Final Report on the 1989 Archaeological Investigations at the Osceola (16TE2) and Reno Brake (16TE93) Sites, Tensas Parish, Louisiana

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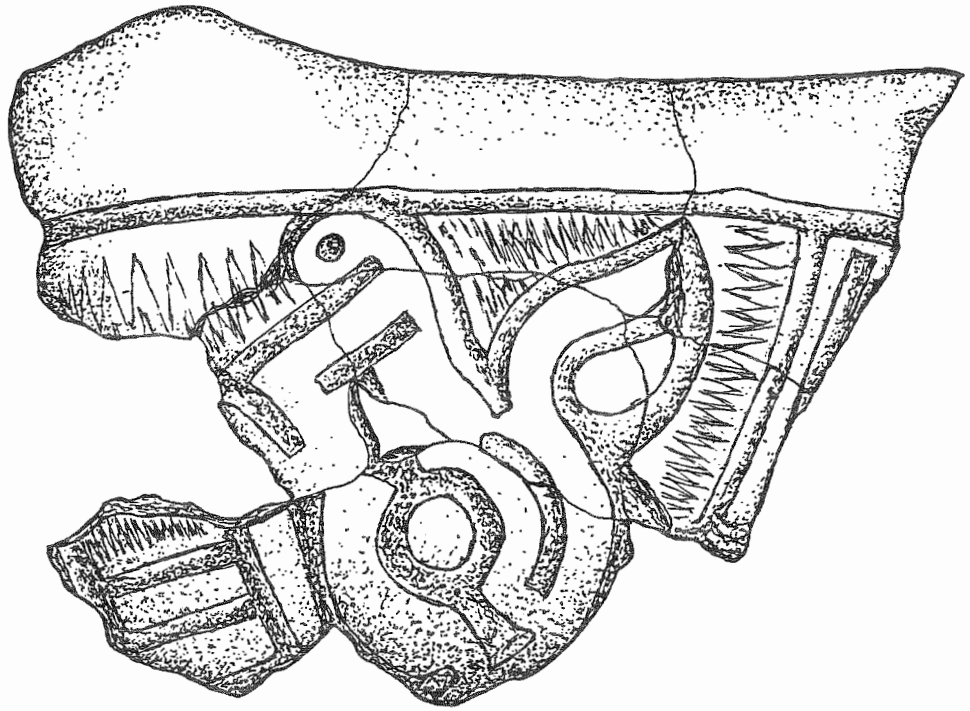

TULANE UNIVERSITY
CENTER FOR ARCHAEOLOGY

ARCHAEOLOGICAL REPORT 1

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by

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ABSTRACT

During the summer of 1989 the Center for Archaeology, Tulane University, and the Lower Mississippi Survey, Harvard University, undertook a program of archaeological testing at the Osceola (16TE2) and Reno Brake (16TE93) sites, Tensas Parish, Louisiana. This research was directed by Dr. Stephen Williams of Harvard University and the program of field research was carried out under the supervision of Dr. Tristram Kidder of Tulane University. The preliminary goal was to determine if either site was eligible for nomination to the National Register of historic Places. We also sought to assess the potential of sites in the Tensas Basin for contributing to an understanding of the causes and consequences of social, political, and dietary change in the Neo-Indian era in Louisiana. Investigations consisted of mapping, surface collections, shovel tests, and test excavations. The research at these two sites has provided us with a wealth of data and has permitted us to consider both sites to be eligible for nomination to the National Register of Historic Places. The contributions of this fieldwork will expand our knowledge of subsistence data and culture historical remains at these sites and aid the understanding of Louisiana's prehistoric legacy.

Acknowledgements

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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 John Gerry, Ken Jones, Gwen Isaac, Gil Tostevin, Jack Barker, Eliot Hoyt, and Caroline Williams. Thanks also go to Ms. Freddy Dimmick, Barbara Bosworth, and Reca Jones for their help and friendship. John Belmont deserves a great deal of credit for his many contributions. Although we did not always agree with each other his ideas and guidance were invaluable. Dr. Gayle Fritz 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 1989 season. Laboratory work was provided by Paul Hughbanks, Christine Hernandez, and Valentina Matte. My wife Eileen provided the bulk of the labor for the initial washing and labelling of the thousands of artifacts recovered in 1989 and my appreciation for her work can hardly be expressed.

My colleagues have also been a great source of support. Thanks go to the faculty of the Department of Anthropology at Tulane University for their patience and encouragement. Jeffrey Brain and Ian Brown have given invaluable council and their labors on my behalf are greatly appreciated. Dr. Stephen Williams has served as mentor and inspiration for the 1989 Osceola project and I cannot thank him enough for his participation.

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CHAPTER ONE

INTRODUCTION

During the summer of 1989, under the joint sponsorship of Tulane University and the Lower Mississippi Survey (LMS) of Harvard University, the Osceola Project conducted a seven week program of archaeological investigation for the purpose of providing information relevant to determining the National Register eligibility of the Reno Brake (16TE93) and Osceola (16TE2) sites, Tensas Parish, Louisiana (Fig. 1). These investigations included mapping, surface collecting, geomorphic testing, subsurface shovel testing, and archaeological test excavations. At Reno Brake we excavated 220 shovel tests, and one test excavation unit, in addition to conducting an intensive controlled surface collection. Investigations at the Osceola site consisted primarily of the excavation of four test excavation units and a small number of shovel tests. This report will detail the program of investigation and outline our substantive contributions.

In addition to ascertaining the National Register eligibility of the two sites, we also undertook to scientifically investigate the relationship between subsistence change and social organization during the Late Woodland period in northeast Louisiana. Our goals were to understand the site contexts and the subsistence patterns at the Osceola and Reno Brake sites. These data would lead to a fuller understanding of the importance of late prehistoric subsistence and social change in an area where little research of this kind had been undertaken. The subsistence base of the Coles Creek (A.D. 700-1100) and preceding periods in the Lower Mississippi Valley (LMV) is poorly understood (Byrd and Neuman 1978). While there is evidence of population gain and increased social complexity which suggest major changes in the diet (Kidder 1988b), the specific nature and cause of such change is yet to be identified (Nassaney 1987).Similarly, we do not understand the chronology of social evolution in this period (Barker 1988). We cannot adequately discuss Coles Creek subsistence and social organization because of incomplete data. This project was one way to rectify this situation.

Site History and Discovery

The Osceola and Reno Brake sites have a relatively long and complex archaeological history. Osceola was first described by James Ford, who in 1935 visited it and recorded its location in the LSU files as site 16TE2. At the time of his visit Ford observed that the site was located in the woods on the west side of a brake, then known as Reno Brake, and also noted that the largest mound was 17 feet high. Ford did not make a collection from the site and he located it in the southeast corner of the 24-K quad. When Phillips' conducted a reinvestigation of the LSU site files in 1956, he suggested, based admittedly on guesswork, that the site was actually located farther south in the 25-K quad near Osceola Plantation. The site was recorded in the LMS (Lower Mississippi Survey) files as 25-K-1.

In 1963 when the LMS Tensas Basin survey conducted field investigations in the alleged location of 25-K-1 they discovered that no site existed in the spot where Phillips' located the site. John Belmont and David Hally both attempted to locate Osceola in 1963. Belmont, guided by a local informant located a small mound in the woods. Because of the dense ground cover he thought the site was in the 24-K quad; he gave the site the number 24-K-13 and named it Stag Camp.

David Hally revisited the area without Belmont at a later date. With the same informant he relocated the site visited by Belmont, but was able to ascertain that the site designated 24-K-13 was really in the 25-K quad, so he renamed and numbered the site, calling it Reno Brake and giving it the number 25-K-22. Hally, however, was using out-of-date quad maps, and he located the site farther south than it actually was. Hally, unlike Belmont, was able to get a small collection from the site he named Reno Brake. Hally's informant also said he knew of a mound site located at the approximate spot where Belmont had mislocated Reno Brake, but they were unable to visit this site (Belmont personal communication 1984).

Thus, in 1963 the LMS knew that Osceola had been mislocated by Phillips, but was unable to actually find the site; it was suspected to lie in the 24-K quad, at, or near where Belmont had identified (or actually misidentified) a site then called Stag Camp. The LMS had found a small mound site, which was correctly identified as being in the 25-K quad, but was mislocated. Tentatively the LMS files were listing the Osceola site as being either LMS 24-K-13, or 25-K-1, and Reno Brake as 25-K-22; however, neither site was securely located.

In 1983 the author and a LMS field crew were on a weekend trip to Natchez when a friend who runs a lumber mill offered to guide us to a site he had located in Tensas Parish. By this time much of the land around the site was clear, but the mound site we were guided to was still in woods. After being guided into the site by Lee Jones of Natchez, who was conducting lumber operations on the site, we quickly realized we had finally found Osceola. The site had at least three mounds (or so we thought), and the largest was a likely candidate to be the one Ford identified as being 17 feet tall. A brief surface collection gathered from mound slopes revealed that the site had late Coles Creek and probably early Plaquemine components.

While we explored the mounds at Osceola our informant mentioned another small group of mounds in a cleared field immediately to the south. Since we were unprepared for any intensive research at Osceola we were content to make a sketch map and a small collection. We did, however, with the aid of Lee Jones, correctly locate the site. It was indeed found at the spot where Belmont had (mis)located Reno Brake, but which he had called Stag Camp (24-K-13). Since the name Osceola had precedence the name Stag Camp was not used but the number 24-K-13 was maintained.

Jones took us to a site south of Osceola with three low, conical mounds which had recently been

plowed. The site was located just across the section line which marked the division of the 24 and 25-K quads. Since this location was farther north of where Hally had located Reno Brake, we named the site Bloom, after the owner, and gave it the number 25-K-24. In 1983 we were able to gather a large collection which on later inspection turned out to date almost entirely to the Baytown period, specifically to the Troyville culture.

When John Belmont inspected the 1983 collection from Bloom and Hally's collection from Reno Brake he, realized that they were culturally and temporally identical. With our notes and certain locations Belmont realized that Hally's Reno Brake was the same as our Bloom, but that Hally had mislocated the site. Thus, we named the site Reno Brake, and used the number 25-K-22. Thus, after 20 years of confusion the locations of these two sites, Osceola and Reno Brake, were finally confirmed.

1988 Reconnaissance

In the early summer of 1988 the author returned to the site area accompanied by Jeffrey Brain. The purpose of the visit was to ascertain if either or both sites were suitable for further investigation specifically focusing on the investigation of Late Woodland subsistence patterns. A small surface collection obtained from Osceola during a short visit to the site with Lee Jones and Jeffrey Brain reconfirmed our notion that the site supported a late Coles Creek component. Sherds were found on the crest and slopes of four mounds we investigated. Because of the sample size no attempt was made to segregate the collection by mound. The only decorated sherd (Beldeau Incised, var. Beldeau) was found on mound C.

A hurried shovel test program was initiated over a half-day period by the author, later assisted by Diane Silvia. Nine shovel tests were excavated to maximum depth. A number of tests in the plaza and at the edges of the mounds were discontinued when we encountered thick, heavy, gumbo clay soils. These gumbo soils were impossible to dig or screen with the tools we had available, and therefore we did not try to penetrate below them. These soils were found across the plaza and along the bank of the slough to the north and east of the site. These soils are the result of periodic overbank flooding and subsequent deposition. That we found no cultural materials in the plaza is probably not an indication of the actual distribution of midden or village area in the site. In fact, Ford (1951:23, fig. 4) observed a similar situation at the roughly contemporary Greenhouse site.

The nine shovel tests were placed on mound slopes or at the base of mounds in an effort to locate intact midden deposits which could be explored more intensively. No systematic attempt was made to be unbiased; in fact the locations were placed based on my expectation that midden would be located between mounds or on mound flanks. Two tests each were placed on mounds A, B, C, and F and a single shovel test was excavated on the flanks of mound E. The results of the shovel test were that intact and apparently very rich midden was located on the eastern side of mound B, on mound F and

also in several locations near mound A. The results were very encouraging, especially those near mound B.

As a result of our shovel testing we decided to place a 1-by-2 meter test excavation unit on the slope of mound B adjacent to the location of shovel test 2. In order to excavate perpendicular to the edge of the mound the unit was oriented 35 degrees north of west, and it was placed 20 cm northwest of the shovel test. Guided by the results of the shovel test natural stratigraphy was to be utilized for data recovery. Excavation was conducted using shovel and trowels, and all soil was sifted through 1/4 inch mesh. All measurements were recorded from the northwest-most stake. Results of the excavation are discussed below in Chapter 5, and the artifacts are tabulated in Table 4.

The results of the 1988 reconnaissance were very encouraging. It was evident that both Reno Brake and Osceola were significant sites for local and regional prehistory. The two sites appeared to span much, if not all, of the Late Woodland period sequence in the Lower Mississippi Valley, and the potential for the recovery of stratified remains seemed very great. Testing at Osceola further demonstrated that well preserved faunal and floral remains might be recovered with appropriate techniques. The dearth of hard data concerning subsistence exploitation patterns by Neo-Indian occupants in the Lower Mississippi Valley is hard to overstate. In the Tensas Basin almost no information existed for post-Marksville times. Because of the need for more precise documentation of subsistence practices, and the pressing need to explore the relationship of subsistence change and social evolution the Osceola project was formed. The 1989 field season was planned to begin a long-term investigation of the regional patterns of culture change and stability.

Organization of Final Report

The rest of this report will be concerned with presenting the results of the 1989 excavations. To a large extent these findings are still preliminary —despite the title of the report. First, our investigations were very limited and were primarily focused on extracting culture historical data and with exploring for the potential to gather subsistence data. Also the results are still being investigated by experts who were not hired consultants. The subsistence data which were recovered were very abundant and more complex than anticipated. As a result their analysis is an ongoing project which will not probably be finished for some time. In addition it should be borne in mind that this is the first season of what we anticipate will be a long-term project having as its broadest goal the investigation of all Neo-Indian subsistence change and its affect on prehistoric societies. Therefore, the conclusions reached in this report are not just preliminary, but speculative to the extent that they will be revised and probably superceded in the coming years.

The report is organized into separate chapters which treat some of the many aspects of the 1989 season. Chapter Two provides background for the research by presenting the culture historical as well

as the theoretical basis for further investigations. This chapter also includes our research design, and the methods by which we accomplished our research goals. Chapter Three is a short discussion of the environmental and geological background of the immediate site area. A fuller discussion of the regional geology is found in Appendix A, a report by Roger Saucier. Chapter Four discusses the investigations at the Reno Brake site, while Chapter Five does the same for the Osceola site. Chapter Six is a summary of our accomplishments and a presentation of some of our tentative conclusions.

CHAPTER TWO

RESEARCH 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 1990; Neuman 1984) (Fig. 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, we have almost no understanding of Archaic, Poverty Point, or Tchefuncte cultures (Gibson 1977; Phillips 1970; Williams et al. 1966). Since the 1989 investigations at Osceola did not specifically address these early cultures, and because it did not uncover remains of later Plaquemine or Mississppian occupations, these cultures cannot be discussed without simply restating existing concepts and ideas. 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 Marksvile through the Coles Creek period. This discussion encompasses the periods of time and the cultures which are represented by the investigations at the Reno Brake and Osceola sites. 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 germaine 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 cultural contacts, and the second a period of local elaboration of existing early Marksville trends (Neuman 1984; Phillips 1970; 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, 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; most components are found near Tensas River. Issaquena sites are generally small midden type occupations, but there are mounds associated with late Marksville culture throughout the Lower Mississippi Valley. Sites of this period suggest a relatively low level of cultural development. It seems doubtful that there were elaborate political systems in place. The 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, 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). No data concerning floral exploitation is documented, though it is generally thought that the Late Marksville period is not associated with the cultivation of domesticates.

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, we know considerably more about Troyville ceramics than any other aspect of society.

Mounds were constructed at this time, both as living platforms and for the interment of the dead (Belmont 1980, 1984:81-83). 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. 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). 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. There is considerable evidence of ties to Weeden Island cultures of Alabama and Florida (Belmont 1967a).

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). There is at present no evidence for horticulture or agriculture at this time (Rose et al. 1984); however, no focused attempt has been made to understand Troyville culture subsistence patterns in the Tensas Basin. Consequently we do not have a firm understanding of the relationship between diet, health, and cultural complexity.

Sicily Island Culture

Recent research on Lower Valley culture history has suggested a temporal gap between Troyville and Coles Creek. Jon Gibson (1987; Belmont and Gibson 1988) 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) Though this designation is still tentative, Gibson (1987), and Belmont and Gibson (1988), have indicated that in the Tensas Basin the Sundown phase should be assigned to the Sicily Island culture. The Sundown phase had previously been the first identified Coles Creek phase in the Tensas Basin (Bitgood 1989; Phillips 1970; Williams et al. 1966) and it appears to have evolved almost directly out of the preceding Marsden phase (Bitgood 1989).

Like the Bayland phase of the Yazoo (Phillips 1970:907; Williams and Brain 1983:366-369, 403-405), Sundown has a transitional feel to it, with ceramics in particular showing a mixture of Troyville and Coles Creek types and varieties (Phillips 1970:918). Settlement patterns and site layouts also appear to indicate continuities with the past while foreshadowing changes in the future (Belmont and Gibson 1988; Bitgood 1989; Williams and Brain 1983:405-408, figs. 12.12, 12.13). There is little available evidence concerning Sicily Island diet. The extant data suggest a broad spectrum subsistence base exploiting the many varied and diverse environments in the Lower Mississippi Valley (Belmont 1983).

Coles Creek Culture

In the Tensas Basin Coles Creek is traditionally subdivided into three sequent phases based on ceramic chronology (Belmont 1984; Phillips 1970; Williams et al. 1966). Following Sundown is the Ballina phase, which is undisputably a Coles Creek cultural manifestation. 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. The Ballina phase is distinguished from the preceding Sundown phase by subtle shifts in ceramics and settlement patterns (Belmont 1967a:32, 1982:68; Kidder 1988b). The similarity of the two phases underscores the slow and gradual pace of change in Lower Valley cultures at this time (Belmont 1967a: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 we know nothing about Ballina phase subsistence. Research at the Osceola site in 1989 has led us to believe that the Ballina phase may be restricted to the very southern Tensas Basin. At the Osceola site a local phase, tentatively called the Saranac phase, takes the place of Ballina. The Saranac phase shows different ceramic frequencies, and our preliminary analysis shows that it was heavily dependant on aquatic food resources and also non-domesticated plant foods. Considerably more research is necessary to confirm our tentative findings from the 1989 investigations.

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 1967a:32-33; Kidder 1988a:94). 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.

Sites increase in size and apparently in complexity. The settlement pattern, however, 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 phase components are found in the Ouachita and Boeuf basins (Fuller 1985:28-29; Kidder 1988a:59-62, 1990a), and their assemblages are so close to those found in the Tensas that they must represent physical contact between the regions (Kidder 1990a). Initial results from our work at Osceola in the summer of 1989 show that all three mounds which were investigated were constructed during the Balmoral phase. However, the Balmoral phase deposits were relatively rare, suggesting that the site function shifted from a habitation site to a vacant ceremonial center.

The Balmoral phase also witnesses an increase in external contacts, with long distance trade goods being imported, albeit in small quantities. The subsistence base is not well understood, but the evidence for maize cultivation is scant (Byrd and Neuman 1978; Kidder 1990b; Rose et al. 1984; Rose and Marks 1985; Rose, Marks, and Tieszen 1985; cf. Shea 1978; Thomas and Campbell 1978; Yarnell and Black 1985). Faunal exploitation was apparently becoming increasingly more focused, with deer and fish assuming a greater role in the subsistence diet. At Osceola we see a very heavy emphasis on aquatic species, but our sample is very limited. More extensive investigations are necessary to determine the nature of Balmoral phase subsistence.

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). This phase apparently reflects a gradual evolution from Coles Creek to Plaquemine culture, with ceramics and settlement presumably demonstrating this transition. Testing at the Osceola site in 1989 indicated that the last occupation of the site apparently dated to the Preston phase, and that these peoples may have lived on the mounds themselves. Unfortunately too little has been written on the proposed Preston phase to make a cogent assessment at this time.

Theoretical Background

During the late Marksville, Baytown, Sicily Island, and Coles Creek periods populations in the Lower Mississippi Valley greatly increased as did evidence of social stratification (Brain 1971, 1978; Kidder 1988b; Neuman 1984; Steponaitis 1986; Williams and Brain 1983). While there is some debate on the cause of these phenomena they generally have been ascribed to the advent of large-scale maize agriculture in the Lower Mississippi Valley (Williams and Brain 1983:408). The data to support this hypothesis are generally inferential with site locations and settlement patterns being commonly cited as evidence that maize agriculture was practiced by Coles Creek times (Belmont 1967b; Brain 1976; Williams and Brain 1983:363, 403).

Recent research on paleoethnobotany and faunal exploitation in the Mississippi Valley is challenging the prevailing concepts which posit a correlation between large-scale social complexity and maize agriculture (Asch and Asch 1985; Cowan 1985; Ford 1985; Fritz 1988a, 1988b; Fritz and Smith 1988; Kidder 1990b; Smith 1986, 1987, n.d.). It is now known that many cultural groups throughout the southeastern United States practiced plant husbandry involving native species (Asch and Asch 1985; Jenkins and Krause 1986; Johannessen 1984; Watson 1985; Yarnell and Black 1985).

In the Lower Mississippi Valley there never has been a systematic analysis of Neo-Indian subsistence practices (Byrd and Neuman 1978; Cowan 1985:242). The few subsistence studies which have been conducted to date have failed to substantiate claims for maize cultivation prior to A.D. 1100 (House 1982, 1985; Kidder 1990b; cf. Shea 1978). Furthermore, research has demonstrated that native plants were a significant part of the diet in the Lower Mississippi Valley during this interval (Fritz 1988a; House 1985; King 1982, 1985). While direct evidence of maize is lacking, bioarchaeological data suggest that maize or a starchy food was present in the diet of Coles Creek populations in the Tensas Basin (Rose et al. 1984; Rose and Marks 1985; Rose, Marks, and Tieszen 1985). The investigators who noted these data have hypothesized that in the face of negative evidence for maize, these data indicate consumption of starchy native food plants (Kidder 1990b; Rose et al. 1984; Rose, Marks, and Tieszen 1985; see also Fritz 1988a; Nassaney 1987, n.d.). Research at Osceola and Reno Brake can contribute to an understanding of the issues surrounding subsistence

intensification and the concomitant development of social complexity during this crucial period of southeastern prehistory.

Research Goals and Hypothesis Testing

Because there is such uncertainty concerning the nature and importance of subsistence patterns in the Lower Mississippi Valley between A.D. 400-1100 it was our goal to explicitly examine the diet of the Troyville, Sicily Island, and Coles Creek peoples in and around the Osceola and Reno Brake sites. Our two primary research interests were to identify and characterize the faunal and floral exploitation patterns during the period in question, and to also correlate the patterns of subsistence use with changes in social and political complexity. In order to accomplish our goals we examined two interrelated hypotheses. These hypotheses are subject to archaeological testing and verification through a research design set forth below.

Hypothesis 1:

Contrary to previously conceived notions concerning subsistence patterns, we do not expect that maize agriculture was a significant aspect of the diet in the Tensas Basin until the late Coles Creek period, ca. A.D. 1000-1200 (Kidder 1990b). Instead, it was hypothesized that the plant food diet consisted largely of intensively exploited native cultigens such as amaranth, chenopod, sunflower, maygrass, squash, and nuts. We would also suggest that as a result of the intensive exploitation of native plant foods, faunal subsistence would shift from a broad spectrum of animals to a more focused dependence on fewer, but more intensively utilized species. It is likely that the faunal diet will be dominated largely by deer and fish resources, with the aquatic contribution increasing through time. The decreased range of faunal exploitation would be a response to the increasing demands on time due to cultivation as well as a result of territorial circumscription caused by population growth (Kidder 1988b).

To demonstrate the validity of this hypothesis we would expect to see a shift through time in the intensity of native cultigen exploitation and a narrowing of the faunal resource base. In Troyville times we suspect that the pattern will be to find a modest quantity of native cultigens with a relatively broad range of fauna being present. As time progresses we expect to see an intensification of floral and faunal exploitation resulting in greater quantities of plant food remains and a smaller number of animal species being utilized. By mid- to late Coles Creek times we hypothesize that maize would enter the diet, but should be confined to certain, probably elite, contexts. By the time transition to the early Mississippi period Plaquemine culture occurs, maize should be increasing in frequency while native plant foods diminish in importance. The fauna should show an increasing trend toward focused exploitation of fewer species.

Hypothesis 2

We hypothesized that we would detect a pattern of increasing levels of socio-political complexity as time passes. While this was an intuitive hypothesis in some regards, we also expected that the degree of political and social evolution was largely a result of changes in the subsistence base. We presumed that the communal activities witnessed in Troyville culture burials and "bathtub-shaped" pits would give way to a more individual or intra-community focus as a result of the need by prehistoric peoples to control their subsistence base in the face of increasing population and territorial pressure. As the subsistence base intensified we hypothesized that leadership roles will become more important and more prominent. We expected to see a change from communal ceremonial activities to those that symbolize the power of the individual. The strength of the individual, or perhaps a select group of individuals, should increase through time, cumulating in a true chiefdom form of government by the beginning of the Plaquemine culture emergence at ca. A.D. 1200.

The archaeological proof of hypothesis 2 will require the correlation of changes in site structure and function with subsistence intensification. We expect to find evidence of hierarchies forming in material culture. Ceramic distribution is expected to show different access to high status wares, while subsistence remains should demonstrate that select groups were commanding more and better food resources. We further anticipated that architecture would mark a change from communal functions such as those seen in the Troyville culture to a pattern of elite residential and ceremonial structures located in conspicuous places. Thus, subsistence change should correlate with the advent of major mound and temple architecture, perhaps with elite, or at least socially restricted, burials being contained within these mounds. Proof of this hypothesis cannot be as certain as that for hypothesis 1. To fully realize our goal we would need to investigate larger areas of the site than we did in 1989. Nonetheless, we should be able to equate the subsistence base and its presumed intensification with the rise, or at least the growth, of social and political complexity.

Research Design

The research design at Osceola and Reno Brake has three components. The first concerns documentation of the natural environment. A geomorphic analysis of the site vicinity was conducted in order to reconstruct the site environments and the prehistoric topography. This action is, we believe, a necessary precursor to any investigation of these sites. The second aim of our research is establishment of intra- and inter- site chronology. Chronological control was maintained through standard analytic techniques developed over forty years of excavation in the Lower Mississippi Valley (Phillips et al. 1951; Phillips 1970; Williams and Brain 1983). The third focus of research, and the one with initial priority, was diet and health. We had hoped to employ a paleoethnobotanist, a faunal analyst and a bioarchaeologist who would coordinate their analyses to examine the full range of subsistence practices at Osceola and Reno Brake. Unfortunately, we were unable to secure the services of the bioarchaeologist or the faunal analyst given time constraints and available funding. Because of this,

especially the absence of a trained faunal analyst, were were unable to securely achieve some of our research goals. Nonetheless, we can address some of the questions concerning faunal utilization with the available data.

Prior to excavation the sites were mapped and a coordinate grid established. Although we had a broad goal in mind the first year of research was largely concerned with locating intact midden and determining site boundaries. To accomplish these aims excavations were focused on vertical stratigraphy and extensive sampling of both sites. We had hoped to test each mound to determine the sequence of intrasite growth and to correlate evidence of site modification and mound building with shifts in the subsistence economy. Time limitations, heavy rain, and logistical problems prevented us from completing our testing schedule.

Research Methods

Mapping

An initial priority for research was the mapping of both sites by instrument survey. Once this was accomplished a coordinate grid was established over each site based on grid north. The grid was theoretically laid out to provide for resolution down to one square meter, although in no case was an actual grid of that dimension physically staked out. Grid points for excavations were determined by instrument survey from a specified datum. Primary datum at each site was marked by metal spike set in concrete. All grid designations (for surface collecting, shovel tests, and test excavation units) used by the Osceola project refer to the northeast corner stake.

Surface Collecting

Inclement weather at the beginning of the field season prevented access to the Osceola site which was slated for initial testing. As a result field priorities were reassessed and it was decided that effort should be expended in a careful and controlled surface collection at Reno Brake. Therefore the site was grided into 10-by-10 m squares, extending from a grid datum (located 10 m south and 6° east of site datum). A grid datum was necessary since the initial site datum had been placed next to an iron deer stand which made our magnetic compass inaccurate. The grid was not extended north of datum as this area was in woods with dense cane stands. The size of the grids was determined based on past experience and with an eye to available resources. Larger grids were ruled out because the spatial data does not yield meaningful patterns of distribution. In essence large grids "average out" spatial variation. Smaller grids were simply impossible to create and collect given our limited time and resources. Ten-m units were a happy compromise and in the field seem to have served their purpose well.

Each 10-by-10 unit was assigned to one or more collectors, and systematically collected by walking a series of transects in one direction, and then repeating the transects in a direction perpendicular to the

first. Due to variable surface cover (weeds, grasses, and some crop cover), the amount of surface exposure was carefully recorded based on a subjective assessment of the total percentage of exposed ground. Every effort was made to be thorough in the surface collection, but it is not possible to suggest that every unit was collected under uniform conditions. In each unit all artifacts were collected if they were larger than 1/4 inch. Generally this led to a complete surface collection, but it is necessary to acknowledge that there was a learning curve involved, which meant that the first units collected, on the north side of the site, were not as thoroughly covered as were later grids. We were fortunate that during the period prior to, and during the surface collecting, rain was common and provided us with excellent surface exposure.

Shovel Tests

We had not planned to excavate extensively at Reno Brake, but decided instead to focus our energies on maximizing our understanding of the subsurface stratigraphy with the minimum amount of work and possible damage. Therefore we initiated a program of shovel testing and took advantage of the surface collection grid intersections as a guide to systematically covering the site. Shovel tests were placed at the intersections of each grid unit. Elevations for each point were established using a transit; excavations were done by shovel, auger, and post-hole digger. Soils were not screened, but artifacts found were saved as a general lot from each shovel test. Notes on the locations, stratigraphy, and contents of each excavation were maintained. Generally two shovel test teams operated simultaneously working on parallel transects. Excavators compared notes and worked to maintain a standard soil color and texture nomenclature. The shovel test grid, unlike the surface collection grid, was extended north of datum to the terrace edge. Shovel tests were placed at 10 m intervals, although in several cases it was necessary to move the test location due to roots or trees.

At Osceola we undertook limited shovel testing, instead preferring to focus our energies on test excavations. Our reasoning was based on several facts. First, we knew from our initial reconnaissance at the site in 1988 that much of the site was probably buried beneath at least 50 cm of alluvial overburden, and thus shovel testing would have involved considerably more effort than was warranted. Our concerns about the amount of sterile alluvium were confirmed during geomorphic tests undertaken by the Soil Conservation Service and the Louisiana Department of Agriculture and Forestry. The only shovel testing accomplished during the 1989 season at Osceola was limited to testing for near-surface midden deposits on mounds D and E. These tests were limited to randomly placed excavations which were excavated in the same manner as was done at Reno Brake.

Geomorphic Testing

An important aspect of our research at the Osceola and Reno Brake sites was achieving an understanding of the prehistoric environment. To gather information pertinent to this goal we retained

Dr. Roger T. Saucier as a geological consultant. We were aided in our efforts by Thurman Allen and Doug Gillette, of the Soil Conservation Service and State Department of Agriculture and Forestry, respectively. These latter two provided us with the service of their hydraulic truck-mounted core rig, which was used to place a number of cores. Dr. Saucier directed the placement of the cores with the following criteria in mind: 1) to define the site limits, and the nature of the site placement relative to natural features; 2) to discern the amount of post occupational flooding and sediment deposition, and 3) to understand the prehistoric environment through an analysis of local sediments.

