

SEEKING CLARITY IN POSTHOLES:  
AN EXAMINATION OF COLES CREEK EARTHFAST ARCHITECTURE

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Honors Thesis  
Curriculum in Archaeology  
University of North Carolina at Chapel Hill

2015

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## ABSTRACT

Isaac Warshauer: Seeking Clarity in Postholes:  
An Examination of Coles Creek Earthfast Architecture  
(Under the Direction of Vincas P. Steponaitis)

This thesis examines evidence of earthfast structures at five Coles Creek sites: Baptiste (16Av25), Gordon (22Je501), Greenhouse (16Av2), Nick Farm (16Av22), and St. Gabriel (16Iv128). Using image analysis techniques to take measurements from site maps, structures at each site are examined and likely construction methods are determined. This information, along with the greater context of the structures, is used to determine the functions of the Coles Creek buildings. Large enclosures and smaller shrines provide evidence for ritual activity on pre-mound surfaces. Residences appear to feature both circular and rectangular structures, perhaps serving as seasonal dwellings. Mound summits do not seem to have held residences and many mound-top post features may not have been associated with roofed structures and instead may represent light construction and ritual post-setting.



## ACKNOWLEDGMENTS

My thanks go, first and foremost, to Vin Steponaitis, who, as my advisor, patiently provided me with the guidance and left me with the independence necessary for this scholarly endeavor. I cannot help but express my gratitude to Steve Davis and Margaret Scarry for their support, not only as patient members of my thesis committee, but as faculty who have always left their doors open to my inquiries and explorations. I must also thank Rebecca Saunders and Beverly Nuschler at the Louisiana State University Museum of Natural Science for their help obtaining better images of WPA excavation maps. I owe my gratitude to Amanda Henley of UNC Libraries for her essential guidance with GIS software. My deep appreciation goes to my family and friends, especially my parents, for their continual encouragement and support, without which, all distractions notwithstanding, this study would have been impossible. Last, my appreciation goes to all those at the Research Laboratories of Archaeology, who from my earliest days at this university, have met my interest in archaeology with extraordinary friendliness and generosity.

## TABLE OF CONTENTS

<b>List of Figures .....</b>	<b>vii</b>
<b>List of Tables.....</b>	<b>xi</b>
<b>Introduction .....</b>	<b>1</b>
<b>Chapter I: Mounds, Structures, and the Lower Mississippi Valley .....</b>	<b>3</b>
The Coles Creek Culture and Late Prehistory .....	6
<b>Chapter II: “Moundbuilders” And Their Earthfast Structures.....</b>	<b>12</b>
<b>Mississippian Earthfast Architecture.....</b>	<b>14</b>
Coles Creek Earthfast Architecture .....	21
<b>Chapter III: Sites Studied.....</b>	<b>24</b>
Baptiste Site .....	25
Gordon Site .....	27
Greenhouse Site .....	29
Nick Farm Site .....	33
St. Gabriel Site .....	34
<b>Chapter IV: Methods .....</b>	<b>36</b>
Diameter Analysis and Prezzano Spacing Analysis .....	38
Further Considerations of Error Regarding Small Post Diameter Analysis .....	40

Problems of Posthole Analysis .....	41
<b>Chapter V: Results .....</b>	<b>44</b>
Baptiste Site .....	47
<i>Mound A</i> .....	47
<i>Mound B</i> .....	49
<i>Village</i> .....	51
Gordon .....	55
<i>Mound B Zone 1</i> .....	55
<i>Mound B Zone 2</i> .....	61
Greenhouse .....	65
<i>Mound A</i> .....	65
<i>Mound F</i> .....	69
<i>Mound D</i> .....	74
Nick Farm .....	77
<i>Mound A</i> .....	77
<i>Mound B Submound</i> .....	80
St. Gabriel .....	85
<b>Chapter VI: Discussion .....</b>	<b>89</b>
Chronology .....	89
Bent-Post Structures .....	90
Rigid-Post Structures .....	97
Large-Scale Enclosures .....	97
Greenhouse Structures: Mounds A and F .....	100
General Conclusions .....	102
<b>References .....</b>	<b>105</b>

**Appendix: Results of Analysis of Coles Creek Structures..... 110**

## LIST OF FIGURES

Figure 1. "Pole Construction" as illustrated by Lewis and Kneberg. ....	16
Figure 2. "Log Construction" as drawn by Brian Sullivan. ....	16
Figure 3. Distribution of Coles Creek sites studied. ....	25
Figure 4. Baptiste site. ....	26
Figure 5. Gordon site. ....	28
Figure 6. Greenhouse site with WPA excavations indicated. ....	30
Figure 7. St. Gabriel site in the 1970s on the location of a planned prison facility. ....	34
Figure 8. Detail from a feature map of Mound B at the Baptiste site. ....	40
Figure 9. Profile of Mound B, Gordon site, showing slanted postholes (termed molds) with widened bases. ....	46
Figure 10. Feature 909, Mound A, Baptiste site. ....	48
Figure 11. Features under Mound B, Baptiste site. ....	50
Figure 12. Baptiste Village. ....	52
Figure 13. Architectural Evidence from Mound B, Zone 1, Gordon site. ....	56
Figure 14. Mound B, Zone 1, Gordon site. Adapted from Cotter (1952:Figure 53). ....	57
Figure 15. Feature 4a, Mound B, Zone 1, Gordon site. ....	58
Figure 16. Feature 4b, Mound B, Zone 1, Gordon site. ....	60
Figure 17. Feature 5, Mound B, Zone 1, Gordon site. ....	61
Figure 18. Features found at Level 2, Mound B, Gordon site. ....	62
Figure 19. Feature 6, Mound B, Zone 2, Gordon site. ....	63

Figure 20. Feature 7, Mound B, Zone 2, Gordon site .....	63
Figure 21. Feature 8, Mound B, Zone 2, Gordon site .....	64
Figure 22. Greenhouse Mound A, Building Level 6. ....	66
Figure 23. Greenhouse Mound A, features just under Building Level 7 .....	68
Figure 24. Greenhouse Mound F, Building Level 1. ....	68
Figure 25. Greenhouse Mound F, Building Level 1, with all sub-floor posts removed, showing discovered alignments. ....	71
Figure 26. Greenhouse Mound F. Building Level 1. This image shows paired posts and an S-shaped alignment in red. Alignments from Figure 25, extended with additional posts, are colored in blue .....	71
Figure 27. Greenhouse Mound F, Building Level 1. Alignments and possible paired posts resulting from Prezzano analysis are colored red.. ....	72
Figure 28. Greenhouse Mound F, Building Level 3. ....	73
Figure 29. Features under Greenhouse Mound D. ....	75
Figure 30. Feature 274, Mound A, Nick Farm site. ....	78
Figure 31. Posts (in red) with diameters greater than six inches extend into the eastern wall of Feature 274 from the extraneous wall. ....	79
Figure 32. Structures under Mound B, Nick Farm site .....	80
Figure 33. Feature 10, under Mound B, Nick Farm site .....	81
Figure 34. Feature 105, under Mound B, Nick Farm site. ....	83
Figure 35. Feature 168, under Mound B, Nick Farm site. ....	84
Figure 36. Feature 3 under the mound at St. Gabriel site. ....	86
Figure 37. Outward-leaning postmold from house 65 at the Hixon site, Tennessee. ....	87
Figure 38. Features found at Level 1, Mound A, Medora site .....	93
Figure 39. Baptiste Village, with structures divided into possible households. ....	96

Figure 40. Watercolor by John White depicting an enclosure of posts in coastal North Carolina in the  
16<sup>th</sup> century..... 98

Figure 41. Structures at Locale IV, Lookout site..... 99

Figure 42. Features at the summit of Mound B, Raffman site..... 101

## LIST OF TABLES

Table 1. Results by structure, part 1 of 3. ....	112
Table 2. Results by structure, part 2 of 3. ....	113
Table 3. Results by structure, part 3 of 3. ....	114



## INTRODUCTION

The activity of setting posts was ubiquitous in the prehistoric Lower Mississippi Valley. Wooden posts formed the structures of many buildings, including domestic dwellings and public structures, and carried religious importance themselves. Timothy R. Pauketat and Susan M. Alt, in asserting the agency evident behind postmolds, the archaeological impression of posts, stated that postmolds represent “embodiments of labor, sociality, and identity” (2005:218). But obtaining this information from a soil stain requires being able to understand the subtleties of the work of post-setting, in addition to having a detailed archaeological information about the posts. Although this resolution may be present in the archaeology of Cahokia and its hinterland, the focus of Pauketat’s and Alt’s work, it is not yet evident for architecture of the Coles Creek period in the Lower Mississippi Valley.

This study attempts to augment the record of the Coles Creek postmold and its constant partner, the posthole, by gathering information about these archaeological features and the structures they formed from maps of excavations of Coles Creek sites. This information was found by parsing through published site reports and articles, examining maps, and applying image analysis and geographic information systems (GIS) tools to the excavation maps and figures that featured structural evidence. With data obtained from this investigation, this study attempts continue the work of Cherie A. Schwab (1998) in moving beyond large-scale typological analysis of postmolds/postholes and their structures—i.e. Ian Brown’s (1985)

landmark work on Plaquemine architecture—and beginning to examine what these features meant to their creators and how they reflected the society of those ancient American Indians.

This study focuses on architecture found at Coles Creek sites in the Mississippi Valley from about Vicksburg in the north to the vicinity of Baton Rouge, examining evidence at the sites of Baptiste (16Av25), Gordon (22Je501), Greenhouse (16Av2), Nick Farm (16Av22), and St. Gabriel (16Iv128). It omits, notably, one site with particularly strong evidence for Coles Creek Architecture, the Morgan site (Fuller and Fuller 1987), which, because of its location in coastal Louisiana, as well as its anomalous and opaque posthole arrangements, possessed unique problems that limited comparability and warranted a thorough examination on its own.

As evidence of Coles Creek architecture is found primarily at mound sites, this study begins with an examination of the prehistory of the Lower Mississippi Valley—Chapter I—with a focus on mound construction and associated earthfast structures, or structures supported by posts set in the ground, before providing a survey of current knowledge about the Coles Creek culture and late prehistory. Chapter II is an overview of the major debate about earthfast architecture in the better-studied Mississippi period, the distinction between rigid-post and bent-post dwellings, and an examination of current scholarship on Coles Creek earthfast architecture. Chapter III describes the sites included in this study and summarizes archaeological investigations at those sites. The next section (Chapter IV) describes the methods used in this study and the uncertainties inherent in studying postmolds and postholes. A section following (Chapter V) outlines the parameters used to tell between bent-post and rigid-post construction at Coles Creek sites and presents the findings made at each site. Chapter VI is a discussion of the possible implications of those findings on our understanding of the Coles Creek culture and its associated earthfast architecture.

# CHAPTER I

## MOUNDS, STRUCTURES, AND THE LOWER MISSISSIPPI VALLEY

The Lower Mississippi Valley has been described as “the cradle of cultural development in eastern North America south of the Arctic” (Brain 1971:2). When it comes to the construction of earthen mounds, the region may certainly claim that title. Mound construction began in the Lower Mississippi Valley in the Middle Archaic period before 3000 BC. Excavations in Louisiana have revealed Archaic mound sites of a variety of sizes, from single-mound sites to sites such as Watson Brake, with eleven mounds. These mounds took a variety of forms, ranging from conical to dome-shaped—as at Watson Brake (Saunders 2010:68-69).

Between about 1700 to 1300 BC, monumental earthworks were created at Poverty Point in northeastern Louisiana (Gibson 2006:316). Notably—because archaeologists long considered mound construction to be the product of a social hierarchy made possible by agricultural surplus (Fritz 1998:32-33)—the Late Archaic constructors of Poverty Point lacked agriculture (Ward 1998:172). This people created a group of mounds, including the enormous Mound A (70 feet in height), accompanied by a set of six concentric semicircular embankments. The embankments may have supported dwellings, as large amounts of daub and charred cane found in a 1968 excavation may indicate (Webb 1982:15-17).

The abandonment of the Poverty Point site around 1300 B.C. (Gibson 2006:315) accompanied a large transition in the lifeways of the Lower Mississippi Valley, long-distance trade decreased, but new technology, in the form of pottery, made its first extensive appearance (Hays and Weinstein 2010:98, 104). This transition marked the movement from the Archaic to the Woodland period. The Early Woodland period in the Lower Mississippi Valley, called the Tchula period, has been subdivided between the Tchefuncte and Lake Cormorant cultures (Kidder 2002:69). Subsistence was still attained exclusively by hunting and gathering, but settlements were almost all small and nearly sedentary, oriented near slow-moving bodies of water (Hays and Weinstein 2010:104-105; Kidder 2002:70-71). Shell middens are evidence of extensive exploitation of riverine and coastal resources (Hays and Weinstein 2010:105). Mound sites were rare in this period; most were constructed as communal places of interment for flexed and bundle burials, but a few Lake Cormorant mounds were pyramidal with platforms (Hays and Weinstein 2010:107). Postholes found at Tchefuncte settlements may indicate earthfast structures. At the site of Little Oak Island in Louisiana, postholes seemed to indicate a shed-like structure (Hays and Weinstein 2010:105). At the mound site of Lafayette, an arc of postholes underneath the mound was compared to circular posthole arrangements under Adena mounds in Kentucky (Ford and Quimby 1945:21).

By about AD 1, improved pottery techniques, as well as increased numbers of burial mounds and other earthen constructions, indicated the beginning of the Middle Woodland period, the time of the Marksville culture in the Lower Mississippi Valley. Domesticated native crops are first evident in this period. Small, likely sedentary, settlements featured wooden structures ranging in form from circular to oval (Anderson and Mainfort 2002:10; Kidder 2002:75). Most mounds were conical in shape and contained burials, although two at the site of Marksville were

truncated, creating a possible platform. Mounds could also be enclosed or connected with embankments of earth (Hays and Weinstein 2010:75). The Marksville culture is considered part of the Hopewell Interaction Sphere, an area of cultural exchange across the Eastern Woodlands. Traits related to this cultural interaction are evident in the mortuary mounds, which included log-covered burials resembling those of the Illinois Hopewell (Kidder 2002:76, 79; Walker 1975:19-24). Trade with other Hopewellian cultures is evident until AD 300 (Brain 1971:62).

Changing ceramic decoration, which involved a wider variety of forms and types of decoration, separates the Middle Woodland period from the Late Woodland in the Lower Mississippi Valley. In this period in the region, the Baytown and Troyville cultures developed, the former in the north and the latter in the south (Kidder 2002:79-80). At this time, the bow and arrow appeared in the region and population seems to have continued to increase (Brain 1971:62-64). The people of the Baytown culture cultivated domesticated seeds crops, but evidence is limited for the Troyville culture (Kidder 2002:83-85). The Baytown culture is connected to a few mounds, including conical mounds and rectangular platform mounds. A platform mound at the Oliver site featured an enclosure of postholes on its summit, perhaps indicating an earthfast structure (Kidder 2002:82). Troyville sites also feature mounds, sometimes found in complex arrangements, as at Indian Bayou, with eight mounds and Troyville, with nine to 13 earthen constructions, including one mound originally 80 feet tall (Kidder 2002:83-85). Baytown and Troyville populations seem to have been fairly dispersed (Kidder 2002:85). Graves, generally lacking any funerary objects, include articulated and secondary burials, as well as dog burials, at times placed under the floors of mound stages (Kidder 2002:82-84).

## **The Coles Creek Culture and Late Prehistory**

Between AD 700 and 800, with changes in pottery and mound construction, the Coles Creek culture emerged from the Baytown and Troyville across the Lower Mississippi Valley (Kidder 2002:75-76). Well-made pottery, which emphasized incised or stamped decoration near the rim and was tempered with fired clay, defines the Coles Creek, and arrowheads predominate the lithic assemblage (Roe and Schilling 2010:167-168). Distinctive ceremonial centers also developed, which included platform mounds arranged around a plaza (Brain 1971:69).

People of the Coles Creek culture continued use of domesticated seed crops, but mostly exploited rich wild resources of the local environment (Roe and Schilling 2010:169). It was formerly thought that the Coles Creek people conducted maize agriculture, as the culture's permanent settlements around mound centers were reminiscent of the later Mississippian culture (Brain 1971). More recent investigations have shown that this was not the case; maize began to be farmed only at the end of the Coles Creek (Fritz 1998:34-36). Bioarchaeological and zooarchaeological information suggests that the bow and arrow may have increased the quantity of meat in the Coles Creek diet, and suggests that starchy foods, whether small quantities of maize or native starchy crops, increased in the Late Coles Creek (Listi 2008).

As in earlier periods, mounds were constructed without evidence of agriculture. Coles Creek mounds were primarily platform mounds that originally lacked burials, although later burials may have been placed within them (Kidder 2007:86). There is no evidence that many mounds ever supported mound-top structures, although many mounds do show patterns of postholes, which show clear alignments in some cases. Williams and Brain, in their study of the Lake George site in the Yazoo Basin, indicate that the presence of a mound-top structure was an important demarcation between Baytown and Coles Creek stages of construction at Mound C of

the site (1983:333-334). The increased presence of mound-top structures, although perhaps not universal, has been taken as an important characteristic of the Coles Creek culture. These structures, however, have been variously interpreted as elite residences, charnel houses, and council houses (Roe and Schilling 2010:163-164).

Kidder suggests that the structures on mounds, because they were often placed over burials and other mortuary features underlying the mound, were likely occupied by high-ranking people seeking to legitimize their status by connecting themselves with ancestors (Kidder 2002:87). Examinations of faunal remains indicate that some mammals, such as deer, were consumed in greater quantity on top of mounds; this may be an indication of the higher status of those eating on mounds (Roe and Schilling 2010:166), but it may also simply indicate that special forms of food consumption occurred on mound summits.

The Coles Creek plaza is usually clean of human artifacts, but it can be delineated by a midden around the periphery, between surrounding mounds, as at Greenhouse (Roe and Schilling 2010:161). Over the course of the Coles Creek period, access to the plazas generally became more restricted as more and larger mounds were constructed on the periphery. In addition, settlements became more closely associated with mound centers (Roe and Schilling 2010:162). There is some evidence that feasting occurred at mound sites, but artifact assemblages indicate that largely similar types of activities were conducted at mound sites and non-mound villages. It remains somewhat unclear how the mound-plaza complexes functioned. One theory is that the mound sites supported small, high-status residential populations and functioned as ceremonial centers for surrounding settlements (Roe and Schilling 2010:162-163).

Unlike the previous Marksville culture and the later Mississippian culture, Coles Creek burials lacked significant indications of status difference. Primary and secondary burials were

often placed in mounds but generally lacked any grave goods. Some archaeologists have identified central bodies in mass burials, as at Lake George and Mount Nebo (Kidder 2002:86), as the remains of important individuals, and others have argued that there is a social distinction between mound burials and others, but no interpretation is conclusive (Roe and Schilling 2010:165-166). Kassabaum (2011), examining the mortuary record at Lake George, Mount Nebo, and Greenhouse sites, found that Coles Creek burial methods differed according to the age, rather than the status, of an individual. She noted, however, that the mortuary record might mask status differences, as the mortuary record is an indirect and inconsistent marker of social hierarchy (2011:222).

Taking the archaeological record into consideration, scholars have attempted to understand the social organization of those within the Coles Creek culture. Using evidence from the mortuary record, the chronology of mound construction at Coles Creek sites, general settlement patterns, and evidence for mound-top construction, Kidder (1992) suggests Coles Creek society became more hierarchical over time, with mound sites becoming the locus of increasingly exclusive activity. Steponaitis (1986), in an earlier synthesis of the region's archaeology, argued that an emerging elite had actually coöpted formerly communal symbols, notably the mounds themselves, as a means of legitimizing power. The presence of structures atop mounds, possibly residences or other structures associated with an elite social class, is important in both of these interpretations (Kidder 1992:156-157; Steponaitis 1986:385). Barker also establishes the existence of a strong social hierarchy in the period, using mound burial, levels of osteoarthritis, greater specialization among potters, and the presence of prestige cuts of deer at mounds as evidence for this sort of stratification (Barker 1999). Wells also provided additional fodder for this case by considering analogous ethnographic and archaeological



examples, demonstrating that the public architecture of the Coles Creek culture, like that of other cultures attested in the archaeological record in Mesoamerica, South America, Polynesia, and the Middle East, indicated an emerging hierarchy (Wells 1998).

Recent literature seems to contradict this conclusion. Schilling found that, in a study of coastal Louisiana settlement patterns, Coles Creek sites seemed to indicate a more egalitarian “tribal” social organization, without real settlement hierarchy, as made evident in the Mississippi Period (Schilling 2002). Evidence from the Natchez Bluffs mound site of Feltus provides evidence of communal ritual activity that consisted of post-setting, feasting in large groups, human interment, and mound-building (Kassabaum 2014). Based on this evidence, Megan Kassabaum suggests that Coles Creek mound sites, rather than emphasizing existing social hierarchies, built on a history of communal activity. She argues that mounds did not serve as the site of exclusive ritual and elite residence, as they did in the later Mississippi period (Kassabaum 2014:348-350).

By about AD 1200, the Coles Creek culture had permeated the entire southern portion of the Lower Mississippi Valley (Brain 1971: 70), but, to the north, Mississippian societies began to coalesce across the Southeast. These peoples shared a number of cultural traits, including intensive maize agriculture, shell tempered pottery, and artifacts decorated with elaborate mythological motifs. Mississippian society was highly hierarchical, with strongly differentiated status exhibited in the placement of burials and associated grave goods (Brain 1971:71-72, 74, 78).

In the Lower Mississippi Valley, Mississippian societies were established in the northern portion of the region, while the Coles Creek culture continued to have greater influence to the south. Coles Creek and Mississippian peoples interacted extensively, and evidence points to both

the formation of alliances and violence between the two groups (Brain 1971:76; Roe and Schilling 2010:160). In this period, these political interactions, along with trade connections, may have influenced the adoption of maize agriculture by the Coles Creek, which led to the transition into what is now called the Plaquemine culture (Fritz 1998:35-36).

The exact nature of the Plaquemine culture is somewhat debated. Brain wrote that the Plaquemine was a hybrid of Coles Creek and Mississippian cultural traits, intertwined by the fully agricultural descendants of Coles Creek people. Brain cites evidence that mound sites never became fully residential and that pottery still resembled that of the Coles Creek (1971:76-77). This is supported by evidence from the Lake George site that indicates a low level of site occupation, even during an unprecedented amount of mound construction (Williams and Brain 1983:338-339). The mounds themselves exhibited features that related to larger Mississippian patterns. Williams and Brain note that, as at Mississippian sites outside of the Lower Mississippian Valley, mound construction during the Plaquemine Period at Lake George put the principal mound in the west (rather than the south, as in Coles Creek times). The principal mound also became larger in relation to others at the site (1983:376-377). Noting this mix of Coles Creek and Mississippian characteristics, Kidder argues that the Coles Creek culture developed Plaquemine traits with a minimum of external interaction (Kidder 2007:202). Brown, however, argues, that, at least in the Natchez Bluffs, the Plaquemine were possibly a separate people that immigrated into the region (Brown 2007:158-159); this view remains provisional and hotly contested by other scholars. North of the Natchez Bluffs, the mix of Mississippian and Coles Creek traits seems to have been eventually replaced by a full-blown Mississippian culture (Williams and Brain 1983:414).

In any case, over the course of the last centuries of prehistory, American Indians of the Lower Mississippi Valley moved toward societies with strong social hierarchies based around maize agriculture. Their mounds featured temples and elite residences. The Natchez people, who exhibited these traits, were encountered by French colonists in the seventeenth century, the last remnant of Plaquemine culture (Brain 1971:83-84).

## CHAPTER II

### “MOUNDBUILDERS” AND THEIR EARTHFAST STRUCTURES

The moundbuilding cultures of North American prehistory have long been of interest to scholars, as their earthen constructions are some of the most obvious indications of the ancient past of human habitation in North America. Famously, Thomas Jefferson investigated a mortuary mound with bundle burials near his home at Monticello prior to 1781 (Jefferson 1853:104-106).

The question of the nature of the ancient moundbuilders had a prominent place in the research of early North American archaeologists. For nearly a century, scholars debated whether American Indians had created the mounds found in Eastern North America. Ephraim Squier and Edwin Davis wrote the first publication of the Smithsonian Institution, *Ancient Monuments of the Mississippi Valley*, which claimed that the builders of the region's mounds must have been related to those who constructed monumental buildings in Mexico and Peru (Squier and Davis 1847:301). After the 1894 publication of a *Report on Mound Explorations of the Bureau of Ethnology* by Cyrus Thomas, American Indians were firmly established as the moundbuilders within scholarly circles, but some of Squier and Davis' assertions remained relevant. They wrote, “It may safely be claimed, and will be admitted without dispute, that a large local population can only exist under an agricultural system,” concluding that large-scale mound constructions could only be managed or justified in the context of a dense agricultural society (Squier and Davis 1847:302). This continued to be the assumption of American archaeologists into the mid-

twentieth century and has only been overturned by recent archaeobotanical evidence (Fritz 1998; Ward 1998). Such evidence demonstrates clearly that the Coles Creek people, for one, constructed mounds in the absence of an agricultural society as mentioned in the previous section.

