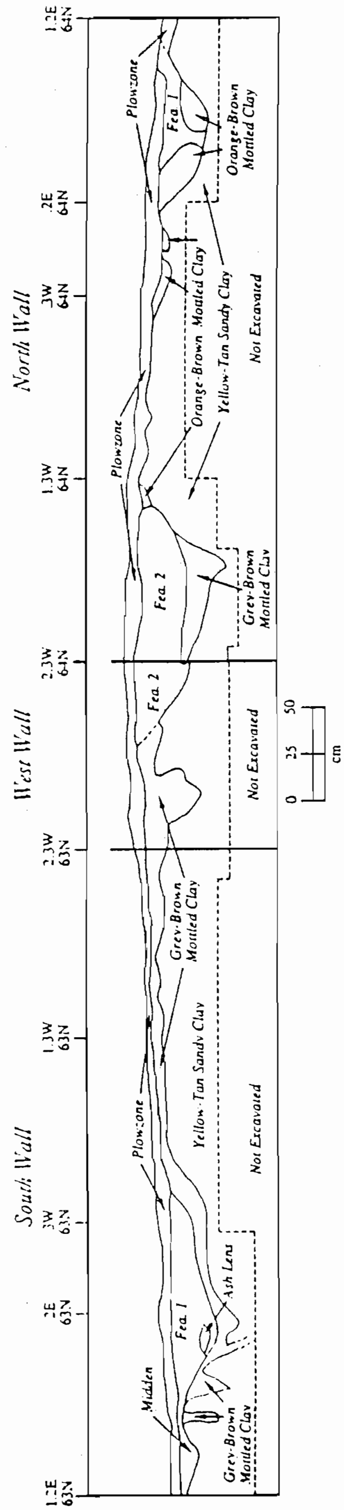

Figure 25: North, West, and South Wall Profile of Unit 1.2E 64N at Emerson

Table 11: Artifacts From Features 1 and 2, Test Unit 1.2E 64N at Emerson

Ceramics		**Fea. 1**			**Fea. 2**		
Type	*variety*	Rim	Body	Total	Rim	Body	Total
Addis Plain,	*var. Addis*		74	74		60	60
Bowls:	"Haynes Bluff"				1		1
	"Simple, Round"	2		2	1		1
	"Flat, Beveled Rim"				1		1
Jars:	"Simple, Round"				2		2
Indeterminate:	"Simple, Round"	3		3	2		2
Bases:	"Round, Flat"	1		1		4	4
Anna Incised,	*var. Anna*		1	1			
Leland Incised	*var. Unspecified*		15	15		2	2
Mazique Incised,	*var. Manchac*		2	2		1	1
Plaquemine Brushed,	*var. Plaquemine*	1	4	5		1	1
Unclassified Interior Incised						1	1
Unclassified Punctated			1	1			
Total Ceramics		***7***	***97***	***104***	***7***	***69***	***76***
Fired Clay				61			23
Lithics							
Flake Cores				2			
Flake Core Fragments							
Unmodified Flakes				1			
Shatter				1			2
Tested Pebble							1
Sandstone				3			
Total Lithics				***7***			***3***
Fauna							
Deer				12			
Squirrel				2			1
Unidentified Mammal				47			16
Unidentified Turtle				4			1
Unidentified Fish				35			42
Unidentified Bird				4			2
Unidentified Bone				22			5
Shell				3			2
Total Fauna				***129***			***69***

these tables demonstrates that the cultural remains found to date are all restricted to the Mississippi period, and can be identified with the Fitzhugh phase of the Plaquemine culture. The only uncertainty lies in the lithic scatter near the mound, where no ceramics were recovered. A single Alba Stemmed projectile point was found here (Figure 27?), which could date this scatter to the Mississippi period, although it could just as well predate such an occupation (Webb 1981; Williams and Brain 1983).

The plain pottery from Emerson has been classified as Addis Plain, var. Addis. While this plainware exhibits a range of variation in paste composition, thickness, and especially inclusions, it is easily recognized when compared with earlier assemblages. Most of the pottery is tempered with unidentifiable small particles of grit, clay, charred organic material, or sand; a small minority has bone and/or finely crushed shell as an additive. This range of inclusions is typical of var. Addis elsewhere in the Lower Mississippi Valley (Brain et al. n.d.; Phillips 1970; Williams and Brain 1983), and is similar to that observed by Hally (1972) from contemporary occupations at the Fitzhugh site and elsewhere. A very small proportion of the plain pottery is classified as Mississippi Plain, var. Pocahontas.

The vessel shapes and rim forms observed in the excavated and surface collected samples helps to bear out the general chronology. Two basic vessel shapes are noted, a shallow, complex or carinated, bowl with flaring rim (Figure 26a-g), and a relatively short, unrestricted jar with a flaring rim ans simple, round lip (Figure 26j-l). Especially important are the "Haynes Bluff," early "Tunica," "Tunica-like," and "Delta City-like" rim forms which are associated with the complex bowls (Figure 26a-c). Most of these were found in the test pit in midden B, but a good example of the "Haynes Bluff" rim was found in Feature 2 in midden A (Figure 26b). The most common rim and lip combinations are what we identify as the "Simple, Round," and "Simple, Flat" forms. These are unmodified rims with lips which are either flat or round and exhibit no other modification. These combinations are found on both jars and bowls (Figure 26c-e, h-l). We are assuming that the bases of the large flaring rim bowls were gently rounded, or possibly disc-

Figure 26: Selected Rim Profiles From Emerson. a, Bowl with "Tunica" rim; b, Bowl with "Haynes Bluff" rim; c, "Walnut Bayou" Bowl rim; d-g, Bowls with Simple, Round lips; h-i, Jars with Flaring rim and Simple, Round lip; j-k, Jars with Flaring rim and Simple, Flat lip; l, Plaquemine Brushed jar with Flaring rim and Simple, Round lip (all full size except l which is 65% of original size)

shaped. Jars definitely had what we term "Round Flat" bases (Figure 261).

The ceramic assemblage from both midden patches is relatively homogeneous and demonstrates a remarkably limited stylistic diversity. Plaquemine Brushed, var. Plaquemine, and Mazique Incised, var. Manchac, are the dominant types in both surface and excavated contexts. Anna Incised, var. Anna, is also found on the surface of both middens. These three decorated types make up the only common threads in the surface collections. Excavations in Feature 1 in midden A recovered nearly a dozen sherds (probably all from the same vessel) of an unclassified Leland Incised design. Wide, close-spaced, curvilinear trailed incised lines are zoned on their upper margin by circular punctations. The ware is a coarse variation of the local Addis, although small flecks of bone are included in the paste. Typologically this is really more akin to Winterville Incised, var. Belzoni, than Leland, although the paste is unequivocally not shell tempered. Hally (1972: 404) noted a similar phenomenon in his excavations in Fitzhugh and Transylvania phase sites in the Tensas Basin. This typological miscegenation is mostly noteworthy for demonstrating the relatively late time frame of the Emerson occupation.

The decorated ceramics, plain pottery, and rim and vessel modes consistently point to a relatively late Mississippi period date for the Emerson site middens. Hally (1972: 343-344) has listed the ceramic diagnostics of the Fitzhugh phase, and all are present in the Emerson assemblage. The stylistic repertoire is limited, and there are few ceramics which might be defined as fine wares. Since this is the first small hamlet or homestead of this period to be excavated in the region, though, it may be no surprise to find that the ceramic assemblage does not mirror those found at contemporary large mound centers (see Hally 1972). Noteworthy also are the ceramics not found at the site. These include Coles Creek Incised, var. Hardy, Harrison Bayou Incised, var. Harrison Bayou, and L'Eau Noire Engraved, var. L'Eau Noire. The vessel shapes and rim modes are both chronologically sensitive and also functionally revealing. The vessel shape assemblage largely is limited to serving vessels, both bowls and small jars. No clear evidence for the presence of large, restricted neck storage vessels was recovered. These larger storage vessels are common at most Mississippi period sites and their absence is worth noting even if it cannot be explained with any certainty. No obviously imported ceramics were found in the assemblage either, but once again this is not especially surprising.

Lithics

The lithic assemblage is at best meager, with one exception— the lithic scatter near the mound. Technologically, the Emerson site lithics are relatively simple, largely consisting of free-hand flake reduction, with few formal tools. Local pebble chert was the only material utilized, although a small proportion appears to have been thermally altered. The entire lithic collection can be characterized as expedient. Tested pebbles suggest that loads of pebble cores were initially sorted for knappability. Flake cores were rarely prepared, and most exhibit multiple platforms, or evidence that they were being reduced into a bifacial tool directly. The number of formal chipped stone tools recovered was low. A chipped pebble celt and an Alba Stemmed, var. Scallorn, point were the most "diagnostic" of these tools (Figure 27a, c). The pebble celt had a very obvious use wear gloss on the bit end, although what it was used for is still uncertain. The wear is similar to that found on large Mississippian hoes, although the size and shape of this tool is completely different. The Scallorn point was found in the lithic scatter and had either been burned by accident or was subject to a significant degree of thermal alteration. The only other tools which could be specifically identified in the chipped stone assemblage consisted of several hammerstones, several crude bifaces or biface preforms, a retouched flake, perhaps a drill, and a retouched flake scraper or "spokeshave" (Figure 27b). A relatively small number of utilized flakes were recovered from the lithic scatter.

A small collection of ground stone tools was also recovered. From the middens we found a fragment of the proximal (e.g., bit) end of a polished gray-green celt. The material has not been identified at present, but it appears to be a basalt or schist of some kind. Half of a biconcave "nut" stone was also found (Figure 27d). This was made on a very iron rich but relatively fine-grained sandstone. Several sandstone abraiders, and amorphous fragments of sandstone round out the

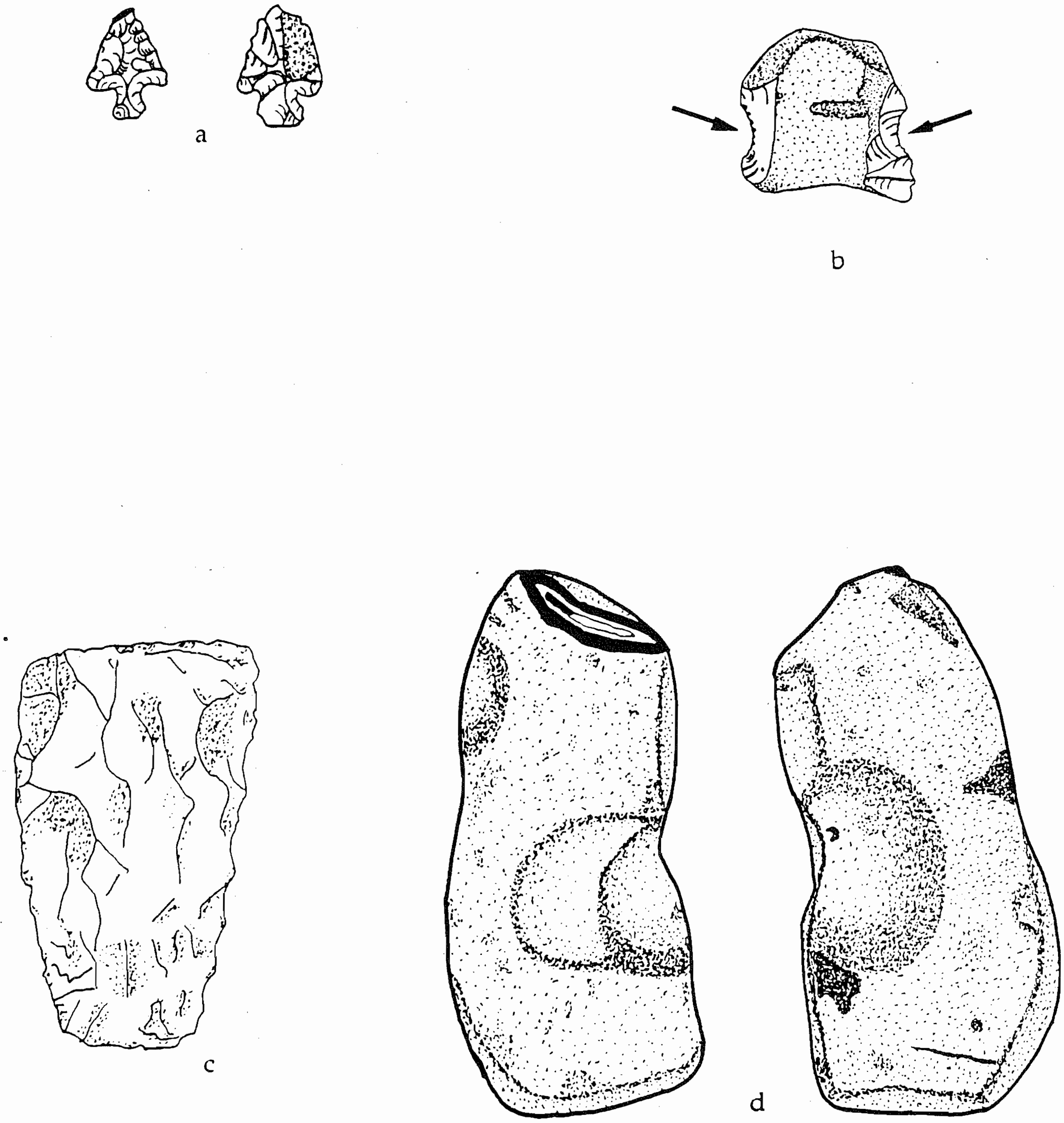

Figure 27: Selected Lithics From Emerson. a, Alba Stemmed, var. Scallorn (front and back); b, Retouched chert scraper (arrows point to working surfaces); c, Chipped pebble celt; d, Biconcave "nutting stone" (front and back)

ground stone lithic assemblage. The lithics suggest a relatively broad range of activities atEmerson, and indicate that lithic production was evidently largely self sufficient. The only non-local lithics were the material for the ground stone celt and the sandstone. And of these, only the celt fragment argues for any great long distance trade or exchange. There is no evidence for specialization *per se*, although the lithic scatter does show that some activities were spatially concentrated. We cannot, however, adequately demonstrate that this lithic scatter is contemporary with the middens, and we are thus not really able to make much of this spatially unique aspect of the site area. Mississippi period sites in the Lower Mississippi Valley are notoriously devoid of formal tools, and Emerson is no exception.

Fauna

The faunal remains from the site are not completely analyzed and to date only the 6.4 mm fraction has been examined. On one hand the available fauna are completely what one would expect from such a site, yet on the other hand there are some interesting differences at the site and among the two midden patches. Broadly speaking, the Emerson fauna emphasized deer and fish, with small mammals, turtles, birds, and shellfish also contributing to the diet. Although fish are not especially predominant in the available counts, they are significantly under represented in the large fraction. One of the most startling differences between the two midden patches is the abundance of fresh water mussel in midden B, and its nearly complete absence in midden A. Since we have no evidence to suggest that these middens were not contemporary we are left to speculate on this notable difference. Interestingly, two shell hoes were found in the excavations of midden B. One disintegrated before it could be recovered, but the other was removed relatively intact.

Comparing Emerson to other known faunal assemblages from the area (Kidder and Fritz 1993) we see that the major difference at this point is that the contribution of mammalian fauna, especially deer, is proportionally higher than that noted in the late Coles Creek deposits at Osceola. At the same time the contribution of fish to the total diet is lower, and the quantity of turtle is significantly reduced. Most of the identified fish is from catfish, gar, and bowfin, but also includes freshwater drum and perch. Several unidentified bird bones were found at Emerson, and one bone from what appears to be a wild turkey. As with the later prehistoric fauna at Osceola, much of the Emerson fauna has been burned or calcined. Evidently this practice of bone disposal became increasingly more common through time. Most of the burned bone at Emerson, however, was mammalian, especially large mammal (almost certainly deer). Fish bone, however, was rarely burned.

Flora

The floral remains from Emerson are, in many ways, unsurprising, yet they provide a nice example of the evolution of floral subsistence practices in the region (Fritz et al. 1992). Only the floral remains from the test pit in midden B have been fully analyzed so far. Two important facts emerge from our preliminary analysis: first, maize was an important staple food at the time of site occupation, and second, there is still no evidence for the domestication of Native American cultigens, despite their ubiquity elsewhere in the Southeast at this time (Fritz and Kidder 1993; Fritz et al. 1992). As we have noted elsewhere in the study area (Fritz and Kidder 1993; Kidder and Fritz 1993), acorn was also a common contributor to the Emerson diet, and was considerably more abundant than any other nut. Wild, or at least not domesticated, native starchy seeds (chenopod, iva, maygrass) were also recovered, along with fleshy fruits from persimmon, palmetto, and grape (Table 12). Palmetto and cane stem fragments were also relatively common. Fragments of starchy tubers were also recovered but cannot be yet identified to genus or species.