Test Excavation Methods

Each excavation unit was given a designated alpha-numeric catalogue number. In the case of the excavations at Reno Brake and Osceola the code was prefixed with the letter "O" followed by a three digit number. For example test pit N42 W1 was given the catalog code O249. Each level within the unit was then designated with an alphabetic suffix; for example O249C was the third level excavated in N42 W1. Since we used both natural and arbitrary levels the suffix letter cannot be used solely to determine depth or strata. Features were designated by sequential numbers following the alphabetic suffix. The catalogue number O249K1 designates feature 1, which was found initially in level K, and which represented the first feature found in that test unit. Each bag of material excavated or removed from the unit was given a waterproof tag which indicated the site name, number (in this case it was the LMS designation 25-K-22 for Reno Brake or 24-K-13 for Osceola), excavation unit or shovel test, level or feature number, date, and the name(s) of the excavators. This information was transferred to a catalogue card at the lab and the tag stayed with the material throughout its processing.

Whenever possible excavations were undertaken by natural stratigraphy. In some cases this proved to be impossible and a combination of arbitrary and natural excavation units was utilized. For all units excavation controls were maintained in both vertical and horizontal provenience, and thick natural levels were arbitrarily subdivided into 10 cm levels. Features were excavated separately from surrounding levels, and all features were carefully mapped and photographed prior to and during removal. All excavation was conducted by hand, using shovels and trowels. The soil was handpicked for large artifacts and then was placed in plastic bags for removal to the lab for waterscreening. Waterproof tags were placed inside the plastic bags and a separate tag was also placed on the outside of the bag. Every effort was made to insure the integrity of each sample. Experienced excavators were responsible for maintaining separate notebooks for each unit, and the field director also kept a separate record of activities and impressions. Each unit was excavated to subsoil (the depth of which was revealed by geomorphic testing conducted around the site area). Units were then cleaned up, the profiles photographed, and profile drawings were rendered for all four walls.

All material excavated in 1989 was screened through 1/4 inch screen, but in some cases smaller screen sizes were utilized. Due to wet soils and heavy clay content within the soil, much of the soil was

transported to the lab for waterscreening. Waterscreening utilized 1/4 and 1/8th inch screens stacked on top of one another. Samples for flotation were taken from each level identified. Flotation samples consisted of 13 liter samples taken, whenever possible, from the northeast corner of each unit. All features defined in the field were 100% floated, and in many cases multiple samples were taken from thick natural units, or where horizontal differences were noted within a strata. Flotation was accomplished with a modified SMAP machine and was supervised by Dr. Gayle Fritz.

CHAPTER THREE

ENVIRONMENT AND GEOLOGY

Environment

The research universe lies in the southern and eastern portion of the Tensas Basin between the Mississippi and Tensas rivers (Fig. 1). The Tensas Basin consists of the lowlands east of Bayou Macon and west of the Mississippi. The basin is dominated by riverine features that are relict channels of the Mississippi and earlier Arkansas rivers. To the southeast and northeast of the sites lie two oxbow lakes, Lake Bruin,and Lake St. Joseph. The topography around Osceola and Reno Brake consists of low ridges and intervening swales, low swampy areas, and occasionally higher levees from an earlier stage of the Mississippi River (Gulf South Research Institute 1974; Saucier 1967, 1974) (Fig. 3). Research in 1989 demonstrated that the sites lie on the levee of a large point bar of an abandoned channel of the Mississippi River (Saucier 1989). A low brake or slough, once known as Reno Brake, lies adjacent to both sites and appears to mark the former bed of this channel (Fig. 3). Geomorphic coring undertaken as part of our research in 1989 revealed that this abandoned channel was most likely a lake at the time the two sites were occupied.

Although the Reno Brake site is now cleared and in cultivation, the adjacent Osceola site is still in a tract of woods. It is not presently known if the Osceola site itself was ever cleared, but it seems unlikely. The present-day vegetation around Osceola can no longer be thought of as a model for both sites. The original occupation surface is buried beneath upwards of 50-70 cm of thick clay, while the former channel has deposits up to three meters in thickness. The current primary forest type is oak-hackberry-gum, but there is also a considerable amount of scrub vegetation, including palmetto, particularly in lower lying areas. Cottonwood is found near the Reno Brake site in the former channel of the Mississippi. Small stands of cane are also found at Osceola, particularly along the edge of the levee overlooking the former channel. We cannot yet reconstruct the original environment at occupation, but we would envision it to have supported more oak and hickory, with perhaps equal amounts of cane, but less understory scrub. Soils would have been sandier and more arable. The current Sharkey and Tunica clay soil complex would not have been found around the sites (it comprises the more recent overburden), but rather the soils would have probably been classified in the Commerce or Sharkey silt loams, which are found on the levee of Lake Bruin (Weems et al. 1968).

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. Deer were certainly the predominant large mammal, with wolf, fox, bobcat, and probably bear also present in the general vicinity. Smaller mammals such as racoon, opossum, squirrel, and rabbit would have been common around the two sites. 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 are not known to be common in the immediate site vicinity, but they were certainly present in the Tensas Basin during prehistoric times and are found in small quantities at the Osceola site.

Geological Setting

Through a preliminary analysis of extant maps and aerial photographs Dr. Saucier hypothesized that the sites may have been situated on the edge of an abandoned channel of the Mississippi River which was largely buried beneath more recent deposits. Inspection of recently published 7.5' U.S.G.S. maps showed that this was a likely fact (Fig. 3), and testing was mostly focused on proving and expanding on this idea. Test cores were placed in the channel of the relict course with the idea that we would be able to identify the past environment and to prove if the site was on an active channel. Cores placed in the channel demonstrated that it was: a) truly a relict course; b) inactive at the time of site occupation and that the occupation occurred well after the channel had become inactive; c) probably a lake or open body of water during the occupation at the Osceola site; and d) very deeply buried beneath later sediments.

Testing at both Osceola and Reno Brake demonstrated that the entire region around this channel, dubbed "Lake Osceola", was buried beneath considerable amounts of sediments. At Osceola the plaza and non-mound portions of the site lie between 30-50 cm below modern ground surface, while the plaza at Reno Brake is almost as deeply buried. The geological setting and background of both the research universe and the Osceola site specifically have been studied by Dr. Roger Saucier, consulting earth scientist, and his report is included as Appendix A.These findings will have a significant impact on our attempts to understand past activities in a region heavily influenced by the Mississippi River.

CHAPTER FOUR

THE RENO BRAKE SITE (16TE93)

Site Description

The Reno Brake site lies 400 meters south of Osceola (Fig. 3). It is located on the bank of the same relict channel as is Osceola, but it is now cleared and in cultivation. The site consists of four low, domed mounds on the levee of the relict channel (Fig. 4). There is a low depression to the east of the site which marks the former channel, and also one immediately to the west and south which may be the remnant of the point-bar ridge and swale topography. The four mounds are in close proximity to each other and they are separated by a large plaza. Mound B is the largest at the site, standing perhaps 1.2 meters above the levee surface. It is at the western end of the site and is adjacent to the slough to the west and south. Mound A is south and slightly east of mound B, and is only about a meter tall. Mound C is east of mound B and slightly northeast of mound A. It would appear to be on the very crest of the levee, but it is only a meter tall. Mound C overlooks the channel of Reno Brake. A fourth mound, D, was discovered during mapping in 1989. It is very low, only 40 cm above the plaza, and lies north of the current tree line. The northern edge of the site is demarcated by an abrupt terrace which drops down into a low slough. There is evidence that a borrow pit was located in the slough north of mound D.

Program of Investigation

Surface Collections

The Reno Brake site is notable for having a dense surface scatter of ceramics, bone, and other cultural debris. Due to the fact that the site is periodically cultivated and cleared of vegetation it is subject to considerable surface disturbance and erosion. When the site was first visited by the author in 1983 a large surface collection was made. This collection was segregated by mound provenience, and a general collection was also obtained. It was evident then, as it is now, that the site was being "hunted" for arrowheads and other objects by the owner and his friends. In the spring of 1988 a human burial was excavated by the owner on the south slope of mound A, and the bones were scattered about the surface. In 1988 a small surface collection was undertaken, again being kept separate by mound; another general collection, along with several sherds donated by the landowner, was obtained.

The results of the 1983 and 1988 surface collections were quite interesting, yet in some ways very frustrating. The culture historical data was very intriguing, and suggested that the bulk of the occupation at Reno Brake could be dated to the early-to-middle Baytown period. This encompassed the Indian Bayou and possibly Marsden phases of the Troyville culture. The surface collections also showed that

there was a small but still notable Coles Creek occupation at the site, and that most of the material came from mound C. A small yet diagnostic Routh phase Plaquemine culture component was identified as well. The nature of the surface collections, however, precluded our being able to investigate certain spatial relations within the site. For example we did not know if there was a cleared plaza, or if the Coles Creek and Plaquemine components were limited to mound C, or if the Troyville phases could not be distinguished across the site. We decided, therefore, to expend much of our energy at Reno Brake in conducting an intensive surface collection covering most of the site, or at least most of the site which was cleared. As was noted above in Chapter Two, the surface collection strategy was to collect 10-by-10 m squares intensively. These squares could be compared to one another and a picture of the entire site could be gained.

Results from each collection unit were tabulated by quantity and weight. The two measures are obviously linked and generally demonstrated a fairly consistent pattern when compared to each other. However, the results are graphically demonstrated using weight for all categories except lithics (see Figs. 5-7). The Reno Brake site has been intensively plowed in recent years, but the southern and western side has been especially impacted since it is nearest to the adjacent cotton fields. Counting pottery which has been churned up by a plow did not seem to be an appropriate means of comparison, particularly when some parts of the site would not have been so severely affected by agricultural machinery. Comparisons of weight, however, would be less biased by the damage of plowing since total weight is unaffected by fragmentation. Lithics were tabulated by quantity because they would not be subject to the same kinds of damage from plowing and also because of the potential skewing effect from a single very heavy piece of stone (an isolated grinding stone, for example).

The results are interesting. As can be seen from Table 1a-k and Figures 5-7 there is no doubt that the overall distribution of cultural material is in an oval-shape along the mounds. The plaza area is practically devoid of artifacts of any sort. The quantity of ceramics and bone is especially high on mounds A and B, and between these two mounds (Figs. 5, 6). Mound C has the least cultural material, and importantly very little bone was found here. Although we have not tabulated the bone by species, much of the bone on mound A is human, while a narrow majority of the bone on mound B is as well. None of the bone from mound C has been identified as human. The pattern for lithics is consistent with that observed for ceramics and bone (Fig. 7). The majority of lithic pieces (flakes, shatter, tools, etc.) is found on mound A, with mound B also having a concentration, especially at the crest of the mound. Mound C has a small amount of lithic material, but no special concentration.

Overall the pattern seen at Reno Brake indicates that the cultural occupation was focused on the mounds and especially their crests and outer slopes. Mound A was clearly the locus of the majority of occupation or deposition, but mound B too showed dense concentrations of all artifact categories. Mound C was consistently the last in terms of quantity of material. Culturally the distribution of material was generally homogeneous. Mounds A, B, and C, had evidence of Issaquena, Troyville Coles Creek,

and Plaquemine components. Issaquena material was most common on mounds A and B, and barely visible on mound C. Troyville material was abundant on all three mounds, and covered both early and middle components of the culture. Coles Creek material was most common on mounds A and C, and primarily consisted of material dating to the middle through late phases of that culture. The Plaquemine component was very minor and was concentrated on mounds A and C. All of the Plaquemine material can be assigned to the Routh phase.

Shovel Tests

A total of 220 shovel tests were excavated during the 1989 season at Reno Brake (Table 2a-o). These tests were placed at the intersection of each of the 10-by-10 m surface collection squares. The shovel tests were not as helpful in revealing the details of the site stratigraphy as we had anticipated, yet they did give us a good picture of the overall nature of the site stratigraphy. In general the deepest shovel tests were found at the crests and along the flanks of the mounds, and the plaza, to no great surprise, did not reveal much in the way of cultural stratification. Shovel tests north of datum in the woods confirmed that there were intact cultural deposits extending all the way top the edge of the terrace on the north end of the site, but we could not ascertain if mound D was indeed an artificial mound.

The basic stratigraphy at Reno Brake consisted of a topsoil level of varying thickness, a clay cap (probably the result of alluvial deposition following occupation), midden or middens, and subsoil, a tan to yellow, often oxidized slightly sandy clay. Given the small window provided by the shovel tests it was not possible to observe mound construction evidence, although several lenses of sterile clay were found in mounds A and B. Cultural information was also recovered which will help us to undertake future investigations. Stratified subsistence remains were only recovered on mounds A and B. The soils beneath mounds C and D appear to be very clayey and apparently as a consequence bone and plant preservation is substantially reduced. On mounds A and B, though, intact faunal and floral deposits were observed in a number of shovel tests, especially those on or near the crests of the mounds. Although the quantity of recovered remains was small, we were able to observe that mostly Issaquena and Troyville remains were recovered from the shovel tests. One shovel test on mound C recovered what was likely to be a Coles Creek period deposit within 30 cm of the surface (Table 2i). The most abundant remains were found in the shovel tests on mound A (Table 2l-m). Here we found several tests which yielded large faunal samples which also contained identifiable seeds and floral remains. These shovel tests helped us to place our single test pit. We found human bone in only one shovel test, located on the west slope of mound B near the crest. These bones were not articulated and came from the topsoil.

Test Excavation S90 W40

A single test pit was excavated at the Reno Brake site. This was a 1x2 m trench, oriented north to south, and designated S90 W40 (Fig. 8). This unit was placed near the crest of mound A in an area where shovel testing had revealed deep midden with good bone and floral preservation. Furthermore, we

were encouraged by the absence of human bone in the immediate area and felt that we could safely excavate the site without posing a risk to the known human burials contained within the mound. We sought to confirm the site chronology as well as to gather a sample of subsistence data which could serve as a preliminary basis for comparison with the nearby and later Osceola site (Table 3a-c).

Excavation proceeded in a combination of natural and arbitrary levels. Initially shovel test data were used to define natural levels, but these data were inadequate for the complexity of the subsurface finds at Reno Brake. Arbitrary levels were used for the most part, but in several instances we could discern true natural strata and these were excavated as a whole. Because this unit was excavated at the end of the season, with time running short, we opted not to waterscreen the sample. This posed few problems as the soil was slightly easier to manipulate through a screen than it had been at Osceola. Still, to insure comparability of faunal and floral samples, special waterscreen samples were taken, along with the regular flotation samples. As at Osceola all features were completely floated and each level had a sample taken from the northeast corner.

The initial stratum of S90 W40 was the topsoil, a relatively loose, grey to dark brown silty clay. Artifacts were relatively abundant and consisted almost solely of pottery sherds. Ceramics within stratum 1 reflect the heterogeneous components at Reno Brake. Issaquena, Indian Bayou, Insley, and Balmoral phase diagnostics were all recovered. A single chert hammerstone was found which was the only tool from this stratum.

Stratum 2 comprised the next four natural and arbitrary levels. This stratum was a thick (up to 40 cm thick in places) relatively homogeneous midden with a dark brown to almost black silty clay matrix. The cultural content of the stratum 2 midden was fairly consistent, although towards the bottom of the midden some Issaquena material started to appear. This stratum reflects a good sample of middle Troyville, or Insley phase material. There is a large showing of terminal Marksville-inspired ceramics (Marksville Incised, vars. Anglim, and Vick; Marksville Stamped, var. Bayou Rouge), along with a host of "Woodland" ceramics (Alligator Incised, Chevalier Stamped, Evansville Punctated, var. Purvis Lake, Larto Red, Mulberry Creek Cordmarked, vars. Edwards, and Eudora, Salomon Brushed, and even a single sherd of Woodville zoned-red, var. Woodville). Vessels consist of both bowls and jars, with jars slightly more common. Bowls are usually shallow with a wide orifice, and bowl rim modes include "plate strap" interior bevel, and most commonly simple round and simple flat types. Jars are usually straight-sided with relatively small mouths, and their height cannot be determined. Sharply restricted jars—often referred to as "seed jars"— are present in small numbers and in some cases they have a single line below the lip which is usually a simple round form.

Lithic artifacts were rare, and the only tool was a simple unhafted biface made on local chert. Small unmodified river-worn pebbles were also found, but not in any great quantity. Bone was also recovered from stratum 2, but not in large numbers. The majority of the fauna was from mammals, and most of

that from deer. Fish, turtle, and birds were rare but still present. The floral remains have not been thoroughly analyzed but they are said to consist solely of wild, non-cultivated species locally available (Gayle Fritz, personal communication, 1990).

At the base of stratum 2 we encountered a thin layer of light yellow to tan sandy clay which was thickest in the north and tapered out within 40 cm of the south wall. This was designated stratum 3 and it appears to represent a brief stage of mound construction or an attempt to cap the underlying midden. The artifact content of this stratum was not particularly great, but it did contain mostly Issaquena phase ceramics, with the exception of a Larto Red sherd. Rim modes were also more reflective of an Issaquena component, most notably the presence of classic "Arcadia" rims. Stratum 3 contained a modest amount of bone and only a few lithic pieces.

Although stratum 3 did not extend across the entire test unit it was still possible to demarcate the midden below it from the midden in stratum 2. Beneath, and in the south end, adjacent to stratum 3, was a midden consisting of dark brown to grey-brown slightly sandy clay with a large but not exceptionally big artifact content. Stratum 4, as this midden is designated, varied in thickness from 20 to 35 cm in thickness. Near the base of stratum 4 were some post holes extending into the underlying subsoil. At the south end of stratum 4 a number of ash lenses were encountered both in the south and west sides of the stratum. These lenses were generally thin horizontal scatters of white ash which were impossible to separate from the surrounding midden. There were also other small pockets of ash in stratum 4 scattered throughout the horizontal and vertical extent of the midden.

The cultural content of the stratum 4 midden was entirely different from the overlying Troyville midden in stratum 2. This midden was a relatively pure and unmixed Issaquena phase deposit. Diagnostic ceramics included Churupa Punctated, var. Churupa, Marksville Incised, vars. Steele Bayou, and Yokena, Marksville Stamped, vars. Manny and Newsome. The rim modes were equally as indicative, with "Arcadia" and various sorts of thickened rims being common. Both bowls and jars were present, and the bowls included both deep and shallow forms, and the jars also included restricted mouth "seed jar" forms. Bases were square and flat, and included the "Satartia" base form. Lithics were rare, but included flakes, a relatively large number of unmodified pebbles, and four chunks of a white sandstone often referred to as "Catahoula" sandstone.

The faunal and floral content of stratum 4 was not particularly great. The fauna from this stratum is dominated again by large mammal, especially deer. Fish, small mammal, and some turtle, make up the rest of the recovered fauna. The stratum 4 fauna does not appear, from a superficial examination, to differ greatly from that recovered in stratum 2. The flora, though only quickly scanned by Gayle Fritz, is comprised solely of wild species. No examples of Native American cultigens have been found in the Reno Brake floral sample.

Beneath stratum 4 was a stained level of yellow to yellow tan sandy clay with numerous small, deep "features" in it. This was the sterile subsoil which contained what we think were numerous crawfish burrows. These "features" were all sterile and of similar shape and form. We designated this level as stratum 5, and we did recover a few sherds from the upper part of this level but these were clearly tramples into the level from stratum 4.

Interpretations

The results of this small excavation at Reno Brake were well worth the efforts expended at the site. We uncovered a previously unsuspected late Marksville midden, as well as evidence for mound construction. Furthermore floral and faunal recovery were excellent and have allowed us to make some important albeit limited generalizations about Troyville subsistence. The presence of the well defined stratified remains provides us with one of the best cases to study the transition from Issaquena into Troyville. It is however, only a small window into a large site and an even larger and more difficult problem.

The stratum 2 midden poses in one sense the greatest problem from a culture historical point of view. It clearly is not a late Troyville (i.e., Marsden phase) component, but its precise placement is a bit uncertain. Largely this is due to the nature of how one subdivides the Troyville components. Belmont often has referred to Indian Bayou I and II, which he places before the advent of Marsden (Belmont 1984; Belmont and Williams 1981), while Bitgood (1989) has defined an Insley phase which post-dates Indian Bayou but is a southern contemporary of Marsden. In terms of culture history I am inclined to agree with Bitgood's hypothesis, although I would be less certain that Insley completely overlaps with Marsden. Our data from Osceola make it difficult to maintain that Insley and Marsden are completely contemporary. At Osceola the submound midden beneath mound A has a very late Marsden, or very early Sundown phase assemblage which has numerous parallels to the Insley component at Reno Brake. This suggests, then, that a Marsden-like component succeeds the Insley phase occupation at Reno Brake. Clearly the two phases overlap to some extent, but they are not completely contemporaneous. The Troyville component at Reno Brake has a large amount of Indian Bayou-like ceramics, particularly the terminal Marksville variants and the large amount of Larto Red, as well as late variants of Churupa Punctated. However, the quantity of "Woodland" ceramics is also very great, particularly the Evansville Punctated, var. Purvis Lake (which is the numerically most dominant "Woodland" variety after Larto Red), the Alligator Incised, Chevalier Stamped, Mulberry Creek Cordmarked, and the Salomon Brushed. The single sherd of Woodville Zoned-Red is also indicative of a post Indian Bayou phase date (Belmont and Williams 1981:32, table 1). The culture history is complicated, though, by the fact that the stratum 2 midden does not conform very neatly with Bitgood's definition of the Insley phase (particularly the quantity of Edwards and the presence of Salomon), nor can it be placed into a Marsden phase component. The possibility of a mixed midden deposit is perhaps one way to explain the ceramic assemblage, yet I am not comfortable with such an explanation. I prefer to see the stratum 2 midden as representing a local variant of the Insley phase, perhaps temporally early in the period. The lack of early

Coles Creek varieties and the relatively good showing of terminal Marksville types suggests, at least to me, that this is a good assemblage which conforms closely, but not perfectly with Bitgood's Insley phase. Regardless, it is not Indian Bayou as defined, nor is it Marsden.

The situation is much simpler below the stratum 2 midden. Stratum 4 represents an Issaquena occupation level which is clearly a typical and easily recognized late Issaquena component. The dating of stratum 3 is a bit more complex. The ceramics within the stratum are almost all Issaquena varieties, except for a single sherd of Larto Red and an unspecified variety of Marksville Stamped with thin, scratchy lines and fine dentate stamping. The Larto Red sherd could be intrusive, or it could be part of the Issaquena component (Bitgood 1989). The absence of any diagnostic Troyville sherds does not, however, preclude a post-Issaquena date for stratum 3. In the end the only thing to be said is that the stratum 3 is an episode of mound building or a construction stage and that it most likely dates to the Late Marksville Issaquena component.

Although the ceramics mark different components and even cultural periods, the available evidence from the fauna and flora fail to note any radical or even significant differences. Both major midden strata have a faunal component overwhelmingly dominated by deer. Small mammals and fish comprise the bulk of the remaining bone, but some turtle and avian fauna have also been noted. The poor showing of fish and turtle is somewhat surprising given that the site was located on the banks of an abandoned oxbow lake which surely must have contained abundant amounts of both fish and turtle. The cursory analysis of the flora was also a bit surprising since no native domesticates were recovered. All of the identified species were wild forms, even though elsewhere some of these species are known to have been cultivated (Maygrass, for example). Since our sample is very small it is best to consider these results very tentative, especially since the analysis has only been conducted on the most superficial level.

Conclusions

The research undertaken at the Reno Brake site in 1989 has yielded significant results which allow us to more fully understand the site and its culture history. Surface collections and shovel testing give us a relatively good, yet superficial, view of the site's history and vertical and horizontal extent. we now know that the site is larger than once thought, and that it contains well stratified and intact deposits in many areas. We also have determined that there are variations across the site in terms of components and occupational history. The single test pit at S90 W40 has given us a tantalizing glimpse into the nature of the Troyville and Issaquena components. But like so much of archaeology, we leave the site with more questions than ever before. Further research into the Troyville component is obviously necessary. In time we will be able to understand more about the nature of subsistence change, which at present looks to be minimal. Overall, in terms of our findings from 1989, one gets a strong impression of continuity and evolution. For all of our culture historical debate, the basic patterns of subsistence and site occupation seem very much alike between the major components of Issaquena and Troyville. Perhaps

other, more revolutionary changes will be identified with further research, but to my thinking we make more out of ceramic variability than is perhaps warranted when other avenues of analysis are explored.

CHAPTER FIVE

THE OSCEOLA SITE (16TE2)

Site Description

The Osceola site consists six mounds arranged around a large plaza (Fig. 9). Immediately to the north and east of the site is a low elongated depression which marks the former course of the Mississippi River (Saucier 1967). This slough or brake (known as Reno Brake) has been enlarged to the north and northwest as a borrow pit for mound construction. The bank of the slough appears to be higher on the side where the mounds are located and the surface of the site is generally quite level.

The largest mound, labeled mound A, lies at the northeast edge of the plaza with the north side dropping directly into the slough. Its height is a little over 5 meters from the plaza. Mound A is rectangular with a flat top measuring some 20-by-18 paces, with its long axis oriented northwest-southeast. To the west of mound A is mound B; these two mounds are connected by a low rise. The two mounds are less than five meters apart, though erosion from both mounds may have filled in some of the distance between them. Mound B is more square than A, but is lower by over two meters.

Southwest of mound B lies mound C. Roughly 35 meters separate these two mounds. Reno Brake appears to curve around to the west of mound C, although it is apparent that there is a borrow pit immediately to the west and north of this mound. Mound C is similar in dimensions to mound B, varying only by being around a meter taller. Mound C is in excellent condition, as are the other mounds at the site. Mound D is to the southeast of mound C, but lies some 50 to 75 meters away. Mound D lies on a low rise which runs in a slight arc along the southern end of the plaza. Thirty meters to the east is mound E (which was formerly designated mound D prior to the discovery of mound E). Mound E forms the southeastern boundary of the plaza and appears to be just over 100 meters roughly due south of mounds A and B. A large borrow pit lies to the south of mound E. Mound D is smaller than mounds B, C, and E; its summit is rounded rather than flat, and it is only a meter to a meter and half tall. Mound E is flat-topped and presumably square-sided, and is roughly one and a half to two meters high. Mound F is the lowest mound known at Osceola and it lies to the southeast of mound A, possibly connected to the larger mound by a raised surface. It is a low platform and seems to be oriented more-or-less north to south, and is roughly a half meter tall.

Test excavations, surface collections and very limited shovel testing at Osceola in 1988 and 1989 have revealed that the site has components which span the Coles Creek period. In addition, a late Marksville Issaquena phase component was discovered in 1989. Evidence of Sundown, Saranac, Balmoral, and probably Preston phase occupations were found, particularly around mounds A, B, and

C. Shovel testing in the plaza failed to uncover cultural debris, but this is largely because this part of the site is buried beneath overbank flood deposits.Stratified deposits with excellent preservation of fauna and flora were located beneath mounds A, B, and F. Our sample is very limited in spatial extent, so it is not possible to make adequate generalizations concerning the whole site. National Register testing in 1989 demonstrated that the three mounds examined, A, B, and F, all dated to the late Coles Creek Balmoral phase, and that the bulk of the midden was datable to the early to middle Coles Creek periods.

Test Excavations

Introduction

Since the preliminary goal of the project was to test both sites to determine their potential for yielding subsistence data relative to the reconstruction of past cultures and environments we expended most of our efforts towards this end. Initial emphasis was given to work at the Osceola site, since it could not be surface collected, and because we knew we could expect some tangible results based on prior research. Our first goal was to continue and increase the test excavations initially begun in the summer of 1988. At that time a single 1-by-2 m unit, later reduced to a 1-by-1 unit was placed into the northeast slope of mound B. Initial results suggested a series of intact middens separated by two or more mound building episodes. The unit excavated in 1988 was not completed, nor was it aligned to magnetic north.

Our first action of the 1989 testing program at Osceola was to relocate Test Pit 1 and to clear it of backdirt. As the excavation of Test Pit 1 was underway two more units were situated, one on mound B, slightly south of Test Pit 1, and one on the west slope of mound A, located east and south of Test Pit 1. The unit on mound B was designated N42 W1, based on its grid location relative to site datum, while the unit on mound A was N32 E1. All designations are respective to the northeast corner stake of each unit. Each pit excavated this summer, except Test Pit 1, was a 1-by-2 m trench; Test Pit 1 was a 1-by-1 m unit. A fourth unit was excavated on the west slope of mound F, and was designated S20 E10. Units were placed to gain a maximum amount of stratigraphic and chronological data, as well as to sample known or suspected midden locations. Shovel testing in 1988 had suggested localized accumulation of midden around mound A, including mounds B and F. Work in 1988, and also more shovel testing in 1989, demonstrated that there was little apparent midden accumulation around mounds C, D, or E.

Test Pit 1

This unit was first begun in the summer of 1988 and was only partly excavated. In 1989 it was decided to reopen this unit so we could use it as a guide to another excavation unit, N42 W1, located just to the south. Although it was begun as a 1-by-2 m trench, we opted to only excavate the 1-by-1 meter square which had been the focus of much of our work in 1988 (Fig.

10). The following description of the excavations treats the work in Test Pit 1 as if it were done in a single season (Table 4).

After clearing the excavation area and staking out the unit the top soil was removed and screened. Using a shovel and trowel material was removed in roughly 5 cm thick blocks. The soil was carefully examined for changes in color, texture, or artifact content. In the western half of the unit a slight textural change was noted at between 11 and 15 cm below surface. In the eastern part of the unit this change was not encountered till the excavation had reached roughly 22 to 30 cm. The explanation for these level differences lies in the fact that the test unit was on the slope of the mound and the upper level was sloping down to the east and north. The artifacts found in this upper level were identified as coming from level 1. Level 1 corresponds to stratum 1, which is identified as topsoil and midden.

Below level 1 was a dark brown soil which was slightly more packed and contained what seemed to be more artifacts. in retrospect it is likely that this level, identified as stratum 2, and stratum 1 were all part of the same midden, being separable only by very slight textural changes. The soil of the midden was a dark brown to black, very clayey silt, which did not screen easily. Rain in the evenings tended to make it very stiff and hard to work, and excavation was considerably slowed by the difficulties in screening. As a consequence of time pressures we only excavated the eastern half of the unit to the base of stratum 2. Excavation in stratum 2 continued until we reached the base of the midden at between 52 and 63 cm. The midden was sloping down to the east and north, with the deepest measures consistently noted for the northeast corner. The separation of the midden of strata 1 and 2 from the underlying soil was quite distinct and we were able to keep the materials from the midden separate from what we found below. A two-gallon soil sample was taken from the midden in the eastern half of the unit at approximately 30 to 35 cm below surface.

During excavation of strata 2 we recovered a fairly good artifact sample. Pottery was particularly abundant, but stone and bone artifacts were also found. Bone was noted to concentrate in the eastern portion of the midden, particularly in the lower part. This might be an indication that the midden is redeposited from a higher level, but if so no other evidence (such as sorting of pottery sherds by size, or pottery being imbedded vertically in the matrix) was found. While sifting the strata 2 soils we noted that there were some very small white flecks throughout the matrix. At first I though that this might be shell, but later investigation of soil samples suggests that these flecks are calcined bone.

The ceramics from strata 2 date to the late Coles Creek Balmoral phase. Coles Creek Incised, var. Mott was relatively abundant, and along with Coles Creek Incised, vars. Blakely, and Greenhouse, help to define this phase. Other notable diagnostics include Beldeau Incised, var. Beldeau, French Fork Incised, var. McNutt, Mazique Incised, var. Kings Point, and the

"Vicksburg" rim. The presence of earlier varieties of Coles Creek Incised (vars. Coles Creek, Keo and Stoner), and also Mazique Incised, var. Mazique, and Mulberry Creek Cordmarked, var. Smith Creek, indicates that there is some mixture from earlier Coles Creek period components. Several sherds identified as Addis Plain also suggest some mixture from a later Preston or Routh phase components.

