5-1-2014

Late Woodland Ceramic Decorative Styles in the Lewis Phase of the Lower Ohio Valley: An Investigation of Social Connectedness

Wesley Albertus Jackson
Southern Illinois University Carbondale, jacksonw@siu.edu

LATE WOODLAND CERAMIC DECORATIVE STYLES IN THE LEWIS PHASE OF THE LOWER OHIO VALLEY: AN INVESTIGATION OF SOCIAL CONNECTEDNESS

by

Wesley A. Jackson
B.S., Grand Valley State University, 2010

A Thesis
Submitted in Partial Fulfillment of the Requirements for the degree of
Master Of Arts In Anthropology

Department of Anthropology
in the Graduate School
Southern Illinois University
May 2014

THESIS APPROVAL

LATE WOODLAND CERAMIC DECORATIVE STYLES IN THE LEWIS PHASE OF THE LOWER OHIO VALLEY: AN INVESTIGATION OF SOCIAL CONNECTEDNESS

By

Wesley A. Jackson

A Thesis Submitted in Partial

Fulfillment of the Requirements

for the Degree of

Master of Arts

in the field of Anthropology

Approved by:

Brian M. Butler, Chair

Paul D. Welch

David Sutton

Graduate School
Southern Illinois University Carbondale
February 8th, 2014

AN ABSTRACT OF THE THESIS OF

WESLEY A. JACKSON, for the Master of Arts degree in Anthropology, presented on January 23rd 2014, at Southern Illinois University Carbondale.

TITLE: LATE WOODLAND CERAMIC DECORATIVE STYLES IN THE LEWIS PHASE OF THE LOWER OHIO VALLEY: AN INVESTIGATION OF SOCIAL CONNECTEDNESS

MAJOR PROFESSOR: Dr. Brain M. Butler

This research focuses on the nature and extent of social relationships between two Late Woodland Lewis phase villages, ca. A.D. 650 to 900, in southern Illinois and western Kentucky. These villages are the Cypress Citadel site in Johnson County, Illinois (111JS76), and the McGilligan Creek site in Livingston County, Kentucky (19LV197). Relationships between the two communities are examined through a detailed comparison of their ceramic assemblages, especially the decorated pottery. Chi square and Cramer's V statistics are used along with the social interaction and information exchange theories to determine the most likely to association between the sites. The results suggest a distancing of the social relations between these sites over their 250-year occupations. With a lack of firm temporal data, however, these conclusions are only a best-fit model. Other significant similarities and differences are noted which provide clues for future avenues of study.

ACKNOWLEDGEMENTS

The process of compiling this thesis was not solely the result of my efforts. Many people helped to motivate me emotionally, push me academically, and to aid in my shortfalls. I first want to thank my wife, Sarah, who followed me away from home in order to allow me the chance to pursue my passion. My advisor Dr. Butler hired me for two and a half years as a research assistant, helped guide me toward this subject matter, helped me develop the analytical skills necessary to carry out the research, and spent countless hours providing extremely helpful feedback on my many drafts and revisions. Dr. Welch, through his many classes and comments, taught me statistical methods and helped make sure that my methodology was sound. Dr. Sutton made sure that my focus was always on anthropology, helping me to remember that humans, not materials, are the focus of this discipline. Drs. Henderson and Pollack of University of Kentucky lent me the McGilligan Creek ceramics. My friend, Amy Szumilewicz, contributed her photography skills. Finally, my sister, Autumn Jackson, did an extremely in-depth edit of the entire document. Thank you to these and all of my other friends and teachers for helping me produce this thesis.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I – THESIS OUTLINE

This thesis explores the nature and extent of a proposed social connection between the occupants of two archaeological sites, one in southern Illinois and the other in western Kentucky. A detailed study and comparison of their respective ceramic assemblages, with an emphasis on the decorative aspects of the incised pottery, is used to examine the relations between the two prehistoric communities. The more than 121,000 sherds recovered from the Cypress Citadel site in Johnson County, Illinois (11JS76), and more than 9,000 sherds recovered from the McGilligan Creek site in Livingston County, Kentucky (19LV197), serve as the basis for this investigation. Previous investigations have shown that both sites were occupied more or less contemporaneously, spanning the latter half of the Late Woodland period, ca. A.D. 650 to 900 (Butler and Wagner 2000, Pollack and Henderson 2000).

The ceramic assemblage from Cypress Citadel fits well within the Lewis phase, first defined by MacNeish (1944) as a focus (Butler 2012:131). Although the ceramics clearly belong to this phase, an unusually high frequency of decoration, in the form of incised lines, is seen at the Cypress Citadel site, a frequency not seen in any other known Late Woodland Lewis site in southern Illinois. Recent investigations in western Kentucky have provided evidence for a site, which has been suggested in the preliminary literature, to be a possible analog for the Cypress Citadel ceramics, not only in terms of the high frequency but also in the similar looking decorative styles (Butler and Wagner 2000:690). Located on opposite sides of the Ohio River,

approximately 53 km east-west of each other (Figure 1.1), McGilligan Creek and Cypress Citadel share several unusual aspects including bluff-top locations, mortuary practice, and the high frequencies and unusual nature of their ceramic decoration. In order to better understand the social implications of these similarities, the ceramic styles will be tested against the social interaction theory and the information exchange theory. This will hopefully elucidate the forms of interaction taking place between Lewis phase villages.

The remainder of this introduction outlines the content of the rest of this thesis. Chapter two begins with a general overview of the Late Woodland period in the Eastern United States. A more detailed account of this period in the vicinity of the research area is presented, focusing on the ceramic traditions known to exist. The Lewis phase, to which both sites belong, is discussed. Another secondary focus here is to provide general information concerning the two sites in question. The geological, ecological, and archaeological settings of each site are briefly discussed, as well the background of all previous archaeological investigations relevant to these sites.

The third chapter examines archaeological theories about the relationship between style and social interaction. This includes a description of the evolution of anthropological thought concerning artifact style and culture. A discussion of how design style analysis is accomplished on prehistoric ceramics and how the resulting information can be used to illuminate prehistoric social connections is presented. Because of the great diversity of views on this matter, emphasis is given to the social interaction and information exchange theories used in this study, and their continued influences on archaeology. These, as well as any amendments to the theories, are explored.

Chapter four presents a description of the analytical methods used in this research, focusing

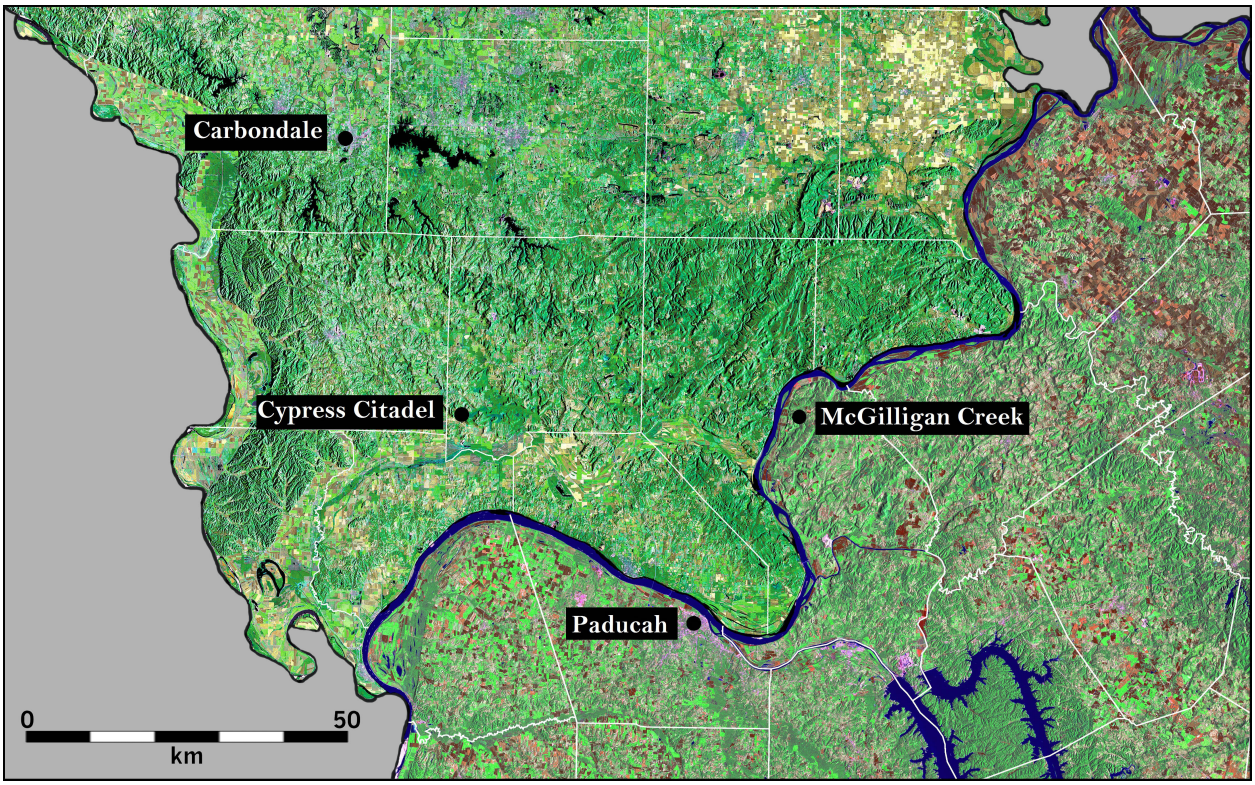


Figure 1.1: Map of southern Illinois and western Kentucky with sites and major cities. (Maps courtesy of the National Agricultural Statistic Service)

on the two aforementioned theories. A description of each coded variable is presented as well as the methods by which they are obtained. The test implications and basic assumptions are also described along with the statistics used for these comparisons. Chapter five gives a brief description of each site's ceramic assemblage. Major patterns in each variable are described along with the several oddities, or outliers, present at each site. Concluding this chapter, focus is put on the stylistic elaboration seen at each site. The several identifiable design elements and limited number of motifs are described.

Chapter six lends visuals to the description of several attributes of the pottery, again focusing on the decorative aspects. Examples are presented to show the similarities and differences between these aspects. Larger motifs from each site are compared against each other as well as the many unique patterns found in the assemblages. The results of the statistical analysis for the ceramic studies are given in chapter seven. Pearson's chi-square and Cramer's V statistics are investigated for each variable, and the interpretation of each statistical output is described.

The final chapter summarizes the major points of the thesis. A brief review of the social interaction and information exchange theories are coupled with the test implications used in this study. The rationale for the choice in attribute division and statistical methods is also reviewed. Finally, the major findings about the social connections between Cypress Citadel and McGilligan Creek are given along with the assumptions required to validate these findings. A discussion about the significance of the statistics and basic assumptions is given. The test implications are compared with the statistical results, and preliminary conclusions about the social connections of these two sites are presented. Finally, future areas of research that will help to solidify the conclusions drawn are suggested.

CHAPTER II – BACKGROUND AND PREVIOUS WORK

In much of the Eastern Woodlands of the United States, the Late Woodland period is dated from around A.D. 400 to ca. 1000, although in some marginal areas the Late Woodland lifestyle continues into the historic period (McElrath et. al 2000:12). Early in defining the period, archaeologists often viewed the Late Woodland as a period of the "good gray cultures" (Williams 1963). This period, which often manifests a relatively uniform, even "bland" material culture, has been described more by the loss of characteristics of the earlier Middle Woodland period than by the characteristics that are specific to the Late Woodland (McElrath et. al 2000:11). The Late Woodland was noted for the diminution or cessation of the extensive trade networks seen in the preceding period. Long distance trade did still occur in many areas throughout the Southeast; however, the distances over which the interaction occurred shortened and exotic materials were absent in most areas (Braun 1991:368; Nassaney 2000:720-721). There also appears to have been a great reduction in the building of elaborate mound constructions and ritual centers compared to the Hopewell climax in Midwest, with complete cessation of mound building occurring is some areas (Nassaney 1995:206).

Scholarly research of this time has developed greatly since it was described as the period of "good gray cultures." Cultural "simplification" can be seen, such as a decrease in the exchange of exotic goods, but the Late Woodland does not represent a simple quiescent period wedged between the Hopewell and Mississippian climaxes, as it has often been described. In the

Southeastern U.S., long distance trade, albeit less of exotic goods and more of utilitarian goods, did continue. Mound building slowed or even ceased in many areas, however, it increased in other areas (Anderson and Mainfort 2002:15-16; Cobb and Nassaney 1995:206). Similarly, while an increase in loosely structured egalitarian groups appeared in most areas, it is believed individual status ranking continued in other areas (Anderson and Mainfort 2002:16; Cobb and Nassaney 1995:206). Evidence for maize in the Southeast is present for much the Late Woodland; however, the rise of maize as a staple food source was a slow process throughout much of the Late Woodland in the Midwest. This crop seems to have been either absent or present only in small amounts (Mainfort and Anderson 2002:18). For much of the region, the Late Woodland marks a time of population dispersal across the landscape, intensification of subsistence practices, and the adoption of bow and arrow technology. These aspects of Late Woodland culture did not all occur simultaneously. Population dispersal and the intensification of an agrarian lifestyle occurred gradually throughout the period (McElrath et. al 2000, Nassaney 2000).

The Late Woodland in Southern Illinois

Two publications from 1951, *Kincaid, A Prehistoric Illinois Metropolis* by Faye-Cooper Cole et al., and Moreau Maxwell's *Woodland Cultures of Southern Illinois*, form the basis for much of our understanding of Woodland period cultures in southern Illinois. Both of these publications stemmed from the investigations in southern Illinois conducted by the University of Chicago (UC) and Southern Illinois Universiy (SIU) throughout the 1930's and early 1940's. Maxwell excavated a series of sites north of the Shawnee Hills in the Big Muddy River drainage.

From this he established a series of foci (later phases) that formed the basic cultural historical framework for the Woodland Period in the region. His sequence included two Late Woodland constructs, Raymond and Dillinger, of which the former is of most interest here. The Kincaid volume summarizes the nearly decade-long UC research program at the Mississippian mound center on the Ohio River but also included chapters that defined earlier cultural units in the area including the Baumer (Middle Woodland) and Lewis (Late Woodland) foci (now phases).

These works offer the first definition of the Lewis phase, which was located south of the Shawnee Hills along the lower Ohio River in southern Illinois and adjacent areas of western Kentucky (Muller 1986:131-133). After the University of Chicago work and these two publications, little attention was paid to Lewis sites until very recently. For decades scholars were not attracted to the simple, largely cord-marked ceramic vessels that characterize this period in the Midcontinent. Instead, early scholars focused on the more elaborate mound building cultures. As a result, the research and literature pertaining to the Late Woodland in southern Illinois and western Kentucky is not as robust as that relating to the earlier Middle Woodland and later Mississippian periods. Much of the recent work on the Late Woodland has been driven by the growing quantity of cultural resource management (CRM) studies (McElrath et. al 2000:4). The 1998 testing of the McGilligan Creek complex and the 2000-2001 excavations at the Cypress Citadel site have renewed academic interest in the Lewis phase and the character of Late Woodland occupation in the area. The data provided by these sites will prove to be very beneficial in aiding our understanding of the Lewis phase cultures.

Maxwell's Raymond phase is essentially contemporaneous with the Lewis phase, dating to ca. A.D. 600-900. The Raymond phase is defined as occurring largely north of the Shawnee Hills, centered in the Big Muddy River drainage. Raymond and Lewis share many basic traits in

their material culture, including stone tools and ceramic vessel forms (Cole et al. 1951:183). There are, however, some clear distinguishing markers in the ceramics, specifically temper and lip modifications (Butler and Wagner 2000). Even with these defining characteristics, the Late Woodland assemblages in certain areas of southern Illinois, such as the Saline River drainage, are so ambiguous that there is difficulty in distinguishing these cultural units (DiCosola 2008:68).

The Lewis Phase

The Lewis phase is a cultural unit of the Late Woodland period found in portions of southern Illinois and western Kentucky. Richard MacNeish first defined the construct in his 1944 thesis at the University of Chicago. MacNeish based this phase, then referred to as a 'focus' in the Midwestern Taxonomic System, on specific cultural traits, of which the ceramics, largely derived from investigations at the Kincaid archaeological site, were the most important (Muller 1986:128). Although the geographic limits of this construct are not yet fully defined, it minimally encompasses most of southern Illinois south of the Shawnee Hills and some adjacent areas of western Kentucky along and near the Ohio River. There are similar ceramic assemblages reported from the Jackson Purchase south of the Ohio-Mississippi confluence, but whether these can be properly termed Lewis has not yet been determined (Butler 2007).

Lewis Phase Ceramics

Lewis ceramics are predominately grog tempered (meaning crushed pottery sherds or fired clay) and largely cord-marked. Sub-conoidal jars with inslanting rims, the so-called “coconut”

jar form, dominate the assemblages. There are also a smaller numbers of shouldered jars and simple hemispherical bowls observed in some assemblages (Cole et al. 1951:178-179; Muller 1986:143). Region wide, most decoration on Late Woodland vessels consists of various forms of rim/lip modification, chiefly small notches, cuts (slashing), or dowel impressions. These lip modifications, common in Lewis phase ceramics, are generally executed from the exterior of the vessel rim. This exterior placement is one characteristic that distinguishes Lewis pottery from Raymond phase pottery (Butler 2007; Muller 1986:130). Lewis assemblages are dominated by grog temper and have rim notching most commonly applied to the exterior portion of the lip. Raymond assemblages, on the other hand, tend to be grit tempered with interior lip notching (DiCosola 2008:68).

What especially distinguishes the ceramics of Cypress Citadel and McGilligan Creek is a high frequency of boldly executed, broad line incising or trailing. This style of decoration is virtually unknown in the Late Woodland of the region outside of the Lewis phase and, so far, has only been found in abundance at the two sites in question. This incising does occur in the Lewis collections from Kincaid (Cole et al. 1951:180-181), but it is rare, having been recorded on only 40 sherds out of over 6500. A small number of similar pieces were also recovered from the Hog Bluff site (11JS199), one of the "stone fort" sites located about 15 km northeast of Cypress Citadel (Brieschke and Rackerby 1973). The great emphasis for this decoration at Cypress Citadel and McGilligan Creek suggests that there is something unusual about these two large sites and that there is some important connection between them that can be investigated through a detailed examination and comparison of their unique decorative elements.

Cypress Citadel

Cypress Citadel is a large Late Woodland complex in the very southwestern corner of Johnson County, Illinois, near the town of Cypress. It is known by several names including Cypress Bluff, Round Bluff, Big Hill, Glass Hill, and Cypress Citadel, the name used here. Originally owned by two private landowners, it was acquired by the Illinois Department of Natural Resources (IDNR) in 1998 and is, today, included in the Cache River State Natural Area. This Lewis phase site was occupied from A.D. 650 to 900 and is situated on top of an isolated sandstone ridge or bluff. The knob is an erosional outlier on the southernmost portion of a larger sandstone escarpment overlooking the Cache River Valley to the south. This location provides ready access to a range of resources within a short distance (Butler and Wagner 2012:32). The site is surrounded on all sides by cliffs or steep, near-vertical slopes up to 20 meters from base to crest. The crest of this ridge vaguely resembles a boot, approximately 340 m long north-south, the heel of which would be on the southeast corner and the toe on the southwest. The habitation area is limited to the approximately 3.2 ha. bluff-top with no habitation evident at the base (Butler and Wagner 2012). A series of small stone burial mounds are located around the base of the ridge, mostly on its eastern side. Remnants of three of these mounds have also been identified atop the bluff as well as an unknown number of small stone cairns or cysts. It is possible that the burial features atop the bluff were placed there after permanent occupation at the site ceased (Butler and Wagner 2012:289).

The site appears to have never been plowed; however it has been heavily damaged by many years of looting activity. It is likely the stone burial mounds surrounding the bluff initially drew the looters. The first records of professional attention in the early 1960's are recorded in the Southern Illinois University Carbondale, SIUC, Museum site files and are presumably in response to looting activity. Archaeological investigations, however, did not follow for nearly a

decade.

In 1972 Alphonse Stadler, leading a group of avocational archaeologists, did limited excavation at the site. His initial interest in the site focused on the heavily disturbed stone burial mounds. In 1974 Joel Klein, a graduate student of Howard Winters, led a New York University field school at Cypress Citadel. Klein completed a dissertation (1981) based on the results of field school excavations and interpreted Cypress Citadel's location as being advantageous for defense. He postulated that this site and the many stone forts scattered throughout the Shawnee Hills in Southern Illinois, were built by Late Woodland populations trying to escape the incursions of Mississippian farmers (Butler and Wagner 2012:30).

Since Klein's dissertation, a more refined chronology has shown that Lewis phase sites were occupied long before the Mississippian period began. The idea of a site being placed at Cypress Citadel because of its easily defensible location may be alluring to archaeologists, but little evidence exists to prove this. Furthermore, little is known about the connection between stone fort sites and Cypress Citadel. Ten stone forts have long been known to exist within the Shawnee Hills, at least eight of which belong to the Lewis phase (Brieschke and Rackerby 1973:5-6; Butler and Wagner 2012:31), and an eleventh has recently been identified at Murray Bluff in Saline county Illinois (Brian Butler, personal communication 2013). Despite similar locations atop sandstone bluffs, the stone forts are very different from Cypress Citadel, the former being viewed as ritual locations by Butler and Wagner (2012:31).

Following the acquisition of the Cypress Citadel by the IDNR in 1998, the Center for Archaeological Investigations at Southern Illinois University Carbondale, SIUC, was commissioned to evaluate its archaeological importance. The two-year investigation, 2001 and 2002, yielded a great deal more information about the site. A partial magnetometry survey was

successful in locating two house basins that were confirmed through excavations. Radiocarbon dating of charcoal demonstrated that the occupation period began as early as A.D. 650. The site appears to have lacked exotic exchange goods from long distances, conforming to the general characteristics common to the Late Woodland (Butler and Wagner 2012:290). More importantly to this research are the more than 121,000 ceramic sherds recovered, providing a more than adequate sample for comparison.

The Late Woodland in Western Kentucky

As is the case in many areas, the onset of the Late Woodland period in this area is marked by the disappearance of many Middle Woodland characteristics. The gradual shift in subsistence strategies and a contraction of the extensive exchange networks and elaborate ritual practices still define the period throughout this region. With these characteristics, the beginning of the Late Woodland period in western Kentucky is commonly marked at A.D. 400 (Pollack and Henderson 2000:614).

The Late Woodland of Kentucky can be divided in two different ways. First, an apparent cultural boundary exists at the Falls of the Ohio; sites downstream from this location remain culturally different from those upstream for much of the Late Woodland. A second division is temporal in nature, with differences being recognized between early (A.D. 400-800) and terminal (A.D. 800/900-1000) periods (Pollack and Henderson 2000:617). Most pertinent to the current research are those cultures downstream from the Falls prior to the terminal Late Woodland.

McGilligan Creek

Much of what is known about the McGilligan Creek site is the result of a 1992 survey of the Mantle Rock Preserve for the Kentucky chapter of The Nature Conservancy (Henderson and Pollack 1996). During this survey several sites were identified with Lewis phase ceramics, including the McGilligan Creek site and five rock shelters, three of which lie at the base of the knob which the McGilligan Creek site occupies. Like Cypress Citadel, the McGilligan Creek site is located on the top of a sandstone bluff. The site is considerably smaller, at 1.6 ha approximately half the size of Cypress Citadel, but is otherwise quite similar to Cypress Citadel (Henderson and Pollack 1996). Nearby are 94 stone mounds, grouped in two locations near the base of the knob. These locations, to the east-southeast of the village area, were given their own site designation as McGilligan Creek Mound Complex. Although no human bone was observed at any of the mounds, half of them exhibited signs of previous looting and Henderson and Pollack still believe them to be stone burial mounds (1996:5). The survey and brief test excavations in the habitation area showed that McGilligan Creek was a substantial Late Woodland site with permanent habitation.

The McGilligan Creek ceramics conform well to the described Lewis phase. The predominance of grog temper, thin walls, and cord-marked surfaces are not only indicative of the Late Woodland of this area, but also specific to the Lewis phase. The presence of southern Illinois cherts also suggests an affiliation with Lewis phase sites across the Ohio River. Two radiocarbon dates were obtained from the Village site, one showing a late Late Woodland occupation and the other an early Late Woodland occupation. Henderson and Pollack believe, in light of the assemblage, the second date is more accurate placing the occupation some time between A.D. 500 and 700 (1996:4).

Of particular interest here is the high frequency of incised pottery that is quite similar to materials from Cypress Citadel (Pollack and Henderson 2000:619-621). No comprehensive analysis has previously been published, but available data did indicate that the McGilligan Creek assemblage has incised ceramics in percentages comparable to those seen at Cypress Citadel (Gwyn Henderson, personal communication with B. Butler). Because of the uniqueness of this style to the region, some researchers have drawn connections between the two sites (Butler and Wagner 2000:690; Pollack and Henderson 2000:619-621), but no hypotheses have yet been proposed or tested to explain the connection.

CHAPTER III – CERAMIC STYLE AND INTERACTION

This research utilizes ceramics from the aforementioned sites, focusing primarily on incised decoration, to investigate the potential social connections. It is clear that these ceramics, through the amount and intricacy of surface decoration, are important in understanding the Late Woodland of southern Illinois and western Kentucky. It is also clear that decorative styles carry a message about the people who made or utilized these vessels. It can be argued that archaeologists may never know the intended message or messages of a particular style, and therefore will not know the important aspects of style to study or compare. However, certain characteristics can allow connections to be drawn.

Traditionally, analysis of pottery style focused on identifying design elements or attributes, motifs, configurations of these motifs, and the overall decorative layout (Rice 1987: 247). To carry out this approach, large portions of vessels are required. Ideally, this research would focus on decorative motifs, or repeated patterns of multiple design elements, as these would exhibit all aspects of this hierarchical system of analysis. These patterns would be compared against each other to understand their similarities and differences, but both collections used here are very fragmented, and few complete motifs were identifiable. Therefore, along with the analysis of these discernible motifs, design elements must be relied upon.

A review of the archaeological theories of style is necessary to better understand the analytical approach used in this study. The early studies reviewed here have led to much

discussion in the field of archaeology, and ultimately helped to form much of our current understanding of the roles which style plays in past cultures. Even so, the advances in archaeological theory have led to much contention concerning what archaeologists can truly discern from style. Therefore, knowledge of these early studies is necessary to understand the debates in modern archaeological theory of style.

Archaeological Approaches to the Study of Style

Style has been of interest to archaeologists since the beginning of the discipline (Longacre 2000:289). As studies of this aspect of material past have become more prevalent and have attempted to answer more anthropological questions, it seems that more contention than consensus has arisen over how style should be studied. Despite a half-century of discussion, this debate continues today, as shown by several volumes which attempt to form a unified definition of style for archaeologists (Carr and Neitzel 1995; Conkey and Hastorf 1990, Rice 1987). Often the ambiguity rises from defining the term itself (Carr and Neitzel 1995:6, Rice 1987:244). There is a lack of agreement over whether technology and function are aspects of style (Hegmon 1992; Sackett 1977; 1985) or whether style is an independent feature (Binford 1965; Wiessner 1990; Wobst 1977). As Rice (1985:249) notes, defining style is only one point of contention; there is even less unity in understanding how style should be interpreted. This should be no surprise, as the way in which we define something no doubt affects the way in which we understand it to function in society. With an apparent lack of unity over how one should approach stylistic studies, several researchers have suggested a synthesis of several theories to be used (Carr 1995, Plog 1990, Voss and Young 1995, Wiessner 1990).

Early studies of style saw archaeologists concerned primarily with developing typologies and chronologies of material culture areas. Similarities in stylistic elaboration were a primary means in defining these (Longacre 2000:290). The 1930s publication by Charles Amsden (1936) and a later elaboration by Colton and Hargrave (1937) helped codify a more refined methodology for this type of stylistic design study. These early studies did not concern themselves with the many social reasons for stylistic similarity; however, many of the typologies that they created have stood the test of time. In the Eastern United States this framework can be seen in the Midwestern Taxonomic System (McKern 1939), which is still employed today in greatly modified form. Over its seventy-plus years of use, the field of stylistic analysis has evolved far beyond this descriptive method.

With the advent of "ceramic sociology" in the 1960s, archaeologists began to use stylistic studies to understand social organizations of past societies (Deetz 1965, Longacre 1970, Hill 1970). In the studies carried out by James Deetz and William Longacre, stylistic variation and distribution in the archaeological record was understood as a direct result of past social organization. Assuming that mothers passed their knowledge of stylistic designs to their daughters, stylistic similarity allowed Deetz and Longacre to identify prehistoric matrilineal social organizations (Deetz 1965, Longacre 1970). The Deetz-Longacre hypothesis, as it became known, was quickly adopted in ceramic sociology studies. Several other hypotheses were also tested to understand the intra-site variability. The underlying concepts of these early studies can be unified under the term "social interaction theory" (Plog 1980: 115). The theory rests on the assumption that the degree of stylistic similarity, both within and between social groups, is a function of the intensity of social contact (Plog 1983, Rice 1987: 246-247).

This approach has been variously assailed. One critique attacks the assumption of stylistic

knowledge being passed from mother to daughter. A second holds that this theory focuses on style as a reflection of social organization at the cost of disregarding the functions that style may play in a society (Hill 1985, Plog 1980, Wobst 1977; for an in depth review of the interaction theory and the critiques surrounding it, see Rice 1987:254-258, Voss and Young 1995:81-82). Despite its shortcomings, this interaction theory approach helped initiate much of the recent interest in stylistic studies (Plog 1995).

Concerned with the lack of an active role for style in society under the social interaction theory, Wobst (1977) developed a theory that treats style as a means of transmitting social information. Coined the information exchange theory, this approach suggests that stylistic attributes also serve a function. He saw style as a means of displaying a variety of social information including identity, group membership, and political ideology (Plog 1980:116-118). Therefore, information exchange can take place at all levels of social interaction from intra-site variation to inter-site relations and is testable as such. Wobst did not carry out his research on pottery styles, instead focusing on hat shapes and colors. Nonetheless, his conclusions were quickly applied to several stylistic analyses, including ceramics.

As often seems to be the case in anthropology, critics of a particular approach successfully point out its flaws but fail to incorporate its strengths—the common academic problem of "throwing the baby out with the bath water." Wobst and other early information exchange proponents believed that style and function could not be separated. More recent research suggests, however, that while certain portions of style do seem to serve social functions as means of communicating information, others may not. Even with this realization, archaeologists have still not found a unified view concerning stylistic analysis in archaeology (Carr and Neitzel 1995, Conkey and Hastorf 1990).

The theoretical divides between social interaction and information exchange theory are still at play in recent debates. In general, these two views continue to dominate the field. On the one hand, there are theories that focus on the visible aspects of style as a means of communication or social identity, and on the other there are those that focus on the less visible choices made during the manufacture process, reflecting social organization. Recent works attempting to delineate which attributes of style are functional and which are not have found this issue to be very complex (Voss and Young 1995:87). Because several publications already discuss the many positions that are currently advocated in detail (See Carr and Neitzel 1995 and Conkey and Hastorf 1990, Rice 1987), the remainder of this chapter focuses on the two theories that are of concern to this research.