Maize was found in all the samples from Emerson, and consists of whole kernels and kernel fragments, cupules and cupule fragments, glumes, and even embryos. The high frequency and ubiquity of maize suggest to us that agriculture had been intensified by this time, and that corn probably assumed a significant role in the diets of the Emerson inhabitants. Much more maize has come from Emerson than from Osceola. Density, measured in terms of number of maize fragments per liter of soil floated, suggests that midden B at Emerson contained 27 times more maize than the Balmoral phase midden deposits at Osceola. It can be argued that the ceremonial nature of the Osceola site makes direct comparison of density measures unwise, and we agree that

Wood and Stem	Fea. 2	Fea. 3	Fea. 4	FS 2	FS 3	FS 4	FS 5	FS 6	FS 7	Total
Wood										
ct.	238	449	194	668	117	470	1525	718	753	5132
wt. (g)	2.53	4.91	1.84	4.73	0.87	3.76	15.9	8.99	8.65	52.18
Cane Stem										
ct.	6	10	7	5	0	5	1	0	4	38
wt. (g)	0.03	0.07	0.02	0.04	0	0.06	<0.01	0	0.09	0.32
Palmetto Stem										
ct.	5	39	32	44	6	35	5	2	53	221
wt. (g)	0.02	0.31	0.27	0.43	0.02	0.32	0.04	0.04	0.43	1.88
Other Stem										
ct.	8	11	3	2	0	0	0	0	26	50
wt. (g)	0.06	0.07	<0.01	0.04	0	0	0	0	0.17	0.35

Nutshell	Fea. 2	Fea. 3	Fea. 4	FS 2	FS 3	FS 4	FS 5	FS 6	FS 7	Total
Acorn Shell										
ct.	118	2738	66	219	87	50	54	54	236	3622
wt. (g)	0.14	1.34	0.07	0.49	0.14	0.09	0.07	0.11	0.45	2.9
Acorn Meat										
ct.	0	0	0	0	0	4	0	0	0	4
wt. (g)	0	0	0	0	0	0.71	0	0	0	0.71
Thick Hickory Nutshell										
ct.	0	0	3	0	0	0	4	1	0	8
wt. (g)	0	0	0.03	0	0	0	0.02	<0.01	0	0.06
Thin Hickory Nutshell										
ct.	0	0	0	0	0	0	0	0	3	3
wt. (g)	0	0	0	0	0	0	0	0	0.04	0.04
Juglandacae Shell										
ct.	0	0	0	0	0	3	0	0	0	3
wt.(g)	0	0	0	0	0	0.01	0	0	0	0.01

Maize	Fea. 2	Fea. 3	Fea. 4	FS 2	FS 3	FS 4	FS 5	FS 6	FS 7	Total
Total Maize wt. (g)	0.2	1.01	0.29	0.27	0.07	0.26	0.45	0.39	0.22	3.16
Kernel frag. ct.	18	85	25	21	21	47	65	43	12	337
Kernel Whole ct.	0	1	0	0	0	1	0	0	0	2
Cupule frag. ct.	22	240	51	37	8	37	106	67	70	638
Cupule Whole ct.	4	21	1	4	0	3	8	5	2	48
Glume ct.	1	46	19	3	1	1	2	7	8	88
Embryo ct.	0	1	1	0	0	1	0	0	0	3
	45	394	97	65	30	90	181	122	92	1116

Table 12: Floral Remains From Test Pit in Midden B at Emerson

Others	Fea. 2	Fea. 3	Fea. 4	FS 2	FS 3	FS 4	FS 5	FS 6	FS 7	Total
Unknown										
ct.	78	48	46	41	4	32	49	23	11	332
wt. (g)	0.43	0.27	0.28	0.33	0.02	0.44	0.26	0.08	0.04	2.15
Tuber ?										
ct.	3	9	0	0	0	0	0	0	5	17
wt. (g)	0.01	0.29	0	0	0	0	0	0	0.05	0.35
Fungal Body										
ct.	0	1	0	0	0	0	0	0	0	1
wt. (g)	0	0.01	0	0	0	0	0	0	0	0.01
Bone										
ct.	15	26	30	42	38	53	148	78	50	480
wt. (g)	0.12	0.38	0.25	0.25	0.22	0.63	1.64	0.94	0.51	4.94
Faunal Globule										
ct.	1	1	0	2	0	0	1	0	1	6
wt. (g)	0.01	0.01	0	0.02	0	0	<0.01	0	0.01	0.06
Shell										
ct.	19	19	18	9	23	31	29	5	5	158
wt. (g)	0.07	0.11	0.06	0.07	0.05	0.1	0.44	0.06	0.07	1.03
Stone/Soil/Sherd										
ct.	11	12	10	17	5	8	29	10	4	106
wt. (g)	0.14	0.74	0.15	0.24	0.05	0.07	0.55	0.1	0.17	2.21
Uncarbonized wt. (g)	0.02	0.02	1.46	0.07	0.08	0.02	0.06	<0.01	0	1.74

Seeds	Fea. 2	Fea. 3	Fea. 4	FS 2	FS 3	FS 4	FS 5	FS 6	FS 7	Total
Sumpweed	3	2	1	2	0	2	0	0	0	10
Amaranth	0	0	0	0	0	0	2	0	0	2
Morning Glory?	2	0	1	0	0	0	0	0	0	3
Palmetto seed	1	6	1	2	0	2	1	0	3	16
Purslane	0	3	0	0	0	0	0	0	0	3
Grass Family	0	1	0	0	0	0	0	0	0	1
Euphorbia cf maculata	0	1	0	0	0	0	0	0	0	1
Sida	0	0	0	0	0	1	0	0	0	1
Maygrass	0	5	2	0	0	0	0	0	1	8
Unidentified Type 1	5	0	1	0	0	0	0	0	0	6
Unidentified Type 2	0	0	4	0	0	0	0	0	0	4
Unidentified Type 3	1	0	0	0	0	0	0	0	0	1
Unidentified Seeds	0	1	1	0	0	2	2	0	1	7
Persimmon	0	1	0	0	0	1	1	1	0	4
Grape Seed	0	0	0	0	0	0	0	1	0	1
Unidentifable Seed Frag.	18	4	0	7	15	3	6	4	10	67
Grand Totals	30	24	11	11	15	11	12	6	15	135

Table 12: Floral Remains From Test Pit in Midden B at Emerson (Continued)

further statistical applications are still needed. Still, we infer that maize was a more important food in the project area at ca. A.D. 1400-1500 than it had been at ca. A.D. 1000-1200, and we accept that the Emerson site data are documenting the existence of serious maize cultivation in northeast Louisiana prior to European contact (Fritz et al. 1992).

Conclusions

Excavations at the Emerson site, limited as they have been, provide us with an important glimpse into the late prehistory of northeast Louisiana. This is the first small hamlet or homestead site of this period to be excavated in the region, and in fact, the entire Lower Mississippi Valley. Coupled with our intensive recovery of subsistence remains, these excavations make Emerson a unique contributor to the archaeology of the entire region. Our findings suggest that Emerson was a relatively short-term, single component occupation. The midden patches are hypothesized to relate to at least two structures which we presume were located on the slope of the levee above the middens. All of our data point to the Emerson site as primarily being an isolated hamlet or homestead, devoted to mixed subsistence pursuits, and evidently occupied year-round.

Our investigation of the mound to the north of the middens has been unproductive in that we cannot say that it is a prehistoric feature. No aboriginal material has actually been found on or in the mound, and large amounts of historic brick are found on and below the surface, at least where we shovel tested. Still, the shape is remarkably "mound-like," and we have found a lithic scatter to the north and a small amount of pottery to the south of the structure. If it is a historic structure *in toto* we have no record of its existence in the historic plat maps of the region. We suspect that it is an aboriginal feature, later modified by historic occupants. It is thus likely, though by no means proven, that it is contemporary with the middens.

Although Emerson seems to represent an isolated community, it is evident that it was but one of many similar small, highly dispersed, Mississippi period settlements in the study area. At the south end of Lake Formosa there was evidently another such contemporary community at the Formosa site (16TE42). Farther south at the junction of Dickard Bayou and Big Choctaw Bayou there was a Plaquemine occupation at the Cooter Point site (16TE37), while to the east the Mayflower (16TE17) and New China Grove (16TE43) sites supported contemporary occupations. At both Mayflower and New China Grove, and even possibly at Cooter Point, single mounds were evidently associated with these Plaquemine components.

Emerson is thus not unique in terms of its possible layout and site structure, although we cannot yet be certain of the association of middens, mound, and lithic scatter. The political organization of the settlements here on these relict segments of the number 2 meander belt is difficult to infer. Were these single mound communities or hamlets linked into a wider sphere of social and political organization, or were they really independent entities? Other than a small handful of lithic objects, Emerson at least was likely to have been fully self-sufficient. How, if at all, it would have been integrated into the larger socio-political world is as yet unknown. The major centers of Plaquemine culture are found nearer to the present-day course of the Mississippi River; however, numerous sites on the Tensas also date to this period and suggest that a significant component of the total settlement organization was found well to the west of the relatively modern courses of the Mississippi River (see also Fuller and Kelley 1993). We suspect, although cannot prove at this point, that communities like Emerson were integrated into a wider network by their participation in community-wide ritual and/or economic and political activity at larger sites.

Our research has unequivocally demonstrated the remarkable research potential of an otherwise small and insignificant site. While we have excavated only 5.5 m^2 in total, we believe that we have made a series of important findings which will help us to better understand the evolution of complex societies in northeast Louisiana. Small sites such as Emerson provide us with a wealth of detail not otherwise seen at larger and more structurally complex sites. Further, here, and at similar sites, we can gain a perspective on how the average people lived, and how they organized their communities. Knowing more about these mundane details will allow us to fully integrate the wealth of archaeological data emerging in the Lower Mississippi Valley.

CHAPTER SEVEN

CONCLUSIONS

Introduction

The 1992 test excavations at the Jolly, Blackwater, and Emerson sites have resulted in a considerable amount of new data pertaining to the later prehistoric occupation of NE Louisiana. There are several significant conclusions which result from our research, and they can be divided into two major areas of concern. First, as regards regional and local culture history, we have demonstrated a convincing trend towards an intensification in agricultural practices, leading to the development of a high maize dependency by the later part of the Mississippi period. This intensification appears to have occurred over a nearly 500 year-long period of time, and to have been gradual and incremental. A number of cultural ramifications follow from this pattern and will be discussed further below.

Our second contribution is that we have, we believe, convincingly demonstrated that small, relatively shallow sites have significant archaeological value that can best be appreciated through large-scale horizontal exposure and clearing. We achieved our project goals fully at only one site, Blackwater, but at the other two sites we have demonstrated the potential for recovering intact subsurface remains and deposits. From a management point of view these findings increase the urgency of the task of preserving all kinds of sites, not just those with visible architecture or deep midden. We believe that it is no longer valid to simply write off sites that do not have intact midden or which are small and lack obviously well preserved features. Archaeologists and planners are faced with the difficult realization that the burden of proof, so to speak, is on their shoulders, and does not lie on the visible surface of a site. These findings and their implications will be reviewed below.

Culture History

The principle focus of our 1992 research was to explore subsistence variation both through time and across a variety of site function types. In addition we investigated regional and local culture historical patterns and the behavioral inferences which could be derived from these patterns. Part of our research was to focus on Baytown and Coles Creek period activities. We could not follow up on this goal because the sites that were tested all post dated these time periods. One of the most significant failings of our research, then, is that the temporal span of our investigation was more limited than we would have desired. On the other hand, the work which we did conduct has lead to a number of important findings and will help us to further understand the archaeology both of this part of NE Louisiana and the Lower Mississippi Valley.

In terms of pure culture history we were remarkably fortunate to be able to work at three essentially single component sites. Single component sites have traditionally been rare in Lower Mississippi Valley prehistory since the focus has usually been on large, deeply stratified multicomponent occupations. Our view of regional culture history has rarely, if ever, been perceived through the lens of single component occupations. The perspective that we have developed has a further consequence of allowing us to see what could be termed simple, unelaborate behaviors associated with day-to-day subsistence activities. Many of the variations in material culture that we have documented may be explained by the fact that these sites are not mound centers, or ceremonial sites. In essence, then, we believe that this research helps to provide a fuller, more complete picture of the prehistory of the Lower Mississippi Valley.

The culture historical sequence explored through our investigations is essentially complete, with the exception of missing a Routh phase early Plaquemine component. At Jolly we excavated a well defined Balmoral phase late Coles Creek culture site. The Blackwater site dates, we believe, to the terminal Coles Creek Preston phase, while Emerson is a solid example of a late Plaquemine Fitzhugh phase occupation. The definition and explication of the previously fuzzy Preston phase is a major contribution, although clearly further work will be necessary. Compared to the mound centers at which these phases have been defined in the past, the occupations at these three sites are different in a number of regards. Most significantly, at least in the case of the Balmoral and Fitzhugh phase occupations at Jolly and Emerson, is the fact that the ceramic assemblages are considerably less diverse than those found at the larger mound centers. Similarly, at these sites the lithic industry is more limited in technological and stylistic range, and one gets the impression that the range of behaviors at these sites is more circumscribed. At Blackwater the ceramics and lithics were very diverse, both technologically and stylistically. The implications of this finding are uncertain, but there may be no coincidence that the site itself is considerably larger, and could be argued to represent the only village-like occupation in our entire sample. We suspect that the Blackwater site occupation represents a period of settlement expansion at a time when social, political, and economic activities were undergoing a series of significant changes marking the shift from Coles Creek to Plaquemine.

One of the most notable transitions documented in our sample is the expansion of agricultural activities centered on the production of corn. The data from the Lower Mississippi Valley indicates that maize was not a significant crop in this part of the Southeast until after ca. A.D. 1000 (Kidder 1992a). Balmoral phase components at Osceola and Jolly show that corn was present but in only small quantities. Elsewhere we have argued that the introduction of maize into the regional subsistence economy may have been initially caused by local elites who imported corn as a sacred or special food (Fritz and Kidder 1993). The findings of maize at Jolly, a small hamlet possibly associated with the nearby Balmoral mound site, causes us to reconsider the notion that maize was initially only an elite food. However, the bioarchaeological evidence suggests that no matter how it was introduced, maize did not become a significant crop until after ca. A.D. 1200 (Fritz and Kidder 1993; Rose et al. 1991).

At Blackwater, a site dating we think to the period ca. A.D. 1100-1200, we found evidence of considerably more corn than has been recovered at earlier Balmoral phase sites. Many of the features at Blackwater contained some evidence of maize, although the absolute representation was relatively low. Also, relative to earlier components, there is little evidence that the introduction of corn brought with it associated changes in the plant food diet. Acorn was probably more important as a contribution to the total diet than was maize, or any other food resource. Native fruits and wild seeds also contributed to the plant food diet and do not appear to be any more or less important than in previous periods. The evidence from Blackwater seems to suggest that the evolution of maize based agriculture was so gradual that it did not cause any notable disruptions in the existing plant food economy.

Remarkably, the increasing quantities of maize found in the Fitzhugh phase component at Emerson were also not accompanied by obvious shifts in the total range of the plant food diet. This was despite obvious and significant increases in maize which mark what we believe is the complete shift to a maize-dependant economy (Fritz et al. 1992). Nuts, native fruits, and wild seeds continue to be important, although the quantity of wild seeds does appear to decrease overall. The use of acorns, however, does not lessen in the slightest, at least as best we can tell. One possible consequence of the achievement of a fully maize-dependant economy by the later Mississippi period, however, may be the expansion of small farmsteads and/or hamlets across the landscape. The distribution of small occupations in a riverine setting with abundant levee soils would represent the best utilization of both labor and resources, so long as the political system was well enough organized to serve the needs of these small communities. Evidently the Routh and Fitzhugh phase political systems were well integrated and sufficiently organized to allow for a notable and seemingly dramatic expansion of small hamlets across virtually all parts of the Tensas Basin landscape.

One of the greater disappointments of the 1992 season was that we did not recover a faunal sample comparable to earlier seasons or in keeping with the floral remains. The faunal remains from both Jolly and Blackwater were generally poorly preserved, highly fragmented or burned, and mostly not identifiable to even genus level. The Emerson remains were somewhat better preserved, but not especially dense, at least in the sample from the 1992 excavations. The trends that can be derived from the existing samples are not at all clear.

Excavations at the Reno Brake and Osceola sites in previous years suggested a pattern of decreasing emphasis on deer, and a general increase in the use of small mammals and especially fish (Kidder and Fritz 1993). Such a pattern is generally borne out, but only in outline. Deer were clearly important in the diet of all of the occupants of the Tensas Basin throughout prehistory. Deer are not evidently well represented at either Jolly or Blackwater, but we cannot be certain if this is a real pattern or the result of differential preservation and/or disposal patterns. At both sites bone was frequently burned, sometimes to the point where it became calcined, and both burning and fragmentation probably obscure the evidence for deer utilization. Small mammal remains are also rare at both sites, but fish are relatively common.