Vessels are divided into bowls, beakers, and jars. The bowls are relatively shallow and apparently quite large. The beakers are a special category as they are made of a thin, well fired and very hard paste equivalent to Phillips' Baytown Plain, var. Vicksburg. The rims of the beakers invariably taper to a fine point, forming characteristic "Vicksburg" rims. Jars are tall, often with a slightly restricted orifice, and a globular body. Round bases are present along with the more typical square ones. A single Alba Stemmed, var. unspecified point was found in stratum 2 along with a well flaked, thin biface fragment. Numerous biface thinning flakes of the same local chert as the biface fragment were found, suggesting lithic rejuvination activities occurred on or around the mound. Sandstone, hematite, and burned debris were also common, and stratum 2 had the highest content of lithic artifacts of any of the strata at Osceola. The fauna from stratum 2 consists largely of fish, with mammals, turtle, and birds comprising the rest of the sample.Deer, rabbit, racoon, opossum, and squirrel make up the identified mammalian fauna, while catfish, gar, and bowfin dominate the fish. Turtle and bird are a distinct minority in this midden.

Below the midden in strata 2 was a level of tan to tan-grey clayey silt with some sand. The artifact content of this level, designated strata 3, was very sparse, particularly compared to that of strata 1 and 2. No evidence of basket loading or other constructional evidence was noted, but it was apparent that strata 3 also sloped to the east and north. The cultural content of strata 3 is mixed, and includes ceramic diagnostics from the Balmoral, Saranac, and possibly Sundown phases. The presence of several sherds of French Fork Incised, var. McNutt which joined with the same vessel from strata 2 makes it evident that this stratum dates to the late Coles Creek Balmoral phase.

Underlying stratum 3 was another layer of mound fill designated stratum 4. This level was a light brown silty clay with a higher artifact count than was found in the overlying stratum. A pocket of large plain sherds was found in the northeast corner of the unit extending into the north wall. Evidently this represented a group of broken vessel fragments deposited during mound construction. No basket loads or stratification was noted in stratum 4 but the lower part of the stratum was extensively bioturbated. No evidence of an occupation level or of a soil horizon was visible at the contact between strata 3 and 4. The two strata of mound fill were distinguishable primarily based on color and to some extent soil texture. The mound fill in stratum 4 contained a number of sherds dating to the early Coles Creek occupation at Osceola,

most notably various kinds of early variants of Coles Creek Incised, and also Mulberry Creek Cordmarked, var. Smith Creek. As is so often the case the dating of the mound fill in stratum 4 is uncertain. An Alba Stemmed point was also found in this stratum. The absence of late Coles Creek material is interesting, but it does not mean that the mound could not have been built during that period. The two mound fill strata are not only separable by color and texture, but also by content. They may represent one mound stage built of different kinds of fill. Although it cannot be resolved at this point other lines of evidence from the nearby excavation at N42 W1 shed some light on this problem and may allow us to date this stratum more confidently.

The base of stratum 4 was found to be essentially horizontal across the entire unit, and the midden which lay beneath it was submound midden. This midden, designated stratum 5, was a relatively thick (30-37 cm thick) deposit of dark brown to almost black silty clay with a very considerable artifact content. The lower half of stratum 5 was a slightly grey-brown color which was only distinguished in profile. At the base of this layer were several pockets of gritty ash and there were also a few shells and shell fragments scattered throughout the stratum 5 matrix. The shell was most common in the southern part of the stratum and also was most notable near the base of the midden. Extensive bioturbation in the western half of the unit brought some of the sandier mound fill down from above, but otherwise no features were noted in stratum 5.

The artifacts in stratum 5 are mostly ceramic and faunal. The ceramics comprise and important sample of Sundown phase material. Early forms of Coles Creek Incised, especially vars. Sorentz (a precursor to Coles Creek), Hunt, and Phillips, are common and indicate a very early occupation in the Coles Creek sequence. Another very common member of the ceramic assemblage is Mulberry Creek Cordmarked, var. Smith Creek. A small number of unclassified French Fork Incised sherds, along with some Chevalier Stamped, var. Chevalier, and even some Salomon Brushed pottery rounds out the sample. The presence of such an early assemblage was something of a surprise, and it was equally interesting to observe the absence of a classic Ballina phase Coles Creek assemblage, even though some of its potential diagnostics were present. Vessel shapes are broken into bowls and jars. Bowls are very large, relatively deep, and usually have rounded or simple flat lips. Some large bowls have large triangular lugs, some of which are decorated with "French Fork"-like designs. John Belmont has identified these as "Joffrion" rims and has argued that they are not properly associated with French Fork Incised varieties. Jars are most commonly tall with a relatively wide orifice and with a slightly restricted mouth. These jars are so common as to form a diagnostic trait and I have identified these as "Clark Bayou" jars. Bowls are considerably more common than jars in this stratum. A biface fragment, utilized flakes, chipping debris and sandstone were found in the stratum 5 midden. Given the quantity of midden and the richness of the ceramic and faunal sample lithics were not well represented.

The faunal assemblage from stratum 4 is overwhelmingly dominated by fish, most notably catfish, gar, bowfin, and buffalo. Deer are surprisingly rare, but small mammal is relatively more abundant. Rabbit, squirrel, racoon and opossum are all present. Medium mammals, most likely dog, wolf, or fox, are also found, but rarely. A single bear vertebra was found as well. Although not thoroughly analyzed the floral material from stratum 4 is comprised of wild plants locally gathered. No tropical domesticates were recovered, nor are there any Native American cultigens. The early Coles Creek occupants of Osceola appear to have been intensive hunter-gatherers who foraged and hunted locally.

The stratum 5 midden lay on a very dense, stiff grey clay which was extensively stained from the overlying dark midden. This clay was identified as stratum 6 and was largely sterile except for a few sherds, which, interestingly enough, dated to the Issaquena phase. The pockets of ash at the base of stratum 5 could possibly have been associated with these deposits but it is unlikely. The stratum 6 deposits were relatively thin and the grey clay lay directly on the original natural levee ground surface. It is likely that the stratum 6 deposit reflected an episode of alluvial deposition across the north end of the site. Similar deposits were encountered at the bases of test units N42 W1, N32 E1, and S20 E10. A very ephemeral yet consistent Issaquena component was identified with the stratum 6 deposits, suggesting an initial occupation of the site area at ca. 200-400 A.D.

Test Excavation N42 W1

The excavation of Test Pit 1 was undertaken in part to provide a guide for stratification to be followed by a unit placed nearby and aligned to the site grid. Unit N42 W 1 was placed slightly to the south and up slope of Test Pit 1. We anticipated gathering further data on the Balmoral phase midden, as well as exploring the mound construction and underlying midden more thoroughly. This excavation unit was dug in natural levels, although in some cases the levels were subdivided into arbitrary strata in order to maintain provenience control. The stratification of this unit is very similar to that identified in Test Pit 1, with several notable exceptions (Fig. 11). The results of our excavations in N42 W1 have both helped our understanding of local culture history, and at the same time made some aspects of interpretation more difficult (Table 5).

Based on our experience with Test Pit 1 the topsoil of N42 W1 was not distinguished as a separate stratum from the midden immediately below. There was some distinction between the upper 5-15 cm of the unit and the lower part of the midden, but this could not be traced across the entire unit and it was not always clear. Stratum 1 in N42 W1 comprised the upper dark brown midden dating to the Coles Creek period and is comparable stratigraphically with strata 1 and 2 in Test Pit 1. The base of stratum 1 was undulating and lay directly on the surface of mound fill which comprised stratum 2. A probable feature was identified in the northwest corner of the unit after it had been excavated. This was a round

bottomed shallow pit which intruded into the underlying mound fill.The contents of stratum 1 define a Balmoral phase assemblage. Ceramics found in stratum 1 include Beldeau Incised, var. Beldeau, Coles Creek Incised, vars. Blakely, Coles Creek, Hilly Grove, and Mott, French Fork Incised, var. McNutt, and Mazique Incised. Vessel shapes included bowls, jars, and beakers, much like strata 1 and 2 in Test Pit 1.

Bone preservation was very poor and almost no bone was recovered in stratum 1. Of great significance, though, was the discovery of maize fragments in this level (Gayle Fritz, personal communication 1990). The quantity is small and it is impossible at present to identify the race or even row number, but the finding of maize in association with clearly defined Balmoral phase ceramics is a very exciting discovery.

Below the Balmoral midden was a thick layer of yellow to yellow-brown sandy silt which represented an episode of mound construction. Identified as stratum 2, this level was apparently equivalent to strata 2 and 3 in Test Pit 1. Stratum 2 in N42 W1 was approximately 50 cm thick, and sloped gently to the south and east. Unlike strata 2 and 3 in Test Pit 1, this layer was not subdivided into two stages by color. In the east wall a dark band of sandy silt was identified in profile but it was not found across the entire unit. In the western half of the unit a lens-shaped feature of dark brown soil was identified, but it yielded no artifacts and was not recognizable as a particular kind of feature (i.e., hearth or pit). The base of stratum 2 was essentially horizontal and it lay over a very thick submound midden. The contents of stratum 2 were very sparse, and diagnostic ceramics were very rare. A single sherd of French Fork Incised, var. McNutt, and a few sherds of Coles Creek Incised, vars. Coles Creek, Campbellsville, and Stoner, and one of Smith Creek were all that were recovered. The McNutt sherd is indicative of a Balmoral date, but alone it is inconclusive.

What allows us to date the mound very securely is a feature found at the base of the mound and lying actually on the underlying stratum 3. Feature 2 was a large fired clay hearth extending out from the east wall. Ceramics associated with this feature include Beldeau Incised, var. Beldeau, Coles Creek Incised, vars. Hilly Grove, and Mott, and French Fork Incised, var. unspecified (probably McNutt). Five "Vicksburg" rim sherds further strengthen the assemblage definition. Based on the ceramics feature 2 unequivocally dates to the Balmoral phase.

The fact that this stratum can be securely dated to the Balmoral phase has important ramifications for the dating of the mound construction episodes in mound B. Test pit 1 had two midden levels which were separated only by color and texture. They did have different ceramic contents, but in mound contexts this may or may not be significant since it may all depend on the source of the fill. The two test units can be correlated, and it is seemingly likely that the mound stages in each unit represent the same building episode(s). Thus, it is likely, though not necessarily proven, that the mound stage or stages was constructed during the Balmoral phase. The mound fill in Test Pit 1, which is the lower of the two (i.e,

down slope) units is actually thicker than in N42 W1, which is the opposite of what one would expect if the ground surface were level. But this is not the case. The ground surface slopes fairly steeply to the east meaning that in order to have a mound of the size and shape of mound B the down slope portion of the site would have to be built up considerably. Otherwise the mound slope would be exceedingly steep, a fact presumably not desired by the builders. Thus the discrepancy of mound thickness is not surprising.

The midden under stratum 2 appears to follow the slope of the mound, that is down towards the east. It is essentially horizontal north to south. This midden, designated stratum 3 is a thick layer of dark brown to brownish-grey silty clay with large pockets of ash and concentrations of bone and ceramics. Several features, including two fired clay hearths were also found on the top of or in this stratum. The artifact content of this stratum is quite high, especially in bone. The ceramics form an early Coles Creek assemblage dating to the Sundown phase. Some of the ceramics are indicative of a Saranac phase association, particularly Chevalier Stamped, var. Chevalier, Coles Creek Incised, var. Coles Creek, and the unspecified varieties of French Fork Incised. But the majority of the component is clearly assignable to the Sundown phase.

Mulberry Creek Cordmarked, var. Smith Creek appears in large quantities, as do a number of early variants of Coles Creek Incised, including Hunt, Phillips, Sorentz, Stoner, and Wade. Many of the multi-line Coles Creek Incised varieties, as well as most of the Smith Creek rims, are adorned with variants of the "classic mode" punctations immediately below the rim. Bowls and jars are about equally represented, and the bowls are mostly shallow with simple rims. Hemispherical bowls with lugs, the so-called "Joffrion" bowls, are present but never common. "Warped" bowls, possibly gourd-shaped forms, are also found. Jars are most commonly straight-sided, but the "Clark Bayou" jar, with a slightly restricted orifice is still characteristic.

Lithics are not common in the stratum 3 midden. One biface fragment was recovered along with flakes, shatter, and some sandstone pieces. Most notable in this midden was the quantity of bone, much in very good condition. The quantity of fish bone is overwhelming, and all other animal types seem dwarfed by comparison. Deer is present but not at all common, at least compared to the Reno Brake faunal assemblage. Small mammal seems to be dominated by squirrel and rabbit, but racoon, opossum, and some kind of canid are also present. Turtles are also well represented, but birds do not seem to be a favored food source. The fish are predominantly catfish, gar and bowfin. The impression from an examination of the fine screen sample is that fish of all sizes were being exploited, from very small to very large. One gets a picture of a society largely dependant on aquatic resources and one which was apparently extensively exploiting the oxbow lake on which the site was located. The plant remains are still being analyzed but there is currently no evidence of domesticates, either native or tropical, from the stratum 3 midden.

Beneath the stratum 3 midden was another midden layer, stratum 4, which was separated based on

its color which was a medium to dark brown and not the dark black to grey of the overlying stratum 3 midden. This level contained abundant concentrations of bone, large amounts of pottery, and several ash lenses and one thin hearth feature. The hearth consisted of a circular patch of fired earth covered with a thin layer of white ash. Immediately below the feature was a thin layer of dark black soil which seemed associated with the hearth. Pockets or lenses of ash were common and seemed to be randomly scattered throughout the midden. Much of the soil was gritty and there were an large number of concretions apparently formed by water mixing with ash and solidifying. Although the color was different than the stratum 3 midden the cultural content was largely the same, except that this deposit represented a relatively pure early Sundown component.

The ceramics were essentially duplicates of those found in stratum 3, except for the addition of Salomon Brushed, var. Salomon, Chevalier Stamped, var. Cornelia, and Coles Creek Incised, var. Marsden. The Salomon seems to replace the Smith Creek as the major variety of surface roughened pottery, and in several cases the Salomon looks as if it were made using a cord-wrapped paddle drawn over the vessel surface (see Phillips 1970:159 for a discussion of this same technique). Clearly the two varieties, Salomon and Smith Creek are closely related in a functional/stylistic sense. Individual sherds of Alligator Incised and Chevalier Stamped, var. McKinney point to affinities with the terminal Troyville Marsden phase or very early Sundown phase component which is located beneath mound A. Also present in small quantities are Issaquena phase sherds of Marksville Incised and Marksville Stamped. Vessel shapes and forms are very similar to those found in the overlying midden.

Two Alba Stemmed points were found in the upper part of this stratum, along with flakes, shatter, sandstone and hematite. The quantity of bone in stratum 4 was relatively high, especially given that this stratum was relatively thin. The bone was well preserved and in at least a couple of instances dense patches of bone were found, sometimes in association with ash patches. Some of the bone was fused together in small clumps which included articulated fish bones, and in one case a cluster of overlapping gar scales. Fish again comprised the most specimens, and turtle and mammal were less common but still apparently important. Bird bones are rare in this stratum, perhaps a reflection of seasonality or simple preference. The flora is thought to be similar to that in stratum 3, that is it is comprised solely of wild native species with no evidence for domestication or cultivation.

A very thin layer of grey to almost grey-blue clay lay beneath stratum 4 and was designated stratum 5. Much of this clay was stained with midden from above and could not be separated from the overlying stratum. A couple of Marksville Stamped, var. Manny sherds were found in this level but little else was recovered. Below stratum 5 was the sterile levee surface which sloped from west to east.

Test Excavation N32 E1

Since a primary goal of the 1989 season was the determination of site chronology and also culture

history we had decided to explore the edges of the mounds to investigate their construction histories and also to get deep deposits which are often found beneath large mounds. Testing in mound B had demonstrated that we might be able to anticipate good preservation and well stratified midden. Mound A at Osceola is the largest mound and was clearly too big to test directly. Instead we decided to place a 1-by-2 m trench into the very toe of the mound on essentially the same line used to test mound B (Fig. 12). Thus test units N32 E1 and N42 W1 would give us data on the construction histories of mounds A and B. Excavations on mound A did not yield the results anticipated, but nonetheless we did discover a good deal of data concerning mound construction and the dating of the mound building stages (Table 6).

Since we were testing on the very edge of the mound we expected that the upper deposits would consist largely of redeposited slope wash from higher up and we were not disappointed in this regard. Stratum 1 in N32 E1 comprises the topsoil and slope wash from the mound surfaces higher up. Because we were on the western side of the mound slope the stratum slopes from east to west. The soils in stratum 1 were a relatively loose silty clay with moderate artifact content but almost no preserved bone.

Ceramics in stratum 1 were to no surprise a mixture of types and varieties. One interesting observation was the relatively large number of Plaquemine sherds found in the slope wash. Plaquemine ceramics included Addis Plain pottery and decorated types and varieties were Anna Incised, var. Anna, an unspecified Avoyelles Punctated sherd which is very close to var. Dupree, Coles Creek Incised, var. Hardy, and Plaquemine Brushed, var. Plaquemine. Overall this assemblage suggests a Routh phase component although it may be that a Preston phase component is also indicated. The actual locus of the component is unknown but we suspect that the final stage of the mound may be a Plaquemine construction. Another possibility is that there was a small Plaquemine occupation on the summit of mound A and that there was no actual Plaquemine mound building. The rest of the ceramics reflect the site culture history, with sherds of Mott and Smith Creek being found together.

The slope wash of stratum 1 lay directly on a very thick mound stage comprised of mottled yellow, orange and brown clay. The clay was extremely dense and hard packed. No basket loads were visible but soil color and texture changes within the clay probably marked individual loads of fill. A slight color change roughly half way into the stratum 2 mound fill may represent a different episode of construction, but no soil horizon formed, nor is there any evidence of a significant hiatus in mound building. The upper surface of the mound stage slopes from east to west but the base of the construction stage is basically level with a slight east to west tilt. The artifact content of the fill was virtually non existent. Only a few sherds were recovered, and they are completely undiagnostic. No features or other cultural evidence was recovered from the mound fill.

Beneath the mound fill in stratum 2 was a relatively thin layer grey-brown silty clay evidently deposited as slope wash from a mound stage further into the mound. Faint evidence of thin laminae were visible in this layer. Immediately beneath this episode of slope wash, designated stratum 3, were two

thin lenses of clay, one which covered the unit, and one which terminated about halfway across from east to west. These appear to have been naturally deposited, but it is possible that they represent brief episodes of mound building or leveling. These lenses cannot be positively associated with stratum 3, nor can they be identified as belonging to the underlying deposit, stratum 4, another level of slope wash. Ceramics from stratum 3 are a mixture of Sundown and Balmoral phase types and varieties, which lets us date the mound to at least the Balmoral phase.

Stratum 4 was a dark grey silty clay which appears to have been deposited in sheets, possibly due to wash from an unidentified mound deeper in the mound. It is possible that this stratum represents an episode of mound construction but this cannot be positively determined. The top of stratum 4 has a slight slope from east to west, but the base of the stratum is essentially level. Only a few artifacts were recovered in stratum 4, and they generally show a Sundown-like ceramic assemblage. It is unfortunate that this assemblage does not necessarily date the mound construction. A thin clay lens was found at the base of stratum 4. This lens extended out from the northeast corner and covered a little under half of the pit.

Beneath stratum 4 we encountered 15-23 cm thick sticky black clay which comprised the submound midden. The matrix was a greasy clay and the artifact content was moderately high, but nothing like the submound midden beneath mound B. Bone preservation was moderately good, but not great, and the faunal sample was relatively meager. At the base of the midden we encountered a series of features comprised of one circular pit extending out of the east wall and a series of small postholes, mostly in the south end of the unit (Fig. 13). Some of the post holes may have formed a circle extending out from and around the small pit, but this may be coincidental. The postholes were roughly the same diameter, averaging between 5-7 cm and they were between 5-8 cm deep. Clearly these were not major structural supports but they may have formed some kind of fire screen or light support for drying foods.

The ceramics from the stratum 5 midden are indicative of a very early Sundown phase component and appear to be slightly earlier than the submound midden beneath mound B. Mulberry Creek Cordmarked, var. Eudora is the dominant ceramic variety, while numerous Coles Creek Incised varieties are also present, especially Hunt, Marsden, Phillips, and Wade. Sherds of Salomon Brushed are also found, but not in great numbers. Several rim modes are present which serve to indicate that this midden is perhaps the earliest Coles Creek deposit on the site. Among the rims from this stratum are a number with notching and punctation in the lip, and at least one "Six Mile"-like rim sherd was found. Bowls and jars are common, and the shapes and rim forms are characteristic of the early occupation at the site. Missing from the assemblage is the Smith Creek variety, and also the distinctive Coles Creek Incised rims that go with it. "Classic" mode punctations are also absent from the assemblage as well. A sherd of Chevalier Stamped, var. McKinney was also found, further suggesting an early date. There is, however, no evidence of red filmed pottery, which is often associated with Troyville assemblages.

The ceramic assemblage from stratum 5 can be correlated with what Belmont has identified as the

Mount Nebo subphase, and which he assigns to the terminal Troyville culture (Belmont and Williams 1981; Bitgood 1989:107). Bitgood has argued that the Mount Nebo subphase is better equated with the earliest part of the Sundown phase and has suggested that it be included as part of the early Coles Creek culture. Although it cannot be readily determined at this point, the culture historical status of the stratum 5 midden in N32 E1 may make it a candidate for inclusion in the Sicily Island culture. It seems to be a combination of terminal Woodland and early Coles Creek, like, but not quite the same as the Marsden phase of Troyville culture. Further research will be required to properly place the stratum 5 assemblage in its correct culture historical order.

A sherd of Churupa Punctated, var. Churupa was also found in this stratum, along with an unspecified variety of Marksville Incised, and several pieces of Marksville Stamped, var. Newsome. Evidently an Issaquena component also underlies the Mound A area, although it could not be isolated in any stratigraphic sense. The bone in stratum 5 was not that well preserved, but mammal, especially deer, was most common. Fish and turtle were surprisingly rare. The flora from stratum 5 is, to no surprise, comprised solely of wild species. Lithics were not common, but a number of unmodified pebbles, and a core fragment were found. The only tools consisted of an unspecifed variant of the Alba Stemmed point, and a battered chert hammerstone.

Beneath stratum 5 the soil was a dense grey clay, underlain by the light yellow to orange silty levee soils. A couple of Marksville Incised sherds were recovered from the grey clay, which is precisely what was found beneath mound B. In many ways mound A was similar to mound B, although the midden quantities varied. The stratum 5 deposits suggest that the submound midden in N32 E1 is probably the earliest post-Issaquena deposit yet located. The mound construction appears to be contemporary with mound B, which would date it to the Balmoral phase.

Test Excavation S20 E10

Shovel testing during the summer of 1988 had suggested that the low platform identified as mound F had midden deposits on its crest and flanks. Since we wanted to both find intact midden and to test the mounds for chronology and culture history we decided to place a 1-by-2 m trench into mound F (Fig. 14). We chose to place the test relatively close to the edge of the summit platform since it was a low mound and we had discovered midden in the general area. The test excavation on mound F did not yield the results we had hoped for in terms of recovering intact and well preserved subsistence deposits, but it did allow us to gather further data on mound construction, chronology, and culture history (Table 7).

The stratification of mound F differed somewhat from the other two mounds that were tested in 1989. The first level encountered consisted of a thin layer of loose brown silt loam which was identified as stratum 1, topsoil. Almost no artifacts were found in this layer, and it was essentially the result of rotting vegetation and perhaps animal and insect disturbance.

Stratum 2, immediately below the topsoil consisted of a relatively thick layer of yellow, tan and brown silty and sandy clay. This was all mound fill although no basket loads were necessarily evident. In the lower part of the stratum a series of clay lumps, some shaped like a giant shoe, were found. These lay directly on the surface of the underlying stratum and probably represent episodes of mound construction deposition— possibly even basket loads of clay. A large feature or pit was found to extend down from stratum 2 into and through the underlying stratum 3 deposits. This was found in the southeast corner of the unit but was not recognized until after the unit was excavated. The pit had sloping sides and in the south wall it was noted to slightly bell-shaped. Since it was found only after excavation it is not possible to say if the pit had any specific content. The artifact content of stratum 2 was very low and reflected a mixture of Balmoral and Sundown phase components.

Beneath the mound fill of stratum 2 was a moderately thick level of light brown to grey midden designated stratum 3. The color was at first difficult to discern, but the texture was lighter and more silty than the overlying stratum. Several features were found in the east and southeast part of the pit in stratum 3. These were large, round bottomed pits with no identifiable contents. One feature, number 2, was found after excavation to consist of two superimposed pits which cut through the midden in the underlying stratum 4.

The artifacts in stratum 3 were large assignable to the Balmoral phase, although they are clearly mixed with earlier deposits. The most diagnostic ceramics in terms of the Balmoral phase is Coles Creek Incised, var. Mott, and the presence of beakers with finely tapered "Vicksburg" rims. Bowls and jars were also found in the stratum 3 assemblage. Sundown phase material is identified by the presence of pre-Balmoral phase varieties of Coles Creek Incised, and the occurrence of Mulberry Creek Cordmarked, var. Smith Creek. Faunal and floral recovery was very poor in this stratum and as a consequence little can be said concerning subsistence at this time. The most important evidence from stratum 3 is that it securely dates the overlying mound fill to at least the Balmoral phase.

Beneath the stratum 3 midden was a level of yellow to yellow brown silty clay, identified as stratum 4. This level probably represents another stage of mound construction. Stratum 4 was truncated on the eastern and northeastern part of the unit by the feature identified in stratum 2 after excavation. So few artifacts were recovered in stratum 4 that it is not possible to date this construction stage.

Stratum 4 overlay a 15-25 cm thick dark brown to black midden. This level, designated stratum 5, could be divided in some parts of the unit into two sublevels. The upper part was a medium to dark brown color and the lower portion was dark brown to black and had a slightly higher artifact content. Still these two sublevels, stratum 5a and 5b, could not be separated by texture or by content, nor was this subdivision evident across the entire unit. The stratum 5 midden as a whole was the richest deposit in the test excavation, and had a moderately rich artifact content which included bone and some charcoal.

The bone was not particularly well preserved nor all that plentiful.

The ceramics from stratum 5 indicate a Sundown phase component. The assemblage is dominated by Mulberry Creek Cordmarked, var. Smith Creek, and early varieties of Coles Creek Incised. Most notable of these early Coles Creek varieties is Phillips, but also Chase, Hunt, and Wade are also present. Vessel shapes are just what would be expected, and are divided into bowls and jars. The bowls range from relatively steep to shallow, and most rims are simple and unadorned. No "Joffrion" bowls with lugs were found. Jars are mostly straight-sided, but "Clark Bayou" forms are also evident. Lithics were rare in the stratum 5 midden and consisted almost solely of unmodified pebbles and some sandstone pieces. Several fragments of Marksville Incised pottery were also found, most notably several pieces of Marksville Incised, var. Yokena. The fauna in stratum 5 was not well preserved and consisted mostly of very fragmented deer bone. Fish and turtle were also present in the faunal assemblage, but not in great quantity. The flora that was present and has been identified is from wild species which would have been locally available.

In most of the unit stratum 5 lay directly on a sterile level of dark grey slightly mottled clay. In the northwest corner we found part of a large, shallow pit, identified as feature 7. Feature 7 was excavated into the dark grey mottled clay and was directly overlain by stratum 5. This feature contained a small amount of Marksville Incised pottery and a number of very fragment deer bones. The only classifiable sherds consisted of a Marksville Incised, var. Yokena rim with deep notches in the lip.

Interpretations

The findings from the 1989 test excavations at Osceola were well worth our effort. Our discoveries during this season have shed new light on the culture history of the site and on the nature of the site occupation. We were surprised to find that beneath all of the units at Osceola we discovered traces of late Marksville pottery assignable to the Issaquena phase. In fact we found a large pit feature at the base of unit S20 E10 which is apparently wholly assignable to this occupation. The bulk of the findings from Osceola, though, show that the site dates to the Coles Creek period. Two, and possibly three separate Coles Creek strata can be tentatively defined. The uppermost midden and all of the mound construction dates to the late Coles Creek Balmoral phase. This midden is sparse and is only found in limited locations on the flanks of mounds. Beneath the mound constructions under mounds A, B, and F, lie two middens which appear to represent middle and early Coles Creek and even possibly Sicily Island occupations. These middens, especially those in mound B, are very rich in faunal and floral remains. The two middens are not really physically separable, but based on external correlations, they seem to represent two phases. Both the middle and early Coles Creek middens seem to have a greater range of material and a more diverse faunal assemblage. Thin fire hearths were found in both the early and middle Coles Creek occupations in mound B and suggest that the middens were the direct result of village types of activities prior to the construction of the mounds. The midden beneath mound A is probably the earliest of the Coles Creek or "proto"-Coles Creek deposits, and may be best attributed to the Sicily

Island culture proposed by Gibson.

The various strata cannot be easily correlated across all four test units. Clearly the two excavation units on mound B have similar histories, although there are expectable differences. The middens beneath mound B apparently extend to the south and may partly underlie mound A. The submound midden beneath mound A is sufficiently different from both of the middens under mound B to suggest that it has a different point of origin. Still, some of the ceramics in the lower midden in mound B may be contemporary with those beneath mound A, but they are mixed with later deposits. The degree to which the stratification in mounds A and B can be linked to mound F is debatable. In mound F the stratigraphy suggests a different sequence of events, but the presence of the submound midden in stratum 5 points to a pre-mound village occupation that was widespread, at least along the northern end of the site. We can speculate that the site function changed somewhat markedly during the Balmoral phase. Mound construction seems to replace midden accumulation, and afterwards there is little evidence of a Balmoral phase component which was depositing midden in great quantity. Certainly the shift to mound construction was dramatic, and appears to have proceeded rapidly. Mounds A, B, and F all seem to have been built quickly and with few, if any pauses. The lack of stratified mound sequences is telling, and suggests that the social changes occurring at Osceola were of some significant magnitude. There is an interesting but not yet proven correlation of the appearance of corn in Balmoral phase contexts with the building of mounds and the hypothesized change in social structure. Further research is required to substantiate this linkage between subsistence change and social evolution. Still the results are tantalizing and intriguing, and make the results of the 1989 testing at Osceola all that more significant.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

The overall goals of the Osceola project are ambitious and will require a multi-year effort. In recognition of the complex nature of the project we have sought to include a broad range of disciplines in our analyses. Our goals initially have been limited to understanding the site contexts and the subsistence patterns of the Osceola and Reno Brake sites. Later work will expand our initial findings into the larger context of the Baytown, Sicily Island, and Coles Creek periods in the Tensas Basin and Lower Mississippi Valley. The data generated by this effort will facilitate comparative analyses of the cause and consequence of subsistence intensification across the Southeast.

Initial results of testing at Reno Brake and Osceola suggest some important directions for future research. Our preliminary assessment of the sites is that they indeed do have the intact resources which will allow for an understanding of past diets. Floral and faunal preservation is excellent and our recovery techniques showed that with modification to take into account local soils, processes for finding and understanding these resources can be developed and implemented. We were able to demonstrate that the culture historical span of both sites was much as we envisioned it, although we discovered late Marksville Issaquena phase occupations below both sites which was something of a surprise. Also the culture historical status of the earliest post-Issaquena material is undecided. It seems to represent an almost unbroken continuity from the Reno Brake Troyville assemblage to the undisputed Coles Creek components at Osceola. This degree of continuity is remarkable because it is largely found in reasonably well stratified contexts. The late Coles Creek period habitation was more sparse than we had thought, giving rise to speculation that the nature of occupation changed from village to ceremonial center. Moreover, we have established a tentative but important link between subsistence change and social organization and this may play an important role in understanding how and why the site function changed through time. We can now understand the site locations in terms of past geography and environments. Although currently located in a low backswamp, at the time of occupation the area was probably well elevated, had loose, sandy levee soils, and with a rich and productive lake adjacent, it was a very choice location.