James Sackett and Polly Wiessner have carried the arguments about which aspects of style are pertinent in archaeology into the current view. Despite their use of different terminology, their views adhere well to the social interaction and information exchange theories. Sackett (1985:157) believes style to be "dictated largely by the craft traditions within which the artisans have been enculturated as members of social groups." Therefore, "each social group or unit of ethnicity tends to possess its own distinctive style, and the overall degree of stylistic similarity represented by two groups' material cultures taken as a whole can be regarded as a direct expression of their ethnic relatedness" (Sackett 1990:33). This application of style does not constrain it to decorative elements of a pot, but rather includes every step of the making of pottery as a stylistic choice. To further his argument, Sackett terms this definition isochrestic style. This type of style is shown through the artisan's choice at any point during manufacture of one option over another equally viable option. This selection will not affect the functionality of the end product, but is chosen based upon the cultural norms of the potter (Sacket 1990). Sackett

believes that isochrestic style can become a stamp of ethnic identity simply through the process of similar products being produced in the same culture and differing from those around them (1986:270). However, isochrestic style is not meant to transmit any messages and is not intentionally coded with the potters' ethnic or cultural affiliations. This definition of style allows archaeologists to identify distinct cultural units based on a culture's ceramic traditions.

Sackett's argument can be understood as a continuation of the thinking that drove the social interaction theory. The way that a potter learns to create a pot will produce end results more similar to others who learned pot-making in the same culture, and less similarity will be seen between these pots and those of potters who learned their traditions elsewhere. Even though Sackett concedes that ethnic identity will inherently be coded into a pot during the manufacture process, he does not agree with Wobst that an intentional social signal was the purpose of this coding.

Polly Wiessner (1985, 1990), on the other hand, has continued to insist that style plays a role in the intentional transmission of messages about social identity. In fact Wiessner, like Wobst, believes that the only purpose of style is to transmit a message about a group or individual identity. To explain stylistic variation within a cultural group, she makes a distinction in her work between assertive and emblemic style. Assertive style is done on the part of the individual, and conveys a message to his or her own cultural group about their individual identity. Alternately, the transmission of a group or cultural identity to more socially distant groups is termed emblemic style (Wiessner 1990:107-108).

Though Sackett and Wiessner are certainly not the only scholars to take up the issue of style, their debate (Sackett 1977, 1985, 1986, 1990; Wiessner 1983, 1985, 1990) over how to define style and what its social purpose is are the most pertinent to this research. It may seem

odd to utilize these apparent opposing theories in one study; however, it must be understood that these two views are not mutually exclusive, a point which has been made by several researchers (Wiessner, Plog, Voss and Young). Plog (1995: 370) discusses three different types of stylistic variation and the virtues of each. The first type is isochrestic variation, modeled after Sackett's definition. This is unconsciously exhibited and arises from behavior that was repeated during the learning process. The second, symbolic variation, reflects the thinking of Wiessner and is based on stylistic elements consciously selected to convey identity. Symbolic variation closely resembles the understanding of variation in information exchange theory. The third type of stylistic variation considered by Plog is iconographic variation. This closely resembles the emblemic definition of style that has already been discussed. This type of style is coded with a specific message that is meant to be transmitted to other social groups (Plog 1995:370).

Understanding that stylistic variation will play out differently in the archaeological record depending on the nature of the variation, it is argued that the use of multiple theoretical approaches to stylistic analysis is the most appropriate means of capturing the nature of any extant social connections. Identifying these different types of variation, however, requires much information that the present study lacks, such as fine temporal control. One avenue for distinguishing these types of variation is described by Wiessner. She suggests that isochrestic variation would exhibit consistent patterns dependent upon the function, material, or the like (Wiessner 1990:107-109). For the purposes of ceramics, we can understand this in terms of the function of the vessel. Conversely, symbolic variation would lack this association with vessel function (Plog 1995:373). These types of enculturated variables are more conservative and less likely to change with newer social contacts, at least in the short term. On the other hand, decorative styles, such as emblemic style, would more readily change to incorporate a newer

social signal with a newly related group (Plog 1995:373).

CHAPTER IV – ANALYTICAL METHODS

Style is much more complex than some analytical approaches give credit (Voss and Young 1995:91). Even so, this synthetic approach is utilized here because of its ability to allow conclusions beyond simple type distinctions. This research compares several functional variables of the assemblages in an attempt to identify any isochrestic relations between the groups. That is, if similarities between the groups are as great as the similarity of these variables within each group, the argument can be made that these groups have developed this ceramic tradition together. This would indicate substantial social interaction taking place between the groups, possibly even intermarriage.

Design element analysis simply compares the similarity (or comparative frequencies) of the design elements between the two assemblages. The procedure begins by compiling all of the design attributes from both assemblages, chiefly dealing with individual incised lines, by means of presence/absence, width, angle, and location. The frequency for each element is tabulated per site. These frequencies allow for direct comparison between the two assemblages in order to discern their similarity. The amount of similarity between the two assemblages provides evidence about the extent of social connections between the two groups (Rice 1987: 252-254). Plog suggests that design element repetition and width of incising are good measures of contact intensity (1983: 129-130), but may be of little use in elucidating the nature of the connection (Rice 1987: 252-254).

Plog shows that a comparison of elements can only be made when the attributes can be considered alternative states of one another (Plog 1980: 43). That is to say, a choice was made for one attribute as opposed to another. Therefore, the design elements in this study will compare line forms and width measurements as separate variables, as they describe two different choices. For the purposes of this paper, a design element is defined as a single line from end to end. With this definition, two different line types are present, curvilinear and linear. The linear, or straight, lines can be subdivided; they can be applied to a vessel horizontally, vertically, or obliquely. Width measurements will also be recorded as either boldly executed or narrowly executed. However, as Plog notes, line forms and width measurement must be kept as separate variables when testing their similarity (Plog 1980: 43).

The few larger and more elaborate sherds are of great importance when attempting to understand any social signaling between the two groups. Analysis of motifs allows the formulation of answers to these questions, which go beyond the simple confirmation of social interaction. This approach analyzes the configurations of multiple design attributes to understand the larger motifs and their location on the vessel. This study attempts to identify several repeatable motifs in the two collections, which cannot be defined *a priori.* Utilizing the design attributes discussed above, primary, repeated configurations, such as a series of horizontal incisions, are defined and compared.

Test Implications

This research, which aims to understand if there is a social connection between Cypress Citadel and McGilligan Creek, utilizes aspects from both Sackett and Wiessner's views of style.

An attempt was made to divide Sackett's isochrestic variables from the iconographic ones, those that Wiessner termed emblemic. This division allows the testing of whether the populations at these sites were involved in economic or social activities. But, as is often the case in archaeological research, much of the information required to adequately define these variables, such as tight temporal control and whole or large portions of vessels, are lacking for these collections. This research, therefore, utilizes the distinction between those variables which are decorative in nature and those which are functional, in order to study the isochrestic and iconographic aspects of pottery separately. This distinction, between function and decoration, is based on the utility of a pot. As has been stated, decoration can and does play a functional role in societies through information exchange; however, the distinctions made in this research do not consider these roles when defining functional variables.

Aspects such as temper, surface treatment, rim stance and vessel form, are all considered here to be functional and are deemed isochrestic. While some archaeologists would not agree with the definition of these as purely functional, justification for this can be seen in the widespread nature of these characteristics in the Late Woodland of this region. Here, these variables are considered to be based on the notion of routine, “this is how we do it because that is how it is done,” not an attempt to adhere to or delineate from another group through stylistic elaboration. These functional aspects of pottery production are passed down from one generation of potters to the next. If this is indeed the case, these variables will allow us to detect social connections such as intermarriage and trade.

On the other hand, there are also several iconographic variables present in each collection that allow a different view of the social connections. Decoration, such as the incised line motifs and the form of lip treatment, are quite variable within each site and throughout the region as a

whole. This suggests that there were several alternatives from which potters could choose, and the rigidity of these choices was less than that of the functional variables. Therefore this stylistic elaboration can be understood as representing information about the identity of these potters. Whether it is a conscious choice, perhaps representing individual identity, or a more unconscious choice, perhaps representing a group identity, is irrelevant with the data at hand. Either choice will exhibit variation per site. If the two sites share a common sense of identity, and this identity is portrayed through pottery, the decorative elaboration of the pots should be similar between the sites. If, on the other hand, only certain similarities are seen, it could be argued that some political or ideological views are shared by the populations, or that loose connections have created loosely shared identities. It is understood that the role of style can be more complex than a division between functional versus non-functional, being neatly divided into learning versus signaling; however the most basic roles of style may indeed be divided in this manner.

Variables and Attributes

A general analysis was done on both assemblages following the methods set out during the initial analysis of the Cypress Citadel collection (Jackson and Butler 2012). This section describes these variables and provides a detailed description of the recording for the attributes. Because of the extreme fragmentation of the ceramic sherds, many of the variables could only be observed on rim fragments. Often, even on rim fragments, characteristics such as vessel morphology could not be determined. Due to the large number of sherds and the little discernible information from those that measured less than 0.5 inches in the largest measurement, these sherds were only counted for an idea of the fragmentation of the assemblages as a whole.

Nearly seventy percent of the sherds in the Cypress Citadel collection were less than 0.5 inches in greatest measurement; however, the remaining sherds totaled nearly 37,000. Therefore, a sample of these sherds was taken to undergo full analysis, and the remainder was subjected to limited analysis. Before sampling the assemblage, all decorated and rim sherds were pulled aside in order to gain the best understanding of the variety of decoration and the form of vessels being produced at the site. Although large in number, the undecorated body sherds were highly uniform in temper and surface treatment and produced little useful information for this study.

Temper

Temper determination was largely based on analysis of the broken edges of sherds, but the surface was also examined to ensure minority tempering agents were not missed. In some instances the edges of the sherds required the creation of a small fresh break to make the temper clearly visible. Only the identity of the temper was determined; no attempt was made to estimate the size or percentage of temper in the paste. Because the majority of the sherds showed very uniform temper, a microscope was only used to confirm a tempering agent in the rare instances in which it was questionable. The major tempering agent was grog, or crushed clay or pottery. Six other minority agents were also observed—sand, grit, limestone, shale, quartz, and one instance of crushed bone. It is important to note that the temper is understood to be an intentional addition of an aplastic to the paste. A sandy paste, not considered a temper, was observed in some sherds. The identified sand temper was notably larger than this naturally-occurring sand. Also observed in several sherds from Cypress Citadel and three sherds from McGilligan Creek, was a micaceous sand, which is also understood to be native to the clay. These native clays with sand or micaceous sand may have been sought for their properties; however, intentional use has

not been determined.

Surface Treatment

As was the case with temper composition, the surface treatment was observed on all analyzed sherds. Surface treatment is understood to be distinct from decoration as it applies to large portions of the vessel surface. Four types of surface treatment were observed: cord-marked, plain, stamped, and eroded surfaces. Cord-marking, the dominant surface treatment, is the result of impressing the exterior surface of a vessel with twisted cordage wrapped around a paddle. Plain sherds either lacked cord impressions or had been smoothed to the point where they were no longer visible. The stamped pottery was created utilizing carved paddles. Finally, eroded sherds were only categorized as such if the original surface was too worn or badly damaged to categorize. No surface treatment was identified on the interior portion of sherds.

Rim Variables

Rim sherds offered a few additional variables that could not be analyzed on the body fragments. Because no whole or even partial vessels are present, these sherds give researchers the best estimate for the original vessel morphology. The lip form and stance were adapted from Ozuk's (1987) classification of Late Woodland pottery, as was the corresponding vessel morphology. This variable was evaluated by holding a rim sherd parallel with the line of sight and determining the correct category. This was repeated for both ends of a sherd to ensure a consistent categorization. In cases in which the opposite ends of the sherd resulted in differing categories, the remaining portion of the lip was utilized to determine the most appropriate category. This technique was often used when a break on the rim was in the center of a notch,

creating an area where the lip form was distorted by the rim modification. Six categories of lip form were observed: Rounded, Squared, Sloped to Exterior, Extruded, Thickened, and finally Sloped to Interior (See Figure 3.1).

Eight rim stances were also adapted from Ozuk (1987), which include Inslanting, Inslanting/Incurved, Vertical/Incurved, Inslanting/Outcurved, Vertical/Outcurved, Outslanting/Outcurved, Outslanting/Incurved, and Everted. The assemblage also included rims that were determined to be Vertical stance only (Figure 3.2). This may indicate a vessel form that was not encountered and recorded by Ozuk. A more likely explanation, however, is that these rims were too small to determine the curve of the shoulder. Identification of the rim stance was accomplished by holding the rim sherd to the bottom of a horizontal plane and adjusting it until the least amount of light (preferably none) could be seen between the plane and the rim. The resulting angle or curvature of the remaining portion of the sherd profile determined the rim stance category in which the sherd was placed. These categories were also used to identify the form of the vessel.

Because no whole vessels or even large portions of vessels were recovered, the inference of vessel morphology rested largely on a comparison of the rim stance to the known vessel forms in other Late Woodland assemblages. Inslanting/Incurved, Vertical/Incurved, Inslanting, Inslanting/Outcurved, Outslanting/Incurved and Everted are categories which all belong to vessels classified as jars, while Vertical/Outcurved, Outslanting/Outcurved and Vertical indicate bowls. Jars dominate both collections, but bowls are also represented. Pinch pots, or crudely made vessels that are produced not by coiling, but rather by inserting a thumb into balls of clay or pinching clay into a pot shape, were also observed in the Cypress Citadel assemblage. These vessels are much smaller than their more common and better-made counterparts. Because of the

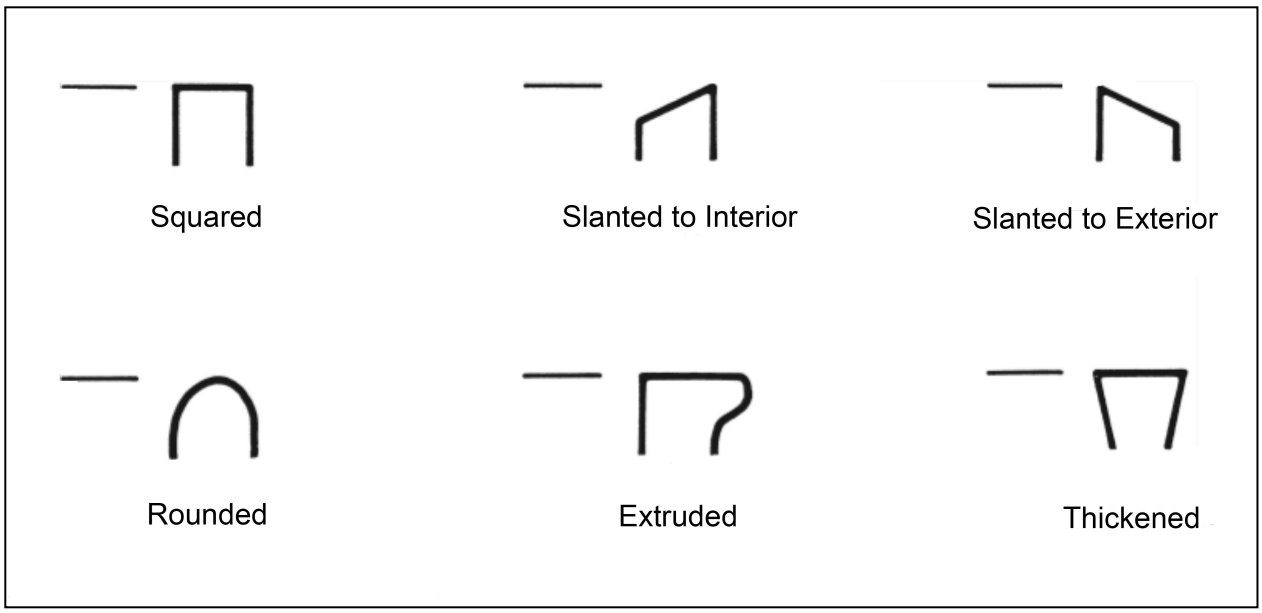


Figure 3.1: Variations of observed lip forms. (adapted from Ozuk 1987)

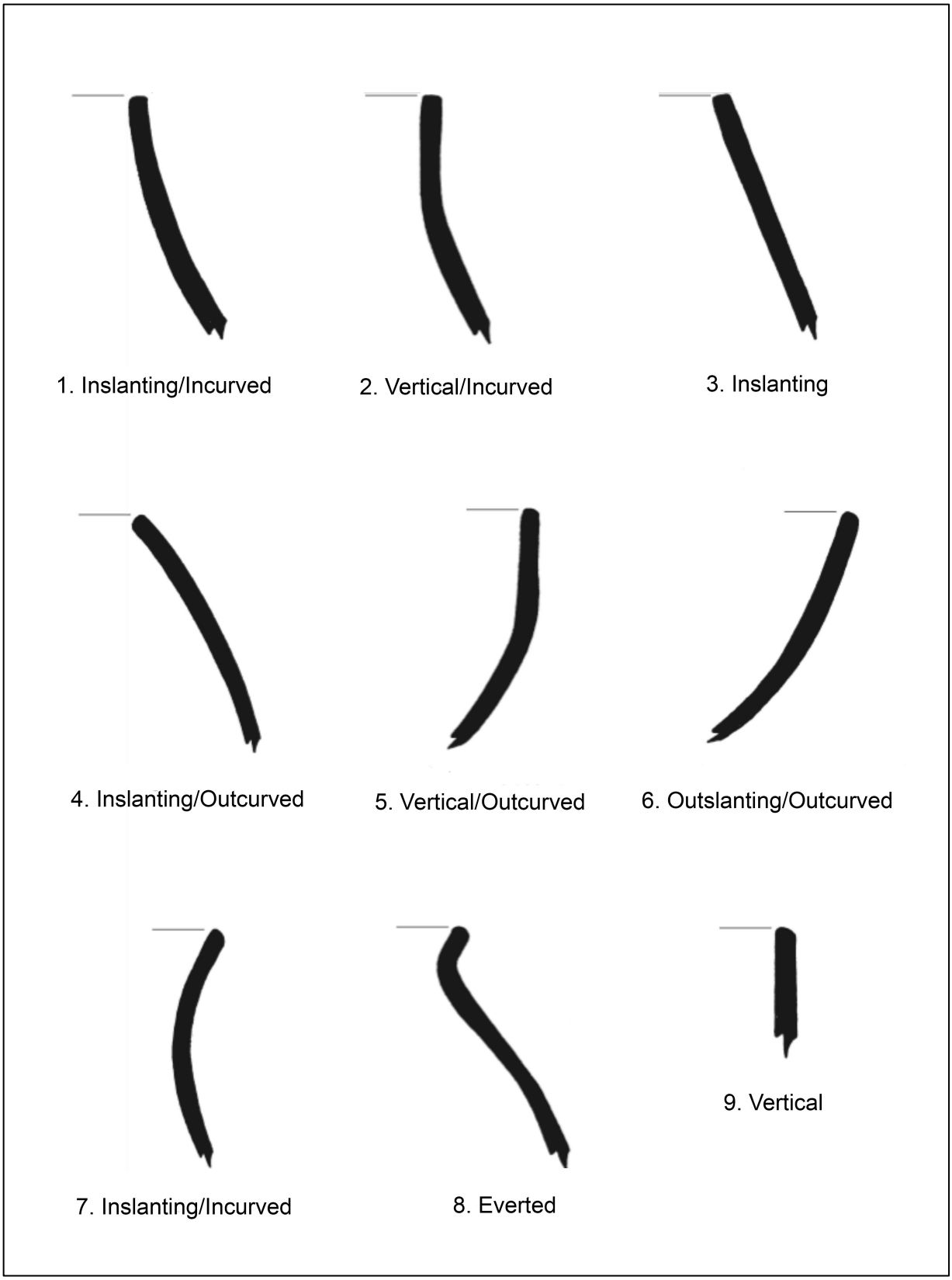


Figure 3.2: Observed rim profiles (adapted from Butler and Wagner 2012; original Ozuk 1987)

uniqueness of such vessels, they have been left out of the comparative analysis but are described separately.

Vessel decoration consists of two general classes: lip modification and surface decoration. Lip modification, or the modification to the uppermost portion of the rim, is a common decorative technique of the Late Woodland. Notching is the most frequent modification in these assemblages and it occurs in three forms: stick notching, slashing, and dowel impressions. Notching generally consists of a narrow indentation on the rim. It is generally created using the end of a stick, but in rare instances can be done with a bone or other tool. Slashing, as the name implies, is a narrow cut in the rim done with a sharper instrument. Dowel impression are accomplished through a similar means as notching, but with a larger round stick, defined here as 7mm wide or larger. A few instances of dowel impressions in the assemblages appear to have been executed with a cord-wrapped dowel. The placement of the notching is recorded; whether initiated from the exterior edge of the lip, the interior edge, or placed on the upper surface (superior). The rim notching for both assemblages is generally applied from the exterior of the rim, a diagnostic trait of Lewis ceramics, however there was an appreciable number of interior-notched rims recorded, as well as few cases of superior (or horizontal) notching.

Decoration, other than lip modification, is usually rare in Late Woodland ceramics from southern Illinois and western Kentucky. All additional decoration observed in the collections are in the form of incised lines, punctations, and lugs and appears to be restricted to the upper portions of vessels. Several aspects of the incised lines were recorded during analysis. The form of incising, be it linear or curvilinear, was recorded along with the width of the line. To expedite the process, width was divided into two categories, narrow (<2mm) and bold (>2mm). Because of the very bold nature of incising that dominated the collections, the vast majority of incised

line widths were easily categorized without need for measuring.

Rim sherds offered additional information, including the angle of incising and the presence of zoning. Zoning occurs when the incised decoration is divided from the rim of the vessel by a horizontal line, achieved by a complete line of incising or punctations running the entire circumference of the vessel. Incised decoration whose uppermost portion exhibited linear incising running parallel to the lip was recorded as zoned motifs. Identifiable repeated patterns of incised combinations as well as motif segments were recorded.

CHAPTER V – THE ASSEMBLAGES

This chapter provides a description and a comparison of the characteristics of each assemblage as a precursor to the statistical analysis. The ceramics from both sites share many of the same characteristics, but some features are unique to each site. The Cypress Citadel collection was derived from SIUC field excavations in 2001 and 2002. These two seasons resulted in over 121,000 ceramic sherds, with nearly seventy percent of them less than 0.5 inches in greatest dimension. The McGilligan Creek assemblage is considerably smaller, obtained from only two weekends of small-scale excavations (Henderson and Pollack 1996:2). This limited work resulted in almost 9400 sherds in the final assemblage with nearly 5700 being smaller than 0.5 inches.

The Cypress Citadel Assemblage

The analysis of Cypress Citadel ceramic assemblage encompassed over 37,000 sherds greater than 0.5 inch, of which 11,709 were subject to formal analysis. This selection includes all diagnostic sherds, rims and those with decoration, as well as the ceramics recovered from eight 2 x 2 units which were selected to be representative of the site as a whole. The collection contains highly fragmented sherds, with few large sections. The information recovered during analysis, based principally on these small sherds, was limited for certain variables, namely: vessel form,

size, and large decorative motifs. Technological variables were generally discernible from all sherds greater than 0.5 inches and are better represented.

Isochrestic Variables

Temper and surface treatment were identifiable on all 11,709 sherds analyzed. As Figures 5.1 and 5.2 show, grog tempering and a cord-marked surface treatment dominate Cypress Citadel ceramics. Grog is the sole tempering agent in nearly 97 percent of the collection, and is present in some quantity in all but eight cases. A fine sand was observed in the paste of many sherds. This sand, because of its small size and smoothness, is believed to be native to the clay source. However, 344 sherds (2.9 percent) were identified to have a much coarser sand combined with the grog in the paste. This coarser sand is believed to have been intentionally included as a tempering agent. Seven additional sherds appeared to be solely sand-tempered. Other tempering agents were not well represented. Limestone is observed in eleven sherds while shale, quartz, grit (crushed rock), and bone all play a very minor role in pottery production at this site. The quartz and shale tempers were very coarse and may indicate a poor attempt to produce a grit temper. There was also one sherd that had no tempering, and may be a fragment of a poorly fired pinch pot.

Less than six percent of the sherds were too badly damaged to identify a surface treatment. This preservation shows that, although the collection is highly fragmented, these vessels were fired very well. Three surface types were recorded: cord-marking, plain or smoothed over surfaces, and one case of check stamping. Cord-marking overwhelmingly dominated the collection, representing more than 97 percent of surfaces that were not eroded. Few plain surfaced sherds were observed and these appear to occur mainly on rim and shoulder areas of

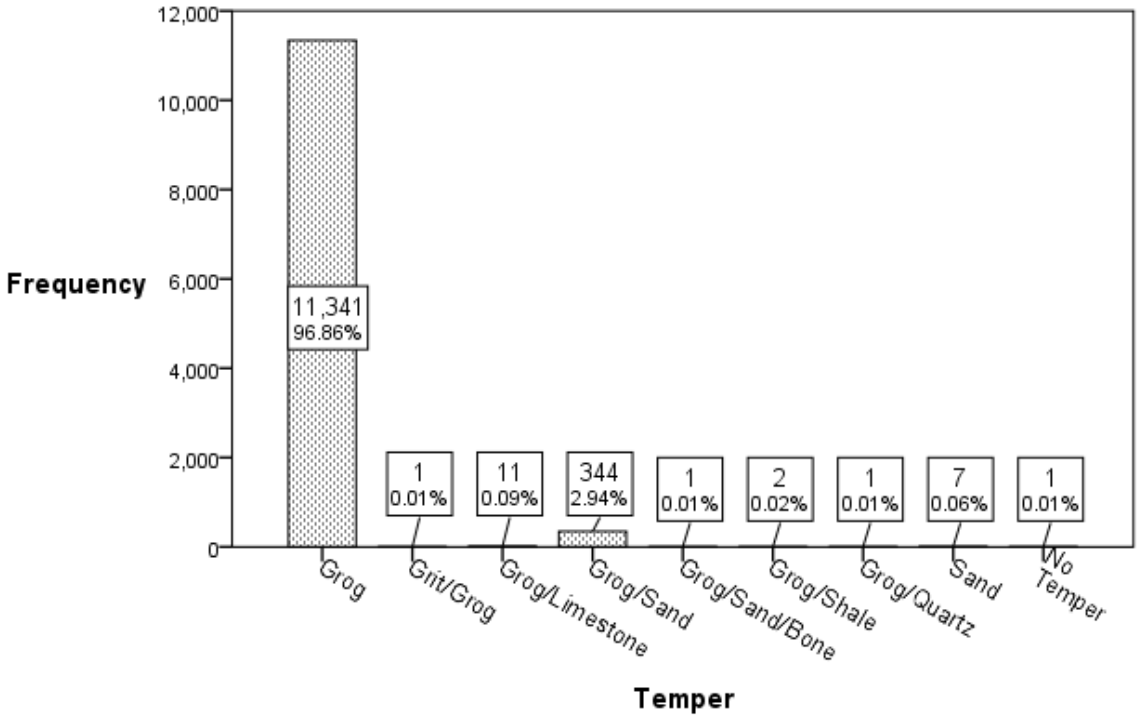


Figure 5.1: Distribution of temper at Cypress Citadel.

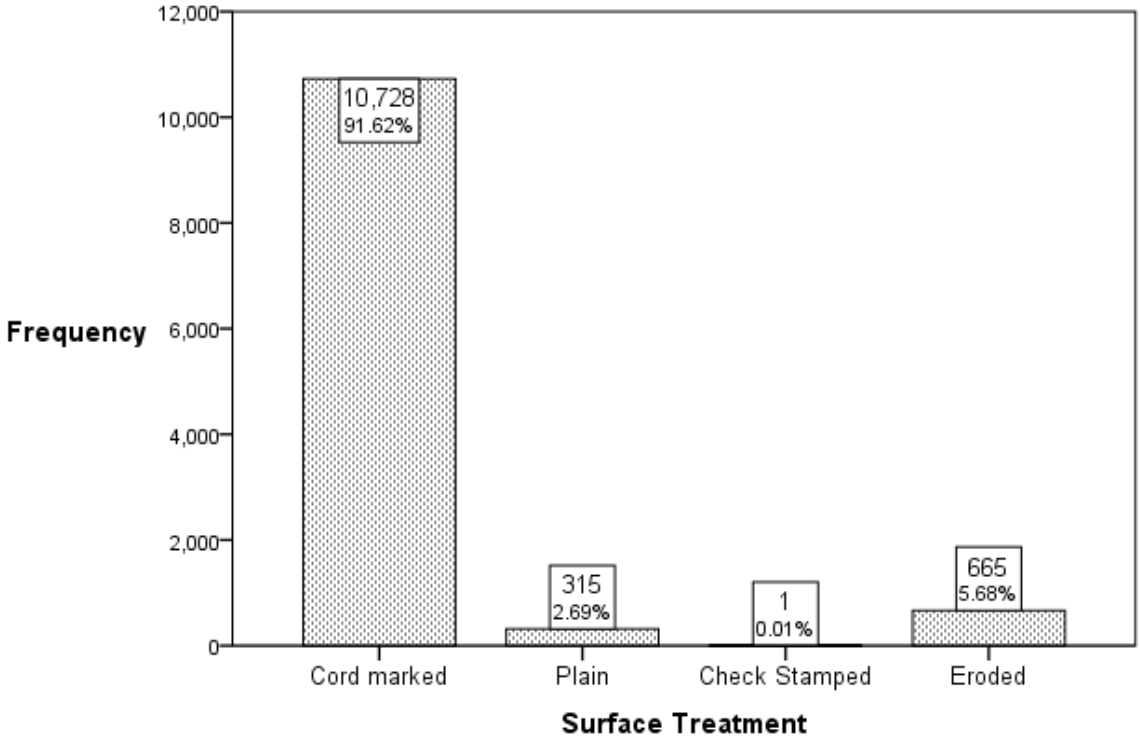


Figure 5.2: Distribution of surface treatment at Cypress Citadel.

bowls. The one check stamped sherd was not identified until after the site report had been published. Although the surface of the sherd is in poor condition, comparisons with check stamped sherds from McGilligan Creek verified this surface treatment.

Since cord-marked surfaces were so common, the angle at which the cord-marking was applied at the lip was also recorded (Figure 5.3). Most often it was applied perpendicular to the plane of the vessel orifice, running vertically when the vessel is in the upright position. Oblique applications—those that were angled at the lip—were observed on nearly one-third of the vessels. More uncommon applications were those which ran parallel with the lip, described here as horizontal, and those which had overlapping, or cross-hatched, cord-marking. The four cases of cross-hatching appeared on notably thicker sherds and may belong to the basal portion of a vessel.

The profile of the lip also varied, with six separate forms being observed (Figure 5.4). Lips were most often rounded, about 69 percent of the assemblage, but squared and extruded lips each comprised more than 10 percent of the collection. Sloped to exterior and thickened lips are also represented in the collection, making up 6.8 and 3.4 percent respectively. A single instance, representing less than 0.1 percent of the total rim assemblage, of sloped to interior was also recorded. This single instance may represent the true nature of the finished vessel, but it may also be an anomalous portion of a vessel with a different lip profile.