At Emerson deer remains are well preserved, although not especially common. Small mammal, fish, turtle, and bird are also found, but here the bone preservation was significantly better than at the other two sites. At Emerson one of the two midden patches contained abundant fresh water mussel shell, yet the other contained almost none. Since both middens appear to be contemporary, as best as we can tell, it suggests either differential resource selection or preference, or both. We cannot, however, ignore the possibility that temporal variation is also represented. It does not appear, though, that the shell is associates with any obvious evidence of subsistence stress, since the deposits containing shell also yielded abundant evidence for corn and other plant food remains, as well as the most diverse faunal assemblage in our sample. Perhaps the use of shell was associated with the processing of corn, or possibly the manufacture of shell tempered pottery, which was recovered in small amounts both on the surface and in the midden.

It is interesting to note that none of the sites tested in 1992 yielded evidence for specialized features or feature functions. No obvious patterns emerge from the welter of features at Blackwater, for example, nor can we do much with the data from Jolly or Emerson. Although we found numerous features at all of the sites, especially relative to the amount of earth moved, none of the features can be identified with any special function, except several possible hearths. This is especially true of the Blackwater site. A number of possible postmolds were identified, but they do not contain debris characteristic of postmolds. No obvious storage features were discovered, nor were any kilns or other kinds of functionally specific features identified. Since our spatial sample is really quite limited we should not make too much of this lack of patterning, but it is tempting to see these sites as being economically and politically highly generalized settlements.

At none of the sites could we identify clear-cut evidence of social differentiation or even spatial variation in material remains. Artifacts clustered in spatially discrete localities, but this is interpreted as reflecting the probable locations of structures, or in the case of the Jolly site, the midden concentration. Evidence for high prestige or status goods was limited at all sites. Jolly seemed to be the site with the least evidence of economically diverse material goods. The ceramic and lithic assemblages were limited, and non-local materials were rare. Jolly is also the site most likely to be closely associated with a nearby mound center, in this case the Balmoral site. At Blackwater and Emerson there were some non-local goods, especially lithic remains, but they were still rare. A fragment of a chunkey stone from Blackwater is really the only evidence of non-subsistence related activities at any of the sites. These occupations seem to be best characterized as subsistence oriented occupations, perhaps linked to a larger social and political system, but perhaps only loosely.

As seems to be the case in most instances, our research in 1992 has raised more questions than it could hope to answer. The sites we tested were both typical of what we could expect and yet they raise tantalizing and intriguing possibilities for further research. Most especially we need to open up larger areas. We still cannot address what we see as the crucial problem of community organization. How were these sites integrated in terms of community or household arrangements. Were they hamlets, farmsteads, or villages? We still cannot confidently answer these questions, although we feel that we are considerably farther along now than we were only a year ago.

Management Concerns

Although our research has raised a number of questions about culture history and behavior, we feel that it has positively answered some of our concerns about site integrity and the management issues associated with small occupations without evident architecture. We articulated a concern at the beginning about how these sites need to be approached from an archaeological standpoint. We felt then, and we feel even more strongly now, that these small, generally unspectacular sites, were a resource being ignored by archaeologists and planners. Our investigations at Jolly, Blackwater, and Emerson demonstrate, we feel conclusively, that these sites have a high potential to yield important information about prehistoric behavior, subsistence, and lifeways. Our methods of targeting smaller, but often single component, sites appears to have been appropriate in that the return on our investment seems to be relatively high. Moreover, we have shown the extent of the potential of these sites in terms of recovering intact features and fragments of community plans.

The archaeology of the Lower Mississippi valley has long been dominated by the paradigm of culture history and its resulting emphasis on vertical stratigraphic excavations. Our work has shown that equally valid data can be recovered within a broader paradigm of behaviorally oriented research which utilizes a more flexible methodological repertoire. We believe strongly now in the necessity of increasing our horizontal exposure of small sites to determine community plans and to explore synchronic variation across and between sites. Testing in 1992 indicated, however, that this approach will need to be tempered by considerations of site integrity, depth of midden deposits, and the expectable returns based on analysis of surface remains. These considerations are not new to North American archaeology, and in fact are important aspects of archaeological research planning elsewhere. Researchers in the Lower Mississippi Valley can no longer afford the luxury of ignoring the data available from these contexts.

Based on our assessment of the archaeological resources at the Jolly, Blackwater, and Emerson sites, and through our evaluation of the remains recovered, we believe that all three sites deserve consideration for inclusion in the National Register of Historic Places. The Jolly site derives its significance from the quality and quantity of remains present in both the intact midden and in its subsurface features. Its proximity to the Balmoral site makes it an ideal candidate for future exploration of the relationship between mound and non-mound communities. As a single component Balmoral phase occupation, Jolly represents perhaps one of the best opportunities yet found to examine the community structure of a late Coles Creek culture occupation. The Blackwater site is significant largely because of its chronological position and the fact that it is a single component occupation dating to the transitional period between Coles Creek and Plaquemine culture. Our investigation at the northern end of the site, where cultural remains were relatively less dense than further south, revealed over 100 intact features in the subsoil. The potential for exposing and delimiting a Preston phase community at Blackwater is immense and of potentially great significance. The lack of intact midden at the site is actually a boon for further research and certainly does not disqualify the site from consideration. The Emerson site represents one of the few well defined single component late Mississippi period hamlets or farmsteads in the entire Lower Mississippi Valley. Intact midden and subsurface features make this site remarkably important for the investigation of Mississippi period settlement and social behavior beyond mound or village contexts. Emerson is a surprisingly rare gem in this regard and deserves all of the protection that can be afforded.

None of the sites discussed in this report are immediately threatened by near-term land use activities. All will continue to suffer incremental damage from plowing and agricultural activities. Emerson is perhaps most threatened in this regard, as relatively deep plowing will hasten erosion and the ultimate destruction of the intact midden. These sites demonstrate, however, the fact that small, shallow occupations do have a story to tell. Moreover, even though these three sites may not be facing imminent destruction, many more throughout the Tensas Basin and Lower Mississippi Valley are. Archaeologists and planners need to recognize the potential of these small sites and focus their research accordingly. Clearly these sites can only tell part of the story, but it is an increasingly important part, and one which has not been heard from often enough.

REFERENCES CITED

Autin, Whitney J., Scott F. Burns, Bobby J. Miller, Roger T. Saucier, and John I. Snead
1991 Quaternary Geology of the Lower Mississippi Valley. In *The Geology of North America, Vol. K-2, Quaternary Nonglacial Geology; Conterminous United States*, edited by R. B. Morrison, pp. 547-582. Geological Society of America, Boulder.

Baker, William S., and Clarence H. Webb
1976 Catahoula Type Projectile Points. *Louisiana Archaeology* 3: 225-251.

Bareis, Charles J., and James W. Porter
1984 Research Design. In *American Bottom Archaeology*, edited by C.J. Bareis and J. W. Porter, pp. 1-14. University of Illinois Press, Chicago and Urbana.

Barker, Alex
1988 Coles Creek in the Heartland: Information Stress and Hierarchy Formation in Simple Chiefdoms. Paper presented at the 45th Annual Meeting of the Southeastern Archaeological Conference, New Orleans.

Belmont, John S.
1967 The Culture Sequence at the Greenhouse Site, Louisiana. *Southeastern Archaeological Conference Bulletin* 6: 27-34.

1980 Gold Mine (16RI13): Preliminary Report on the 1980 Season. Ms., Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge.

1982 Toltec and Coles Creek: A View from the Southern Lower Mississippi Valley. In *Emerging Patterns of Plum Bayou Culture*, edited by M.A. Rolingson, pp. 64-70. Arkansas Archeological Survey, Research Series 18, Fayetteville.

1983 Analysis of the Bone and Shell. In *Excavations at the Lake George Site, Yazoo County, Mississippi, 1958-1960*, by S. Williams and J. P. Brain, pp. 453-469. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University 74, Cambridge.

1984 The Troyville Concept and the Gold Mine Site. *Louisiana Archaeology* 9: 65-98.

1985 A Reconnaissance of the Boeuf Basin, Louisiana. *Louisiana Archaeology* 10: 271-284.

n.d. Typological Notes. Unpublished manuscript, Center For Archaeology, Tulane University, New Orleans.

Belmont, John S., and Stephen Williams
1981 Painted Pottery Horizons in the Southern Lower Mississippi Valley. *Geoscience and Man* 22: 19-42.

Bitgood, Mark J.
1989 *The Baytown Period in the Upper Tensas Basin*. Lower Mississippi Survey, Bulletin 12. Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge.

Brain, Jeffrey P.
1978 Late Prehistoric Settlement Patterning in the Yazoo Basin and Natchez Bluffs Regions of

the Lower Mississippi Valley. In *Mississippian Settlement Patterns*, edited by B.D. Smith, pp. 331-368. Academic Press, New York.

1989 *Winterville: Late Prehistoric Culture Contact in the Lower Mississippi Valley*. Mississippi Department of Archives and History, Archaeological Report 23, Jackson.

1991 Cahokia From the Southern Periphery. In *New Perspectives on Cahokia: Views From the Periphery*, edited by J. B. Stoltman, pp. 93-100. Monographs in World Archaeology 2. Prehistory Press, Madison.

Brain, Jeffrey P., Ian W. Brown, and Vincas P. Steponaitis
n.d. Archaeology of the Natchez Bluffs Region, Mississippi. Unpublished manuscript.

Brown, Ian W.
1985a *Natchez Indian Archaeology: Culture Change and Stability in the Lower Mississippi Valley*. Mississippi Department of Archives and History, Archaeological Report 15, Jackson.

1985b Plaquemine Architectural Patterns in the Natchez Bluffs and Surrounding Regions of the Lower Mississippi Valley. *Midcontinental Journal of Archaeology* 10: 251-305.

Byrd, Kathleen M.
n.d. Marksville Faunal Use: Material from Mansford Plantation. Paper Presented at the 4th Annual Meeting of the Louisiana Archaeological Society, Baton Rouge.

Byrd, Kathleen M., and Robert W. Neuman
1978 Archaeological Data Relative to Prehistoric Subsistence in the Lower Mississippi Alluvial Valley. *Geoscience and Man* 19:9-21.

Cotter, John L.
1952 The Gordon Site in Southern Mississippi. *American Antiquity* 18: 110-126.

Decker, Deena S.
1988 Origin(s), Evolution, and Systematics of Cucurbita pepo (Cucurbitaceae). *Economic Botany* 42: 3-15.

Decker-Walker, Deena S.
1990 Evidence of Multiple Domestications of Cucurbita pepo. In *Biology and Utilization of the Cucurbitaceae*, edited by D.M. Bates, R.W. Robinson, and C. Jeffrey, pp. 96-101. Cornell University Press, Ithaca.

Espenshade, Christopher T., and B.G. Southerlin
1988 Limited Data Recovery Excavations at 16MO103 and 16MO60, Morehouse Parish, Louisiana. Report submitted to ANR Pipeline Co., Inc. Brockington and Associates, Atlanta.

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.

Ford, James A.
1951 *Greenhouse: A Troyville-Coles Creek Period Site in Avoyelles Parish, Louisiana*. Anthropological Papers Vol. 44, Pt. 1. American Museum of Natural History, New York.

Fowler, Melvin L.
1991 Mound 72 and Early Mississippian at Cahokia. In *New Perspectives on Cahokia: Views From the Periphery*, edited by J. B. Stoltman, pp. 1-28. Monographs in World Archaeology 2. Prehistory Press, Madison.

Fritz, Gayle J.
1990 Multiple Pathways to Farming in Precontact Eastern North America. *Journal of World Prehistory* 4: 387-435.

Fritz, Gayle J., and Tristram R. Kidder
1993. Recent Investigations Into Prehistoric Agriculture in the Lower Mississippi Valley. *Southeastern Archaeology* 12: 1-14.

Fritz, Gayle J., Christopher J. Smith, and Tristram R. Kidder
1992 Plaquemine Plant Use in Tensas Parish, Louisiana. Paper presented at the 49th Annual Meeting of the Southeastern Archaeological Conference, Little Rock.

Fuller, Richard S., Jr.
1985 *Archaeological Survey of the Southern Boeuf Basin, Louisiana: 1984*. Boeuf Basin Research Notes 2, Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge.

Fuller, Richard S. Jr., and David B. Kelley
1993 *Archaeological Survey and Testing Within Items 4-A and 4-B of the Sicily Island Levee Project, Catahoula Parish, Louisiana*. Coastal Environments Inc., Baton Rouge.

Gibson, Jon L.
1977 *Archaeological Survey of Portions of Little River, Boeuf River, and Big Creek, East Central and Northeastern Louisiana*. Center for Archaeological Studies, University of Southwestern Louisiana, Lafayette

1984 The Troyville-Baytown Issue. *Louisiana Archaeology* 9: 29-62.

1985 An Evaluatory History of Archaeology in the Ouachita Valley of Louisiana. *Louisiana Archaeology* 10: 25-101.

1987 Punctuating Lower Mississippi Valley Prehistory, a Hyphen or a Period Between Troyville and Coles Creek. In *The Emergent Mississippian: Proceedings of the Sixth Mid-South Conference, June 6-9, 1985*, edited by R. A. Marshall, pp. 71-84. Cobb Institute of Archaeology, Mississippi State University, Occasional Papers 87-01. Cobb Institute of Archaeology, Starkville, Mississippi.

Greengo, Robert E.
1964 *Issaquena: An Archaeological Phase in the Yazoo Basin of the Lower Mississippi Valley*. Memoirs of the Society for American Archaeology 18.

Guccione, M.J., R. H. Lafferty III, and L. Scott Cummings
1988 Environmental Constraints of Human Settlement in an Evolving Holocene Alluvial System, The Lower Mississippi Valley. *Geoarchaeology* 3: 65-84.

Gulf South Research
1974 *Environmental Assessement in the Tensas River Basin*. Gulf South Research Institute, Baton Rouge.

Hally, David J.
1967 Post-Coles Creek Cultural Development in the Upper Tensas Basin of Louisiana. *Southeastern Archaeological Conference Bulletin* 6: 35-41.

1972 *The Plaquemine and Mississippian Occupations of the Upper Tensas Basin, Louisiana.* Unpublished Ph.D. dissertation, Department of Anthropology, Harvard University, Cambridge.

House, John H.
1992 Boydell: Three Centuries at a Prehistoric Ceremonial Center in Southeast Arkansas. Paper presented at the 49th Southeastern Archaeological Conference, Little Rock.

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. University Microfilms, Ann Arbor.

Jones, Reca B.
1979 Human Effigy Vessels from Gold Mine Plantation. *Louisiana Archaeology* 4: 117-121.

1987 The Panola Plantation Site: A Plaquemine Burial Mound in Northeast Louisiana. *Louisiana Archaeology* 11: 139-163.

Kelley, David B.
1990 *Coles Creek Period Faunal Exploitation in the Ouachita River Valley of Southern Arkansas: The Evidence From the Paw Paw Site.* Ph.D. dissertation, Tulane University, New Orleans. Ann Arbor: University Microfilms.

Kidder, Tristram R.
1986 *Final Report on Archaeological Test Excavations in the Central Boeuf Basin, Louisiana, 1985.* Lower Mississippi Survey Bulletin 10. Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge.

1988 *Protohistoric and Early Historic Culture Dynamics in Southeast Arkansas and Northeast Louisiana, A.D. 1542-1730.* Ph.D. Dissertation, Harvard University. University Microfilms, Ann Arbor.

1990a *Final Report on the 1989 Archaeological Investigations at the Osceola (16TE2) and Reno Brake (16TE93) Sites, Tensas Parish, Louisiana.* Center For Archaeology, Archaeological Report 1. Tulane University, New Orleans.

1990b Ceramic Chronology and Culture History of the Southern Ouachita River Basin: Coles Creek to the Early Historic Period. *Midcontinental Journal of Archaeology* 15: 51-99.

1990c The Ouachita Indians of Louisiana: An Ethnohistorical and Archaeological Investigation. *Louisiana Archaeology* 12: 179-202.

1992a Coles Creek Period Social Organization and Evolution in Northeast Louisiana. In *Lords of the Southeast: Social Inequality and the Native Elites of Southeastern North America*, edited by A. Barker and T. Pauketat, pp. 145-162. Archaeological Papers of the American Anthropological Association 3, Washington, D.C.

1992b Timing and Consequences of the Introduction of Maize Agriculture in the Lower

Mississippi Valley. *North American Archaeologist* 13: 15-41.

1992c Excavations at the Jordan Site (16MO1), Morehouse Parish, Louisiana. Southeastern Archaeology 11(2):109-131.

Kidder, Tristram R., and Gayle J. Fritz
1993 Investigating Subsistence and Social Change in the Lower Mississippi Valley: The 1989 and 1990 Excavations at the Reno Brake and Osceola Sites, Tensas Parish, Louisiana. *Journal of Field Archaeology*, in press.

Kidder, Tristram R., and Douglas C. Wells
1992 Baytown Period Settlement Organization in the Lower Mississippi Valley. Paper presented at the 49th Annual Meeting of the Southeastern Archaeological Conference, Little Rock.