Given what is now understood about the length of time over which mounds were constructed, by both agricultural and hunter-gatherer societies, archaeologists have taken a more detailed approach to the study of mound sites in order to understand the diversity of motives the “moundbuilder” Americans had over the course of millennia. These more sophisticated approaches to the investigation of mound sites were jumpstarted during the Great Depression, with the large-scale excavations of New Deal agencies, notably the Works Progress Administration. With unprecedented resources at their disposal, archaeologists investigated sizeable areas of many mound sites, including a majority of those examined in this study: Baptiste site, Greenhouse site, and Nick Farm site. Dealing with hundreds of laborers with little or no archaeological training, New Deal archaeologists, out of necessity, developed more systematic means of excavation with standardized paper forms (Means 2013:10). This systematic approach to archaeology meant that some features, which had been poorly documented previously, such as postholes, were documented on a large scale. With these discoveries, archaeologists began to devote greater energy to studying the more ephemeral structures represented by postholes and, occasionally charred remains.

Most archaeological reports of the period focused on the systematic interpretation of ceramics and other artifacts, in addition to burials, which had always attracted significant attention from American archaeologists. Remains of wooden architecture were noted but not thoroughly analyzed. James Ford’s report on the Greenhouse site (Ford 1951), for example, did

not include much consideration of earthfast architecture, other than a general consideration of building shape. George I. Quimby identified square and circular structures at the Plaquemine site of Medora as temples, and postulated that they had been constructed with wattle and daub, but otherwise deflected attention to artifacts (Quimby 1951). Efforts that did devote significant energy towards earthfast architecture in the Southeast dealt with the Mississippi period, as evidence was most abundant from that time. This focus on the Mississippi period has continued to the present day, building on early work from the Great Depression era. For this reason, in order to provide an overview of the study of prehistoric earthfast architecture, I will first focus on the interpretation of Mississippian structures before considering how that has carried over into the study of the earthfast architecture of the Late Woodland period, including that of the Coles Creek culture.

### **Mississippian Earthfast Architecture**

Thomas M. N. Lewis and Madeline D. Kneberg undertook a notable analysis of Mississippian structures with information compiled from WPA digs in the Chickamauga Basin in Tennessee (Lewis and Kneberg 1995). These authors studied post diameter and spacing, the presence or absence of wall trenches, structure size, and interior features “such as seats, platforms, benches, cache pits, and partitions,” in order to determine structure, form, and use (Lewis and Kneberg 1995:55).

Lewis and Kneberg distinguished between two readily apparent construction methods for what were mostly rectangular structures: construction with small, closely spaced posts between 0.3 and 0.5 feet in width and situated in wall trenches and construction with large, widely and unevenly spaced posts from 0.6 to 1 foot in diameter, with posts usually individually set

(1995:55, 67). The former, called “pole construction,” was interpreted as having “unified wall and roof construction.” Termed “bent-post construction” in this study, this meant that long, flexible poles were placed in the wall trenches and bent over to form the roof, likely resulting in a dome-like shape (Figure 1). Lewis and Kneberg noted wedges within trenches that could have resisted the outward forces generated by the bent poles. They also cited examples of postmolds that were clearly bent inward within the wall trench. At the Hixon site, the charred poles were up to 25 feet long and were interwoven, clear evidence that these posts were bent over to form the roof (Lewis and Kneberg 1995: 56-60). The latter type of construction, termed “log construction” (“rigid-post construction” will be used elsewhere here) was interpreted as having rigid walls with roof beams attached above (Figure 2). Charred evidence suggested that wattle and daub was placed between wall posts. Many of the dwellings of log construction were built in shallow pits. Lewis and Kneberg noted that the pole buildings were common in earlier stratigraphic levels than the log buildings, suggesting temporal changes in construction methods within the Mississippi period (1995:67-68).

The authors also divided structures into two main types, based on apparent use. One type was the “community building” with large dimensions, well-established fire basins, interior earthen platforms, and evidence of benches and partitions. The other type was called the “dwelling” and included structures of similar form, but with smaller size and fewer features on the interior, other than a hearth (Lewis and Kneberg 1995:60-71).

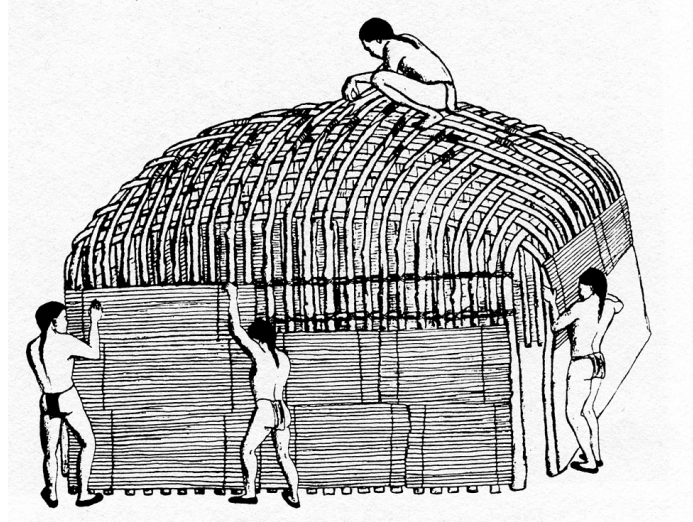


Figure 1. "Pole Construction" as illustrated by Lewis and Kneberg (1995: Figure 4.2).

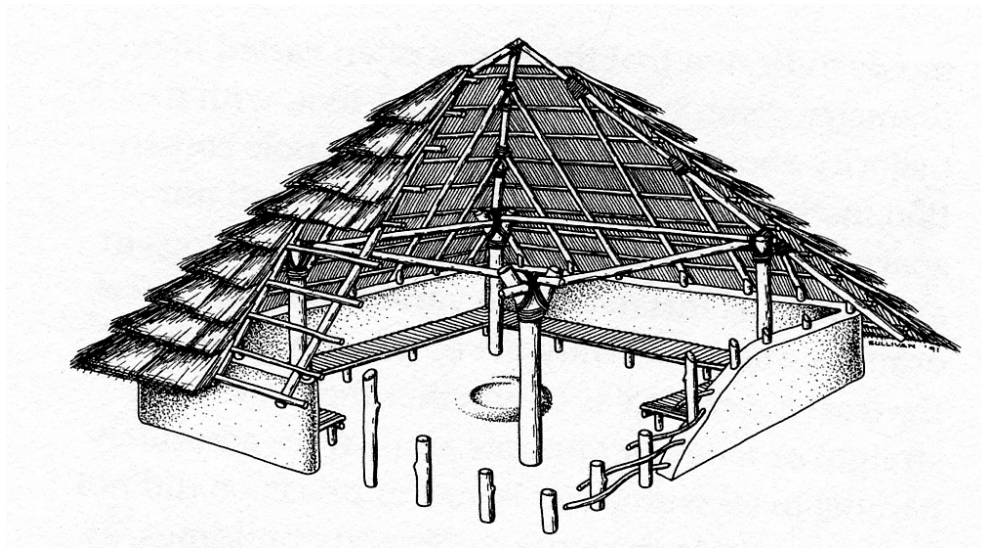


Figure 2. "Log Construction" as drawn by Brian Sullivan (Lewis and Kneberg 1995: Figure 4.9).

In this same period, Charles A Nash and George H. Lidberg began experimental reconstructions of Mississippian structures (Sullivan 2007:121). At the Tennessee site of Thompson village, they successfully erected, with the assistance of WPA relief workers, a bent-pole structure using nearby ash saplings as a source of poles. They tied the posts at the top, rather than weaving them together. Nash and Lidberg added cane wattle and clay daub to the walls of



the structure and determined that, because there were no eaves to protect the daub from the rain, that the building needed to be thatched from the ground up (Sullivan 2007:123-130).

Over the next few decades, many archaeologists departed from the interpretations of Lewis, Kneberg, Nash, and Lidberg, arguing that even structures with small, closely-spaced postholes featured a separate roof structure. James A Price, after work at the Turner and Snodgrass sites in Missouri, interpreted buildings that met Lewis and Kneberg's criteria for "pole" buildings as buildings with separate roof structures (Lacquement 2004:47-49). Mark A. McConaughy argued in a 1985 paper that most of the burned Mississippian dwellings that had been uncovered in Illinois should be interpreted as having rigid-post construction. Charred evidence of straight poles, the presence of large postholes in corners, the presence of large support posts and ridge poles (that would have supported the roofs of these structures at their apex), as well as poles that had collapsed in a radial fashion—interpreted as roof beams, indicated that structures with posts as small as 8 cm were built in this manner (McConaughy 2007:104-107, 112-113).

However, in the 1980s, considerable attention returned to bent-post construction. In 1964, Nelson A. Reed completed a reconstruction of a house at Cahokia, which used small, closely-set poles to support a separate hipped roof. The dramatic failure of this reconstruction led to further investigation. Considering ethnohistorical evidence, ethnographic, and Mississippian archaeological evidence, Reed built 12 additional and successful structures in 1974, testing a variety of bent-pole building techniques (2007:12-19). From this research and experimentation, Reed argues that the open corner plan of many small-post structures was best suited for the bent-post technique, as it allowed adjacent walls to be interwoven without impediment. He also argued that there was plenty of ethnographic evidence to indicate that wall braces and temporary

and permanent roof supports can be present in bent-pole structures, as well as rigid-post structures. As additional evidence, Reed pointed out that the majority of identified wood in structures was hardwood, which performs well in bent poles (Reed 2007:22-37).

In 1981, Dennis B. Blanton and Thomas H. Gresham continued the experimental approach at the Etowah site in Georgia, recreating the plan of a small-post, wall trench structure found at the site (Blanton and Gresham 2007). Using Lewis and Kneberg's analysis as a guide, the authors proceeded, with the help of volunteers, to create a dome-shaped structure, with interwoven bent posts set wall trenches with open corners (Blanton and Gresham 2007:37-40). This structure demonstrated that open corners were advantageous for bent-post construction, but, as with the reconstruction by Nash and Lidberg, the bent structure allowed daub on walls to deteriorate rapidly (Blanton and Gresham 2007:42. 44-46).

McConaughy, in publishing his 1985 study, returned to the subject and recognized that some of the structures he interpreted as rigid-post should instead be viewed as bent-post. However, he argues that many of his criteria remain valid; he finds it likely that bent-post and rigid-post constructions were likely built contemporaneously and featured similar floorplans (McConaughy 2007:13-16).

Lacquement, in a 2004 Master's thesis, argued for the validity of Lewis and Kneberg's interpretations. He built a bent-post structure with interwoven poles, following the suggestions of Lewis and Kneberg. Lacquement didn't include daub at all, limiting the structure's covering to thatch (2004:100-101). After five months, he burned the structure, noting that the thatch accumulated around the edge of the structure and how the posts tended to burn at their base and fall inward (Lacquement 2004:107). The experiment validated the practicality of Lewis and Kneberg's suggestions, and Lacquement noted the ease and speed of construction. Lacquement

noted the importance of horizontal supports on the bent poles in maintaining a sound structure (2004:108). Lacquement also included a survey of the structures uncovered at Moundville, in order to determine temporal changes in earthfast structures. Using dates determined by ceramic assemblages, he determined a transition from composite structures, which had two bent sides and two rigid sides (Lacquement saw these as possibly being similar to the structures encountered by John White in coastal North Carolina), to bent-post structures with individually-set posts. He found a later transition to bent-post structures with wall trenches, followed by a move toward rigid-post structures with large, widely spaced posts (Lacquement 2004:131-145). Lacquement argues that this change in construction may have been the result of a number of possible factors: Increasing household complexity may have caused the shift, for rigid-post structures were, on average, greater in size and contained room for partitions (2004:136, 140). Cooling in the Little Ice Age may have encouraged architecture with thicker daub application (2004:137-138). Thirdly, the supply of straight saplings may have become depleted (2004:138-140).

In contrast, Laura Brennan, in a recent study (2007), deviates from what seems to be the dominant view and reinterprets the structures found at the Kincaid site as having rigid posts. She emphasizes that the pits of some Mississippian houses, as well as earth applied to the outside of walls, would reinforce narrower poles, allowing them to support a separate roof. Brennan emphasizes that few single features of a structure can rule out bent or rigid construction, although large postmolds can definitively rule out bent construction (Brennan 2007:82-83).

As shown above, studies of Mississippian earthfast construction have generally revolved around one main issue, which has not yet been completely resolved: possible changes in construction methods over time and whether those changes meant that, in the early Mississippi period, bent-post structures predominated. This debate is of great relevance to understanding the

structures of the Coles Creek culture, as many similarities exist between the remains of earthfast buildings of these two cultures.

However, there is much more to a structure than whether it had bent or rigid posts. Other authors have fruitfully examined other aspects of earthfast structures. David Hally, in his study of the King site, a late Mississippian Town, postulates that the sunken rigid-post structures found at the site (called “primary dwelling structures”) were likely winter dwellings for the inhabitants of northern Georgia. Lightly constructed arbors ( termed “rectangular structures”) were likely used in the warmer months (Hally 2008:50-120). Hally cites ethnohistorical accounts to document the presence of seasonal dwellings in the region. He also includes strong evidence of partitions within the primary dwelling structures that likely divided household activities (2008:88-92, 100-106). In what he identifies as the plaza of the King site, he found a complex of three associated structures that he identified as public buildings: a possible temple, a council house, and a pavilion for warm weather use. These were identified on the basis of interior features, including benches in the council house, ceremonial ash deposits outside the temple, and the presence of large numbers of burials (Hally 2008:121-151).

In a massive salvage excavation in anticipation to dam construction, Richard R. Polhemus, among others, completed excavations at the Mississippian Toqua site in Tennessee. In reporting the findings, Polhemus paid particular attention to the 133 structures uncovered, systematically determining a variety of metrics for each structure, including mean post diameters, floor areas, presence of roof supports, charred remains, daub, burials, hearths, and other interior features. Polhemus followed Lewis and Kneberg’s general framework for structure classification, based on post diameter and spacing, but further developed a variety of types based on other characteristics (1987:241-243). Polhemus placed emphasis on the distinction between

the posthole and the postmold. His work on this subject will be included in a following section. Polhemus also examined artifact scatters within dwellings to get at information about structure use. Polhemus wrote that the early buildings, of Lewis and Kneberg's "pole" construction type, generally had cleaner floors and no evidence of either partitions or elaborately-formed hearths. The rigid-post Dallas Phase structures featured partitions that divided living spaces around a central area containing the hearth. Polhemus noticed that debris accumulated in the peripheries of the buildings. Public buildings, according to Polhemus, resembled the domestic structures but were larger and with less food and craft debris (1987:259).

### **Coles Creek Earthfast Architecture**

The authors mentioned previously have studied a variety of aspects of late prehistoric construction, including physical appearance (whether bent-pole or rigid-pole), temporal changes in construction methods, forms of use (e.g. community structures, dwellings, outbuildings, winter dwellings, summer dwellings), interior patterns of use, and duration of use. Few authors have investigated the same research questions with regard to the Coles Creek culture, but a few studies stand out.

John L. Cotter, in a study of the Gordon site (1952), stemming from the late Coles Creek and Early Plaquemine cultures, noted, upon comparing the architecture of his site with that of Greenhouse and Medora sites, that there seemed to be a general trend from circular to rectangular structures, regardless of whether a wall trench were used.

Ian W. Brown (1985) studied the architecture of the Lower Mississippi Valley's predominant Mississippi period culture, the Plaquemine, as well as sites containing architecture from the late Coles Creek period, in order to document temporal changes in construction

between the two periods. Brown used a narrow range of criteria, considering only buildings shape (circular or rectangular) and the presence or absence of a wall trench to evaluate temporal patterns. Looking at a variety of sites in the region around the Natchez Bluffs, including the Greenhouse and Gordon sites (considered in this study), Brown determined that architecture transitioned from a circular wall trench form to circular structures without wall trenches in the south of the region, while also moving into rectangular shapes. To the north, in the Yazoo River Basin, rectangular structures predominated and moved toward wall trench construction. In the Plaquemine, rectangular structures with individually-set posts predominated in the south, while wall trenches remained common in the north. Brown notes the presence of circular structures without wall trenches in the early Plaquemine in the Natchez Bluffs (primarily citing evidence from Gordon).

Cherie A. Schwab (1998) returned to Brown's analysis, adding the structures discovered at the Nick Farm site, excavated originally by the WPA, into the sample. Unlike Brown, Schwab considered structure function, as well as shape and wall trench presence or absence. Schwab found that the structures at Nick Farm differed from Brown's analysis. All dated to the late Coles Creek or early Plaquemine period, a time when Brown argued that open-cornered rectangular structures were most prevalent in the area, the southern part of the region he examined. The structures at Nick Farm all had open corners, and two structures featured wall trenches. Moreover, when Schwab compared the structures at Nick Farm to those at the nearby sites of Greenhouse, Baptiste, and Medora, she noticed that, rather than being exceptions to a general trend, the structures resembled those at nearby sites. Analysis of structure function, using limited numbers of diagnostic sherds, allowed Schwab to show that the buildings at the site probably differed in form from each other on the basis of function rather than chronology. Schwab's

particular conclusions with regard to each structure will be examined in later sections, as the Nick Farm structures are included in this study.

## CHAPTER III

### SITES STUDIED

This study of Coles Creek earthfast architecture includes evidence from five sites from Mississippi and Louisiana (Figure 3). Baptiste, Greenhouse, and Nick Farm sites, located in Avoyelles Parish, Louisiana, were excavated by the Works Progress Administration between 1938 and 1940, under the direction of James A. Ford and Robert S. Neitzel. Neitzel managed the excavations in the field (Ford 1951:12; Schwab 1998:2; Whitmer 1987:3). Gordon site, in the Natchez Bluffs, was excavated by John L. Cotter prior to the 1950s (Cotter 1952). St. Gabriel site near Baton Rouge was excavated by Deborah K. Woodiel in the 1970s (Woodiel 1993). As a result, this study focuses heavily on WPA information from sites in the Marksville area, with some architecture from the northwest in the Natchez Bluffs, and a little from near Baton Rouge.





Figure 3. Distribution of Coles Creek sites studied. Sites studied are marked in red. Other relevant Coles Creek sites with architecture are marked with black. Basemap courtesy of National Geographic and ESRI.

## Baptiste Site

Baptiste site (Figure 4), located five miles south of the Marksville site in Avoyelles Parish, Louisiana, includes two small mounds. The site was under cultivation when excavated, so the mounds were not well preserved (Whitmer 1987:3). Despite cultivation, a total of 22 structures were identified at Baptiste, primarily found in a large excavated area between the two mounds (Whitmer 1987:122). All of these features were found at the bottom of the cultural deposits on the site, underneath or between the mounds, with the exception of two structures in Mound A (Whitmer 1987:124). On Mound A, the bottom portions of postholes were discovered

in what was called "Phase 5," and the likely originated within or on top of a midden layer just above the construction phase (Whitmer 1987:93). Mound B included no evidence of distinct cultural phases (Whitmer 1987:94). Underneath Mound B, excavators found "postmolds and pits" dug into the subsoil (Whitmer 1987:Table 14, 96). Above these postmolds was a "brownish-black midden," termed Zone IV, which contained burned clay and a layer of charcoal. In between the mounds, the postholes indicated a group of circular and rectangular houses.

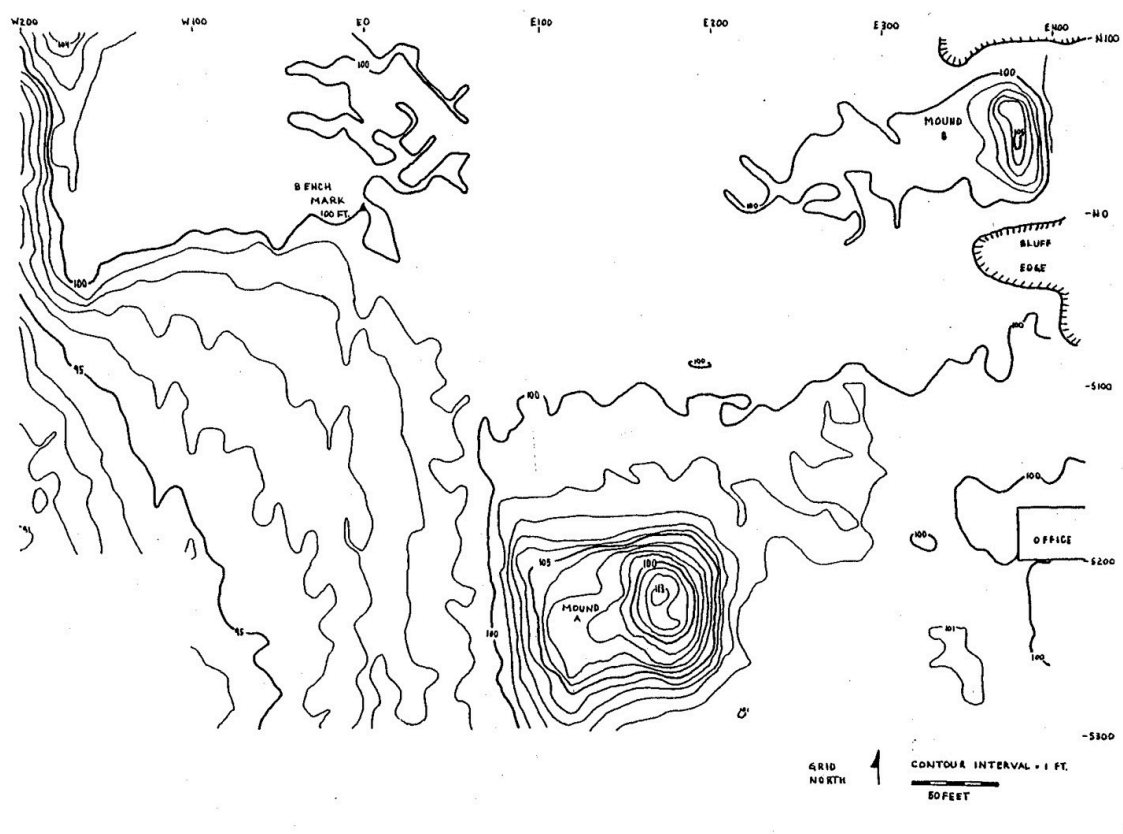


Figure 4. Baptiste site. Mound A is at center; Mound B is in the upper right. The area designated the "Village" is located between the two mounds. Excerpted from Whitmer (1987: Figure 25).

Ann Whitmer, in a 1987 Masters thesis, studied the WPA field documents from the 1939-1940 excavation of Baptiste to complete analysis of the site structure. Whitmer writes that the field notes indicated postholes were difficult to spot within dark midden soils found in the mounds and the area excavated in between the mounds, and these postholes, if found, were often only distinguished from surrounding soil in the lighter soil beneath middens (Whitmer

1987:117). This suggests that the record of postholes is highly incomplete. The mounds also featured a few burials that may or may not represent intentional deposits, according to Whitmer. One human burial, two dog burials, and one historic horse burial were recovered in Mound A. Three human burials, two accompanied by artifacts (including a ceramic vessel, an arrowhead, copper fragments, and other vessel fragments), were found in Mound B (Whitmer 1987:Table 22, 31). However, these burials were all found in deposits above the structures, and so were from a later period (Whitmer 1987:Table 16). A possible hearth may be associated with the lower structures in Mound A. In Mound A, Neitzel identified two circular structures under the mound and two at a level higher up. One of the circular structures beneath the mound featured a wall trench; the other structures were individually set. In Mound B, three rectangular wall trench houses were found with no posts in the corners, and one rectangular structure was found with individually set posts. Three more possible structures had undecipherable characteristics. Off the mounds, Neitzel identified four circular structures, two with wall trenches and two without, as well as four rectangular structures with wall trenches and open corners. Two structures were of unclear characteristics (Whitmer 1987:Table 16, Table 20). The structures considered in this study only represent a fraction of those found at the site, as only a few of the maps were available at a useful resolution.

## **Gordon Site**

Gordon is a site in Jefferson County, Mississippi, on a terrace above the South Fork of Coles Creek. The site consists of two highly-eroded mounds of uncertain original form, which measured to be 80 and 70 feet across with a height of about six feet (Figure 5). Cotter, who excavated the site in the early 1950s, called a heavily plowed and eroded area between the

mounds "the village", which featured only "a few shallow pits and unrelated postmolds" (Cotter 1952:113). Human burials were evident in both the mound fill and in the middens beneath the mounds.