Initial findings suggest that we can investigate further the sequence of site occupation through an understanding of the local geomorphology. After an initial Issaquena phase occupation along the lake margin the Troyville peoples focused in on the southern end of the lake. Why this area was initially chosen is not known. However, subsequent flooding and infilling came from the south, perhaps silting in the lake bed around Reno Brake. As this occurred it appears that the occupants moved north, to Osceola, to establish a new site. The occupation at Osceola was long-lived, but ended by roughly A.D. 1200. Although it is speculation, habitation may have been terminated due to the continued sedimentation of "Lake Osceola". Certainly the site was not occupied after the early Mississippi period Plaquemine

culture began to flourish in the region. We have been able to come up with preliminary data which suggest a change in function at the Osceola site. The initial deposits below the mounds suggest a village type function, with considerable evidence of multiple functions and depositional environments. Mound construction appears at present to be limited to the late Coles Creek period, and midden formation at this time is considerably reduced. These data tentatively suggest that the vacant ceremonial center concept, seen elsewhere in the Lower Mississippi Valley, may be applicable to Osceola. If so, this will have important consequences for our understanding of diet and social organization.

In terms of our specific hypotheses we feel that we have been able to at least partially address their concerns. Our first hypothesis was formulated to test the idea that subsistence in the Coles Creek period was not dependant on maize cultivation, but rather an intensification of native food sources. To some extent we have demonstrated this to be true, but not fully. So far we have no evidence of the cultivation of tropical domesticates prior to the late Coles Creek Balmoral phase. At this time corn is present, but in small quantities. What was surprising is that there is also no evidence for the cultivation of native food species such as maygrass, chenopod, or any other plants which are known to be cultivated elsewhere in contemporary contexts. The early Coles Creek plant food exploitation appears to have been one of intensive foraging. The pattern of faunal intensification was also not expected. At Reno Brake there is an emphasis on deer, while at Osceola the early Coles Creek peoples focused on fish and turtle. They do seem to have focused their exploitation on a more narrow range of primary foods, but many different species were recovered, suggesting a wide territorial range.

Our second hypothesis was confirmed to a point, but only to the degree that we can identify changes in site patterns associated with mound building. With the exception of the tentative link of corn agriculture with the Balmoral occupation we cannot be certain about the significance of the construction of the mounds. We can speculate that they represent physical symbols of power and expressions of chiefly authority, but confirming these notions is beyond the scope of our findings. Excavating chiefs in the archaeological record is notoriously difficult, and it will require much more work at Osceola if we are to confirm our suspicions concerning the correlation of social change and subsistence exploitation.

The excavations at Osceola and Reno Brake were very successful in terms of project goals and data recovery. More research is clearly necessary, and further analysis of the subsistence remains is critical. The results of our research allow us to recommend that both the Reno Brake and Osceola sites should be nominated to the National Register of Historic Places.

The Reno Brake site represents perhaps one of the few remaining well stratified Issaquena and Troyville sites left in the Lower Mississippi Valley. Reno Brake is easily the counterpart to the Gold Mine site (16RI13), and further research at Reno Brake would certainly be instructive. Relatively well preserved subsistence remains at Reno Brake further make its importance stand out. Baytown period diets and dietary patterns are poorly documented. Research at Reno Brake could make a significant

contribution to understanding the changes and patterns of the early Late Woodland period in northeast Louisiana. It is also important to note that Reno Brake is being slowly destroyed by continued agricultural utilization and by random looting. The presence of human burials at the site makes it important to salvage some of these data before they are destroyed. Obviously research concerning human skeletal remains needs to be approached with care and due respect, but it should be done soon, before the burials are destroyed by plowing and vandalism.

Osceola too represents an important site in Louisiana prehistory. The site is relatively well preserved, and it has abundant stratified deposits. In terms of culture history it spans a crucial time in the Southeast. Many scholars consider Coles Creek to be a local variant of Emergent Mississippian and if so it should show evidence of the kind of complexity associated with that phenomenon. Coles Creek, though, seems to be misunderstood. It is not a single entity, but rather one which was rapidly evolving and adapting to changing environmental and social conditions. At Osceola we can see an almost unbroken sequence of Coles Creek cultural development from the earliest Sicily Island, or "proto"-Coles Creek culture, up to the end of the culture after A.D. 1000. Research at Osceola has tentatively demonstrated that there are important correlations between environment, subsistence, and social change. These different parameters are by no means well understood. Osceola, though, has the potential to help archaeologists understand some of the forces affecting social change and evolution in the Southeast.

The well stratified subsistence remains at Osceola are an incomparable resource which needs to be investigated. Coles Creek subsistence in the Lower Mississippi Valley proper is so poorly known that any research will make a significant contribution. Moreover, because of the ability to securely date the deposits we can utilize these data to construct an understanding of changes in faunal exploitation and how this affects, and is affected by humans. The same applies to understanding the patterns of plant food use. Even less is known of Coles Creek floral diets, and yet this may have been one of the most important aspects of the subsistence system.

The contributions of the 1989 Osceola project are just the beginning of what needs to be a thorough investigation of a very productive archaeological region. Our results, though tentative and limited because of our sample size are nonetheless important because they point to the potential of the sites and the regions. We have been able to positively ascertain that the sites should be nominated providing the landowners are willing. We have also demonstrated the scientific potential of the sites, and shown that even with minimal research important results can be forthcoming. Future research can build on these results and provide a means for these sites to contribute to the better understanding of human behavior in Louisiana and the Southeast.

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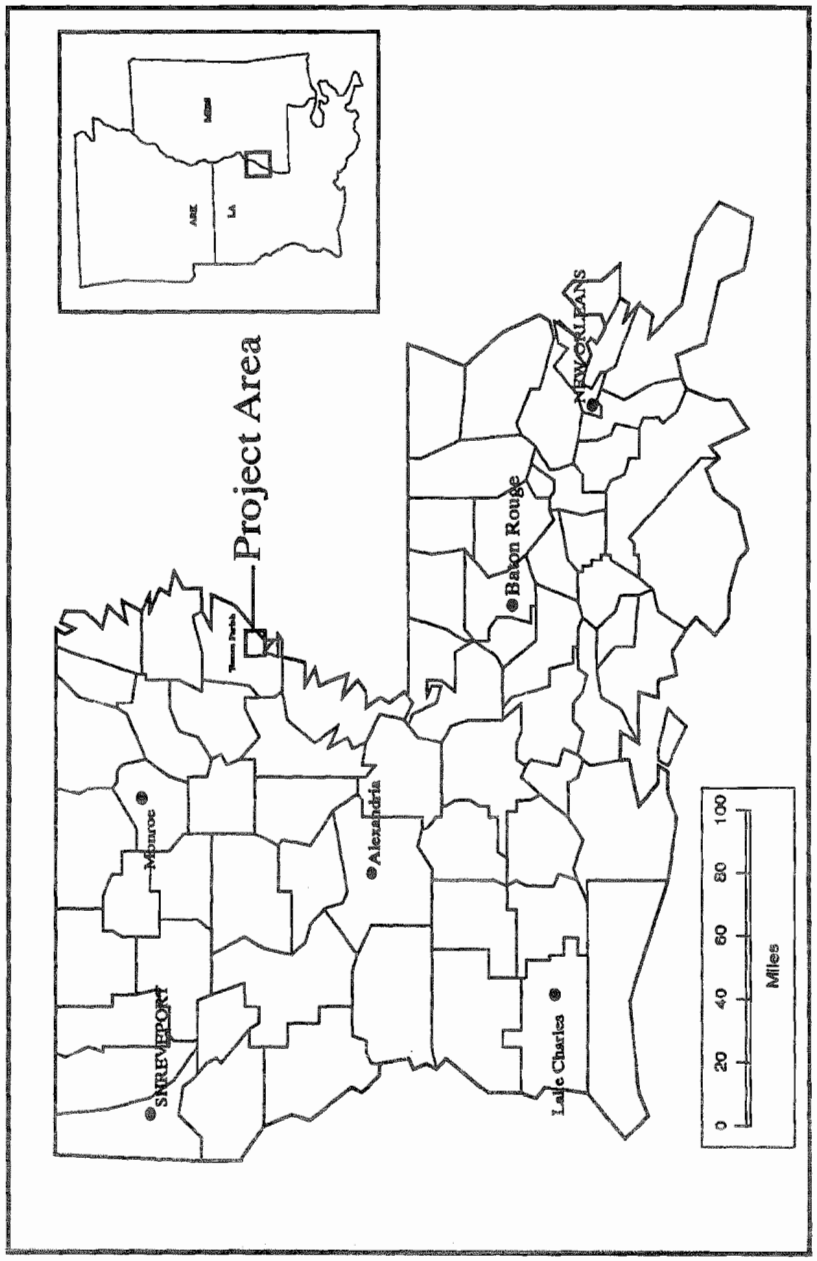


FIGURE 1

Location of Project Area, Tensas Parish, Louisiana

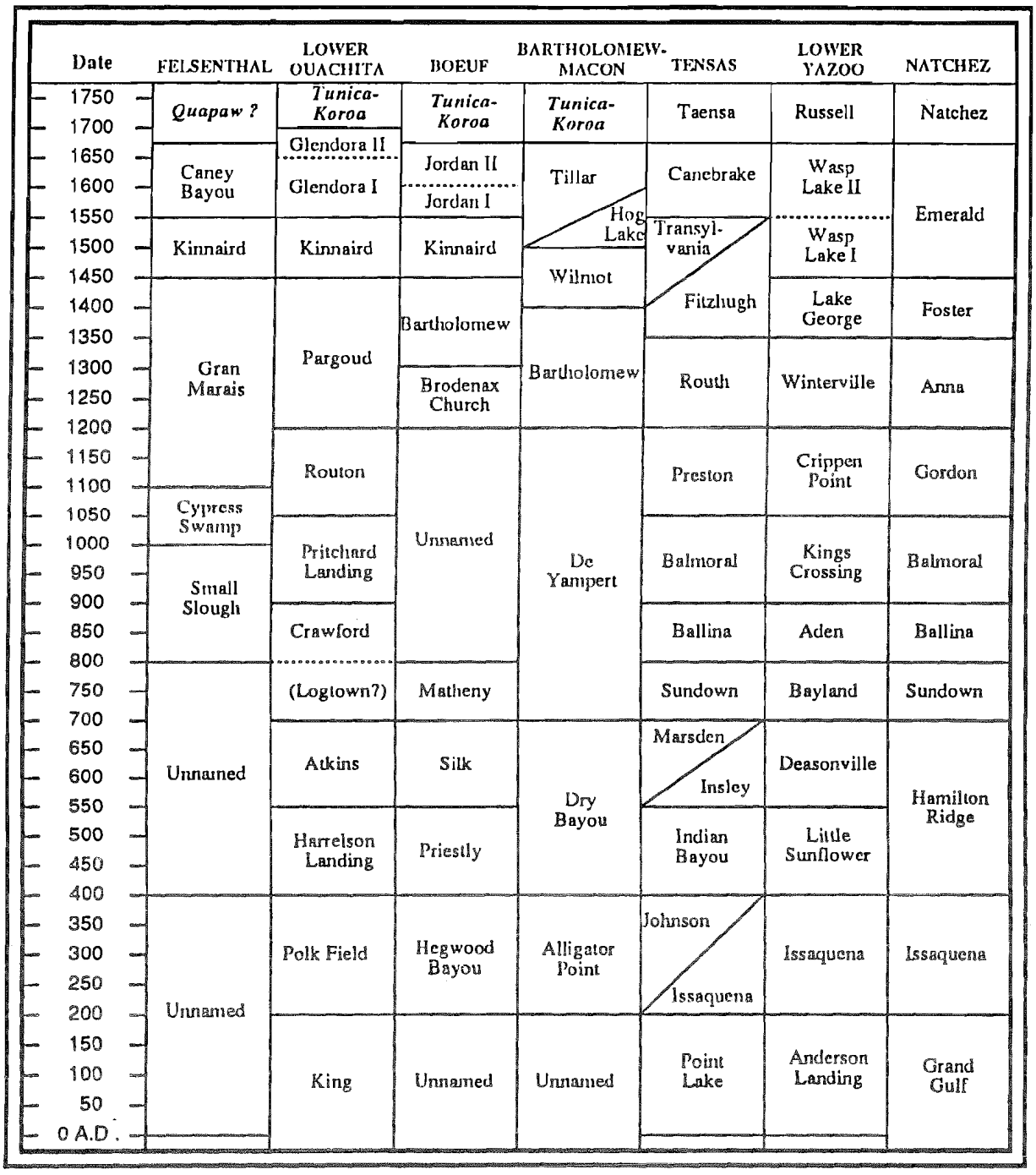


Figure 2: Culture Historical Sequence in the Project Area and Adjacent Regions

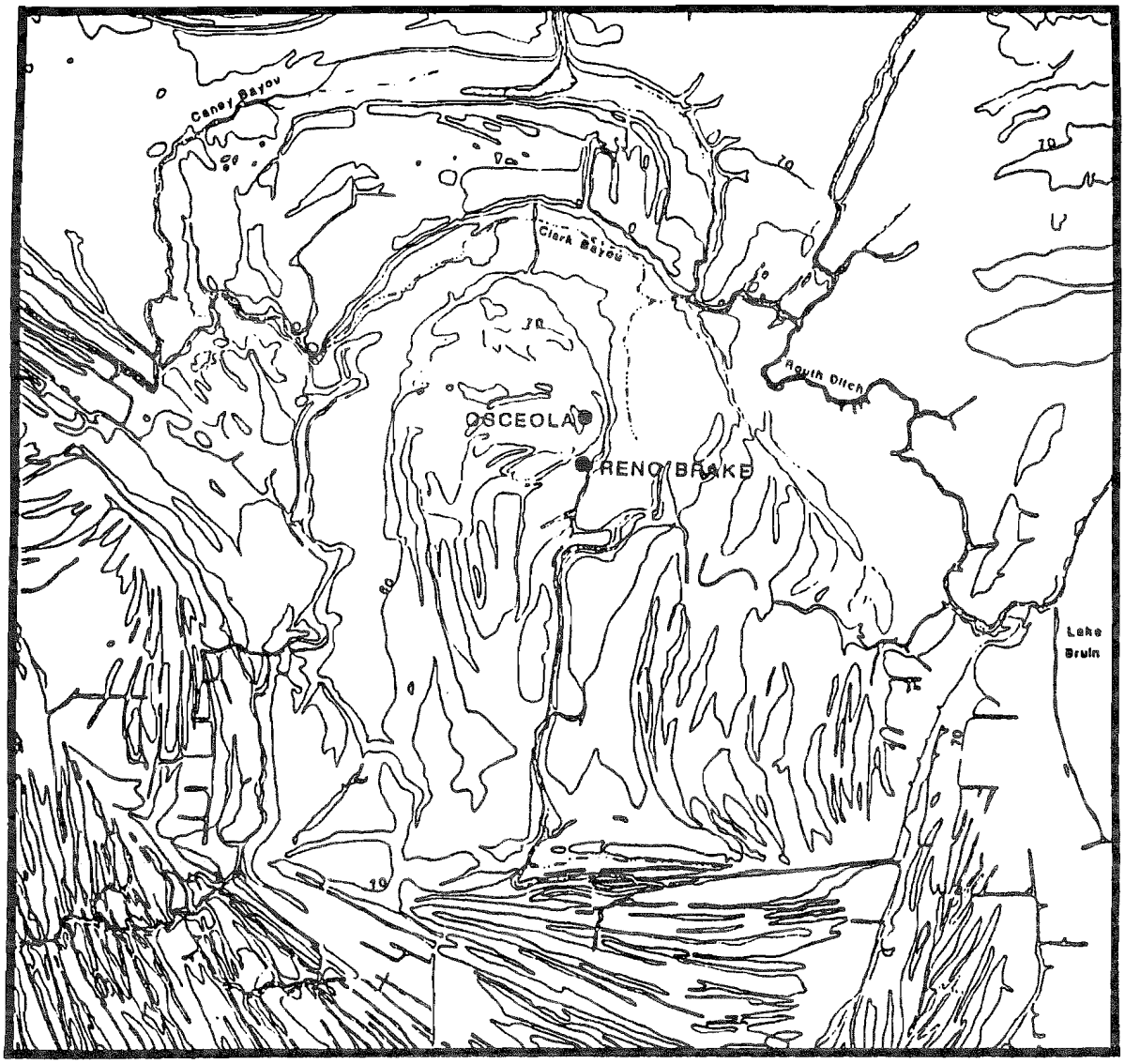


Figure 3: Topography of Project Area, Tensas Parish, Louisiana

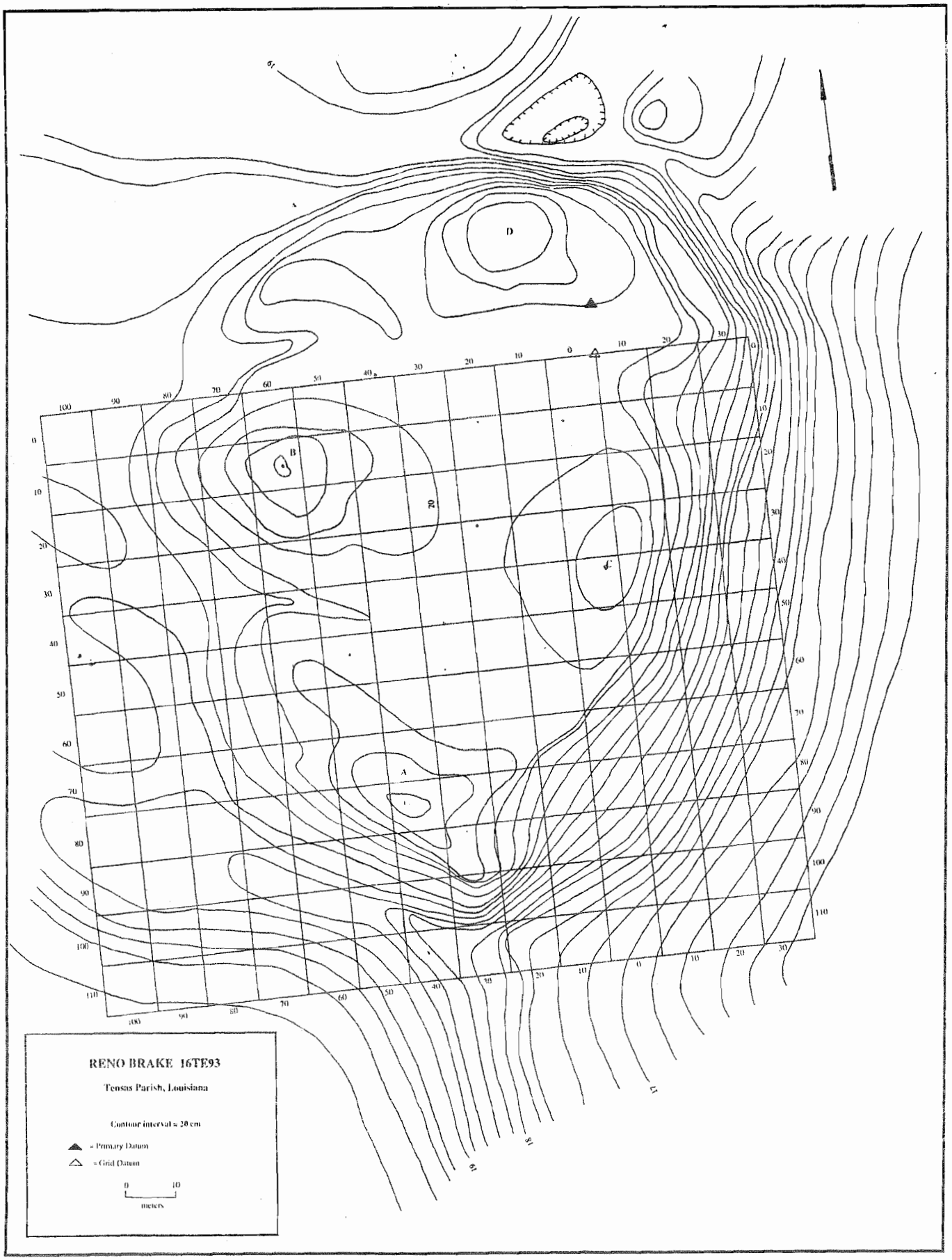


Figure 4: Reno Brake Site (16TE93)

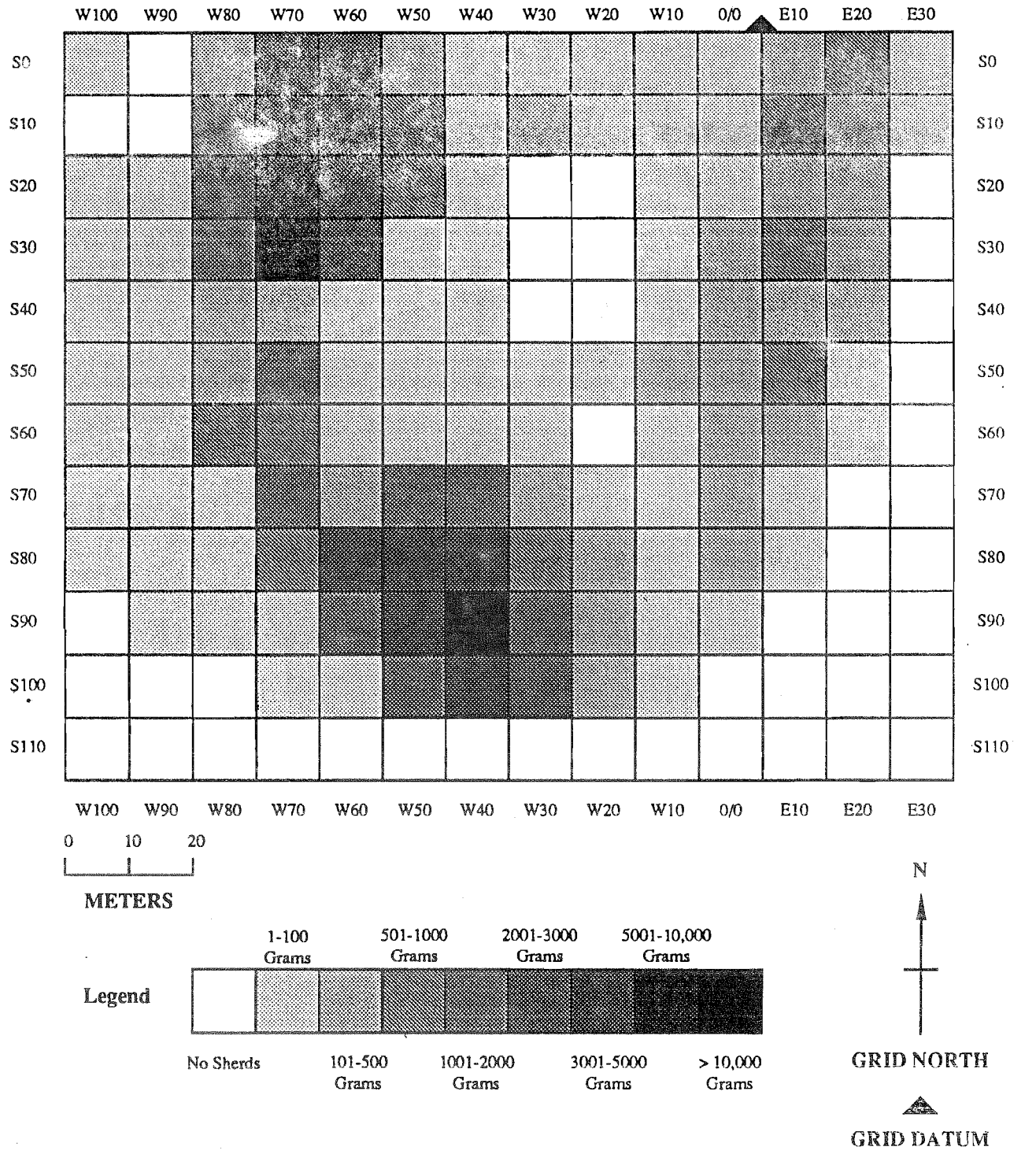


Figure 5: Distribution of Surface Collected Ceramics at Reno Brake

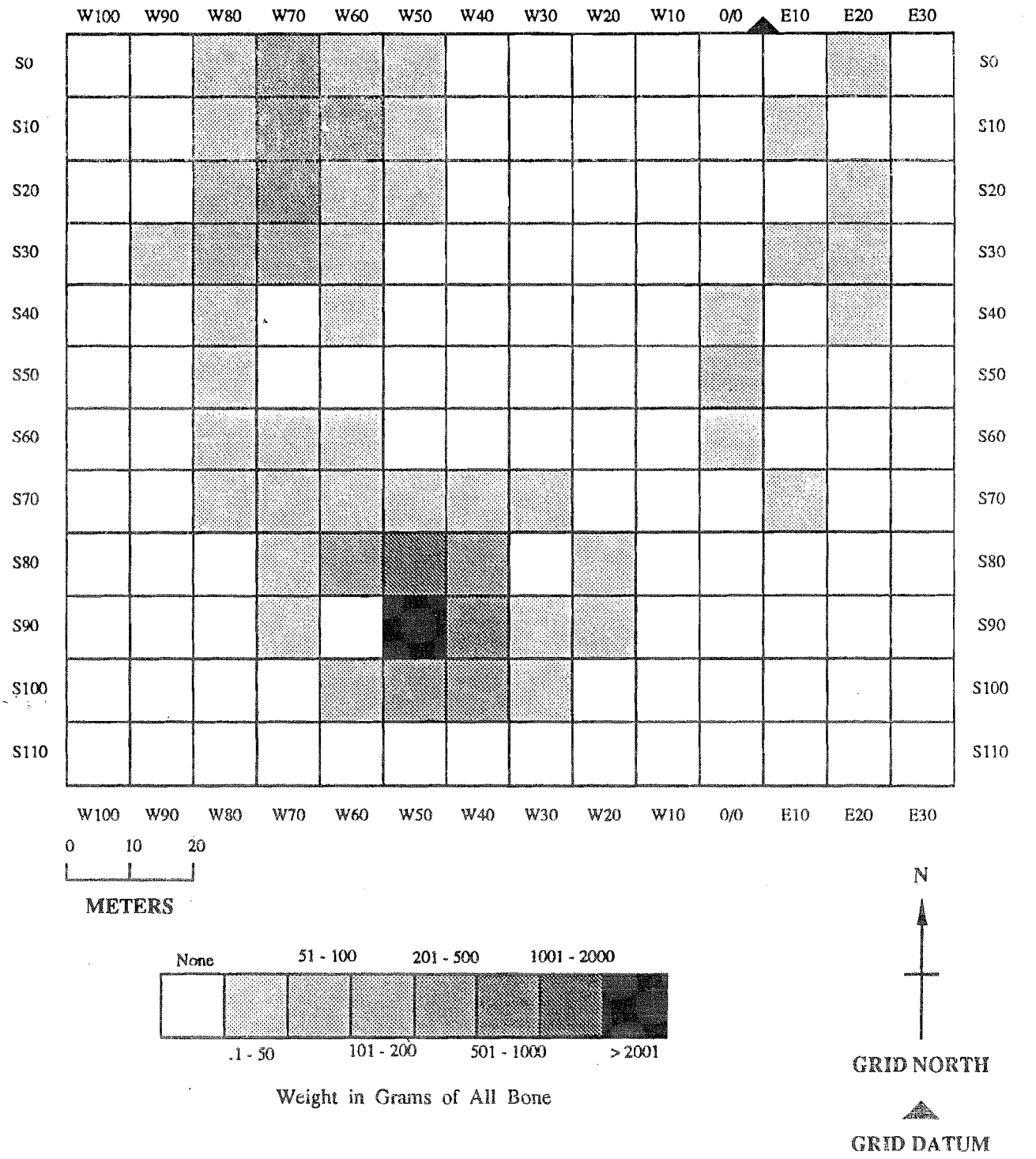


Figure 6: Distribution of Surface Collected Bone at Reno Brake

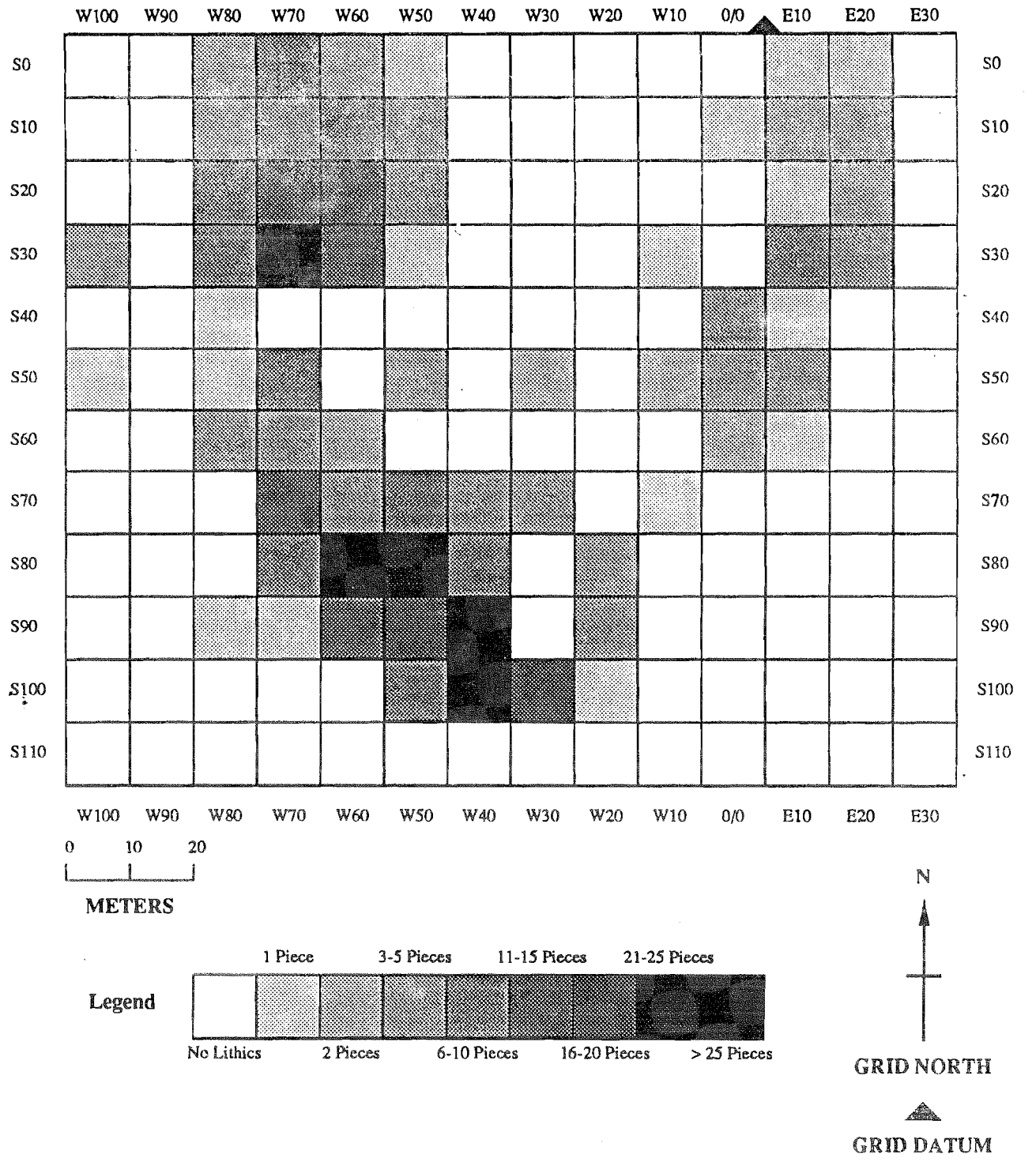
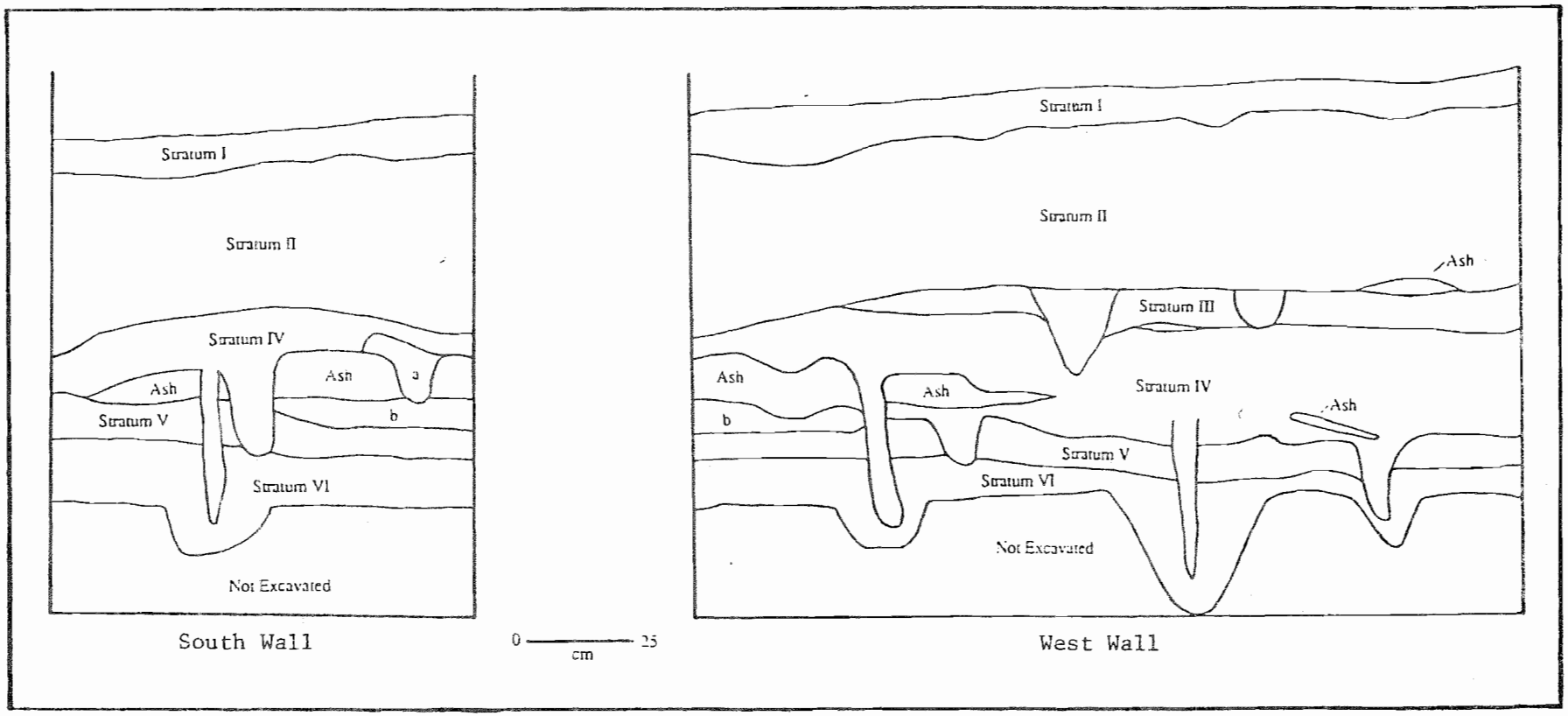