Krueger, Harold W., and Charles F. Weeks
1966 GeoChron Laboratories, Inc. Radiocarbon Measurements II. *Radiocarbon* 8: 142-160.

Lambou, Victor W.
1959 Fish Populations of Backwater Lakes in Louisiana. *Transactions of the American Fisheries Society* 88: 7-15.

1960 Fish Populations of Mississippi River Oxbow Lakes in Louisiana. *Proceedings of the Louisiana Academy of Sciences* 23: 52-64.

Lambou, Victor W., and Donald W. Geagan
1961 Fish Populations of Alluvial Floodplain Lakes in Louisiana. *Proceedings of the Louisiana Academy of Sciences* 24: 95-115.

Lantz, Kenneth E.
1970 An Ecological Survey of Factors Affecting Fish Production in a Louisiana Backwater Area and River. *Louisiana Wildlife and Fisheries Commission, Dingell-Johnson Project Fisheries Bulletin* 5.

Mariaca, Maria Teresa
1988 *Late Marksville/Early Baytown Period Subsistence Economy: Analysis of Three Faunal Assemblages from Northeastern Louisiana*. Unpublished M.A. Thesis, Department of Archaeology, Boston University, Boston.

Nassaney, Michael S.
1987 On the Causes and Consequences of Subsistence Intensification in the Mississippi Alluvial Valley. In *Emergent Horticultural Economies of the Eastern Woodlands*, edited by W. F. Keegan, pp. 129-151. Southern Illinois University at Carbondale Center For Archaeological Investigations, Occasional Paper 7. Southern Illinois University Press, Carbondale.

1991 Spatial-Temporal Dimensions of Social Integration During the Coles Creek Period in Central Arkansas. In *Stability, Transformation, and Variation: The Late Woodland Southeast*, edited by M. S. Nassaney and C. R. Cobb, pp. 177-220. Plenum Press, New York.

Neuman, Robert W.
1984 *An Introduction to Louisiana Archaeology*. Louisiana State University Press, Baton Rouge.

Quimby, George I.
1957 The Bayou Goula Site, Iberville Parish, Louisiana. *Fieldiana: Anthropology* 47(2): 91-170.

Chicago Museum of Natural History, Chicago.

Phillips, Philip
1970 *Archaeological survey in the Lower Yazoo Basin, Mississippi, 1949-1955.* Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University 60, Cambridge.

Price, G.R. Dennis
1990 Archeological Site Testing, Site 16TE61, Tensas Parish, Louisiana. Draft Report, Division of Archaeology, Louisiana Department of Culture, Recreation, and Tourism, Baton Rouge.

Rolingson, Martha A.
1990 The Toltec Mounds Site: a Ceremonial Center in the Arkansas River Lowland. In *The Mississippian Emergence*, edited by B. D. Smith, pp. 27-49. Smithsonian Institution Press, Washington, D.C.

Rose, Jerome C., Barbara A. Burnett, Mark W. Blaeuer, and Michael S. Nassaney
1984 Paleopathology and the Origins of Maize Agriculture in the Lower Mississippi Valley and Caddoan Culture Areas. In *Paleopathology at the Origins of Agriculture*, edited by M.N. Cohen and G. Armalagos, pp. 393-424. Academic Press, Orlando.

Rose, Jerome C., Murray K. Marks, and Larry L. Tieszen
1991 Bioarchaeology and Subsistence in the Central and Lower Portions of the Mississippi Valley. In *What Mean These Bones?*, edited by M. L. Powell, P. S. Bridges, and A. M.W. Mires, pp. 7-21. University of Alabama Press, Tuscaloosa, AL.

St. Amant, Lyle S.
1959 *Louisiana Wildlife Inventory*. Louisiana Wildlife and Fisheries Commission, New Orleans.

Saucier, Roger T.
1967 *Geological Investigation of the Boeuf-Tensas Basin, Lower Mississippi Valley.* U.S. Army Corps of Engineers, Waterways Experiment Station, Technical Report 3-757, Vicksburg.

1974 *Quaternary Geology of the Lower Mississippi Valley.* Arkansas Archeological Survey, Research Series 6, Fayetteville.

1981 Current Thinking on Riverine Processes and Geological History as Related to Human Settlement in the Southeast. *Geoscience and Man* 22: 7-18.

1983 Geomorphological Considerations. In *Cultural Resources Survey of Items 3 and 4, Upper Yazoo River Projects, Mississippi, with a Paleoenvironmental Model of the Lower Yazoo Basin*, Apendix IV. Center for Archaeological Research, University of Mississippi.

1985 Fluvial Response to Late Quaternary Climatic Change in the Lower Mississippi Valley. *Geological Society of America Abstracts with Programs* 17: 190.

1990 The Geomorphic Context of the Osceola Site, Tensas Parish, Louisiana. In *Final Report on the 1989 Archaeological Investigations at the Osceola (16TE2) and Reno Brake (16TE93) Sites, Tensas Parish, Louisiana*, by Tristram R. Kidder, Appendix I. Tulane University, Center For Archaeology, Archaeological Report 1, New Orleans.

Smith, Bruce D.
1987 The Independent Domestication of Indigenous Seed-Bearing Plants in Eastern North America. In *Emergent Horticultural Economies of the Eastern Woodlands*, edited by W. F. Keegan, pp. 3-47. Southern Illinois University at Carbondale Center For Archaeological Investigations, Occasional Paper 7. Southern Illinois University Press, Carbondale.

1989 Origins of Agriculture in Eastern North America. *Science* 246: 1566-1571.

Smith, Bruce D., C. Wesley Cowan, and Michael P. Hoffman
1992 Is It an Indigene or a Foreigner? In *Rivers of Change*, by B.D. Smith, pp. 67-100. Smithsonian Institution Press, Washington, D.C.

Smith, Steven D., Philip G. Rivet, Kathleen M. Byrd, and Nancy W. Hawkins
1983 *Louisiana's Comprehensive Archaeological Plan*. Louisiana Division of Archaeology, Department of Culture, Recreation, and Tourism, Office of Cultural Development, Baton Rouge.

Springer, James W.
1980 An Analysis of Prehistoric Food Remains from the Bruly St. Martin Site, Louisiana, With a Comparative Discussion of Mississippi Valley Faunal Studies. *Midcontinental Journal of Archaeology* 5: 193-224.

Steponaitis, Vincas P.
1986 Prehistoric Archaeology in the Southeastern United States, 1970-1985. *Annual Review of Anthropology* 15: 363-404.

Stuiver, Minze, and Gordon W. Pearson
1986 High-Precision Calibration of the Radiocarbon Time Scale, A.D. 1950-500 B.C. *Radiocarbon* 28(2B): 805-838.

Swanton, John R.
1911 *Indian Tribes of the Lower Mississippi Valley and Adjacent Coast of the Gulf of Mexico*. Bulletin 43. Bureau of American Ethnology, Washington, D.C.

Thompson, Richard C., Robert A. Muller, and Stephen H. Crawford
1983 *Climate at the Northeast Research Station St. Joseph, Louisiana 1931-1980*. Louisiana Agricultural Experiment Station Bulletin 755, Baton Rouge.

Toth, Edwin A.
1988 *Early Marksville Phases in the Lower Mississippi Valley: A Case Study of Culture Contact Dynamics*. Mississippi Department of Archives and History, Archaeological Report 21, Jackson.

Watson, Patty Jo
1976 In Pursuit of Prehistoric Subsistence: A Comparative Account of Some Contemporary Flotation Techniques. *Midcontinental Journal of Archaeology* 1: 77-100.

1989 Early Plant Cultivation in the Eastern Woodlands of North America. In *Foraging and Farming: The Evolution of Plant Exploitation*, edited by D. R. Harris and G. C. Hillman, pp. 555-571. Unwin Hyman, London.

Webb, Clarence H.
1981 Stone Points and Tools of Northwestern Louisiana. *Louisiana Archaeological Society Special Publication* 1.

Webb, Clarence H., and Monroe Dodd
1939 Further Excavations of the Gahagan Mound: Connections with a Florida Culture. *Bulletin of the Texas Archeological and Paleontological Society* 11: 92-127.

Webb, Clarence H., and Ralph R. McKinney
1975 Mounds Plantation (16CD12), Caddo Parish, Louisiana. *Louisiana Archaeology* 2: 39-127.

Weems, Tracey A., Charles E. Martin, Garland P. Colvin, Stanley D. Mathews, Billie B. Nutt, Robert F. Letlow, and Robert L. Leuth
1968 *Soil Survey of Tensas Parish, Louisiana.* U.S. Department of Agriculture, Soil Conservation Service, Washington.

Weinstein, Richard A.
1985 Development and Regional Variation of Plaquemine Culture in South Louisiana. In *The Emergent Mississippian: Proceedings of the Sixth Mid-South Conference, June 6-9, 1985,* edited by R. A. Marshall, pp. 85-106. Cobb Institute of Archaeology, Mississippi State University, Occasional Papers 87-01. Cobb Institute of Archaeology, Starkville, Mississippi.

Weinstein, Richard A., Wayne P. Glander, Sherwood M. gagliana, Eileen K. Burden, and Kathleen G. McCloskey
1979 *Cultural Resources Survey of the Upper Steele Bayou Basin, West-Central Mississippi.* Coastal Environments, Inc., Baton Rouge.

Welch, Paul D.
1990 Mississippian Emergence in West-Central Alabama. In *The Mississippian Emergence*, edited by B. D. Smith, pp. 197-225. Smithsonian Institution Press, Washington, D.C.

Williams, Stephen
1967 On the Location of the Historic Taensa Villages. *Conference on Historic Site Archaeology Papers 1965-1966* 1: 3-13.

Williams, Stephen, William Kean, and Alan Toth
1966 *The Archaeology of the Upper Tensas Basin.* Lower Mississippi Survey, Bulletin 1. Lower Mississippi Survey, Peabody Museum, Harvard University, Cambridge.

Williams, Stephen, and Jeffrey P. Brain
1983 *Excavations at the Lake George Site, Yazoo County, Mississippi, 1958-1960.* Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University 74, Cambridge.

APPENDIX A1: Provenience of Surface Collected Ceramics From Jolly (16TE103)

	Collection Unit	*149.8W 0S*			*129.8W 0S*			*119.8W 0S*			*109.8W 0S*			*99.8W 0S*			***TOTAL***
Type	*variety*	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Baytown Plain	*var. unspecified*		1	1		3	3		3	3		5	5		4	4	***16***
Total Plain Ceramics		0	1	1	0	3	3	0	3	3	0	5	5	0	4	4	***16***
Total Ceramics		***0***	***1***	***1***	***0***	***3***	***3***	***0***	***3***	***3***	***0***	***5***	***5***	***0***	***4***	***4***	***16***

	Collection Unit	*149.8W 10S*			*139.8W 10S*			*129.8W 10S*			*119.8W 10S*			*109.8W 10S*			*99.8W 10S*			***TOTAL***
Type	*variety*	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Coles Creek Incised,	*var. Coles Creek*			0			0			0			0		1	1			0	***1***
Coles Creek Incised,	*var. unspecified*			0			0			0			0		1	1			0	***1***
Mazique Incised,	*var. Preston*			0	1		1			0			0			0			0	***1***
Total Decorated Ceramics		0	0	0	1	0	1	0	0	0	0	0	0	0	2	2	0	0	0	***3***
Baytown Plain,	*var. unspecified*		4	4		7	7		5	5		35	35		34	34		3	3	***88***
Bowls																				
Simple, Round				0			0			0			0	1		1			0	***1***
Total Bowl Rims		0		0	0		0	0		0	0		0	1		1	0		0	***1***
Jars																				
Simple, Flat				0			0			0	3		3	2		2	1		1	***6***
Total Jar Rims		0		0	0		0	0		0	3		3	2		2	1		1	***6***
Beakers																				
"Vicksburg"				0			0			0	1		1			0			0	***1***
Total Beaker Rims		0		0	0		0	0		0	1		1	0		0	0		0	***1***
Total Plain Rims		0			0			0			4			3			1			***8***
Total Plain Ceramics		0	4	4	0	7	7	0	5	5	4	35	39	3	34	37	1	3	4	***96***
Total Ceramics		***0***	***4***	***4***	***1***	***7***	***8***	***0***	***5***	***5***	***4***	***35***	***39***	***3***	***36***	***39***	***1***	***3***	***4***	***99***

Type	*Collection Unit* / *variety*	*149.8W 20S* Rim	Body	Total	*139.8W 20S* Rim	Body	Total	*129.8W 20S* Rim	Body	Total	*119.8W 20S* Rim	Body	Total	*109.8W 20S* Rim	Body	Total	*99.8W 20S* Rim	Body	Total	*89.8W 20S* Rim	Body	Total	***TOTAL***
Coles Creek Incised,	*var. Coles Creek*			0			0	1		1	1		1	1	2	3			0			0	***5***
Coles Creek Incised,	*var. Mott*			0			0			0		2	2		1	1			0			0	***3***
Coles Creek Incised,	*var. unspecified*			0			0			0			0		1	1		1	1			0	***2***
French Fork Incised,	*var. McNutt*			0			0			0		1	1			0			0			0	***1***
Unclassified Incised	*on Baytown Plain*			0			0		2	2		1	1			0			0			0	***3***
Total Decorated Ceramics		0	0	0	0	0	0	1	2	3	1	4	5	1	4	5	0	1	1	0	0	0	***14***
Baytown Plain,	*var. unspecified*		3	3		9	9		51	51		322	322		346	346		53	53		2	2	***786***
Bowls																							
Simple, Round				0			0			0	3		3	2		2			0			0	***5***
Simple, Flat				0			0	1		1	2		2			0			0			0	***3***
Warped, Round				0			0			0			0	1		1			0			0	***1***
Tapered				0			0			0	1		1			0			0			0	***1***
Total Bowl Rims		0		0	0		0	1		1	6		6	3		3	0		0	0		0	***10***
Jars																							
Simple, Round				0			0			0			0	1		1			0			0	***1***
Simple, Flat				0			0			0	10		10	3		3			0			0	***13***
Total Jar Rims		0		0	0		0	0		0	10		10	4		4	0		0	0		0	***14***
Beakers																							
Tapered				0			0			0	2		2	1		1	1		1			0	***4***
Total Beaker Rims		0		0	0		0	0		0	2		2	1		1	1		1	0		0	***4***
Indeterminate Rims																							
Simple, Round				0			0	2		2	1		1	1		1			0			0	***4***
Simple, Flat				0			0			0	2		2			0			0			0	***2***
Total Plain Rims		0		0	0		0	3		3	21		21	9		9	1		1	0		0	***34***
Bases																							
Indeterminate			1	1			0			0		3	3			0			0			0	***4***
Total Bases			1	1		0	0		0	0		3	3		0	0		0	0		0	0	***4***
Total Plain Ceramics		0	4	4	0	9	9	3	51	54	21	325	346	9	346	355	1	53	54	0	2	2	***824***
Total Ceramics		***0***	***4***	***4***	***0***	***9***	***9***	***4***	***53***	***57***	***22***	***329***	***351***	***10***	***350***	***360***	***1***	***54***	***55***	***0***	***2***	***2***	***838***

Appendix A1: Provenience of Surface Collected Ceramics From Jolly (16TE103)

Type	variety	*149.8W 30S* Rim	Body	Total	*139.8W 30S* Rim	Body	Total	*129.8W 30S* Rim	Body	Total	*119.8W 30S* Rim	Body	Total	*109.8W 30S* Rim	Body	Total	*99.8W 30S* Rim	Body	Total	*79.8W 30S* Rim	Body	Total	***TOTAL***
Collection Unit																							
Coles Creek Incised,	*var. Coles Creek*			0			0	1		1			0			0			0			0	***1***
Coles Creek Incised,	*var. Hilly Grove*			0			0		2	2		1	1			0			0			0	***3***
Coles Creek Incised,	*var. Mott*			0			0		3	3	2	5	7	1	2	3			0			0	***13***
Coles Creek Incised,	*var. unspecified*			0			0		1	1		5	5	1		1			0			0	***7***
Evansville Punctated,	*var. unspecified*			0			0			0			0		1	1			0			0	***1***
Mazique Incised,	*var. Kings Point*			0			0			0		1	1			0			0			0	***1***
Unclassified Incised	*on Baytown Plain*			0			0		1	1		4	4		2	2			0			0	***7***
Unclassified Interior Incised				0			0			0		1	1	1		1			0			0	***2***
Total Decorated Ceramics		0	0	0	0	0	0	1	7	8	2	17	19	3	5	8	0	0	0	0	0	0	***35***
Baytown Plain,	*var. unspecified*		3	3		10	10		178	178		835	835		434	434		48	48		18	18	***1526***
Bowls																							
Simple, Round				0			0	3		3	3		3	3		3			0			0	***9***
Simple, Flat				0			0	2		2	4		4			0			0			0	***6***
Warped, Flat				0			0			0			0	1		1			0			0	***1***
Warped, Round				0			0	1		1			0			0			0			0	***1***
Thickened, Round				0			0			0	1		1			0			0			0	***1***
Interior Bevel				0			0			0	3		3	1		1			0			0	***4***
Total Bowl Rims		0		0	0		0	6		6	11		11	5		5	0		0	0		0	***22***
Jars																							
Simple, Flat				0			0	7		7	7		7	6		6	1		1			0	***21***
Flaring, Round				0			0			0	2		2			0			0			0	***2***
Exterior Bevel, Restricted				0			0			0			0	1		1			0			0	***1***
Tapered				0			0			0	1		1			0			0			0	***1***
Total Jar Rims		0		0	0		0	7		7	10		10	7		7	1		1	0		0	***25***
Beakers																							
"Vicksburg"				0			0			0	4		4			0			0			0	***4***
Tapered				0			0	1		1	1		1	4		4	1		1			0	***7***
Total Beaker Rims		0		0	0		0	1		1	5		5	4		4	1		1	0		0	***11***
Indeterminate Rims																							
Simple, Round				0	1		1	3		3	5		5	4		4			0			0	***13***
Simple, Flat				0			0	1		1	4		4	2		2			0			0	***7***
Total Plain Rims		0		0	1		1	18		18	35		35	22		22	2		2	0		0	***78***
Total Plain Ceramics		0	3	3	1	10	11	18	178	196	35	835	870	22	434	456	2	48	50	0	18	18	***1604***
Total Ceramics		***0***	***3***	***3***	***1***	***10***	***11***	***19***	***185***	***204***	***37***	***852***	***889***	***25***	***439***	***464***	***2***	***48***	***50***	***0***	***18***	***18***	***1639***