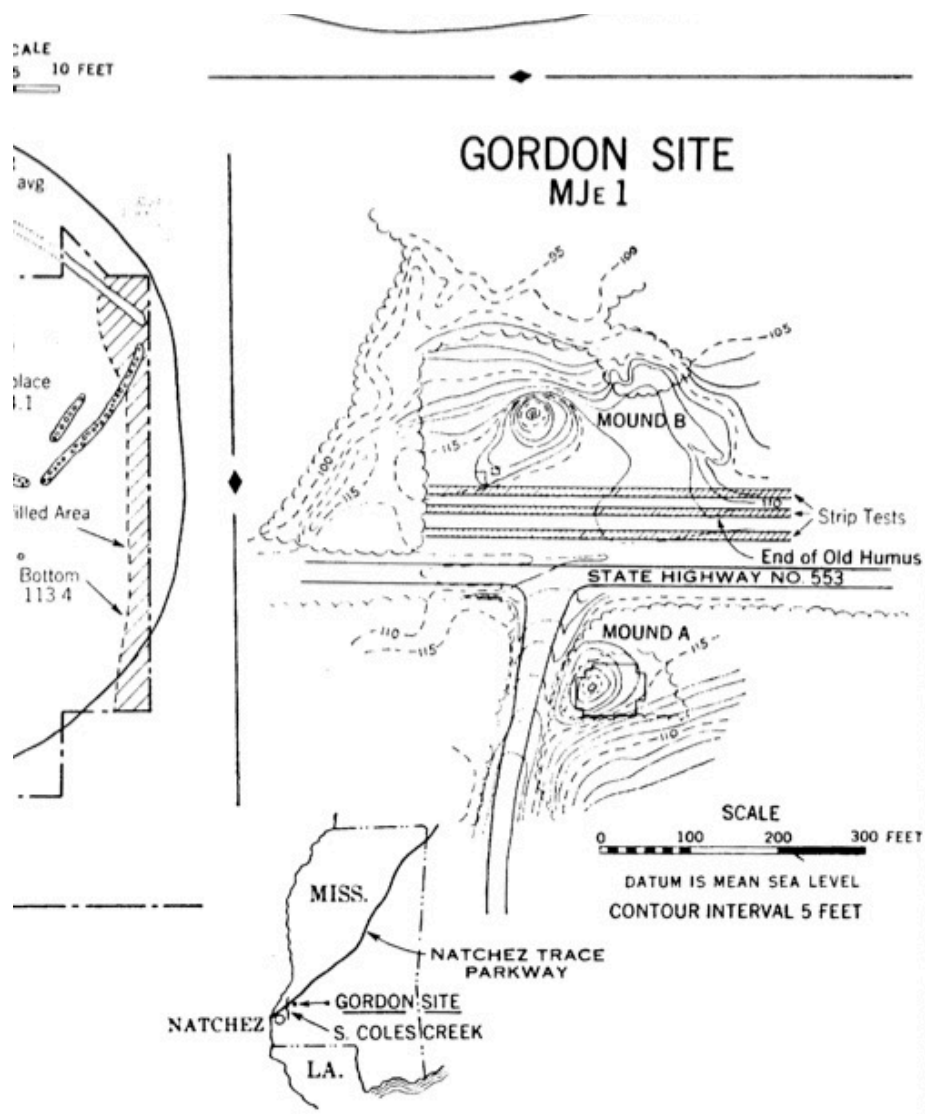


Figure 5. Gordon site. Mound B was the site of architecture examined in this study. Excerpted from Cotter (1952:Figure 15).

The mound Cotter named "Mound A" seems to have been constructed in one stage, and featured no evidence of structures at its summit or beneath it (1952:113-114). Structures were found at two levels in Mound B. Cotter argues that the structures found within Mound B may date from

after the construction of mound layers at a higher level, as the mound may have been extended laterally to cover structures in the northwest portion of the mound after the mound had been raised in other areas (1952:113). Mound B appears to have had at least three stages, the first low stage contained evidence of two rectangular structures and one circular structure (Feature 3, 4, and 5). Multiple wall trenches on the rectangular structures may indicate a double wall, overlap with another building, or rebuilding (Cotter 1952:114). Two child burials were placed in the fill within Feature 5, the large circular structure (Cotter 1952:114-115). On a mound stage above the first three structures, Cotter found Features 6, 7 and 8, which represent fragmentary rectangular structures. The features were accompanied by burials (1952:115). Cotter dated the pottery of the site to the late Coles Creek and early Plaquemine periods (Cotter 1952: 119).

### **Greenhouse Site**

The Greenhouse site (Figure 6) consists of “seven fairly small mounds” in bottomland below the bluff that holds the Marksville site in Avoyelles Parish, Louisiana (Ford 1951: 15). Similar to other mound complexes from the Coles Creek culture, the mounds, three of which retain a rectangular appearance, are arranged around a plaza. The largest, Mounds A, E, and G, retain a rectangular shape. Mounds A and E—to the northeast and southeast, respectively, are 12 and 10 feet in height, and 120 feet on a side. Mound G, to the northwest, is 160 feet square and six feet tall.



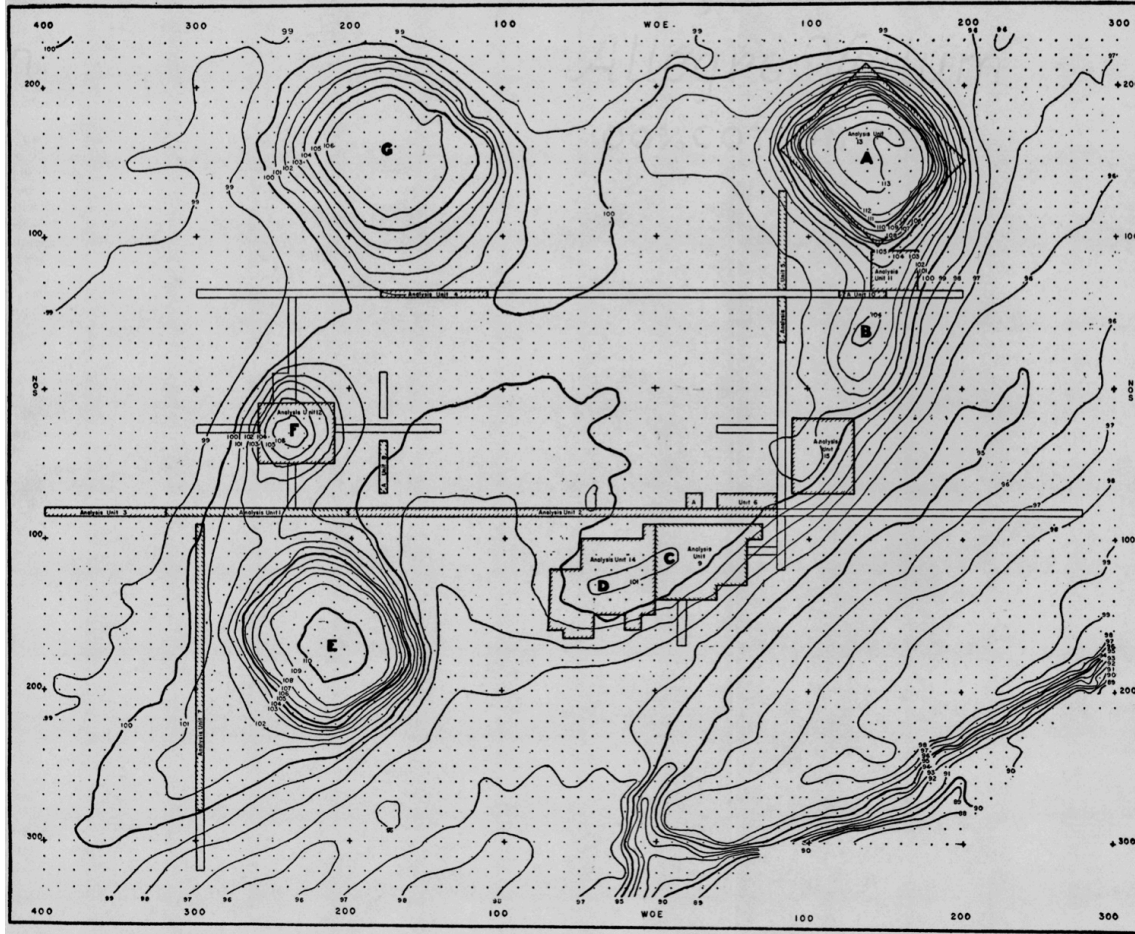


Figure 6. Greenhouse site with WPA excavations indicated. Image from Ford (1951:Figure 3).

Mound F, located between Mounds E and G, was five feet tall at the time of excavation, and 60 feet in diameter. Ford, the author of the report on the Greenhouse site excavations, noted that Mound F was likely a rectangular platform mound before cultivation severely eroded the construction. Mounds B, C, and D, located between Mounds A and E, were about 1 foot high, although excavations by Fowkes in the 1920s eroded Mound B from 5 ½ feet (Ford 1951: 20-21).

Neitzel directed excavations of Mounds A, C, D and F. The work revealed that Mound A was constructed in at least eight levels, and postholes were found on the mound surfaces of Levels 3, 4, 5, 6, and 7. Only Level 6 and Level 7 revealed postholes that clearly

formed a structure. Level 4 had more postholes than Levels 3 and 5, but Ford describes these postholes as “a maze” that failed to describe a structure (Ford 1951: 36). The postholes of Level 7 were not evident on the mound surface of the level, but became apparent slightly underneath, probably due to disturbance at the time Level 8 was added (Ford 1951: 35-36). Excavations revealed that eight human burials and the remains of a dog had been deposited in a midden in Level 5. Ford describes these as “incidental inclusions” (Ford 1951: 37). Ford associated earlier stages of Mound A with the Troyville culture (Ford 1951:101). John Belmont re-examined the ceramics from Greenhouse site, redefining the site’s chronology. He states that the earlier stages of Mound A, along with Mound E, were constructed in the early Coles Creek period, on top of a midden that had long surrounded a plaza. The later stages, which would include Level 6 and Level 7, date to the late Coles Creek (1967:31-32).

In Mound F, Neitzel discovered evidence of structures on the four mound surfaces extant in this highly eroded construction. Levels 1 and 3 revealed what seemed to be rectangular structures with baked clay floors and fire basins. Ford notes that the corner posts were missing from the rectangular structure at Level 3. These postholes originated from three to four inches beneath the baked floor. Ford is particularly uncertain about describing the Level 1 structure as rectangular. He states, “Numerous post holes were scattered about the edges of the floor, and with the assistance of some imagination a rectangular building about 30 feet square can be traced” (1951: 41). Level 2 contained irregularly spaced postholes, for which no map was published, and Level 4 had only 2 postholes in evidence after the mound had suffered extensive cultivation (Ford 1951: 41). Both of these levels featured fire basins, however (Ford 1951:103). Below Mound F, Neitzel found two burials, a human bundle burial and a flexed dog, that had been placed within midden deposits. Mound F is considered by Belmont to date to the late Coles

Creek period, added with Mound G to an earlier site layout that had included Mounds A and E (Belmont 1967:33).

Mound C contained no apparent construction stages and seemed to function exclusively as a mortuary mound, with a total of 93 burials. Postholes were found under sterile clay (an alluvial deposit from the Red River) on top of Mound C, as well as in an exploration trench dug near the mound, but the postholes did not clearly outline structures (Ford 1951: 42). Maps of these features have not been published.

Mound D, which is described by Ford as a continuation of the one-foot rise that formed Mound C, was formed of alluvial clay overlaying black soil containing ashes. At the top of the black soil layer, Neitzel uncovered a circular arrangement of postholes, including the fragment of a wall trench, overlaying a bathtub-shaped pit and surrounded by other scattered postholes. Beneath the black soil was a midden deposit containing numerous but scattered postholes, as well as more bathtub-shaped pits (Ford 1951: 45-46). At a level within Mound D, postholes indicated two overlapping circular wall trench structures with a diameter of 25 feet each (Ford 1951:103). The maps of these structures were not published in the report. Mound D and Mound C were not characterized as monumental architecture by Belmont, rather as “the major living area” for the site (1967:31). The association with bathtub-shaped pits likely dates the structure under Mound D to the early Coles Creek (Belmont 1967:31).

Additional structures were found between Mounds A and B. These were defined by circular patterns of postmolds, which consisted, to the south and east, of postholes spaced six to 12 inches apart and measuring from four to 10 inches across. To the north and west, smaller postholes had been placed in concentric wall trenches. Two postholes, possibly roof supports, were placed in the center of the structure (Ford 1951: 29). Ford identifies three structures from



these patterns, each about 22 feet across. Burned areas were found on the floor where the postholes originated (Ford 1951:103). No map has been published of these patterns, and they were not analyzed in this study.

### **Nick Farm Site**

The Nick Farm site consists of two mounds located in Avoyelles Parish, Louisiana. The site was originally considered part of the same “Marksville Site,” along with Greenhouse and Baptiste, by Gerard Fowke (Schwab 1998:3, 10). The site was later excavated by Neitzel as part of the WPA projects in the area, in 1940 and 1941 (Schwab 1998:2). One of the site’s mounds, Mound A, was measured 17½ feet high Gerard Fowkes (Schwab 1998:10) and had a clear flat-topped pyramidal shape. Mound B, was so eroded that it was only identified as an artificial feature by test trench in 1940 (Schwab 1998:13). Excavations of Mound A revealed the postholes of multiple structures with individually set posts, although only one structure was recorded (Feature 274), which was located at the summit of a mound stage. Most evidence of wooden architecture was found under Mound B, which featured overlapping lines of postholes, both individually set and in wall trenches. The postholes formed three clearly separate structures, a large wall-trench structure (Feature 10) intruding on top of two rectangular structures, one with wall trenches, the other without (Features 105 and 168, respectively) (Schwab 1998:22-24). Ceramics from the site reveal that it dates from the time of the late Coles Creek and early Plaquemine, estimated within the broad range of AD 1000-1400 (Schwab 1998:3).

## St. Gabriel Site

This site, located in Iberville Parish about 15 miles from Baton Rouge on the Mississippi River Floodplain, was discovered in 1977 during the construction of a facility on land owned by the Louisiana Department of Corrections (Figure 7). The site included a mound and surrounding midden (Woodiel 1993: 1).

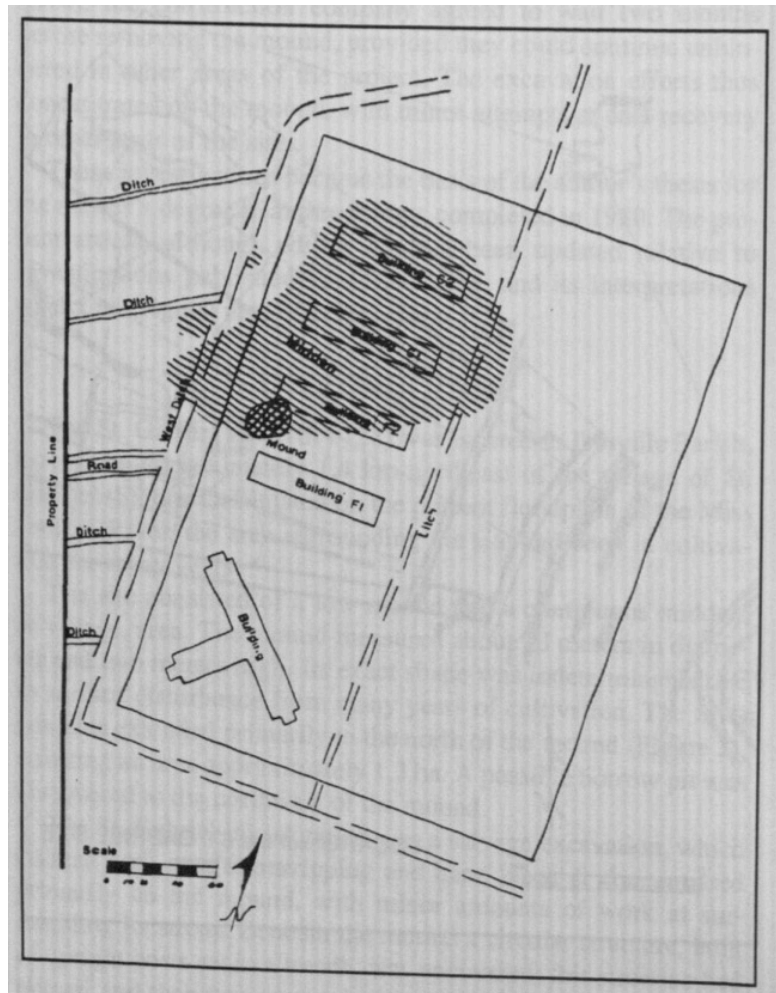


Figure 7. St. Gabriel site in the 1970s on the location of a planned prison. Shaded area is the site's midden. The Mound at the site is hatched, overlying a southern portion of the midden. Image from Woodiel (1993: Figure 2).

In a salvage excavation conducted that year, the mound was excavated (Woodiel 1993:1-2). Using two trenches to guide excavation by the mounds stratigraphy, Woodiel revealed that

there were at least three stages of mound construction. The two lower levels of construction contained some evidence of structures, and the lowest contained burials. Structures on the mound stages, poorly defined, contained postholes in patterns that suggested both circular and rectangular structures (Woodiel 1993:124). Underneath the mound, a well-preserved circular structure, Feature 3, was found (Woodiel 1993:37). Radiocarbon dating suggested the submound structure was built of wood collected about AD 1000; ceramics suggested that the site, in part, dated to the transition between the Coles Creek and Plaquemine cultures (Woodiel 1993:56, 100). The upper stages of mound construction might have dated from Plaquemine times, given radiocarbon dates that tentatively suggest a date at about AD 1300 (Woodiel 1993:124). Woodiel found the site comparable to the sites of Medora and Bayou Goula, given the similarity in site size, location on a floodplain, and, in the case of Medora, similarities in earthfast structures (Woodiel 1993:123-124, 126).

## CHAPTER IV

### METHODS

This study attempts to apply the analytical methods of scholars of Mississippian earthfast structures to the earthfast architecture of the Coles Creek culture. Although Brown (1985) and Schwab (1998) focused almost completely on structure shape and the presence or absence of wall trenches in their analysis of Coles Creek and Plaquemine architecture, scholars of Mississippian earthfast architecture have long made note of other important diagnostic characteristics, especially post diameter and spacing, and the presence or absence of support posts (Lacquement 2004:2004; Lewis and Kneberg 1995:1946; Polhemus 1987:1987). By considering this range of factors, these scholars have created a more nuanced picture of structure use and temporal changes in construction for the Mississippi period. This study attempts to provide greater insight into Coles Creek earthfast architecture by examining a similar range of characteristics.

Existing maps of the remains of earthfast architecture from Coles Creek sites were studied by examining a list of diagnostic characteristics. These included the shape of evident structures, such as whether the structures appeared to be rectangular or circular; the dimensions of evident structures, including width and length or diameter; the presence or absence of a wall trench; the median diameter of postholes or postmolds; the median spacing of the holes in a

structure's wall; and the presence of other features, such as hearths, partitions, or benches. This analysis was completed for most of the structures found in the maps analyzed.

Some of these characteristics were readily apparent from viewing maps and reading site reports. However, other information, notably average post diameter and post spacing is not always noted in site reports and requires more than a simple review of maps. To obtain this information, maps were processed digitally using Adobe Photoshop, ImageJ (an image analysis software) and Microsoft Excel. The resolution of each map was adjusted to one universal value: 8 pixels per real-life inch. Using Photoshop, all features were removed from the maps except postholes. Postholes, if left as outlines on site maps, were also filled in.

It is important to note that the "Magic Wand" tool was frequently used to make postholes a solid black. However, all images, being in color or grayscale originally, left postholes with a slightly blurry outer edge that included values intermediate between white and black. When the "Magic Wand" tool was used, the entire blurry edge was often included as part of the posthole. For this reason, postholes were consistently made slightly enlarged, in processed maps, than on unprocessed maps. This was a larger source of error on maps with low resolution or with many small postholes, for which a blurry border represented a larger proportion of original posthole size.

The maps were thus reduced to white space and black postholes. For each structure, when the postholes were isolated in their own image, the file was imported into ImageJ, where images were made binary; this was a simple process, given that the images were already black-and-white. Using the "Measure Particle" tool in ImageJ, a spreadsheet was created listing the areas, in square inches, of each posthole. The spacing between posts was then measured with the

“Straight Line” tool, each measurement proceeding from the center of one post to the center of its neighbor.

Tables with both of these values were imported into Excel, where post area was mathematically converted to post diameter using the formula,

$$Diameter = 2 \times \sqrt{\frac{Area}{\pi}}.$$

Median diameter and a preliminary median post spacing value were then calculated. The final post spacing value was determined by subtracting the median post diameter from the preliminary post spacing value. This calculation allowed the median post spacing value to actually reflect the distance between the postholes, rather than the distance between their centers.

Structure dimensions were also calculated in ImageJ with the “Straight Line” tool, measuring the diameter of circular structures and length and width of rectangular structures.

### **Diameter Analysis and Prezzano Spacing Analysis**

For some of the maps considered, postholes did not form distinct patterns of walls upon first glance. To better interpret these maps, a set of iterative processes was used. First, using the “Analyze Particles” tool on ImageJ, masks were created of posthole maps, which included only those posts within certain diameter ranges. These filtered maps were visually searched for patterns that became apparent after the removal of postholes of different sizes. If any clear patterns emerged, such as alignments that could indicate walls, postholes associated with the patterns were removed from the map before beginning the process again. In this manner, a series of patterns was collected that could better indicate the presence of structures.

These maps were also examined based on post spacing, using ArcGIS to perform a type of image analysis created by Susan C. Prezzano. In a study of the Sackett site in New York, Prezzano (1988) measured the distances between postholes, linking those that fell within certain distances of each other. After completing this process for a variety of distances, she found that postholes formed alignments that, instead of creating oval structures, as hypothesized previously (Ritchie 1936), formed a longhouse. Prezzano continued this approach in a 1992 dissertation on the Boland site, a Late Woodland site in Central New York. She began by removing the postholes associated with identified structures and then linked postholes using posthole spacing intervals known from those structures. Using this method, Prezzano found evidence of a rectangular structure, a fourth longhouse, and possible drying racks. When these were discovered, they were removed from consideration, and the remaining posts were examined for additional patterns (Prezzano 1992:108-112).

Prezzano conducted her examination of the Boland site by hand, measuring directly from print maps. In 2005, UNC-Chapel Hill undergraduate students Thomas Bien, Nickolas Everett, and Andrew Hartsell created a plug-in for ArcGIS that automated Prezzano's process, as part of a course taught by Diane Pozefsky ("Archaeological Post Analysis"). This plug-in, updated to work with ArcGIS 9.2, proved impossible to use, in its current state, within versions of ArcGIS available to the author. However with the help of UNC-CH GIS Librarian Amanda Henley, a method of accomplishing the same process with built-in features of ArcGIS 10.2 was found and used on maps from two sites, Greenhouse and Baptiste.

First, the distances between each posthole and all other postholes in the map were determined using the XY-coordinates of the centroids found for each posthole. Lines were drawn between each posthole and all others in the map. By limiting these links to those within certain

lengths, or those that were between posts of a certain range in diameter, postholes were found that were spaced at certain intervals from similar neighbors.

### **Further Considerations of Error Regarding Small Post Diameter Analysis**

When high-resolution scans of structure maps from Baptiste site and Nick Farm site were obtained from Louisiana State University, it became clearly apparent how swiftly the posthole maps must have been drawn at WPA sites. It appears that the excavator, who drew the map, marked out the location of the center of the posthole on graph paper and quickly circled that point, leaving a general impression of posthole's size (Figure 8).

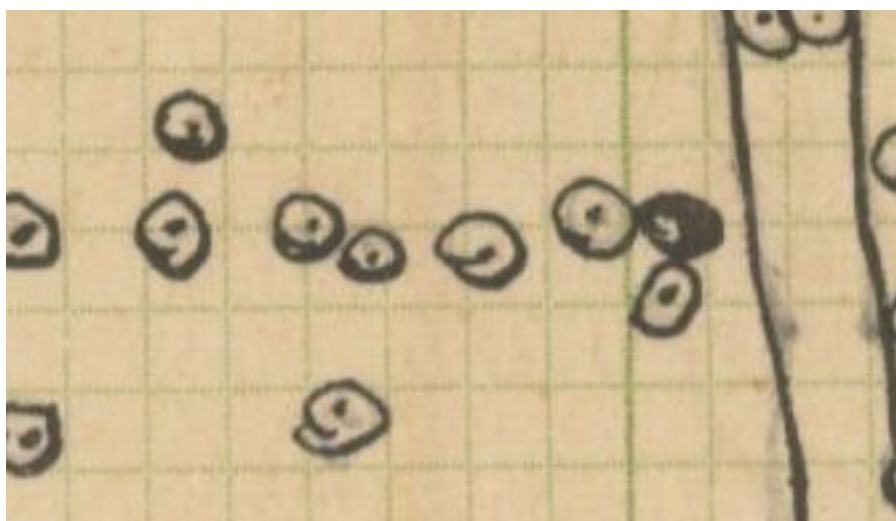


Figure 8. Detail from a feature map of Mound B at the Baptiste site (see also Figure 10). Excerpted from Map 388, Flat Map Collection, Louisiana State University Museum of Natural Science.

Since a single square of the fine graph paper used represented six inches of excavated area at both sites, the fineness of the pen nib used may have made drawing difficult of postholes less than six inches across. This set of circumstances, along with the poor resolution of reprinted maps used at times during image analysis may explain why many structures that appear to be bent-post in construction feature posthole or postmold diameters that exceed the maximum for post flexibility. For these reasons, the results of posthole size for postholes in the smaller range



of sizes are of questionable accuracy. Because methods of processing scanned maps for image analysis consistently contained the entire blurred outline of postholes within their actual diameter, it even more likely that the width of all posts, and small posts most of all, have been overestimated in image analysis.

### **Problems of Posthole Analysis**

Interpretation of archaeological information in this study has not only been complicated by the above limitations of map accuracy and image processing, but the ephemeral nature of earthfast architecture makes interpretation of the structures difficult after their prehistoric destruction. When these structures were destroyed, whether dismantled, burned, or left to rot, they left behind only their earthen floor, the holes dug for the posts, and whatever organic material was carbonized by fire. It is these meager remnants that are studied by North American archaeologists.