The tabulation for the final isochrestic variables, rim stance and vessel form, are shown in Figures 5.5 and 5.6. As previously noted, these variables are related in that the rim stance is used to determine the vessel form. Of the total rims, the fragmentation on 911 sherds was too great to allow definitive classification of the rim stance and corresponding vessel form. Therefore, the vessel form was based on 159 rims sherds. Excluding pinch pots, rim stances indicative of jars

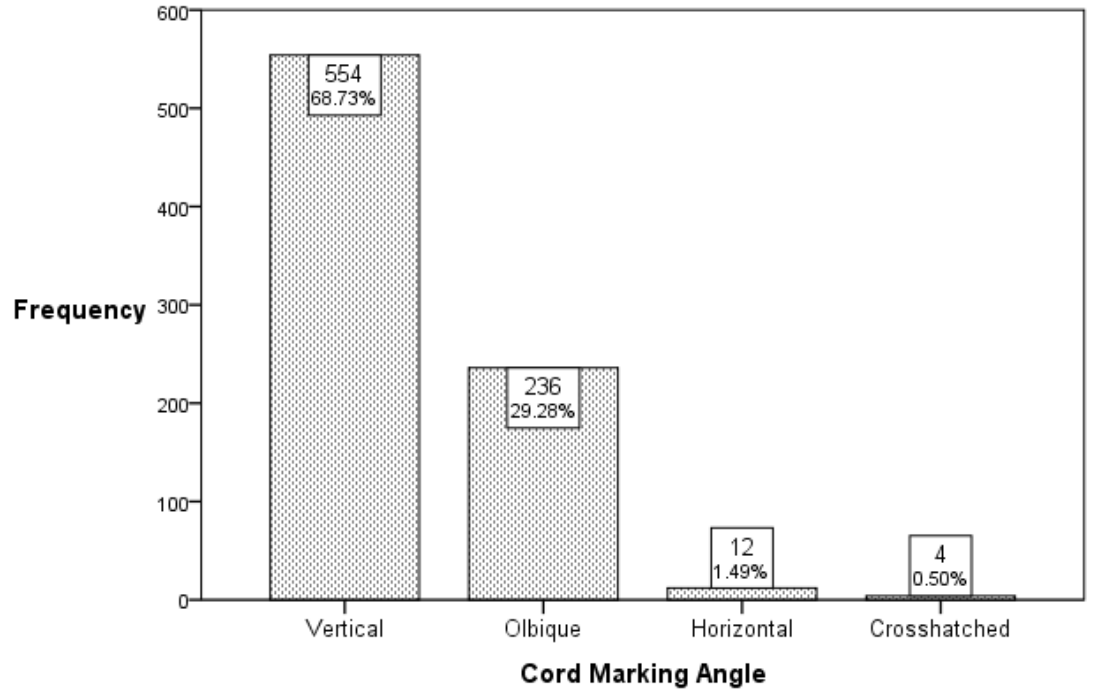


Figure 5.3: Distribution of cord-marking angle at cypress citadel.

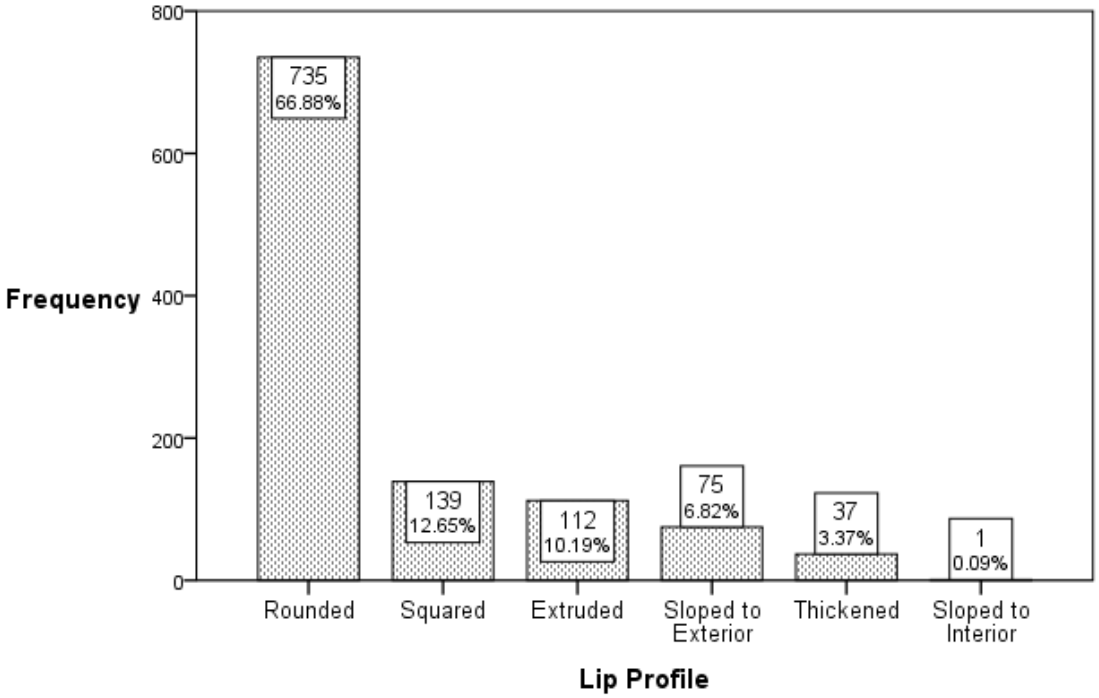


Figure 5.4: Distribution of rim profiles at Cypress Citadel (see Figure 3.1)

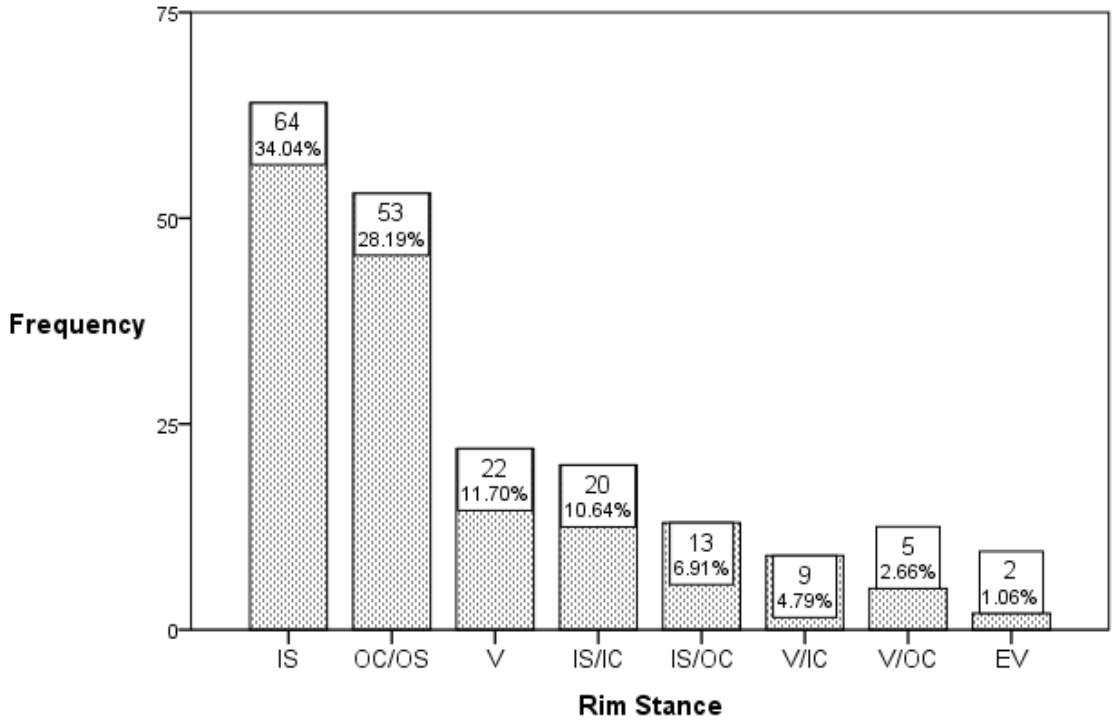


Figure 5.5: Distribution of rim stances at Cypress Citadel (see Figure 3.2).
Key: IS, inslanting; IC, incurved; OS, outslanting; OC, outcurved; V, vertical; EV, everted

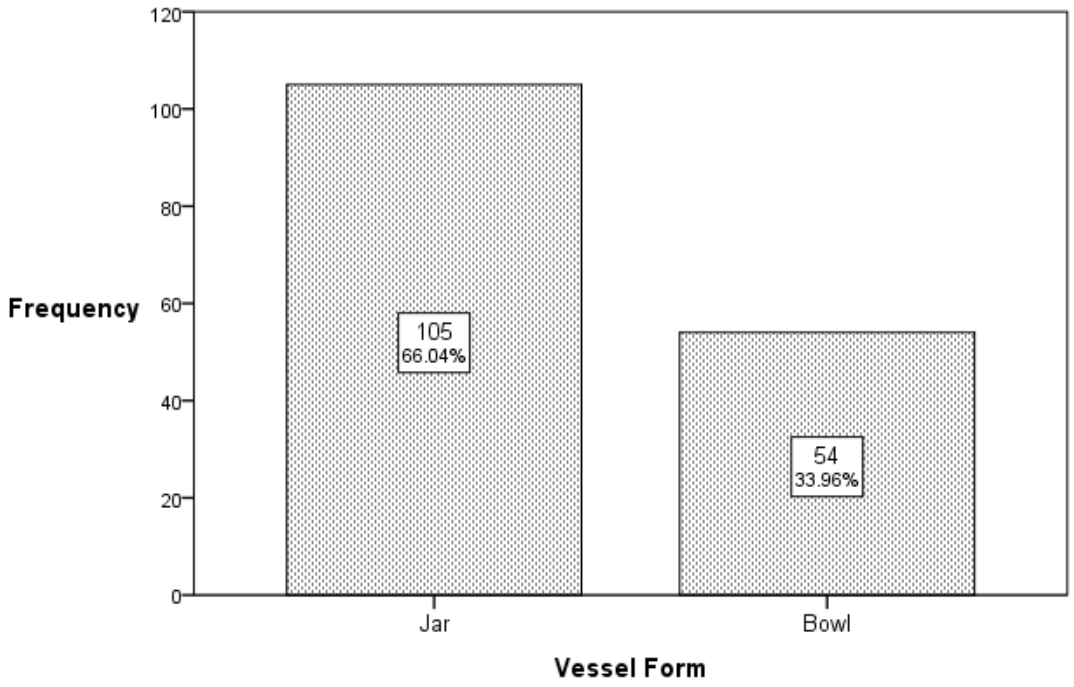


Figure 5.6: Distribution of vessel types at Cypress Citadel.

make up two-thirds of the Cypress Citadel collection, while those indicating bowls make up the remaining one-third.

Iconographic Variables

The remaining variables are decorative in nature and are believed in this research to have been used for the transmission of information, political or ideological. Lip decoration in the Cypress Citadel collection is generally done in the form of notching (72 percent). Dowel impressions and slashing each comprise 4 to 5 percent of the assemblage. Unmodified lips (ca.17 percent) seem to be much more strongly correlated with bowls and pinch pots than with jars. Eleven cases of cord-wrapped dowel impressions were also observed, along with two impressions made by a small bone epiphysis. Decoration also occurred on the interior and superior portions of the lip, but with much less frequency. The majority, 83 percent, of lip decoration is applied to the exterior of the rim (Figure 5.8). Superior placement is present on 12 percent, while interior placement is uncommon, shown on less than 5 percent of the rims.

Lip decoration is more common at Cypress Citadel than any other known Lewis site in southern Illinois; however much more interesting are the incised surfaces. More than 28 percent of the rim sherds exhibited incised decoration. Linear, or straight lines, are present on more than 96 percent of all decorated sherds. Curvilinear incising is relatively uncommon in this assemblage, occurring on less than eight percent of decorated sherds. The low incidence of curvilinear lines differentiates the Cypress Citadel ceramics from those at McGilligan Creek.

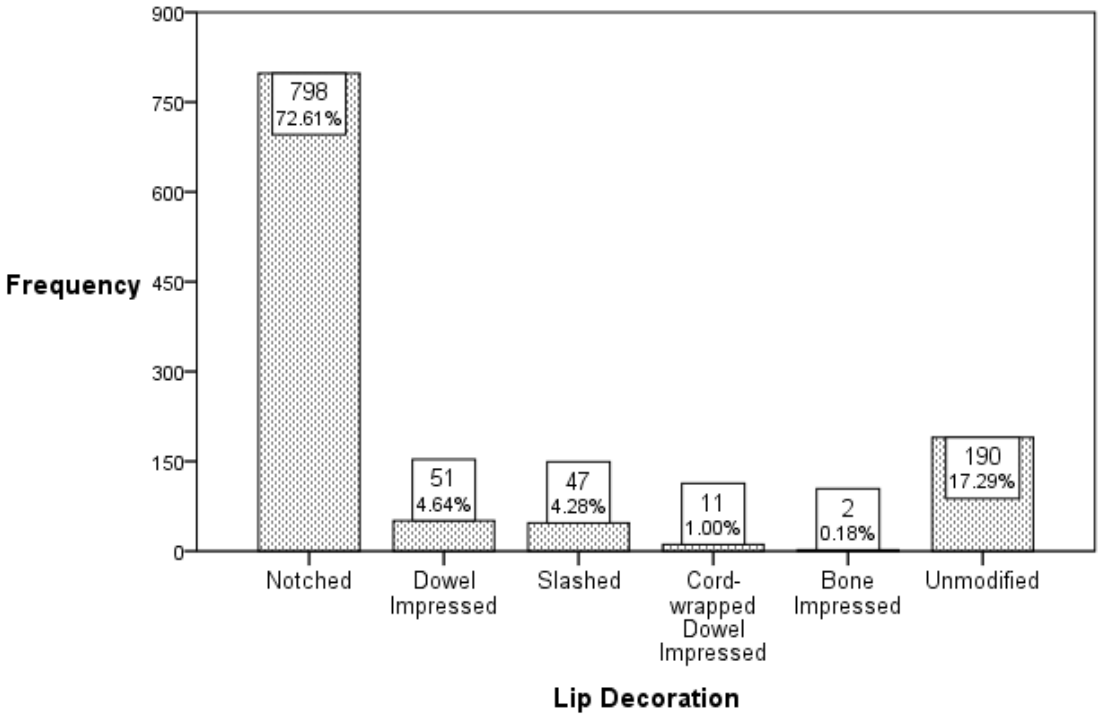


Figure 5.7: Distribution of lip decoration at Cypress Citadel.

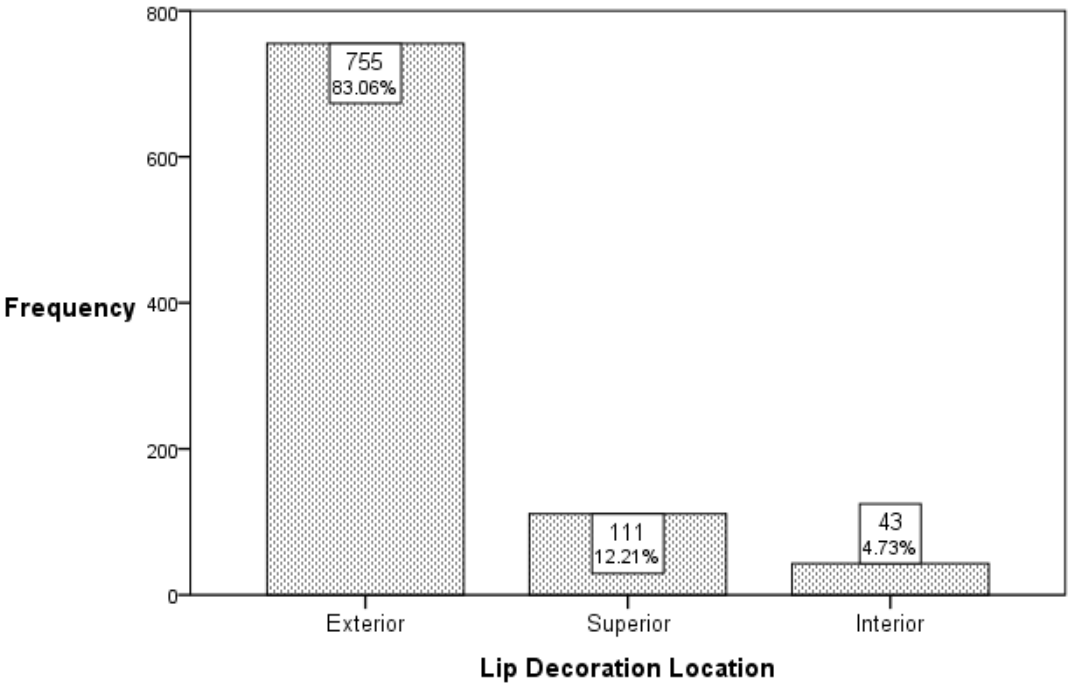


Figure 5.8: Distribution of lip decoration location at Cypress Citadel (see Figure 6.1).

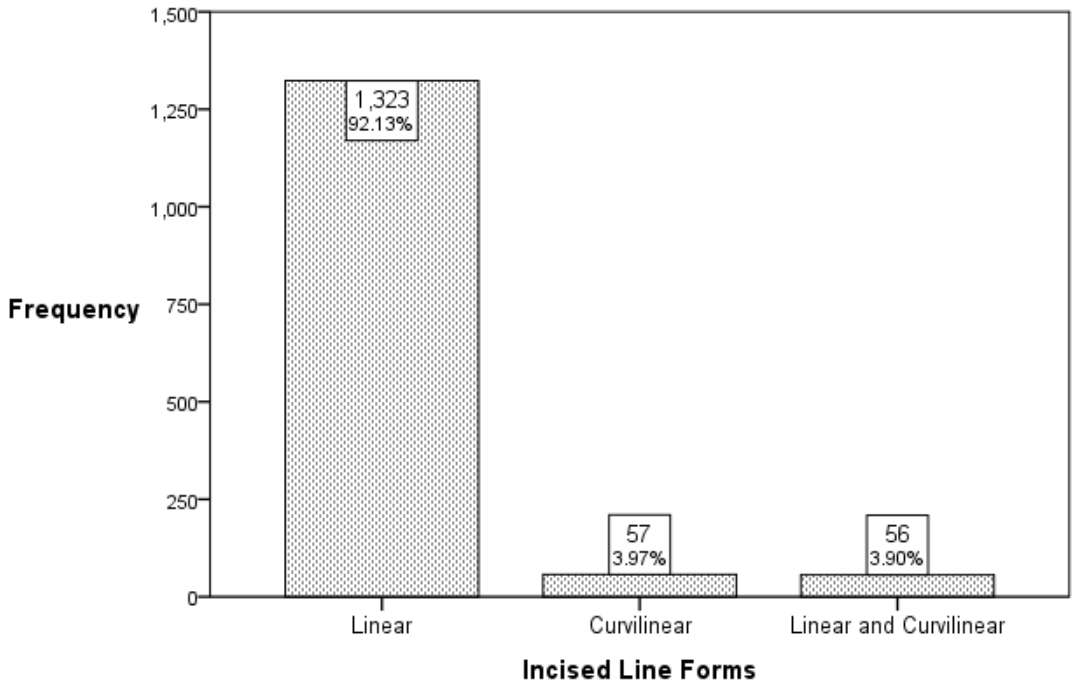


Figure 5.9: Distributions of incised line types at Cypress Citadel.

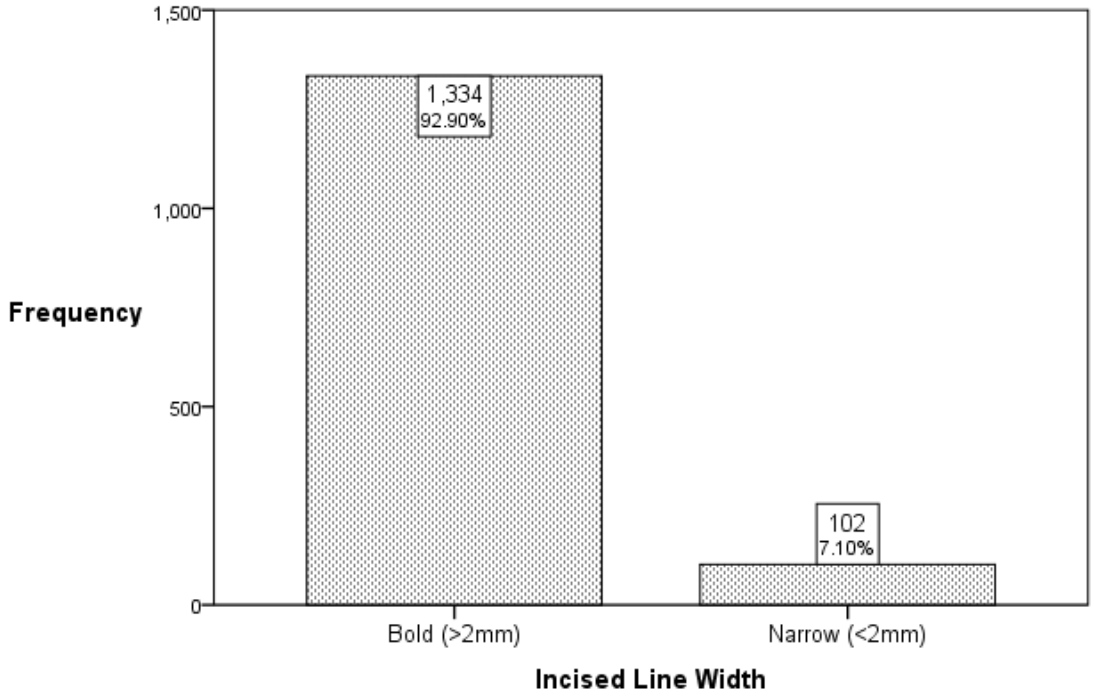


Figure 5.10: Distribution of incising width at Cypress Citadel.

The McGilligan Creek Assemblage

The McGilligan Creek assemblage contains far fewer sherds than Cypress Citadel. Less than 9400 ceramic sherds were recovered here during the archaeological investigations. Only 40 percent of these sherds, 3713 in total, measured greater than 0.5 inches in greatest dimension. All of these were analyzed. Like Cypress Citadel, the collection largely consists of small fragments of vessels. Only 147 rim sherds were identified, while the remaining 3566 were body sherds. That fact is important as only the rim sherds exhibit several of the variables analyzed. As in the Cypress Citadel collection vessel size was not discerned due to the fragmentation.

Isochrestic Variables

The two assemblages were most divergent in temper. The most common tempering agent at McGilligan Creek was grog, as nearly 96 percent of the sherds contained at least minority proportions of grog in their paste (Figure 5.11). Unlike Cypress Citadel, however, only 61.4 percent were exclusively grog tempered. Temper consisting of both grog and limestone was observed in 22 percent of the sherds, while a grit-and-grog medley was present in nearly 12 percent. A grit-only temper, which is widely observed in Raymond ceramics, was seen in 150, or 4 percent, of the McGilligan Creek ceramics. A minority tempering of grog and sand was also observed. This sand temper had rounded surfaces, as opposed to the shattered edges of grit, and was similar to the sand tempering observed in the Cypress Citadel assemblage.

The surface treatment on McGilligan Creek ceramics is generally consistent with both Cypress Citadel and the larger Lewis phase (Figure 5.12). One curiosity is the amount of check stamped pottery. Cord-marked surfaces account for roughly 95 percent of all surfaces observed,

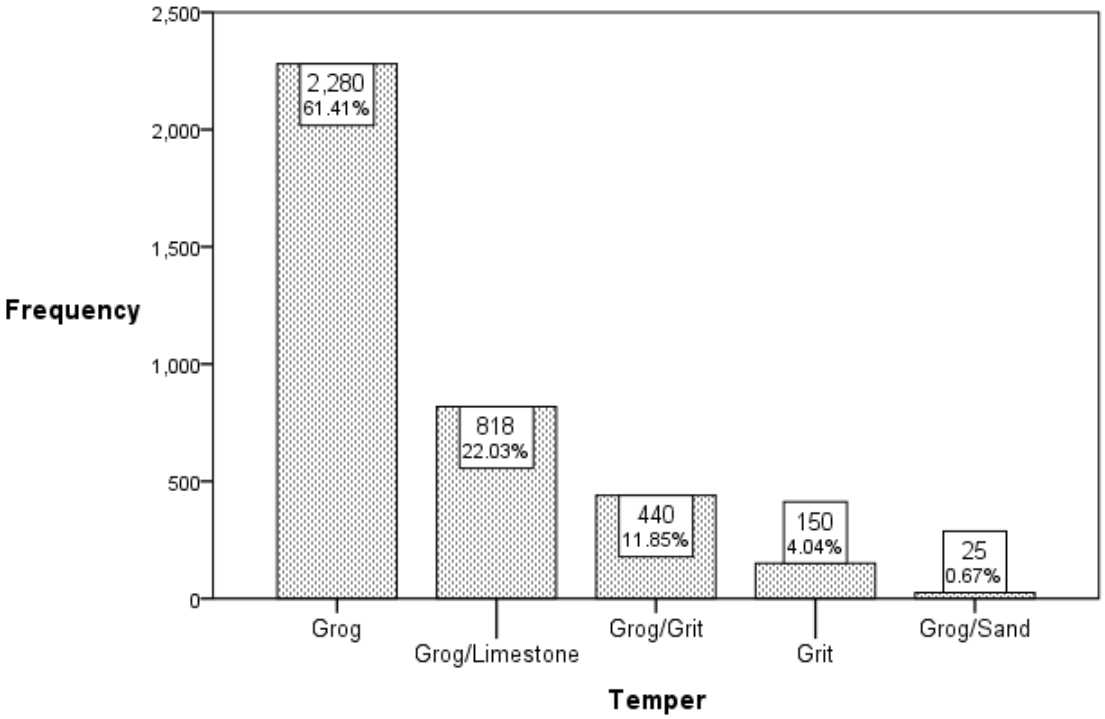


Figure 5.11: Distribution of temper at McGilligan Creek.

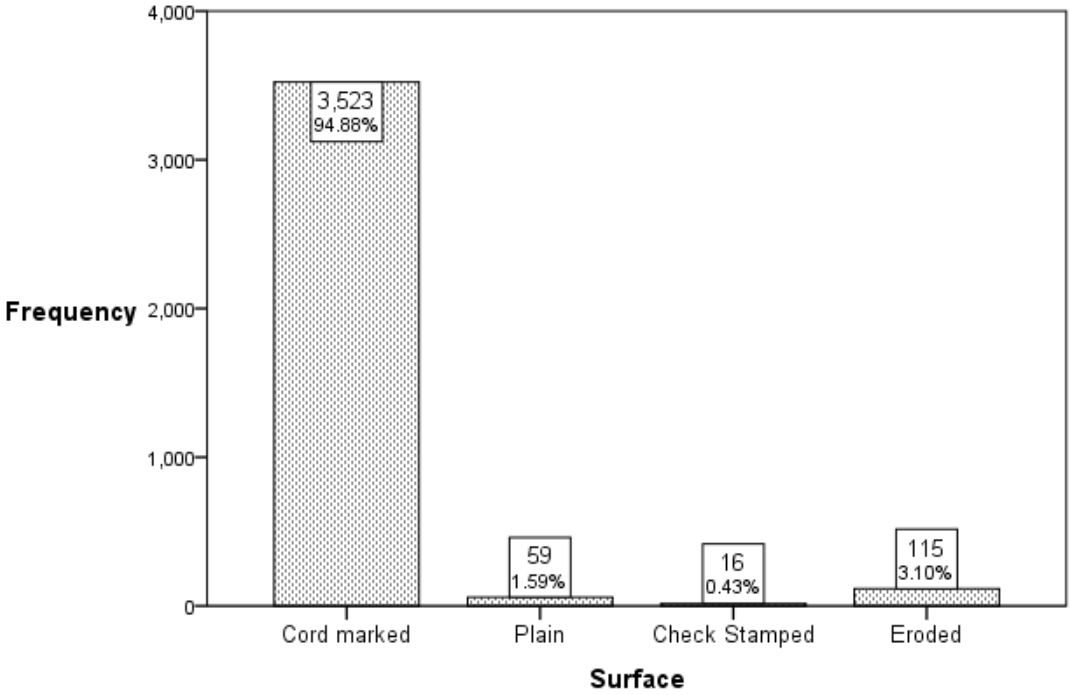


Figure 5.12: Distribution of surface treatment at McGilligan Creek.

and 98 percent of those which were identifiable. Plain or smoothed-over surfaces were uncommon at McGilligan Creek, accounting for only 1.6 percent of the total surfaces analyzed. The populations at this site also seemed to utilize carved paddles to create check stamped surfaces. Only 16 of these sherds were found, less than half a percent of the total assemblage, but their presence is important. Check stamping is widely distributed throughout northern and eastern Alabama and along the Gulf Coastal Plain during the Late Woodland (Nassaney 2000:721), but is not well represented in the Ohio River Valley. Check stamping appears in several sites throughout southern Illinois, but the instances are generally limited to the late Middle Woodland, with few Late Woodland sites containing this surface treatment (Winters 1963:86).

The rim sherds allowed for the analysis of the direction in which the cord-marking was applied to the vessel (Figure 5.13). Only vertical and oblique orientations were seen in at McGilligan Creek. Vertical cord-marking was most common at 63 percent, while oblique cord-marking made up the remaining 37 percent of the surfaces. No rim sherds were present which contained check stamping; therefore, no orientation for this surface treatment could be recorded. As stated in the description of the Cypress Citadel assemblage, the rim sherds also allowed for analysis of several lip characteristics lip characteristics.

The profile of the lips at McGilligan Creek contained several of the same forms as were seen at Cypress Citadel (Figure 5.14). Two notable exceptions are the absence of sloped to interior lips, only one of which was observed at Cypress Citadel, and the presence of two folded rims. Round lip profiles were most common at 70 percent. Squared lips made up nearly 16 percent, while extruded and sloped to interior profiles were each observed on approximately five percent of the collection. Only four rims, less than three percent, exhibited thickened lip profiles

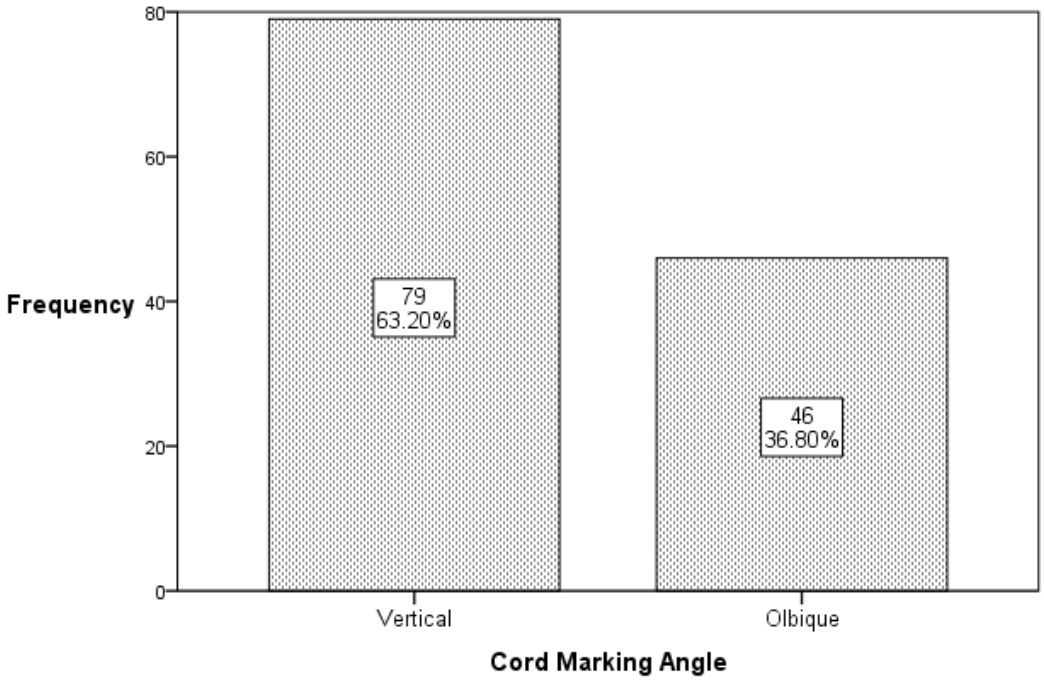


Figure 5.13: Distribution of cord-marking angle at McGilligan Creek.