Appendix A1: Provenience of Surface Collected Ceramics From Jolly (16TE103)

	Collection Unit	*149.8W 40S*			*139.8W 40S*			*129.8W 40S*			*119.8W 40S*			*109.8W 40S*			*99.8W 40S*			*89.8W 40S*			*79.8W 40S*			***TOTAL***
Type	*variety*	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Coles Creek Incised,	*var. Coles Creek*			0			0			0			0			0	1	2	3			0			0	***3***
Coles Creek Incised,	*var. Greenhouse*			0			0			0			0			0	2		2			0			0	***2***
Coles Creek Incised,	*var. Hilly Grove*			0			0			0			0		1	1			0			0			0	***1***
Coles Creek Incised,	*var. Mott*			0			0			0			0			0		4	4			0			0	***4***
Coles Creek Incised,	*var. unspecified*			0			0		3	3			0	1	3	4			0			0			0	***7***
French Fork Incised,	*var. McNutt*			0			0			0			0			0		2	2			0			0	***2***
Unclassified Incised	*on Baytown Plain*			0			0		1	1			0			0		4	4			0			0	***5***
Unclassified Interior Incised				0			0			0			0			0		1	1			0			0	***1***
Total Decorated Ceramics		0	0	0	0	0	0	0	4	4	0	0	0	1	4	5	3	13	16	0	0	0	0	0	0	***25***
Baytown Plain,	*var. unspecified*		3	3		23	23		76	76		181	181		90	90		576	576		1	1		1	1	***951***
Bowls																										
Simple, Round				0	1		1			0			0			0	4		4			0			0	***5***
Simple, Flat				0			0			0			0	1		1	2		2			0			0	***3***
Warped, Round				0			0			0			0			0	1		1			0			0	***1***
Tapered				0			0			0			0			0	2		2			0			0	***2***
Thickened, Round				0			0	1		1			0			0			0			0			0	***1***
Interior Bevel				0			0			0			0			0			0			0	1		1	***1***
Total Bowl Rims		0		0	1		1	1		1	0		0	1		1	9		9	0		0	1		1	***13***
Jars																										
Simple, Flat				0			0			0	1		1	1		1	11		11			0			0	***13***
Flaring, Round				0			0			0			0			0	3		3			0			0	***3***
Exterior Bevel				0			0			0			0			0	2		2			0			0	***2***
Exterior Bevel, Restricted				0			0			0			0			0	1		1			0			0	***1***
Total Jar Rims		0		0	0		0	0		0	1		1	1		1	17		17	0		0	0		0	***19***
Beakers																										
"Vicksburg"				0			0			0			0			0	2		2			0			0	***2***
Tapered				0			0			0	1		1			0	1		1			0			0	***2***
Total Beaker Rims		0		0	0		0	0		0	1		1	0		0	3		3	0		0	0		0	***4***
Indeterminate Rims																										
Simple, Round				0			0			0			0			0	3		3			0			0	***3***
Simple, Flat				0			0			0			0			0	2		2			0			0	***2***
Total Plain Rims		0		0	1		1	1		1	2		2	2		2	34		34	0		0	1		1	***41***
Total Plain Ceramics		0	3	3	1	23	24	1	76	77	2	181	183	2	90	92	34	576	610	0	1	1	1	1	2	***992***
Total Ceramics		***0***	***3***	***3***	***1***	***23***	***24***	***1***	***80***	***81***	***2***	***181***	***183***	***3***	***94***	***97***	***37***	***589***	***626***	***0***	***1***	***1***	***1***	***1***	***2***	***1017***

Appendix A1: Provenience of Surface Collected Ceramics From Jolly (16TE103)

Type	variety	*149.8W 50S* Rim	Body	Total	*139.8W 50S* Rim	Body	Total	*129.8W 50S* Rim	Body	Total	*119.8W 50S* Rim	Body	Total	*109.8W 50S* Rim	Body	Total	*99.8W 50S* Rim	Body	Total	*79.8W 50S* Rim	Body	Total	***TOTAL***
Coles Creek Incised,	*var. unspecified*			0			0			0			0		1	1			0			0	*1*
Unclassified Incised	*on Baytown Plain*			0			0			0			0			0		1	1			0	*1*
Unclassified Interior Incised			1	1			0			0			0			0			0			0	*1*
Total Decorated Ceramics		0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	*3*
Baytown Plain,	*var. unspecified*		1	1		23	23		18	18		49	49		115	115		84	84		3	3	*293*
Bowls																							
Simple, Round				0			0			0			0	2		2			0			0	*2*
Simple, Flat				0			0			0			0	1		1			0			0	*1*
Total Bowl Rims		0		0	0		0	0		0	0		0	3		3	0		0	0		0	*3*
Jars																							
Simple, Flat				0			0			0			0	4		4			0			0	*4*
Total Jar Rims		0		0	0		0	0		0	0		0	4		4	0		0	0		0	*4*
Indeterminate Rims																							
Simple, Round				0			0			0	3		3			0			0			0	*3*
Simple, Flat				0			0			0			0			0	1		1			0	*1*
Total Plain Rims		0		0	0		0	0		0	3		3	7		7	1		1	0		0	*11*
Bases																							
Indeterminate				0			0			0			0		1	1			0			0	*1*
Total Bases			0	0		0	0		0	0		0	0		1	1		0	0		0	0	*1*
Total Plain Ceramics		0	1	1	0	23	23	0	18	18	3	49	52	7	116	123	1	84	85	0	3	3	*305*
Total Ceramics		*0*	*2*	*2*	*0*	*23*	*23*	*0*	*18*	*18*	*3*	*49*	*52*	*7*	*117*	*124*	*1*	*85*	*86*	*0*	*3*	*3*	*308*

Appendix A1: Provenience of Surface Collected Ceramics From Jolly (16TE103)

Type	*variety*	***149.8W 60S*** Rim	Body	Total	***139.8W 60S*** Rim	Body	Total	***129.8W 60S*** Rim	Body	Total	***119.8W 60S*** Rim	Body	Total	***109.8W 60S*** Rim	Body	Total	***99.8W 60S*** Rim	Body	Total	***TOTAL***
Coles Creek Incised,	*var. unspecified*			0			0			0	1	1	2			0			0	***2***
Mazique Incised,	*var. unspecified*			0			0			0	1		1			0			0	***1***
Unclassified Incised	*on Baytown Plain*			0			0			0		5	5	1	1	2			0	***7***
Total Decorated Ceramics		0	0	0	0	0	0	0	0	0	2	6	8	1	1	2	0	0	0	***10***
Baytown Plain,	*var. unspecified*		1	1		5	5		27	27		235	235		79	79		10	10	***357***
Bowls																				
Simple, Round				0			0			0	3		3			0			0	***3***
Simple, Flat		1		1			0			0	1		1			0			0	***2***
Total Bowl Rims		1		1	0		0	0		0	4		4	0		0	0		0	***5***
Jars																				
Simple, Flat		1		1			0			0	2		2	1		1			0	***4***
Total Jar Rims		1		1	0		0	0		0	2		2	1		1	0		0	***4***
Indeterminate Rims																				
Simple, Round				0			0			0	4		4			0			0	***4***
Simple, Flat				0			0			0	1		1	1		1			0	***2***
Total Plain Rims		2		2	0		0	0		0	11		11	2		2	0		0	***15***
Total Plain Ceramics		2	1	3	0	5	5	0	27	27	11	235	246	2	79	81	0	10	10	***372***
Total Ceramics		***2***	***1***	***3***	***0***	***5***	***5***	***0***	***27***	***27***	***13***	***241***	***254***	***3***	***80***	***83***	***0***	***10***	***10***	***382***

Appendix A1: Provenience of Surface Collected Ceramics From Jolly (16TE103)

Type	variety	Collection Unit: *149.8W 70S* Rim	Body	Total	*139.8W 70S* Rim	Body	Total	*129.8W 70S* Rim	Body	Total	*119.8W 70S* Rim	Body	Total	***TOTAL***
Coles Creek Incised,	*var. unspecified*			0			0		1	1			0	***1***
Total Decorated Ceramics		0	0	0	0	0	0	0	1	1	0	0	0	***1***
Baytown Plain,	*var. unspecified*		1	1		3	3		10	10		22	22	***36***
Beakers														
Tapered				0			0	1		1			0	***1***
Total Beaker Rims		0		0	0		0	1		1	0		0	***1***
Total Plain Rims		0		0	0		0	1		1	0		0	***1***
Total Plain Ceramics		0	1	1	0	3	3	1	10	11	0	22	22	***37***
Total Ceramics		***0***	***1***	***1***	***0***	***3***	***3***	***1***	***11***	***12***	***0***	***22***	***22***	***38***

Appendix A1: Provenience of Surface Collected Ceramics From Jolly (16TE103)

Type	*variety*	*149.8W 80S* Rim	Body	Total	*119.8W 80S* Rim	Body	Total	*129.8W 90S* Rim	Body	Total	*139.8W 100S* Rim	Body	Total	***TOTAL***
Baytown Plain, **Beakers**	*var. unspecified*		1	1		3	3		1	1		5	5	***10***
Tapered				0			0	1		1			0	***1***
Total Beaker Rims		0		0	0		0	1		1	0		0	***1***
Total Plain Rims		0		0	0		0	1		1	0		0	***1***
Total Plain Ceramics		0	1	1	0	3	3	1	1	2	0	5	5	***11***
Total Ceramics		***0***	***1***	***1***	***0***	***3***	***3***	***1***	***1***	***2***	***0***	***5***	***5***	***11***

Appendix A2: Provenience of Surface Collected Lithics From Jolly (16TE103)

Collection Unit	*119W 0S*	*109W 0S*	***TOTAL***
Chipped Stone			
Hammerstone		1	***1***
Flake Cores	2		***2***
Tested Pebbles	1		***1***
Unmodified Pebbles	1	1	***2***
Total Lithics	***4***	***2***	***6***

Collection Unit	*149W 10S*	*139W 10S*	*119W 10S*	*109W 10S*	*99W 10S*	***TOTAL***
Chipped Stone						
Tested Pebbles			1			***1***
Utilized flakes				1		***1***
Shatter						
Local Chert		1				***1***
Groundstone						
Quartzite Celt (?) Fragment					1	***1***
Unmodified Pebbles	2				1	***3***
Total Lithics	***2***	***1***	***1***	***1***	***2***	***7***

Collection Unit	*139W 20S*	*129W 20S*	*119W 20S*	*109W 20S*	*99W 20S*	***TOTAL***
Chipped Stone						
Hammerstone			3			***3***
Flake Cores			2	1		***3***
Utilized flakes		1				***1***
Unutilized flakes						
Local Pebble Chert		1	2	1		***4***
Shatter						
Local Chert	1				3	***4***
Burned Debitage	1		6	1		***8***
Groundstone						
Hematite			1			***1***
Unmodified Pebbles			2	2	1	***5***
Total Lithics	***2***	***2***	***16***	***5***	***4***	***29***

Appendix A2: Provenience of Surface Collected Lithics From Jolly (16TE103)

Collection Unit	*129W 30S*	*119W 30S*	*109W 30S*	*99W 30S*	*79W 30S*	***TOTAL***
Chipped Stone						
Flake Cores	2					***2***
Tested Pebbles		1				***1***
Battered Cobble					1	***1***
Utilized flakes	1		1			***2***
Unutilized flakes						
Local Pebble Chert	1	7	2			***10***
Thermally Altered Chert		2				***2***
Non-Local Chert		1				***1***
Shatter						
Local Chert	1	2	1			***4***
Burned Debitage	1	1	1			***3***
Groundstone						
Round Pallette Fragment		1				***1***
Sandstone Pieces		1				***1***
Unmodified Pebbles		4	1	1		***6***
Total Lithics	***6***	***20***	***6***	***1***	***1***	***34***

Collection Unit	*149W 40S*	*139W 40S*	*129W 40S*	*119W 40S*	*109W 40S*	*99W 40S*	*89W 40S*	***TOTAL***
Chipped Stone								
Hammerstone	1							***1***
Hammerstone/Abraider							1	***1***
Flake Cores					1		1	***2***
Unutilized flakes								
Local Pebble Chert				1	3	2		***6***
Thermally Altered Chert						2		***2***
Non-Local Chert						1		***1***
Shatter								
Local Chert						1		***1***
Burned Debitage							1	***1***
Groundstone								
Round Pallette Fragment *						1		***1***
Sandstone Pieces						1		***1***
Unmodified Pebbles		1	1	1				***3***
Total Lithics	***1***	***1***	***1***	***2***	***4***	***8***	***3***	***20***

Collection Unit	149W 50S	139W 50S	129W 50S	109W 50S	99W 50S	TOTAL
Chipped Stone						
Hammerstone					1	*1*
Retouched Flake				1		*1*
Unutilized flakes						
Local Pebble Chert			1	2		*3*
Shatter						
Local Chert	1	1				*2*
Burned Debitage				1		*1*
Groundstone						
Round Pallette Fragment *					1	*1*
Unmodified Pebbles					1	*1*
Total Lithics	*1*	*1*	*1*	*4*	*3*	*10*

* This piece joins with one from 99.8W 40S

Collection Unit	149W 60S	129W 60S	119W 60S	109W 60S	99W 60S	TOTAL
Chipped Stone						
Unutilized flakes						
Local Pebble Chert		2	4	1		*7*
Non-Local Chert			1			*1*
Shatter						
Quartz Pebble					1	*1*
Unmodified Pebbles	1				2	*3*
Total Lithics	*1*	*2*	*5*	*1*	*3*	*12*

Appendix B1: Provenience of Surface Collected Ceramics From Blackwater (16TE101)

	Collection Unit	20E 131N			30E 131N			40E 131N			50E 131N			60E 131N			70E 131N			80E 131N			90E 131N			100E 131N			TOTAL
Type	*variety*	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Coles Creek Incised,	*var. Coles Creek*			0			0			0			0			0			0		1	1			0			0	**1**
Coles Creek Incised,	*var. Hilly Grove*			0			0			0			0	1		1			0			0			0			0	**1**
Coles Creek Incised,	*var. unspecified*			0			0			0			0			0		1	1			0			0			0	**1**
Plaquemine Brushed,	*var. Plaquemine*			0			0			0			0		2	2			0			0			0			0	**2**
Unclassified Incised	*on Addis Plain*			0			0			0		1	1			0			0			0			0			0	**1**
Unclassified Incised	*on Baytown Plain*			0			0			0			0			0			0		1	1			0			0	**1**
Unclassified Incised	*on Unclass. Plain*			0			0			0			0			0	1	2	3			0			0			0	**3**
Unclassified Inc./Punctated				0			0			0			0			0	1		1			0			0			0	**1**
Total Decorated Ceramics		0	0	0	0	0	0	0	0	0	0	1	1	1	2	3	2	3	5	0	2	2	0	0	0	0	0	0	**11**
Unclassified Plain			4	4		4	4		7	7		47	47		71	71		53	53		8	8		9	9		3	3	**206**
Bowls																													
Simple, Round				0			0	1		1			0	1		1			0			0			0			0	**2**
Simple, Flat				0			0			0			0	1		1			0			0	1		1			0	**2**
Thin, Simple, Flat				0			0			0			0			0	1		1			0			0			0	**1**
Total Bowl Rims		0		0	0		0	1		1	0		0	2		2	1		1	0		0	1		1	0		0	**5**
Jars																													
Simple, Flat				0			0			0			0	1		1			0			0			0			0	**1**
Total Jar Rims		0		0	0		0	0		0	0		0	1		1	0		0	0		0	0		0	0		0	**1**
Indeterminate Rims																													
Simple, Round				0			0			0			0	2		2	1		1			0			0			0	**3**
Simple, Flat				0			0			0			0			0	2		2			0			0			0	**2**
Total Plain Rims		0		0	0		0	1		1	0		0	5		5	4		4	0		0	1		1	0		0	**11**
Bases																													
Indeterminate				0			0			0			0		2	2			0			0			0			0	**2**
Total Bases			0	0		0	0		0	0		0	0		2	2		0	0		0	0		0	0		0	0	**2**
Total Plain Ceramics		0	4	4	0	4	4	1	7	8	0	47	47	5	73	78	4	53	57	0	8	8	1	9	10	0	3	3	**219**
Total Ceramics		**0**	**4**	**4**	**0**	**4**	**4**	**1**	**7**	**8**	**0**	**48**	**48**	**6**	**75**	**81**	**6**	**56**	**62**	**0**	**10**	**10**	**1**	**9**	**10**	**0**	**3**	**3**	**230**