Post taphonomy additionally complicates the picture. If the posts were burned at the time of the structure's destruction, the posts may have remained until the present in carbonized form. If unburned, they usually rotted, but the color and texture of the soil left behind can often be used to differentiate between the space within the ground formerly occupied by the post (the postmold), the space emptied to set the post (the posthole), and the surrounding substrate. Nevertheless, these soil differences are often subtle and may be missed by excavators. Furthermore, the difference between postmold and posthole is often impossible to determine. As a post rots, voids are left as the post loses mass through decompositional processes (Edmonds 1990), and they fill with soil from the posthole, rendering the distinction between the postmold and posthole more indistinct than that between the substrate and the posthole. The posthole and

postmold can also be made indistinct if a post is removed and the mold not filled in. At that point, the fill of the posthole can collapse into the postmold, thereby obscuring it. A postmold is left more clearly when it is filled in immediately or if the charred post remains in place. Unfortunately, these circumstances rarely occur with structural posts--although Kassabaum (2014: 312) documented that the postholes of extra-structural ritual posts were often purposefully plugged after post removal at the Feltus site, giving a clearer impression of postmold versus posthole. Where postmold and posthole are not distinct, it is likely that the posthole is what is distinguishable from the surrounding soil. This posthole can differ significantly from the size of the postmold. Evidence at the Toqua site demonstrated that the postmold was usually 25-50 percent smaller than the posthole (Polhemus 1985, cited in Lacquement 2007:54). These uncertainties about extrapolating information about posts from postholes create some of the most basic problems in the study of earthfast architecture.

In the sites studied within this thesis, the only clear postmolds evident are those contained within wall trenches. Even this may not be completely true, however, as archaeologists sometimes discover the individual posts in wall trenches only at the base of the trenches, where the posts extended beneath the trench floor. If these depressions were excavated, in prehistoric times, as postholes were, they may also differ significantly from the post size. The situation is further complicated by the fact that posts were cut down by stone blade, and, in the case of large posts, by burning as well. For this reason, posts likely had tapered ends. Therefore it is likely that the evidence of posts underneath wall trenches may have the impression of the narrower end of the post. For these reasons, wall trenches posts can be either underestimated or overestimated, depending on the circumstances.

None of the maps studied distinguished between postmolds and postholes, where posts were set individually. Where no distinction was made, I have assumed that the posthole was indicated, as opposed to the postmold. As discussed already, this can lead to significant overestimation of post-size.

What happens after a structure is destroyed greatly complicates the understanding of earthfast architecture in the archaeological record, but alterations to postmolds and postholes don't just start at that point. Buildings themselves can modify postholes. As Cameron Lacquement indicates, bent saplings, if strong enough, can dent or widen postholes while under tension (Lacquement 2004:84). Postholes affected by this process, especially in softer soils, could be widened as a result of this process, further risking over-estimation of post size by archaeologists.

## CHAPTER V

### RESULTS

The information obtained by the above methods was used to determine the construction method of Coles Creek structures at the sites studied, using a set of construction parameters based on interpretations of Mississippi period structures.

Lewis and Kneberg (1946) created an enduring framework for viewing earthfast construction in the Mississippian world. No matter the debate about the particulars, Lewis and Kneberg's division of Mississippian structures into "pole" and "log" construction types has largely stood the test of time. This division, which Lewis and Kneberg based on strong archaeological evidence, was also grounded in ethnohistorical accounts. Their classifications and the work of later archaeologists have provided a set of parameters that will be used in this study to determine the probable construction of Coles Creek structures.

The thorough experimentation of Cameron Lacquement has done a great deal to elucidate the practical requirements of bent-post construction. In an experiment that measured the force necessary to bend saplings, he determined that a sapling of three inches is probably the maximum one person could bend effectively by hand (2004:81-82). Ethnohistorical evidence suggests, however, that posts of three inches were certainly not the upper limit, especially when the labor of multiple people could be harnessed. Andreas de San Miguel, a Spanish Monk, who wrote of the practices of American Indians on St. Simons Island in today's Georgia, described

the structure he stayed in as “a big cabin, circular in shape, made of entire pines from which the limbs had been removed, set up with their lower ends in the earth and the tops all brought together above like a pavilion or the ribs of a parasol” (Swanton 1969:222, 405). A less extreme example of wider posts used for bent architecture was recorded by Henri Joutel in the first half of the eighteenth century. He observed the Caddo creating bent-post structures with “tall trees as big around as the thigh” (Swanton 1946:419). Given the width of the human thigh—certainly larger than three inches—bent-post architecture certainly contained posts greater than the maximum Lacquement recorded.

However, Lacquement noted that most postholes in Mississippian buildings were not slanted, meaning that bent posts must have been narrow enough that the force to bend them was not strong enough to widen the postholes. This meant, according to his experiments, that posts couldn’t be greater than 3.25 inches across (2004:84). Although no authors reported slanted or distorted postholes at the sites Lacquement studied, a couple of profile maps from the Gordon site (Figure 9) indicate posts with slants and widened bottoms and tops, all possible indications of force from posts under tension. For this reason, it is possible that posts of larger diameters were used in bent-post construction. Lewis and Kneberg probably propose a reasonable range of post diameters: from four to six inches. Lewis and Kneberg also note that posts were usually spaced about six inches apart in these types of structures (1995:55).

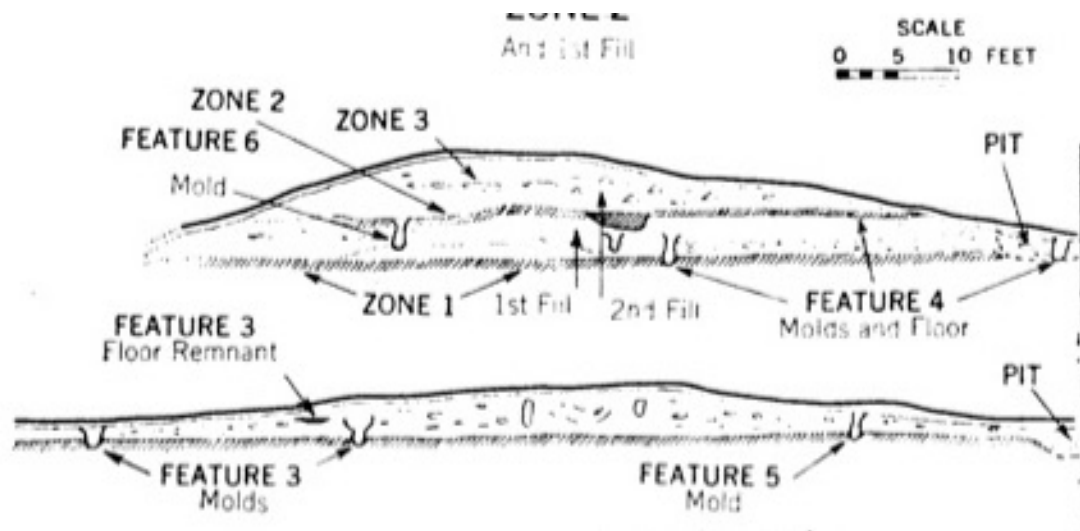


Figure 9. Profile of Mound B, Gordon site, showing slanted postholes (termed molds) with widened bases. Excerpted from Cotter (1952:Figure 53).

As is probably obvious, construction based on hardwood saplings can only get so large. But, according to Antoine-Simon le Page du Pratz, who wrote about the Natchez in the early 18<sup>th</sup> century, that upper limit may have been fairly high in the Lower Mississippi Valley. He writes of the bent-post dwellings of the Natchez: “The cabins of the natives are all perfectly square. There is not one which measures less than 15 feet each way, but there are some more than 30” (Swanton 1969:418). This is also reflected in the small-pole patterns that Polhemus identified as bent-post structures at Toqua site, which varied from 14 to 32 feet on a side (1987:235). Lewis and Kneberg actually identify some buildings as large as 60 feet on a side as being of bent-pole construction, and they propose that a third sapling was lashed between two earthfast saplings in the construction of those buildings (1995:57).

Rigid-post construction, in contrast, can theoretically cover an indefinite expanse, as long as enough roof supports are provided. According to Lewis and Kneberg, posts making up the walls were spaced from one to more than three feet apart in the log-type houses of the

Chickamauga Basin. Wall posts were usually between 7 and 10 inches in width (1995:55), but roof support posts could be much larger.

In a general sense, this information indicates that structures with postmolds less than 6-inches in diameter and spaced less than a foot apart could have been of bent-post construction, while buildings with larger posts spaced over a foot apart and accompanied by roof supports were of rigid-post construction. With these characteristics in mind, the structures were examined at each of the studied sites.

### **Baptiste Site**

Findings from Baptiste site have not been fully published, and study of this site is partial as a result. The only structures included in the study are a selection of those found on Mound A and Mound B, as well as the structures from the area designated the “Village.” The poor resolution of the map used to examine the Village area of the site meant that structures present could not be fully analyzed. The ceramic assemblage from the site remains to be analyzed and, as a result, all of the structures considered from this site are of uncertain date.

#### *Mound A*

A lower stage of Mound A featured an arrangement of postholes that was completely indecipherable at first. The postholes, all individually set, were collectively designated “Feature 909.” This feature was described simply as an “occupation level” by its excavators (Whitmer 1987:Table 16). Both Diameter and Prezzano Analysis were applied to this feature, in order to tease out patterns indicating structures (Figure 10). Fragmentary posthole alignments identified three possible structures, designated Feature 909a, Feature 909b, and Feature 909c. These

alignments, although they fail to indicate clear buildings, support the idea that rectangular buildings once stood on this stage of Mound A. All three alignments suggest rigid-post construction, given the wide space between postholes. Postholes are in an intermediate zone between those of rigid-post and bent-post construction, based on parameters mentioned in the previous section. They feature widely spaced posts, but those posts are relatively narrow in dimension.

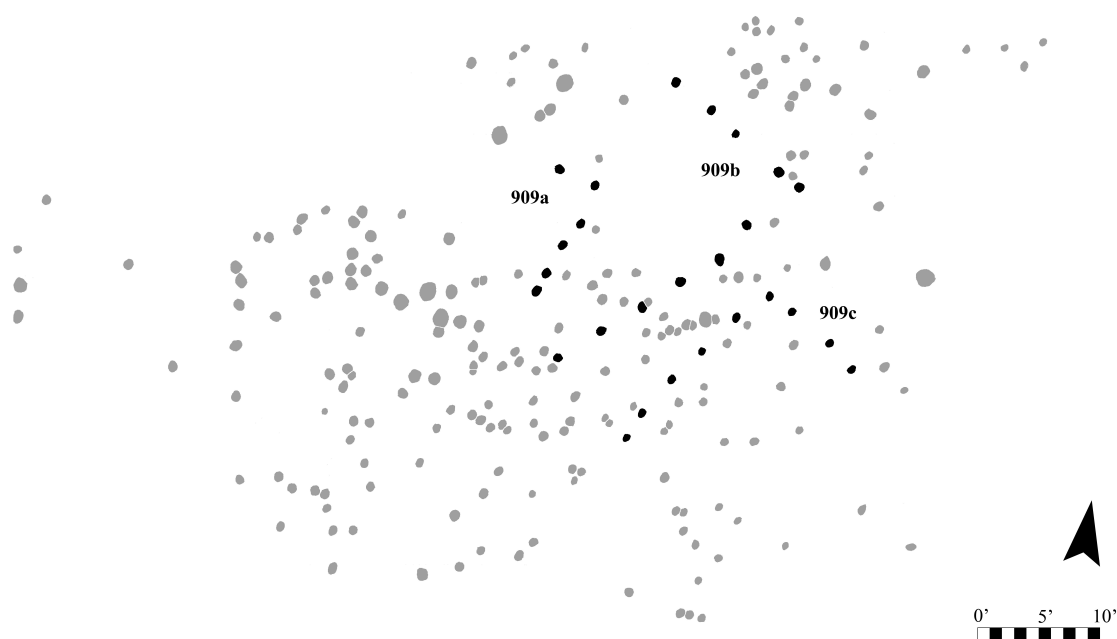


Figure 10. Feature 909, Mound A, Baptiste site. Discovered alignments are in black. Adapted from Map 533, Flat Map Collection, Louisiana State University Museum of Natural Science

*Feature 909a.* This posthole alignment contains postholes with a median diameter of 9.4 inches spaced a median 20.9 inches apart. The alignment extends 9.6 feet before perhaps meeting another wall at a right angle.



*Feature 909b.* This alignment continues 24.2 feet before it may terminate in a corner.

Postholes are a median 9.9 inches in diameter and spaced 35.3 inches apart.

*Feature 909c.* This alignment meets at a clear corner, with a wall of postholes running 16.4 feet approximately northeast to southwest and 9.1 feet northwest to southeast. Postholes are an average 8.3 inches in diameter and spaced an average 31.5 inches apart.

### *Mound B*

Mound B featured extensive posthole evidence (Figure 11), including some post features found within wall trenches. These features revealed two clearly differentiated structures toward the south end of the mound (Features 1030 and 1031). Evidence for further structures was unclear but featured posts of similar diameter and spacing to those to the south of the mound. Given the clarity the two southern structures, these were taken as representative of other structural evidence on the mound, and further analysis of the post features found on Mound B was left to future study. Associated with some of the other possible structures were two patches of wattle (Whitmer 1987:Table 16).



Figure 11. Features under Mound B, Baptiste site. Pit features associated with structures are colored gray. Adapted from Map 388, Flat Map Collection, Louisiana State University Museum of Natural Science.

*Feature 1030.* This structure was square in shape with wall trenches that had closed corners on at least two sides. The structure measured 22.7 feet on a side, with postmolds a median 6.1 inches in diameter. Postmolds were spaced a median 11.3 inches apart. Given a lack of evidence for any interior features, including roof supports, this building was likely of bent-post construction, given relatively narrow posts and spacing within one foot. . The date of the structure is uncertain, as with most features at this site. There was not evidence of a hearth within the structure. A pot, filled with refuse upon excavation, Feature 1043, was dug right outside the structure and may be associated (Whitmer 1987:Table 16).

*Feature 1031.* This structure, also nearly square in shape, was built after Feature 1030, as it intruded upon the other structure's wall trench to the east. This structure was of similar size to Feature 1030, measuring 21.2 feet in one direction and an estimated 21 feet in the other (this dimension, about north-to-south, is unclear, as the southern wall of the structure does not survive). Postmolds were set within wall trenches with widths an average 5.7 inches across and spacing averaging 6.9 inches. These metrics, which indicate similarities to Feature 1030, strongly indicate bent-post construction. A pit (Feature 1039) also lies just outside of this structure (Whitmer 1987:Table 16), and, being at about the same elevation, may be associated.

### *Village*

Given the poor quality of scanned maps obtained from this part of the site (Figure 12), little analysis of posthole diameter or spacing was conducted for the structures in the Baptiste Village. Such analysis was tested for Feature 169, from which it was concluded that further analysis would be fruitlessly imprecise. Despite an effort by Beverly Nuschler at the Louisiana State University Museum of Natural Science to find the original WPA map, it was not

uncovered. As a result, I can only provide a description of the shape, dimensions, and presence or absence of a wall trench for the structures found in this part of the site. Structures mostly appeared to be bent-post in construction, because each appeared to feature relatively small postholes closely spaced about an interior that featured no sign of support posts. Except in places where structures intrude, it is difficult to understand the relative chronology of each structure's construction, and, without greater analysis of the site's ceramics, it is difficult to place the structures within an absolute time of construction. Two hearths (fire basins) were found at the periphery of the structures, along with a variety of pit features.

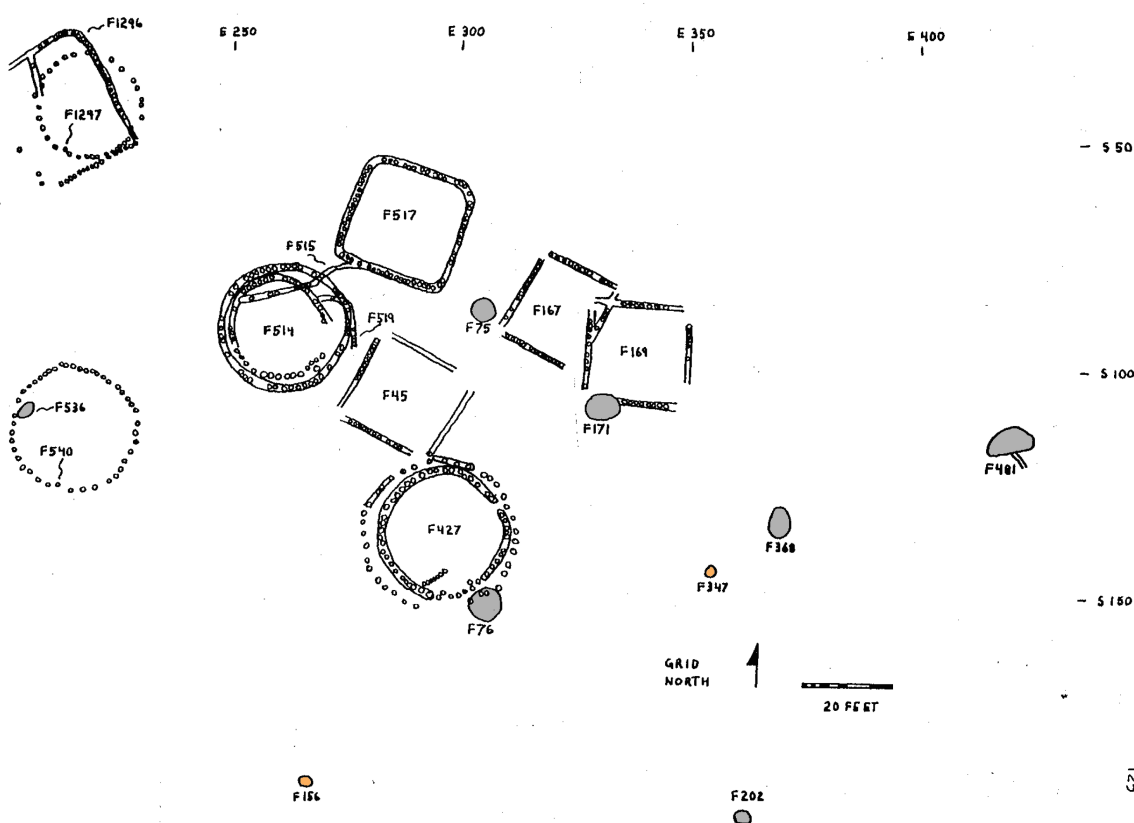


Figure 12. Baptiste Village. Hearths are colored orange; pit features are colored gray. Adapted from Whitmer (1987:Figure 39).

*Feature 45.* This structure was open-cornered and square. It featured wall trenches and had dimensions of about 23 by 21 feet.

*Feature 167.* This was an open-cornered square structure with wall trenches, with dimensions about 21 by 18 feet. A pit is closely associated to the west.

*Feature 169.* This structure was an open-cornered square structure with wall trenches, with dimensions about 23 by 22 feet. It intrudes upon the north of Feature 167. Image analysis of the low quality map resulted in a tentative post diameter of 14.56 inches. This was found to be outlandishly high for such a small structure with closely spaced posts (evident from the map). Given the imprecision inherent in the low-resolution image, further image analysis was foregone. Because the resolution was so small that it was impossible to precisely differentiate between each individual postmold within the wall trench of this structure, analysis of median postmold spacing was not attempted. A pit overlies part of the southern wall trench and therefore postdates the structure.

*Feature 427a.* This was a circular wall trench structure with a diameter of about 28 feet. Depending on the chronology of construction, it may be associated with a pit to the south.

*Feature 427b.* This was a circular wall trench structure (the wall trench was partially uncovered) with diameter about 34 feet. This structure circumscribes Feature 427a, and may have been intruded upon by that structure, given the poor state of its wall trench. It intrudes upon a pit in south, which must predate the structure.

*Feature 514.* This was a circular wall trench structure with a diameter of about 22 feet.

*Feature 515.* This was a wall trench that intruded upon Features 514 and 516, and connects to the wall trench of Feature 517. Interpretation of this feature is impossible without more information.

*Feature 519.* This was a circular wall trench structure with a diameter about of about 29 feet, which circumscribed Feature 514. The wall trenches of the structure overlap on the east end.

*Feature 517.* This was a square wall trench structure with closed corners and dimensions about 25 by 24 feet.

*Feature 540.* This was a circular structure with no distinguishable trace of a wall trench. It measured about 27 feet in diameter. Within the structure is a pit feature.

*Feature 1296.* This was a rectangular wall trench structure with closed corners (two are apparent). It seems to have been intruded upon by another wall trench structure in the north wall. The wall trench was not found on the southeastern wall of the structure, and the western wall was barely evident. It had approximate dimensions of 29 feet by 24 feet.

*Feature 1297.* This was a circular structure without evidence of a wall trench. It measured approximately 27 feet in diameter, and was intruded upon by Feature 1296.

## Gordon

The maps used for this site, which were taken from small figures in an issue of *American Antiquity*, were probably not precise enough for dependable assessment of post diameter. All features, except for Feature 5, a large circular enclosure and Feature 6, exhibited signs of bent-post construction, but calculated postmold diameters were too large to allow for such a method to be followed. Numbers in parentheses represent those presented by John L. Cotter in his 1952 article about the Gordon site, as opposed to those obtained from image analysis. Unfortunately, he did not provide information about post diameter.

### *Mound B Zone 1*

Three structures were found at this level of Mound B. Two rectangular structures were built over a large circular enclosure (Figure 13).

*Feature 3.* This structure (Figure 14), with an open-cornered rectangular shape measuring about 28 by 20 feet (27 by 20 feet), featured postmolds a median 8.7 inches in diameter. The postmolds were spaced a median 6.8 inches apart. The close spacing of the postmolds, the open cornered wall trenches, and the lack of possible support posts in this structure would seem to indicate a structure similar in form to the Mississippian bent-post structures examined by Lewis and Kneberg (1995), Lacquement (2004), and other authors. However, the postmolds have a diameter greater than that found in the Mississippian bent-post dwellings. This set of circumstances may indicate that the postmolds were not an accurate reflection of post size, but probably indicates that the processing of the low-resolution site map increased the apparent

diameter of the postmolds. As measured, the structure could not have supported a roof as a rigid-post dwelling, as no support posts were evident.

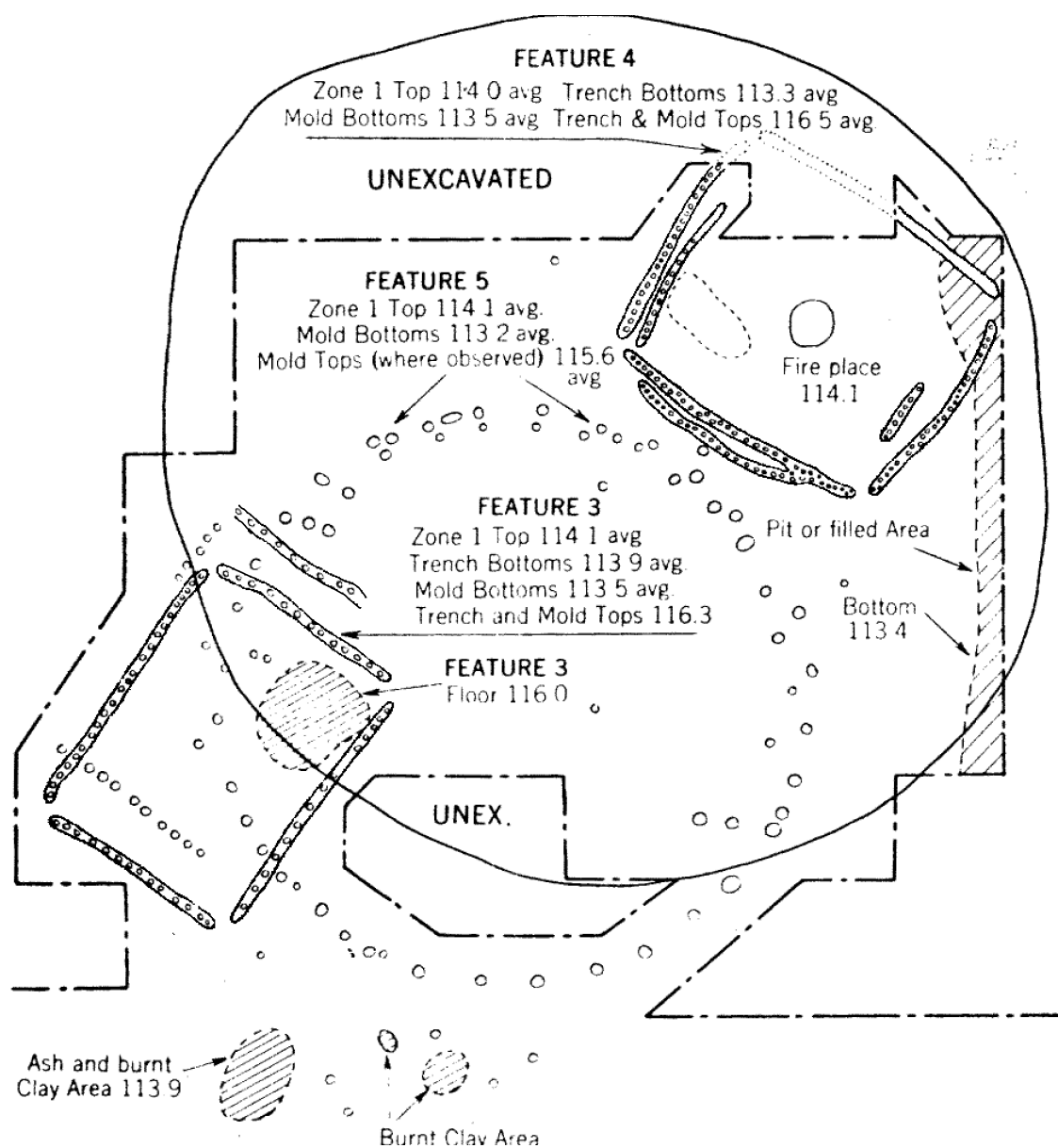


Figure 13. Architectural Evidence from Mound B, Zone 1, Gordon site. Excerpted from Cotter (1952:Figure 53).