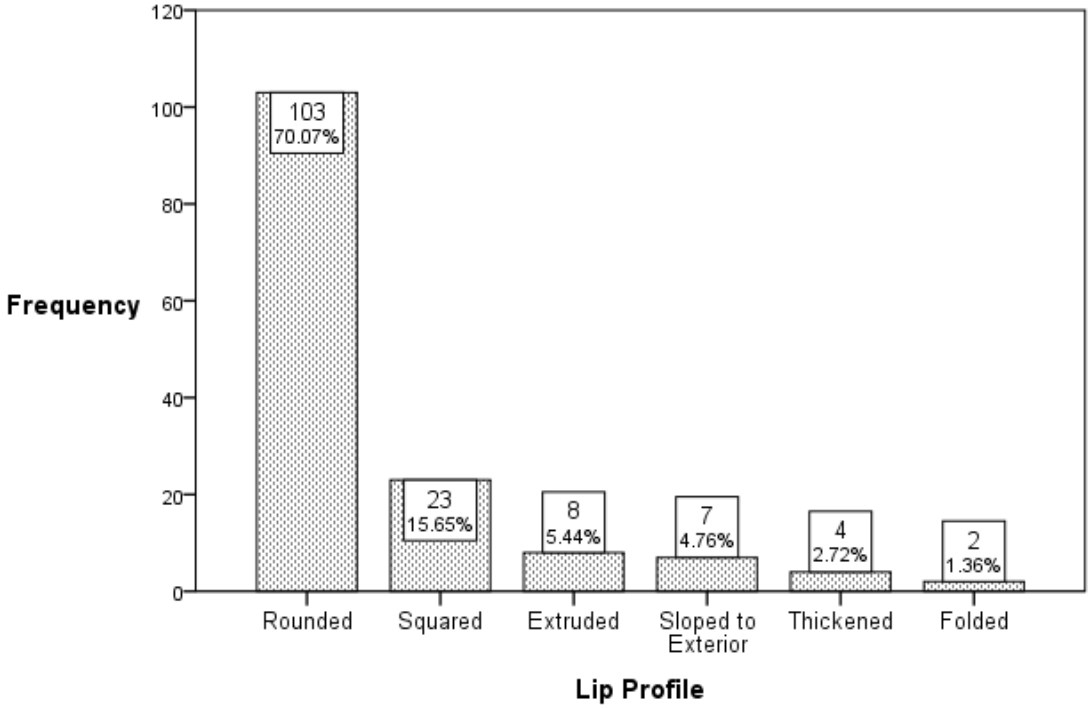


Figure 5.14: Distribution of rim profiles at McGilligan Creek (see Figure 3.1).

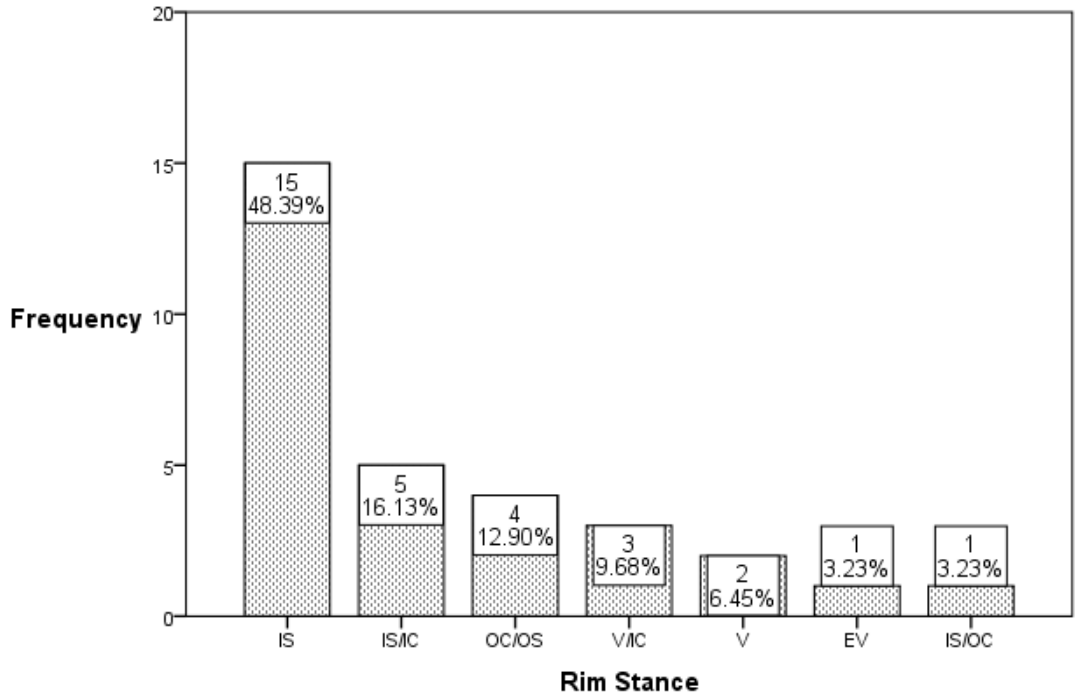


Figure 5.15: Distribution of rim stances at McGilligan Creek (see Figure 3.2).
Key: IS, inslanting; IC, incurved; OS, outslanting; OC, outcurved; V, vertical; EV, everted

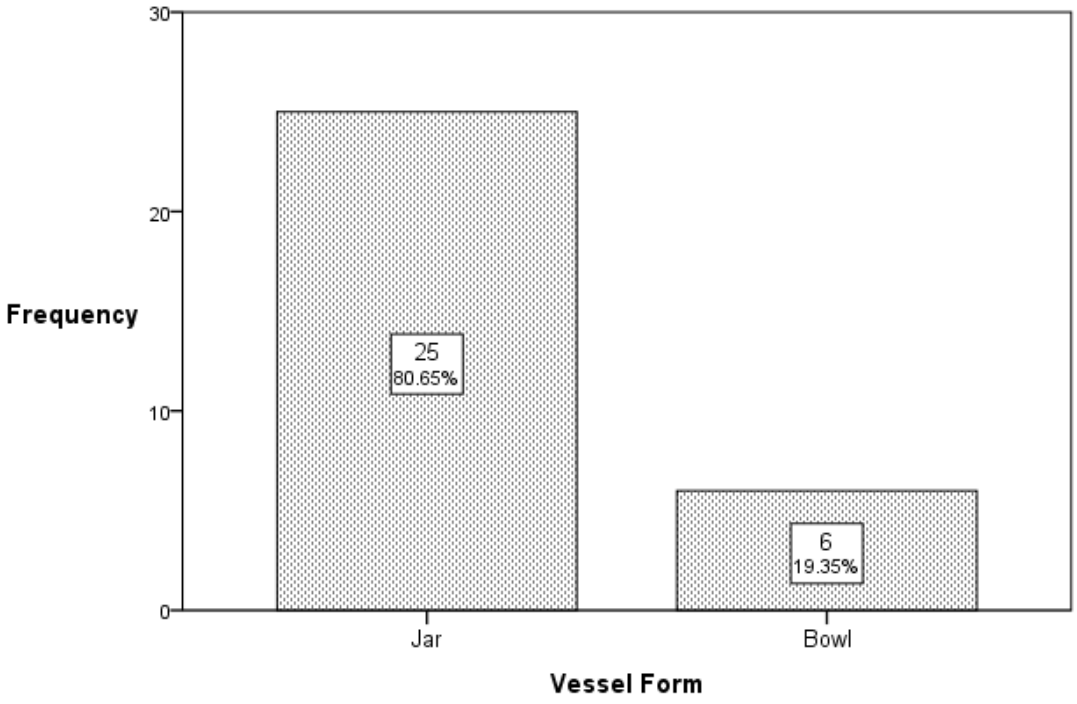


Figure 5.16: Distribution of vessel types at McGilligan Creek.

and two folded rims were observed, just over one percent.

Rim stances were obtained from only 31 rims (Figure 5.15). Nearly half of these were inslanting, while 16 percent were inslanting/incurved, both of which are consistent with jars. Outcurved/ outslanting were third most common, followed by vertical/incurved, and vertical bowl rims, at 13, 10, and six percent respectively. One instance, three percent, of each everted and inslanting/ outcurved rims were present. This suggests that 81 percent jars and 19 percent bowls comprise the collection recovered from McGilligan Creek (Figure 5.16).

Iconographic Variables

Lip decoration and incised surface decoration are both present on the McGilligan Creek ceramics. Although differences exist in terms of frequencies between the two assemblages, the same categories are present. Nearly 65 percent of McGilligan Creek vessels exhibited lip decoration (Figure 5.17). More than half of the rim sherds, 55 percent, were notched, a majority followed by unmodified or undecorated rims at 35 percent. Dowel impressed lips were next most common lip decoration at five to six percent, while three to four percent of the rims were slashed. Only one instance of cord-wrapped dowel impressions was observed. No impressions appeared to be executed with a bone. An exterior placement of lip decoration is dominant, with nearly 57 percent of decorated lips being executed in this fashion (Figure 5.18). Superior placement is observed on 33 percent of the lip sherds, while the remaining 10 percent of decorated lips were applied to the interior.

As has been stated, incised decoration was common at McGilligan Creek. Although a slightly lower percentage of rims were decorated compared to Cypress Citadel (21 percent at Milligan versus 28 percent at Cypress Citadel), the amount is still unusually high for the Late

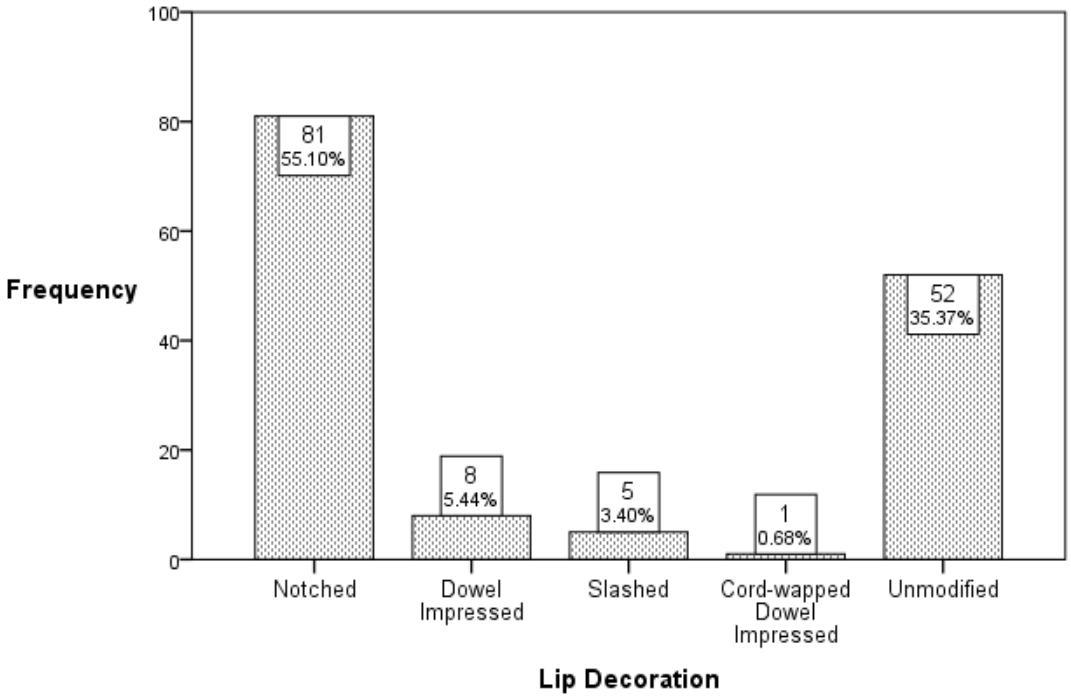


Figure 5.17: Distribution of lip decoration at McGilligan Creek.

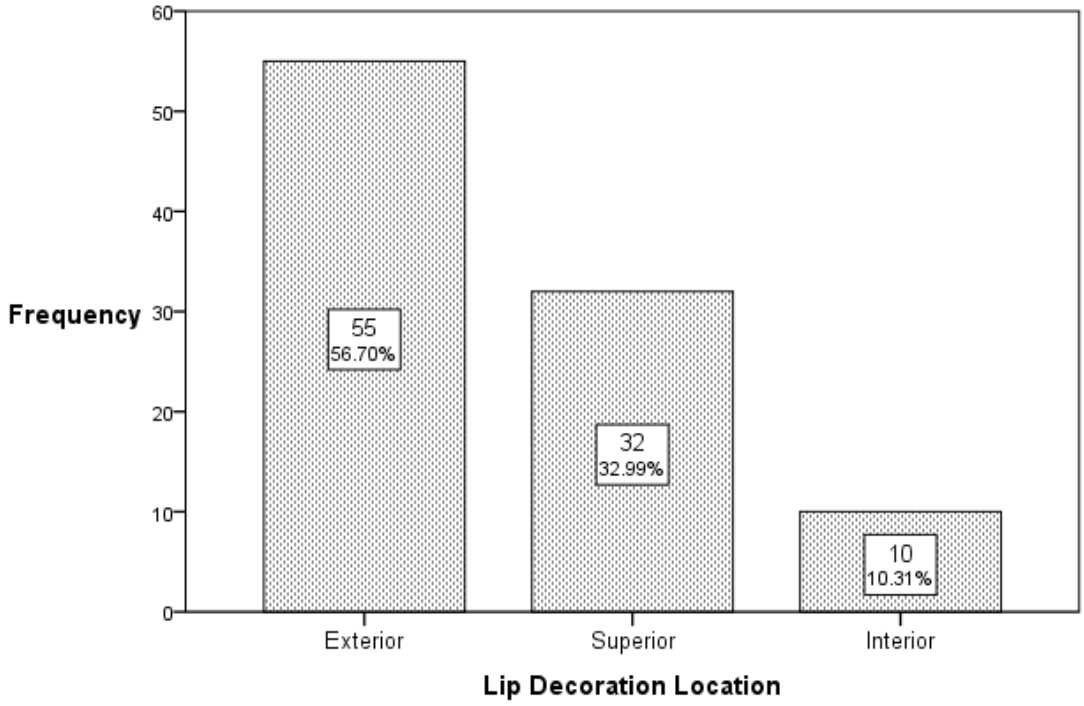


Figure 5.18: Distribution of lip decoration location at McGilligan Creek (see Figure 6.1).

Woodland of the lower Ohio River Valley. Linear incising was again preferred over curvilinear, but not as strongly as at Cypress Citadel. Virtually 70 percent of the incised rim sherds had only linear incising, with 12 percent showing both linear and curvilinear (Figure 5.19). This 12 percent, combined with the 18 percent that exhibited only curvilinear incising, shows that nearly a third of all decorated rims in the McGilligan Creek collection have some curved patterning.

The final variable, incised width, was recorded on 194 sherds (Figure 5.20). As was the case for the Cypress Citadel collection, bold line incising was most common in the McGilligan Creek incising tradition, with over 87 percent of all incised lines executed in this fashion. Narrow incising was observed on nearly 13 percent of the decorated sherds, almost double the seven percent narrow incising noted at Cypress Citadel. The culmination of these variables show that similarities noted by researchers are indeed present between the collections. Several attributes of each variable are shared between the two ceramic assemblages. Some unique attributes and higher frequencies do show differences exist. A visual comparison of the motifs and statistical analysis of the variables will aid in identifying these similarities and differences.

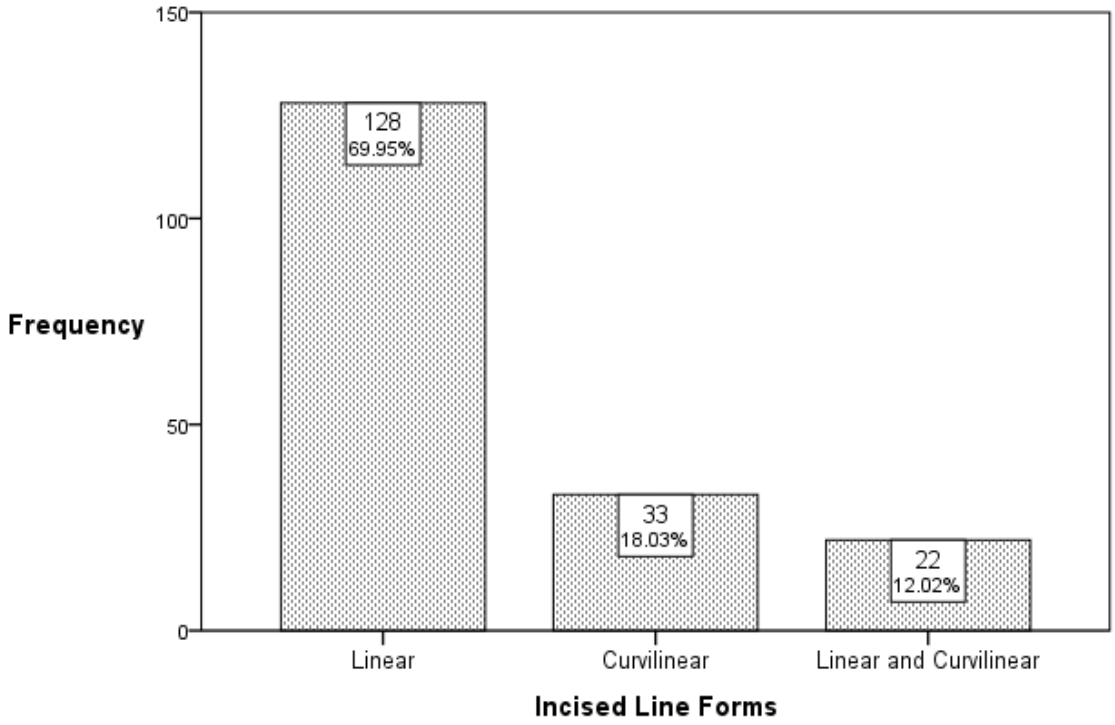


Figure 5.19: Distribution of incised line types at McGilligan Creek.

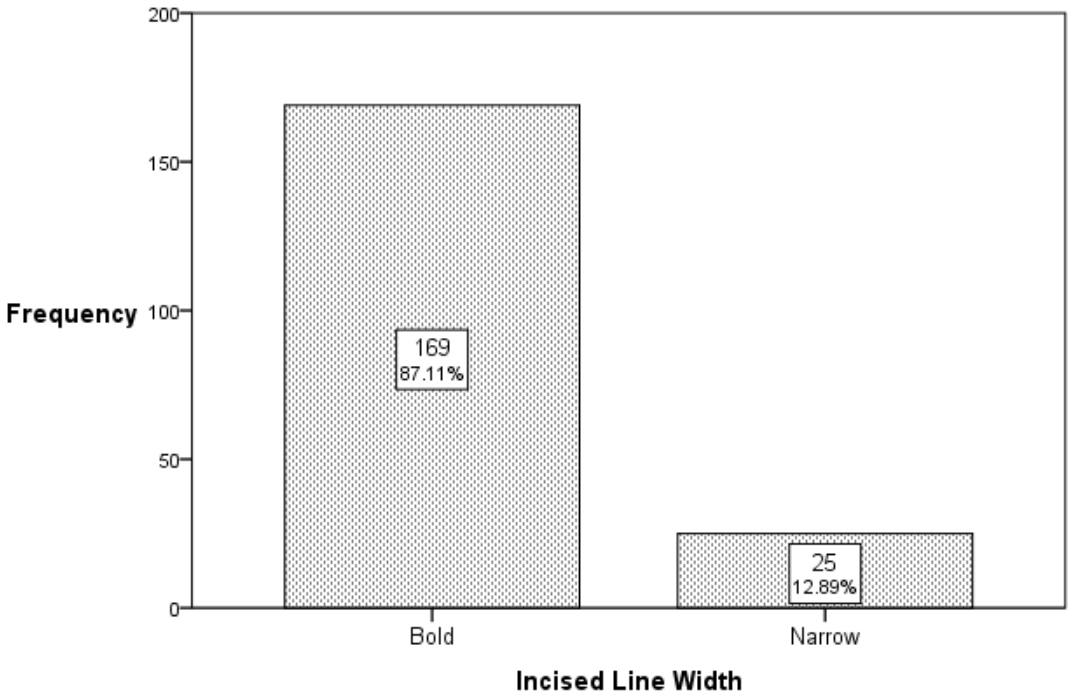


Figure 5.20: Distribution of incising width at McGilligan Creek.

CHAPTER VI – DESIGN COMPARISON

The Chi-square and Cramer's V analysis of the variables will give an understanding of the statistical similarities between the Cypress Citadel and McGilligan Creek ceramics. These statistics are, of course, limited in what they can reveal about similarities and differences between the two collections. So few large motifs were identified that statistics are not the most accurate way to compare them. For this reason, motifs from each site will also be visually compared. Although such analysis is more subjective, it is combined with the statistical analysis of the design elements and other variables, and it is the best available means that can truly encompass all of the various aspects of the incised designs. Beginning this chapter are depictions and descriptions of several other aspects of the pottery that have were discussed in the previous chapter. Where it is possible, these aspects will be analyzed with the statistics following the visual comparisons of the incised motifs.

Figure 6.1 shows examples of the variety of rim decoration locations from each site. Sherds from McGilligan Creek are prefixed with MC and those from Cypress Citadel with CC. Sherds MC-A and CC-A portray typical examples of exterior notching. Sherds MC-B and Sherds CC-B, show examples of superior, or horizontal, notched rims, while examples of interior rim decoration are displayed with Sherds MC-C and Sherds CC-C. Representative examples of undecorated rims are shown in Sherds MC-D and Sherds CC-D.

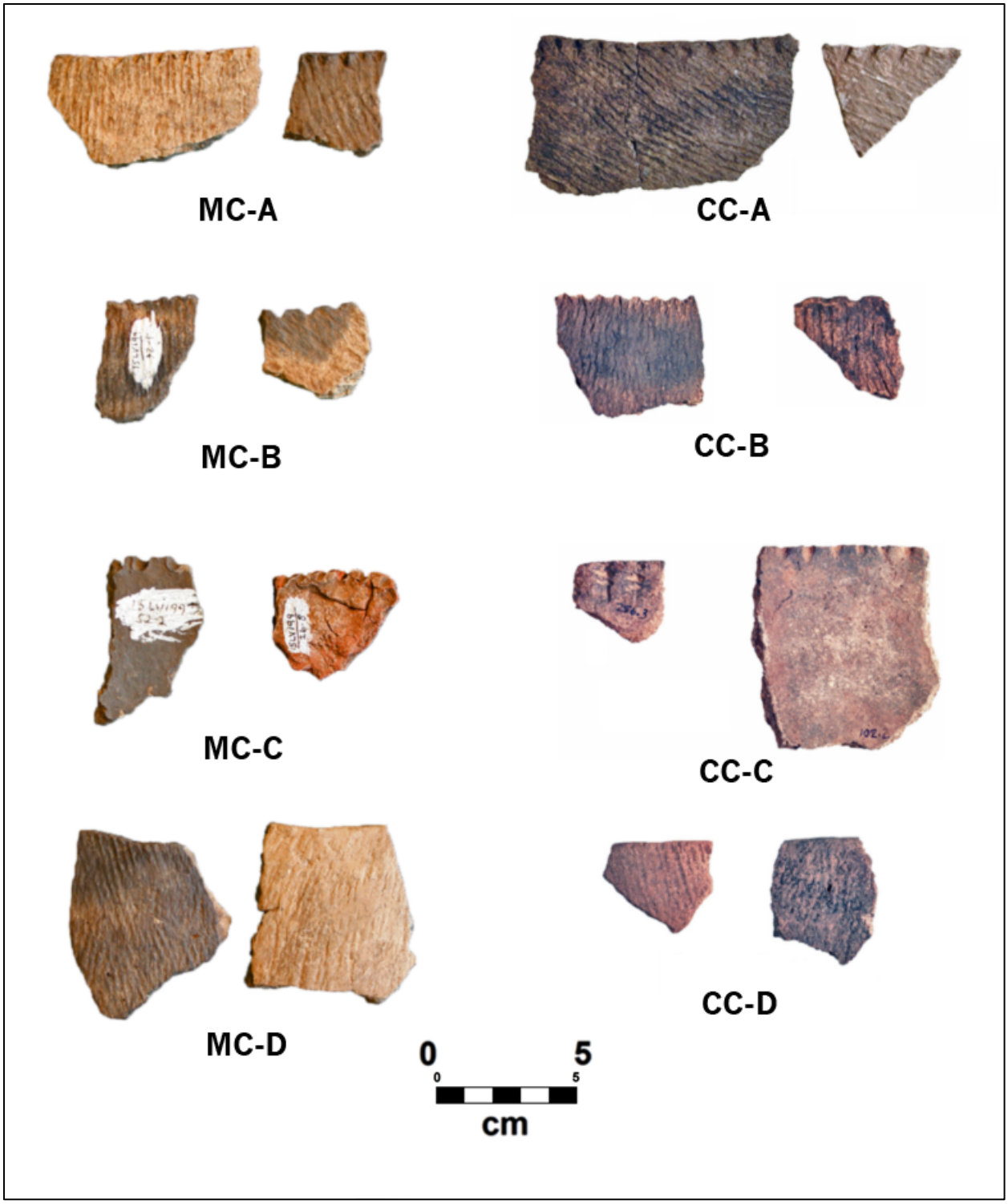


Figure 6.1: Examples of rim notching from Cypress Citadel and McGilligan Creek.

First row shows exterior notched rims, second row shows superior (horizontal) notched rims, the third row has examples of interior notching, and the final row are undecorated rims. (Cypress Citadel sherds adapted from Butler and Wagner 2012).

Surface Decoration

As is the case with the high frequency of lip decoration, surface decoration is also much more common at Cypress Citadel and McGilligan Creek than other known Late Woodland sites in the area (Butler and Wagner 2000:690). Surface decoration at McGilligan Creek and Cypress Citadel was almost exclusively limited to incised motifs, however punctations were also observed in limited quantities (Figure 6.2). Incised decoration was present on 21 percent of the McGilligan Creek rims and 28 percent of the Cypress Citadel rims. Punctations, both in combination with incising and alone, accounted for 1.8 percent (n=26) of the surface decoration at Cypress Citadel and 2 percent (n=4) of all surface decoration at McGilligan Creek. Even with their minority representation, punctations in any amount are noteworthy in the Late Woodland of the lower Ohio River Valley. Punctations are noted on earlier Crab Orchard and Baumer ceramics, but in low frequencies (Maxwell 1951:159; Cole et al. 1951:194). MacNeish also encountered seven punctated sherds during his initial analysis of Lewis ceramics, but he postulated that these may have been trade vessels (Cole et al. 1951:179). One of the sherds MacNeish describes had a line of punctations that ran parallel to an incised line, something that is also observed in both the Cypress Citadel and McGilligan Creek assemblages.

The presence of punctations at both sites is significant in suggesting a connection, but differences in their execution are observed between the assemblages. As seen in Figure 6.2, the punctations observed at McGilligan Creek, Sherds MC-A and MC-B, appear to have been made by utilizing a small solid twig or round instrument to punch into the surface of the sherd. This form of punctation was also observed at Cypress Citadel, but the majority of punctations at the latter site were applied with a small hollow instrument, possibly a feather or bone. This

execution created a small crescent shaped, sometimes completely round, punctation, as is seen on Sherds CC-A, CC-B and CC-C.

Check Stamping

Figure 6.3 illustrates sherds with check stamped surfaces from McGilligan Creek. A single, eroded check stamped sherd was recovered from Cypress Citadel, but was too poorly preserved for photographing. As has been noted, check stamping is more associated with southern ceramic traditions than Midwest Late Woodland traditions (Nassaney 2000:721). Sherds A and D are the most easily identifiable surfaces of their kind. The parallel rows of square impressions are indicative of pottery stamped with a paddle. Check stamped ceramics are so rare in the region that the single sherd from the Cypress Citadel collection could provide evidence of trade with McGilligan Creek, even though check stamping also comprises only a small minority of vessels at the latter site.

The relatively high prevalence of check stamped sherds compared to other Late Woodland sites in the area suggest that the McGilligan Creek population interacted, either directly or indirectly, with more southern populations. Simple stamping and complicated stamping were observed in earlier assemblages along the lower Ohio River Valley in southern Illinois, but had all but disappeared near the end of the Middle Woodland (Muller 1986:123). Like check stamping, these traditions utilized paddles to impress surface and compress the walls of the vessel. zthis patterning is easily discernible from check stamped pottery and these earlier traditions do not reflect this later check stamping. Check stamping is seen scattered along the Wabash River during the Late Woodland, but its occurrence is rare (Winters 1963: 86).