Appendix B1: Provenience of Surface Collected Ceramics From Blackwater (16TE101)

Type	variety	20E 121N Rim	20E 121N Body	20E 121N Total	30E 121N Rim	30E 121N Body	30E 121N Total	40E 121N Rim	40E 121N Body	40E 121N Total	50E 121N Rim	50E 121N Body	50E 121N Total	60E 121N Rim	60E 121N Body	60E 121N Total	70E 121N Rim	70E 121N Body	70E 121N Total	80E 121N Rim	80E 121N Body	80E 121N Total	90E 121N Rim	90E 121N Body	90E 121N Total	100E 121N Rim	100E 121N Body	100E 121N Total	TOTAL
Beldeau Incised,	*var. Bell Bayou*			0			0			0			0			0			0		1	1			0			0	**1**
Coles Creek Incised,	*var. Coles Creek*			0			0			0			0			0			0			0		1	1			0	**1**
Coles Creek Incised,	*var. Hardy*			0			0			0			0			0			0		1	1			0			0	**1**
Coles Creek Incised,	*var. Hilly Grove*		1	1			0			0			0		1	1			0		2	2			0			0	**4**
Mazique Incised,	*var. Kings Point*			0			0			0			0			0		1	1			0			0			0	**1**
Mazique Incised,	*var. unspecified*			0			0			0			0			0		2	2			0			0			0	**2**
Plaquemine Brushed,	*var. Plaquemine*			0			0		1	1			0			0			0			0		1	1			0	**2**
Unclassified Incised	*on Addis Plain*			0			0			0			0		1	1			0			0			0			0	**1**
Unclassified Incised	*on Baytown Plain*			0			0			0			0			0			0			0		1	1			0	**1**
Unclassified Incised	*on Unclass. Plain*			0			0			0			0		1	1			0			0			0		1	1	**2**
Total Decorated Ceramics		0	1	1	0	0	0	0	1	1	0	0	0	0	3	3	0	3	3	0	4	4	0	3	3	0	1	1	**16**
Unclassified Plain			11	11		13	13			0		4	4		54	54		37	37		61	61		28	28		12	12	**220**
Bowls																													
Simple, Round				0			0			0	1		1	3		3	2		2	3		3			0			0	**9**
Total Bowl Rims		0		0	0		0	0		0	1		1	3		3	2		2	3		3	0		0	0		0	**9**
Jars																													
Simple, Flat				0			0			0			0			0			0	1		1			0			0	**1**
Total Jar Rims		0		0	0		0	0		0	0		0	0		0	0		0	1		1	0		0	0		0	**1**
Indeterminate Rims																													
Simple, Round				0	1		1	1		1			0			0	1		1	1		1			0			0	**4**
Simple, Flat				0			0			0			0	1		1			0	1		1			0			0	**2**
Total Plain Rims		0		0	1		1	1		1	1		1	4		4	3		3	6		6	0		0	0		0	**16**
Total Plain Ceramics		0	11	11	1	13	14	1	0	1	1	4	5	4	54	58	3	37	40	6	61	67	0	28	28	0	12	12	**236**
Total Ceramics		**0**	**12**	**12**	**1**	**13**	**14**	**1**	**1**	**2**	**1**	**4**	**5**	**4**	**57**	**61**	**3**	**40**	**43**	**6**	**65**	**71**	**0**	**31**	**31**	**0**	**13**	**13**	**252**

Appendix B1: Provenience of Surface Collected Ceramics From Blackwater (16TE101)

Collection Unit		10E 111N			20E 111N			30E 111N			40E 111N			50E 111N			60E 111N			70E 111N			80E 111N			90E 111N			100E 111N			TOTAL
Type	variety	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Beldeau Incised,	var. Bell Bayou			0			0			0			0			0			0		1	1			0			0			0	1
Beldeau Incised,	var. unspecified			0			0			0			0			0			0			0			0			0		1	1	1
Coles Creek Incised,	var. Hardy			0			0			0			0			0			0		1	1			0			0			0	1
Coles Creek Incised,	var. Hilly Grove			0			0			0			0			0			0		3	3			0			0			0	3
Coles Creek Incised,	var. unspecified			0			0			0			0			0			0		1	1		1	1			0			0	2
Evansville Punctated,	var. unspecified			0			0	1		1			0			0			0			0			0			0			0	1
Harrison Bayou Inc.,	var. Harrison Bayou			0			0			0			0			0		1	1			0			0			0			0	1
Hollyknowe Pinched,	var. Patmos			0			0			0			0			0			0		1	1			0			0			0	1
Mazique Incised,	var. Manchac			0			0			0			0			0		1	1			0			0			0			0	1
Mazique Incised,	var. Preston			0			0			0			0			0		1	1			0			0			0			0	1
Mazique Incised,	var. unspecified			0			0			0			0			0		3	3			0			0		1	1	1		1	5
Plaquemine Brushed,	var. Plaquemine			0			0			0			0			0			0			0			0		1	1			0	1
Unclassified Incised	on Addis Plain			0			0			0			0			0			0			0		1	1			0			0	1
Unclassified Incised	on Baytown Plain			0			0			0			0			0		1	1			0			0			0			0	1
Unclassified Incised	on Unclass. Plain			0			0			0			0			0			0			0			0			0		1	1	1
Total Decorated Ceramics		0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	7	7	0	7	7	0	2	2	0	2	2	1	2	3	22
Unclassified Plain			7	7		4	4		22	22			0		26	26		147	147		130	130		28	28		19	19		33	33	416
Bowls																																
Simple, Round				0			0			0			0	1		1	2		2	1		1			0			0			0	4
Complex Bowl, Round				0			0			0			0			0	2		2	1		1			0			0			0	3
Simple, Flat				0			0			0			0	1		1			0	2		2			0			0	1		1	4
Interior Strap				0			0			0			0			0			0	1		1			0			0			0	1
Interior Bevel				0			0			0			0			0	1		1			0			0			0			0	1
Total Bowl Rims		0		0	0		0	0		0	0		0	2		2	5		5	5		5	0		0	0		0	1		1	13
Jars																																
Simple, Round				0			0			0			0			0			0	1		1			0			0			0	1
Simple, Flat				0			0			0			0			0			0			0	1		1			0			0	1
Thickened Strap, Round				0			0			0			0			0			0			0	1		1			0			0	1
Total Jar Rims		0		0	0		0	0		0	0		0	0		0	0		0	1		1	2		2	0		0	0		0	3
Indeterminate Rims																																
Simple, Round				0			0			0			0	1		1	1		1	2		2			0			0			0	4
Simple, Flat				0			0			0			0			0	1		1	1		1			0			0			0	2
Total Plain Rims		0		0	0		0	0		0	0		0	3		3	7		7	9		9	2		2	0		0	1		1	22
Bases																																
Indeterminate				0			0			0			0		1	1		2	2			0			0			0			0	3
Total Bases			0	0		0	0		0	0		0	0		1	1		2	2		0	0		0	0		0	0		0	0	3
Total Plain Ceramics		0	7	7	0	4	4	0	22	22	0	0	0	3	27	30	7	149	156	9	130	139	2	28	30	0	19	19	1	33	34	441
Total Ceramics		0	7	7	0	4	4	1	22	23	0	0	0	3	27	30	7	156	163	9	137	146	2	30	32	0	21	21	2	35	37	463

Appendix B1: Provenience of Surface Collected Ceramics From Blackwater (16TE101)

Type	variety	10E 101N			20E 101N			30E 101N			40E 101N			50E 101N			60E 101N			70E 101N			80E 101N			90E 101N			100E 101N			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Chevalier Stamped,	*var. unspecified*			0	1		1			0			0			0			0			0			0			0			0	1
Coles Creek Incised,	*var. Blakely*	1		1			0			0			0			0			0			0			0			0			0	1
Coles Creek Incised,	*var. Hardy*			0		1	1		1	1			0			0			0			0			0			0			0	2
Coles Creek Incised,	*var. Hilly Grove*			0			0		3	3			0	1		1	1	1	2		3	3		3	3			0		2	2	14
Coles Creek Incised,	*var. Mott*			0			0			0			0			0			0			0			0		2	2			0	2
Coles Creek Incised,	*var. unspecified*	1		1			0			0			0			0			0	1		1			0			0			0	2
Mazique Incised,	*var. Preston*			0		1	1			0			0			0			0			0			0			0			0	1
Mazique Incised,	*var. unspecified*		1	1			0		2	2			0			0			0			0			0			0			0	3
Plaquemine Brushed,	*var. Plaquemine*			0		2	2		1	1			0			0			0			0			0			0			0	3
Unclassified Incised	*on Addis Plain*			0		1	1		1	1			0			0			0		1	1		3	3			0			0	6
Unclassified Incised	*on Baytown Plain*			0		1	1		1	1			0		1	1			0			0		1	1			0			0	4
Unclassified Incised	*on Unclass. Plain*	1		1			0			0			0			0			0			0		1	1			0			0	2
Unclassified Interior Incised (Addis Pl.)				0			0		1	1			0			0			0			0			0			0			0	1
Total Decorated Ceramics		3	1	4	1	6	7	0	10	10	0	0	0	1	1	2	1	1	2	1	4	5	0	8	8	0	2	2	0	2	2	42
Unclassified Plain			39	39		31	31		109	109		54	54		11	11		63	63		68	68		115	115		48	48		26	26	564
Bowls																																
Simple, Round				0			0	2		2			0			0	1		1	2		2	3		3	1		1			0	9
Simple, Flat				0			0			0			0			0	2		2	1		1			0			0			0	3
Tapered				0			0			0			0			0			0	1		1			0			0			0	1
Exterior Strap, Round				0			0			0			0			0	1		1			0			0			0			0	1
Total Bowl Rims		0		0	0		0	2		2	0		0	0		0	4		4	4		4	3		3	1		1	0		0	14
Jars																																
Simple, Round				0			0			0			0			0			0			0			0	1		1			0	1
Simple, Flat				0			0	2		2			0	2		2			0			0			0	1		1			0	5
Tapered				0			0			0			0			0	1		1			0			0			0			0	1
Total Jar Rims		0		0	0		0	2		2	0		0	2		2	1		1	0		0	0		0	2		2	0		0	7
Beakers																																
"Vicksburg"				0			0	1		1			0			0			0			0			0	1		1			0	2
Tapered				0			0	1		1			0			0			0			0			0	1		1			0	2
Total Beaker Rims		0		0	0		0	2		2	0		0	0		0	0		0	0		0	0		0	2		2	0		0	4
Indeterminate Rims																																
Simple, Round				0			0			0			0			0	1		1			0			0			0			0	1
Simple, Flat		1		1	2		2			0			0	1		1			0	2		2	2		2			0			0	8
Total Plain Rims		1		1	2		2	6		6	0		0	3		3	6		6	6		6	5		5	5		5	0		0	34
Bases																																
Indeterminate				0			0		2	2			0			0		2	2		1	1			0			0			0	5
Total Bases			0	0		0	0		2	2		0	0		0	0		2	2		1	1		0	0		0	0		0	0	5
Total Plain Ceramics		1	39	40	2	31	33	6	111	117	0	54	54	3	11	14	6	65	71	6	69	75	5	115	120	5	48	53	0	26	26	603
Total Ceramics		4	40	44	3	37	40	6	121	127	0	54	54	4	12	16	7	66	73	7	73	80	5	123	128	5	50	55	0	28	28	645

Appendix B1: Provenience of Surface Collected Ceramics From Blackwater (16TE101)

Type	variety	10E 91N			20E 91N			30E 91N			40E 91N			50E 91N			60E 91N			70E 91N			80E 91N			90E 91N			100E 91N			TOTAL
	Collection Unit	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Avoyelles Punctated,	*var. unspecified*			0			0			0			0			0		1	1			0			0			0			0	1
Beldeau Incised,	*var. Bell Bayou*			0			0		1	1		1	1		1	1			0		1	1		1	1			0			0	5
Carter Engraved,	*var. unspecified*			0			0			0		1	1			0			0			0			0			0			0	1
Coles Creek Incised,	*var. Blakely*			0			0	1		1			0			0			0			0			0			0			0	1
Coles Creek Incised,	*var. Hardy*			0			0		1	1			0		1	1			0			0			0		1	1			0	3
Coles Creek Incised,	*var. Hilly Grove*			0		1	1		5	5	2	2	4		4	4	3	3	6	1	2	3	3	2	5			0			0	28
Coles Creek Incised,	*var. unspecified*			0		1	1			0			0			0			0			0		2	2			0			0	3
Evansville Punctated,	*var. unspecified*			0		1	1		1	1			0		2	2		2	2			0		1	1			0			0	7
French Fork Incised,	*var. Iberville*			0			0			0			0			0			0			0		1	1			0			0	1
Harrison Bayou Inc.,	*var. Harrison Bayou*			0			0		1	1			0			0		1	1		1	1			0			0			0	3
Hollyknowe Pinched,	*var. unspecified*			0			0			0			0		1	1			0			0			0			0		1	1	2
Leland Incised,	*var. unspecified*			0			0			0			0			0		1	1			0		1	1			0			0	2
Mazique Incised,	*var. Kings Point*			0			0			0			0		2	2			0			0			0			0			0	2
Mazique Incised,	*var. Manchac*		1	1			0			0		1	1			0			0			0			0			0			0	2
Mazique Incised,	*var. Preston*			0			0			0	1	1	2			0			0			0			0			0			0	2
Mazique Incised,	*var. unspecified*			0		1	1			0			0			0		2	2		1	1		1	1			0			0	5
Plaquemine Brushed,	*var. Plaquemine*			0			0		5	5		5	5	1	3	4	1	2	3			0			0		1	1			0	18
Unclassified Incised	*on Addis Plain*			0			0			0			0			0			0			0			0			0	1	2	3	3
Unclassified Incised	*on Baytown Plain*			0			0			0			0			0	1		1		1	1			0		1	1			0	3
Unclassified Incised	*on Unclass. Plain*		1	1			0		3	3	1		1	2	4	6			0			0		3	3			0		1	1	15
Unclassified Inc./Punctated				0			0		1	1		1	1			0			0			0			0			0			0	2
Total Decorated Ceramics		0	2	2	0	4	4	1	18	19	4	12	16	3	18	21	5	12	17	1	6	7	3	12	15	0	3	3	1	4	5	109
Unclassified Plain			63	63		51	51		213	213		187	187		244	244		134	134		70	70		157	157		55	55		80	80	1254
Bowls																																
Simple, Round				0			0	1		1	1		1	7		7	1		1	1		1	3		3	1		1			0	15
Simple, Flat		1		1			0	1		1	2		2	4		4	2		2	1		1			0	2		2	1		1	14
Warped, Round				0			0			0	1		1			0			0			0			0			0			0	1
Tapered				0			0	3		3			0			0			0			0			0			0			0	3
Thin, Simple, Round				0			0			0			0			0			0	1		1			0			0			0	1
Total Bowl Rims		1		1	0		0	5		5	4		4	11		11	3		3	3		3	3		3	3		3	1		1	34
Jars																																
Simple, Round				0			0	1		1	1		1	1		1			0			0			0			0			0	3
Simple, Flat				0	1		1	1		1			0	7		7	1		1	3		3	1		1			0			0	14
Tapered				0			0			0			0	1		1			0			0			0			0			0	1
Exterior Flange, Flat				0			0			0			0			0			0			0	1		1			0			0	1
Total Jar Rims		0		0	1		1	2		2	1		1	9		9	1		1	3		3	2		2	0		0	0		0	19
Beakers																																
Tapered				0			0	1		1	1		1			0			0	1		1			0			0			0	3
Total Beaker Rims		0		0	0		0	1		1	1		1	0		0	0		0	1		1	0		0	0		0	0		0	3
Indeterminate Rims																																
Simple, Round				0	1		1			0	4		4	2		2			0	1		1			0			0			0	8
Simple, Flat		3		3			0			0	2		2			0			0	1		1			0			0			0	6
Total Plain Rims		4		4	2		2	8		8	12		12	22		22	4		4	9		9	5		5	3		3	1		1	70
Bases																																
Flat, Round				0			0			0			0		1	1			0			0			0			0			0	1
Indeterminate				0		1	1		1	1		3	3		4	4			0			0		1	1			0			0	10
Total Bases			0	0		1	1		1	1		3	3		5	5		0	0		0	0		1	1		0	0		0	0	11
Total Plain Ceramics		4	63	67	2	52	54	8	214	222	12	190	202	22	249	271	4	134	138	9	70	79	5	158	163	3	55	58	1	60	81	1335
Total Ceramics		4	65	69	2	56	58	9	232	241	16	202	218	25	267	292	9	146	155	10	76	86	8	170	178	3	58	61	2	84	86	1444