The structure, which was associated with ceramics from the Coles Creek-Plaquemine transition (Cotter 1952:119), intruded upon a previous wall trench, with similar postmold size and spacing, to the north. Feature 3 might have intruded upon another structure to the south, which had no visible wall trench and posts that averaged 12.2 inches in diameter and were spaced a median 6.5 inches apart. All these features and Feature 3 postdate Feature 5, upon which they themselves intrude. Cotter found evidence that the building was burned on a part of the floor (1952:114).

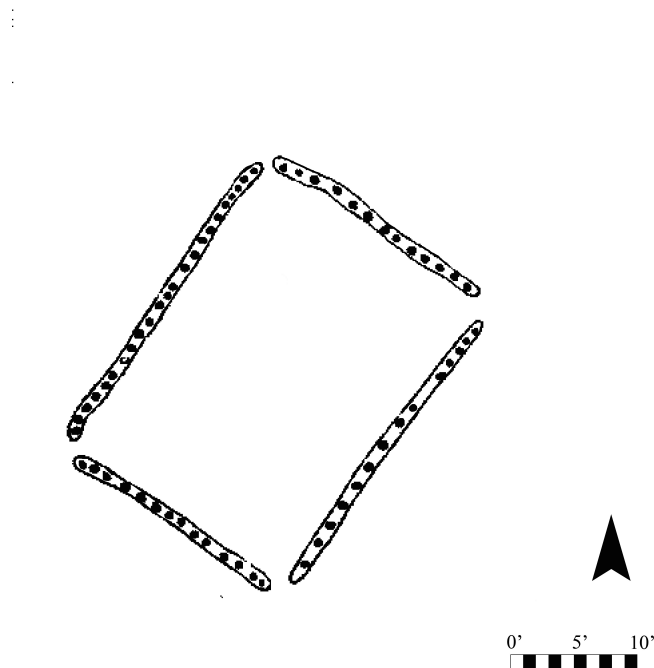


Figure 14. Mound B, Zone 1, Gordon site. Adapted from Cotter (1952:Figure 53).

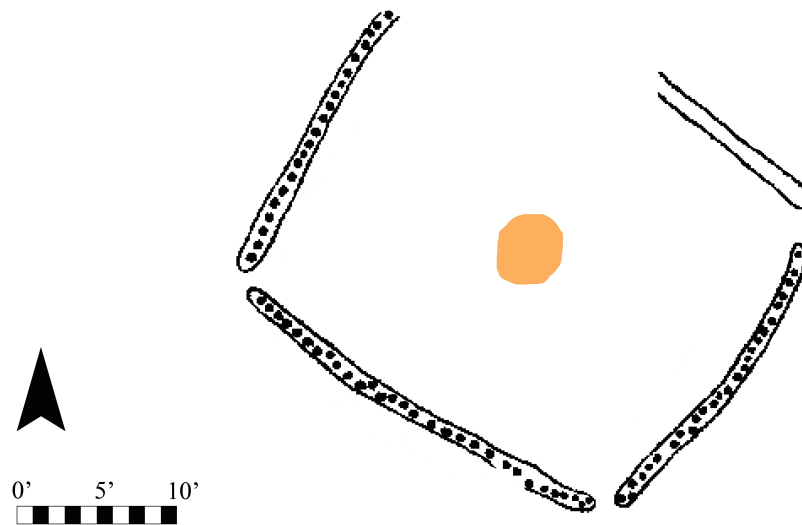


Figure 15. Feature 4a, Mound B, Zone 1, Gordon site. A hearth, possibly associated, is colored orange. Adapted from Cotter (1952:Figure 53).

*Feature 4a.* This structure was part of that identified by Cotter as Feature 4. Based on the angle of the wall trenches, Feature 4 has been subdivided into two structures in this study. Both structures had been destroyed by fire, and charred posts remained in postmolds. The postmolds for Feature 4a (Figure 15) were a median 6.8 inches in diameter and were spaced 3.3 inches apart. The structure was 30.5 feet by 25.5 feet in dimension (27 by 23 feet). This structure was rectangular with open-cornered wall trenches and walls bowed slightly outward. All indications except post diameter indicate bent-post construction. Given the excellent preservation of the posts, except on the northeast wall of the structure where no posts were evident near an intruding borrow pit (Cotter 1952:114), postmolds should have been easy to accurately define. Either this structure, despite all indications, used rigid posts, or the map used to measure diameter was

inaccurate. The latter is more likely. This structure dates from after Feature 5, based on pottery associated with the structure's floor. A circular fire pit is associated with this structure (Cotter 1952:114-115).

*Feature 4b.* Cotter identifies the walls of this structure as either double walls for Feature 4a or a separate construction. Given that the walls of Feature 4b do not line up well with those of Feature 4a, the latter scenario is by far the most plausible. Feature 4b was another rectangular construction with open-cornered wall trenches and walls that bowed outwards. It was slightly smaller than Feature 4a, with only one identifiable dimension of 25 feet, given that only three walls of structure are preserved. Postmolds were of equivalent size, at a median of seven inches wide, and spacing was also equivalent at a median 4.6 inches. Feature 4b, when standing, likely had nearly identical characteristics to those of Feature 4a, and was probably built just previously or afterward, given the close association of the two structures' walls. It may have been associated with the hearth that has been linked to Feature 4a, but the hearth is not centered as well in the structure.

*Feature 5.* This feature (Figure 17) contains individually-set postholes arranged in a circle about 55 feet in diameter. Postholes are a median 14.2 inches across and spaced a median 40.1 inches apart. The postholes are not associated with any floor, but pottery within the mound fill beneath the structure tentatively dates the slightly earlier than the rectangular features on the same level (Cotter 1952:114-115). As stated above, two child burials are associated with the fill beneath the structure. The great width of the posts of this structure, as well as their wide spacing indicate that it was necessarily of rigid-post construction; however, the interior of the structure is

free of postholes, which indicates that no roof was present, especially given the size of the structure. All evidence points to this structure being a circular enclosure of large posts. The precise geometry of the enclosure is remarkable.

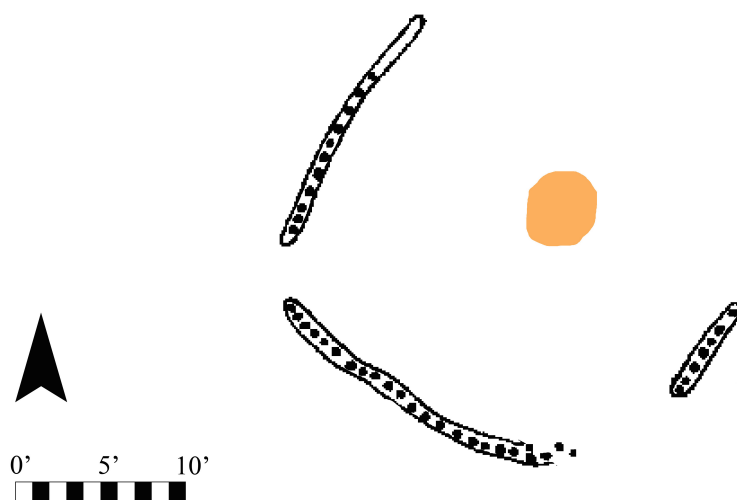


Figure 16. Feature 4b, Mound B, Zone 1, Gordon site. A hearth, possibly associated, is colored orange. Adapted from Cotter (1952:Figure 53).

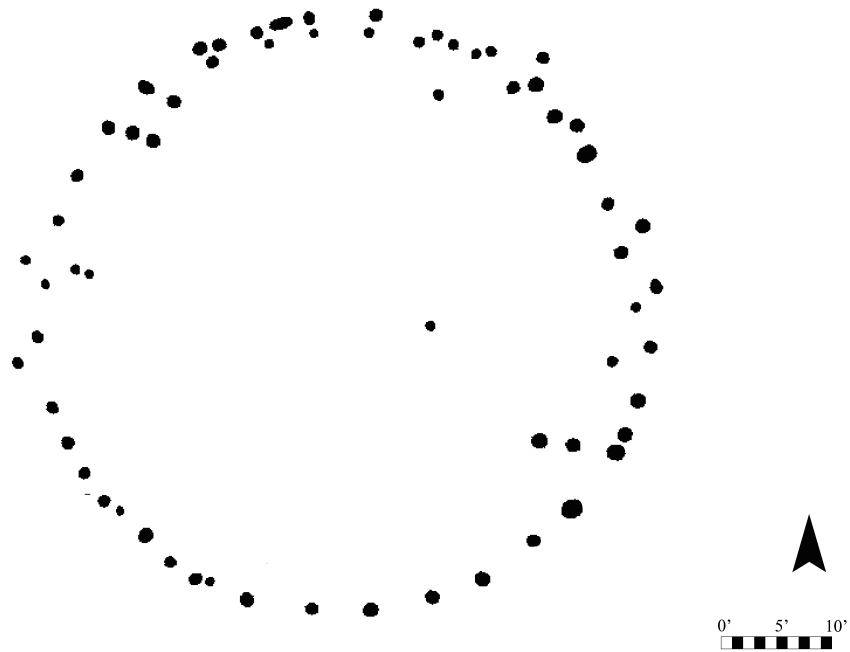


Figure 17. Feature 5, Mound B, Zone 1, Gordon site. Adapted from Cotter (1952:Figure 53).

### *Mound B Zone 2*

These partial structures (Figure 18) were discovered at different elevations within Zone 2, the region of fill above the previous four structures.

*Feature 6.* Cotter linked three strings of individually-set postholes to form this structure (Figure 19), which consists of postholes that are an average of 10.2 inches wide and spaced apart 11 inches. These postholes seem to indicate a rectangular structure extending 33.5 feet northwest to southeast. This structure seemed to center around a fire basin (Cotter 1952: 115), but that basin was constructed significantly higher than the tops of the structure's postholes, as

discovered during excavation. The basin may still be associated, as the postholes were probably discovered below the original mound surface. Based on the post size (accounting for some overestimation due to map processing) and spacing obtained from the published map, Feature 6 lies in the middle between bent-post and rigid-post construction. Given no evidence of support posts and the open-corner arrangement of posts, which would have aided in bent-pole construction, it seems more likely that Feature 6 had a bent-post form.

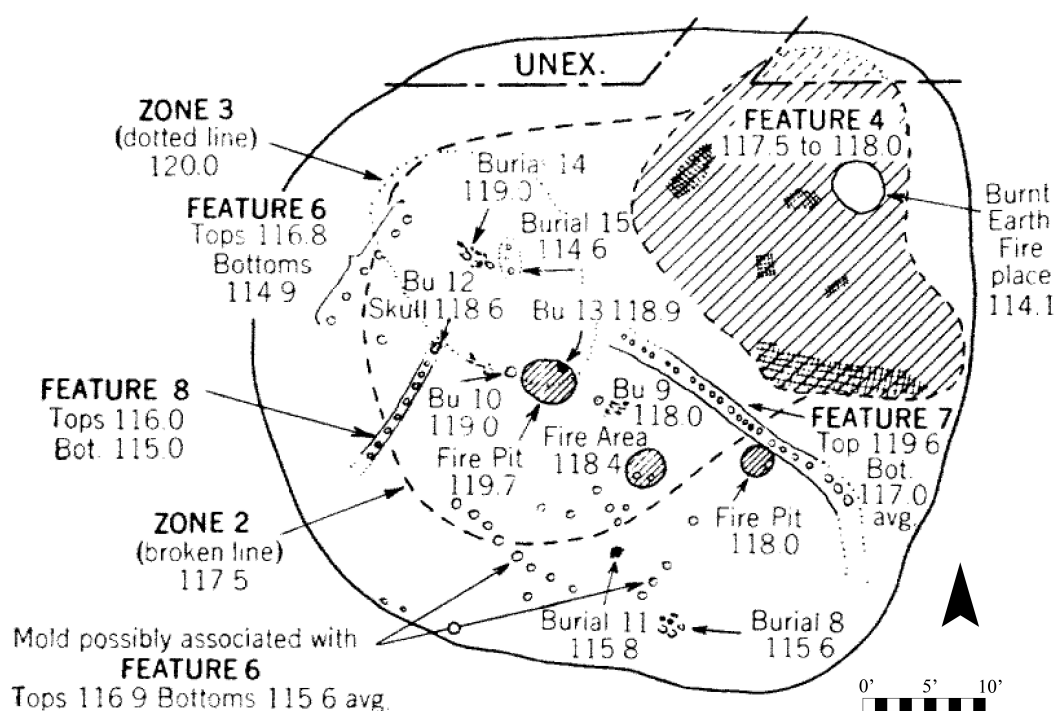


Figure 18. Features found at Level 2, Mound B, Gordon site. Excerpted from Cotter (1952:Figure 53).

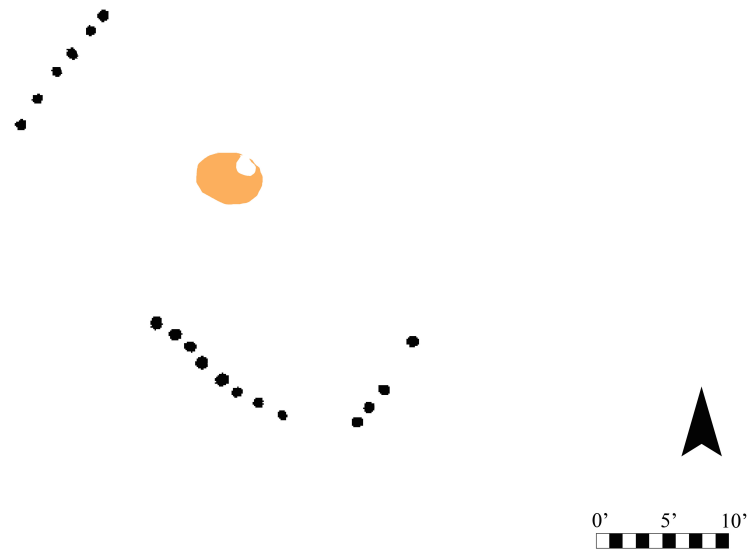


Figure 19. Feature 6, Mound B, Zone 2, Gordon site. A hearth, possibly associated, is colored orange. Adapted from Cotter (1952:Figure 53).

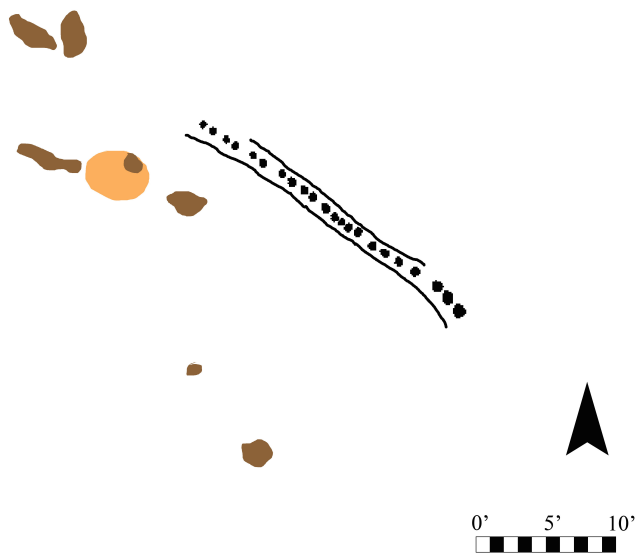


Figure 20. Feature 7, Mound B, Zone 2, Gordon site. A hearth and burials, possibly associated, are colored orange and brown, respectively. Adapted from Cotter (1952:Figure 53).

Feature 7. This feature (Figure 20) is a row of postmolds within a wall trench. The postmolds are an average of 7.6 inches wide, spaced by an average distance of 5.8 inches. This means that the postmolds are positioned in a manner that would describe bent-post architecture but are too large to hold flexible posts. This is a problem that seems universal at Gordon site and is probably the result of imprecision in map analysis, rather than the actual characteristics of the prehistoric structures. These postmolds were found beginning 2.8 feet above those of Feature 6 in the mound fill. This structure may have been associated with a hearth, as well as a number of burials found in the fill below.



Figure 21. Feature 8, Mound B, Zone 2, Gordon site. Adapted from Cotter (1952:Figure 53).



*Feature 8.* This structure (Figure 21), like Feature 7, is a string of postmolds within a trench. The postmolds have a median diameter of 8.1 inches and are spaced a median 9.2 inches apart. These postmolds are slightly larger and spaced slightly wider than those found in Feature 7. The postholes were also found 3.6 feet below those of Feature 7 (Cotter 1952:Fig. 53). Like the postmolds in Feature 7, these postmolds are positioned in a manner that would describe bent-post architecture but are too wide to have held suitable posts. Considering the likelihood of post-size overestimation, Feature 8 was likely part of a bent-pole structure.

## **Greenhouse**

Measurements in parentheses for this site are those referenced by James A. Ford in his 1951 report on the WPA excavations at Greenhouse, as opposed to those obtained from image analysis.

### *Mound A*

*Mound A Level 6.* This level of Mound A featured postholes that formed the remnants of a circular structure a little more than 35 feet in diameter (Figure 22). Posts were set individually, spaced a median 23.6 inches apart, with postholes having a median width of 13 inches. Ford noted that the postholes, arranged in what he called “an irregular circle,” appeared to be arranged in close-set pairs, with each pair separated by about two feet (Ford 1951: 36). This pattern, however, is very difficult to discern except to the north of the structure, where four postholes are separated from others and paired. Although no hearth was found, burned patches were evident on the mound surface in three places within the structure (Ford 1951: 36). The wide diameter of postholes on top of Level 6 indicates that rigid-post construction was likely the only possibility. An inner ring of postholes may indicate possible roof supports, but the north side of this inner

ring actually lines up with the south side of the outer ring, indicating that the wall may have curved in on itself. The inner ring may also be evidence of rebuilding on Level 6.

Given the irregularity of the postholes and the absence of roof supports, it is possible that, rather than a roofed structure, these postholes could represent a post enclosure or represent screens or other light earthfast structures. Some of the postholes, such as the paired postholes, could have ritual origins, as examined in the next section.

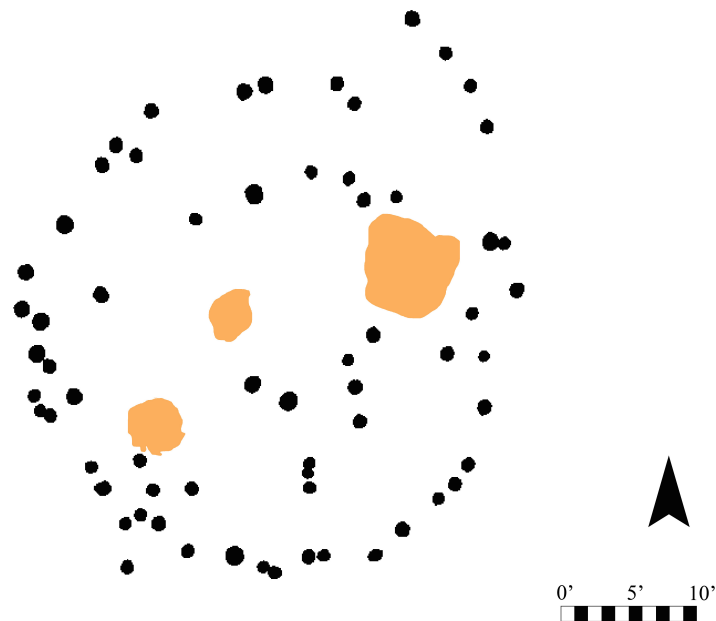


Figure 22. Greenhouse Mound A, Building Level 6. Areas of burned are clay colored orange. Adapted from Ford (1951:Figure 6).

*Mound A Just Under Level 7.* For excavators, Level 7 of Mound A “proved a very uneven surface that was poorly defined and difficult to trace” (Ford 1951:36). This is probably one of the reasons why the structure discovered at Level 7 was only apparent six inches below the old mound surface. For this reason, it is probable that the postholes found may be of a smaller

diameter than they would be if discovered at a higher point, as the posts once contained likely had tapered ends. Postholes at this level indicate a circular structure with a diameter of between 33 and 34 feet (Figure 23). The postholes are an average of eight inches in diameter and placed individually. Postholes are spaced an estimated median of 19 inches apart, but walls are so unclear that this value is probably not well founded. There are no clear candidates for postholes of roof supports; the largest posts are actually found at the periphery, not the apparent ring of posts. Posthole size and spacing, given that size is probably underestimated, indicates a likely rigid-post construction. However, post size may also have been augmented again, due to the image processing, placing the postholes within a range that may have accommodated posts less than six inches in diameter. A lack of candidates for roof support posts, which would have been sizable and deeply buried also complicates the idea of rigid-post construction, so assuming that some posts may have been missed on this poorly-defined level, this structure could have been a bent-post structure, if post spacing was, in actuality, narrower.

There is a case to be made that the postholes at this level may not represent a roofed construction at all, but rather are the result of an extended period of post-setting, in which a few posts were placed at a time, perhaps to generate an enclosure of posts. The posts do not form well-defined wall, and second, the postholes are of inconsistent size, indicating that posts might have been placed at different times by different people. Alternatively, they may have been part of screens or other light structures.

A well-made fire basin, four feet deep and two feet wide, was found on the floor of Level 7 (Ford 1951:36). If such a hearth was generally only found indoors, this would be strong evidence of the existence of a roofed structure. However, these sorts of fire basins are occasionally in outdoor settings, as indicated in the Village at Baptiste site (Figure 12).

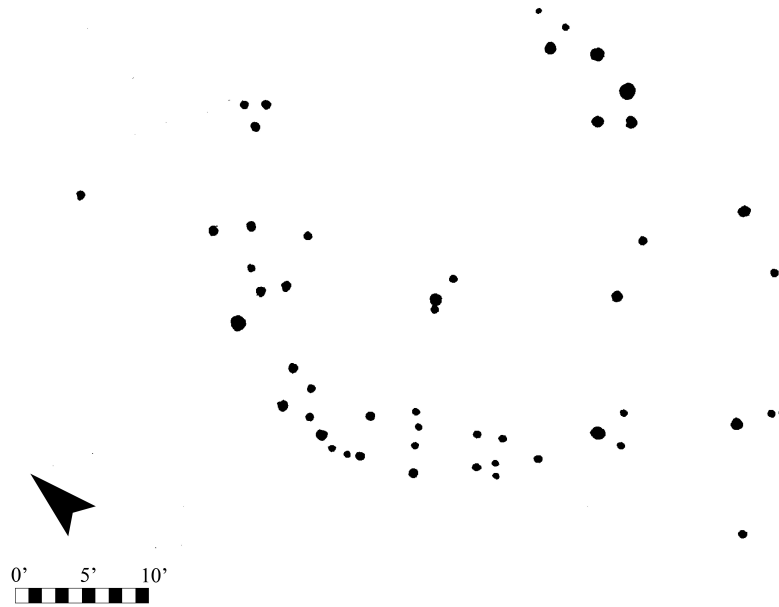


Figure 23. Greenhouse Mound A, features just under Building Level 7. Adapted from Ford (1951: Figure 7).

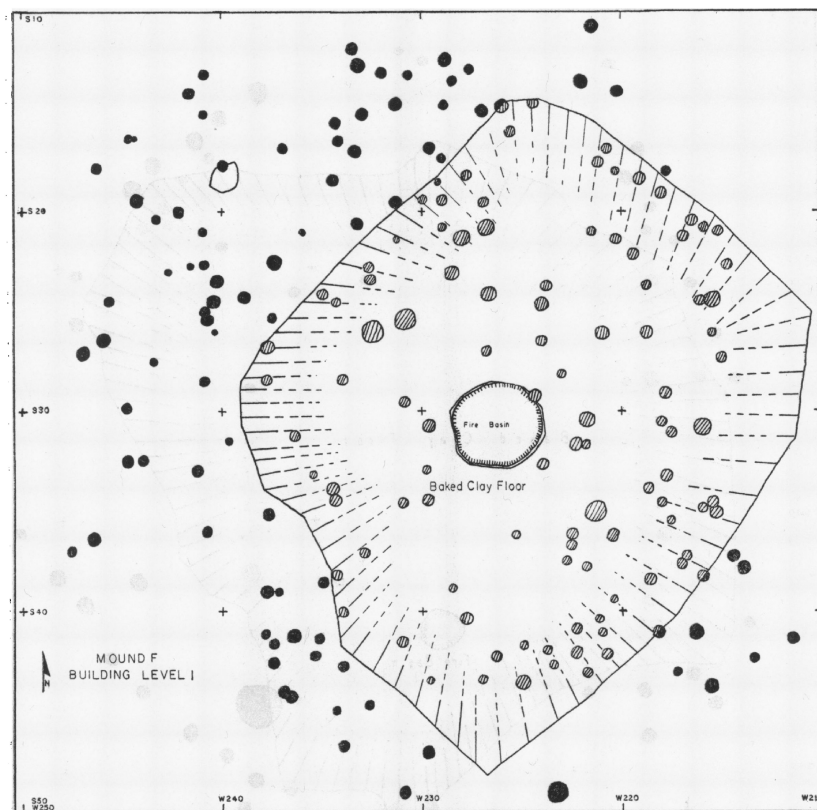


Figure 24. Greenhouse Mound F, Building Level 1. Image from Ford (1951: Figure 9).