Figure 7: Distribution of Surface Collected Lithics at Reno Brake

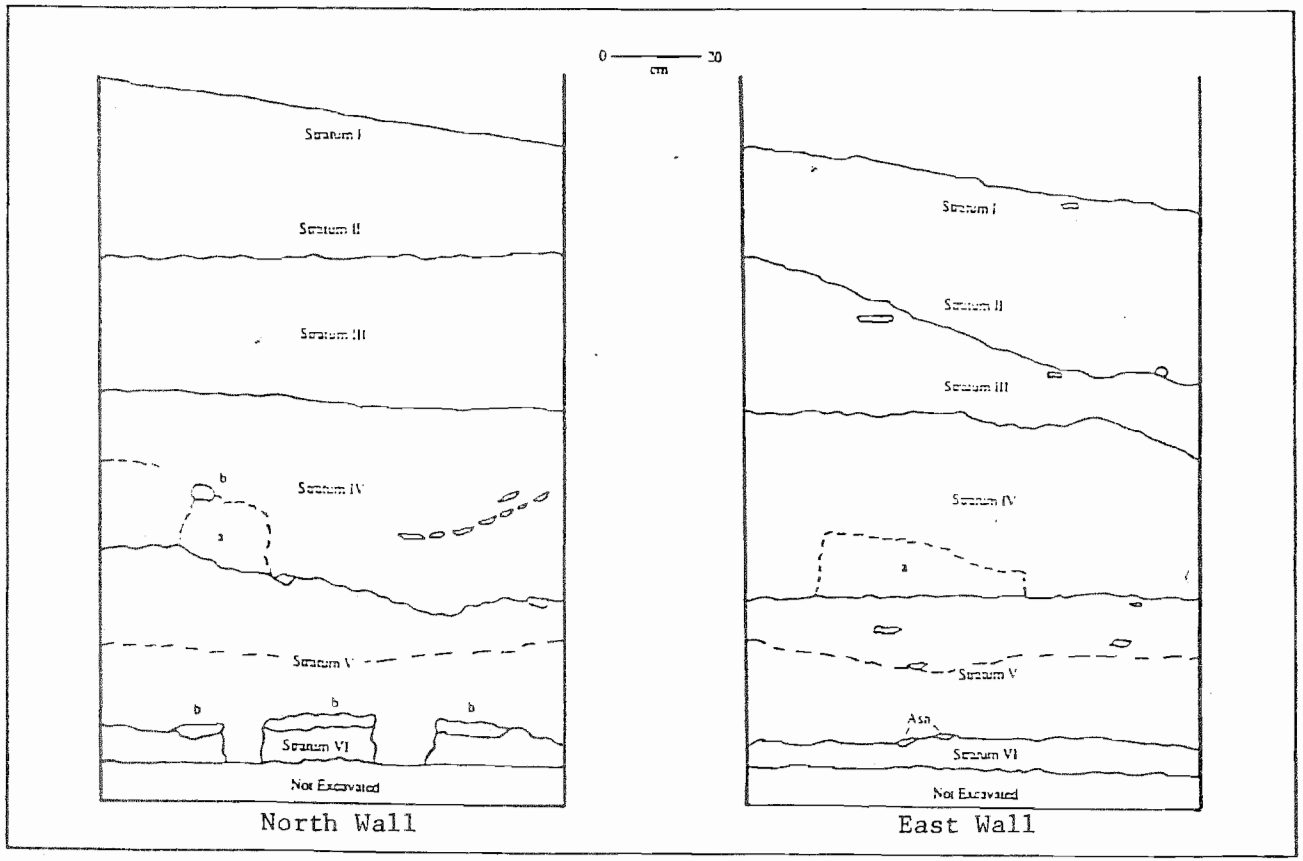
Figure 8: Excavation Unit S90 W40, Reno Brake (16TE93)



a= Yellow Clay and Midden Fill
b= Reddish Brown Heat Altered Clay

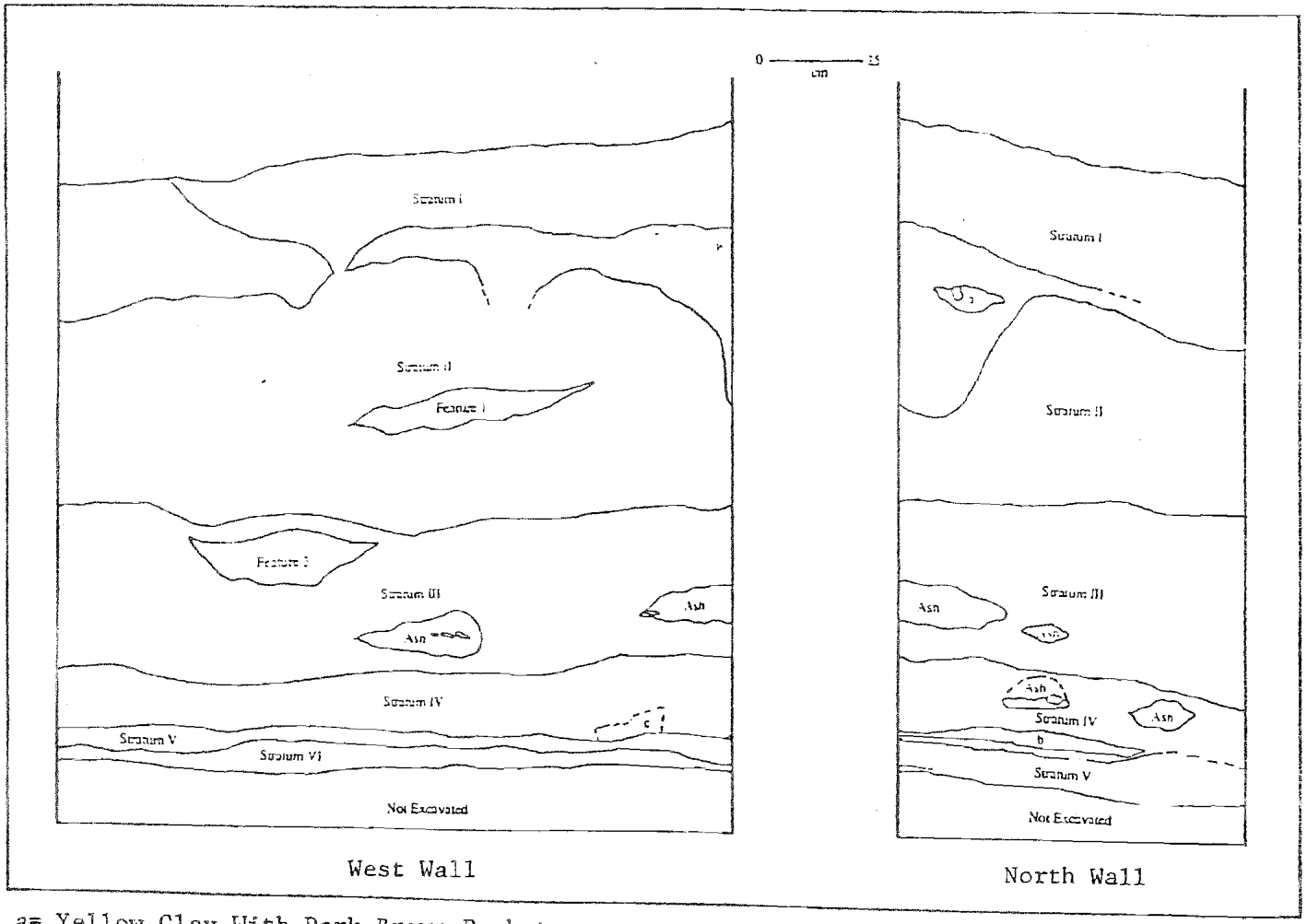
Figure 9: Osceola Site (16TE2)

Figure 10: Test Pit 1, Osceola (16TE2)



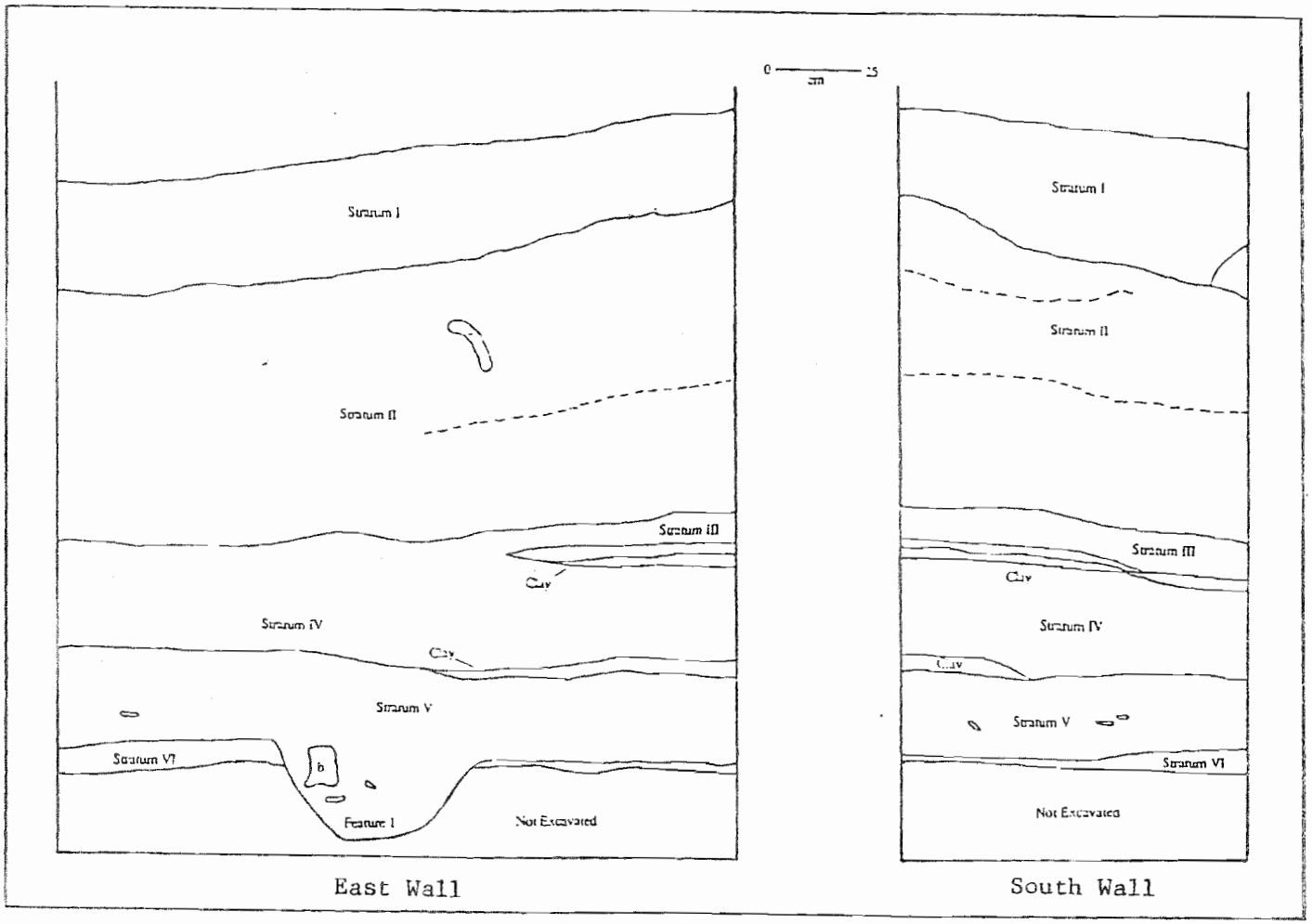
a= Yellow Brown Bioturbated Soil
b= Gritty Ash

Figure 11: Excavation Unit,N42 W1, Osceola (16TE2)



a= Yellow Clay With Dark Brown Pocket
b= Feature 10
c= Concentration of Bone

Figure 12: Excavation Unit N32 E1, Osceola (16TE2)



a= Dark Brown Stain
b= Very Pure Sand

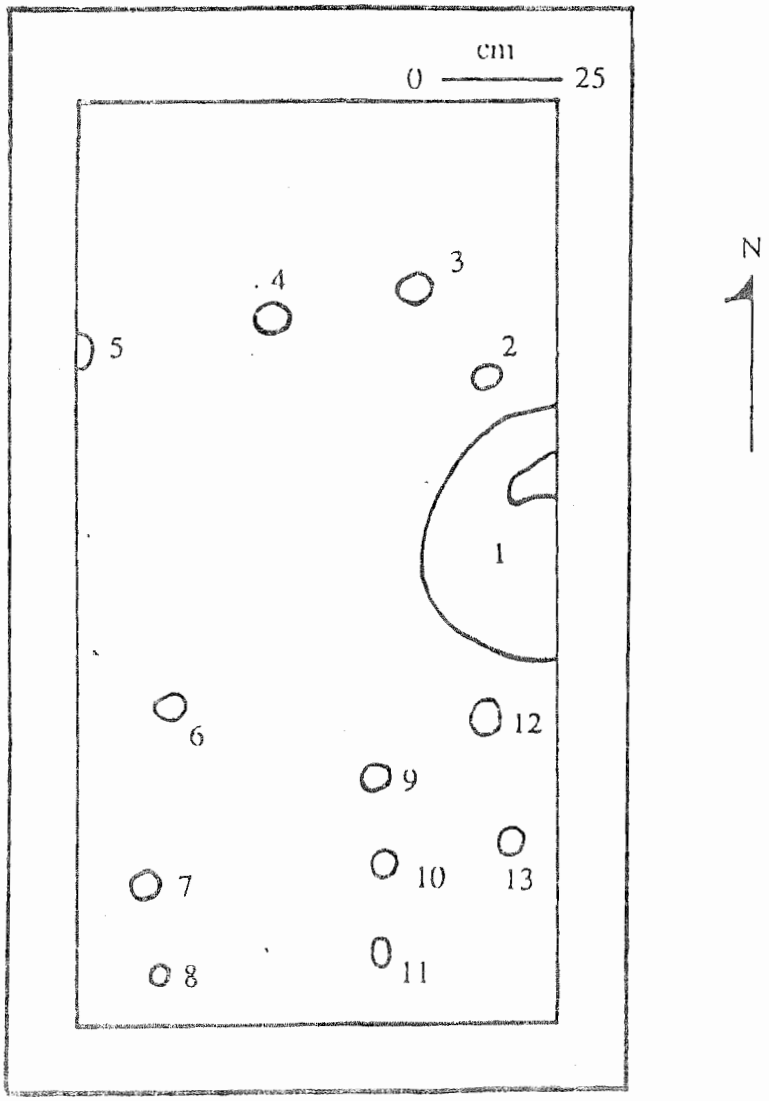


Figure 13: Plan of Base of Excavation Unit N32 E1, Osceola (16TE2)

Figure 14: Excavation Unit S20 E10, Osceola (16TE2)

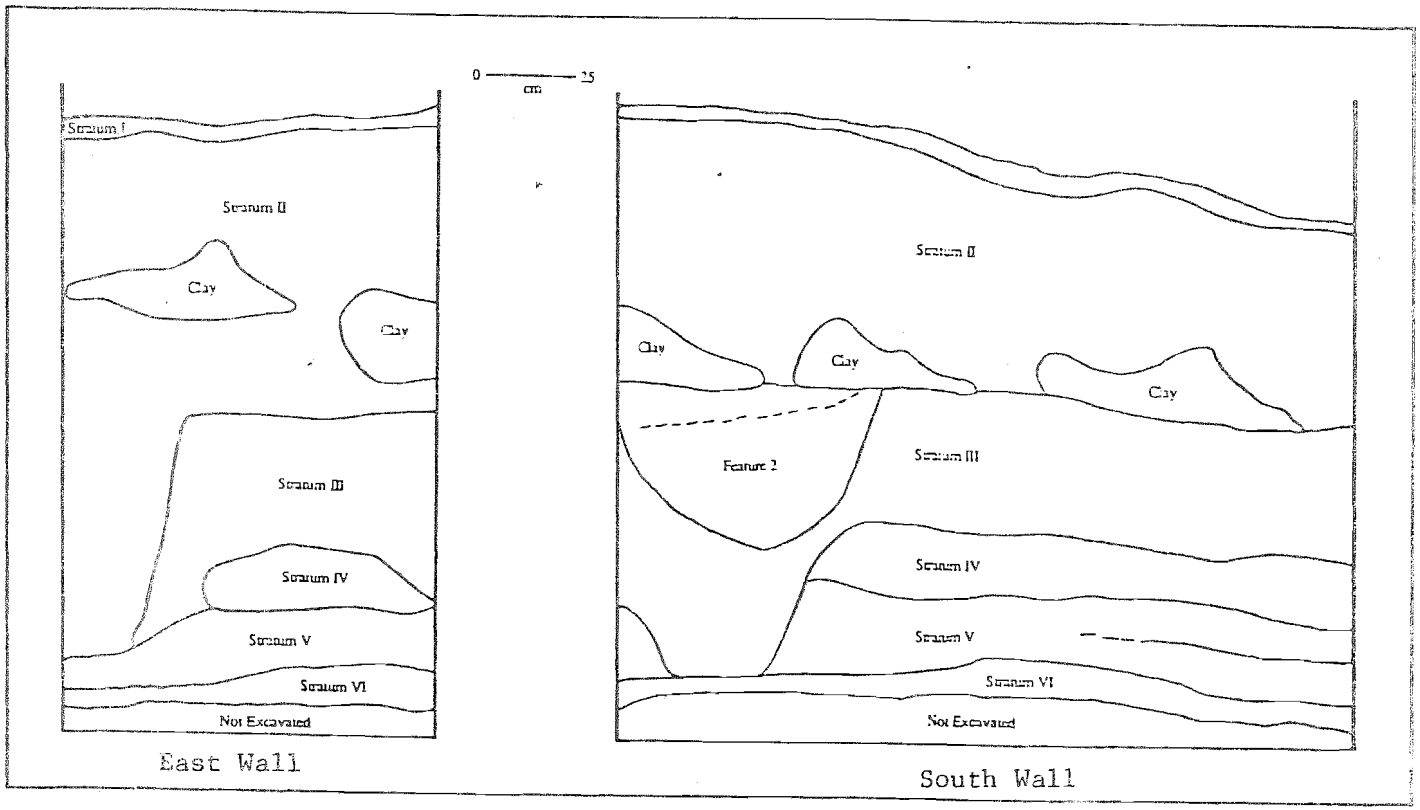


TABLE 1a
Reno Brake
16TE93
Surface Collections

Collection Unit	S0 E30	S0 E20	S0 E10	S0 E0	S0 W10	S0 W20	S0 W30	S0 W40	S0 W50	S0 W60	S0 W70	S0 W80	S0 W100	TOTAL
Ceramics:														
Decorated	2	8	12					2	4	51	93	4		176
Undecorated	16	137	73	6	1	4		8	65	128	377	35	3	853
Historic		1			1	1	2		1					6
Total Ceramics	18	146	85	6	2	5	2	10	70	179	470	39	3	1035
Fired Clay (grams)			6.1										4.8	10.9
Bone (grams)		3.8							5.5	48.3	247	13.5		318.1
Lithics		1	1						1	3	10	2		18

TABLE 1b
Reno Brake
16TE93
Surface Collections

Collection Unit	S10 E30	S10 E20	S1O E10	S10 E0	S10 W20	S10 W30	S10 W40	S10 W50	S10 W60	S10 W70	S10 W80	S10 W100	TOTAL
Ceramics:													
Decorated	1	12	20	4		16		30	59	66	24		232
Undecorated	7	67	102	6	2	9	11	60	163	255	67		749
Historic						1						1	2
Total Ceramics	8	79	122	10	2	26	11	90	222	321	91	1	983
Fired Clay (grams)	5	6	4			5		1		11.3			32.3
Bone (grams)			1.7					10.4	203.9	559.4	38.9		814.3
Lithics		2	2	1				5	10	5	2		27

TABLE 1c
Reno Brake
16TE93
Surface Collections

Collection Unit	S20 E20	S20 E10	S20 W10	S20 W40	S20 W50	S20 W60	S20 W70	S20 W80	S20 W90	S20 W100	TOTAL
Ceramics:											
Decorated	13	6		1	49	84	174	62		1	390
Undecorated	49	25	3	13	165	411	793	373	8	2	1842
Historic			2		1	2		1			6
Total Ceramics	62	31	5	14	215	497	967	436	8	3	2238
Fired Clay (grams)				13.3		3.9		12.5			29.7
Bone (grams)	1.4				2.2	34.1	756.1	53.1			846.9
Lithics	2	1			5	12	12	9			41

TABLE 1d
Reno Brake
16TE93
Surface Collections

Collection Unit	S30 E20	S30 E10	S30 E0	S30 W10	S30 W40	S30 W50	S30 W60	S30 W70	S30 W80	S30 W90	S30 W100	TOTAL
Ceramics:												
Decorated	13	22	8	2	1	3	17	150	51	1		268
Undecorated	130	162	112	16	4	31	508	1045	417	3	3	2431
Historic			1	2		1		1			1	6
Total Ceramics	143	184	121	20	5	35	525	1196	468	4	4	2705
Fired Clay (grams)	3.6	5.2						3				11.8
Bone (grams)	0.9	23.3					20.8	114.2	60.9	1		221.1
Lithics	3	6		1		1	15	27	10		4	67

TABLE 1e
Reno Brake
16TE93
Surface Collections

Collection Unit	S40 E20	S40 E10	S40 E0	S40 W10	S40 W30	S40 W40	S40 W50	S40 W60	S40 W70	S40 W80	S40 W90	S40 W100	TOTAL
Ceramics:													
Decorated	2	12	13	4				2	17	9	1		60
Undecorated	26	101	114	35		2	3	16	107	50	2	3	459
Historic					1				1			1	3
Total Ceramics	28	113	127	39	1	2	3	18	125	59	3	4	522
Fired Clay (grams)			4.7										4.7
Bone (grams)	1.4		1.6					1.3		0.4			4.7
Lithics		1	4							1		1	7

TABLE 1f
Reno Brake
16TE93
Surface Collections

Collection Unit	S50 E20	S50 E10	S50 E0	S50 W10	S50 W20	S50 W30	S50 W40	S50 W50	S50 W60	S50 W70	S50 W80	S50 W90	S50 W100	TOTAL
Ceramics:														
Decorated	9	36	25	3			1	1	5	68	10			158
Undecorated		216	95	49	2	3	2	5	20	415	108	2	3	920
Historic			4	2					1					7
Total Ceramics	9	252	124	54	2	3	3	6	26	483	118	2	3	1085
Fired Clay (grams)		1		1.6				37.4		23				63
Bone (grams)			6.5								10			16.5
Lithics		4	5	2		2		3		7	1		1	25

TABLE 1g
Reno Brake
16TE93
Surface Collections

Collection Unit	S60 E20	S60 E10	S60 E0	S60 W10	S60 W30	S60 W40	S60 W50	S60 W60	S60 W70	S60 W80	S60 W90	S60 W100	TOTAL
Ceramics:													
Decorated			23		1		1	6	28	28		1	88
Undecorated	1	6	106	6	3	1	13	19	119	256	4	4	538
Historic		59		1		1	1					1	63
Total Ceramics	1	65	129	7	4	2	15	25	147	284	4	6	689
Fired Clay (grams)			5.7		53.9			4.6		14.5			78.7
Bone (grams)			21.5					15	14.5	2.5			53.5
Lithics		1	2					2	5	4			14

TABLE 1h
Reno Brake
16TE93
Surface Collections

Collection Unit	S70 E10	S70 E0	S70 W10	S70 W20	S70 W30	S70 W40	S70 W50	S70 W60	S70 W70	S70 W80	S70 W90	S70 W100	TOTAL
Ceramics:													
Decorated	6	6	1	2	14	52	58	14	31	5	2	2	193
Undecorated	29	27	6	15	112	300	315	100	224	30	7	3	1168
Historic					4		2	1				1	8
Total Ceramics	35	33	7	17	130	352	375	115	255	35	9	6	1369
Fired Clay (grams)	0.7	4.6		17	11.4	3	2.5						39.2
Bone (grams)	6				15	8.3	9.7	48.6	7.5				95.1
Lithics		1	1		4	5	6	5	11				33

TABLE 1i
Reno Brake
16TE93
Surface Collections

Collection Unit	S80 E10	S80 E0	S80 W10	S80 W20	S80 W30	S80 W40	S80 W50	S80 W60	S80 W70	S80 W80	S80 W90	S80 W100	TOTAL
Ceramics:													
Decorated	1	2	2	14	43	162	255	279	29	2	1	2	792
Undecorated	3	4	6	46	113	811	1150	1830	321	5	4		4293
Historic													0
Total Ceramics	4	6	8	60	156	973	1405	2109	350	7	5	2	5085
Fired Clay (grams)					4		49.3	58.2					111.5
Bone (grams)				43.8	96.7	455.8	1318.5	258.1	15				2187.9
Lithics				3	17	10	25	29	6				90

						TABLE 1j					
						Reno Brake					
						16TE93					
						Surface Collections					
Collection Unit	S90 E0	S90 W10	S90 W20	S90 W30	S90 W40	S90 W50	S90 W60	S90 W70	S90 W80	S90 W90	**TOTAL**
Ceramics:											
Decorated	1		6	42	414	146	82	2	1	1	695
Undecorated	2	6	44	179	1953	871	513	49	2	6	3625
Historic											0
Total Ceramics	3	6	50	221	2367	1017	595	51	3	7	4320
Fired Clay (grams)				12.4	5.5	6.8	6.3				31
Bone (grams)			1.1	40.7	771	2459.3		15.4			3287.5
Lithics			5	14	32	20	11	1	1		84

				TABLE 1k				
				Reno Brake				
				16TE93				
				Surface Collections				
Collection Unit	S100 W10	S100 W20	S100 W30	S100 W40	S100 W50	S100 W60	S100 W70	TOTAL
Ceramics:								
Decorated	3	7	73	143	41		1	268
Undecorated	18	62	766	815	300	21	3	1985
Historic				1				1
Total Ceramics	21	69	839	959	341	21	4	2254
Fired Clay (grams)			37.6	7.2	6.6			51.4
Bone (grams)			27.9	359	353.4	8		748.3
Lithics		1	17	31	9		1	59

TABLE 2a: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		N30 E0			N30 W10			N30 W20			N30 W30			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*													
Churupa Punctated,	*var. Churupa*			0			0		1	1			0	1
Coles Creek Incised,	*var. Busby*			0			0	1		1			0	1
Marksville Incised,	*var. Anglim*		2	2			0		1	1			0	3
Marksville Incised,	*var. unspecified*			0		1	1			0			0	1
Marksville Stamped,	*var. Bayou Rouge*			0		1	1			0			0	1
Marksville Stamped,	*var. unspecified*			0			0		2	2			0	2
Unclassified Incised				0			0		1	1			0	1
Total Decorated Ceramics		0	2	2	0	2	2	1	5	6	0	0	0	10
Bowls														
Simple, Round		1		1			0	1		1			0	2
Total Plain Rims		1		1	0		0	1		1	0		0	2
Bases														
Indeterminate				0			0		1	1			0	1
Total Bases			0	0		0	0		1	1		0	0	1
Baytown Plain,	*var. unspecified*		3	3		3	3		6	6		8	8	20
Total Ceramics		1	5	6	0	5	5	2	12	14	0	8	8	33
Fired Clay (in grams)										6.8				6.8
Lithics														
Edwards Stemmed,	*var. unspecified*												1	1
Total Lithics				0			0			0			1	1
Bone (in grams)				26.9										26.9

TABLE 2b: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		N20 E10			N20 E0			N20 W10			N20 W20			N20 W30			N20 W40			N20 W50			N20 W60			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	
Type	*variety*																									
Larto Red,	*var. Larto*			0			0			0			0		1	1			0			0			0	1
Marksville Stamped,	*var. Bayou Rouge*			0			0			0			0		1	1			0			0			0	1
Marksville Stamped,	*var. unspecified*			0			0			0			0			0		1	1			0			0	1
Mulberry Creek Cordmarked,	*var. Edwards*		1	1			0		1	1		1	1			0			0			0		1	1	4
Mulberry Creek Cordmarked,	*var. unspecified*			0			0			0			0		1	1			0			0			0	1
Unclassified Incised				0			0			0			0			0			0		1	1			0	1
Total Decorated Ceramics		0	1	1	0	0	0	0	1	1	0	1	1	0	3	3	0	1	1	0	1	1	0	1	1	9
Bowls																										
Simple, Round				0	2		2			0			0			0	1		1			0			0	3
Simple, Flat				0	1		1			0			0			0			0			0			0	1
Warped				0	1		1			0			0			0			0			0			0	1
Total Plain Rims		0		0	4		4	0		0	0		0	0		0	1		1	0		0	0		0	5
Bases																										
Indeterminate			1	1			0			0			0			0			0			0			0	1
Total Bases			1	1		0	0		0	0		0	0		0	0		0	0		0	0		0	0	1
Baytown Plain,	*var. unspecified*		7	7		13	13		5	5		1	1		4	4		9	9		7	7		3	3	49
Total Ceramics		0	9	9	4	13	17	0	6	6	0	2	2	0	7	7	1	10	11	0	8	8	0		0	64
Fired Clay (in grams)				1.2			1.3						0.5			1.9			1.8			6.7				13.4
Lithics																										
Unutilized Flakes:																										
	Local Pebble Chert						1																			1
Total Lithics				0			1			0			0			0			0			0			0	1
Bone (in grams)							0.9												0.9			2				3.8