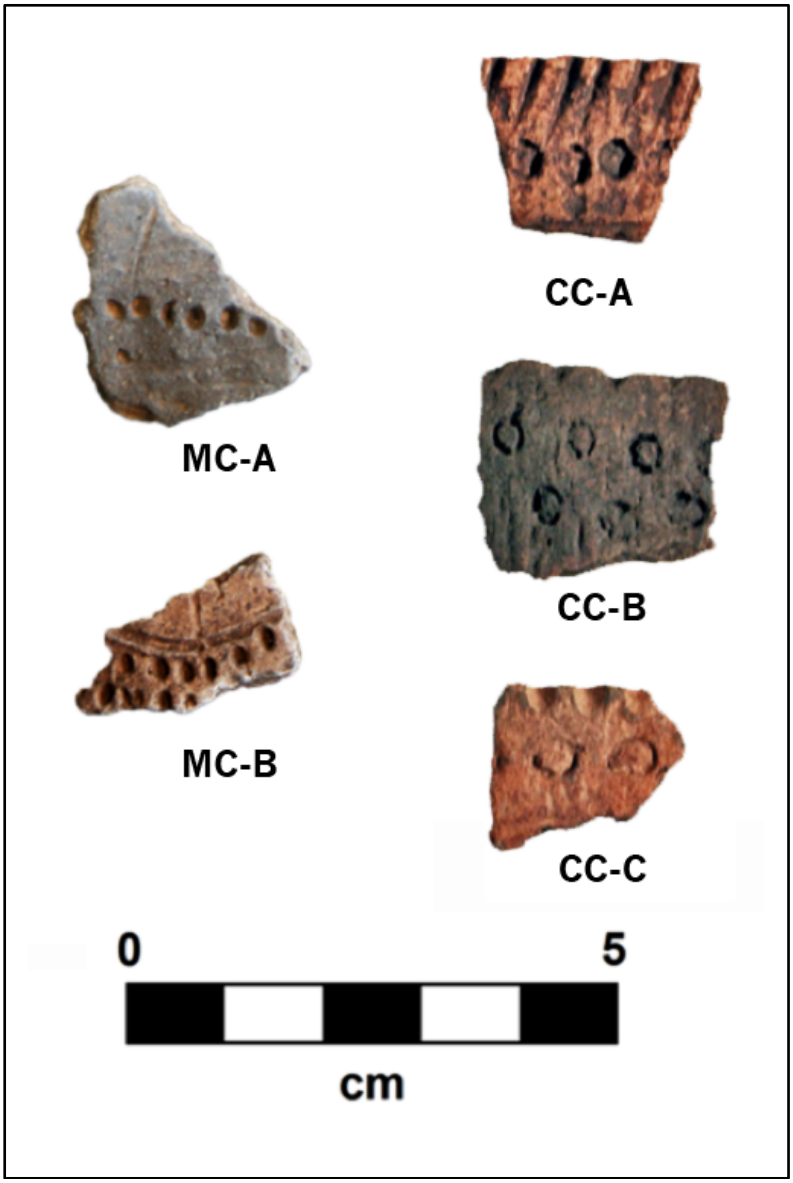


Figure 6.2: Punctated sherds from McGilligan Creek and Cypress Citadel. (Cypress Citadel sherds adapted from Butler and Wagner 2012).

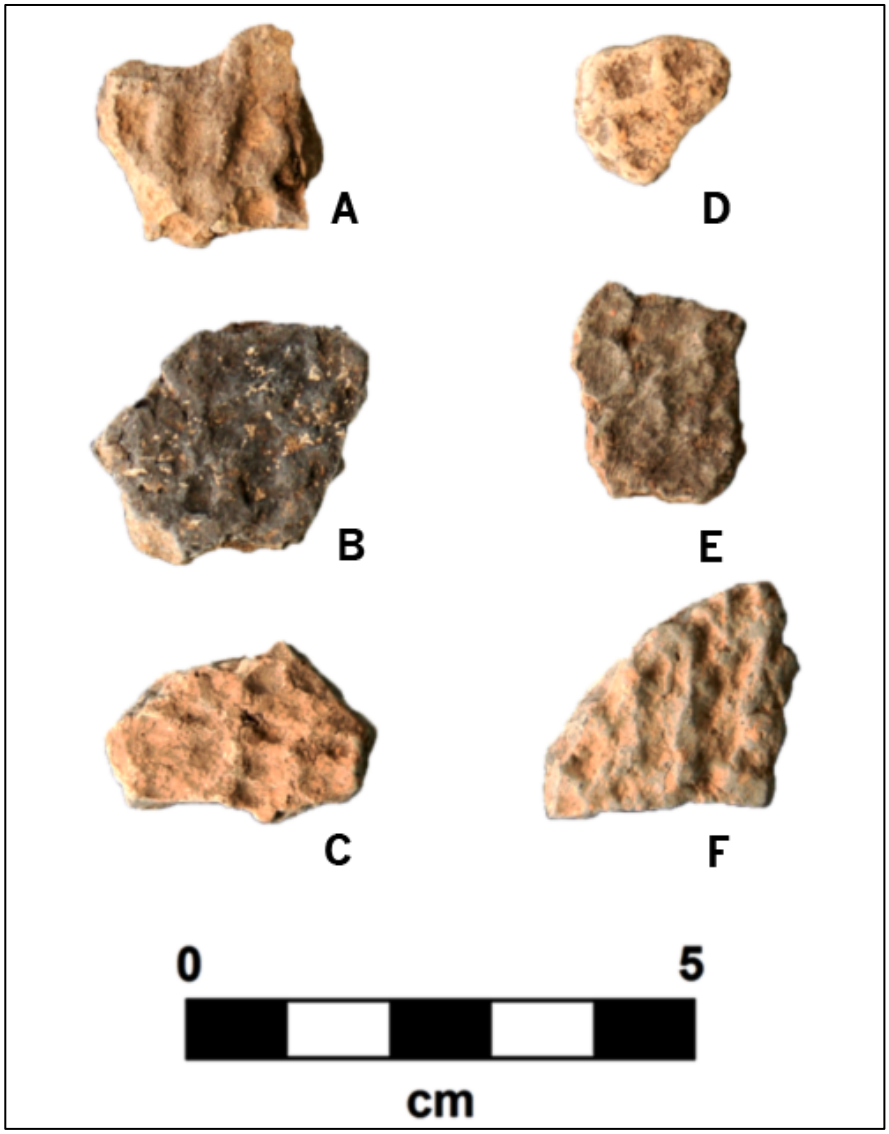


Figure 6.3: Check stamped sherds from McGilligan Creek.

Incised Patterns

Figure 6.4 shows some of the simple patterns of combined design elements observed in both assemblages. Patterns on Sherd MC-A, from McGilligan Creek, and Sherd CC-A, from Cypress Citadel, show straight lines applied obliquely to the vessel rim with no zoned incising segregating the lip from the decoration. Sherd MC-A shows clear incising trailing to the orifice, while Sherd CC-A is a slightly aberrant example. This is also one of the few designs that was applied over a plain or smoothed over surface. Given the small sherd size, there is a great possibility that these combinations of design elements were part of a larger design. The second and third rows provide an idea of the most commonly-observed design in each assemblage: multiple parallel lines applied horizontally over a cord-marked surface. Some of these lines are likely fragments of larger, more complex patterns, but their abundance in sherds from both sites shows the emphasis of this type of decoration. The complete patterns either likely consisted of small segments which were more complex, with long runs of horizontal lines, or the motifs were made up solely of these horizontal lines. The frequency of this pattern's appearance is much greater at Cypress Citadel than McGilligan Creek.

Several combinations of design elements were observed in the Cypress Citadel assemblage that were absent in the McGilligan Creek collection. The examples depicted in Figure 6.5 are not only unique to Cypress Citadel, but are also rare. Each pattern described was observed only five or fewer times. Even with the fragmentation of these sherds, the combinations of design elements observed do not readily fit any of the larger motifs that were observed. These combinations of unique designs suggest a substantial diversity in the incised decoration produced at Cypress Citadel. McGilligan Creek has sherds with patterns similar to Sherds A and C, but both were body sherds, and their orientation could not be verified.

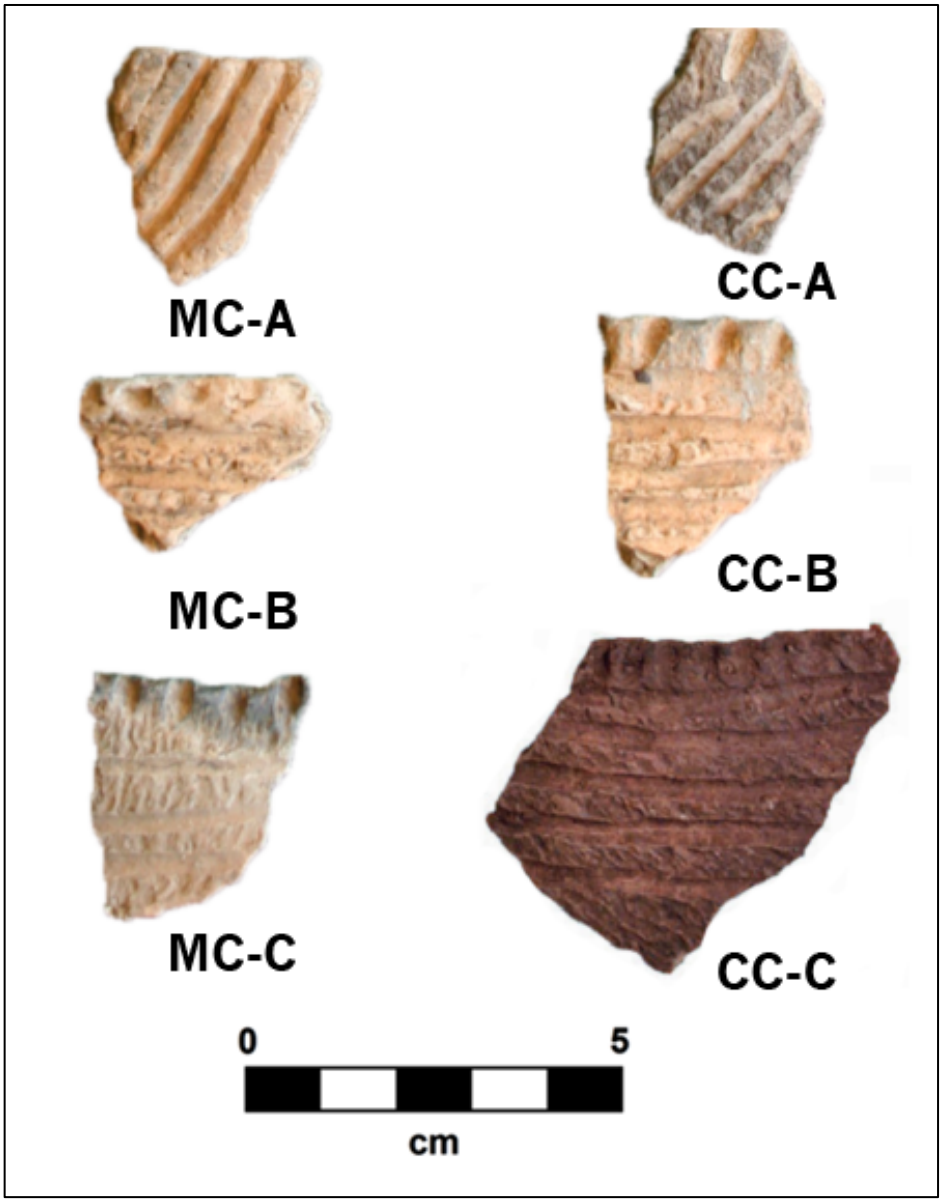


Figure 6.4: Simple design patterns from Cypress Citadel and McGilligan Creek. (Cypress Citadel photographs are adapted from Butler and Wagner 2012).

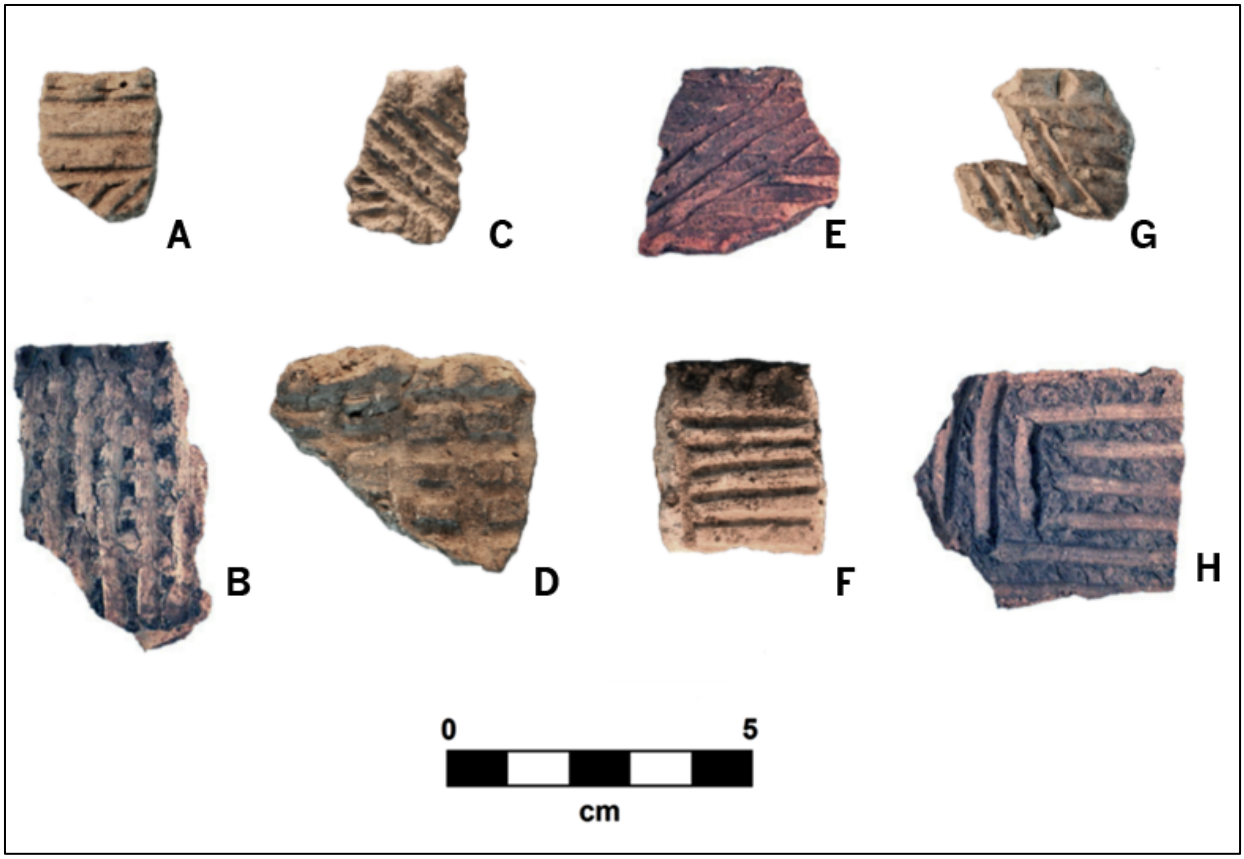


Figure 6.5: Unique linear incised patterns from Cypress Citadel. (adapted from Butler and Wagner 2012)

Sherds C, E, and G offer examples of unzoned decoration, in which the oblique lines meet the lip. Sherds E and G contain similar patterns, a series of five horizontally incised parallel lines running below the lip. Applied atop these lines is a set of oblique lines that do not terminate until crossing the top horizontal line. Sherds B and D on the bottom row also exhibit this rare overlapping of incised lines. These sherds, however, have a series of horizontal lines overlaid by vertical incising, creating a checked or cross-hatched pattern. The Sherds F and H are examples of rectilinear incising. Although it is not readily visible in Figure 6.5, Sherd F contains a single vertical incised line running along the left edge. Sherd H is a unique rectilinear pattern, with horizontal lines abruptly changing to vertical lines.

The curvilinear patterns observed at Cypress Citadel are also very diverse. Figure 6.6 shows several examples of curvilinear patterns observed during the analysis. It is important to recall that curvilinear motifs are not common at Cypress Citadel, accounting for less than 8 percent of all incised decoration. Sherd A exhibits a pattern which appears to contain one curvilinear line with a single horizontal line on top joined by at least two oblique lines running from bottom left to top right. Sherd C differs from A as it appears to have two horizontal lines that zone the remaining motif. Sherd E contains one horizontal line, again presumed to be a zoning line, with two curvilinear lines directly below this. The complete curvilinear line resembles a shallow parabola, with each end approaching the zoning line. The second, less complete, curvilinear line appears to follow the contour of this parabola. The complete motif may have consisted of a series of parabolic shapes in various locations around the circumference of the neck. Sherd F shows a pattern that appears similar to the Sherd C, except that it has only one horizontal zoning line appears on the top. The rim is large enough to show that a horizontal line exists at the bottom of the motif as well, possibly acting as a zoning line between

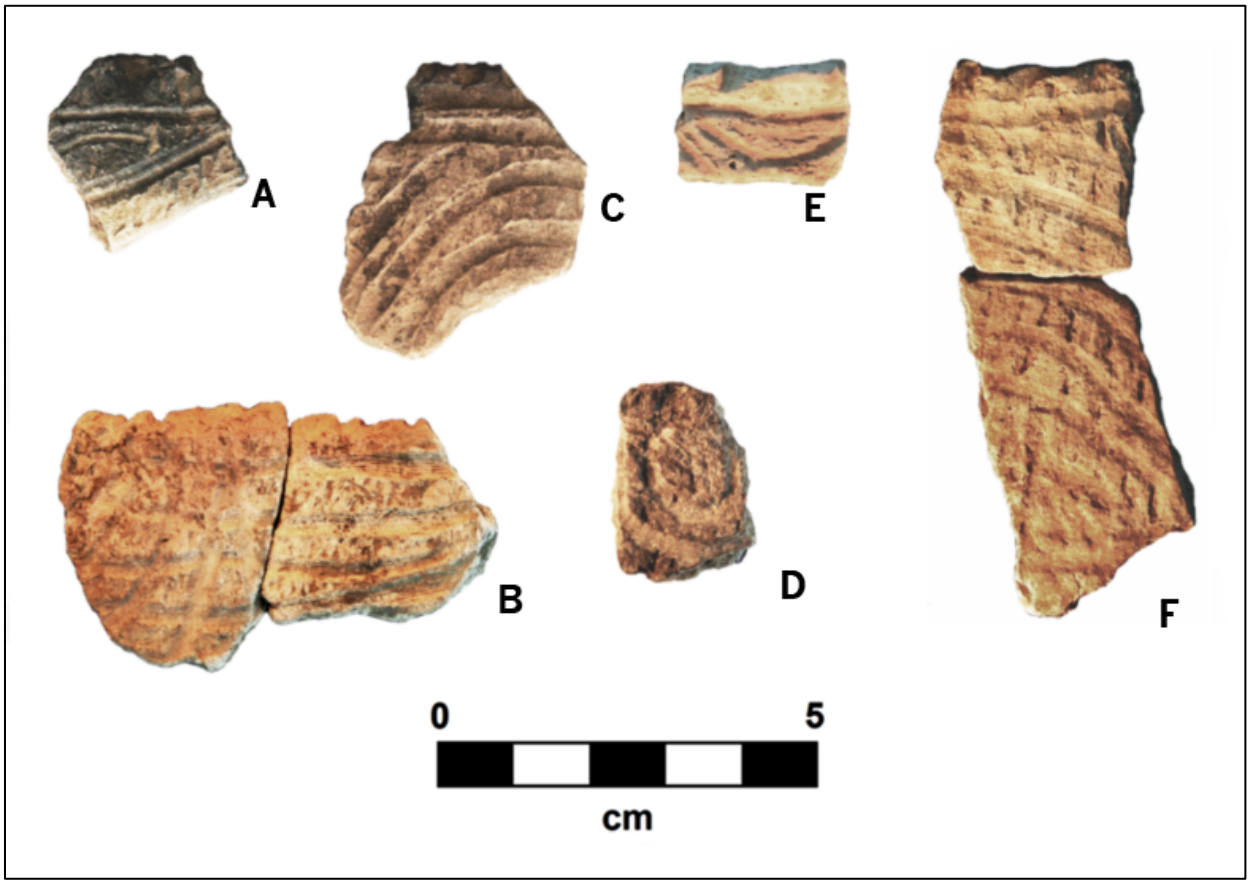


Figure 6.6: Curvilinear patterns from Cypress Citadel.

the motif and the remainder of the vessel body. Between these are nine approximately parallel curvilinear lines.

Sherds B and D in Figure 6.6 are one-of-a-kind patterns. Sherd B resembles Sherds B and D in Figure 6.5, which also come from Cypress Citadel, with curvilinear rather than vertical linear lines overlapping the horizontal ones. The pattern on rim Sherd D is badly eroded and is one of the smallest of all illustrated sherds, but it is included here because of its uniqueness. It appears to begin with a very small complete or nearly complete incised circle. On the left side is another curvilinear line that begins vertical near the lip and seems to conform to the bottom curve of the smaller inner circle as it progresses, suggesting that semi-circles are used to encase a complete circle.

Figure 6.7 shows different expressions of similar curvilinear decoration in both assemblages. All four rims show a pattern of several curvilinear lines running parallel to each other. These are essentially arcs beginning at the rim and extending downward. This pattern was never observed with zoning at McGilligan Creek, while the Cypress Citadel examples always contained a zoning line. This is but one example of the differences in the use of zoned decoration in these two assemblages, which have been previously noted. Also of note is the scarcity of notching on the McGilligan Creek rims, although this appears to have been more of a preference than a rule.

Figure 6.8 shows some of the more complex designs that were identifiable on the basis of larger sherds. Again, McGilligan Creek examples are featured on the left and Cypress Citadel specimens on the right. The top two rows exhibit patterns of nested arcs or parabolic curves extending down from the rim, set within a field of parallel horizontal lines. The difference between the first and second row specimens is that the former lack a zoning line at the lip,

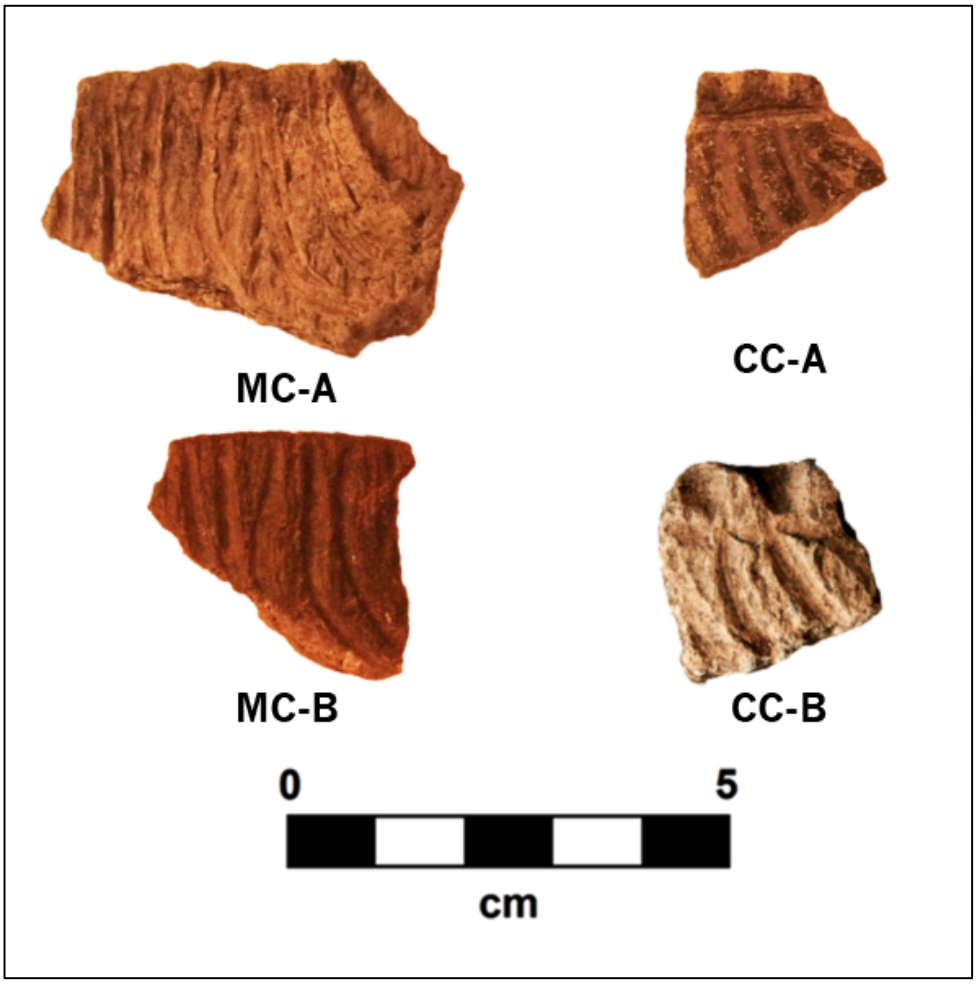


Figure 6.7: Curvilinear patterns from Cypress Citadel and McGilligan Creek. McGilligan Creek examples, left, are not zoned motif, while Cypress Citadel examples, right, are.

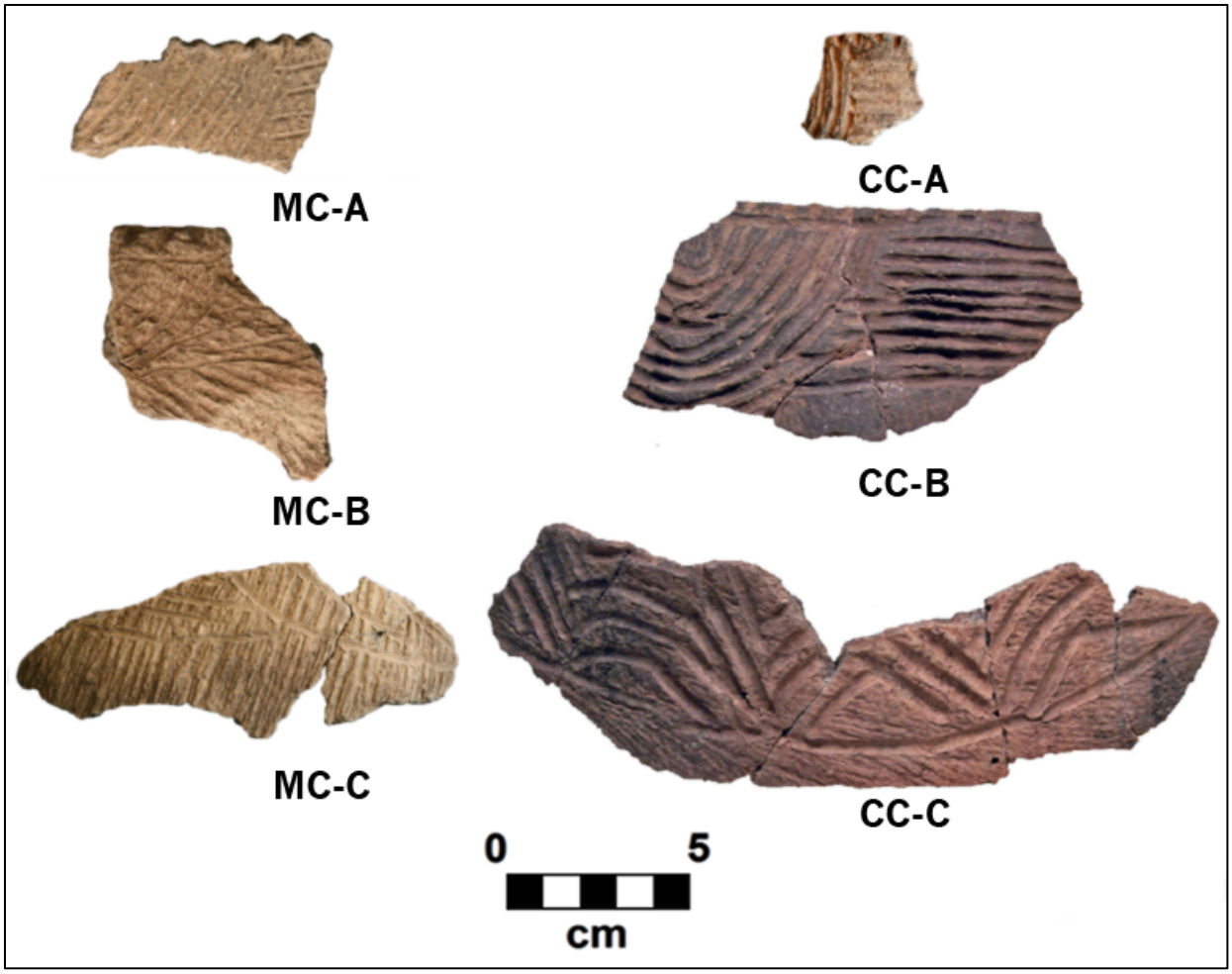


Figure 6.8: Complex design motifs from Cypress Citadel and McGilligan Creek.

whereas the second row specimens are zoned. The overall pattern is similar at both sites, however the McGilligan Creek examples are notably cruder in their execution and the incised lines more widely spaced. The spacing between the incising at Cypress Citadel appears to be approximately the same as the width of the incised lines themselves, but, the spacing exhibited on the McGilligan Creek sherds is two or three times the width of the incised lines. A similar difference is seen with the depth of the incising, as a noticeably deeper execution is observed on the Cypress Citadel examples. For each site these are the only rim sherds that were identified with this pattern, although the specimens in Figure 6.7 could belong to a variant or a portion of this pattern.

The two examples of curvilinear decoration in the bottom row are body sherds. These were among the very small number of body sherds whose orientation could be definitively derived from their curvature. Sherd MC-C, from McGilligan Creek, shows several curvilinear lines that begin widely spaced and appear to converge as they trail to the right. This gives the impression of overlapping arc patterns, possibly similar to scales. The Cypress Citadel specimen, Sherd CC-C, is the largest complex pattern observed in the entire analysis. Here, a single horizontal line forms the base of the decorative band and separating it from the lower portion of the vessel. Above this are a series of stacked or nested arcs with their open sides down, essentially the opposite of the nested lines shown in the upper two rows of rim sherds. This example suggests that the other, smaller patterns are possibly repeated around the perimeter of the vessel.

Figure 6.9 shows several more examples that may be small fragments of the designs observed in Figure 6.8, providing evidence that these decorative patterns may have been prevalent at each site. Sherds MC-A and MC-B, from McGilligan Creek, and Sherd CC-A, from Cypress Citadel, exhibit the same pattern, assuming the orientation of the sherds was correctly

determined: curvilinear lines approaching vertical as they turn up toward the rim. To the right of these lines are a series of parallel horizontal lines. These examples are very similar to the patterns on Sherds MC-A, MC-B, CC-A and CC-B in Figure 6.8. Sherd MC-C of Figure 6.9 shows a body sherd from McGilligan Creek that has two horizontal lines at the top and a series of oblique lines below. The corresponding example from Cypress Citadel, Sherd CC-B, is provided to give a clearer idea of how the McGilligan Creek example may have looked with a complete rim segment.

McGilligan Creek produced a much higher percentage of curvilinear decorated sherds than Cypress Citadel, but the significantly larger sample from Cypress Citadel provides a greater diversity of curvilinear decorated sherds. Figure 6.10 provides some idea of the additional curvilinear patterns observed at each site. The curvilinear patterns from McGilligan Creek vary greatly. Sherds MC-A and MC-B are small fragments that show either a series of concentric circles or parallel curvilinear lines in the shape of half circles. Sherd MC-B is the most intriguing, as no rim sherd exists in the McGilligan Creek collection that contains a similar pattern. The pattern consists of groups of nested curved lines overlapped in scale-like fashion. This decoration bears some resemblance to Sherd CC-C in Figure 6.8. These patterns may not be exact replicas of each other, but the similarities are sufficient to suggest that one may be an attempt to emulate the other. The orientation of Sherd MC-C, therefore, can only be described as having a set of nested curved lines opposite a single curved line, which could be the outermost line of another set of nested arcs.