## *Mound F*

*Mound F Level 1.* This level featured an almost indecipherable array of posts with a median diameter of a little over seven inches (4-8 inches), based on the published map (Figure 24). Despite Ford's claim that a "baked clay floor" was associated with this structure (Ford 1951:41), all posts that overlap with the floor seem to have originated beneath it. This may indicate that the floor postdates any structure, although posts from beyond the edges of the burned floor may have made up the walls of a structure contemporaneous with the floor. Ford notes a layer of refuse over the burned floor (Ford 1951:39); if this included charred building material—no mention was made of such a finding—that would have provided strong evidence of a structure and have explained how the floor had become burned. Had a structure been burned and the debris immediately covered with earth for the next mound stage, the clay beneath would have been fired to some extent.

Ford interprets the structure at this level as having a rectangular shape, but he recognized such an assertion was uncertain (Ford 1951: 41). The posts were individually set and span an area about 30 feet across. Some large posts toward the center may have acted as roof supports, but they do not seem to be regularly arranged. A hearth or fire basin was associated with the floor, which was measured at 4.5 feet wide and 10 inches deep (Ford 1951:39); this is evidence that makes it more likely that the floor was associated, in some way, with a structure, although outdoor hearths of this type exist at Baptiste site. Postholes are scattered relatively widely, but they fit within a width range appropriate for bent-post construction. It is possible that many postholes were overlooked during the excavation.

Given the confused pattern of postholes at this level, iterative image analysis was conducted on the map of this level, in order to piece out any wall patterns. By isolating posts of

similar diameter, it was discovered that some of the posts seem to have been arranged in pairs, including the two largest posts on the map (Figure 26). No distinct wall patterns were identified, although an S-shaped pattern became apparent towards the south of the structure.

When all posts underneath the clay floor were removed, A few apparent walls appeared (Figure 25). When postholes between six and eight inches in diameter that lay outside of the floor were isolated, two apparent post alignments appeared, but, as few posts were found along the northeast and southeast of the structure, these tentative wall alignments were very incomplete. With posts spaced about three feet apart, these walls would indicate rigid-post construction, but no possible support posts were found that passed through the baked floor. When the postholes six-to-eight inches across were taken out of the map, two alignments of slightly wider postholes became apparent to the north of the structure, which were spaced slightly closer together. When these alignments were examined on maps with all postholes present, some alignments could be continued (Figure 26).

Prezzano's methods were also applied to the postholes on this level (Figure 27). Linkages of certain lengths, between postholes within defined diameter ranges, again linked some of the identified pairs of postholes. Links between posts less than nine inches in diameter spaced less than 1.5 feet apart revealed a few parallel alignments in the northwest part of the map. The links also verified the S-shaped alignment to the south of the map. This analysis was unsuccessful at finding any longer alignments that clearly delineated a structure. Perhaps some of the small alignments, such as those in the northwest and the "S" shaped pattern to the south, represent light constructions, such as screens and racks, rather than buildings. The parallel alignments to the northwest could represent successive screen construction. Some of the largest posts, sometimes arranged in pairs, could be evidence of ritual post-setting.

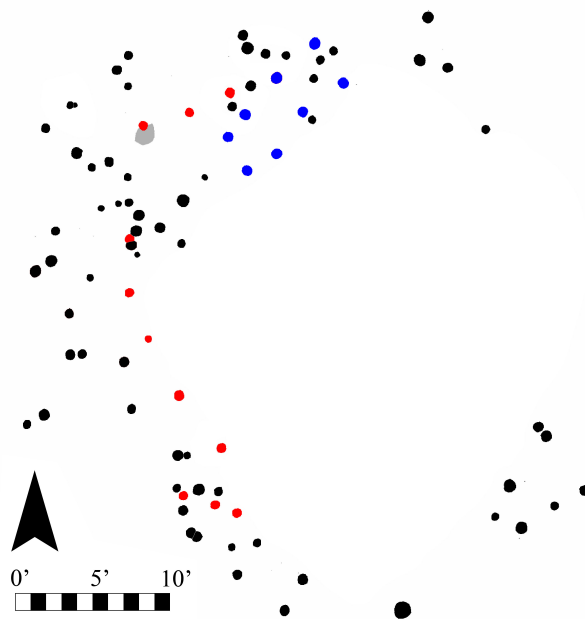


Figure 25. Greenhouse Mound F, Building Level 1, with all sub-floor posts removed, showing discovered alignments. Alignments of posts between 6 and 8 inches in diameter are colored red. Alignments of larger posts are colored blue. A small pit is indicated in gray. Adapted from Ford (1951:Figure 9).

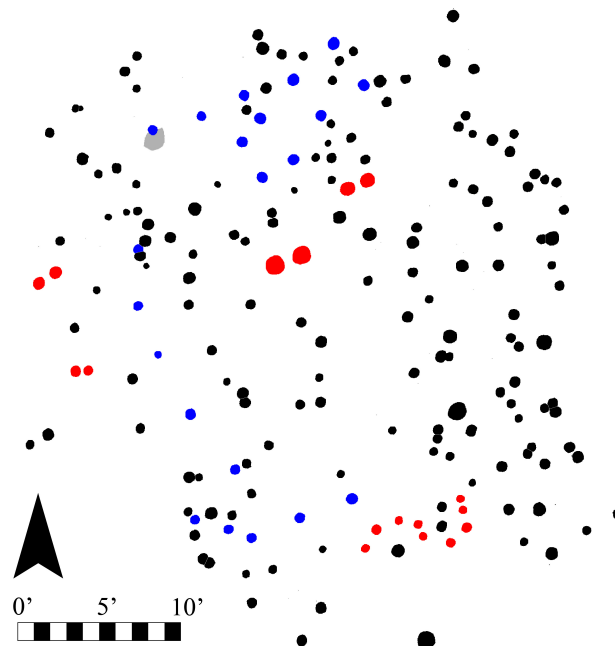


Figure 26. Greenhouse Mound F, Building Level 1. This image shows paired posts and an S-shaped alignment in red. Alignments from Figure 25, extended with additional posts, are colored in blue. Adapted from Ford (1951:Figure 9).

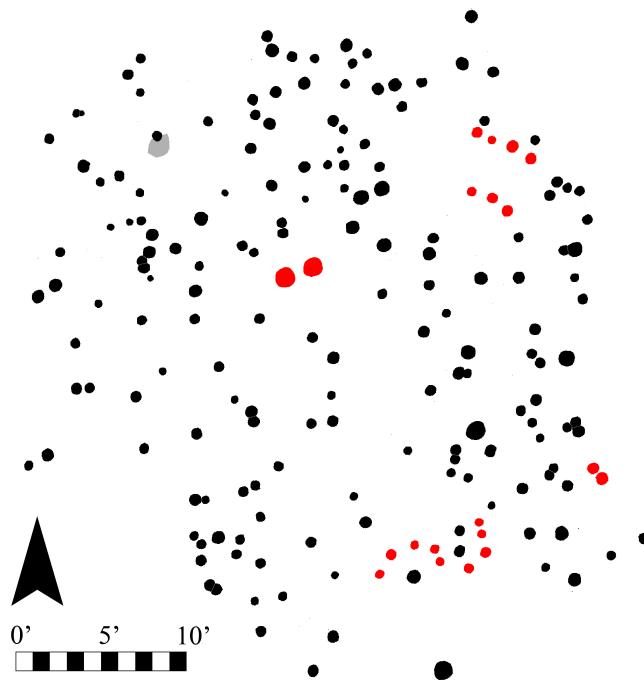


Figure 27. Greenhouse Mound F, Building Level 1. Alignments and possible paired posts resulting from Prezzano analysis are colored red. Adapted from Ford (1951:Figure 9).

*Mound F Level 3.* Postholes on this level were individually set with an average diameter of 7.1 (6) inches and spaced a median 14.7 inches apart. Postholes form lines that seem to indicate a rectangular structure bordering a fired clay floor (Figure 28). Ford estimated the dimensions as running 24 feet along a southwest axis and 26 feet at a right angle to that (Ford 1951:41). Measured from the published map, it is approximately 28 feet square. As with the structure at Level 1 of Mound F, few postholes penetrated the clay floor; most postholes, which overlapped the floor, began beneath it. This may indicate that the postholes mostly dated from before the construction of the floor, but it is possible that postholes beyond the edges of the fired surface were contemporaneous. A hearth was found on the southern portion of the clay floor.



One posthole, greater than a foot in diameter, lay just inside the southeastern row of postholes and may not be associated with any structure, due to its anomalous size.

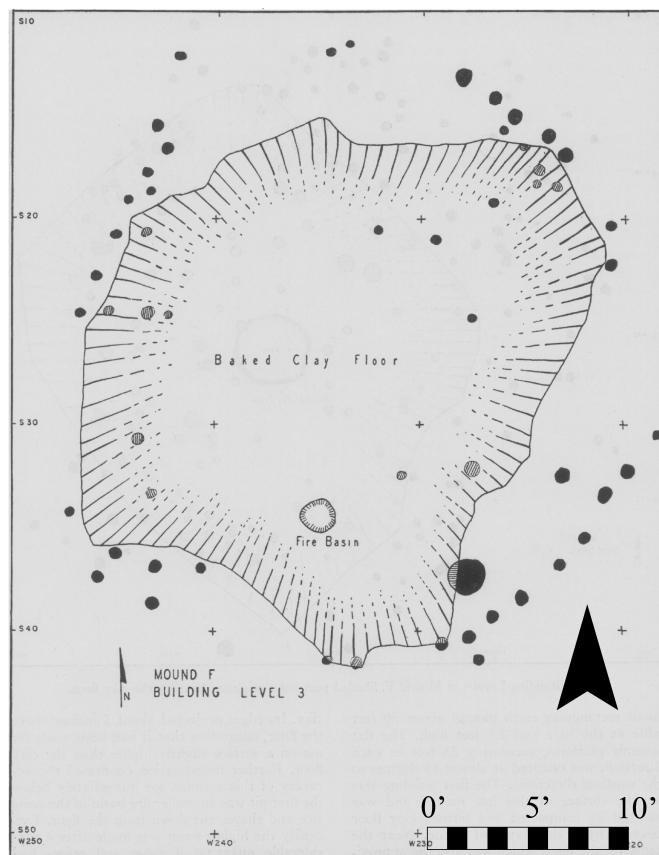


Figure 28. Greenhouse Mound F, Building Level 3. Image adapted from Ford (1951: Figure 10).

The postholes in this structure present the same problems as at Level 1 of the mound: the postholes seem to indicate bent-post construction, in terms of their width, while posthole spacing may indicate rigid-post construction. The absence of apparent support posts is equally confounding. It is likely that the postholes were discovered well beneath the prehistoric mound surface, as the postholes only became apparent “3 to 4 inches” beneath the level of the floor. Perhaps the postholes had already begun tapering at that level and therefore the excavations underestimated the post size for the structure. If post size was originally larger than indicated, a

roofed structure would be made more unlikely in the absence of roof supports, given the necessity for rigid-post construction.

Structural problems with posthole characteristics, paired with the uncertainty that these postholes were even associated with the clay floor, in addition to the fact that the alignments of postholes are not even parallel and do not seem to form discrete corners, come together to indicate that the postholes may not represent a roofed structures at all, but, like levels of Mound A and Mound F, light post constructions and ritual post placement. The single large posthole is an excellent candidate in support of ritual post-setting, as the postholes involved in this activity were often unusually large (Kassabaum 2014: 343).

### *Mound D*

*Mound D Submound.* A circular structure (Figure 29) was evident underneath Mound D that featured posts with an average eight inches in diameter and spaced an estimated median of 8.5 inches apart. The structure had an approximate diameter of 30 feet. These posts were at least partially placed in wall trenches, and the presence of multiple wall trenches to the west and south of the structure likely indicates rebuilding. Posts overlay a bathtub-shaped pit to the south, and a pit to the north, part of evidence of frequent cultural activity underneath Mound D (Ford 1951: 45). Large posts with a diameter of over 15 inches lie within the southern portion of the structure. They may precede or supersede the structure, given their incongruous diameter, and not be contemporaneous with the other postholes.

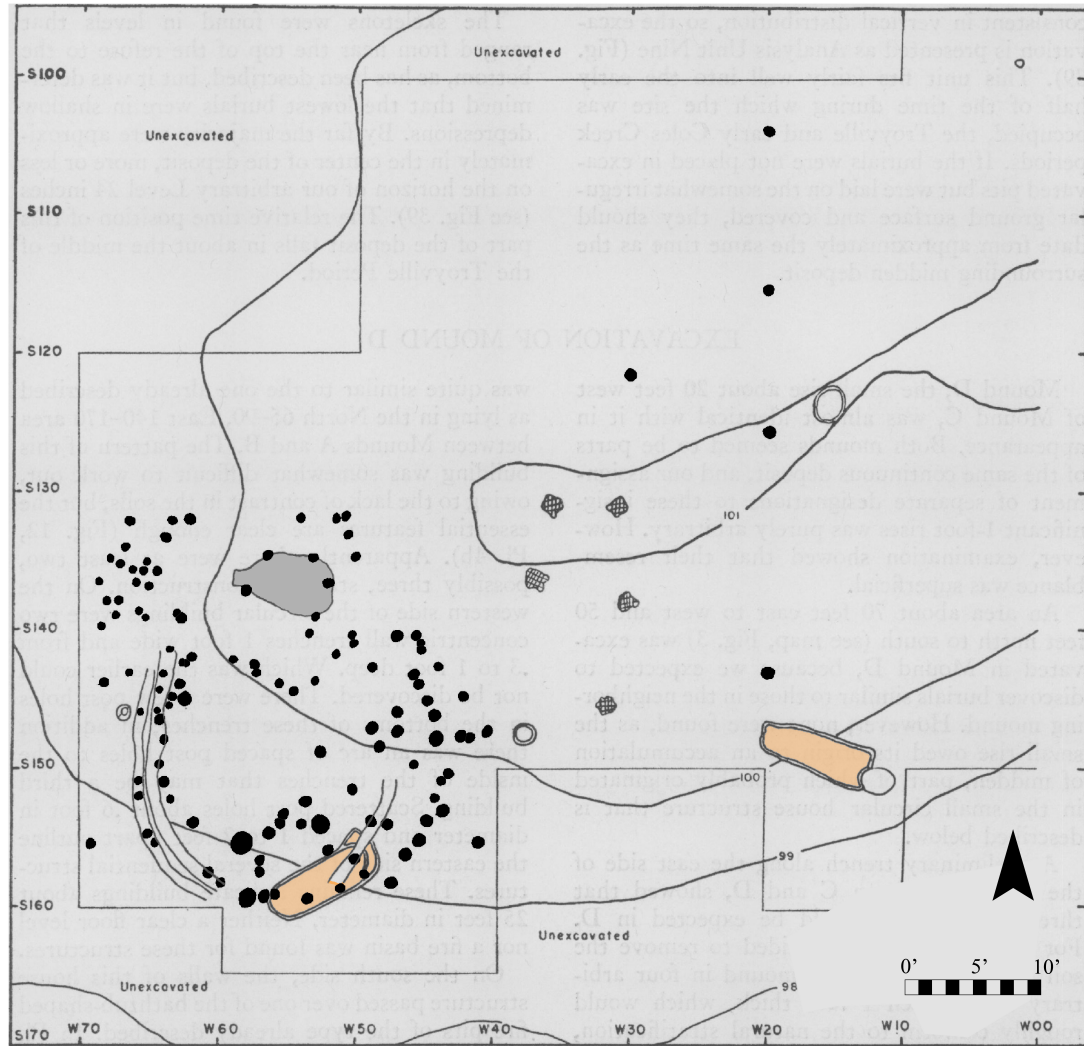


Figure 29. Features under Greenhouse Mound D. Pit features are colored gray. Bathtub-shaped pits are colored orange. Adapted from Ford (1951:Figure 12).

In general, the postholes are of greater size toward the southeast part of the structure. Because of the lack of contrast in the soil (Ford 1951:45), WPA laborers may have excavated lower before seeing posts in northern units containing the structure. Or, it is possible that the larger posts indicate another period of construction. Larger postholes seem to align poorly with the wall trenches and likely supersede them to the south of the structure. The only posts that seem to align with or sit in the trenches are of smaller diameter to the north of the structure. It

seems these two sets of posts may represent two different periods of activity, a first period, which involved the construction of a wall trench building, followed by a later period, in which larger posts were set in curved alignments that may not have formed a structure themselves but traced the walls of the previous structure. It is the intrusion of these later, larger posts that probably explains why excavators were not able to trace the wall trenches farther around southern and eastern sides. Support for contemporaneous extra-structural post-setting activity exists to the east of the structure in the form of a number of widely spaced postholes, which seem to form an alignment.

Because many of the postholes should actually be classified postmolds (even though only one part of the wall trench was traced by the excavators, likely due to the low soil contrast, it probably continued around the structure), the structure may have been of rigid-post construction, as a post with a diameter of 8-inches is too large to be bent easily. Close spacing of postholes could have been the result of rebuilding, rather than being characteristic of bent-post construction. In addition, a few of the posts scattered within the interior of the structure may have served as support posts, although no clear candidates stand out.

However, it is probably that posthole size is exaggerated a little because of the limited map resolution. Keeping this in mind, and noting the absence of regularly arranged support posts, bent-post construction actually seems more likely for this structure. The presence of wall trenches that form a nearly semicircular shape strongly support the existence of a structure, despite contradictory evidence of construction, which was shed doubt on the structural nature of postholes on other Greenhouse mounds.

A cloud of small postholes to the north of the structure could represent a lightly constructed shelter, perhaps akin to the Hiwassee Phase arbors attached to public buildings that

Lewis and Kneberg note (Lewis and Kneberg 1995:66-67). Those small posts could also represent other types of light construction.

## **Nick Farm**

Measurements in parentheses represent those from Cherie Schwab's 1998 thesis. As Schwab was working from the original maps, her measurements may have a sound basis, but her methods, which were not published in detail, may not have used a precise method to come up with average measurements. Measurements, whether obtained from digital image analysis or from the text of Schwab's thesis are generally close enough that the difference does not matter for interpretation.

### *Mound A*

*Feature 274.* This structure (Figure 30) has a rectangular form with postholes of a median 6.6 (6) inches in diameter, with a median spacing of 3.9 inches (2-6 inches). The structure has dimensions of about 26 feet by 24 feet, with closed corners. Three postholes in the middle of the structure were greater than 10 inches in diameter. These may have held supports of some kind, but they were asymmetrically placed within the structure. A line of postholes spaced wider than the postholes of the wall itself—at a median 11 (6-12) inches apart—ran west from the northeast corner of the structure. Schwab interprets this as a possible windscreen or privacy wall for an entrance (Schwab 1998:22).

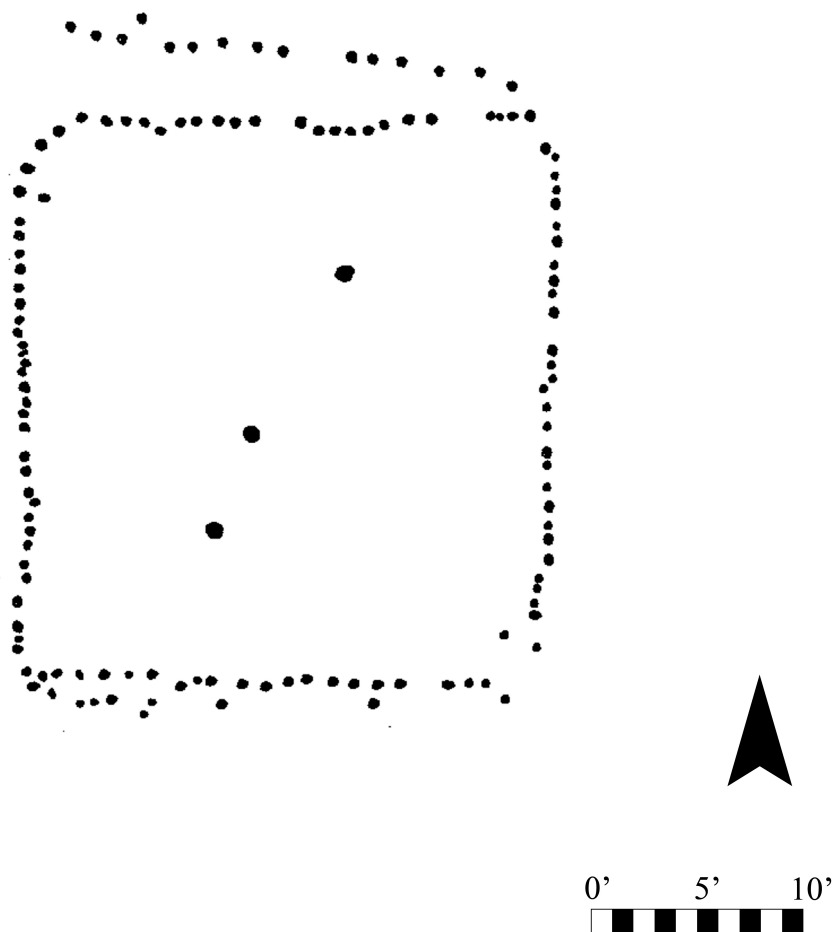


Figure 30. Feature 274, Mound A, Nick Farm site. Adapted from Schwab (1998:Figure 2).

These postholes are slightly wider than some of the posts in the building but are of similar size to others. When all postholes less than six inches in diameter are removed from consideration, it becomes clear that this extraneous line may actually connect with the eastern wall of the structure, becoming part of a line of evenly-spaced postholes that extends down the eastern wall (Figure 31). This line of postholes has a spacing comparable—14.6 inches, compared to 11 inches—to that of the extraneous wall, but smaller postholes were placed in between the larger ones in the eastern wall of the structure, obscuring that fact. This connection

between the extraneous and eastern walls may lend some insight into the construction of the dwelling. Perhaps, rather than a windscreen, the extraneous line of postholes represented an aborted wall, for which posts were pulled when the line of posts was adjusted to a more appropriate angle.

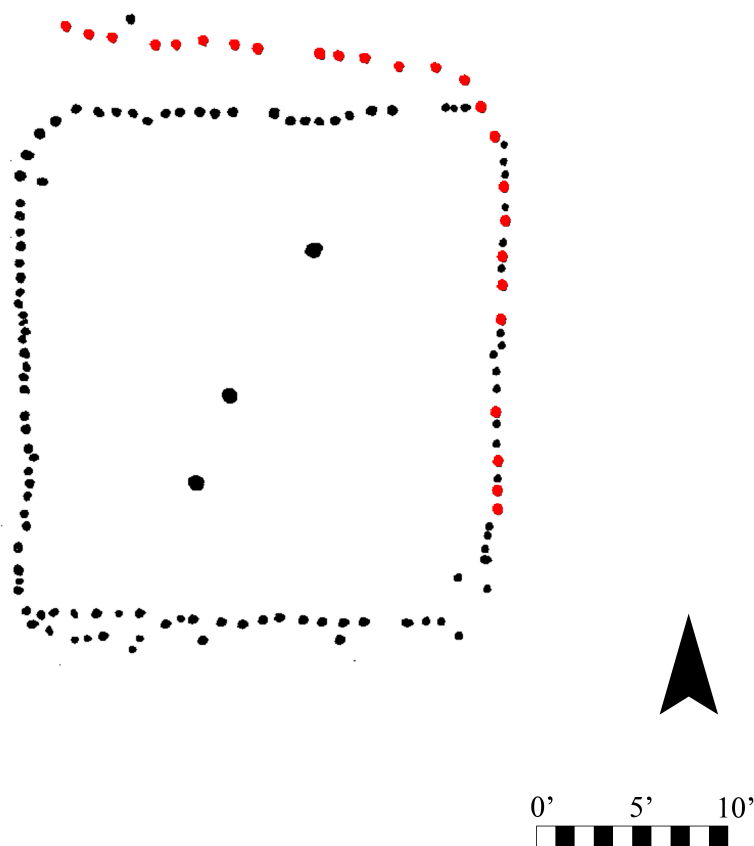


Figure 31. Posts (in red) with diameters greater than six inches extend into the eastern wall of Feature 274 from the extraneous wall. Adapted from Schwab (1998:Figure 2).

The size of the posts and their spacing almost certainly indicate that this was a bent-pole structure. The posts were closely spaced and, because postholes overestimate the diameter of the post, the posts could easily have been in a range of widths suitable for bent-post construction. According to Schwab, this structure was associated with a few diagnostic sherds that indicated

flat-bottomed storage vessels. For this reason, in the absence of evidence of a hearth, she tentatively designated this structure as having a storage and, perhaps, a ceremonial use (Schwab 1998: 84).

### *Mound B Submound*

Like the structures in Zone 1 of Mound B at Gordon site, this area of Nick Farm site included evidence for three distinct structures (Figure 32), two smaller rectangular structures and one large (almost) round structure. However, in this setting, the rectangular structures predate the circular one, and the large structure was likely roofed.