TABLE 2c: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		N10 E10			N10 E0			N10 W10			N10 W20			N10 W30			N10 W60			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																			
Coles Creek Incised,	*var. unspecified*			0			0			0			0			0	2		2	2
Marksville Incised,	*var. Yokena*			0			0	1		1			0			0			0	1
Mulberry Creek Cordmarked,	*var. Edwards*			0			0			0			0			0		2	2	2
Mulberry Creek Cordmarked,	*var. unspecified*			0			0			0			0		1	1			0	1
Total Decorated Ceramics		0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	2	2	4	6
Bowls																				
Simple, Round				0			0			0			0			0	1		1	1
Indeterminate Rims				0			0			0			0	1		1	1		1	2
Total Plain Rims		0		0	0		0	0		0	0		0	1		1	2		2	3
Bases																				
Indeterminate				0			0			0		2	2			0			0	2
Total Bases			0	0		0	0		0	0		2	2		0	0		0	0	2
Baytown Plain,	*var. unspecified*		4	4		2	2		9	9		3	3		9	9		19	19	46
Total Ceramics		0	4	4	0	2	2	1	9	10	0	5	5	1	10	11	4	21	25	57
Fired Clay (in grams)										0.9									7.3	8.2
Lithics																				
Unutilized Flakes:																				
	Local Pebble Chert																		1	1
Unmodified Pebbles																			1	1
Total Lithics				0			0			0			0			0			2	2
Bone (in grams)																0.3			0.3	0.6

TABLE 2d: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		S0 E10			S0 E0			S0 W10			S0 W60			S0 W70			S0 W80			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																			
Coles Creek Incised,	*var. unspecified*			0			0			0			0		1	1			0	1
Marksville Incised,	*var. unspecified*			0			0		1	1			0			0			0	1
Unclassified Incised			1	1			0			0			0			0			0	1
Total Decorated Ceramics		0	1	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	3
Jars																				
Exterior Thickened, Flat		1		1			0			0			0			0			0	1
Indeterminate Rims				0			0			0			0	1		1			0	1
Total Plain Rims		1		1	0		0	0		0	0		0	1		1	0		0	2
Baytown Plain,	*var. unspecified*		7	7		2	2		2	2		6	6		7	7		2	2	26
Total Ceramics		1	8	9	0	2	2	0	3	3	0	6	6	1	8	9	0	2	2	31
Fired Clay (in grams)				1																1
Bone (in grams)																0.4				0.4

TABLE 2e: Reno Brake (16TE930 Shovel Tests

Shovel Test Coordinates		S10 E10			S10 E0			S10 W60			S10 W70			S10 W80			S10 W90			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																			
Larto Red,	*var. Larto*			0			0			0			0		2	2			0	2
Marksville Stamped,	*var. Bayou Rouge*			0			0			0		1	1			0			0	1
Unclassified Incised				0			0			0	1	1	2			0			0	2
Total Decorated Ceramics		0	0	0	0	0	0	0	0	0	1	2	3	0	2	2	0	0	0	5
Bowls																				
Interior Bevel				0			0			0			0	1		1			0	1
Indeterminate Rims				0			0			0	1		1			0			0	1
Total Plain Rims		0		0	0		0	0		0	1		1	1		1	0		0	2
Bases																				
Flat, Rectangular				0			0			0		1	1			0			0	1
Total Bases			0	0		0	0		0	0		1	1		0	0		0	0	1
Baytown Plain,	*var. unspecified*			0		8	8		6	6		9	9		6	6		2	2	31
Total Ceramics		0	0	0	0	8	8	0	6	6	2	12	14	1	8	9	0	2	2	39
Fired Clay (in grams)							2.5			1.5			8.5							12.5
Lithics																				
Sandstone													1							1
Total Lithics				0			0			0			1			0			0	1
Bone (in grams)										0.4			30			1			8.8	40.2

TABLE 2f: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		S20 E10			S20 E0			S20 W10			S20 W60			S20 W70			S20 W80			S20 W90			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																						
Marksville Incised,	*var. Vick*			0			0			0			0			0			0		1	1	1
Marksville Incised,	*var. unspecified*		1	1			0			0			0			0			0			0	1
Marksville Stamped,	*var. unspecified*			0			0			0			0	1		1			0			0	1
Mulberry Creek Cordmarked,	*var. Edwards*			0			0			0	1	1	2			0			0			0	2
Plaquemine Brushed,	*var. Plaquemine*			0			0			0	1		1			0			0			0	1
Total Decorated Ceramics		0	1	1	0	0	0	0	0	0	2	1	3	1	0	1	0	0	0	0	1	1	6
Bowls																							
Simple, Round				0			0			0			0	1		1			0			0	1
Warped				0			0			0			0	1		1			0			0	1
Total Plain Rims		0		0	0		0	0		0	0		0	2		2	0		0	0		0	2
Baytown Plain,	*var. unspecified*		16	16		9	9		1	1		13	13		17	17		5	5		1	1	62
Total Ceramics		0	17	17	0	9	9	0	1	1	2	14	16	3	17	20	0	5	5	0	1	1	70
Fired Clay (in grams)				7.7			1.6									3.5							12.8
Lithics																							
Core													1										1
Total Lithics				0			0			0			1			0			0			0	1
Bone (in grams)																41.5			0.4			1.2	43.1

TABLE 2g: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		S30 E20			S30 E10			S30 E0			S30 W10			S30 W50			S30 W60			S30 W70			S30 W80			S30 W90			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	
Type	*variety*																												
Marksville Incised,	*var. Yokena*			0			0			0			0			0			0			0		1	1			0	1
Marksville Incised,	*var. unspecified*			0			0			0			0			0		1	1			0			0			0	1
Marksville Stamped,	*var. Elm Ridge*			0			0			0			0			0		1	1			0			0			0	1
Marksville Stamped,	*var. Manny*			0			0			0			0			0			0		1	1			0			0	1
Mulberry Creek Cordmarked,	*var. Edwards*			0			0			0			0			0		2	2			0			0			0	2
Unclassified Incised				0			0			0			0			0			0			0	1		1			0	1
Total Decorated Ceramics		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	1	1	1	1	2	0	0	0	7
Bowls																													
Simple, Round				0			0			0			0			0	1		1			0			0			0	1
Beakers																													
"Vicksburg"				0			0			0			0			0			0	1		1			0			0	1
Indeterminate Rims				0	1		1			0			0	1		1			0	1		1			0			0	3
Total Plain Rims		0		0	1		1	0		0	0		0	1		1	1		1	2		2	0		0	0		0	5
Bases																													
Indeterminate				0			0			0			0			0			0		1	1			0			0	1
Total Bases				0		0	0		0	0		0	0		0	0		0	0		1	1		0	0		0	0	1
Baytown Plain,	*var. unspecified*		1	1		3	3		1	1		7	7		1	1		13	13		15	15		7	7		5	5	53
Historic Ceramics/Glass				0			0			0			0			0			0		1	1			0			0	1
Total Ceramics		0	1	1	1	3	4	0	1	1	0	7	7	1	1	2	1	17	18	2	18	20	1	8	9	0	5	5	67
Fired Clay (in grams)							2.4			2.2									0.7			0.8			1.2				7.3
Lithics																													
Sandstone																						1							1
Total Lithics				0			0			0			0			0			0			1			0			0	1
Bone (in grams)																						23.4			5.6				29

TABLE 2h: Reno Brake (16TE930 Shovel Tests

Shovel Test Coordinates		S40 E10			S40 E0			S40 W10			S40 W60			S40 W70			S40 W80			S40 W90			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																						
Larto Red,	*var. Larto*			0			0			0			0			0		1	1			0	1
Marksville Stamped,	*var. Elm Ridge*			0			0		1	1			0			0			0			0	1
Mulberry Creek Cordmarked,	*var. unspecified*		1	1			0			0			0			0			0			0	1
Total Decorated Ceramics		0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	3
Bowls																							
Simple, Round		1		1	1		1			0			0			0			0			0	2
Indeterminate Rims				0			0	2		2			0			0			0			0	2
Total Plain Rims		1		1	1		1	2		2	0		0	0		0	0		0	0		0	4
Baytown Plain,	*var. unspecified*		1	1		2	2		3	3			0		4	4		7	7		1	1	18
Total Ceramics		1	2	3	1	2	3	2	4	6	0	0	0	0	4	4	0	8	8	0	1	1	25
Fired Clay (in grams)				2.3			6.6			1.2			1.5									0.7	12.3
Bone (in grams)				0.2						0.5						0.7							1.4

TABLE 2i: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		S50 E10			S50 E0			S50 W10			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*										
Coles Creek Incised,	*var. Hunt*			0	2		2			0	2
Plaquemine Brushed,	*var. Plaquemine*			0		1	1			0	1
Unclassified Incised				0		1	1			0	1
Total Decorated Ceramics		0	0	0	2	2	4	0	0	0	4
Bowls											
Arcadia				0	1		1			0	1
Total Plain Rims		0		0	1		1	0		0	1
Baytown Plain,	*var. unspecified*		1	1		7	7		3	3	11
Total Ceramics		0	1	1	3	9	12	0	3	3	16

TABLE 2j: Reno Brake (16TE930 Shovel Tests

Shovel Test Coordinates		S60 E0			S60 W70			S60 W80			S60 W100			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*													
Evansville Punctated,	*var. Purvis Lake*			0		1	1			0			0	1
Marksville Incised,	*var. Anglim*		2	2			0			0			0	2
Marksville Incised,	*var. Yokena*			0			0		1	1			0	1
Marksville Stamped,	*var. unspecified*		1	1			0			0			0	1
Mulberry Creek Cordmarked,	*var. Edwards*			0			0		1	1			0	1
Unclassified Incised				0		1	1			0			0	1
Total Decorated Ceramics		0	3	3	0	2	2	0	2	2	0	0	0	7
Bowls														
Simple, Flat				0			0	1		1			0	1
Jars														
Simple, Round				0	1		1			0			0	1
Indeterminate Rims				0			0	2		2			0	2
Total Plain Rims		0		0	1		1	3		3	0		0	4
Bases														
Flat, Rectangular			1	1			0			0			0	1
Total Bases			1	1		0	0		0	0		0	0	1
Baytown Plain,	*var. unspecified*		12	12		10	10		16	16		2	2	40
Total Ceramics		0	16	16	1	12	13	3	18	21	0	2	2	52
Fired Clay (in grams)				8.5			2.4							10.9
Lithics														
Sandstone				1										1
Total Lithics				1			0			0			0	1

TABLE 2k: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		S70 E0			S70 W10			S70 W50			S70 W60			S70 W70			S70 W80			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																			
Coles Creek Incised,	*var. Campbellsville*			0			0			0	1		1			0			0	1
Larto Red,	*var. Larto*			0			0		4	4			0			0			0	4
Marksville Incised,	*var. unspecified*	1		1		1	1			0			0			0			0	2
Mulberry Creek Cordmarked,	*var. Edwards*			0			0		1	1			0		2	2			0	3
Unclassified Incised				0			0		1	1			0	1		1			0	2
Total Decorated Ceramics		1	0	1	0	1	1	0	6	6	1	0	1	1	2	3	0	0	0	12
Bases																				
Flat, Rectangular				0			0		1	1			0			0			0	1
Flat, Round				0			0			0		1	1			0			0	1
Indeterminate			1	1			0			0			0			0			0	1
Total Bases			1	1		0	0		1	1		1	1		0	0		0	0	3
Baytown Plain,	*var. unspecified*		7	7		1	1		8	8		10	10		16	16		9	9	51
Historic Ceramics/Glass				0			0		1	1			0			0			0	1
Total Ceramics		1	8	9	0	2	2	0	16	16	1	11	12	1	18	19	0	9	9	67
Bone (in grams)				7.2						0.4			1.5							9.1

TABLE 21: Reno Brak (16TE93) Shovel Tests

Shovel Test Coordinates		S80 E0			S80 W20			S80 W30			S80 W40			S80 W50			S80 W60			S80 W70			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																						
Coles Creek Incised,	*var. Coles Creek*			0			0			0			0			0		1	1			0	1
Larto Red,	*var. Larto*			0			0			0			0		1	1			0			0	1
Marksville Incised,	*var. Yokena*			0			0			0			0			0		1	1			0	1
Marksville Incised,	*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
Total Decorated Ceramics		0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0	2	2	0	0	0	5
Bowls																							
Round, restricted				0			0			0			0	1		1			0			0	1
Indeterminate Rims		1		1			0			0	1		1	1		1			0			0	3
Total Plain Rims		1		1	0		0	0		0	1		1	2		2	0		0	0		0	4
Bases																							
Flat, Rectangular				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
Baytown Plain,	*var. unspecified*		1	1		1	1		2	2		4	4		6	6		12	12		1	1	27
Historic Ceramics/Glass				0			0			0		1	1		1	1			0			0	2
Total Ceramics		1	1	2	0	1	1	0	2	2	1	6	7	2	10	12	0	14	14	0	1	1	39
Fired Clay (in grams)				3.7									1			4.7			3.5				12.9
Lithics																							
Unutilized Flakes:																							
	Local Pebble Chert			1																			1
Total Lithics				1			0			0			0			0			0			0	1
Bone (in grams)										0.1			0.5						1				1.6

TABLE 2m: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		S90 W10			S90 W20			S90 W30			S90 W40			S90 W50			S90 W60			S90 W70			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																						
Evansville Punctated,	*var. Purvis Lake*			0			0			0		3	3			0			0			0	3
Larto Red,	*var. Larto*			0		1	1			0		1	1			0			0			0	2
Marksville Incised,	*var. Anglim*			0			0			0		1	1			0			0			0	1
Marksville Incised,	*var. Vick*			0		1	1			0			0			0			0			0	1
Marksville Incised,	*var. unspecified*		1	1		1	1		2	2		1	1			0			0			0	5
Marksville Stamped,	*var. Bayou Rouge*		1	1			0			0			0			0			0			0	1
Marksville Stamped,	*var. Elm Ridge*			0			0			0		1	1			0			0			0	1
Mulberry Creek Cordmarked,	*var. Edwards*		1	1			0			0		1	1			0			0			0	2
Unclassified Incised				0			0		1	1		1	1			0			0			0	2
Total Decorated Ceramics		0	3	3	0	3	3	0	3	3	0	9	9	0	0	0	0	0	0	0	0	0	18
Bowls																							
Flat, Flaring				0			0			0	1		1			0			0			0	1
Arcadia				0			0			0	1		1			0			0			0	1
"T"-shaped				0			0			0	1		1			0			0			0	1
Jars																							
Simple, Flat				0			0			0	2		2			0			0			0	2
Indeterminate Rims				0			0			0	2		2			0			0			0	2
Total Plain Rims		0		0	0		0	0		0	7		7	0		0	0		0	0		0	7
Bases																							
Indeterminate				0			0			0		2	2			0			0			0	2
Total Bases			0	0		0	0		0	0		2	2		0	0		0	0		0	0	2
Baytown Plain,	*var. unspecified*		3	3		11	11		13	13		27	27		5	5		1	1		1	1	61
Total Ceramics		0	6	6	0	14	14	0	16	16	7	38	45	0	5	5	0	1	1	0	1	1	88
Fired Clay (in grams)				1.9						12.1						14							28
Lithics																							
Biface Fragment													1										1
Hematite										1													1
Unmodified Pebbles				1						2													3
Total Lithics				1			0			3			1			0			0			0	5
Bone (in grams)													55.7			74.7							130.4

TABLE 2n: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		S100 W20			S100 W30			S100 W40			S100 W50			S100 W60			TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																
Unclassified Incised				0			0			0		1	1			0	1
Total Decorated Ceramics		0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1
Indeterminate Rims				0			0	1		1			0			0	1
Total Plain Rims		0		0	0		0	1		1	0		0	0		0	1
Baytown Plain,	*var. unspecified*		4	4		3	3		6	6		30	30		4	4	47
Total Ceramics		0	4	4	0	3	3	1	6	7	0	31	31	0	4	4	49
Fired Clay (in grams)															0.6		0.6
Lithics																	
Unutilized Flakes:																	
	Local Pebble Chert									1							1
Total Lithics				0			0			1			0			0	1
Bone (in grams)													15.1			2	17.1

TABLE 2o: Reno Brake (16TE93) Shovel Tests

Shovel Test Coordinates		S110 W40			S110 W50			TOTAL
		Rim	Body	Total	Rim	Body	Total	
Type	*variety*							
Unclassified Incised			1	1			0	1
Total Decorated Ceramics		0	1	1	0	0	0	1
Bowls								
Simple, Round		1		1			0	1
Total Plain Rims		1		1	0		0	1
Baytown Plain,	*var. unspecified*		3	3		1	1	4
Total Ceramics		1	4	5	0	1	1	6
Bone (in grams)				2				2

TABLE 3a: Reno Brake (16TE93) Test Excavation S90 W40

Catalogue No. O353		Stratum I								Stratum II								Stratum IV						Stratum III						Stratum IV						Stratum V									
Decorated Ceramics	Excavation Level		A			B			C			D			E			F			G			H			I			J			K			Fea. 2			Fea. 9			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	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	variety																																												
Alligator Incised,	*var. Alligator*			0		2	2		3	3	2		2			0			0			0			0			0			0			0			0			0			0	7
Chevalier Stamped,	*var. unspecified*			0			0		1	1			0			0			0			0			0			0			0			0			0			0			0	1
Churupa Punctated,	*var. Churupa*		1	1			0		1	1			0			0			0			0		2	2		2	2			0			0			0			0			0	6
Churupa Punctated,	*var. Thornton*		1	1			0			0			0			0			0			0			0			0			0			0			0			0			0	1
Churupa Punctated,	*var. Watson*			0			0		0	0	2	2	4		3	3			0			0			0			0			0			0			0			0			0	7
Churupa Punctated,	*var. unspecified*			0			0			0			0			0			0			0			0			0			0		1	1			0			0			0	1
Coles Creek Incised,	*var. Mott*		1	1			0			0			0			0			0			0			0			0			0			0			0			0			0	1
Coles Creek Incised,	*var. unspecified*			0			0			0			0			0			0			0		1	1			0			0			0			0			0			0	1
Evansville Punctated,	*var. Purvis Lake*	1	2	3		3	3	1	9	10		4	4		2	2			0			0			0			0			0			0			0			0			0	22
Evansville Punctated,	*var. unspecified*			0			0	1		1			0			0			0			0			0			0			0			0			0			0			0	1
French Fork Incised,	*var. unspecified*	2		2			0		1	1		2	2			0			0			0			0			0			0			0			0			0			0	5
Hollyknowe Pinched,	*var. Hollyknowe*			0		1	1			0			0			0			0			0			0			0			0			0			0			0			0	1
Indian Bay Stamped,	*var. Gammon*			0			0	1		1			0			0			0			0			0			0			0			0			0			0			0	1
Indian Bay Stamped,	*var. unspecified*			0			0			0			0		2	2			0			0			0			0			0			0			0			0			0	2
Larto Red,	*var. Larto*	3	11	14	3	1	4	2	5	7	4	10	14		6	6		1	1			0		1	1			0			0			0			0			0			0	47
Marksville Incised,	*var. Anglim*			0			0			0			0	1	2	3			0			0			0			0			0			0			0			0			0	3
Marksville Incised,	*var. Steele Bayou*			0			0		1	1			0			0			0		2	2			0			0		1	2	3			0			0			0			0	6
Marksville Incised,	*var. Vick*		2	2			0			0		12	12		6	6			0			0			0			0			0			0			0			0			0	20
Marksville Incised,	*var. Yokena*			0			0			0		4	4		2	2		1	1		2	2	1	3	4	2	6	8		6	6			0		1	1			0			0	28
Marksville Incised,	*var. unspecified*			0			0	1	2	3		1	1	1	2	3			0		2	2		2	2		4	4	1		1			0		2	2			0			0	18
Marksville Stamped,	*var. Bayou Rouge*		4	4		6	6		4	4	1	7	8			0			0			0			0			0			0			0			0			0			0	22
Marksville Stamped,	*var. Manny*			0			0		1	1			0			0			0			0		2	2		2	2			0			0			0			0			0	5
Marksville Stamped,	*var. Newsome*			0			0			0			0			0			0			0		1	1	1		1			0			0			0			0			0	2
Marksville Stamped,	*var. unspecified*		1	1		1	1		3	3			0		3	3			0			0		1	1			0			0			0			0		1	1			0	11
Mazique Incised,	*var. unspecified*		1	1		1	1			0			0			0			0			0			0			0			0			0			0			0			0	2
Mulberry Creek Cordmarked,	*var. Edwards*		4	4		3	3	1	2	3			0			0			0			0			0			0			0			0			0			0			0	10
Mulberry Creek Cordmarked,	*var. Eudora*			0			0		1	1			0			0			0			0			0			0			0			0			0			0			0	1
Mulberry Creek Cordmarked,	*var. unspecified*		1	1			0			0			0			0			0			0			0			0			0			0			0			0			0	1
Salomon Brushed,	*var. Salomon*			0		2	2			0			0			0			0			0			0			0			0			0			0			0			0	2
Woodville Zoned Red,	*var. Woodville*		1	1	1		1			0			0			0			0			0			0			0			0			0			0			0			0	2
Unclassified Decorated		1	1	2			0			0			0			0			0			0			0			0			0			0			0			0			0	2
Unclassified Incised			2	2			0		4	4	1	5	6		1	1			0			0			0			0			0			0			0			0			0	13
Unclassified Painted				0			0			0		1	1			0		1	1			0			0			0			0			0			0			0			0	2
Total Decorated Ceramics		7	33	40	4	20	24	7	38	45	10	48	58	2	29	31	0	3	3	0	6	6	1	13	14	3	14	17	2	9	11	0	1	1	0	4	4	0	0	0	254

TABLE 3b: Reno Brake (16TE93) Test Excavation S90 W40

Catalogue No. O353	Str. I		Stratum II			Stratum IV		Str. III	Stratum IV		Str. V			
Plain Pottery	A	B	C	D	E	F	G	H	I	J	K	Fea. 2	Fea. 9	TOTAL
Baytown Plain,														
var. unspecified														
Bowls														
Simple, Round	1	1	5	2	3				1	1	1			15
Simple, Flat	1			3	1									5
Warped, Round								1						1
Tapered			1	2										3
Thickened, Round			2					2	1					5
Interior Bevel	1				1									2
Arcadia	1					1		2	5	3				12
Round, with Exterior Fold		1												1
Thin, Flat			1											1
Thin, Round				1										1
"Troyville Thick"				2										2
Plat Strap, with Notches				1	2									3
Interior Strap, Round								1						1
"Wedge-shaped"									1					1
Crisp Flat										2				2
Exterior Thickened										1				1
Total Bowl Rims	4	2	9	11	7	1	0	6	8	7	1	0	0	56
Jars														
Simple, Round	6	1	2	2	2			2				2		17
Simple, Flat	4	1	3	4	1			2	1					16
Simple, Flat, with Notches	1													1
Exterior Flare, Flat		1				1								2
Interior Bevel			3											3
Round, Restricted			3	1	3	1			4					12
Flat, Restricted				3				1	2					6
Interior Bevel				1										1
Exterior Flange, Flat				1										1
Exterior Thickened, Flat							1		2					3
Exterior Thickened, Round												1		1
Total Jar Rims	11	3	11	12	6	2	1	5	9	0	0	3	0	63
Indeterminate Rims	7	3	6	13	2				3	1		1		36
Total Plain Rims	22	8	26	36	15	3	1	11	20	8	1	4	0	155
Bases														
Flat, Rectangular	2		14		8			1						25
Flat, Round			3		2									5
Indeterminate				16		3		1	1					21
Total Bases	2	0	17	16	10	3	0	2	1	0	0	0	0	51
Baytown Plain,														
var. unspecified	370	135	350	318	231	38	44	137	200	87	8	10	2	1930
Total Plain Ceramics	394	143	393	370	256	44	45	150	221	95	9	14	2	2136

TABLE 3c: Reno Brake (16TE93) Test Excavation S90 W40

Catalogue Number O353													
Lithics, Fired Clay, Bone													
		Str. I		Stratum II			Stratum IV		Str. III	Stratum IV		Str. V	
Lithics	Excavation Level	A	B	C	D	E	F	G	H	I	J	K	**TOTAL**
Bifacial Tool			1										1
Hammerstone		1									1		2
Anvil/Abraider											1		1
Cores		1								1			2
Unutilized Flakes:													
	Local Pebble Chert	1	1		1		1						4
	Thermally Altered Chert							1	1				2
	Non-Local Chert	1											1
Shatter:													
	Local Chert					1							1
	Burned Debris	3											3
Sandstone										3	1		4
Hematite		1						1					2
Unmodified Pebbles		5		2		2	4	3	5	21	11	2	55
Unidentified								1					1
Total Lithics		13	2	2	1	3	5	6	6	25	14	2	79
Fired Clay (in grams)		0	0	44.7	54.3	76.2	22.7	70.9	16.8	50.9	28.5	4.1	369.1
Bone (in grams)													
	Mammal	10	18.5	182	462.8	300.7	26.6	19.1	188.7	503.9	122.7	15	1850
	Fish	0.5	0	0	16.9	35	33.9	93.2	47.2	77.4	193.2	2.3	499.6
	Turtle	0	0	0	44.2	58	5	10.2	12.7	24.1	18.8	0	173
	Bird	0	0	0	5.2	0	0	0	1	0	0	0	6.2
Total Bone		10.5	18.5	182	529.1	393.7	65.5	122.5	249.6	605.4	334.7	17.3	2528.8

TABLE 4a: Osceola (16TE2) Test Pit 1

Catalogue No. O351		Stratum I			Stratum II			Stratum III			Stratum IV			Stratum V			Stratum VI						
Decorated Ceramics	Excavation Level		A			B			C			D			E			F			Fea. 2		TOTAL
		Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	
Type	*variety*																						
Beldeau Incised,	*var. Beldeau*		1	1		3	3			0			0			0			0			0	4
Chevalier Stamped,	*var. Chevalier*			0			0			0	1	1	2	1	2	3			0			0	5
Chevalier Stamped,	*var. McKinney*			0			0			0			0		1	1			0			0	1
Chevalier Stamped,	*var. unspecified*			0			0			0			0		2	2			0			0	2
Coles Creek Incised,	*var. Blakely*			0		1	1			0			0			0			0			0	1
Coles Creek Incised,	*var. Busby*			0			0			0	1		1			0			0			0	1
Coles Creek Incised,	*var. Coles Creek*			0		3	3	1		1	2	1	3			0			0			0	7
Coles Creek Incised,	*var. Greenhouse*			0	1		1			0	1		1			0			0			0	2
Coles Creek Incised,	*var. Hardy*	1		1			0			0			0			0			0			0	1
Coles Creek Incised,	*var. Hilly Grove*			0			0			0	1		1			0			0			0	1
Coles Creek Incised,	*var. Hunt*	1		1			0			0	4		4	10		10			0			0	15
Coles Creek Incised,	*var. Keo*			0	2		2			0			0			0			0			0	2
Coles Creek Incised,	*var. Mott*	1	5	6	8	35	43			0			0			0			0			0	49
Coles Creek Incised,	*var. Sorentz*			0			0			0			0	4		4			0			0	4
Coles Creek Incised,	*var. Phillips*			0			0			0	4		4	7		7			0			0	11
Coles Creek Incised,	*var. Stoner*			0	3		3			0	3		3			0			0			0	6
Coles Creek Incised,	*var. unspecified*	3	2	5	7	45	52		2	2		1	1	4	2	6			0			0	66
French Fork Incised,	*var. McNutt*		1	1		2	2	1	1	2			0			0			0			0	5
French Fork Incised,	*var. unspecified*	1	2	3		2	2			0	1	1	2	1	1	2			0			0	9
Hollyknowe Pinched,	*var. unspecified*			0	2		2			0			0			0			0			0	2
Marksville Incised,	*var. Yokena*			0			0			0			0			0		1	1			0	1
Marksville Incised,	*var. unspecified*			0			0			0		1	1		3	3	1		1			0	5
Marksville Stamped,	*var. Bayou Rouge*			0			0			0			0	1	2	3			0		4	4	7
Marksville Stamped,	*var. Manny*			0			0			0			0			0		1	1			0	1
Marksville Stamped,	*var. Newsome*			0			0			0			0		2	2			0			0	2
Marksville Stamped,	*var. unspecified*			0			0		2	2			0			0			0			0	2
Mazique Incised,	*var. Kings Point*			0	2		2			0			0			0			0			0	2
Mazique Incised,	*var. Mazique*			0		1	1			0			0			0			0			0	1
Mulberry Creek Cordmarked,	*var. Smith Creek*			0		2	2			0	2	12	14	2	80	82			0			0	98
Mulberry Creek Cordmarked,	*var. unspecified*			0			0		1	1			0			0			0			0	1
Plaquemine Brushed,	*var. Plaquemine*		1	1			0			0			0			0			0			0	1
Salomon Brushed,	*var. Salomon*			0			0			0			0	1	7	8			0			0	8
Unclassified Brushed				0		1	1			0			0			0			0			0	1
Unclassified Decorated			2	2		7	7			0			0		2	2			0			0	11
Unclassified Incised			4	4		7	7		1	1			0		15	15			0			0	27
Unclassified Interior Incised				0			0			0		1	1			0			0			0	1
Total Decorated Ceramics		7	18	25	25	109	134	2	7	9	20	18	38	31	119	150	1	2	3	0	4	4	363

TABLE 4b:Osceola (16TE2) Test Pit 1

Catalogue No. O351									
Undecorated Ceramics	Str. I	Str. II	Str. III	Str. IV	Str. V	Str. VI			
Excavation Level	A	B	C	D	E	F	Fea. 1	Fea. 2	**TOTAL**
Baytown Plain,									
var. unspecified									
Bowls									
Simple, Round				1	19				20
Simple, Flat				1	3				4
Warped				1					1
"Joffrion"				1	5				6
Tapered					1				1
Interior Bevel					2				2
Round, with Exterior Fold					4				4
Thin, Flat					1				1
Thin, Round							1		1
Exterior Strap, Round					1				1
Total Bowl Rims	0	0	0	4	36	0	1	0	41
Jars									
Simple, Round					5				5
Simple, Flat				1	6				7
"Clark Bayou"					6				6
Warped				1	1				2
Total Jar Rims	0	0	0	2	18	0	0	0	20
Beakers									
"Vicksburg"	3	24							27
Indeterminate Rims	17	111	7	5	39				179
Total Plain Rims	20	135	7	11	93	0	1	0	267
Bases									
Flat, Rectangular				3	5				8
Flat, Round					4				4
Indeterminate		20	1	7	2				30
Total Bases	0	20	1	10	11	0	0	0	42
Baytown Plain,									
var. unspecified	293	1763	84	732	1735	4	5	5	4621
Total Plain Ceramics	313	1918	92	753	1839	4	6	5	4930

TABLE 4c: Osceola (16TE2) Test Pit 1

	Catalogue No. O351										
	Lithics, Fired Clay, Bone										
		Str. I	Str. II	Str. III	Str. IV	Str. V	Str. VI				
Lithics	Excavation Level	A	B	C	D	E	F	G	Fea. 1	Fea.2	**TOTAL**
Alba Stemmed			1		1						2
Biface Fragment			1		1	1					3
Cores			4	1							5
Utilized Flakes						2					2
Unutilized Flakes:											
	Local Pebble Chert	1	77	1	8	8					95
	Thermally Altered Chert	1									1
	Non-Local Chert		1			2					3
Shatter:											
	Local Chert				1	3					4
	Burned Debris	1	13		5	4					23
Sandstone			2	1	1	1					5
Hematite			2		2	3					7
Unmodified Pebbles			4		5	14	12				35
Unidentified					4			1			
Total Lithics		3	105	3	24	38	12	0	0	0	185
Fired Clay (in grams)					283.8	512.7	5.9				802.4
Bone (in grams)											
	Mammal		29.3	15.2	166.8	483	1.3				695.6
	Fish		89.5	3.2	140.3	1723.2	2	0.8			1959
	Turtle		17.2	0.1	16.4	122.2	0.6				156.5
	Bird		2.7		5.4	23.4					31.5
	Shell					12					12
	Unidentified		17.9	0.7	1.6	16.3					36.5
Total Bone		0	156.6	19.2	330.5	2380.1	3.9	0.8	0	0	2891.1

TABLE 5a: Osceola (16TE2) Test Excavation N42 W1 (cont.)