Sherds CC-A and CC-B, are assumed to be derived from the same pattern. Both are fragments of what is believed to have been a series of concentric circles. The tight curves of each line suggest that the curvilinear pattern continued past the observed portion. It is unknown

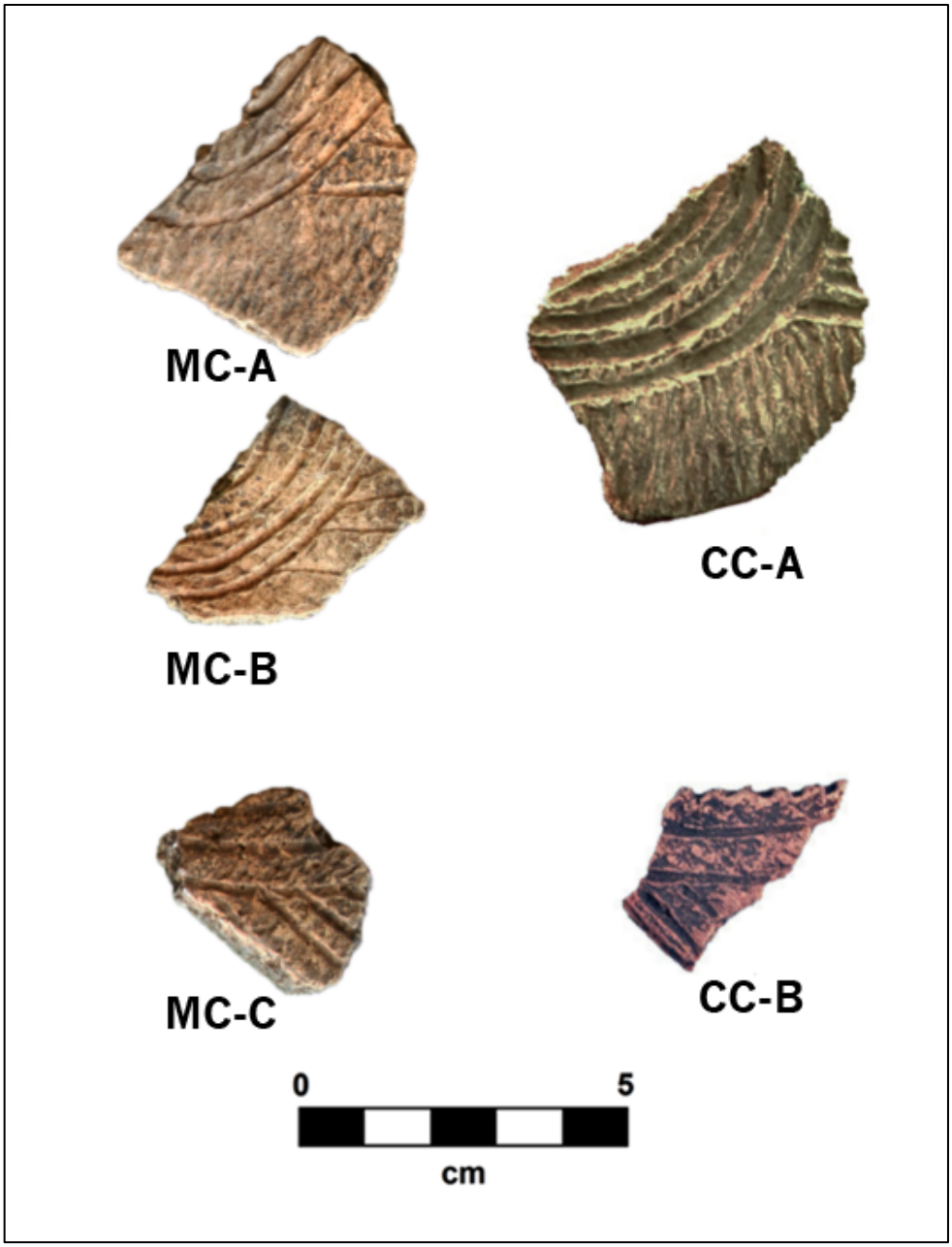


Figure 6.9: Comparison of design patterns on body sherds.

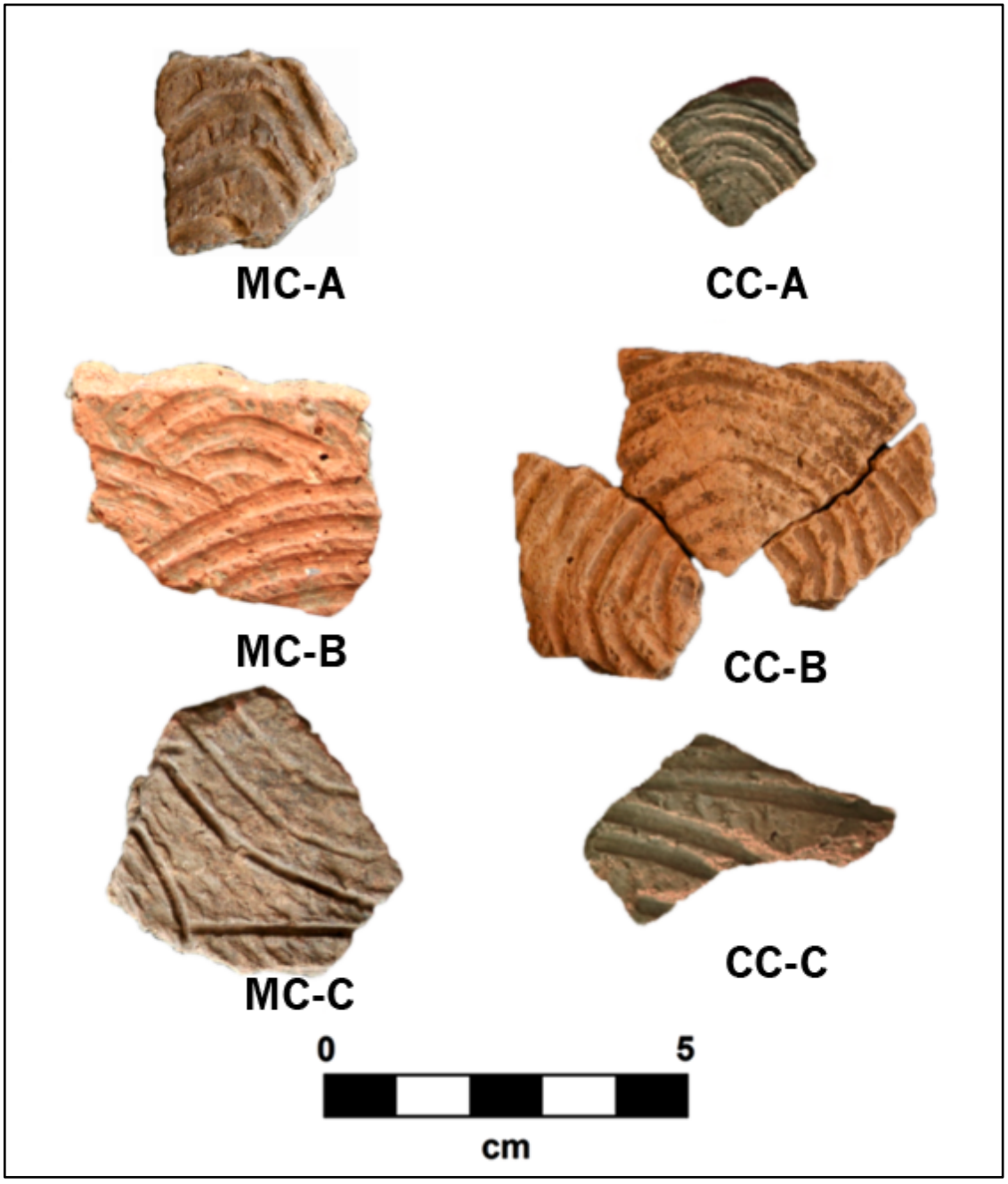


Figure 6.10: Comparison of curvilinear design patterns on body sherds.

whether this pattern was repeated around the vessel, or whether this only was applied once. When joined, the body sherds pictured as Sherd CC-B creates a slight protrusion in the center. This may suggest that the vessel had a series of large protrusions or 'bosses' along the shoulder, each of which were decorated with a set of concentric circles. A Late Woodland vessel form similar to what is being described, albeit without incised decoration, was recovered from the Old Runway site, a Raymond phase site near Carbondale (Koeppel and Butler 2000:213). Like Sherd MC-C from McGilligan Creek, Sherd CC-C from Cypress Citadel does not provide much information about the larger motif. Again, they are included here to show the diversity of curvilinear patterns observed.

This visual comparison shows the similarities and differences in the two assemblages. Certain motifs share a general pattern, but their execution seems to vary in some obvious ways. Additionally, there are several unique motifs that are not shared by both sites. The statistical analysis that follows focuses on the isochrestic variables, but also includes several iconographic variables. The analysis of these design elements help to better understand the differences observed throughout the previous comparison.

CHAPTER VII – STATISTICAL COMPARISON

This chapter explores the statistical similarities and differences between the ceramic assemblages from the Cypress Citadel and McGilligan Creek sites in terms of the variables described in the previous chapters. Pearson's chi-square statistic, x^2, is used to aid in understanding any significance of the variation between the certain attributes, but it only provides a level of statistical significance and cannot be used to measure the strength of association between two variables. For this reason, Cramer's V is employed to describe the strength of association. This statistic is a useful measure of association even when the chi-square statistic fails to reach its desired significance level (Acock and Stavig 1979:1381). It is important to understand that the fragmentation of the sherds and the low counts of some attributes could give inaccurate representations of the sites as a whole. Since chi-square is sensitive to low expected frequencies, Fisher's Exact test was run on variables which had expected frequencies of less than 5 for greater than one fifth of the cells.

The null hypothesis, H_0, can be stated as: the variable tested is unrelated to the site location. In practical terms, the null hypothesis states that the assemblages cannot confidently be divided into different populations and not dissimilar. Therefore, the alternative hypothesis for this analysis, H_a, can be described as follows: the variable tested is related to the site location, that is, the ceramics assemblages are from statistically different populations. Prior to running the statistics, a 95 percent significance level was chosen to test the similarities. To ensure that this

confidence level is maintained across all tests a Bonferroni correction was applied. This means that the p-value must be below 0.004 in order to reject the null hypothesis and show the assemblages are statistically different.

With this statistic, a p-value of 1.00 would indicate that there is 100 percent confidence that the variable being tested between the sites do not represent different populations; the variable is essentially the same at each site. Conversely, a p-value of 0.000 would allow us to reject the null hypothesis, and would suggest with complete confidence that the variable tested between the sites represent two different populations. All values between 0 and 1 are only confidence levels and do not indicate a strength of association. For this reason the Cramer's V statistic is utilized to describe the association, or lack of association, observed by Pearson's chi-square. The larger the Cramer's V statistic, the stronger the association between the attributes tested and the site from which they originated. This would mean that certain attributes are more common on one site and others more common on the other site. If the Cramer's V statistic is low, the site location has a small effect on the variable indicating a greater amount of social association between the populations of the two sites.

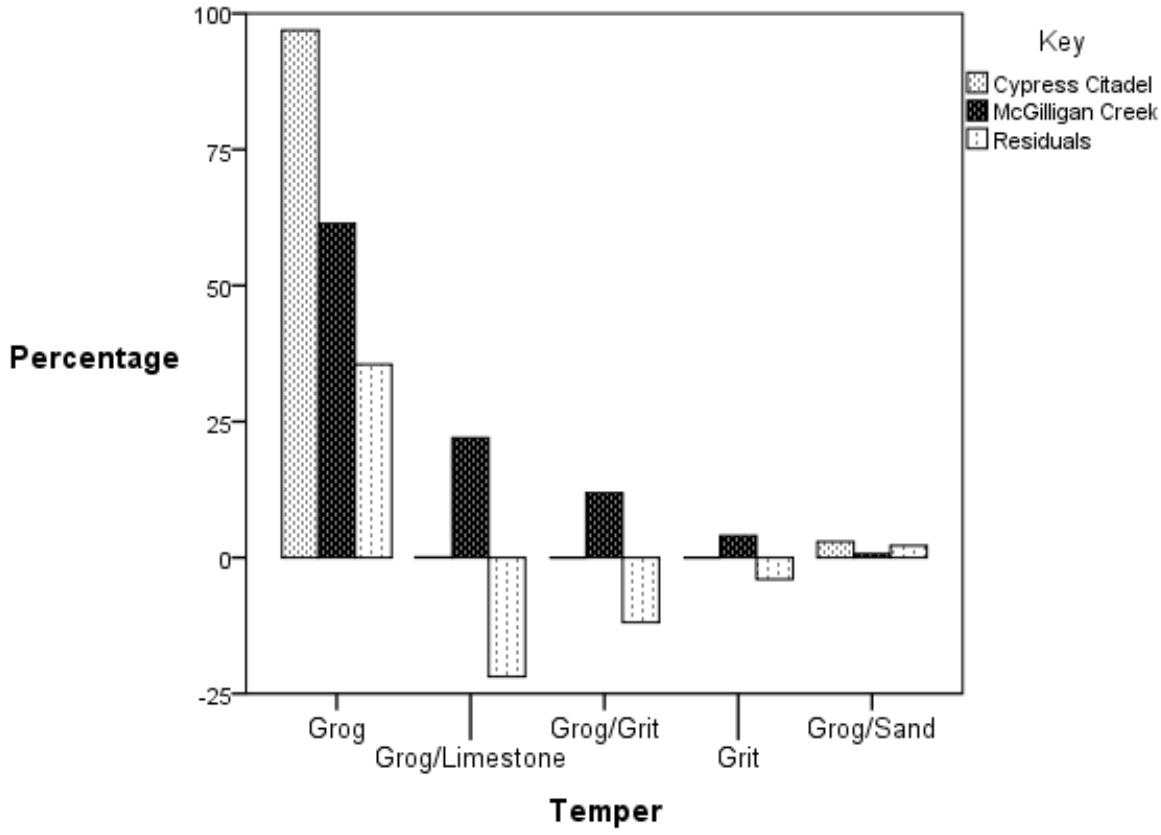
Isochrestic Variables

As previously suggested, the similarities and differences between the isochrestic variables between the two sites may provide evidence for direct social interactions. According to the social interaction theory and James Sackett's ideas of isochrestic variables, populations that exhibit similarities in the isochrestic variables may reflect economic and marriage relations between the two sites. The attributes of these functional variables are more likely to be passed on from one

potter to another based on the notion of habit and tradition. Figure 7.1 gives a comparison of the temper composition observed at each site along with associated chi-square and Cramer's V statistics. The large sample size for this statistic provides ample credibility for rejecting the null hypothesis ($p<0.001$). That is to say, the variable tested differs between the assemblages. The Cramer's V ($V=0.560$) also suggests that the site has a large effect on the temper. It is also important to note that five other observed temper compositions were excluded from this analysis as they were deemed outliers. These five—grog/quartz, grog/shale, grog/sand/bone, sand, and un-tempered—were recovered from Cypress Citadel and combined made up only 0.1 percent of the total sherds recovered from the site. These data suggests that the temper composition of ceramics differs significantly between the assemblages.

Statistical analysis of the surface treatment (Figure 7.2) excluded all eroded sherds as the erosion process is post-depositional and does not give clear insight into the ceramic traditions of the populations who produced them. Pearson's chi-square analysis of the surface treatment ($p<0.001$) again supports rejecting the null hypothesis, showing that differences are observed between the assemblages. Cramer's V ($V=0.064$), however, suggests that site location has only a very small effect on this variable. So, a statistical difference is observed between the assemblages, but it is only a weak difference. It is clear that check stamping is much more common in the McGilligan Creek collection, which may be one reason why Pearson's chi-square is so low. This data suggests that a weak difference exists between the surface treatment proportions of the two assemblages.

Chi-square analysis on the angle of cord-marking ($p=0.173$) does not support rejection of the null hypothesis (Figure 7.3). This suggests that the differences observed between the variables from each assemblage may be due to sampling error, and cannot confidently be stated



Chi-Square Tests

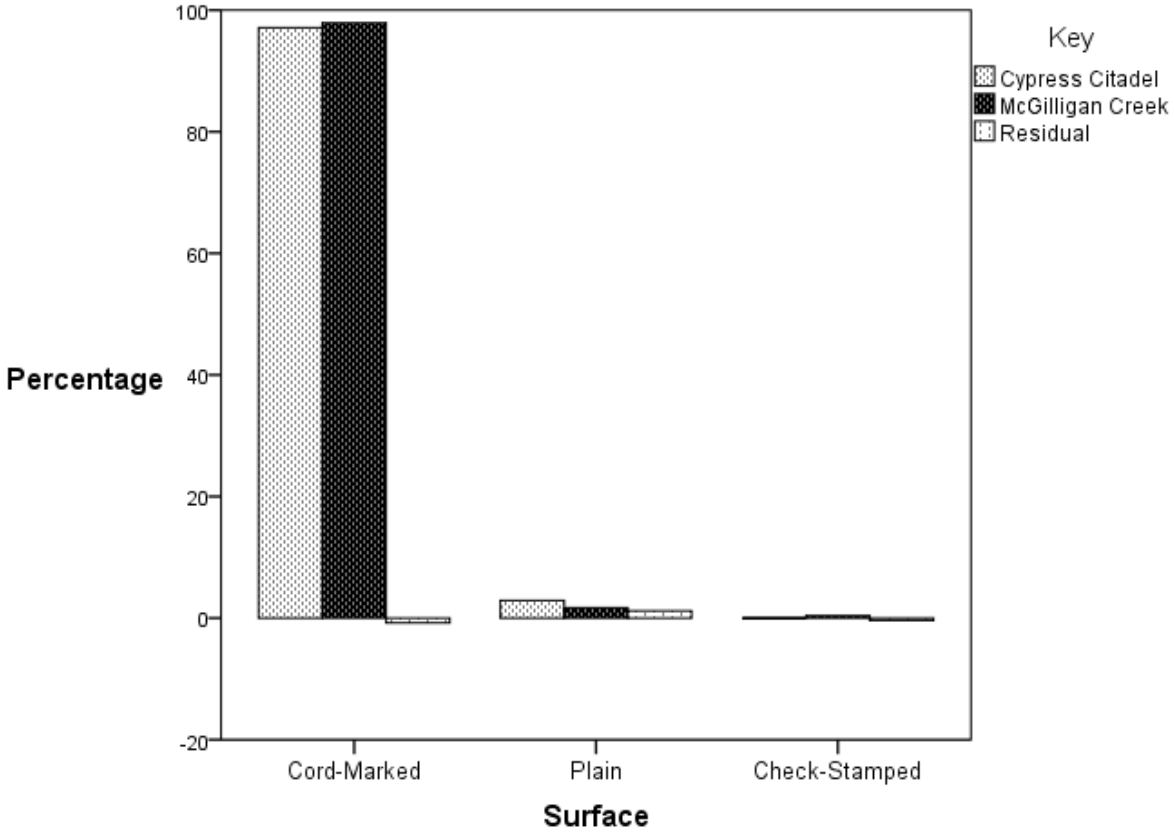
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4839.054[a]	5	.000
N of Valid Cases	15422		

a. 1 cells (8.3 percent) have expected count less than 5. The minimum expected count is 2.65.

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Cramer's V	.560	.000
N of Valid Cases		15422	

Figure 7.1: Temper composition statistical comparison.



Chi-Square Tests

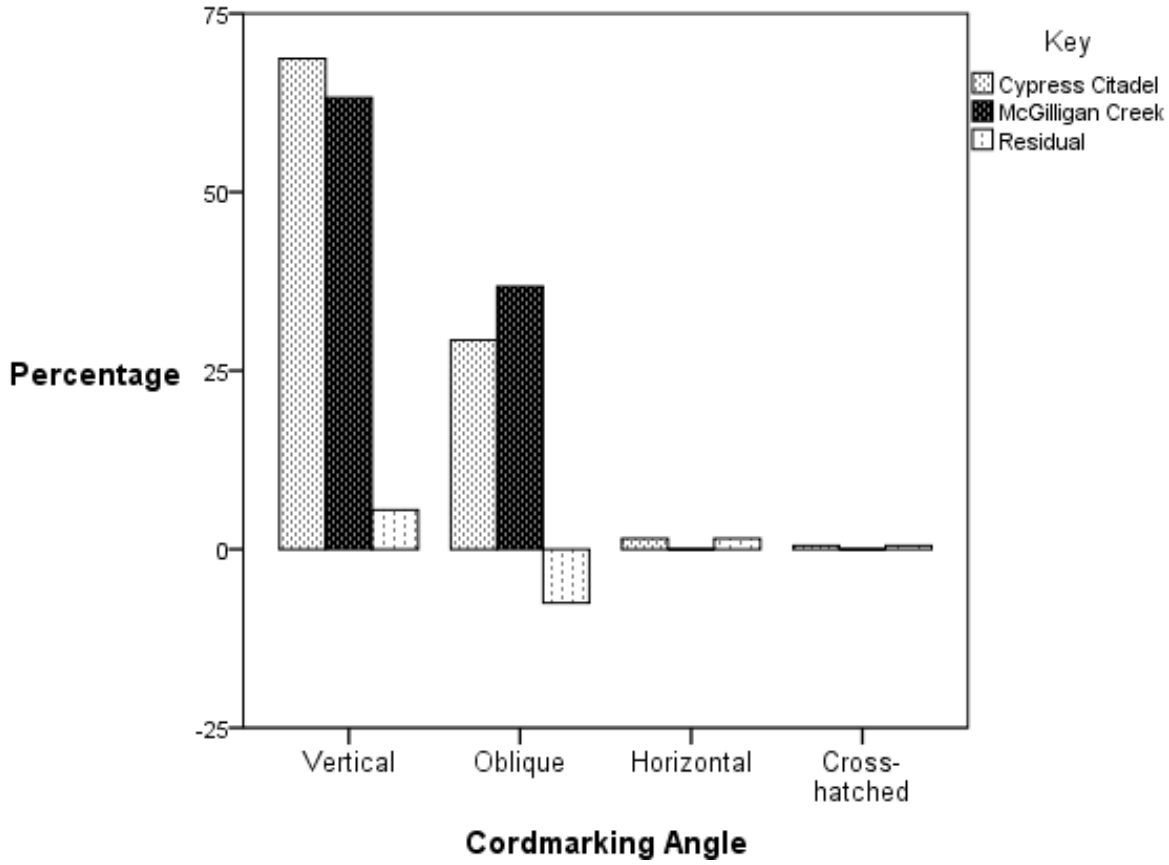
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	60.145[a]	2	.000	.000
N of Valid Cases	14643			

a. 1 cells (17.7 percent) have expected count less than 5. The minimum expected count is 4.18.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.064	.000	.000
N of Valid Cases		14643		

Figure 7.2: Surface treatment statistical comparison.



Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	4.989[a]	3	.173	.171
Fisher's Exact Test	3.881			.245
N of Valid Cases	931			

a. 3 cells (37.5 percent) have expected count less than 5. The minimum expected count is .54.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.073	.173	.171
N of Valid Cases		931		

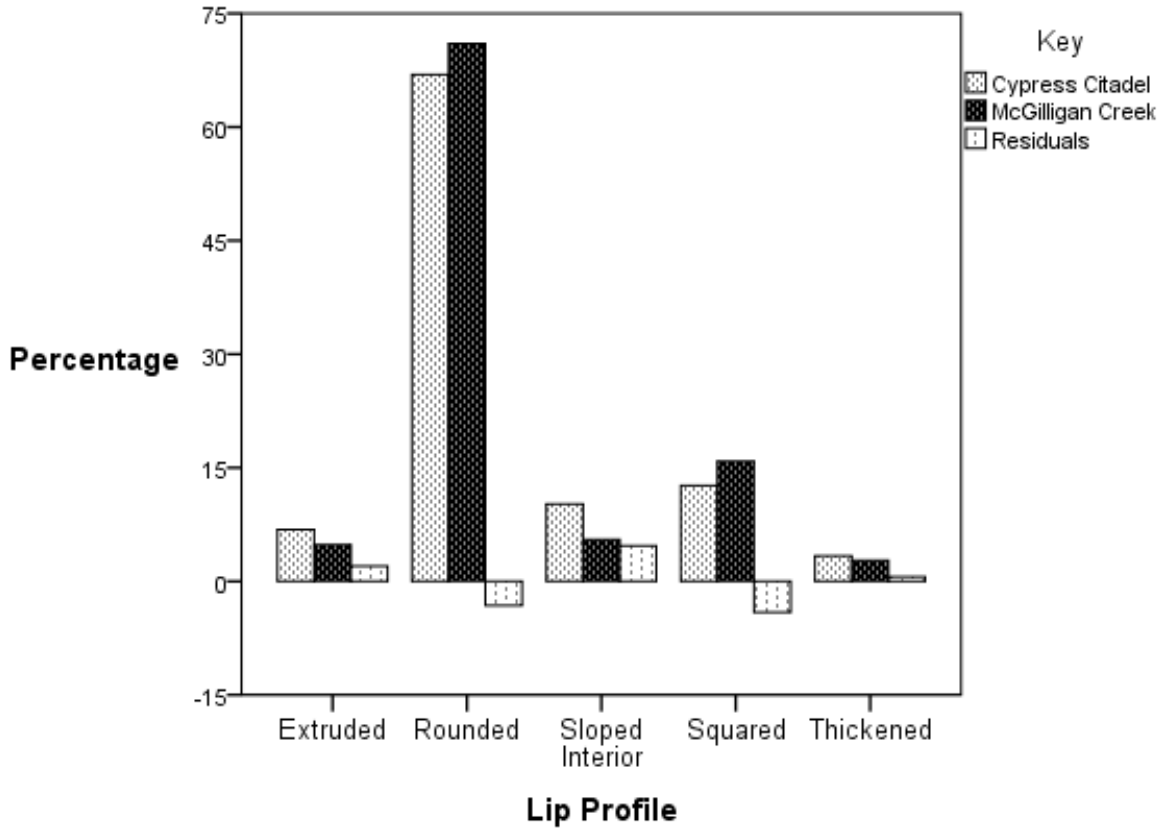
Figure 7.3: Angle of cord-marking statistical comparison.

as a true representation of the ceramic populations as a whole. The Cramer's V statistic (V=0.073) shows that the site location has only a small effect on the surface treatment, suggesting the statistical difference observed very weak. This data suggests that the angle of cord-marking is similar between the sites.

Chi-square analysis (p=0.271) of the lip profiles also fails to reject the null hypothesis (Figure 7.4). Therefore, the lip profile between the two assemblages cannot be said to differ significantly. Cramer's V strength of association test (0.064) shows that the site from which the sherd was recovered has only a small effect on the difference observed in this variable, giving further credibility to this conclusion. This data suggests that the lip profiles on the rim sherds are consistent between the assemblages and that the populations at these two sites were creating consistent lip profiles.

Due to the small counts for several of the rim stance categories, Fisher's Exact test was required to truly understand if any association is present between rim stances and the separate assemblages (Figure 7.5). Fisher's Exact statistic (p=0.220) for rim stances provides evidence that this variable cannot be confidently divided as having originating from two separate populations. However, Cramer's V (V=0.200) suggests that site has a moderate effect on the difference observed for the rim stance. Likely the source of this dissimilarity lies with the presence of pinch pots at Cypress Citadel and their complete absence at McGilligan Creek. As previously cautioned, the Cramer's V statistic is sensitive to low counts. Therefore, the Fisher's exact test is the most accurate measure, suggesting that the rim stances in each assemblages are similar.

Analysis of the vessel forms was done both including and excluding pinch pots. Not surprisingly, as no pinch pots were observed in the McGilligan Creek collection, the analysis that



Chi-Square Tests

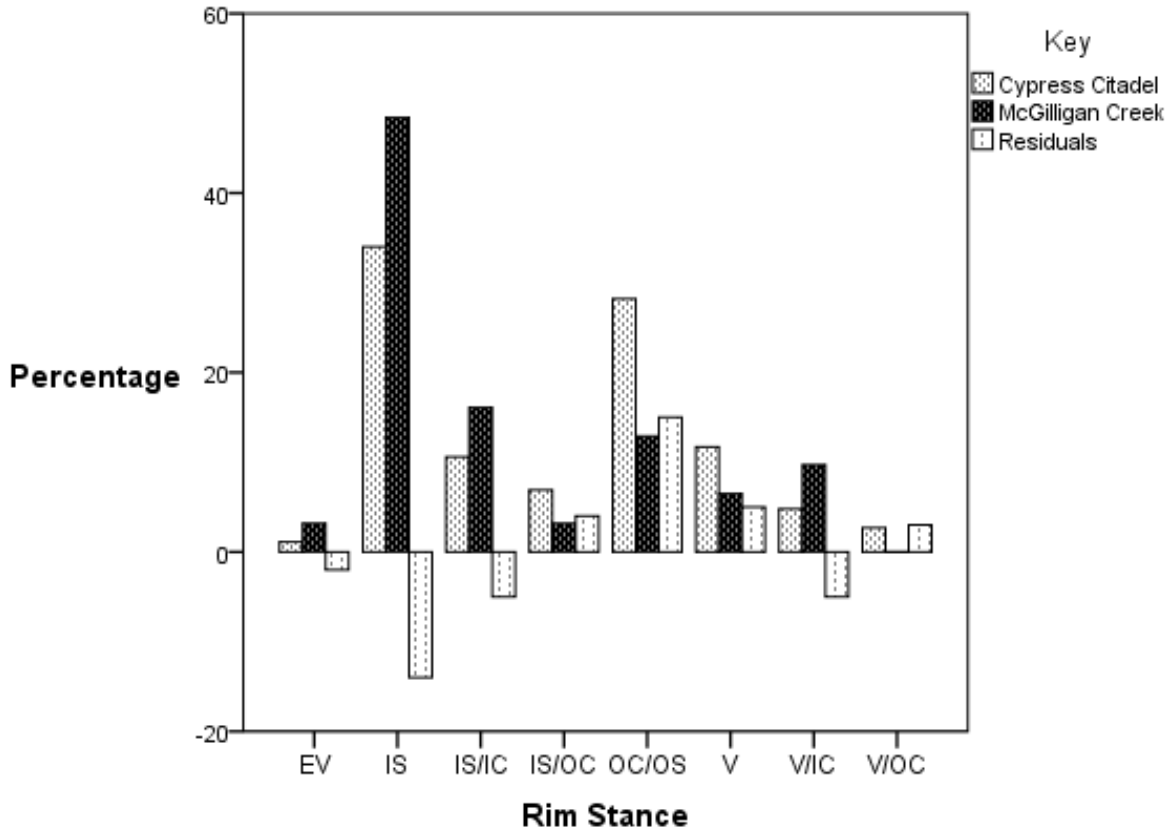
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	5.160[a]	4	.271	.269
N of Valid Cases	1243			

a. 1 cells (10.0 percent) have expected count less than 5. The minimum expected count is 4.78.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.064	.271	.269
N of Valid Cases		1243		

Figure 7.4: Lip profile statistical comparison.



Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	8.740[a]	7	.272	.261
Fisher's Exact Test	8.631			.220
N of Valid Cases	219			

a. 8 cells (50.0 percent) have expected count less than 5. The minimum expected count is .42.