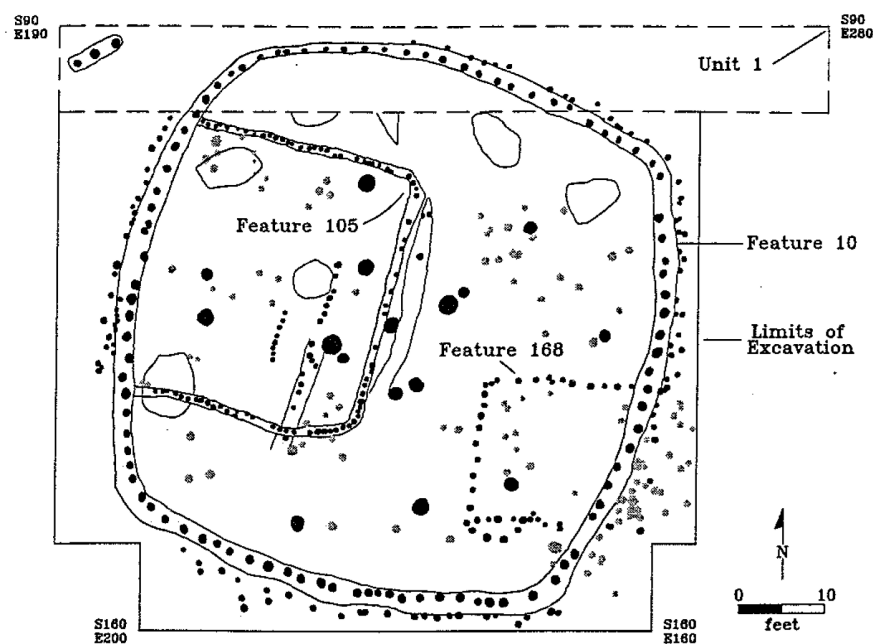


Figure 32. Structures under Mound B, Nick Farm site. Outlined shapes are areas of burned clay, possible hearths. Image from Schwab (1998:Figure 4).

*Feature 10.* This structure (Figure 33) was constructed over the other two features under Mound B, Feature 105 and Feature 168. Associated sherds verify the later date of construction. In the shape of a square with the sides bent outwards, the structure is about 60 feet in length and



width. Postmolds in a continuous wall trench, a median 12.4 (10-12) inches in diameter, are spaced a median 13.2 (12-18) inches apart. Large postholes on the interior of the structure are an average of 21.1 inches (1-2 feet) across. Small postholes mass along the exterior of the feature, with unclear purpose. Schwab writes that these postholes probably represent "episodes of repair or reinforcement to the walls of the structure" (1998:26). This seems reasonable, given that the postholes were not placed systematically but only where needed.

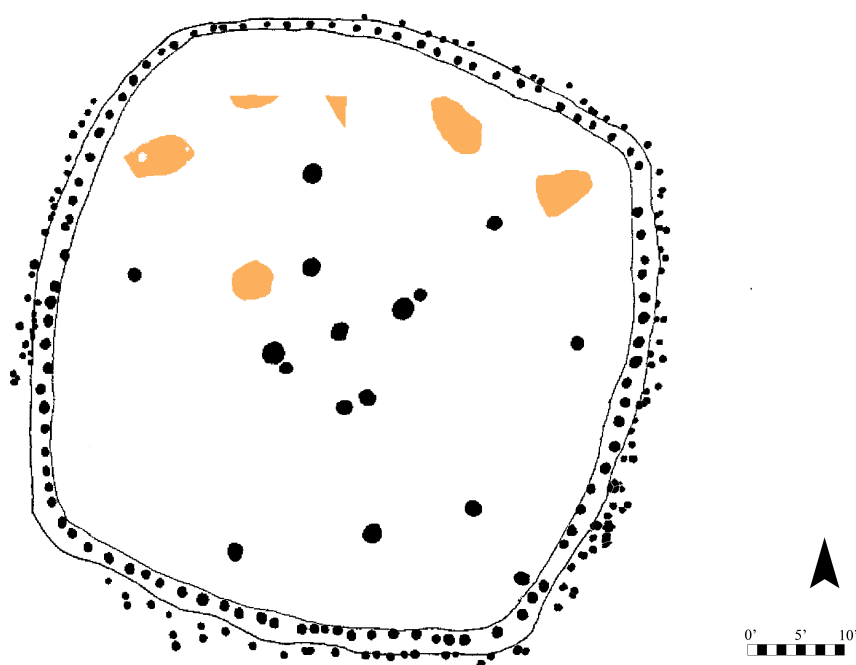


Figure 33. Feature 10, under Mound B, Nick Farm site. Hearths, possibly associated, are colored orange. Adapted from Schwab (1998:Figure 4).

The diameters of the postholes and postmolds of this building indicate that it definitely was of rigid-post construction, and the presence of large postholes on the interior, symmetrically arranged, probably held roof supports, as Schwab points out (1998:26), providing further evidence of this fact. Six areas of fired earth indicated hearths. These hearths are spread about along the edge of the building, and a posthole sits in the center of the structure, a

contrasting arrangement compared to later Mississippian structures, with central hearths in almost all cases (See Polhemus 1987). These fired areas, irregularly formed, may represent temporary locations for fires, rather than well-established hearths. It is possible that these hearths are not associated with Feature 10. The southernmost hearth, which Schwab associates with Feature 10 (Schwab 1998: Figure 21), is actually superimposed by earlier Feature 105 (Figure 32), making its association impossible. The other hearths may be of similar vintage.

A few large postholes, which may have held support posts, were irregularly scattered in the interior. This may indicate roof repairs on the large building or perhaps partitions. Some of the posts may not have been associated with the building at all and perhaps predated the structure. Schwab interprets Feature 10 as a public building for social gathering, based on the structure's size, the large amount of ceramics associated with the structure, and the prevalence of cooking and serving ware (Schwab 1998:82-83). Two gaps in the main wall posts of the structure are evident on the eastern wall of Feature 10. These may have represented doors into the structure (Figure 33).

*Feature 105.* This structure (Figure 34) features 7 (6) inch postmolds spaced a median of 5.5 (2-6) inches apart in a continuous wall trench. The wall trench ranges from 10 to 12 inches across (Schwab 1998:26). The building measures 31.4 feet along the north-south axis. The other dimension, confused by Feature 10, is likely equivalent (Schwab interprets the dimensions as 30 x 30 feet).

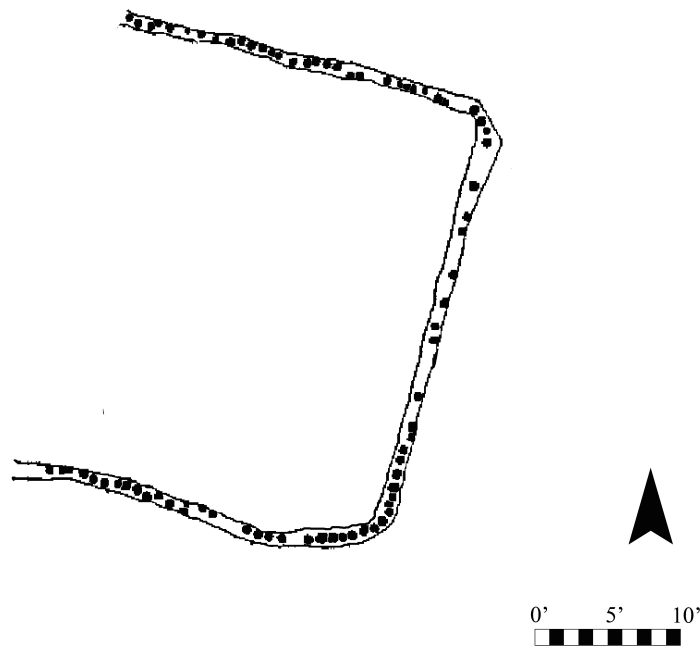


Figure 34. Feature 105, under Mound B, Nick Farm site. Adapted from Schwab (1998:Figure 4).

Schwab interpreted small postholes along the western exterior of Feature 10 (Figure 32) as belonging to Feature 105, despite the fact that they are not associated with any wall trench. Schwab states that the proximity of Feature 10's wall trench would have obliterated any sign of the wall trench for Feature 105 in that area (Schwab 1998:26).

However, the postholes Schwab associates with Feature 105 may have belonged to Feature 10, as they are similarly sized to the small posts on the exterior of that structure's other three sides. Moreover, they are more disordered, varying more widely in size and spacing than the postmolds associated with Feature 105. I find it more likely that Feature 10 completely obliterated evidence of the northwest wall of this structure.

The close spacing of the postmolds within Feature 105's wall trench indicates possible bent-post construction, but posts were slightly too large for such construction. However, because

the structure also lacks clear support posts, which would be necessary for rigid-post construction, the incompatibility of post-size may better be attributed image processing than archaeological fact. It is important to note that Schwab's measurements indicated smaller postmold diameter. Bent-post construction is most likely for this structure. Schwab tentatively interprets this Feature 105 as a place of cooking and storing food, based on the presence of ceramic vessel bases, one of which was burned (Schwab 1998:83).

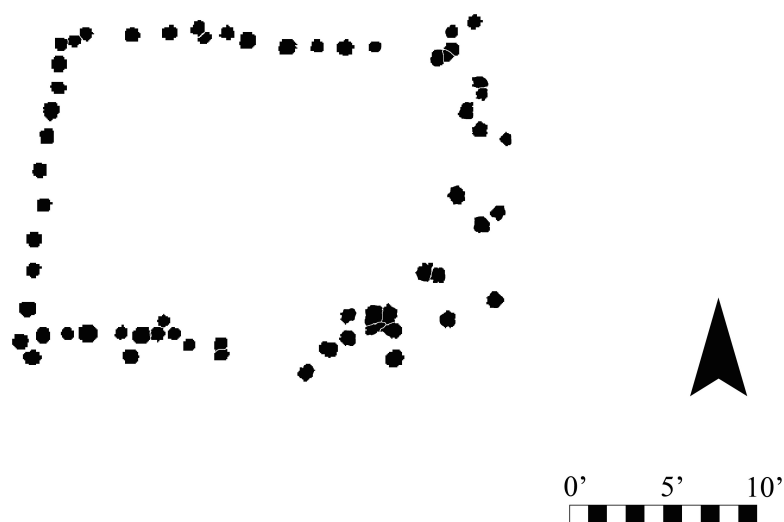


Figure 35. Feature 168, under Mound B, Nick Farm site. East wall obscured due to intrusion from Feature 10. Adapted from Schwab (1998:Figure 4).

*Feature 168.* This structure (Figure 35) had a closed-cornered rectangular shape with individually-set posts. Dimensions were about 23 feet by 15.5 feet. Because Feature 10 intruded on the eastern wall of the structure, it is unclear where the eastern wall lay. I have placed the east wall a little farther east than Schwab, but this is really just guesswork. The postholes had a median width of 9.6 (6-10) inches and were spaced a median 9.4 (12—this difference is probably

due to different postholes chosen for the eastern wall) inches apart. Posthole size and spacing is right on the border between bent-post and rigid-post construction, according to the parameters set out (assuming postholes 50 percent larger than their posts). An absence of postholes that could have held roof supports (Figure 32) tips the scales in favor of bent-post construction. Schwab postulates that this structure was associated with cooking and serving food, based on the associated ceramic assemblage (Schwab 1998:84).

### **St. Gabriel**

Due to the great amount of information provided by Woodiel in the site report, this site's structure was not examined for basic metrics with image analysis software, as the information necessary was already provided. The small size of the structure's map would have resulted in measurements less accurate than those obtained directly from the archaeologist (Woodiel) in this case.

*Feature 3.* This structure (Figure 36) was the only complete building preserved at the St. Gabriel site. It had been burned and rapidly buried, circumstances that improved the preservation of the structure. The circular wall trench structure measured 18.7 feet across, with postmolds that measured 4.7 to 7 inches in diameter, spaced 5.9 to 7.9 inches apart. The postmolds leaned outward by 14 degrees (Woodiel 1993:29). Along the interior edge of the wall, a sloping embankment had been piled up against the wall, leaving a partial clay and silt floor over black soil in the middle. A large hearth, one meter across, was in the middle of the floor, with burned patches around. A pit was also found in the structure. A small earthen ramp served an unknown purpose within the structure (Woodiel 1993:29-33). Some posts were charred in place, and a few

posts wood were identified as made of cypress. Other wood found in the charred material that overlay the structure's floor included ash, hickory, maple, alder, sweetgum, cedar, walnut, pine, sycamore, and oak (Woodiel 1993:52). Woodiel interpreted small postholes within the structure as possible partitions or benches. Large posts were interpreted as possible roof supports (1993:29).

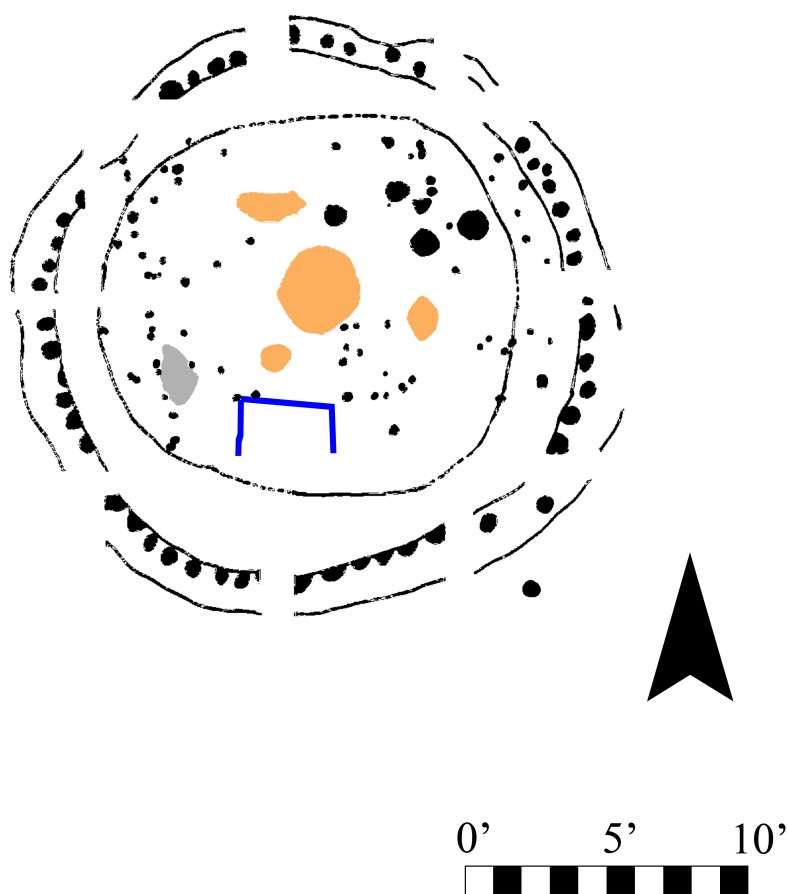


Figure 36. Feature 3 under the mound at St. Gabriel site. The clay embankment is outlined to the inside of the wall trench. The hearth and burned areas are colored orange. The ramp is outlined in blue. Gaps in the map are areas within balks. Adapted from Woodiel (1993:Figure 13).

The postmolds, based on diameter and spacing, seemed to suggest bent-post construction. Moreover, the outward slanting postmolds may actually be evidence of wedges put in the wall

trenches. This would have helped resist the tensile forces of the post against the ground, in the event of bent-post construction. Lewis and Kneberg documented slanting postmolds (Figure 37) that result from employment of this construction method (1995:56-57). But cypress posts do not have good bending strength, as judged by Lacquement's analysis of the structural qualities of woods native to the Southeast (2004:66-76; USDA 2010:Table 5-3b) and would have been ill-suited to use in such a structure. This fact pointed to rigid post construction, although Woodiel noted that any possible roof support postholes were not well positioned to serve their supposed function (1993:29).



Figure 37. Outward-leaning postmold from house 65 at the Hixon site, Tennessee. The associated structure featured bent-post wall trench construction. Horizontal wedges on the inside of the post left the post in this position, once tension was applied. Excerpted from Lewis and Kneberg (1995:Figure 4.1).

The structure must have been roofed, as the bowl-shaped interior of the structure would have quickly filled with water if exposed to precipitation. Evidence of cane, daub, and thatch suggests that the structure had wattle-and-daub walls with a thatched roof (Woodiel 1993:118).

Unfortunately evidence found within Feature 3 showed that, assuming structural posts were of cypress, neither bent-post or rigid-post methods would have been apt in constructing the building without roof supports. But what if the cypress posts were not structural elements? Not all elements in a wall need support the roof. Intermediate posts can fill in gaps or serve other subsidiary roles. A few cypress posts are the pieces of evidence supporting rigid post construction. Ash, the second most common wood found in the structure (after cypress), was used by Nash and Lidberg to build a successful bent-post structure (Sullivan 2007), as mentioned in a previous section. Although it was not found in the structure's postmolds, ash was discovered in the collapsed roof of the structure.

It is possible that cypress posts were the only members intact within postmolds because of preservation bias. Cypress is more susceptible to burning than the hardwoods in evidence in the structure—based on flame spread index (USDA 2010:Table 18-11). This could make it more likely for cypress members to become completely charred and survive intact until the present day. The rot resistant nature of cypress posts, as noted by du Pratz (1774:333), would have also increased preservation. Given these facts, cypress members may have served any number of non-structural purposes, such as filling in gaps in the structure's wall, while hardwood posts, with appropriate elastic strength but poorer preservation (such as ash or oak saplings) provided the structure of the building.



## CHAPTER VII

### DISCUSSION

The structures analyzed above, at first individually considered, reveal interesting patterns when viewed in the aggregate. Although they may not shed much light on chronology, the structures reveal aspects of Coles Creek ritual practice and shed doubt on the presence of residences atop Coles Creek mounds.

#### **Chronology**

A glance at the results of this study (Table 1) reveals that chronological trends are unclear based on structure shape and construction method. Circular and rectangular structures seem to have coexisted at many of the sites (Gordon, Nick Farm, Baptiste), and wall trenches and individually-set posts were used in both the earlier and later structures. However, it is also true that many of the most obvious structures are rectangular and of bent-post construction, and date toward the end of the Coles Creek period. This tendency may not have much meaning to it, however, as most of the structures examined in this study dated to the later phases of the Coles Creek culture.

## **Bent-Post Structures**

Bent-post structures were found in a wide variety of contexts, representing the majority of analyzed structures. They included structures under mounds (under Mound B at Nick Farm and Mound B at Baptiste, possibly Feature 3 at St. Gabriel, and possibly under Mound D at Greenhouse) and on Mound stages (Feature 274 at Nick Farm, structures at Gordon), and possibly some structures located near mounds, as in the Baptiste Village. A few of these structures contained evidence of hearths (Features 6 and Features 4a and/or 4b at Gordon, Feature 3 at St. Gabriel). The rest did not have hearths or any other notable interior features. All dated bent-post structures dated to the terminal Coles Creek, with the possible exception of the circular structure under Mound D of Greenhouse. All structures were also rectangular (excluding structures within the Baptiste Village), with the exception of the Greenhouse structure and the St. Gabriel structure. These included both wall trench structures and structures with posts set within individual postholes, although the only structures with individually set posts were found at the Nick Farm site.

The many differences between the structure under Mound D at Greenhouse and other bent-post structures warrant special consideration for this structure. Evidence for the structure is fragmentary enough that its identification is tentative. If roofed, the structure was likely of bent-post construction, as it didn't include roof supports. The structure is also set apart from others because it lies in a midden with signs of extra-structural activity, including bathtub shaped pits and postholes set individually or in broadly-spaced alignments. This context is reminiscent of the submound midden excavated under Mound A of the Feltus site. This midden included a field of postholes and, although it didn't contain any bathtub-shaped pits, the overlying mound contained one (Kassabaum 2014:41-43, 47-48). These features, associated with feasting at Feltus, may

indicate similar communal activity under Mound D at Greenhouse. The richness of the midden under Mound D led Belmont to consider the area the primary living area of the site, but feasting, just as much as domestic activity, could have made the deposit. As a structure positioned over possible feasting deposits, it may have had a ceremonial use itself.

Bent-post structures with hearths may have served a domestic function, but they also may have served a ritual purpose in certain cases. Du Pratz writes of the importance of an eternal fire to the religion of the Natchez (1774:314-315). This aspect of Natchez religion may have had roots in the earlier religious practices of the Lower Mississippi Valley. The products of fire, namely ash, certainly had a ritual importance for the Coles Creek. Kassabaum describes ritual post-setting at the Feltus site, in which ash, sometimes containing unusual materials, such as bear and human remains, was used to line the post within the posthole (2014:85).

Feature 3 at the St. Gabriel site featured the best-established hearth at the site, a raised disk one meter across. Given the absence of unusual artifacts in the structure and the presence of interiors partition and/or furniture, Woodiel interpreted the structure as a residence (1993). The building, however, was of unusually elaborate construction, including a large hearth and an encircling embankment that would have limited usable floor space. Furthermore Feature 3 only yielded 59 sherds from the floor of the structure. Fill within the structure only revealed one ceramic form, a “shallow bowl” (1993:118). The small assemblage from Feature 3 suggests that the structure was either not used intensively or that it was well cleaned before being burned. Although it is possible that this structure was a residence, other indicators show that the building probably had a more unusual function.

Woodiel identified a ramp in the southern part of the building, noting that it failed to relate to any apparent doorway into the structure (Woodiel:118). Perhaps the ramp was simply an

elevated platform within the structure. A circular structure of almost equivalent size at Medora had a large and well defined—but cruciform—hearth with a platform to the south (Figure 38). Quimby identified the platform as an altar (1951:94). Feature 3 at St. Gabriel may have served a similar function, possibly a ceremonial use. A cursory study of a few postmolds of the Medora structure, featured on the published map, revealed that they were about six inches in diameter, similar to those at St. Gabriel.

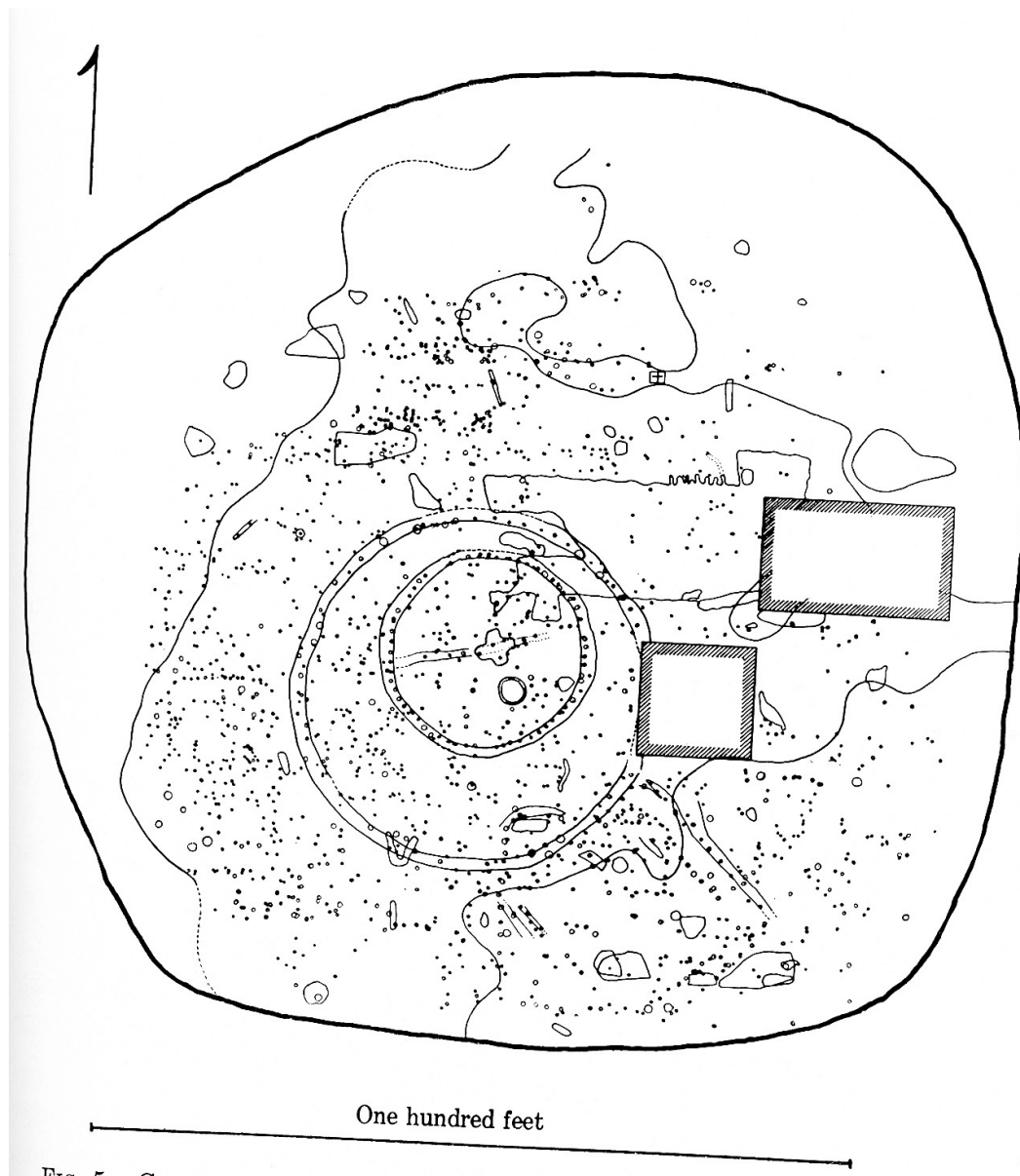


Figure 38. Features found at Level 1, Mound A, Medora site. The interior wall trench includes a cruciform hearth and a circular platform to the south. Adapted from Quimby (1951:Figure 5).