Appendix B1: Provenience of Surface Collected Ceramics From Blackwater (16TE101)

Type	variety	10E 81N			20E 81N			30E 81N			40E 81N			50E 81N			60E 81N			70E 81N			80E 81N			90E 81N			100E 81N			TOTAL
Collection Unit		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Anna Incised	*var. Anna*		1	1			0			0			0			0			0			0			0			0			0	1
Avoyelles Punctated,	*var. Kearney*			0			0			0			0			0			0	1	1	2			0			0			0	2
Avoyelles Punctated,	*var. unspecified*			0			0			0		1	1			0			0			0			0			0			0	1
Beldeau Incised,	*var. Beldeau*			0			0			0			0	1		1			0			0			0			0			0	1
Beldeau Incised,	*var. Bell Bayou*			0			0			0			0		1	1		1	1			0			0			0			0	2
Coles Creek Incised,	*var. Blakely*			0			0			0		1	1			0	1		1			0			0			0			0	2
Coles Creek Incised,	*var. Coles Creek*			0			0		1	1			0			0		1	1			0			0			0			0	2
Coles Creek Incised,	*var. Hardy*			0		1	1			0		1	1			0	1	2	3		1	1			0			0			0	6
Coles Creek Incised,	*var. Hilly Grove*			0		2	2		3	3	1	3	4	3	6	9	3	4	7		5	5	2	6	8		4	4		1	1	43
Coles Creek Incised,	*var. Mott*			0			0			0			0			0			0			0			0		3	3			0	3
Coles Creek Incised,	*var. unspecified*			0			0			0			0	1	2	3		1	1			0			0			0			0	4
Evansville Punctated,	*var. unspecified*			0		1	1			0			0			0		1	1			0			0			0			0	2
Harrison Bayou Inc.,	*var. Harrison Bayou*			0			0			0			0			0			0		1	1			0		3	3			0	4
Hollyknowe Pinched,	*var. Patmos*			0			0			0			0		2	2			0			0			0			0			0	2
Mazique Incised,	*var. Manchac*			0			0			0			0			0			0			0		1	1			0		1	1	2
Mazique Incised,	*var. Preston*			0			0			0		1	1		1	1	1	3	4			0			0			0			0	6
Mazique Incised,	*var. unspecified*	1		1			0			0			0	1		1	2		2			0			0			0			0	4
Plaquemine Brushed,	*var. Plaquemine*			0			0		1	1			0	1	3	4	1	2	3		1	1		2	2			0			0	11
Unclassified Incised	*on Addis Plain*			0		1	1		1	1			0			0			0			0			0			0			0	2
Unclassified Incised	*on Baytown Plain*			0		2	2		1	1		1	1			0			0		2	2			0		2	2			0	8
Unclassified Incised	*on Unclass. Plain*			0			0			0			0		2	2			0			0			0			0			0	2
Unclassified Interior Incised				0			0			0			0			0		2	2			0			0			0			0	2
Unclassified Punctated				0			0			0			0		1	1			0		1	1			0			0			0	2
Total Decorated Ceramics		1	1	2	0	7	7	0	7	7	1	8	9	7	18	25	9	17	26	1	12	13	2	9	11	0	12	12	0	2	2	114
Unclassified Plain			16	16		39	39		71	71		150	150		230	230		218	218		160	160		142	142		179	179		73	73	1278
Bowls																																
Simple, Round				0			0			0	1		1	3		3	3		3	4		4			0	1		1	1		1	13
Simple, Flat				0			0			0	1		1	3		3			0	1		1	3		3	1		1	1		1	10
Exterior Strap, Round				0			0			0			0	1		1			0			0			0			0			0	1
Interior Bevel				0			0			0	1		1			0			0			0			0			0			0	1
Total Bowl Rims		0		0	0		0	0		0	3		3	7		7	3		3	5		5	3		3	2		2	2		2	25
Jars																																
Simple, Round				0			0			0	1		1	1		1	2		2			0			0			0			0	4
Simple, Flat				0			0			0	3		3	6		6	7		7	1		1	4		4			0			0	21
"Seed" Jar				0			0			0			0			0			0			0			0	1		1			0	1
Exterior Bevel				0			0			0	1		1			0			0			0			0			0			0	1
Exterior Bevel, Restricted				0			0			0			0	1		1			0			0			0			0			0	1
Total Jar Rims		0		0	0		0	0		0	5		5	8		8	9		9	1		1	4		4	1		1	0		0	28
Beakers																																
"Vicksburg"				0			0			0			0	1		1			0			0			0			0			0	1
Tapered				0			0			0			0	2		2	1		1			0			0			0			0	3
Total Beaker Rims		0		0	0		0	0		0	0		0	3		3	1		1	0		0	0		0	0		0	0		0	4
Indeterminate Rims																																
Simple, Round				0			0	3		3	1		1			0	2		2			0			0	2		2			0	8
Simple, Flat				0			0			0			0			0	3		3			0	1		1			0			0	4
Total Plain Rims		0		0	0		0	3		3	9		9	18		18	18		18	6		6	8		8	5		5	2		2	69
Bases																																
Indeterminate				0			0			0		1	1		5	5			0		4	4			0		1	1			0	11
Total Bases			0	0		0	0		0	0		1	1		5	5		0	0		4	4		0	0		1	1		0	0	11
Total Plain Ceramics		0	16	16	0	39	39	3	71	74	9	151	160	18	235	253	18	218	236	6	164	170	8	142	150	5	180	185	2	73	75	1358
Total Ceramics		1	17	18	0	46	46	3	78	81	10	159	169	25	253	278	27	235	262	7	176	183	10	151	161	5	192	197	2	75	77	1472

Appendix B1: Provenience of Surface Collected Ceramics From Blackwater (16TE101)

Type	variety	10E 71N			20E 71N			30E 71N			40E 71N			50E 71N			60E 71N			70E 71N			80E 71N			90E 71N			100E 71N			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Avoyelles Punctated,	*var. unspecified*			0			0			0			0			0		1	1			0			0			0			0	1
Beldeau Incised,	*var. Bell Bayou*			0			0			0		1	1			0	1	2	3		1	1			0			0			0	5
Coles Creek Incised,	*var. Coles Creek*			0			0			0			0			0			0			0			0			0	1		1	1
Coles Creek Incised,	*var. Hardy*			0			0			0			0			0			0			0		2	2		1	1			0	3
Coles Creek Incised,	*var. Hilly Grove*			0		1	1			0		1	1	1	6	7	3	10	13	1	4	5	1	6	7			0	1	1	2	36
Coles Creek Incised,	*var. Mott*			0			0			0			0			0	1	2	3			0			0			0			0	3
Coles Creek Incised,	*var. unspecified*			0			0			0	2	2	4			0			0	1	3	4	1	1	2			0	1		1	11
Evansville Punctated,	*var. unspecified*			0			0			0			0			0	2		2			0			0			0			0	2
Harrison Bayou Inc.,	*var. Harrison Bayou*			0			0			0			0	1		1			0			0		1	1			0			0	2
Hollyknowe Pinched,	*var. unspecified*			0			0			0			0			0			0			0		1	1			0			0	1
Mazique Incised,	*var. Kings Point*			0			0		1	1			0			0			0			0			0			0			0	1
Mazique Incised,	*var. Preston*			0			0			0			0			0		2	2		1	1		1	1		1	1			0	5
Mazique Incised,	*var. unspecified*			0			0			0			0	1		1			0		1	1	1		1			0		1	1	4
Plaquemine Brushed,	*var. Plaquemine*			0			0		2	2			0	2	9	11			0		4	4		4	4		2	2		1	1	24
Unclassified Incised	*on Addis Plain*			0			0		1	1			0			0			0		2	2			0			0			0	3
Unclassified Incised	*on Baytown Plain*			0			0			0			0		1	1		3	3		1	1			0			0			0	5
Unclassified Incised	*on Unclass. Plain*			0			0			0			0			0			0			0			0			0		1	1	1
Unclassified Inc./Punctated				0			0			0			0			0			0	1		1		1	1		1	1			0	3
Total Decorated Ceramics		0	0	0	0	1	1	0	4	4	2	4	6	5	16	21	7	20	27	3	17	20	3	17	20	0	5	5	3	4	7	111
Unclassified Plain			16	16		44	44		44	44		103	103		216	216		238	238		205	205		180	180		104	104		46	46	1196
Bowls																																
Simple, Round				0	1		1			0			0	1		1	5		5	3		3	2		2			0			0	12
Simple, Flat				0			0			0	2		2			0	3		3	1		1	2		2			0	1		1	9
Warped, Round				0			0	1		1			0			0			0	1		1			0			0			0	2
Interior Strap				0			0			0			0	1		1			0			0			0			0			0	1
Tapered				0			0			0			0			0			0			0	3		3			0			0	3
Exterior Thickened, Flat				0			0			0			0			0	1		1			0			0			0			0	1
Exterior Strap, Round				0			0			0			0			0			0	1		1			0			0			0	1
Thin, Simple, Flat				0			0			0			0	4		4			0			0			0			0			0	4
Thin, Simple, Round				0			0			0			0			0			0			0			0	3		3			0	3
Total Bowl Rims		0		0	1		1	1		1	2		2	6		6	9		9	6		6	7		7	3		3	1		1	36
Jars																																
Simple, Round				0			0			0			0			0	1		1			0			0			0			0	1
Simple, Flat				0	1		1			0	2		2	2		2	5		5	6		6	1		1	3		3	2		2	22
Exterior Flare, Simple, Flat				0			0			0			0			0	1		1			0			0			0			0	1
Total Jar Rims		0		0	1		1	0		0	2		2	2		2	7		7	6		6	1		1	3		3	2		2	24
Beakers																																
Tapered				0			0			0	2		2	2		2	1		1	3		3	1		1			0			0	9
Total Beaker Rims		0		0	0		0	0		0	2		2	2		2	1		1	3		3	1		1	0		0	0		0	9
Indeterminate Rims																																
Simple, Round				0			0	1		1			0	1		1			0	2		2			0			0			0	4
Simple, Flat				0	2		2			0			0	3		3	3		3	1		1	3		3			0			0	12
Total Plain Rims		0		0	4		4	2		2	6		6	14		14	20		20	18		18	12		12	6		6	3		3	85
Bases																																
Flat, Round				0			0			0			0			0		1	1			0			0			0			0	1
Indeterminate				0			0			0			0			0			0			0			0		1	1			0	1
Total Bases			0	0		0	0		0	0		0	0		0	0		1	1		0	0		0	0		1	1		0	0	2
Total Plain Ceramics		0	16	16	4	44	48	2	44	46	6	103	109	14	216	230	20	239	259	18	205	223	12	180	192	6	105	111	3	46	49	1283
Total Ceramics		0	16	16	4	45	49	2	48	50	8	107	115	19	232	251	27	259	286	21	222	243	15	197	212	6	110	116	6	50	56	1394

Type	Collection Unit / variety	10E 61N Rim	10E 61N Body	10E 61N Total	20E 61N Rim	20E 61N Body	20E 61N Total	30E 61N Rim	30E 61N Body	30E 61N Total	40E 61N Rim	40E 61N Body	40E 61N Total	50E 61N Rim	50E 61N Body	50E 61N Total	60E 61N Rim	60E 61N Body	60E 61N Total	70E 61N Rim	70E 61N Body	70E 61N Total	80E 61N Rim	80E 61N Body	80E 61N Total	90E 61N Rim	90E 61N Body	90E 61N Total	100E 61N Rim	100E 61N Body	100E 61N Total	TOTAL
Anna Incised	*var. unspecified*			0			0			0		1	1			0			0	1		1			0			0			0	**2**
Avoyelles Punctated,	*var. unspecified*			0			0			0			0			0			0			0		1	1			0			0	**1**
Coles Creek Incised,	*var. Hilly Grove*			0			0			0			0			0	1	4	5	1	4	5	2	4	6		1	1			0	**17**
Coles Creek Incised,	*var. unspecified*			0			0			0		1	1			0			0			0			0	1		1	1	1	2	**4**
Evansville Punctated,	*var. unspecified*			0			0			0			0			0		1	1		1	1			0			0		1	1	**3**
Harrison Bayou Inc.,	*var. Harrison Bayou*			0			0			0			0		1	1			0			0			0			0			0	**1**
Hollyknowe Pinched,	*var. Patmos*			0			0			0			0			0			0	1		1			0			0			0	**1**
Mazique Incised,	*var. Kings Point*			0			0			0			0			0			0		1	1			0			0			0	**1**
Mazique Incised,	*var. Manchac*			0			0			0			0			0	1		1			0			0			0			0	**1**
Mazique Incised,	*var. Preston*			0			0			0			0			0		2	2			0		1	1			0		1	1	**4**
Mazique Incised,	*var. unspecified*			0			0			0		1	1			0			0			0			0			0			0	**1**
Plaquemine Brushed,	*var. Plaquemine*			0			0			0		1	1		2	2			0			0		1	1		1	1			0	**5**
Unclassified Incised	*on Addis Plain*			0			0			0			0			0		1	1		3	3			0		1	1			0	**5**
Unclassified Incised	*on Baytown Plain*			0			0			0			0			0			0			0			0	1		1			0	**1**
Unclassified Incised	*on Unclass. Plain*			0			0			0			0		2	2			0			0			0			0			0	**2**
Total Decorated Ceramics		0	0	0	0	0	0	0	0	0	0	4	4	0	5	5	2	8	10	3	9	12	2	7	9	2	3	5	1	3	4	**49**
Unclassified Plain			9	9		13	13		31	31		47	47		118	118		177	177		117	117		85	85		49	49		25	25	**671**
Bowls																																
Simple, Round				0			0			0	1		1			0			0			0	1		1			0	1		1	**3**
Simple, Flat				0			0			0	1		1			0	3		3			0			0			0	1		1	**5**
Interior Strap				0			0			0			0			0	1		1			0	1		1			0			0	**2**
Exterior Strap, Flat				0			0			0			0	1		1			0			0			0			0			0	**1**
Interior Bevel				0			0			0			0	1		1			0			0			0			0			0	**1**
Total Bowl Rims		0		0	0		0	0		0	2		2	2		2	4		4	0		0	2		2	0		0	2		2	**12**
Jars																																
Simple, Flat				0			0			0			0	2		2	6		6	1		1	2		2			0			0	**11**
Flaring Rim, Flat				0			0			0			0			0	2		2			0			0			0			0	**2**
"Seed" Jar				0			0			0			0			0			0	1		1			0			0	1		1	**2**
Total Jar Rims		0		0	0		0	0		0	0		0	2		2	8		8	2		2	2		2	0		0	1		1	**15**
Beakers																																
Tapered				0			0			0	1		1			0	3		3			0	2		2	1		1			0	**7**
Total Beaker Rims		0		0	0		0	0		0	1		1	0		0	3		3	0		0	2		2	1		1	0		0	**7**
Indeterminate Rims																																
Simple, Round				0			0			0			0			0			0	1		1	1		1	1		1			0	**3**
Simple, Flat				0			0	2		2			0			0			0			0	2		2			0			0	**4**
Total Plain Rims		0		0	0		0	2		2	3		3	4		4	15		15	3		3	9		9	2		2	3		3	**41**
Bases																																
Flat, Round				0			0			0			0			0		1	1			0			0			0			0	**1**
Indeterminate				0			0			0			0		1	1			0		3	3		1	1			0			0	**5**
Total Bases			0	0		0	0		0	0		0	0		1	1		1	1		3	3		1	1		0	0		0	0	**6**
Total Plain Ceramics		0	9	9	0	13	13	2	31	33	3	47	50	4	119	123	15	178	193	3	120	123	9	86	95	2	49	51	3	25	28	**718**
Total Ceramics		**0**	**9**	**9**	**0**	**13**	**13**	**2**	**31**	**33**	**3**	**51**	**54**	**4**	**124**	**128**	**17**	**186**	**203**	**6**	**129**	**135**	**11**	**93**	**104**	**4**	**52**	**56**	**4**	**28**	**32**	**767**

Appendix B1: Provenience of Surface Collected Ceramics From Blackwater (16TE101)