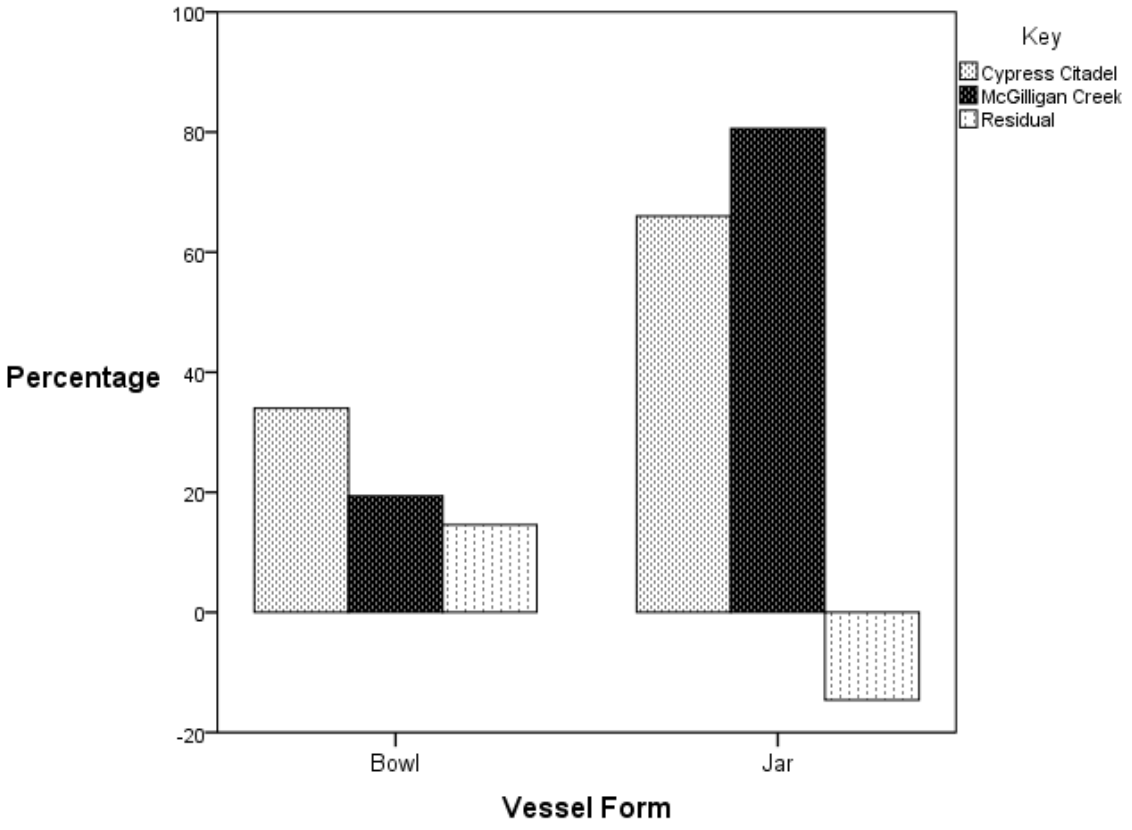
Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.200	.272	.261
N of Valid Cases		219		

Figure 7.5: Rim stance statistical comparison. Key: IS, inslanting; IC, incurved; OS, outslanting; OC, outcurved; V, vertical; EV, everted.

included pinch pots (p=0.001; V=0.235) showed an association between vessel form and assemblage. However, since pinch pots are produced in a manner different from the remaining vessels at the site, excluding them from the vessel analysis might be seen as more appropriate means of analyzing the ceramic traditions of the sites (Figure 7.6). This analysis (p=0.109) shows that the vessel form proportions between the two assemblages cannot confidently be said to differ. In addition, the site location has only a weak effect on the variable (V=0.116). This data suggests that the vessel form, excluding the pinchpots found at Cypress Citadel, is similar between the sites.

The statistical similarity between several of the isochrestic variables tested is expected. These attributes are not unique to any Late Woodland site in this region. "Exterior cord-marked, thin, conoidal vessels" (Muller 1986:128) generally characterize the Lewis ceramic tradition, which defines the Late Woodland of the lower Ohio River Valley. This description suggests that the surface treatment, rim stance, and vessel form are similar over a broad geographical area while more diversity can be seen in the temper composition between Lewis sites. This pattern is exactly what is observed in the data above, suggesting that the isochrestic variables on the ceramics recovered Cypress Citadel and McGilligan Creek do indeed adhere to the Lewis phase. However, the remainder of Muller's quote "… with very little decoration" (1986:128) suggests that isochrestic variables do not fully describe this ceramic tradition. Decoration at both Cypress Citadel and McGilligan Creek are anything but rare, as this current research has indicated. Not only are there a high percentage of decorated pots, but also the decoration is also very elaborate and not seen elsewhere.



Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.562[a]	1	.109	.140	.079
N of Valid Cases	190				

a. 0 cells (.0 percent) have expected count less than 5. The minimum expected count is 9.79.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.116	.109	.140
N of Valid Cases		190		

Figure 7.6: Vessel form statistical comparison.

Iconographic Variables

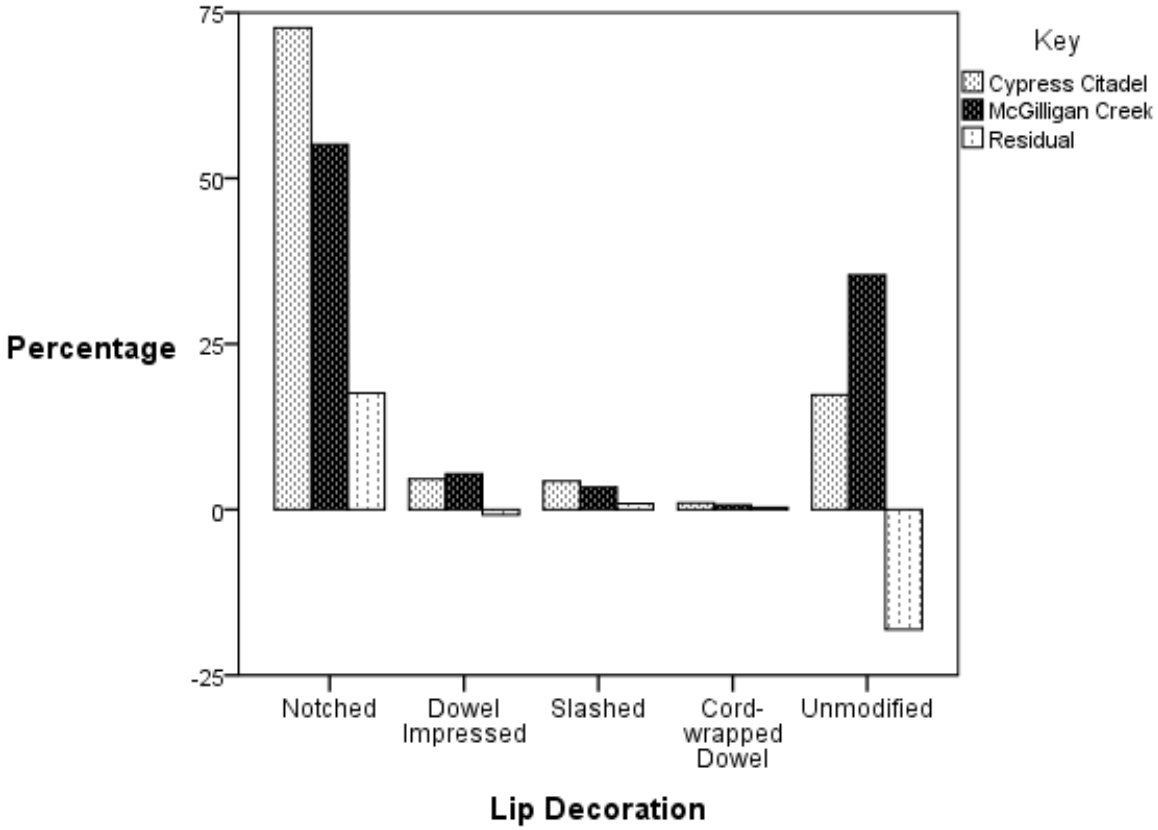
According to the information transmission theory and Polly Wiessner's ideas about iconographic variables, analysis of decorative aspects of a group will give insight into the social transmission of messages. The purpose of this analysis is not to discern the messages that were intended from the motif designs, as discerning these messages would require intimate knowledge of the society in which they were produced. Rather, the goal here is to identify any similarities between the motifs in the two assemblages, which in turn provides evidence that these populations were transmitting similar messages. Populations that share motifs are likely able to mutually discern their significance, whether this is a conscious understanding or not. This suggests that any similarities in motifs between Cypress Citadel and McGilligan Creek would have resulted from a shared understanding of the messages encoded in the decoration. If Wiessner is correct that these messages transmit information about the identity of the populations producing them, a shared identity—political or ethnic—would be portrayed through a shared set of decorative motifs.

Statistical analysis was not possible for all iconographic variables due to small sample sizes. Here design elements, patterns of combined elements, and more complete design motifs undergo separate analysis. The design elements, defined in this analysis as individual incised lines, are tested with Pearson's chi-square and Cramer's V statistics, while analysis of design motifs relies largely on the descriptive qualities of similarities and differences explored in Chapter 6. These few larger decorated sherds are of immense importance when discussing the shared motifs from the assemblages.

Lip Decoration

The first iconographic variable tested does not deal with incised motifs at all (Figure 7.7). The similarities and differences of lip decoration between the sites are also understood to be a measure of group identity. The chi-square analysis ($p<0.001$) gives great confidence in rejecting the null hypothesis, suggesting that the two populations differ; however, Cramer's V ($V=0.150$) suggests that the site has only a small effect on the difference observed in lip decoration. Looking at the comparative graph, it is obvious that little difference is seen in the three minority categories: dowel impressed, slashed, and cord-wrapped dowel impressed; however, a substantial difference is seen in the amount of notched and undecorated rims between the two assemblages. McGilligan Creek does not exhibit nearly as much lip decoration as Cypress Citadel. These data suggest that slight differences between in lip decoration can be seen between the assemblages.

Figure 7.8 gives the statistical analysis for the location of notching on the 1,006 rim sherds which exhibit decorated lips from both collections. Analysis of this variable ($p<0.001$) shows that a statistically significant difference is observed between the sites. Cramer's V ($V=0.198$) suggests that the location from which a sherd is recovered has a moderate effect on the difference observed for this variable, suggesting that the differences observed are at least in some part, due to cultural preferences. Exterior placement of lip modification is most frequent at both sites; however, this placement is nearly a third more common at Cypress Citadel. In addition to this, the percentage of superior and interior lip decoration at McGilligan Creek far surpasses what is observed at Cypress Citadel. This data suggests that statistical differences exist between the ceramic collections in terms of the location of lip decoration.



Chi-Square Tests

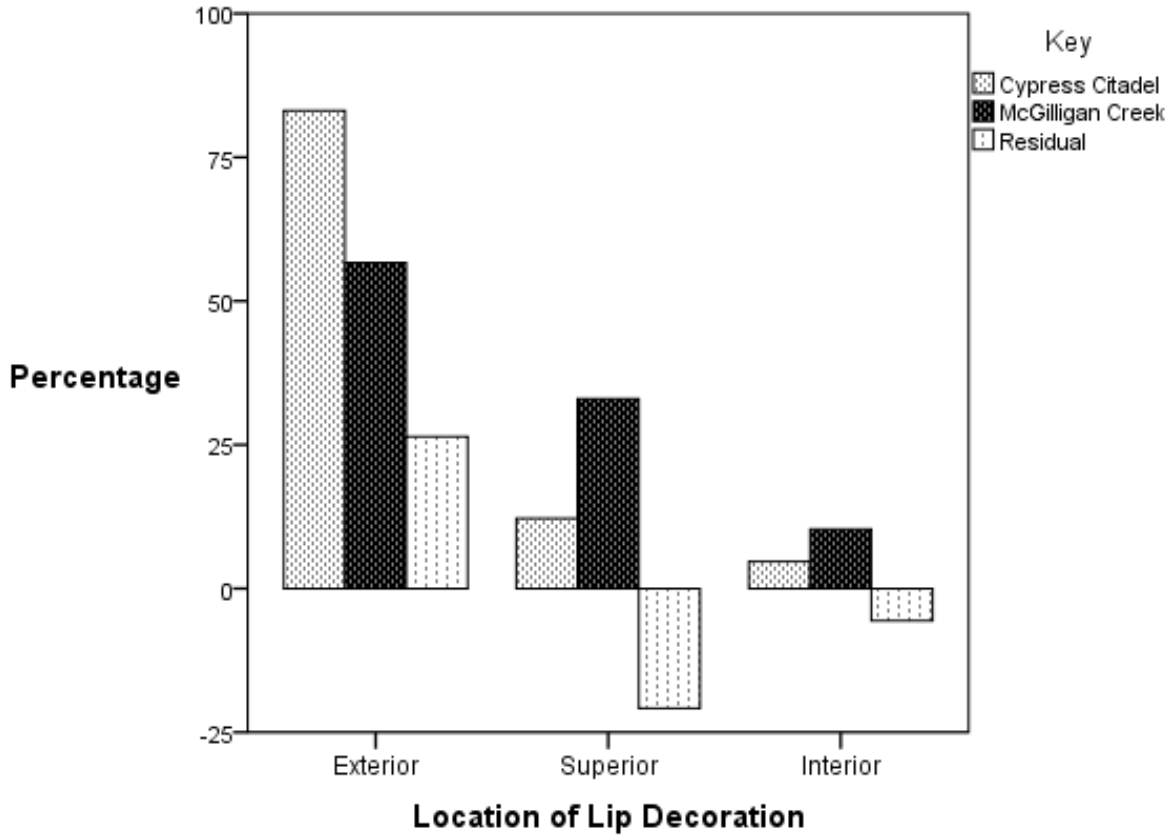
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	27.984[a]	4	.000	.000
N of Valid Cases	1244			

a. 1 cells (10.0 percent) have expected count less than 5. The minimum expected count is 1.42.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.150	.000	.000
N of Valid Cases		1244		

Figure 7.7: Lip decoration statistical comparison.



Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	39.361[a]	2	.000	.000
N of Valid Cases	1006			

a. 0 cells (.0 percent) have expected count less than 5. The minimum expected count is 5.11.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.198	.000	.000
N of Valid Cases		1006		

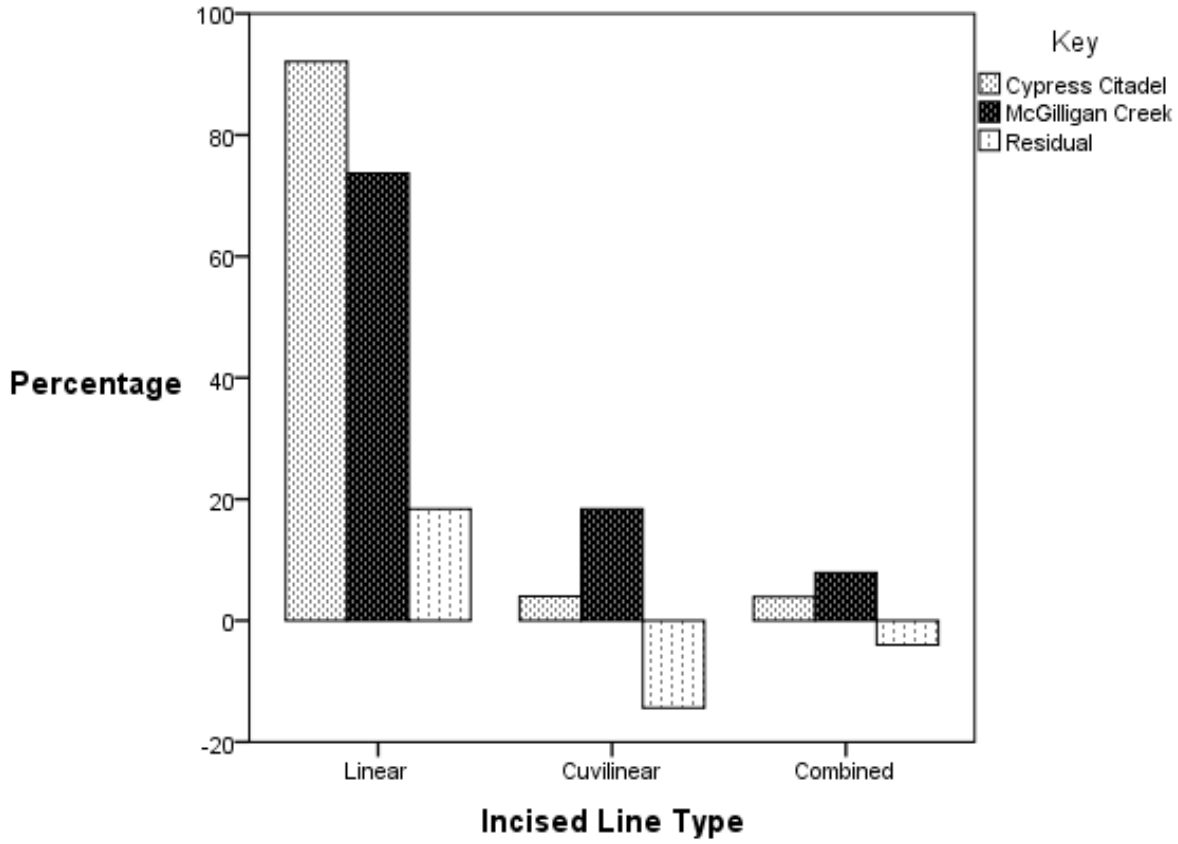
Figure 7.8: Lip decoration location statistical comparison.

Surface Decoration

Incised designs are understood as another means for the transmission of messages from one social group to another and are also used here to aid in the understanding of any shared identity between these groups. Only two types of lines were recorded for the design elements: linear, or straight lines, and curvilinear. Because most incised sherds contained more than one design element, linear and curvilinear lines were occasionally combined on the same sherd. A small number of sherds were also observed which definitely contained incised decoration, but were too fragmented to determine the type of line. The omission of these sherds in the design element analysis explains the discrepancy in total number of incised lines analyzed for line type and those analyzed for width.

The chi-square analysis ($p<0.001$) shows that a statistically significant difference is seen between the assemblages (Figure 7.9). Cramer's V ($V=0.201$) supports that the site has a moderate effect on the variable, suggesting that the difference can be explained by the cultural preferences of the populations at the two sites. The graphical representation shows that the Cypress Citadel decoration relies very heavily on linear incising, with little use of curvilinear lines. The McGilligan Creek decoration also shows a high frequency of linear incising, but curvilinear lines are present on more than a quarter of the decorated sherds, triple the frequency recorded for Cypress Citadel. These data shows that the line choice is moderately different between Cypress Citadel and McGilligan Creek.

The width of incising was observed on all incised sherds from both sites (Figure 7.10). The chi-square statistic ($p=0.005$) fails to reject the null hypothesis. Cramer's V ($V=0.070$) indicates that the site has a small effect on this variable. This difference between the sites may suggest different cultural preferences of the two populations. This is to say that, although the frequency



Chi-Square Tests

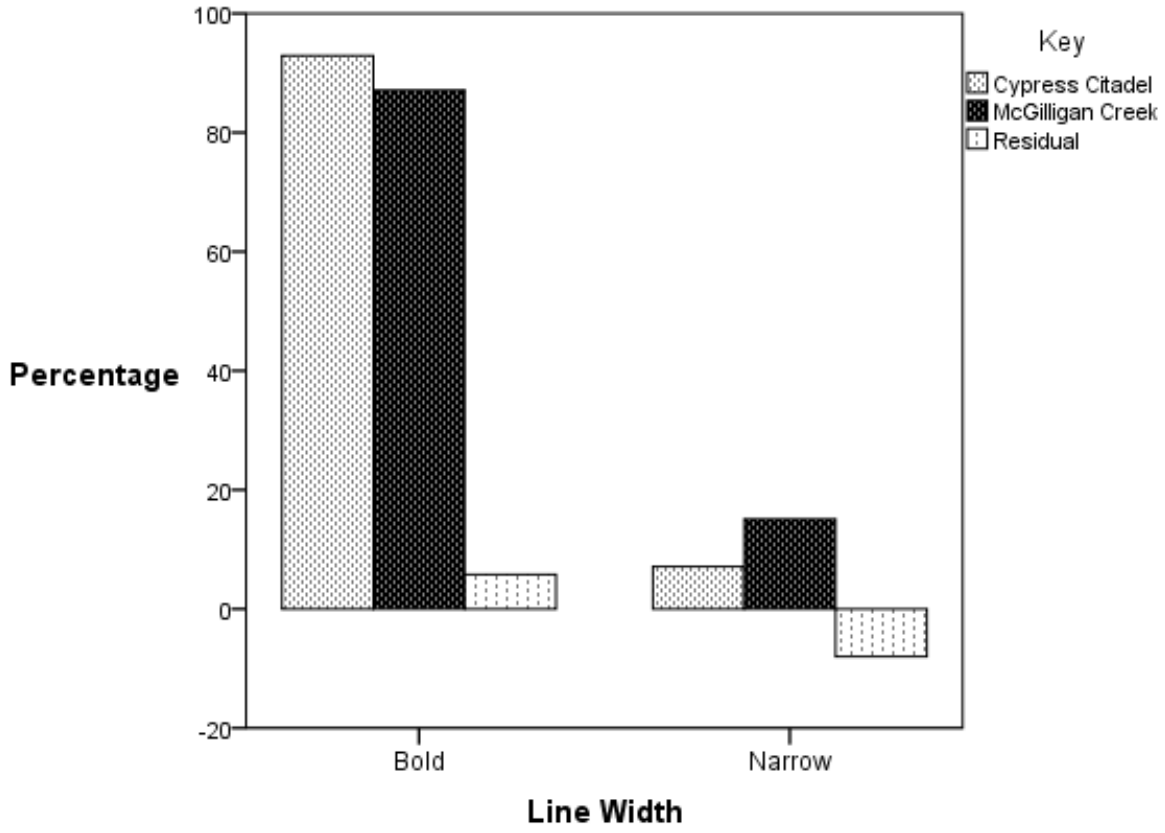
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	63.930[a]	2	.000	.000
N of Valid Cases	1588			

a. 0 cells (.0 percent) have expected count less than 5. The minimum expected count is 7.51.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.201	.000	.000
N of Valid Cases		1588		

Figure 7.9 Incised line type statistical comparison.



Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.957[a]	1	.005	.007	.006
N of Valid Cases	1630				

a. 0 cells (.0 percent) have expected count less than 5. The minimum expected count is 15.12.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.070	.005	.007
N of Valid Cases		1630		

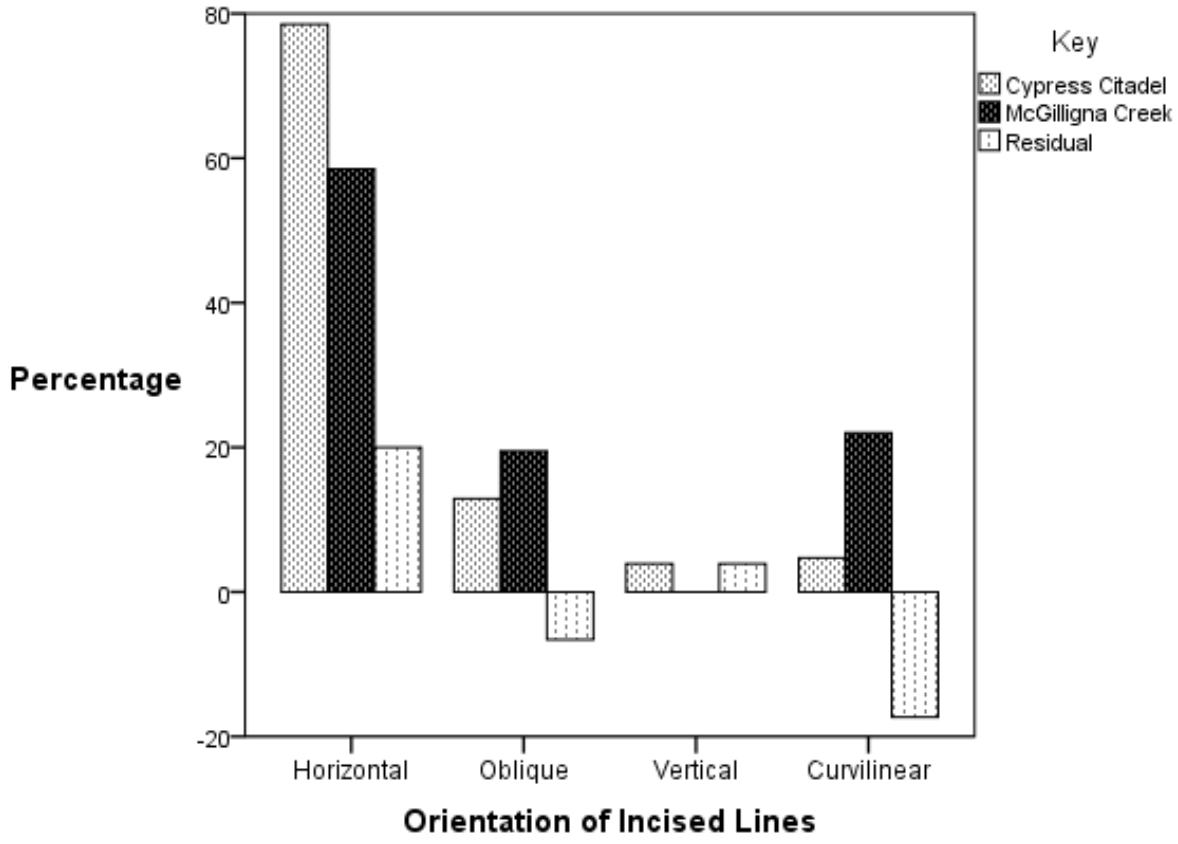
Figure 7.10: Line width statistical comparison.

of narrow incising at McGilligan Creek is nearly double that observed at Cypress Citadel, the predominance of bold incising at both sites suggests that more similarity than dissimilarity is present. These data suggests that the weak differences observed between the sites in terms of the width of incising could be due to random sampling.

Rim sherds offered the ability to observe the orientation of the incised decoration as it appeared on the whole vessel (Figure 7.11). Chi-square analysis ($p<0.001$) suggests that the incising orientation statistically differs between the sites. Cramer's V test of association ($V=0.232$) confirms that the site has a moderate effect on the difference observed on the orientation of the incised lines. This suggests that the difference can be explained the cultural preferences of the two populations. With the inclusion of curvilinear lines, which approached the orifice with a bend, it is not surprising that McGilligan Creek differed greatly from Cypress Citadel.

The final statistic examined on the design elements was the presence or absence of zoning (Figure 7.12). Not surprisingly, due to the high frequency of horizontally incised lines and the strong preference for linear incising, Cypress Citadel exhibits a far greater frequency of zoning than McGilligan Creek does. Chi-square analysis ($p<0.001$) allows confident rejection of the null hypothesis. Cramer's V ($V=.351$) shows that the site has a large effect on the presence or absence of zoning, suggesting that the statistical differences observed are heavily influenced by the cultural preferences of the populations producing the designs. This data suggests that the amount of zoning differs greatly between the assemblages.

Figure 7.13 summarizes the Pearson's chi-square data for both the isochrestic and the iconographic variables. Several of the isochrestic variables failed to show differences between



Chi-Square Tests

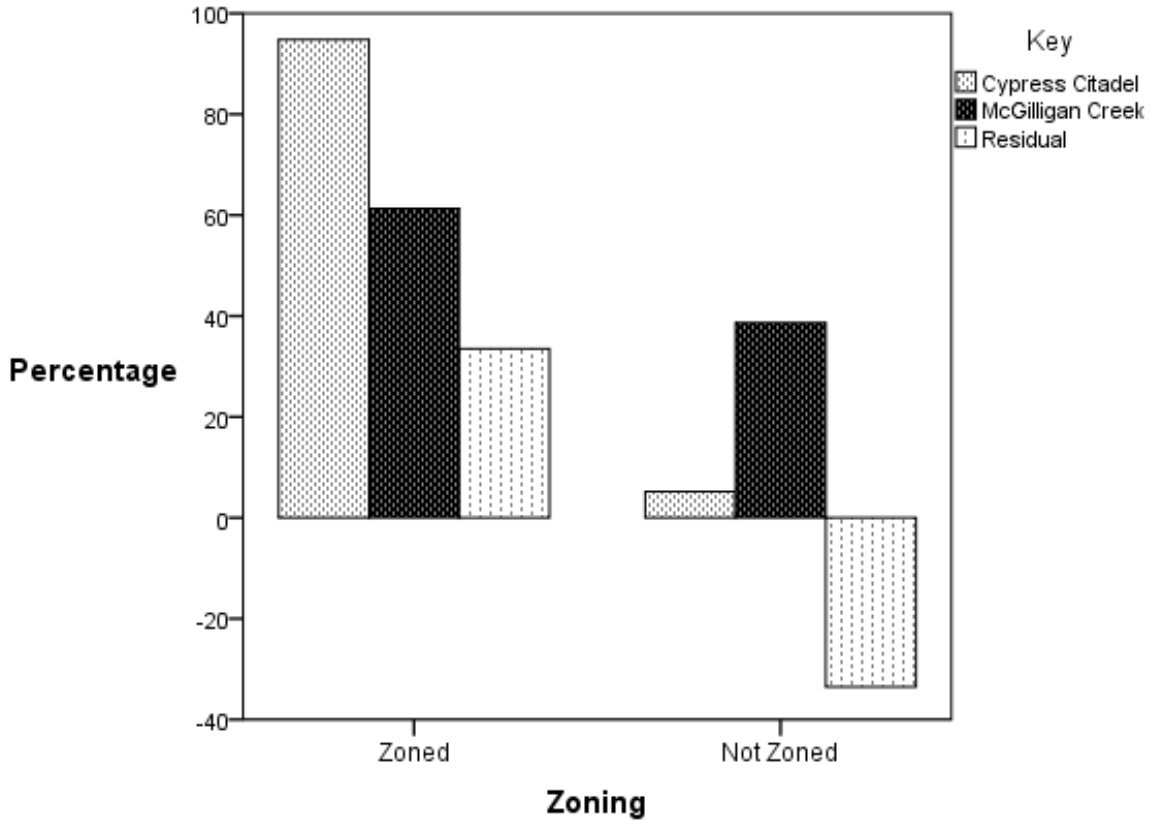
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	21.738[a]	3	.000	.000
Fisher's Exact Test	17.333			.001
N of Valid Cases	404			

a. 2 cells (25.0 percent) have expected count less than 5. The minimum expected count is 1.42.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.232	.000	.000
N of Valid Cases		404		

Figure 7.11: Orientation of incised line statistical comparison.



Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	41.918[a]	1	.000	.000	.000
Fisher's Exact Test				.000	.000
N of Valid Cases	340				

a. 1 cells (25.0 percent) have expected count less than 5. The minimum expected count is 2.55.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Cramer's V	.351	.000	.000
N of Valid Cases		340		

Figure 7.12: Zoned designs statistical comparison.

Isochrestic Variable	**Dissimilar**	**Iconographic Variable**	**Dissimilar**
Temper	Yes	Lip Decoration	Yes
Surface Treatment	Yes	Lip Decoration Location	Yes
Cord-Marking Angle	No	Incised Line Type	Yes
Lip Profile	No	Line Width	No
Rim Stance	No	Orientation of Line	Yes
Vessel Form	No	Zoned Motif	Yes

Table 1: An overview of the statistical results.

the two assemblages, however the temper and surface treatment were statistically different. The similarity between these variables is not unique to any Late Woodland Lewis site and should be expected for assemblages that belong to the same archaeological phase.