Catalogue No. O249																													
Decorated Ceramics							Stratum IV							Stratum V															
	Excavation Level		Q			R			S			T			U			Fea. 2			Fea. 3			Fea. 5			Fea. 7		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	
Type	variety																												
Alligator Incised,	*var. Alligator*			0			0			0	1		1			0			0			0	1		1			0	2
Alligator Incised,	*var. unspecified*	1	3	4	1	2	3			0			0			0			0			0			0			0	7
Avoyelles Punctated,	*var. Avoyelles*			0			0			0			0			0			0			0			0			0	1
Avoyelles Punctated,	*var. unspecified*			0			0			0			0			0	1	1	2			0			0			0	4
Beldeau Incised,	*var. Beldeau*			0			0			0			0			0			0			0			0			0	1
Chevalier Stamped,	*var. Chevalier*			0			0			0			0			0			0	1		1		1	1			0	8
Chevalier Stamped,	*var. Cornelia*	2		2			0			0			0			0			0			0			0			0	3
Chevalier Stamped,	*var. McKinney*			0		1	1			0			0			0			0			0			0			0	1
Chevalier Stamped,	*var. unspecified*			0			0		1	1			0			0			0	1		1			0			0	5
Coles Creek Incised,	*var. Blakely*			0			0			0			0			0			0			0			0			0	1
Coles Creek Incised,	*var. Campbellsville*			0			0			0			0			0			0			0			0			0	3
Coles Creek Incised,	*var. Chase*			0			0			0			0			0			0			0			0			0	4
Coles Creek Incised,	*var. Coles Creek*			0			0			0			0			0			0			0			0			0	6
Coles Creek Incised,	*var. Hilly Grove*			0			0			0			0			0	1	6	7			0			0			0	24
Coles Creek Incised,	*var. Hunt*	4		4			0			0			0			0			0			0			0			0	9
Coles Creek Incised,	*var. Marsden*			0	1		1			0	1		1			0			0			0			0			0	2
Coles Creek Incised,	*var. Mott*			0			0			0			0			0	2	2	4			0			0			0	19
Coles Creek Incised,	*var. Sorentz*	2		2			0			0			0			0			0	2		2			0			0	19
Coles Creek Incised,	*var. Phillips*	7		7	2		2			0			0			0			0			0			0			0	23
Coles Creek Incised,	*var. Stoner*			0			0			0			0			0			0			0			0			0	11
Coles Creek Incised,	*var. Wade*	1		1			0			0			0			0			0			0			0			0	15
Coles Creek Incised,	*var. unspecified*	3		3		1	1			0		1	1			0	3	2	5	2		2			0			0	46
French Fork Incised,	*var. McNutt*			0			0			0			0			0			0			0			0			0	2
French Fork Incised,	*var. Wilzone*			0			0			0			0			0			0			0			0			0	1
French Fork Incised,	*var. unspecified*	2	1	3			0			0			0			0	1		1			0			0			0	15
Larto Red,	*var. Larto*			0			0			0			0			0			0			0			0			0	1
Marksville Incised,	*var. Yokena*			0			0			0			0			0			0			0			0			0	1
Marksville Incised,	*var. unspecified*			0			0			0			0			0			0			0			0			0	1
Marksville Stamped,	*var. Manny*			0			0			0			0	1	1	2			0			0			0			0	2
Marksville Stamped,	*var. Newsome*			0			0	1		1			0			0			0			0			0			0	1
Marksville Stamped,	*var. unspecified*			0			0			0			0			0			0			0			0			0	1
Mazique Incised,	*var. unspecified*			0			0			0			0			0			0			0			0			0	3
Mulberry Creek Cordmarked,	*var. Edwards*			0			0			0			0			0			0			0			0			0	2
Mulberry Creek Cordmarked,	*var. Smith Creek*		16	16	1	5	6		2	2		2	2			0		4	4		5	5		5	5		1	1	240
Salomon Brushed,	*var. Salomon*	1	8	9	1	2	3			0			0			0			0			0			0			0	19
Unclassified Brushed				0			0			0			0			0			0			0			0			0	1
Unclassified Decorated				0			0			0			0			0			0			0			0			0	1
Unclassified Incised			2	2			0			0			0			0			0			0		1	1			0	33
Unclassified Interior Incised				0			0			0	1		1			0			0			0			0			0	1
Unclassified Painted				0			0			0			0			0			0			0			0			0	1
Total Decorated Ceramics		23	30	53	6	11	17	1	3	4	3	3	6	1	1	2	8	15	23	6	5	11	1	7	8	0	1	1	540

TABLE 5a: Osceola (16TE2) Test Excavation N42 W1

Catalogue No. 0249																																													
Decorated Ceramics								Stratum I																					Stratum II														Stratum III								
	Excavation Level		A			B			C			D			E			F			G			H			I			J			K			L			M			N		O			P	
		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	Rim	Body	Total	Rim	Body	Total	Rim	Body	Total	Rim	Base	Total	Rim	Body	Total	Rim	Body	Total
Type	variety																																															
Alligator Incised,	*var. Alligator*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0
Alligator Incised,	*var. unspecified*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0
Avoyelles Punctated,	*var. Avoyelles*			0			0			0		1	1			0			0			0			0			0			0			0			0			0			0			0			0
Avoyelles Punctated,	*var. unspecified*			0			0			0	1		1			0			0			0			0			0			0			0			0			0			0			0	1		1
Beldeau Incised,	*var. Beldeau*			0			0			0	1		1			0			0			0			0			0			0			0			0			0			0			0			0
Chevalier Stamped,	*var. Chevalier*			0			0			0			0			0			0			0			0			0	1		1	1	1	2	1	1	2			0	1		1			0
Chevalier Stamped,	*var. Cornelia*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0	1		1
Chevalier Stamped,	*var. McKinney*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0
Chevalier Stamped,	*var. unspecified*			0			0			0			0			0			0			0			0			0			0	1		1			0	1		1			0		1	1			0
Coles Creek Incised,	*var. Blakely*			0			0			0			0	1		1			0			0			0			0			0			0			0			0			0			0			0
Coles Creek Incised,	*var. Campbellsville*			0			0			0			0			0			0			0			0			0	3		3			0			0			0			0			0			0
Coles Creek Incised,	*var. Chase*			0			0			0			0			0			0			0			0			0			0			0			0	1		1			0	2		2	1		1
Coles Creek Incised,	*var. Coles Creek*			0			0			0			0	1	1	2	2		1	1		1	1		1			0	1		1			0			0			0			0			0			0
Coles Creek Incised,	*var. Hilly Grove*			0			0		1	1	1	10	11	1	1	2			0			0			0			0	2	1	3			0			0			0			0			0			0
Coles Creek Incised,	*var. Hurst*			0			0			0			0			0			0			0			0			0			0			0			0			0			0	3		3	2		2
Coles Creek Incised,	*var. Marsden*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0
Coles Creek Incised,	*var. Mott*			0			0			0			0	3	3	3	3	6	2	4	6			0			0			0			0			0			0			0			0			0
Coles Creek Incised,	*var. Sorena*			0			0			0			0			0			0			0			0			0			0	2	1	3	3		3	1		1	1		1	7		7			0
Coles Creek Incised,	*var. Phillips*			0			0			0			0			0			0			0			0			0			0			0	7		7	1		1	2		2	4		4			0
Coles Creek Incised,	*var. Stoner*			0			0			0			0	1	1	2	3			0			0			0	1		1	1	1	2	5		5			0			0			0			0
Coles Creek Incised,	*var. Weeks*			0			0			0			0			0			0			0			0			0			0	6		6	3		3	5		5			0			0			0
Coles Creek Incised,	*var. unspecified*		1	1			0			0	1		1			0	9	9		3	3			0			0	3		3		1	1			1		3	2	5	4		4			0	6	1	7
French Fork Incised,	*var. McNutt*			0			0			0			0			0	1	1			0			0	1	1			0			0			0			0			0			0			0			0
French Fork Incised,	*var. Wilsons*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0	1		1
French Fork Incised,	*var. unspecified*			0			0			0			0			0			0			0			0			0		1	1	1	1	2	1	3	4			0	1		1			0	3		3
Larto Red,	*var. Larto*			0			0			0			0			0			0			0			0			0			0			0			0			0			0		1	1			0
Marksville Incised,	*var. Yokena*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0		1	1
Marksville Incised,	*var. unspecified*		1	1			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0
Marksville Stamped,	*var. Manny*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0
Marksville Stamped,	*var. Newsome*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0
Marksville Stamped,	*var. unspecified*		1	1			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0
Mariaue Incised,	*var. unspecified*			0			0			0			0	1	1	1			1			0	0	1	1			1			0			0			0			0			0			0			0
Mulberry Creek Cordmarked,	*var. Edwards*			0			0			0			0			0			0			0	0	1	1			1			0			0			0			0			0			0	1		1
Mulberry Creek Cordmarked,	*var. Smith Creek*			0			0			0			0			0			0			0			0			0	1	7	8	3	41	44		35	35	1	10	11	5	67	72	2	27	29
Salomon Brushed,	*var. Salomon*			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0	2	5	7
Unclassified Brushed				0			0			0			0			0			0			0			0			0		1	1			0			0			0			0			0			0
Unclassified Decorated				0			0			0			0			0			0			0			0			0			0			0	1		1			0			0			0			0
Unclassified Incised				0			0			0		3	3		4	4		6	6			0			0			0		2	2		3	3	1	2	3			0		3	3	1	3	4		2	2
Unclassified Interior Incised				0			0			0			0			0			0			0			0			0			0			0			0			0			0			0			0
Unclassified Painted				0			0			0			0			0			0			0			0			0			0			0		1	1			0			0			0			0
Total Decorated Ceramics		0	3	3	0	0	0	0	0	0	0	6	6	3	20	23	6	24	30	2	8	10	0	1	1	2	1	3	8	3	11	14	17	31	24	48	72	12	40	52	9	13	22	23	72	95	15	41	56

TABLE 5b: Osceola (16TE2) Test Excavation N42 W1

Catalogue No. O249																												
Undecorated Ceramics																												
				Stratum I					Stratum II			Stratum III						Stratum IV				Str. V						
Excavation Level	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	Fea. 1	Fea. 2	Fea. 3	Fea. 5	Fea. 7	Fea. 10	TOTAL
Baytown Plain,																												
var. unspecified																												
Bowls																												
Simple, Round				1		3	1	3	1		7	11	10	4	26	12	10	9		1			1	1	2			103
Simple, Flat						1					1	3		1	2		7	1										16
Warped, Round					1				1				1															3
Warped											3																	3
"Joffrion"								1				2		2	2	2	2	1					2					14
Interior Strap, Flat										1																		1
Tapered											1		1				1						4					7
Thickened, Round											2			1			1	2		1								7
Interior Bevel																	1							1				2
"Beaded-lip"	1																											1
Total Bowl Rims	1	0	0	1	1	4	1	4	2	1	14	16	12	8	30	14	22	13	0	2	0	0	7	2	2	0	0	157
Jars																												
Simple, Round					1	2	1			1	1	4			5	2	2						2					21
Simple, Flat	3			1	6	6	5	3	6	2	1	1			1	1												36
Simple, Flat, with Notches											2														1	1		4
Exterior Flare, Flat					1							2							1									4
Exterior Flare, Round											1																	1
"Seed" Jar												1																1
Round, Restricted									1						1		1											3
"Clark Bayou"											3	6	4										6					19
Flat, Restricted						1																						1
Exterior Bevel, Restricted										1																		1
Interior Bevel								1																				1
Tapered				3	3																			1				7
"Wedge-shaped"				1																								1
"Beaded-lip"							1																					1
Total Jar Rims	3	0	0	5	11	9	7	4	7	4	8	14	4	0	7	3	3	0	1	0	0	0	8	1	1	1	0	101
Beakers																												
"Vicksburg"						10	2																5					17
Crisp Flat							3																					3
Total Beaker Rims	0	0	0	0	0	10	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	20
Plates																												
Exterior Bevel										1	1																	2
Indeterminate Rims	2	1				3		1		1	6	9	7	5	16	16	3	3					1				1	75
Total Plain Rims	6	1	0	6	12	26	13	9	9	7	29	39	23	13	53	33	28	16	1	2	0	0	21	3	3	1	1	355
Bases																												
Flat, Rectangular										2		8	3		3									2				18
Flat, Round	2				2	2	5	3		1			1	1	1			1										19
Indeterminate	2	1			1	2			1		6		5	4	9	2	3	1	1				4					42
Total Bases	4	1	0	0	3	4	5	3	1	3	6	8	9	5	13	2	3	2	1	0	0	0	4	2	0	0	0	79
Baytown Plain,																												
var. unspecified	55	26	8	50	209	270	208	118	78	97	386	381	292	151	623	385	369	304	84	62	15	16	245	37	23	2	4	4498
Total Plain Ceramics	65	28	8	56	224	300	226	130	88	107	421	428	324	169	689	420	400	322	86	64	15	16	270	42	26	3	5	4932

TABLE 5c: Osceola (16TE2) Test Excavation N42 W1

	Catalogue No. 0249																									
	Lithics, Fired Clay, Bone				Stratum I					Stratum II				Stratum III				Stratum IV				Str. V				
Lithics	Excavation Level	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	Fea. 1	Fea. 2	Fea. 3	Fea. 5	TOTAL
Alba Stemmed																		2								2
Biface Fragment														1												1
Cores										1															1	2
Core Fragments									1																	1
Utilized Flakes								1								1										2
Retouched Flakes						1												1								2
Unutilized Flakes:																					1					
	Local Pebble Chert	1		1	1	1	1					4	3	1	1	3	1	5	3	3			2				31
	Thermally Altered Chert				1		1	1		1				1	1	2				1			12		1		22
	Non-Local Chert															1		1	1								3
Shatter:																										
	Local Chert												1			6	1		1	1		1	1	3			15
	Burned Debris										2	1		2			1	5		2			4				17
Sandstone Palette																		1								1
Sandstone											7	5				1			1								14
Hematite							1					1				1	3			1							7
Unmodified Pebbles		1		2	15	2		1					2			1	4	1		11	1	2		4			47
Unidentified													1												1		2
Total Lithics		2	0	3	17	4	3	3	1	2	9	11	7	5	2	16	10	16	6	19	2	3	19	7	2	1	170
Fired Clay (in grams)		3			21.1	41.7	82.4	42.3	23.3	40.9	30.9	212	431.8	278.5	92.8	543.8	504.5	598.5	365.6	63.5	60		51.2	79			3566.8
Bone (in grams)																										
	Mammal						2.1	0.7	2.9	2.9	40.2	41	131.3	171.1	24.5	413.7	59.2	102	30.3	0.7	12.3	11.5					1046.4
	Fish						0.1		0.1			156.9	1143.1	541.5	269.3	1263.1	839.7	1090.9	753.4	29.6	149						6236.7
	Turtle											31.3	31.2	55.2	25	140	114.5	82.8	62.5	1.7	6.9						551.1
	Bird													11.3	< .1	18.6											29.9
	Shell											0.5	19.6	0.7	2	11.9	13.5	103.5	16.2	2.5	22.7						193.1
	Unidentified			0.25		< .1						11.3	8.6	25.2	9.9	41.8	66.7	122.7	149.9	0.9	36.6		0.8		0.1	26.7	501.45
Total Bone		0	0	0.25	0	0	2.2	0.7	3	2.9	40.2	241	1333.8	805	330.7	1889.1	1093.6	1501.9	1012.3	35.4	227.5	11.5	0.8	0	0.1	26.7	8558.65

TABLE 6a: Osceola (16TE2) Test Excavation N32 E1

Catalogue No. 0250																																						
Decorated Ceramics								Stratum I										Stratum II						Stratum III			Stratum IV					Stratum V							
	Excavation Level		A			B			C			D			E			F			G			H			I			J			K			Fea. 1		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	Rim	Body	Total	Rim	Body	Total	
Type	variety																																					
Alligator Incised,	*var. Alligator*			0			0			0			0			0			0			0			0			0	2	2	4			0			0	4
Anna Incised,	*var. Anna*			0			0		1	1			0			0			0			0			0			0			0			0			0	1
Avoyelles Punctated,	*var. Avoyelles*			0			0			0			0			0			0			0			0	2		2			0			0			0	2
Avoyelles Punctated,	*var. unspecified*			0			0		2	2			0			0			0			0			0			0			0			0			0	2
Chevalier Stamped,	*var. McKinney*			0			0			0			0			0			0			0			0			0	2	4	6			0			0	6
Chevalier Stamped,	*var. unspecified*			0			0			0			0			0			0			0			0	2		2		1	1			0			0	3
Churupa Punctated,	*var. Churupa*			0			0			0			0			0			0			0			0			0		3	3			0			0	3
Churupa Punctated,	*var. unspecified*			0			0			0			0			0			0			0			0			0		1	1			0			0	1
Coles Creek Incised,	*var. Busby*			0			0			0			0			0			0			0			0			0	1		1	1		1			0	2
Coles Creek Incised,	*var. Chase*			0			0			0			0			0			0			0			0			0	3		3			0			0	3
Coles Creek Incised,	*var. Coles Creek*			0			0			0	1	1	2	1	1	2		1	1			0			0	4		4			0			0			0	9
Coles Creek Incised,	*var. Hardy*			0			0	2		2		1	1			0			0			0			0			0			0			0			0	3
Coles Creek Incised,	*var. Hilly Grove*			0			0			0			0	1		1			0			0			0			0			0			0			0	1
Coles Creek Incised,	*var. Hunt*			0			0			0	1		1			0			0			0			0			0	7		7			0			0	8
Coles Creek Incised,	*var. Jacoby*			0			0			0			0			0			0			0			0			0	1		1			0			0	1
Coles Creek Incised,	*var. Marsden*			0			0			0			0			0			0			0			0	2		2	3		3			0			0	5
Coles Creek Incised,	*var. Mott*			0			0	1	1	2	2		2			0			0			0		2	2			0			0			0			0	6
Coles Creek Incised,	*var. Phillips*			0			0			0			0	1		1			0			0			0	2		2	8		8			0			0	11
Coles Creek Incised,	*var. Stoner*			0			0			0			0			0			0			0			0			0	1		1			0			0	1
Coles Creek Incised,	*var. unspecified*			0			0	3	2	5		3	3			0			0		2	2	1		1	1	4	5	5	3	8			0			0	24
French Fork Incised,	*var. Mt. Nebo*			0			0			0			0			0			0			0			0			0		1	1			0			0	1
French Fork Incised,	*var. Rugby*			0			0			0			0			0			0			0			0			0	2		2			0			0	2
French Fork Incised,	*var. unspecified*			0			0			0			0			0			0			0			0			0	1		1			0			0	1
Marksville Incised,	*var. Anglim*			0			0			0			0			0			0			0			0			0		2	2			0			0	2
Marksville Incised,	*var. Vick*			0			0			0			0			0			0			0			0			0		2	2			0			0	2
Marksville Incised,	*var. unspecified*			0			0	1		1	1		1			0			0			0			0			0		6	6			0			0	8
Marksville Stamped,	*var. Bayou Rouge*			0			0			0			0			0			0			0			0			0		1	1			0			0	1
Marksville Stamped,	*var. Newsome*			0			0			0			0			0			0			0			0			0	2	7	9			0			0	9
Mulberry Creek Cordmarked,	*var. Eudora*			0			0			0			0			0			0			0			0			0		66	66		1	1		2	2	69
Mulberry Creek Cordmarked,	*var. Smith Creek*			0			0			0			0			0			0		1	1			0		1	1			0			0			0	2
Mulberry Creek Cordmarked,	*var. unspecified*			0			0			0		2	2			0			0			0			0			0			0			0			0	2
Plaquemine Brushed,	*var. Plaquemine*		1	1			0	1	5	6			0			0			0			0			0			0			0			0			0	7
Salomon Brushed,	*var. Salomon*			0			0			0			0			0			0			0			0			0		6	6			0			0	6
Salomon Brushed,	*var. unspecified*			0			0			0			0			0			0			0			0			0	1		1			0			0	1
Unclassified Incised				0			0			0			0			0			0			0			0			0		19	19			0		3	3	22
Unclassified Interior Incised				0			0			0			0			0			0			0			0			0			0			0		1	1	1
Total Decorated Ceramics		0	1	1	0	0	0	8	11	19	5	7	12	3	1	4	0	1	1	0	3	3	1	2	3	13	5	18	39	124	163	1	1	2	0	6	6	232

TABLE 6b: Osceola (16TE2) Test Excavation N32 E1

Catalogue No. 0250													
Plain Pottery													
	Stratum I					Stratum II		Str. III	Str. IV	Stratum V			
Excavation Level	A	B	C	D	E	F	G	H	I	J	K	Fea. 1	TOTAL
Baytown Plain,													
var. unspecified													
Bowls													
Simple, Round					5		1	1	2	21			30
Simple, Round, with Notches										1			1
Simple, Flat				3			1		3	2			9
Simple, Flat, with Notches										1			1
Warped, Round						1							1
"Joffrion"										2			2
Thickened, Round										2			2
Interior Bevel				1						2			3
Arcadia										1			1
"T"-shaped										1			1
Total Bowl Rims	0	0	0	4	5	1	2	1	5	33	0	0	51
Jars													
Simple, Flat				6	3	1			6				16
Simple, Flat, with Notches										1			1
Exterior Flare, Round										1			1
"Seed" Jar									2	1			3
Round, Restricted										2		1	3
Flat, Restricted				1									1
Exterior Bevel			1										1
"Clark Bayou"				4			1		2	9			16
Tapered				5									5
Exterior Strap, with Punctations										1			1
Warped							1						1
Warped, with Punctations										2			2
Total Jar Rims	0	0	1	16	3	1	2	0	10	17	0	1	51
Beakers													
"Vicksburg"			1		1								2
Indeterminate Rims				1		1			5	17			24
Total Plain Rims	0	0	2	21	9	3	4	1	20	67	0	1	128
Bases													
Flat, Rectangular									1	12			13
Flat, Round					2				1	2			5
Indeterminate			1	1					3	8			13
Total Bases	0	0	1	1	2	0	0	0	5	22	0	0	31
Baytown Plain,													
var. unspecified	2	2	187	215	139	43	133	37	249	742	6	12	1767
Total Plain Ceramics	2	2	190	237	150	46	137	38	274	831	6	13	1926

TABLE 6c: Osceola (16TE2) Test Excavation N32 E1

	Catalogue No. 0250													
	Lithics, Fired Clay, Bone													
			Stratum I				Stratum II		Str. III	Str. IV	Stratum V			
Lithics	Excavation Level	A	B	C	D	E	F	G	H	I	J	K	Fea. 1	**TOTAL**
Alba Stemmed											1			1
Hammerstone											1			1
Cores				1	1	1			1					4
Core Fragments								1						1
Utilized Flakes				2					1					3
Unutilized Flakes:														
	Local Pebble Chert					1		1			8			10
	Thermally Altered Chert						1							1
Shatter:														
	Local Chert			2							5			7
	Burned Debris					1			1		3			5
Sandstone Palette							1							1
Sandstone Abraider										1				1
Sandstone				1	1									2
Hematite				2							5			7
Unmodified Pebbles					1	1					21		1	24
Unidentified														
Total Lithics		0	0	8	3	4	2	2	3	1	44	0	1	68
Fired Clay (in grams)				28.8		88.5	6	66.8	0.2	8	164			362.3
Bone (in grams)														
	Mammal										180.7			180.7
	Fish										15.2			15.2
	Turtle										3.7			3.7
	Bird													0
	Shell							0.5			1.5			2
	Unidentified					0.8				2.8				3.6
Total Bone		0	0	0	0	0.8	0	0.5	0	2.8	201.1	0	0	205.2

TABLE 7a: Osceola (16Te2) Test Excavation S20 E10

Catalogue No. O352																													
Decorated Ceramics		Stratum I				Stratum II					Stratum III			Stratum IV			Stratum V				Fea.1			Fea.2			Fea.7		
	Excavation Level		A			B			C			D			E			F											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	
Type	*variety*																												
Alligator Incised,	var. Oxbow			0			0			0		1	1			0			0			0			0			0	1
Alligator Incised,	*var. unspecified*			0			0			0			0			0	2		2			0			0			0	2
Beldeau Incised,	*var. Beldeau*			0			0			0			0			0		1	1			0			0			0	1
Chevalier Stamped,	*var. Chevalier*			0			0	1		1			0			0			0			0			0			0	1
Chevalier Stamped,	*var. Cornelia*			0			0			0			0			0	1	1	2			0			0			0	2
Chevalier Stamped,	*var. McKinney*			0			0			0			0			0	3	1	4			0			0			0	4
Chevalier Stamped,	*var. unspecified*			0			0			0			0			0	2	2	4			0			0			0	4
Coles Creek Incised,	*var. Blakely*			0			0			0			0			0	1		1			0			0			0	1
Coles Creek Incised,	*var. Campbellsville*			0			0			0	1		1			0			0			0			0			0	1
Coles Creek Incised,	*var. Coles Creek*			0	1	1	2			0		1	1			0			0			0			0			0	3
Coles Creek Incised,	*var. Hunt*			0	1		1			0	1		1			0	3		3			0			0			0	5
Coles Creek Incised,	*var. Keo*			0			0			0	4		4			0			0	1		1			0			0	5
Coles Creek Incised,	*var. Mott*	1		1	1	1	2			0		4	4			0			0			0			0			0	7
Coles Creek Incised,	*var. Sorentz*			0			0			0			0			0	3	1	4			0			0			0	4
Coles Creek Incised,	*var. Phillips*			0			0			0	1		1			0	7		7			0			0			0	8
Coles Creek Incised,	*var. Stoner*			0			0	1		1	2		2			0			0			0			0			0	3
Coles Creek Incised,	*var. Wade*			0			0			0	1		1			0			0			0			0			0	1
Coles Creek Incised,	*var. unspecified*			0		2	2		1	1		5	5		4	4	1		1		1	1			0			0	14
French Fork Incised,	*var. Wilzone*			0			0			0			0			0			0		2	2			0			0	2
French Fork Incised,	*var. unspecified*			0			0			0	1		1			0			0			0			0			0	1
Marksville Incised,	*var. Yokena*			0			0			0			0			0			0			0			0	2	1	3	3
Marksville Incised,	*var. unspecified*			0			0			0			0			0		2	2			0			0	1	4	5	7
Marksville Stamped,	*var. unspecified*			0			0		1	1			0			0			0			0			0		3	3	4
Mazique Incised,	*var. unspecified*			0			0			0			0			0		1	1			0			0			0	1
Mulberry Creek Cordmarked,	*var. Eudora*			0			0			0			0			0		21	21			0			0			0	21
Mulberry Creek Cordmarked,	*var. Smith Creek*			0			0		1	1		1	1			0			0			0			0			0	2
Salomon Brushed,	*var. Salomon*			0			0			0			0			0		4	4			0			0			0	4
Unclassified Decorated				0		1	1			0			0			0			0		1	1			0			0	2
Unclassified Incised				0			0			0		5	5			0	1	3	4			0		1	1			0	10
Total Decorated Ceramics		1	0	1	3	5	8	2	3	5	11	17	28	0	4	4	24	37	61	1	4	5	0	1	1	3	8	11	124

TABLE 7b: Osceola (16TE2) Test Excavation S20 E10

Catalogue No. O352										
Plain Pottery	Str. I	Stratum II		Str. III	Str. IV	Str. V				
Excavation Level	A	B	C	D	E	F	Fea. 1	Fea.2	Fea. 7	TOTAL
Baytown Plain,										
var. unspecified										
Bowls										
Simple, Round		2		6		9	2			19
Simple, Flat		2		2		2				6
Round, Exterior Flange				1						1
Warped, Round						1				1
"Joffrion"						2				2
"Arcadia"					1					1
Tapered		1								1
Thickened, Round						1				1
Interior Bevel						2	1			3
Total Bowl Rims	0	5	0	9	1	17	3	0	0	35
Jars										
Simple, Round						2				2
Simple, Flat			1	4		6		1		12
Flat, Restricted						1				1
"Clark Bayou"		2	1				1			4
Flat, Exterior Strap									1	1
Exterior Bevel								1		1
Total Jar Rims	0	2	2	4	0	9	1	2	1	21
Beakers										
"Vicksburg"				1			1			2
Indeterminate Rims		1		5		3	2		2	13
Total Plain Rims	0	8	2	19	1	29	7	2	3	71
Bases										
Flat, Rectangular				4		2			2	8
Flat, Round		3	2	1		2	1			9
Indeterminate		2	1			1	2			6
Total Bases	0	5	3	5	0	5	3	0	2	23
Baytown Plain,										
var. unspecified	6	157	65	428	22	304	80	14	16	1092
Total Plain Ceramics	6	170	70	452	23	338	90	16	21	1186

TABLE 7c: Osceola (16TE2) Test Excavation S20 E10

	Catalogue No. O352										
	Lithics, Fired Clay, Bone										
		Str. I	Stratum II		Str. III	Str. IV	Str. V				
Lithics	Excavation Level	A	B	C	D	E	F	Fea. 1	Fea. 2	Fea. 7	**TOTAL**
Cores					1		2				3
Core Fragments							1				1
Utilized Flakes					1						1
Unutilized Flakes:											
	Local Pebble Chert				2		1	2		6	11
	Thermally Altered Chert						1	2			3
	Non-Local Chert							3	3	1	7
Shatter:											
	Local Chert				1					3	4
	Burned Debris	1			1			4			6
Sandstone								5		1	6
Hematite							3	6			9
Unmodified Pebbles			1	1	1		1	1		1	6
Unidentified					1	1				2	4
Total Lithics		1	1	1	8	1	9	23	3	14	61
Fired Clay (in grams)				97.7	84		30.5	202	23	348	785.2
Bone (in grams)											
	Mammal									22.5	22.5
	Unidentified				0.1		17.5	6.5	1.4	65.5	91
Total Bone		0	0	0	0.1	0	17.5	6.5	1.4	88	113.5

THE GEOMORPHIC CONTEXT OF THE OSCEOLA SITE, TENSAS PARISH, LOUISIANA

by

Roger T. Saucier

Introduction

The Osceola Site is situated in the eastern part of Tensas Parish, Louisiana, about 11 km north-northwest of the town of St. Joseph, or about 4 km west of Lake Bruin, a prominent natural feature near the Mississippi River. Archeologically, the site is a Coles Creek period village that includes at least 6 mounds situated around a central plaza. Although previously recorded on the basis of informants reports, the site has not been archeologically tested or excavated prior to the present project. Its scientific value at least in part is due to its excellent state of preservation, which includes no history of plowing and a conspicuous lack of vandalism and pothunting. At present, the site is in a selectively logged bottomland hardwood forest with no all-weather road access.

Purpose and Scope

The intent of this report basically is to reconstruct the paleoenvironmental setting of the Osceola Site as a means of understanding the influence of the natural physical environment on its prehistoric inhabitants. This includes both landscape description and evolution with emphasis on the geomorphic processes that led to the major changes in

this dynamic environment. Reconstruction of former landscapes is extremely important in determining site location and configuration and in making interpretations regarding such factors as subsistence practices.

A secondary purpose of the report is to explain the post-habitation landscape evolution insofar as it has influenced site stratigraphy and artifact preservation and discovery. Finally, the report discusses contributions that the archeological record has made to developing the geological chronology for this part of the Mississippi Alluvial Valley.

Methods

Other than at the Osceola Site *per se*, no new geological/geomorphological data were collected and no investigations were conducted as part of this study. Existing information in both published and unpublished form was collected and previous geomorphic mapping (Saucier, 1967) was refined using additional sets of aerial photos and more recent and more detailed topographic maps (7 1/2-minute series) than were available for the original mapping (made using 15-minute series maps). Although somewhat out of date, the parish soil survey (Weems and others, 1968) also was of value in helping to refine the geomorphic mapping.