Indications of a ceremonial use are exaggerated if Feature 3 is compared to du Pratz' observations about the Natchez temple, which had posts of cypress, and an inner compartment to the south. He writes, "In the largest [southern] compartment, the eternal fire is kept, and there is likewise a table or altar in it..." (1774:333). Feature 3 shares remarkable similarities with the Natchez temple, although interior postholes do not indicate an east-west partition of the

structure. If this comparison is valid, Feature 3 can be identified as a religious structure and strong parallels can be drawn between Natchez and Coles Creek religion.

Features 4a and 4b from Zone 2 of Mound B at Gordon, as well as Feature 6 or Feature 7 in Zone 2 of that same mound may have been associated with hearths. It is hard to identify these buildings by hearth alone, as this feature could indicate either domestic or ceremonial function in the absence of other traits. Fortuitously Feature 7 in Zone 2 was possibly also associated with burials, as mentioned above, a fact that points toward mortuary use, perhaps as a charnel house. Burials could also have been placed under domestic structures, but, because the Gordon structure is rare in its mortuary associations (i.e. intramural burial does not seem common in Coles Creek architecture), the structure probably fulfilled a function more unusual than the domestic.

Many buildings without evidence of interior features were difficult to identify, but associated features can be helpful for identification. Structures at the first occupation level at Baptiste, including the structures under Mound B and the Village, were all of similar size, a little over 20 feet in diameter or dimension. The structures were also associated with pits, some of which were filled with refuse. Two hearths were identified just outside of the village (Figure 12), and may be a sort of outdoor clay hearth as attested to ethnohistorically (Swanton 1969:427). The pits, likely storage pits, some later filled with refuse, support a residential context for the structures, with separate storage for each structure. The relative uniformity of structure size supports the idea that all the structures were put to similar types of use.

Most intriguing about these Baptiste structures is the seemingly contemporary presence of wall trench structures and structures with individually-set posts, as well as the simultaneous existence of rectangular and circular structures. It would probably be unwise to place much weight on the presence or absence of wall trenches in the Village, as excavators had trouble

following the wall trenches on some structures, and it is possible that the structures with individual postholes actually had wall trenches that were too faint to distinguish in the field. More importance can probably be placed on the contemporaneous presence of circular and rectangular structures.

One could argue that the circular and rectangular buildings date from different periods, with one following the other. In fact, in the only place where the two types overlap, a rectangular building intrudes upon a circular structure. However, an equally valid interpretation places both structure types as contemporaneous. Circular and rectangular buildings tended to be rebuilt on the same sites (e.g. Features 1030 and 1031, Features 167 and 169, Features 427a and 427b, and Features 514 and 519). This might suggest that the locations of structures had enough significance for new buildings of the same type to be relocated in the same location. In this light, when the buildings are viewed as a complex, it might be possible to place significance in the mutual arrangement of circular and rectangular structures in the Baptiste Village.

At a general level, circular houses were positioned to the south of the rectangular structures. The structures were also arranged in a way that allowed rectangular structures to be paired with circular structures (Figure 39). These houses, if paired together, might indicate summer and winter dwellings for the same household. David Hally (2008) notes the possible presence of summer and winter dwellings within individual households at the Mississippian King site. The structures at Baptiste, however, are not quite analogous with the King structures. Unlike the arbors and rigid-post “primary dwelling structures” apparent at King site, neither structure type at Baptiste seems particularly well adapted to either warm or cold weather. None have evidence of interior hearths. If hearths were more apparent in the circular structures, an argument could be made that these served as winter dwellings, much like the Cherokee “hothouses” noted

in the historical record. According to the accounts of William Richardson and Henry Timberlake in the mid-eighteenth century, Cherokee built both summer and winter houses with earthfast posts; summer houses were built in a rectangular shape, whereas winter hothouses were circular (Swanton 1969:43). This possible seasonal differentiation between circular and rectangular structures is an exciting possibility, but it would require further analysis of Baptiste materials to be much substantiated.

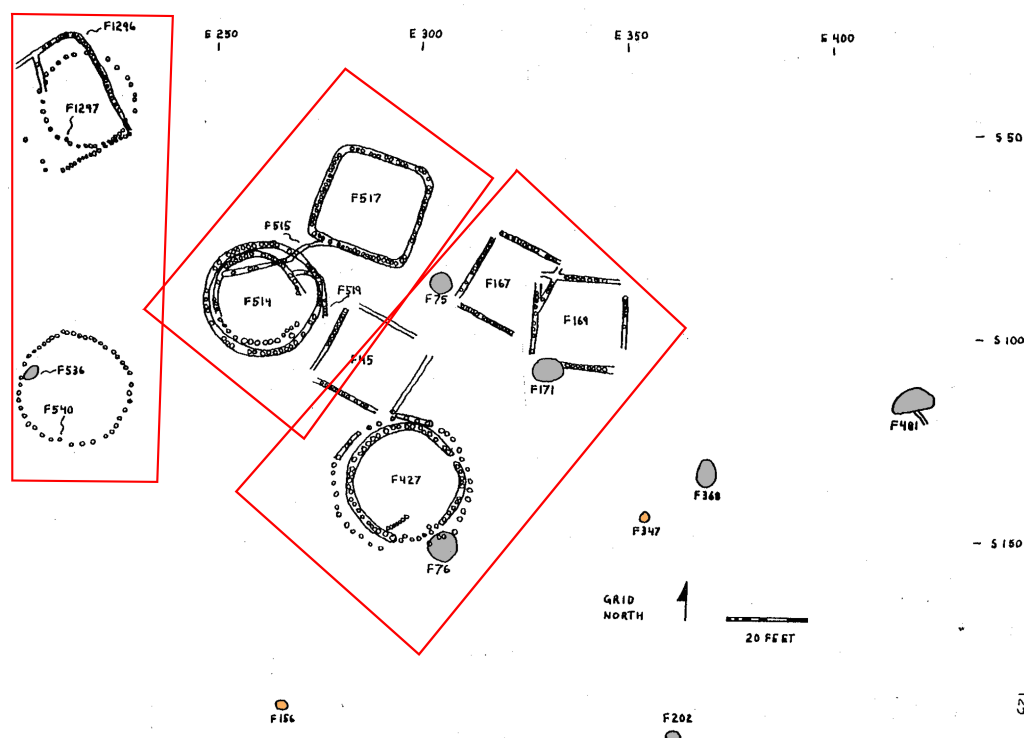


Figure 39. Baptiste Village, with structures divided into possible households. Adapted from Whitmer (1987:Figure 39).

Other structures without interior features include the bent-post structures at Nick Farm. Schwab (1998) used associated forms of pottery to associate the buildings with broad storing (Features 274 and 105) and cooking (Feature 168) uses. Similar ceramic analysis of structures at the other sites studied could shed light on structure use of these types of buildings, but that is out of the scope of this study.



## **Rigid-Post Structures**

The maps examined in this study revealed concrete evidence for only one rigid-post structures. This was the enormous Feature 10 under Mound B at Nick Farm. As stated above, this structure, with its large size, multiple entrances, and large number of associated ceramics, including possible gaming pieces and storage containers, is justifiably interpreted by Schwab as a site of communal and perhaps ceremonial activity (1998:82-83). It's possible position within a larger architectural grammar will be discussed below.

## **Large-Scale Enclosures**

The enclosure at Gordon is simply too large to be covered without roof supports. With posts in its postholes, this well-planned circular feature might have resembled the enclosure depicted by John White in North Carolina (Figure 40). Such a comparison makes ritual use seem most appropriate. In any case, the widely spaced posts of the enclosure likely made any activities widely accessible in the space inside.

The size of this structure (comparable with Feature 10 at Nick Farm) and its association with bent-post structures of differing dimensions suggests that there may be parallels between this rigid-post enclosure on a low mound stage and the other submound rigid-post covered building. Remarkably, a third site, Lookout, also includes a round enclosure (about half the size of the Gordon enclosure) with two associated rectangular structures (Figure 41) (Brown 1985: 274).



Figure 40. Watercolor by John White depicting an enclosure of posts in coastal North Carolina in the 16<sup>th</sup> century. Image courtesy of Wikimedia Commons.

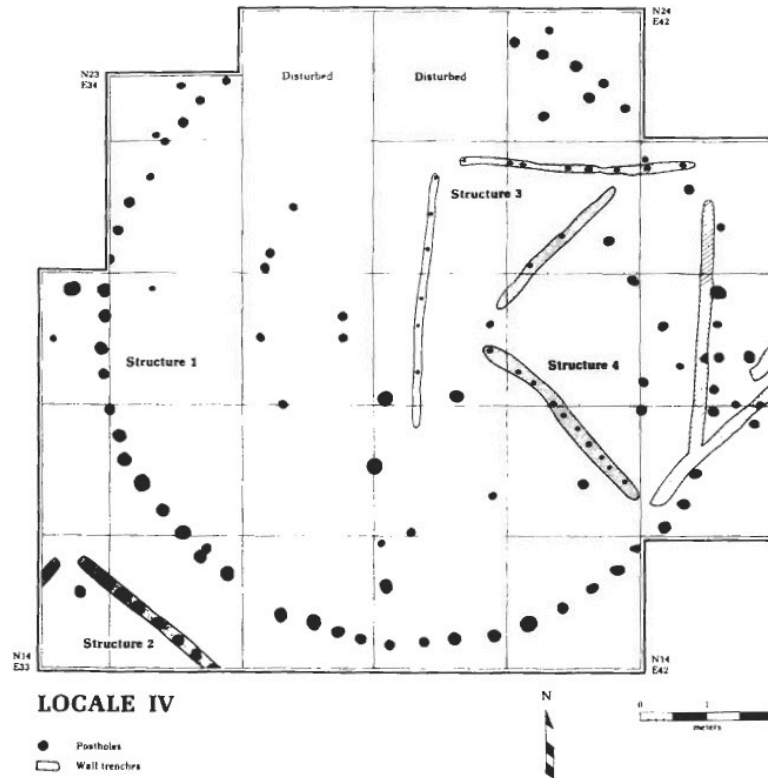


Figure 41. Structures at Locale IV, Lookout site. Image from Brown (1985:Figure 6).

When the architecture found under Mound A at Medora (Figure 38) is added to the equation, a pattern of late Coles Creek submound enclosures and buildings emerges. It is unclear whether the structures at Medora, a circular wall trench structure with a 45-foot diameter containing a smaller wall trench structure 25 feet across (Figure 39), had roofs, but, because they are associated with a cruciform hearth and possible elevated earthen altar, they have been interpreted as religious structures. Quimby was uncertain, upon excavating the circular wall trenches, whether they were contemporaneous, erected at different times, or even part of the same building (Quimby:94-96). As mentioned previously, the inner ring of postholes is reminiscent of Feature 3 of St. Gabriel, with its large interior hearth and raised area to the south of the floor. The outer ring no matter its construction method or whether it was roofed, seems to

be similar to Feature 10 at Nick Farm and Feature 5 at Gordon, simply by virtue of its size. If these connections are valid, Gordon, Nick Farm, St. Gabriel, and Medora sites suggest a system of pre-mound construction at Coles Creek sites, involving the construction of large enclosed areas and small ritual structures, possibly shrines. Chronologically, the sites are not identical; at Gordon, the enclosure came first, but it came second at Nick Farm, but, regardless of this difference, the interplay between small and large structures under Coles Creek mounds probably has some significance.

### **Greenhouse Structures: Mounds A and F**

Many of the buildings at Greenhouse proved difficult to interpret. Throughout the site, architectural evidence revealed possible structures with inconsistent characteristics. To some extent these post features may have been poorly recorded by the WPA crews under Neitzel's direction. If found at varying depths, the postholes might have been recorded at inconsistent sizes, due to the taper present in most postholes. It is also possible, however, that the postholes at Greenhouse were fairly accurately recorded but simply didn't form roofed structures.

Earthfast construction evident on the two last stages of Mound A contained messy patterns of postholes that, although describing circles, failed to indicate many lengthy alignments of posts with similar spacing or similar size, and, where alignments seemed possible, lacked evidence of necessary roof supports. Although these may simply have been poorly preserved remnants of structures, they could also represent the result of many independent episodes of post-setting, including the construction of small lightweight structures, such as screens and racks, as well as ritual post-setting. Similar patterns could be seen on Mound F, where post diameter

and Prezzano analysis failed to provide convincing evidence of a structure on Level 1, and the Level 3 structure had a very irregular form.

Post-setting of this piecemeal sort is not without precedent at other Coles Creek sites. At the Raffman site, whose occupation dates to the late Coles Creek period, much like the architecture on Mound F and the upper stages of Mound A at Greenhouse, Roe uncovered postholes in a curved alignment on Mound B of the site (Figure 42). The postholes were not of uniform size and depth, although they were associated with a possible hearth (2010:111-113). Because of the wide spacing of postholes as well as the absence of storage features and a well-formed hearth, Roe argues that these posts did not represent a “permanent or semi-permanent residence.” Instead, Roe points out that mound use was likely the result of periodic large-scale consumption events, likely feasting, which may have required shelter or privacy (2010:192-197).

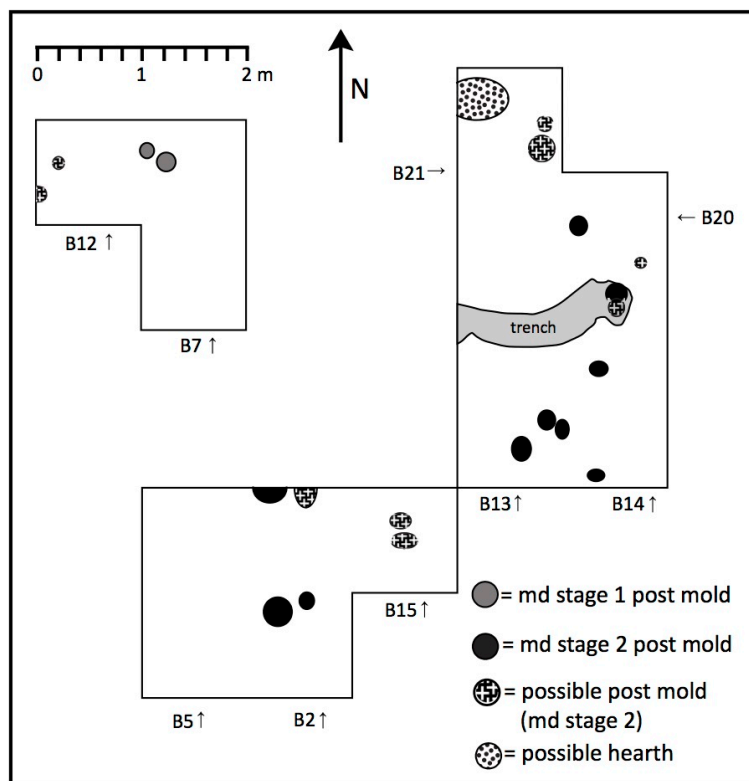


Figure 42. Features at the summit of Mound B, Raffman site. Image from Roe (2010:Figure 5.7).

The structural evidence on Mounds A and F at Greenhouse follows a similar pattern to that of Raffman, with sparse and irregular patterns of postholes. Like evidence found at Raffman, the Greenhouse post features could represent construction to accommodate the requirements of periodic mound activity, and may have been built and rebuilt periodically as well.

Some posts, especially large posts, could have been the result of ritual post-setting, much like that at Feltus, in which posts were set in association with feasting events both on the ground surface and on Mound B of the site (Kassabaum 2014:314, 343-346). It is interesting to note that some of the posts at Greenhouse seem to have been set in pairs, but it is unclear whether the pairs were contemporaneous or represent the replacing or resetting posts in proximity to their former placement. Kassabaum notes that ritual posts usually received special treatment, such as a lining of ash or clay, a plug of clean clay after the removal of the associated post, or the inclusion of special artifacts (2014:85). Ford (1951) did not note evidence of this sort at Greenhouse, but it is important to acknowledge that he merely sketched over the site's post features before focusing on ceramics in his published report. It is also unclear whether some subtle depositional practices, such as the lining and plugging of posts with clay, would have been recorded by WPA crews at Greenhouse. These circumstances leave a strong possibility that ritual post-setting did occur at Greenhouse in the Feltus mode.

## **General Conclusions**

This study clearly reveals the great uncertainties inherent in interpreting evidence of earthfast structures. Despite this, analysis of post features from Coles Creek sites based on posthole diameter and spacing, as well as other indicators, has resulted in a few interesting, but very tentative, findings. Evidence suggests that almost all roofed structures, especially domestic

structures, of the Coles Creek period were constructed using a bent-post method, based on parameters laid out by scholars of Mississippian earthfast architecture. Although some mounds were built over structures that resembled dwellings in form (e.g., rectangular bent-post structures beneath Mound B at Baptiste), small ritual structures and large roofed or unroofed enclosures are some unusual structure that tend to be found near the original ground surface where mounds were later constructed. An architectural grammar of enclosure and shrine may have leant significance to pre-mound construction efforts.

Evidence also suggests, that, in many instances, post features on mound summits may not have formed roofed buildings but instead have represented periodic construction of screens, racks, scaffolds, and individual posts, constructed to meet the requirements of public ritual. Interestingly, of the sites studied, Feature 274 at Nick Farm and the structures in Mound B of Gordon were the only roofed buildings atop mounds. The Nick Farm structure (Figure 30), as it lacked a hearth, was unlikely to have served a domestic function (Schwab:77). The Gordon structures in Zone 2 (Figures 18-21), given mortuary evidence, probably served a funerary use rather than a domestic function. Only the rectangular structures of Zone 1 in Mound B at Gordon (Figures 13-16) could, in all probability, have served as residences, although their association with an enclosure might point to a ceremonial function.

Taken together, this evidence provides further indication that mounds did not serve as residences during the Coles Creek period. It is most likely, given current research and existing evidence of earthfast structures, that mounds served primarily ceremonial purposes, continuing an earlier tradition of communal ritual and feasting that had been present at the site before mounds were constructed. This conclusion supports the recent findings of scholars indicating

that Coles Creek society was much more egalitarian than the Mississippian societies that succeeded it (Kassabaum 2014; Roe 2010; Schilling 2002).

This study sought, to some extent, to use postholes and postmolds to learn, not only about the characteristics of Coles Creek mound sites and activities associated with them, but to better understand the people who placed the posts themselves. It is Feature 274 at Nick Farm that may have presented the most tantalizing clue: possible evidence of trial-and-error in building construction (Figure 31).

It is unfortunate, but perhaps inevitable, that the post features included in this study raise just as many questions they give answers. At times, it seems just as great a challenge to consider the right possibilities as to find the right answer. For some sites, such as Baptiste, only further analysis of excavated material will allow a thorough understanding of the structural evidence uncovered. For the rest, clarity, if it comes, will likely, of course, require further excavation of Coles Creek sites.



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APPENDIX

RESULTS OF ANALYSIS OF COLES CREEK STRUCTURES

Table 1. Results by structure, part 1 of 3.

Structure	Mound Relationship	Age	Construction
<b>Baptiste</b>			
<i>Mound A</i>			
F909a	summit	N/A	uncertain
F909b	summit	N/A	uncertain
F909c	summit	N/A	uncertain
<i>Mound B</i>			
F1030	submound	N/A	bent-post
F1031	submound	N/A	bent-post
<i>Village</i>			
F45	intermound	N/A	N/A (bent-post?)
F167	intermound	N/A	N/A (bent-post?)
F169	intermound	N/A	N/A (bent-post?)
F427a	intermound	N/A	N/A (bent-post?)
F427b	intermound	N/A	N/A (bent-post?)
F514a	intermound	N/A	N/A (bent-post?)
F514b	intermound	N/A	N/A (bent-post?)
F517	intermound	N/A	N/A (bent-post?)
F519q	intermound	N/A	N/A (bent-post?)
F540	intermound	N/A	N/A (bent-post?)
F1296	intermound	N/A	N/A (bent-post?)
F1297	intermound	N/A	N/A (bent-post?)
<b>Gordon</b>			
<i>Mound 1 Z1</i>			
F3	low summit	Late Coles Creek/Early Plaquemine	bent-post
F4a	low summit	Late Coles Creek/Early Plaquemine	bent-post
F4b	low summit	Late Coles Creek/Early Plaquemine	bent-post
F5	low summit	Late Coles Creek/Early Plaquemine	unroofed rigid-post enclosure
<i>Mound B Z2</i>			
F6	summit	Late Coles Creek/Early Plaquemine	bent-post
F7	summit	Late Coles Creek/Early Plaquemine	bent-post
F8	summit	Late Coles Creek/Early Plaquemine	bent-post
<b>Greenhouse</b>			
Mound A L7	summit	Late Coles Creek	not a structure
Mound A L6	summit	Late Coles Creek	not a structure
Mound D	submound	Early Coles Creek	bent-post
Mound F L1	summit	Late Coles Creek	not a structure
Mound F L3	summit	Late Coles Creek	not a structure
<b>Nick Farm</b>			
<i>Mound A</i>			
F274	summit	Late Coles Creek/Early Plaquemine	bent-post
<i>Under Mound B</i>			
F105	submound	Late Coles Creek/Early Plaquemine	bent-post
F10	submound	Late Coles Creek/Early Plaquemine	rigid-post
F168	submound	Late Coles Creek/Early Plaquemine	bent-post
<b>St. Gabriel</b>			
F3	submound	Late Coles Creek/Early Plaquemine	probably bent-post



Table 2. Results by structure, part 2 of 3.

Structure	Structure Shape	Structure Diameter or Dimensions (Feet)	Wall Trench?	Roof Supports?
<b>Baptiste</b>				
<i>Mound A</i>				
F909a	rectangular	N/A	no	N/A
F909b	rectangular	N/A	no	N/A
F909c	rectangular	N/A	no	N/A
<i>Mound B</i>				
F1030	rectangular	22.7 x 22.7	yes	no
F1031	rectangular	21.2 x ~21	yes	no
<i>Village</i>		18-25		
F45	rectangular	23.0 x 21.2	yes	no
F167	rectangular	21.4 x 18.3	yes	no
F169	rectangular	22.8 x 22.2	yes	no
F427a	circular		27.7 yes	no
F427b	circular		34 yes	no
F514a	circular		22.4 yes	no
F514b	circular		28.5 yes	no
F517	rectangular	25.1 x 24.0	yes	no
F519q	circular		yes	no
F540	circular		26.6 no	no
F1296	rectangular	28.8 x ~24.3	yes	no
F1297	circular		22.7 no	no
<b>Gordon</b>				
<i>Mound 1 Z1</i>				
F3	rectangular	28.3 x 20.3	yes	no
F4a	bent rectangular	30.5 x 25.5	yes	no
F4b	bent rectangular	25 x (25?)	yes	no
F5	circular		55.1 no	no
<i>Mound B Z2</i>				
F6	rectangular?	33.5 x ?	no	no
F7	rectangular?	? perhaps similar to Feature 6	yes	no
F8	rectangular?	? perhaps similar to Feature 6	yes	no
<b>Greenhouse</b>				
<i>Mound A L7</i>	circular		33.5 no	no
<i>Mound A L6</i>	circular		35.6 no	no
<i>Mound D</i>	circular		21.4 yes	possible
<i>Mound F L1</i>	circular?	~29.2	no	
<i>Mound F L3</i>	rectangular?	27.7 X 27.9	no	no
<b>Nick Farm</b>				
<i>Mound A</i>				
F274	rectangular	26.1 x 24.2	no	possible
<i>Under Mound B</i>				
F105	rectangular	31.4 x ~28.9	yes	no
F10	bent rectangular	61.2 x 59.5	yes	yes
F168	rectangular	~23.4 x 15.5	no	no
<b>St. Gabriel</b>				
F3	circular		18.7 yes	possible

Table 3. Results by structure, part 3 of 3.

Structure	Median Post Diameter (inches)	Post Spacing (Inches)	Hearth?	Other Features
<b>Baptiste</b>				
<i>Mound A</i>				
F909a	9.4	20.9	no	
F909b	9.9	35.3	no	
F909c	8.3	31.5	no	
<i>Mound B</i>				
F1030	6.1	11.3	no	possible pit
F1031	5.7	6.9	no	possible pit
<i>Village</i>				
F45	N/A	N/A	no	
F167	N/A	N/A	no	possible pit
F169	N/A	N/A	no	
F427a	N/A	N/A	no	possible pit
F427b	N/A	N/A	no	possible pit
F514a	N/A	N/A	no	
F514b	N/A	N/A	no	
F517	N/A	N/A	no	
F519q	N/A	N/A	no	
F540	N/A	N/A	no	possible pit
F1296	N/A	N/A	no	
F1297	N/A	N/A	no	
<b>Gordon</b>				
<i>Mound 1 Z1</i>				
F3	8.7	6.8	no	
F4a	6.8	3.3	probable	
F4b	7	4.6	possible	
F5	14.2	40.1	no	child burials
<i>Mound B Z2</i>				
F6	10.2	11.8	possible	
F7	7.6	5.8	possible	burials
F8	8.1	9.2	no	
<b>Greenhouse</b>				
Mound A L7	8	19	possible	none
Mound A L6	13	23.6	yes	three areas, fired clay
Mound D	8	8.5	no	bathtub-shaped pit underneath
Mound F L1	7.2	N/A	possible	baked clay floor over most postholes
Mound F L3	7.1	14.7	possible	baked clay floor over most postholes
<b>Nick Farm</b>				
<i>Mound A</i>				
F274	6.6	3.9	no	
<i>Under Mound B</i>				
F105	7	5.5	no	
F10	Primary Wall: 12.4; exterior posts: 8.9; supports: 21.1		13.2	no
F168	9.6	9.4	no	
<b>St. Gabriel</b>				
F3	4.7-7	5.9-7.9	yes	clay embankment, ramp