Collection Unit		10E 51N			20E 51N			30E 51N			40E 51N			50E 51N			60E 51N			80E 51N			90E 51N			100E 51N			TOTAL
Type	variety	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Coles Creek Incised,	*var. Hardy*			0	1		1			0		1	1			0			0			0			0			0	**2**
Coles Creek Incised,	*var. Hilly Grove*			0			0			0		1	1			0	3	3	6			0			0			0	**7**
Coles Creek Incised,	*var. unspecified*			0			0			0			0		3	3			0		2	2			0		1	1	**6**
Harrison Bayou Inc.,	*var. Harrison Bayou*			0			0			0			0			0		1	1	1		1			0			0	**2**
Mazique Incised,	*var. unspecified*			0			0			0			0			0			0		1	1			0			0	**1**
Unclassified Incised	*on Addis Plain*			0			0			0			0			0		1	1			0			0			0	**1**
Unclassified Incised	*on Baytown Plain*			0			0			0			0			0			0	1		1			0			0	**1**
Unclassified Punctated				0			0			0			0		1	1			0			0			0			0	**1**
Total Decorated Ceramics		0	0	0	1	0	1	0	0	0	0	2	2	0	4	4	3	5	8	2	3	5	0	0	0	0	1	1	**21**
Unclassified Plain			1	1		4	4		10	10		16	16		47	47		180	180		81	81		36	36		16	16	**391**
Bowls																													
Simple, Round				0			0			0	2		2	1		1	1		1	1		1			0			0	**5**
Simple, Flat				0			0			0			0			0			0	2		2			0			0	**2**
Interior Strap				0			0			0			0			0			0			0	1		1			0	**1**
Thickened, Round				0			0			0			0			0	1		1			0			0			0	**1**
Interior Bevel				0			0			0			0			0	1		1			0			0			0	**1**
Total Bowl Rims		0		0	0		0	0		0	2		2	1		1	3		3	3		3	1		1	0		0	**10**
Jars																													
Simple, Flat				0			0			0			0	1		1	3		3			0			0			0	**4**
Flaring Rim, Flat				0			0			0			0			0	1		1			0			0			0	**1**
Exterior Bevel				0			0			0			0			0	1		1			0			0			0	**1**
Total Jar Rims		0		0	0		0	0		0	0		0	1		1	5		5	0		0	0		0	0		0	**6**
Beakers																													
Tapered				0			0			0			0			0			0			0	1		1			0	**1**
Total Beaker Rims		0		0	0		0	0		0	0		0	0		0	0		0	0		0	1		1	0		0	**1**
Indeterminate Rims																													
Simple, Round				0			0			0	1		1			0			0			0			0			0	**1**
Simple, Flat				0			0			0			0	1		1			0	1		1			0			0	**2**
Total Plain Rims		0		0	0		0	0		0	3		3	3		3	8		8	4		4	2		2	0		0	**20**
Bases																													
Flat, Round				0			0			0		1	1			0		1	1			0			0			0	**2**
Indeterminate				0			0			0			0			0		1	1			0			0			0	**1**
Total Bases			0	0		0	0		0	0		1	1		0	0		2	2		0	0		0	0		0	0	**3**
Total Plain Ceramics		0	1	1	0	4	4	0	10	10	3	17	20	3	47	50	8	182	190	4	81	85	2	36	38	0	16	16	**414**
Total Ceramics		**0**	**1**	**1**	**1**	**4**	**5**	**0**	**10**	**10**	**3**	**19**	**22**	**3**	**51**	**54**	**11**	**187**	**198**	**6**	**84**	**90**	**2**	**36**	**38**	**0**	**17**	**17**	**435**

	Collection Unit	30E 41N			40E 411N			50E 411N			60E 41N			70E 41N			80E 41N			TOTAL
Type	variety	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Coles Creek Incised,	*var. Hilly Grove*			0			0		1	1			0			0			0	**1**
Harrison Bayou Inc.,	*var. Harrison Bayou*			0			0			0		2	2			0			0	**2**
Hollyknowe Pinched,	*var. unspecified*			0			0			0		1	1			0			0	**1**
Mazique Incised,	*var. Preston*			0			0			0			0		1	1	1		1	**2**
Mazique Incised,	*var. unspecified*			0			0			0			0		1	1			0	**1**
Plaquemine Brushed,	*var. Plaquemine*			0			0			0		1	1			0			0	**1**
Unclassified Incised	*on Baytown Plain*			0			0		1	1			0			0		1	1	**2**
Unclassified Incised	*on Unclass. Plain*			0			0			0			0		1	1			0	**1**
Unclassified Inc./Punctated				0			0			0		1	1			0			0	**1**
Total Decorated Ceramics		0	0	0	0	0	0	0	2	2	0	5	5	0	3	3	1	1	2	**12**
Unclassified Plain			2	2		3	3		11	11		67	67		27	27		21	21	**131**
Bowls																				
Simple, Round				0			0			0	1		1			0			0	**1**
Interior Bevel				0			0			0			0	1		1			0	**1**
Total Bowl Rims		0		0	0		0	0		0	1		1	1		1	0		0	**2**
Jars																				
Simple, Round				0			0			0	1		1			0			0	**1**
Total Jar Rims		0		0	0		0	0		0	1		1	0		0	0		0	**1**
Indeterminate Rims																				
Simple, Round				0			0			0	1		1			0			0	**1**
Simple, Flat				0			0	1		1			0			0			0	**1**
Total Plain Rims		0		0	0		0	1		1	3		3	1		1	0		0	**5**
Total Plain Ceramics		0	2	2	0	3	3	1	11	12	3	67	70	1	27	28	0	21	21	**136**
Total Ceramics		**0**	**2**	**2**	**0**	**3**	**3**	**·1**	**13**	**14**	**3**	**72**	**75**	**1**	**30**	**31**	**1**	**22**	**23**	**148**

	Collection Unit	50E 131N	60E 131N	70E 131N	80E 131N	100E 131N	TOTAL
Chipped Stone							
Bifacial Tool/Preform						1	**1**
Anvil/Abraider		1					**1**
Flake Cores			2		1	1	**4**
Utilized flakes				1			**1**
Unutilized flakes							
	Local Pebble Chert	1		2			**3**
	Non-Local Chert				1		**1**
Shatter							
	Local Chert					1	**1**
	Fire-Cracked		2				**2**
Groundstone							
Sandstone Abraider			1				**1**
Sandstone Pieces				1			**1**
Total Lithics		**2**	**5**	**4**	**2**	**3**	**16**

	Collection Unit	20E 121N	30E 121N	60E 121N	70E 121N	80E 121N	90E 121N	100E 121N	TOTAL
Chipped Stone									
Hammerstone					1				**1**
Flake Cores		1			1		1		**3**
Unutilized flakes									
	Local Pebble Chert			1	1	2		1	**5**
	Thermally Altered Chert			1					**1**
Shatter									
	Local Chert				1	1	2	1	**5**
	Burned Debris				2	3			**5**
Groundstone									
Nutting Stone						1			**1**
Sandstone Abraider				1					**1**
Sandstone Pieces				1					**1**
Unmodified Pebbles			1		1	1			**3**
Total Lithics		**1**	**1**	**4**	**7**	**8**	**3**	**2**	**26**

Appendix B2: Provenience of Surface Collected Lithics From Blackwater (16TE101)

Collection Unit	30E 111N	60E 111N	70E 111N	80E 111N	90E 111N	TOTAL
Chipped Stone						
Bifacial Tool/Preform		1				**1**
Hammerstone		1				**1**
Flake Cores	1	4	1		1	**7**
Unutilized flakes						
Local Pebble Chert	1	3	1	1	1	**7**
Thermally Altered Chert		2				**2**
Shatter						
Local Chert	1	1		1		**3**
Burned Debris			4			**4**
Groundstone						
Sandstone Pieces	1	1	1			**3**
Petrified Wood Piece			1			**1**
Unmodified Pebbles		1			1	**2**
Total Lithics	**4**	**14**	**8**	**2**	**3**	**31**

Collection Unit	10E 101N	20E 101N	30E 101N	40E 101N	50E 101N	60E 101N	70E 101N	80E 101N	90E 101N	100E 101N	TOTAL
Chipped Stone											
Bayogoula Fishtailed						1					**1**
Bifacial Tool/Preform						1					**1**
Hammerstone								2			**2**
Anvil/Abraider									1		**1**
Flake Cores			1	2			1	3	1	1	**9**
Battered Cobble	1					1				1	**3**
Unutilized flakes											
Local Pebble Chert	1		4	2	1	1	2			3	**14**
Thermally Altered Chert							1				**1**
Shatter											
Local Chert	1		3	1		2	1	3	1		**12**
Burned Debris						1				2	**3**
Groundstone											
Greenstone Celt Fragments						1				1	**2**
Sandstone Abraider				1							**1**
Sandstone Pieces			1			1		1			**3**
Unmodified Pebbles		1				1				1	**3**
Total Lithics	**3**	**1**	**9**	**6**	**1**	**10**	**5**	**9**	**3**	**9**	**56**

Collection Unit	10E 91N	20E 91N	30E 91N	40E 91N	50E 91N	60E 91N	70E 91N	80E 91N	90E 91N	100E 91N	TOTAL
Chipped Stone											
Hammerstone					2						2
Anvil/Abraider					1						1
Flake Cores			3	2	3	2	4	1			15
Battered Cobble				1							1
Unutilized flakes											
Local Pebble Chert	1		3	2	5	5		2	2		20
Thermally Altered Chert					2		1				3
Shatter											
Local Chert		2	1	6	7	2	2	2		1	23
Burned Debris			2		1	2	1	2	2		10
Groundstone											
Gound Quartzite Piece				1							1
Sandstone Pieces				1	3			1	1		6
Pumice							1			1	2
Hematite					1						1
Unmodified Pebbles						1			1	1	3
Total Lithics	1	2	9	13	25	12	9	8	6	3	88

Collection Unit	10E 81N	20E 81N	30E 81N	40E 81N	50E 81N	60E 81N	70E 81N	80E 81N	90E 81N	100E 81N	TOTAL
Chipped Stone											
Alba Stemmed, *var. Catahoula*							1				1
Bifacial Tool/Preform										1	1
Hammerstone					1		1		1		3
Hammerstone/Anvil/Abraider							1	3			4
Flake Cores			1	6	7	1	4	3	3	2	27
Utilized flakes			1		3		1		1		6
Unutilized flakes											
Local Pebble Chert		1	1	2	2	5	1	3	4	1	20
Thermally Altered Chert						2	2	6	1	2	13
Shatter											
Local Chert			1	1	2	1			2		7
Burned Debris							3	1	1	1	6
Groundstone											
Sandstone Pieces			1					2	2		5
Hematite						1					1
Unmodified Pebbles				1		3		1			5
Total Lithics	0	1	5	10	15	13	14	19	15	7	99

Appendix B2: Provenience of Surface Collected Lithics From Blackwater (16TE101)

Collection Unit	*10E 71N*	*20E 71N*	*30E 71N*	*40E 71N*	*50E 71N*	*60E 71N*	*70E 71N*	*80E 71N*	*90E 71N*	*100E 71N*	**TOTAL**
Chipped Stone											
Bayougoula Fishtailed									1		**1**
Biface Fragment					1						**1**
Hammerstone										1	**1**
Flake Cores	1	1	1	1	4	3	3	3		1	**18**
Tested Pebbles								3			**3**
Battered Cobble			1				1				**2**
Utilized flakes			1				1				**2**
Unutilized flakes											
Local Pebble Chert			2	2	3	4	3	5	4	1	**24**
Thermally Altered Chert				1		3					**4**
Shatter											
Local Chert			1	3		5		5	1		**15**
Burned Debris		1			1			2	3		**7**
Groundstone											
Sandstone Pieces						1	3			1	**5**
Unmodified Pebbles							1	2	1		**4**
Total Lithics	**1**	**2**	**6**	**7**	**9**	**16**	**12**	**20**	**10**	**4**	**87**

Collection Unit	*30E 61N*	*40E 61N*	*50E 61N*	*60E 61N*	*70E 61N*	*80E 61N*	*90E 61N*	*100E 61N*	**TOTAL**
Chipped Stone									
Alba Stemmed, *var. Alba*								1	**1**
Stemmed Biface Fragment			1						**1**
Flake Cores		1	1	4		2		2	**10**
Tested Pebbles				1				1	**2**
Tested Cobble			1						**1**
Utilized flakes					1				**1**
Unutilized flakes									
Local Pebble Chert		3	1	3	1	3			**11**
Thermally Altered Chert		1		3	1	1			**6**
Shatter									
Local Chert	1	3	2	2	1		1		**10**
Burned Debris			2			2		4	**8**
Groundstone									
Chunkey Stone Fragment				1			1		**2**
Sandstone Pieces				3		1		2	**6**
Pumice			1						**1**
Unmodified Pebbles				2					**2**
Total Lithics	**1**	**8**	**9**	**19**	**4**	**9**	**2**	**10**	**62**

Appendix B2: Provenience of Surface Collected Lithics From Blackwater (16TE101)

Collection Unit	30E 51N	40E 51N	50E 51N	60E 51N	80E 51N	90E 51N	100E 51N	TOTAL
Chipped Stone								
Flake Cores				3				**3**
Unutilized flakes								
Local Pebble Chert			1	3			1	**5**
Thermally Altered Chert	1		1					**2**
Non-Local Chert		1						**1**
Shatter								
Local Chert		1					1	**2**
Burned Debris				1	1	1	1	**4**
Groundstone								
Sandstone Pieces			1	1	1			**3**
Total Lithics	**1**	**2**	**3**	**8**	**2**	**1**	**3**	**20**

Collection Unit	50E 41N	60E 41N	70E 41N	80E 41N	TOTAL
Chipped Stone					
Flake Cores		1			**1**
Utilized flakes	1				**1**
Unutilized flakes					
Local Pebble Chert	3	1			**4**
Shatter					
Local Chert		2		1	**3**
Burned Debris			1		**1**
Groundstone					
Sandstone Pieces		1			**1**
Total Lithics	**4**	**5**	**1**	**1**	**11**

Feature	*Elevation **	*Feature*	*Elevation **	*Feature*	*Elevation **
1	23.15	**51**	23.18	**104**	23.14
2	23.04	**52**	23.16	**105**	23.14
3	23.2	**53**	23.15	**106**	23.15
4	23.18	**54**	23.18	**107**	23.16
5	23.1	**55**	23.2	**108**	23.14
6	23.07	**56**	23.19	**109**	23.24
7	23.08	**57**	23.14	**110**	23.27
8	23.25	**58**	23.16	**111**	23.25
9	23.19	**59**	23.23	**112**	23.26
10	23.15	**60**	23.23	**113**	24.26
11	23.14	**61**	23.13	**114**	23.25
12	23.18	**62**	23.13	**115**	23.25
13	23.2	**63**	23.11	**116**	23.29
14	23.2	**64**	23.19	**117**	23.22
15	23.21	**65**	23.19	**118**	23.24
16	23.13	**66**	23.19	**119**	23.27
17	23.25	**69**	23.12	**120**	23.32
18	23.21	**70**	23.08	**121**	23.24
19	23.26	**71**	23.09	**122**	23.22
20	23.21	**72**	23.07	**123**	23.24
21	23.19	**73**	23.14	**124**	23.25
22	23.16	**74**	23.15	**125**	23.23
23	23.14	**75**	23.17	**126**	23.21
24	23.22	**76**	23.13	**127**	23.22
25	23.18	**77**	23.11	**128**	23.25
26	23.17	**78**	23.12	**129**	23.24
27	23.11	**79**	23.2	**130**	23.24
28	23.24	**80**	23.15	**131**	23.25
29	23.18	**81**	23.12	**132**	23.27
30	23.18	**82**	23.15	**133**	23.22
31	23.16	**83**	23.15	**134**	23.2
32	23.23	**85**	23.2	**135**	23.25
33	23.15	**86**	23.15	**136**	23.21
34	23.15	**87**	23.1	**137**	23.21
35	23.15	**88**	23.13	**138**	23.22
36	23.18	**89**	23.14	**139**	23.24
37	23.19	**90**	23.16	**140**	23.18
38	23.17	**91**	23.11	**141**	23.27
39	23.16	**92**	23.11	**142**	23.22
40	23.19	**93**	23.16	**143**	23.25
41	23.22	**94**	23.19	**144**	23.21
42	23.16	**95**	23.18	**145**	23.19
43	23.17	**96**	23.12	**146**	23.22
44	23.2	**97**	23.13	**147**	23.2
45	23.19	**98**	23.18		
46	23.19	**99**	23.18		
47	23.17	**100**	23.15		
48	23.17	**101**	23.14		
49	23.2	**102**	23.15		
50	23.19	**103**	23.16		

* Datum = +20 m; the surface elevation at 60E 101N is 23.5 m, at 70E 101N 23.49 m, at 80E 101N 23.4m, at 90E 101N 23.41 m, and at 100E 101N 23.34 m (see Figure 18)