A brief field reconnaissance of the site and its environs was made on July 11, 1989. The topography and soils of the site area were examined and several exploratory core holes were made using a pickup truck-mounted rig operated by the Louisiana Department of Agriculture and Forestry under the direction of Mr. Thurmond Allen.

Regional Geomorphic Setting and Processes

Physiographically, the Osceola Site is situated in the Mississippi Embayment segment of the Gulf Coastal Plain province. More specifically, it lies 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. At the latitude of the Osceola Site, the valley is about 80 km wide and is bordered on both sides by a 45- to 60-m-high bluff that separates 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. Local relief in the uplands typically is on the order of 15 to 30 km.

The Alluvial Valley is a flat to slightly undulating plain generally lying at an elevation of 18 to 23 m NGVD with local relief of 3.0 to 4.5 m at the latitude of the Osceola Site. 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 about 25 km west of the Osceola Site, is the nearest manifestation in this part of the Alluvial Valley and is of little or no significance as far as the subject of this report is concerned. 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 Osceola Site is situated 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. 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 swales. These 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 formed 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 that 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 with 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 this time, channel filling, point bar development, and natural levee growth continued as the stream discharge slowly declined (over a time frame measured in decades) and

the channel became narrower and shallower. The surviving streams (broadly sinuous bayous) are important elements in the present local drainage network that serves to remove local runoff.

Another major depositional environment and landscape type is the backswamp (or floodbasin). Backswamp areas are very flat and poorly drained tracts of land lying between meander belts or sometimes between a meander belt 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 (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 in the vicinity of the Osceola Site, silts and fine sands are restricted primarily to point bar ridges. Next coarsest sediments, 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 effects all environments/landforms. Consequently, the older a meander

belt, the greater the degree of veneering by clays and silts and the finer the parent material on which soils are formed. For example, young natural levees of the present Mississippi River 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 and others, 1968). Soils formed on the flat, poorly drained clays of abandoned channels and in backswamp areas belong to the Sharkey-Alligator-Tunica association.

Site/Landform Relationships

The Osceola Site is located in the eastern part of the Tensas Basin segment of the Mississippi Alluvial Valley. 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, joins the Ouachita River to form Black River which, in turn, flows into the Red and Atchafalaya Rivers and finally 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 much more recent (Autin and others, 1989). Figure 1 portrays the latest interpretation of general meander belt trends and their relative ages.

It can be seen from Figure 1 that the Mississippi River has been progressively shifting eastward by abandoning older meander belts and adopting newer ones toward 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 northwest of the Osceola Site (Fig. 1). South of this location, their trends were obliterated by the next to youngest meander belt (No. 2) and, in turn, parts of meander belt 2 have been reworked by migration of the river within its present (No. 1) meander belt.

Figure 1 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, the 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 (younger) meander 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 have natural levee ridges of older meander belts been overtopped and inundated.

The Osceola Site lies near the western edge of meander belt 2 (Fig. 1). In terms of precise landform association, it is situated on point bar accretion topography on the inside of an abandoned channel (cutoff) of the Mississippi River (Fig. 2). The channel has no known proper name: for convenience of discussion in this report, it is designated the Clark Bayou channel after the small stream that flows through the northern part of the feature.

The Clark Bayou channel is essentially sediment filled and, because of appreciable post-cutoff deposition, especially in the southern part near the point of cutoff, it is not as distinctive in terms of topography and soils as most such features in the Alluvial Valley. In fact, the precise limits of the channel south of the Osceola Site are difficult to define. Opposite the site (to the east), the floor of the relict channel is about 900 m wide and lies at an elevation of about 18 m, only about 3 m lower than the "island" of point bar deposits on which the site is located. The Clark Bayou channel is characterized by Sharkey clay soils while the point bar area is characterized mostly by Tunica-Alligator clays (Weems and others, 1968). Both are formed in poorly drained, slowly permeable deposits; however, the latter occur in areas with slightly higher relief.

Drainage of and within the Clark Bayou channel is extremely poor. Local runoff from the eastern arm of the channel enters Clark Bayou which conveys it to the west out of the channel at its northern end. Runoff from the western arm also probably enters Clark Bayou to the north; however, there are only swampy depressions and no well defined stream courses indicated on even the most detailed topographic quadrangles.

Regional Drainage Network

Despite the dynamic nature of the physical environment in the Tensas Basin during the Holocene, man/land relationships at the Osceola Site apparently were much more heavily influenced by changes in the regional interior drainage pattern than by shifts in Mississippi River meander belts *per se*. However, the two cannot be separated because the regional drainage pattern was strongly influenced by meander belt shifts. Because of the timing of the occupation of the site, 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 are included in Figure 3; however, totally artificial canals and ditches have been omitted.

Figure 4 is a portion of a map of the same area as Figure 3 that was prepared in 1885 by the Mississippi River Commission. It is apparent that the basic hydrography was taken from township plats, at least for the areas away from the Mississippi River. The map has been extremely helpful in differentiating natural from man-made features and in

delineating minor but significant interconnections of streams that no longer exist. The 1885 map is the earliest regional map that is reasonably accurate away from the well-known and frequently surveyed Mississippi River corridor and that predates most artificial drainage changes.

A comparison of Figures 3 and 4 with Figure 2 reveals that virtually all present basin drainage is controlled in whole or most 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 in 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.

In the next section of this report, attention will be focused on Clark Bayou, Andrews Bayou, and the eastern segment of Little Choctaw Bayou (Fig. 3 and 4). The history and chronology of these streams are especially relevant to the occupation of the Osceola Site since the movement of water and sediment through them from channels (both active and abandoned) in meander belt 1 would have influenced the physical environment in the site area. The two abandoned channels of particular concern are the ones now occupied by Lake Bruin and Lake St. Joseph (Fig. 3).

Dating 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 yrs. This extraordinary work has been widely used by archeologists to estimate cultural site age 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 is essentially invalid except for the relative sequence of major events (Saucier, 1974; 1981). It is now known with certainty that portions of the present Mississippi River meander belt are more than 9,000 yrs old rather than just 2,000 yrs old as originally envisioned. It is also known 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 far insufficient geological data on which to develop a revised chronology in other than general framework terms. A small number of apparently valid

radiocarbon dates exist for individual courses and especially channels; however, these are insufficient for use in establishing regional chronologies. Many if not most dated organic remains from abandoned channels and courses apparently are not indicative of the ages of the features because of contamination problems (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 archeological 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. Archeological site artifact 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 following discussion of the geomorphic history of the Osceola Site area relies heavily on subjective interpretations by this writer and the crude model referred to above with very little refinement possible for archeological site/landform associations for the specific

abandoned courses and channels involved. Archeological data are sparse and ambiguous; therefore, only age ranges and/or approximations are possible in most cases.

Geomorphic History

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 the end of the Sangamon Interglacial Stage about 100,000 yrs ago (Autin and others, 1989). At that time, the Mississippi River flowed in a meandering regime and its floodplain was 7 or more meters higher than at present in the area of the present Tensas Basin.

With the onset of the Early Wisconsin glaciation more than 75,000 yrs ago, the Mississippi River began degrading its floodplain by both lateral planation and vertical scouring as it's regime changed in response to meltwater discharge and climate change. During the succeeding 20,000 to 30,000 yrs, the Sangamon Stage floodplain was almost entirely reworked with a new one formed at a level lower than at present.

Between about 30,000 and 40,000 yrs ago, there was a significant recession of North American glaciation with an accompanying major discharge of outwash into the Alluvial

Valley. It was during this interval, known as the mid-Wisconsin or Farmdalian Substage, that the floodplain once again aggraded to a level above that of present (by 3 to 5 m) and the sediments that form the present Macon Ridge were deposited by braided streams.

Still another cycle of river regime change and downcutting (degradation) began about 30,000 yrs ago with the onset of the Late Wisconsin glaciation. Much previously deposited outwash was reworked and removed, leaving Macon Ridge as an erosional remnant. Maximum downcutting took place near the time of greatest glacial extent about 18,000 yrs B.P. In the Tensas Basin area, the floodplain surface was more than 20 m lower than at present (between Macon Ridge on the west and the Tertiary uplands on the east).

The last episode of outwash deposition by a braided Mississippi River lasted from about 18,000 to 11,000 yrs B.P. Large volumes of sand and gravel were transported in pulses through the Alluvial Valley into the Gulf of Mexico by a Mississippi River whose meltwater-augmented discharge periodically may have been ten 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 7,000-yr-long period in the area of northeastern Louisiana, it was also a time of loess deposition (because of seasonal silt deflation from valley

trains) (Autin and others, 1989). Most of the loess was deposited east of the Alluvial Valley on the uplands, but a thin layer was also deposited on Macon Ridge. Paleo-ecological investigations (Delcourt and Delcourt, 1981) indicate that the Alluvial Valley landscape was characterized by a white spruce ecotype that also contained larch and fir while the adjacent uplands were characterized by a mixed hardwood forest dominated by oak and hickory.

The very last pulse of outwash deposition into the Mississippi Alluvial Valley probably began about 11,600 yrs B.P. (Autin and others, 1989) and very likely terminated by about 11,000 yrs B.P. Very quickly thereafter, and definitely by about 9,000 yrs B.P. (Guccione and others, 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 11,000 yrs ago in the Tensas Basin area.

Between 11,000 and about 7,500 yrs 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. 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 manifestation. Based on locations of later meander belts, there is a suggestion that the one or ones dating to the 11,000- to 7,500-yrs-ago period were located near the present (modern) meander belt.

Discharge of the Mississippi River during that 3,500-yr period was comparable to that of the present as were its general morphology and behavior. Although the climate may have been slightly cooler and wetter than at present, the vegetation of the Alluvial Valley was essentially that of present in terms of species composition. Following a major climatic amelioration about 12,000 yrs B.P. (Delcourt and Delcourt, 1981), spruce forest was replaced by cypress-gum forest in poorly drained areas and a mixed deciduous hardwood forest characterized natural levees and better drained areas.

Meander belt 4, the oldest discernible one in the Tensas Basin (Fig. 1), is estimated to be between 7,500 and 5,800 yrs old (Autin and others, 1989). The next youngest, meander belt 3, is estimated to have been active between about 6,000 and 3,800 yrs ago. While the former was active, the area of the Osceola Site was in the midst of a broad backswamp and the floodplain surface was no more than 3 m lower than at present. Sedimentation rates were low to moderate. When meander belt 3 was active, the rates were moderate to high and the average floodplain level aggraded to its approximate present level.

The period from 7,500 to 3,800 yrs 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 no apparent significant change in Alluvial Valley vegetation assemblages in the area of the Tensas Basin. Swamp and open water areas 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; however, the data are ambiguous and other explanations for observable changes are equally as viable (Saucier, 1985).

Meander belt 2 is estimated to have begun forming about 4,800 yrs B.P., probably experienced full-flow discharge conditions within several hundred years, continued as the main channel until about 3,000 yrs B.P., and then slowly was abandoned (Autin and others, 1989). Final discharge was probably realized by about 2,600 yrs B.P. Meander belt 2 intercepted and cut across or into meander belt 3 in the vicinity of the Osceola Site (Fig. 1), thereby reworking the older deposits. Thick backswamp deposits and underlying glacial outwash were reworked to a depth of 25 m or more and replaced with point bar silts and sands as the river channel migrated and lateral accretion took place.

The precise time of cutoff of the Clark Bayou channel (on which the Osceola Site is located), is not known.

However, its size indicates it formed after full-flow conditions occurred in the meander belt and its relative position suggests it was one of the earlier cutoffs in the life of the meander belt. Therefore, its age can probably be bracketed between about 4,000 and 3,500 yrs B.P. Fisk (1944) estimated the age of the cutoff to be about 1,300 to 1,400 yrs (Stage 7), but as pointed out earlier, there was no direct evidence or sound rationale for this determination and it is in conflict with known archeological evidence. For example, the Reno Brake Site, located immediately south of the Osceola Site in the same geomorphic context, is believed to have been first inhabited about 500 A.D. (T. R. Kidder, personal communication, 1989). This means that an absolute minimum age of about 1,800 to 2,000 yrs is necessary for the Clark Bayou channel.

Immediately following cutoff, the Mississippi River migrated southward away from the point of cutoff. During that time, the subaqueous parts of the lower arms of the cutoff channel were quickly filled with channel silts and sands and the upper parts with silts and clays deposited in a natural levee-like environment. Beyond these sediment "plugs," the remainder of the cutoff channel was characterized by an oxbow lake several kilometers long and probably as wide as the original channel. After the sediment plugs formed, sedimentation rates in the oxbow lake area would have been quite low with only silts and clays entering the lake during times of major floods on the river.

Thus, by about 3,000 to 3,500 yrs ago, conditions would have been highly favorable for prehistoric habitation anywhere along the outer or inner margins of the Clark Bayou channel, especially adjacent to the oxbow lake. Natural levees around this feature would have provided a reasonably flood-free physical setting with silty to sandy loam soils immediately adjacent to an unquestionably rich aquatic environment. In turn, this environment was in the midst of a productive bottomland deciduous hardwood forest along the flank of the active Mississippi River meander belt. Essentially modern conditions prevailed with regard to climate and vegetation assemblages.

Since an oxbow lake existed in the northern end of the Clark Bayou channel, Clark Bayou *per se* did not exist within or to the east of the abandoned channel during that period. However, the oxbow lake probably had a drainage outlet in a direction other than toward the Mississippi River which was to the southeast. The most likely outlet was to the northwest along the present western segment of Clark Bayou and thence into Cow Slough, Mound Bayou, and finally the Tensas River (Fig. 3).

Formation of Mississippi River meander belt 1 probably began about 2,800 yrs B.P. (Autin and others, 1989) with full-flow conditions being achieved by 2,600 yrs B.P. Initially, this event probably meant very little environmental change in the Osceola Site area. There may have been some decrease in the extent of seasonal flooding

caused by Mississippi River overflow, but there were no landform or basin drainage changes involved.

The next events that strongly influenced the landscape in the Osceola Site area were ones that led to the formation of the cutoff channels in meander belt 1 that are now occupied by Lake Bruin and Lake St. Joseph (see Figs. 1 and 2). As bends of the Mississippi River meandered westward immediately prior to these cutoffs taking place, flooding intensity and frequency must have increased markedly in the site area. 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 the site area by way of Clark Bayou (from Lake St. Joseph) and Little Choctaw and Andrews Bayous (from Lake Bruin) (Fig. 3). Figure 4 affirms that these streams historically were connected to the lakes and served as drainage outlets for them.

Little Choctaw and Andrews Bayous are underfit streams generally within the confines of the relict course in meander belt 2 (Fig. 1). When the Lake Bruin bend intercepted the course, it was probably a broad depression of the width of the Mississippi River, a natural route for floodwater channelization into a lower area. However, sediments from meander belt 1 soon filled and narrowed it to its approximate present extent wherein only the small bayous remain. Thus, the bayous briefly functioned as distributary

channels to transport sediments from meander belt 1 into meander belt 2.

Flooding before, during, and after formation of the Lake Bruin and Lake St. Joseph cutoffs also was accompanied by the introduction of large quantities of clays and silts that were deposited overbank in backswamp areas and in abandoned channels, including the Clark Bayou channel. There is no question that this sedimentation led to the eventual almost complete filling of the oxbow lake in the Clark Bayou channel and its conversion to a cypress-gum swamp forest. Most aggradation took place in the topographically lowest areas such as 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 in the site vicinity.

The progressive shallowing and filling of the Clark Bayou channel oxbow lake and the regional increase in flooding signified an appreciable environmental change and deterioration in living conditions in the Osceola Site area. Therefore, the age of these events is very important to understanding the cultural history of the site. Accordingly, it is necessary to focus attention on the chronology of Lake Bruin-Lake St. Joseph development.

Fisk (1944) postulated that the Lake Bruin cutoff took place about 500 to 600 yrs ago (Stage 15) and that the Lake St. Joseph cutoff took place about 400 to 500 yrs ago (Stage

16). As in almost every case in his work, these estimates are too young. No definitive geological evidence exists to date them more accurately, but once again archeological evidence provides some important help.

The Routh Site is an Early Plaquemine site (T. R. Kidder, personal communication, 1989) located about half way between Lakes Bruin and St. Joseph about 9 km east of the Osceola Site. In the Mississippi Alluvial Valley, this cultural component dates from about 1,200 to 1,400 yrs A.D. Although the precise landform association of the site is not known, it is situated on a natural levee that could have been developed by either of the cutoff channels. Assuming without real evidence that Lake Bruin is slightly older than Lake St. Joseph, it is assumed herein that the site was founded on the natural levee ridge of the former and was influenced by but not buried by the levee that developed around the latter. Therefore, the age of the Lake Bruin cutoff can be postulated at about 1,000 yrs B.P. It is further hypothesized that Lake St. Joseph formed about 600 yrs B.P. and may have been a factor in the termination of habitation at the Routh Site about 1,400 A.D. This scenario is highly speculative but is offered as a model for further consideration.

According to this model, increased flooding, overbank sedimentation, and a shallowing and reduction in the area of the oxbow lake would have occurred at the Osceola Site beginning about 1,000 yrs B.P. This would not have

precluded prehistoric habitation and, in fact, may have enhanced some aspects of the natural environment. Certain plant and animal species may have become more abundant; however, in general, it is felt that the overall productivity of the environment would have been diminished.

As the Lake Bruin channel was migrating westward prior to cutoff, the sources of floodwater and sediment would have been basinwide, overbank, seasonal inundation (sheetflow) from the Mississippi River and channelized flow via Little Choctaw-Andrews Bayous, Big Choctaw Bayou, and thence Routh Bayou (Fig. 3). The developing Lake St. Joseph bend, on the other hand, probably had a more direct impact on the Osceola Site area. Natural levees around the recently formed Lake Bruin cutoff served to block water movement to the south and to funnel a proportionately larger amount of overbank flow to the site area. Development of the eastern segment of Clark Bayou provided a route for the introduction of water and sediment directly into the Clark Bayou channel oxbow lake (Fig. 3). Consequently, after about 600 yrs B.P., the rate of flooding, sedimentation, and lake filling at the site would have significantly increased. After that time, the favorability of the site area for habitation would have more noticeably declined from what it had been previously and especially prior to 1,000 yrs ago.

Site Characteristics

Several short core holes (3.5 m and less) were made at the Osceola Site from the flank of the largest artificial mound eastward into the Clark Bayou abandoned channel. Figure 5 is an idealized cross section based on these holes that is intended to show the relative positions and relationships of the major stratigraphic units encountered. The deepest core hole (No. 1) representative of the easternmost part of Figure 5, was logged and sampled: a description is provided in Table 1. Its location and elevation are given in _____.

The natural levee/point bar sedimentary sequence on which the Osceola Site is situated was found to consist of a very friable, light gray brown to tan, well oxidized, very silty loam. Midden deposits consisting of very dark gray, organic, silty clay or clay loam directly overlie the natural levee/point bar sequence. The largest of the several mounds at the site evidently was constructed at the very edge of the several-meter-high, linear escarpment separating the natural levee/point bar sequence from the adjacent abandoned channel. An apron of colluvium (slope wash) mantles the former bank line and has muted this topographic break.

Verification that the Osceola Site was situated on the edge of an open lake (oxbow) was found in core hole 1 in the form of a winnowed, gray, fine to medium sand at a depth of almost 2 m. The sand contained abundant fragments of wood,

animal bone, and artifacts. These unquestionably represent materials that fell into and/or were discarded into the shallow body of water off the edge of the site. The sandy deposits, laminated with gray clays and organic debris, extended to the base of the core hole (Table 1) and are likely several more meters thick. They represent the initial channel fill that entered the cutoff from the south shortly after abandonment of the feature as an active river bend.

The uppermost 2 m of channel fill (above the former lake bottom) consists mostly of soft to medium, mottled dark gray and brown clay and slightly silty clay. The slight to moderate oxidation indicates the channel occasionally dried seasonally to allow some desiccation of the soils. These deposits are interpreted to be materials primarily of Mississippi River origin that were borne by floodwaters originating from that stream while the Lake Bruin and Lake St. Joseph bends were active. They were deposited in a shallow lake that soon became a deep swamp and finally a shallow swamp that briefly dried when water levels fell seasonally.

At a depth of 122 to 152 cm in core hole 1, several thin layers (to 4 cm thick) of medium reddish brown clay were observed which, on the basis of their highly distinctive color, are interpreted as sediments of Red River origin. Such layers are common in channel and backswamp sequences in the lower Tensas and upper Atchafalaya Basins,

but to this writer's knowledge, have not previously been identified this far north in the Alluvial Valley. There presence indicates that there were several instances in the last several hundred years when floodwaters from the Red River backed up along Black River and thence into the Tensas River and its tributaries. This would have occurred only when the Red River was in major flood but the Mississippi River was below flood stage, otherwise the Red River sediments would have been diluted by and rendered indistinguishable from the Mississippi River sediments.

Summary and Conclusions

The Osceola Site is situated in the Tensas Basin segment of the Mississippi Alluvial Valley on deposits entirely of Quaternary (Holocene) age. Following the waning of the Lake Wisconsin glaciation, the Mississippi River slowly aggraded within its valley, forming 4 distinct meander belts. Each meander belt can be differentiated into several distinct environments of deposition/landforms such as natural levee, point bar, backswamp, and abandoned channel in which sediments were laid down by both vertical and lateral accretion. Factors that influenced prehistoric settlement patterns and subsistence included not only meander belt formation but also subsequent local basin drainage that distributed floodwaters and sediment from younger meander belts.

Existing chronologies are inaccurate and available data are insufficient to permit the precise dating of landforms and channel changes; however, archeological evidence allows at least a general model for the Osceola Site area. The site is situated on the inside of a Mississippi River abandoned channel in meander belt 2 that probably formed between about 4,000 and 3,500 yrs B.P. From that time until about 1,000 yrs B.P., the abandoned channel contained an oxbow lake that was immediately adjacent to the site. After 1,000 yrs B.P. and especially after 600 yrs B.P., flooding and sedimentation from the Lake Bruin and Lake St. Joseph bends of meander belt 1 caused a deterioration of the environment in the site area and resulted in the complete filling of the oxbow lake. Therefore, the Osceola Site was inhabited during and near the end of a period characterized by rich local aquatic resources in the midst of a productive bottomland hardwood forest.

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Table 1

Field Log of Core Hole 1

Depth (mm)	Description
0 - 122	Medium soft, mottled dark gray and brown, oxidized, slightly silty clay with numerous small iron nodules.
122 - 152	Soft, dark gray, slightly oxidized slightly silty clay interbedded with soft, medium reddish brown clay.
152 - 198	Soft, gray, very slightly oxidized, plastic clay.
198 - 213	Dark gray, loose, fine to medium sand with scattered wood fragments, bone, and pottery fragments. Sampled for possible radiocarbon dating.
213 - 366	Organic rich, gray, fine to medium sand with thin layers of soft, gray, sandy clay.

FIGURE CAPTIONS

Figure 1. Holocene geology of the eastern Tensas Basin. Hb = Holocene backswamp; Hmm_1 to Hmm_4 = Holocene Mississippi River meander belts 1 to 4.

Figure 2. Distribution of abandoned channel (black) and abandoned course (stippled) environments of deposition in the eastern Tensas Basin.

Figure 3. Natural drainage systems of the eastern Tensas Basin.

Figure 4. Reproduction of a portion of an 1885 map of the Lower Mississippi Valley by the Mississippi River Commission.

Figure 5. Idealized cross section through largest mound at the Osceola Site showing relationship of site to adjacent abandoned channel.

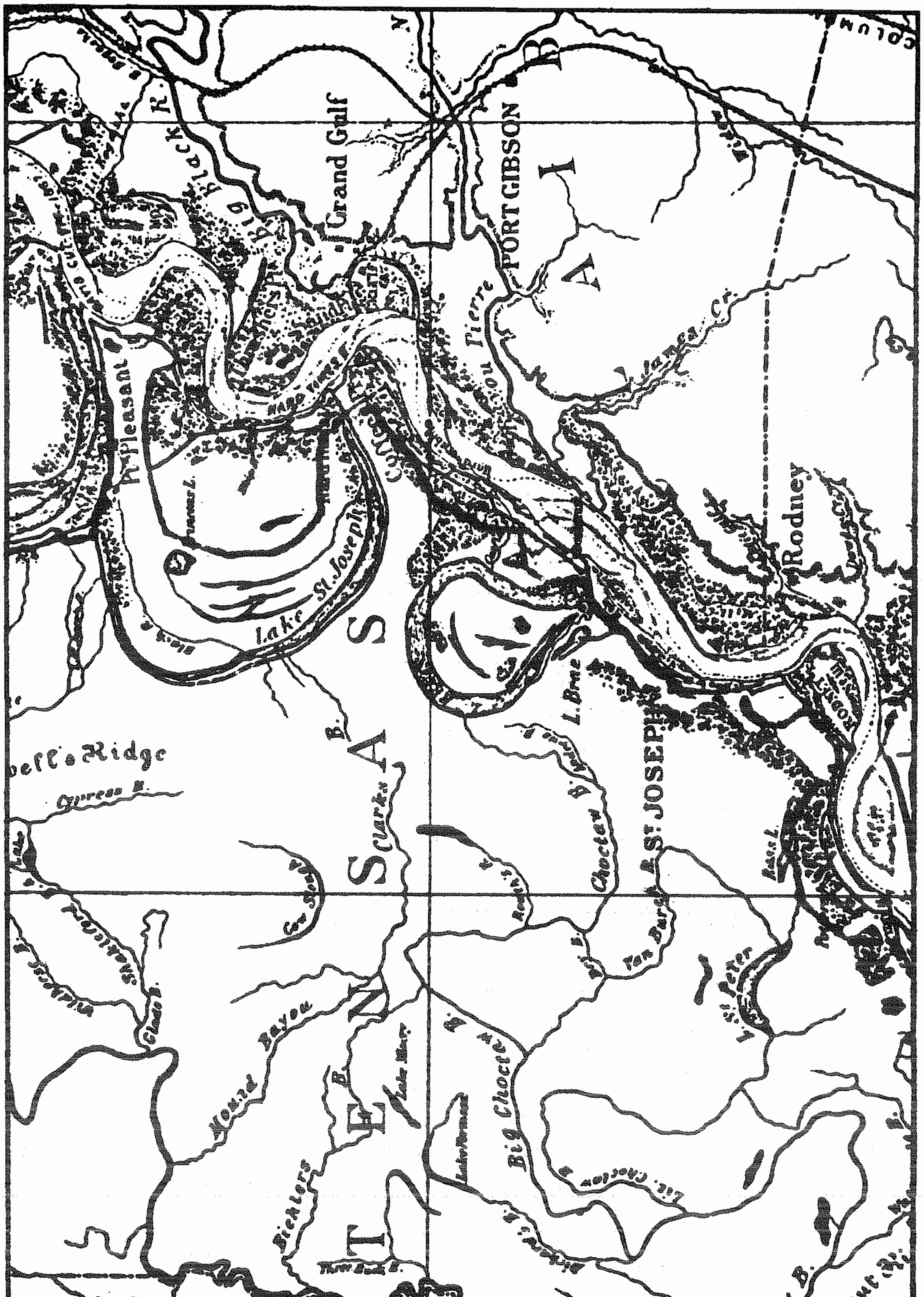
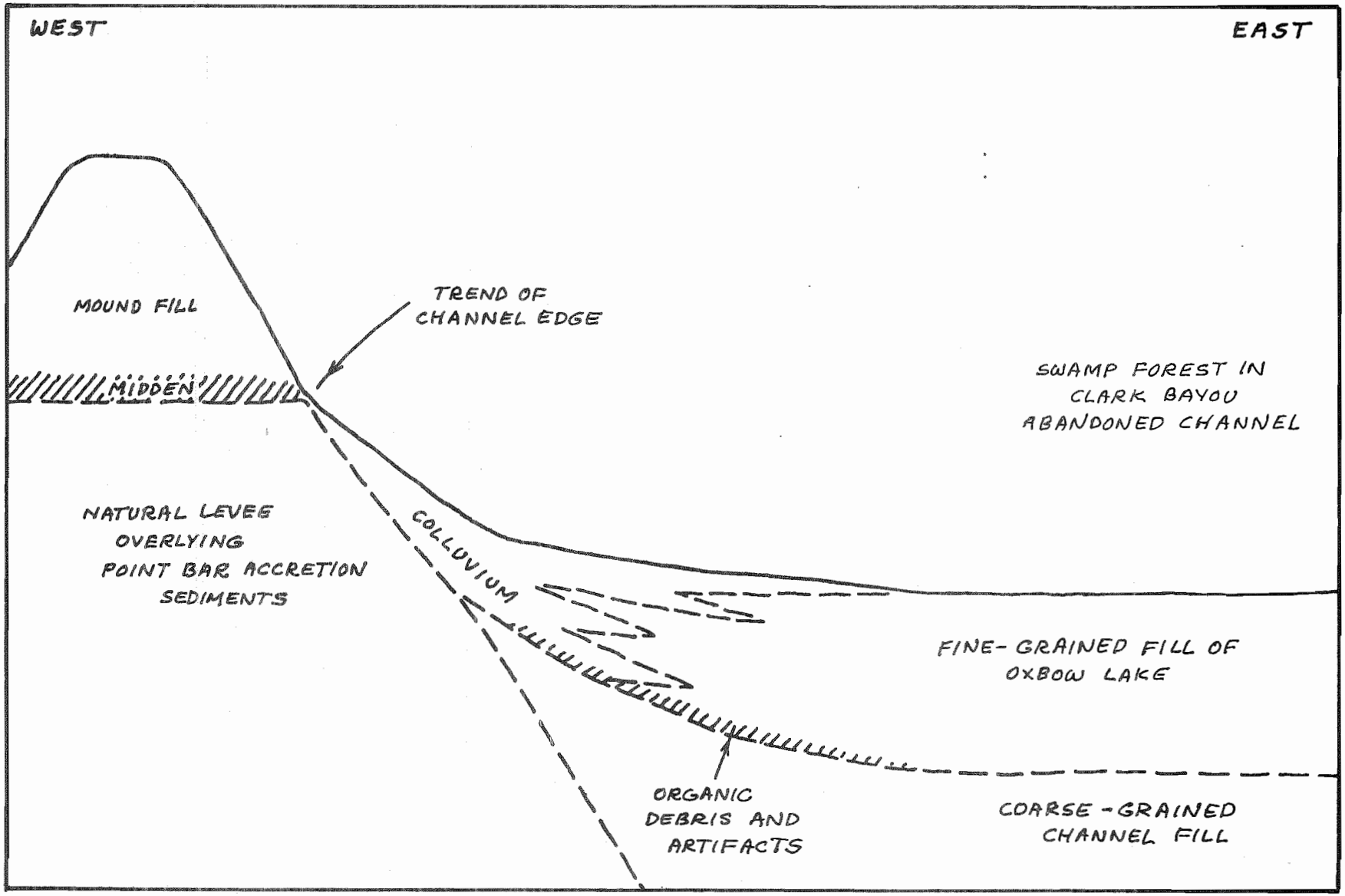

PORT GIBSON
Grand Gulf
Big Black R.
Bayou Pierre
Rodney
ST. JOSEPH
Lake St. Joseph
L. Bruce
Pleasant
Cypress B.
Glade B.
Mound Bayou
Clarks B.
Choctaw B.
Big Choctaw
Van Buren
Lost Peter
Bicklers
Choctaw B.
Independent R.
T E N S A S
B I A

Fig. 4


WEST
EAST
MOUND FILL
TREND OF CHANNEL EDGE
MIDDEN
SWAMP FOREST IN CLARK BAYOU ABANDONED CHANNEL
NATURAL LEVEE OVERLYING POINT BAR ACCRETION SEDIMENTS
COLLUVIUM
FINE-GRAINED FILL OF OXBOW LAKE
ORGANIC DEBRIS AND ARTIFACTS
COARSE-GRAINED CHANNEL FILL