All iconographic variables except the incised line type showed statistical differences according to the chi-square test. This may appear to suggest that the ideological tie of these populations is low, but analysis of design elements only tells part of the story. These variables provide insight into the manufacture of incised design, how the decoration was executed, but do not readily reflect the overall motifs. The visual comparisons used in Chapter 6 show that several designs are shared between the two populations, while small differences were observed in their execution. This analysis also shows that the way in which these designs were created differs. It suggests that the populations were indeed creating similar designs based on their ideological commonalities, but were applying them to pottery differently based on their local manner of production.

Figures 7.13 and 7.14 show the results of the Cramer's V strength of association test results. Again, this test measures the effect that the site location has on a partcular variable. The larger the effect, the lower the amount of social connection suggested. Figure 7.13 summarizes the Cramer's V statistics for the isochrestic variables. The temper type is heavily influenced by the site location, which is consistent with the statistical data. However, all other isochrestic variables show that the site has only a small effect on the variable, including the surface treatment which showed statistical differences. This suggest that the social connection of these populations is greater according to these variables.

Figure 7.14 shows the effect that site location had on the iconographic variables. Several of the variables show that the site has only a small effect on the variable, suggesting that the

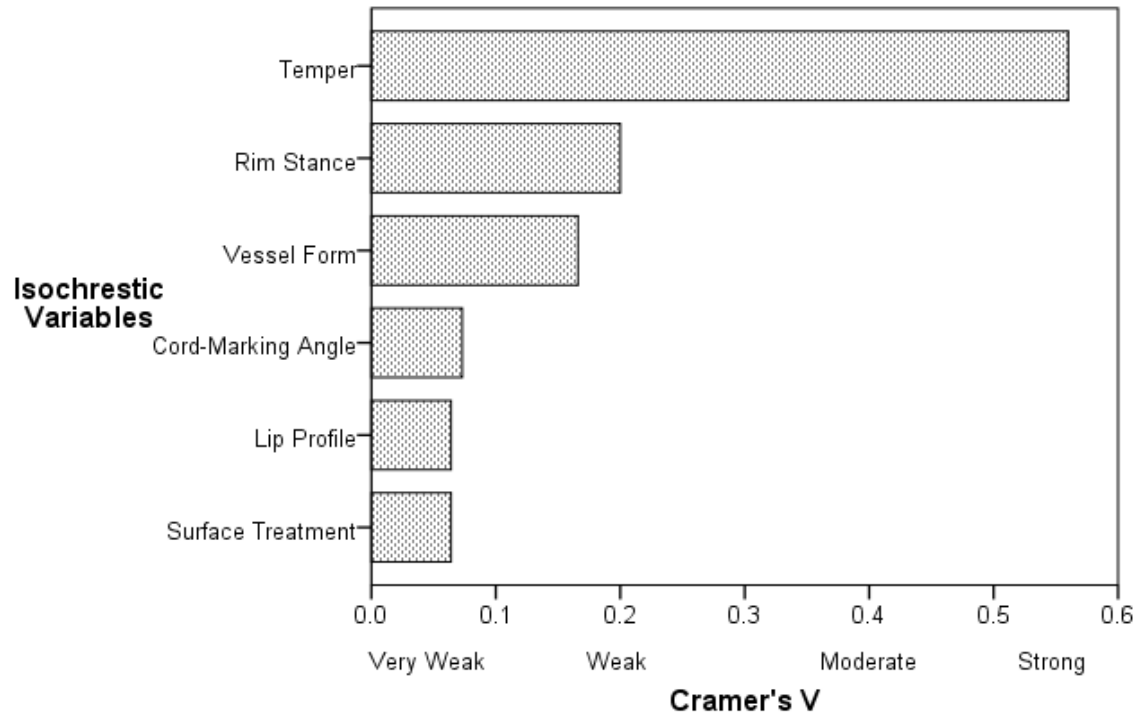


Figure 7.13: Strength of association between sites and specific isochrestic variables.

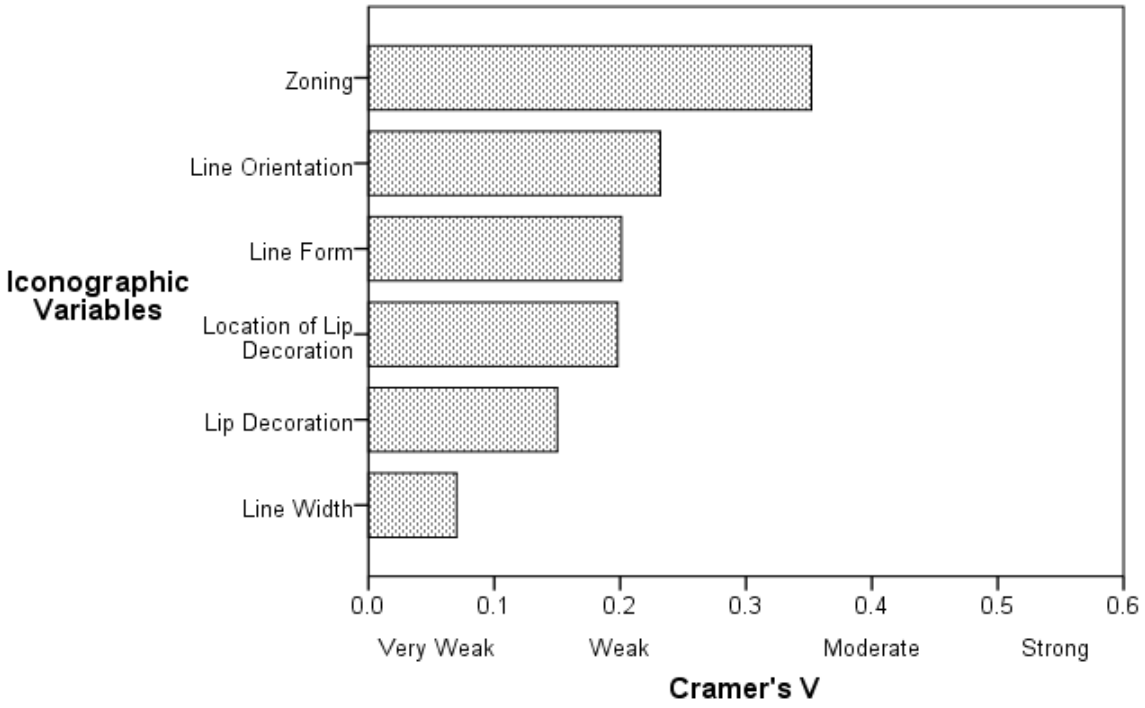


Figure 7.14: Strength of association between site and specific iconographic variables.

social connections of these populaitons is larger thant the statistics may suggest. The zoning variable however, does show that the site has a moderate effect on the attributes observed. According to this, zoning may indeed show the cultural prefecences of the populations at either site.

These statistical data indicate that the pottery at both sites is consistent with Lewis Phase characteristics except in the amount of decoration. Chi-square tests on the isochrestic variables show that many of the defining attributes of Lewis Phase pottery are similar between both sites. Cramer's V also supports this conclusion, showing that temper is the only variable which exhibits a strong difference between the assemblages. The chi-square results for the iconographic variables show several varibles are different between the two sites, but Cramer's V reveals that, while statistically significant, many of these differences are weak. Temper and zoning appear to be the most distinctive differences between the assemblages.

CHAPTER VIII – DISCUSSION

The Late Woodland of the lower Ohio River Valley is still not well represented in archaeological literature, but recent research is proving this period to be more than "the good grey" period between two mound building climaxes. Lewis phase sites scattered throughout southern Illinois and western Kentucky are providing a wealth of information, advancing our understanding of the populations of the Late Woodland in this area. The ceramics from these sites mostly conform to the description provided by Muller (1986), suggesting a time period of little decorative elaboration. The two sites explored here, McGilligan Creek and Cypress Citadel, are aberrant in this regard, exhibiting large amounts of decoration. Evidenced by their emphasis on information transmission through elaborate incised designs as well as their size and intense occupation, both sites appear to have been important social or political centers during the Late Woodland. This research provides a detailed analysis of this decoration in order to better understand the social connections of these sites. Understanding that ceramic characteristics cannot be easily divided into purely functional variables and purely decorative variables, decoration is defined here as surficial modifications which go beyond the utilitarian functions of a pot.

Archaeological theories that are used to understand social aspects of designs are still hotly debated. The social interaction and the information exchange hypotheses were among the first notions to be used and have undergone much scrutiny and revision over their more than four

decades of use in anthropology. Current adaptations of these theories are now well-accepted in archaeology as addressing at least some of the social aspects of decoration. More recent studies of decoration have advocated a synthesis of these in order to gain the most information from the data. In this research, the social interaction theory is utilized to explore the differences in the more functional aspects of the vessel. Frequent interaction between two groups may signify close social connections through trade and intermarriage. These interactions would in turn produce similarities in pottery and other materials goods, either by means of physical trade or the transfer of knowledge of production through marriage. The information exchange theory is used to explore the design differences for the stylistic variables. Under this theory, similarities in designs suggest a unified message between the groups, possibly indicating a shared political or religious ideology.

Analysis of the isochrestic variables, provided in the first half of Chapter 7, conforms largely to what is expected for two assemblages belonging to the same archaeological phase defined largely on the basis of ceramics. Muller's description of several isochrestic variables of Lewis phase ceramics, cord-marked exteriors, thin walls, and concoidal shaped vessels describe several Late Woodland ceramic assemblages of the research area. The two sites in question showed similarity in all of these variables including rims stance and vessel form when omitting the pinchpots from the analysis. The statistical comparison of surface treatment shows some valid differences but the association is weak and the difference may result primarily from a minority presence of check stamped pottery at McGilligan Creek and its near absence at Cypress Citadel.

One isochrestic variable that does show a statistically significant difference is temper. Both sites do exhibit a dominance of grog tempering in their ceramics, but the near uniformity at

Cypress Citadel and great variation at McGilligan Creek provide an evident contrast between the assemblages. Temper, however, is more heterogeneous throughout the region than other isochrestic variables. Lewis phase ceramics are partially defined by grog-dominated pottery, but several other temper types are common as minority additions in many assemblages. Both grog and grit tempering are common on sites bordering the Lewis and Raymond divide. Recently Butler and Wagner (2012: 291) have proposed the location of rim notching as a useful tool in segregating these two phases when differences in temper are insufficient for categorization.

These data provide ample evidence to conclude that both Cypress Citadel and McGilligan Creek belong to the Lewis phase, suggesting at the very least some shared ideology between the populations. The near uniformity in temper at Cypress Citadel, as well as the lack notable quantities of check stamped sherds suggests that McGilligan Creek populations were more open to experimentation. The closer proximity of McGilligan Creek to the Ohio River compared to Cypress Citadel may have allowed more diverse contact for the residents of McGilligan Creek. The difference in temper and surface treatment are noteworthy and do give some insight into the relations of these sites; however, the comparison in the decorative aspects of the pottery tell more.

The information exchange theory is used here to tests decorative variables, or Wiessner's ideas about iconographic variables. The incised decoration present at both sites share several design elements (see Figures 6.4, 6.7, 6.8 and 6.9), suggesting that these populations shared, to a considerable degree, ideas on how incised pottery should look. If these decorative motifs do indeed represent some ideology or political connections, it could be argued that these similarities portray beliefs held in common. Element analysis, however, shows that the motifs contain a great many differences in the detailed aspects of the designs. It is clear that the McGilligan Creek and

Cypress Citadel populations shared a similar decorative vocabulary but that local preferences and execution differ in some significant ways. Both assemblages exhibit several design patterns and design element combinations not found in the other assemblage. This absence could be due to sampling, as both sites have had very little of their total habitation area excavated; however it could provide evidence that these populations did not completely adhere to one unified set of designs or beliefs.

The motifs shared by both sites tend to be rather simple (Figures 6.4 and 6.7). Some more elaborate patterns are found at both sites (Figures 6.8 and 6.9), but such patterns are quite rare. Moreover, the most elaborate designs found at each site are not common to either. The execution of even the common motifs varies slightly between the sites. Chapter 6 describes the execution differences in line spacing and depth observed during the analysis. These differences suggest that the motifs common to both sites are indeed part of a shared design vocabulary, but the process to produce the designs was not shared. It appears that these different populations were attempting to produce the similar patterns through different means.

Statistical analysis also shows differences in the frequency of design elements used to create the motifs. The emphasis of curvilinear incising seen at McGilligan Creek is not shared at Cypress Citadel. Curvilinear incising exists there, but is much less common. Zoning is perhaps the most evident of differences between the motifs of each assemblage. Cypress Citadel motifs strongly emphasize zoning, as it is present in nearly 95 percent of the observed motifs, while only around 60 percent of those found at McGilligan Creek share this attribute. Other attributes that are considered decorative—lip notching and punctations—also exhibit differences in frequency and execution. The McGilligan Creek ceramics have double the frequency of unmodified rims when compared to the Cypress Citadel collection, with more than a third of all

rims remaining unmodified. The McGilligan Creek rims are also more varied than Cypress Citadel ceramics in the placement of the decoration.

Nearly a quarter of all vessels identified at Cypress Citadel are considered pinchpots. The difference in the manufacture of these vessels leads to an obvious difference in overall appearance of their sherds compared to the sherds of their better-made counterparts. This count is likely exaggerated due to the fact that nearly all rim sherds belonging to pinchpots are believed to be identifiable, while only 14 percent of the remaining rims could be categorized. Nonetheless, the complete absence in the McGilligan Creek collection of pots manufactured in this way provides another clear contrast between the assemblages. This, combined with the differences noted in the execution of incising, the different frequencies of check stamping, the location of lip decoration, and the execution of the punctuations, give the iconographic variables in each assemblages their own unique appearance. The assemblages do share broad similarities and have the same design vocabulary, but this analysis has shown that small but significant differences set them apart. With the similarities in manufacture and design a social connection is clearly present, however, the differences show that these populations were not involved in intensive trade or intermarriage.

Conclusions

Because no earlier assemblages have been discovered that provide a precursor to the decorative motifs at these sites, they are believed to be a Late Woodland development. The settlement of bluff-tops, as is seen at the two sites, is also something not seen in the earlier Middle Woodland of this area. It is still unclear to researchers why these populations would

establish major residential settlements atop waterless bluffs. Klein's hypothesis about Cypress Citadel populations attempting to escape Mississippianization has been disproven, as the site was settled long before Mississippian peoples began to populate the region (Butler and Wagner 2012:297). The idea of these areas being chosen for their easily defendable locations is still attractive, but unproven. Both sites are situated in similarly diverse ecosystems. As populations expanded into more marginal areas, subsistence practice intensified, something already noted throughout this research. Diverse ecosystems may have given the populations at Cypress Citadel and McGilligan Creek the ability to exploit a great number of resources, more so than populations located in the heart of the Shawnee Hills, providing some competition for these areas. The purpose here is not to determine why these populations chose these bluff-tops, but rather to show that their choice likely stemmed from a common social impetus.

There are strong indications that trade occurred between the two locations. Southern Illinois cherts, both Mill Creek and Kaolin, have been also recovered from McGilligan (Butler and Wagner 2012:292). Kaolin only comprises 4 percent of the chert at Cypress Citadel, but Mill Creek is prevalent (Hughes and Butler 2012:216). The acquisition of these cherts by the McGilligan Creek populations almost certainly came from trade with Cypress Citadel peoples. Another curiosity not quantified during the analysis was the presence of a handful of sherds from McGilligan Creek that contained a micaceous sand in the paste. This sand, similar to the micaceous sand present in at least 10 percent of the Cypress Citadel assemblage (Jackson and Butler 2012:138), may indicate that vessels were imported from Cypress Citadel. Furthermore, the one check stamped sherd recovered at Cypress Citadel may suggest that McGilligan Creek ceramics were carried to Cypress Citadel in small quantities.

The conclusion can be drawn that these sites likely had loose social connections. The sites

share many isochrestic variables, such as cord-marking and vessel shape, that creates some difficulty in observing traded pots. Additionally, the grog tempered ceramics from Cypress Citadel are visually the same as many McGilligan Creek ceramics. The greater use of limestone and other minority tempering at McGilligan Creek would make trade of pottery from McGilligan Creek to Cypress Citadel evident in the Cypress Citadel collection. Small amounts of check stamped pottery at Cypress Citadel and the presence of micaceous sand inclusions at McGilligan Creek suggest that ceramics may have been traded in limited quantities between the two sites. Trade of cherts, moving from Cypress Citadel to McGilligan Creek, is also known to have occurred. The evidence of trade is substantial, but evidence of intermarriage is still lacking.

The differences in pottery production and motif execution suggest that intermarriage, which would have resulted in common practices between potters, was not the vehicle of transmission. The connections failed to result in a completely shared group identity between the populations, but the few large similar motifs suggest that some ideas or aspects of their identity were shared. When and how these populations were in contact and how often contact occurred could not be definitively resolved through this analysis, but two possible interpretations are proposed here.

The first scenario proposes that these populations derived from common ancestors with similar ideologies. The similarity in the site placement, burial patterns, and decorative frequencies provide the basis for thinking that these populations shared this historical connection. When the populations diverged, they established the unique sites of Cypress Citadel and McGilligan Creek based their shared experiences and beliefs. Sometime after settlement of these two sites, the populations became more isolated from each other, resulting in greater variation of pottery manufacture and design.

Prior to or early in the settlement of Cypress Citadel and McGilligan Creek, the populations had frequent interaction resulting in a similar design vocabulary and possibly indicating a shared ideology. Because no predecessor has been discovered for the pottery decoration seen in these assemblages, it is possible that the design vocabulary was developed on a medium other than pottery and transferred to pottery after settlement of the sites. The difference in execution of shared motifs and the experimentation within each site, however, suggest that contact between the populations became less frequent over time. Sustained, personal contact, like that which would result in intermarriage or intensive trade, is not supported by the data. Intermarriage between these populations may have occurred for a short period of time, resulting in flow of the motif designs and basic manufacture, but the differences in overall ceramic traditions suggest that intermarriage was not the primary means of the similarities. The greater uniformity in several Cypress Citadel ceramics would have allowed for easy identification of an intrusive tradition. For this same reason, a high frequency of trade in ceramics is also unlikely, at least from McGilligan Creek to Cypress Citadel. The declining contact between these populations allowed for greater local elaboration of the decoration on ceramics. The incised decoration at either site preserved the frequency and some of motifs that were shared during the initial or historical contact, but elaborated beyond these once contact lessened.

Given the apparent historical connection between these groups based on their adherence to the Lewis pottery tradition, an alternate explanation can be proposed. In this scenario the ceramic decorative style is developed on one site and later emulated at the other site. The trade of vessels or other goods with decoration similar to that observed, resulted in the transfer of these designs into the already established ceramic tradition of the recipient population. The shared set of beliefs from the historical connection allows for adoption of these designs and symbols. The

local means of design execution were preserved, creating a different appearance of the motifs for each site. A lack of intermarriage and only limited trade in pottery would be consistent with the observed differences. [This could be phrased a couple of different ways.]

Recent research by Megan Donnigan Cook (2013) used the lip form on a sample of Cypress Citadel rims to reveal temporal trends in the ceramic production at this site. Her results suggest that a stronger preference for squared lips was found later in the site's occupation (Cook 2013: 73). Additionally, the incising applied to vessels with squared lips, while less common, was more intricate and incorporated more oblique design elements into the motifs. Her results suggest that the horizontal incising, which is much more prevalent at Cypress Citadel, is earlier and that the more intricate oblique and curvilinear patterns were a later elaboration. If this holds true, the later populations at Cypress Citadel may have influenced the more elaborate and curvilinear patterns found at McGilligan Creek, suggesting that either the design vocabulary was developed at Cypress Citadel and later transferred to McGilligan Creek. An alternate scenario also consistent with the data might involve the McGillgian Creek occupation period extending beyond that the Cypress Citadel population.

More work is needed to truly understand the implications of Cook's findings. Her results also suggest that lip decoration, in the form of notching, becomes more prevalent in later vessels with greater design elaboration (2013:74). The McGilligan Creek ceramics show a much lower frequency of decorated rims, which would suggest less contact with the Cypress Citadel populations later in the occupation. A better idea of the temporal trends at McGilligan Creek may provide a clearer picture of the evolution of the unique decoration found at these two sites. This could possibly be achieved by studying the lip form trends and analysis of the incising correlations with lip decoration.

REFERENCES CITED

Acock, Alan C. and Gordon R. Stavig

1979 A Measure of Association for Nonparametric Statistics. *Social Forces.* 51(4) :1381-1386.

Amsden, Charles Avery

1936 An Analysis of Hohokam Pottery Design. *Medallion Papers* No. XXIII. Guila Pueblo, Globe, Arizona.

Anderson, David G. and Robert C. Mainfort Jr.

2002 *The Woodland Southeast.* The University of Alabama Press.

Binford, Lewis R.

1965 Archaeological Systematics and the Study of Cultural Process. *American Antiquity* 31(2):203-210.

Brashler, Janet G., Elizabeth B. Garland, Margret B. Holman, William A. Lovis, and Susan R. Martin

2000 Adaptive Strategies and Socioeconomic systems in Northern Great Lakes Riverine Environments: The Late Woodland of Michigan. In *Late Woodland Societies: Tradition and Transformation across the Midcontinent*, edited by Thomas E. Emerson, Dale L. McElrath, and Andrew C. Fortier. pp. 543-579. University of Nebraska Press, Lincoln.

Braun, David P.

1991 Why Decorate a Pot: Midwestern Household Pottery, 200 B.C.-A.D. 600. *Journal of Anthropological Archaeology* 10:360-397.

Braun, David P. and Steven Plog

1982 Evolution of "Tribal" Social Networks: Theory and Prehistoric North American Evidence. *American Antiquity* 47(3):504-525

Brieschke, Walter L. and Rackerby, Frank.

1973 The "Stone Forts" of Illinois. In *Notes on Makanda*, edited by Walter L. Brieschke. Pp. 5-10. Self-Published.

Butler, Brian M.

2007 Late Woodland in the Lower Ohio River Valley: Revisiting the Lewis Focus (Phase). Paper presented at the 24th Annual Kentucky Heritage Council Archaeology Conference, Natural Bridge State Park, Slade, Ky.

Butler, Brian M. and Mark J. Wagner

2000 Land between the Rivers: The Late Woodland Period in Southernmost Illinois. In *Late Woodland Societies: Tradition and Transformation across the Midcontinent*, edited by Thomas E. Emerson, Dale L. McElrath, and Andrew C. Fortier. pp. 685-712. University of Nebraska Press, Lincoln.

2012 *Cypress Citadel (11JS76), A Lewis Phase Village Complex in the Cache River Valley of Southern Illinois*. Technical Report 12-1. Center for Archaeological Investigations, Southern Illinois University Carbondale.

Carr, Christopher, and Jill E. Neitzel

1995 *Style, Society, and Person: Archaeological and Ethnographical Perspectives.* Plenum Press, New York.

1995 Integrating Approaches to Material Style in Theory and Philosophy. In *Style, Society, and Person: Archaeological and Ethnographical Perspectives*. pp. 3-26. Plenum Press, New York.

Cobb, Charles R. and Michael S. Nassaney

1995 Interaction and Integration in the Late Woodland Southeast. In *Native American Interactions: Multiscalar Analyses and Interpretations in the Eastern Woodlands*, edited by Michael Nassaney and Kenneth E. Sassaman. pp. 205-226. The University of Tennessee Press, Knoxville.

Cole, Fay-Cooper, Robert Bell, John Bennett, Joseph Caldwell, Norman Emerson, Richard MacNeish, Kenneth Orr, and Roger Willis

1951 *Kincaid: A Prehistoric Illinois Metropolis*. University of Chicago Press, Chicago, IL

Colton, Harold S. and L. L. Hargrave

1937 Handbook of Northern Arizona Pottery Wares. *Museum of Northern Arizona Bulletin* No. 11.

Conkey, Margret W.

1990 *The Uses of Style in Archaeology*. Cambridge University Press, Cambridge.

Conkey, Margret W. and Christine Hastorf

1990 Introduction. In *The Uses of Style in Archaeology,* edited by M.W. Conkey. pp. 1-4. Cambridge University Press, Cambridge.

Cook, Megan Donnigan

2013 *Decorated Ceramics at Cypress Citadel (11JS76): Patterning at a Late Woodland Site in Southern Illinois*. Unpublished thesis, The University of Mississippi, Oxford.

Cronin, Constance

1962 An Analysis of Pottery Design Elements, Indicating Possible Relationships between Three Decorated Types. In *Chapters in the Prehistory of Eastern Arizona*, edited by Martin et al., pp. 87-104. Fieldiana: Anthropology 53(1), Chicago.

DeBoer, Warren R.

1990 Interaction, Imitation, and Communication as Expressed in Style: The Ucayali Experience. In *The Uses of Style in Archaeology*, edited by Margaret Conkey and Christine Hastorf, pp. 82-104. Cambridge University Press, Cambridge.

Deetz, James

1965 The Dynamics of Stylistic Change in Arikara Ceramics. *Illinois Studies in Anthropology* No. 4. University of Illinois Press. Urbana.

1968 The Inference of Residence and Descent Rules from Archaeological Data. In *New Perspectives in Archaeology,* edited by Binford and Binford. pp. 49-60. Aldine Publishing Company, Chicago.

DiCosola, Anne Cobry

2008 Ceramic Analysis. Ch. 5 from *The Kaesberg-Schaudt Site (11R594) and Late Woodland Settlement in the Mary's River Valley.* Illinois Transportation Archaeological Research Program, Transportation Archaeological Research Report No. 13. Champaign.

Emerson, Thomas E., Dale L. McElrath, and Andrew C. Fortier (editors)

2000 *Late Woodland Societies: Tradition and Transformation Across the Midcontinent.* University of Nebraska Press, Lincoln.

Hegmon, Michelle

1992 Archaeological Research on Style. *Annual Review of Anthropology*. 21:517-536

1995 *The Social Dynamics of Pottery Style in the Early Puebloan Southwest*. Crow Canyon Archaeological Center. Cortez, Colorado.

Hughes, Erin and Butler M. Butler

2012 Lithic Analysis. In *Cypress Citadel (11JS76), A Lewis Phase Village Complex in the Cache River Valley of Southern Illinois*, edited by Brian M. Butler and Mark J. Wagner, pp 191-213. Technical Report 12-1. Center for Archaeological Investigations, Southern Illinois University Carbondale.

Henderson, A. Gwynn and David Pollack

1996 Archaeological Investigations at Mantle Rock Nature Preserve, Livingston County, Kentucky. Paper Presented at the 13th Annual Kentucky Heritage Council Archaeological Conference, Louisville, Kentucky.

Hill, James N.

1970 Broken K Pueblo: prehistoric social organization in the American Southwest. *Anthropological Papers of the University of Arizona* 18.

1985 Style: A Conceptual Evolutionary Framework. In: *Decoding Prehistoric Ceramics*, edited by Ben A. Nelson. pp.362-385. Southern Illinois University Press, Carbondale.

Jackson, Wesley A. and Brian M. Butler

2012 Ceramic Analysis. In *Cypress Citadel (11JS76), A Lewis Phase Village Complex in the Cache River Valley of Southern Illinois*, edited by Brian M. Butler and Mark J. Wagner, pp 131-254. Technical Report 12-1. Center for Archaeological Investigations, Southern Illinois University Carbondale.

Jernigan, E. W.

1986 A Non-Hierarchical Approach to Ceramic Decoration Analysis: A Southwestern Example. *American Antiquity*. 51(1). pp. 3-20.

Klein, Joel I.

1981 *Cypress Citadel and Its Role in the Subsistence-Settlement System of the Late Woodland Lewis Culture of Extreme Southern Illinois*. Unpublished Ph.D. dissertation, New York University.

Koeppel, Christopher D., and Brian B. Butler

2000 Ceramics. In *The Old Runway Site (11J-1009), a Late Woodland Settlement on the Big Muddy River*. Report prepared for the Illinois Department of Transportation. Center for Archaeological Investigations, Southern Illinois University at Carbondale.

Longacre, William A.

1964 Sociological Implications of the Ceramic Analysis. In *Chapters in the Prehistory of Eastern Arizona II*, edited by Martin et al., pp. 155-170. Fieldiana: Anthropology 55. Chicago.

1968 Some Aspects of Prehistoric Society in East-Central Arizona. In *New Perspectives in Archaeology,* edited by Binford and Binford. pp. 89-102. Aldine Publishing Company. Chicago.

1970 Archaeology as Anthropology: A Case Study. *Anthropological Papers of the University of Arizona, No.17*. University of Arizona Press, Tucson.

2000 Exploring prehistoric social and political organization in the American Southwest. *Journal of Anthropological Research* 56(3). pp.287-300.

McElrath, Dale L., Thomas E. Emerson, and Andrew C. Fortier

2000 Social Evolution or Social Response? A Fresh Look at the "Good Gray Cultures" After Four Decades of Midwest Research. In *Late Woodland Societies: Tradition and Transformation across the Midcontinent*, edited by Thomas E. Emerson, Dale L. McElrath, and Andrew C. Fortier. pp. 3-36. University of Nebraska Press, Lincoln.

McKern. W. C.

1939 The Midwestern Taxonomic Method as an Aid to Archaeological Culture Study. *American Antiquity*. 4(4). Pp. 301-313.

Muller, Jon

1986 *Archaeology of the Lower Ohio River Valley*. Academic Press, Orlando, California.

Nassaney, Michael S.

2000 The Late Woodland Southeast. In *Late Woodland Societies: Tradition and Transformation across the Midcontinent*, edited by Thomas E. Emerson, Dale L. McElrath, and Andrew C. Fortier. pp.713-730. University of Nebraska Press, Lincoln.

Nassaney, Michael S. and Kenneth E. Sassaman

1995 *Native American Interactions: Multiscalar Analyses and Interpretations in the Eastern Woodlands*. The University of Tennessee Press, Knoxville.

Ozuk, Stephen J.

1987 Patrick Phase Ceramics. In The Ridge Site: Archaic Through Late Woodland Occupations, by John E. Kelley, Andrew C. Frontier, Steven J. Ozuk, and Joyce A. Williams. *American Bottom Archaeology FAI-270 Site Reports* 16, pp. 404-416. University of Illinois Press, Urbana.

Plog, Stephen

1980 *Stylistic Variation in Prehistoric Ceramics*. Cambridge University Press, New York, New York.

1983 Analysis of Style in Artifacts. *Annual Review of Anthropology* 12:125-142.

1995 Approaches to Style: Complements and Contrasts. In *Style, Society, and Person: Archaeological and Ethnographical Perspectives*, edited by Christopher Carr and Jill E. Neitzel. pp. 369-387. Plenum Press, New York.

Pollack, David and A. Gwynn Henderson

2000 Late Woodland Cultures in Kentucky. In *Late Woodland Societies: Tradition and Transformation across the Midcontinent*, edited by Thomas E. Emerson, Dale L. McElrath, and Andrew C. Fortier. pp. 613-642. University of Nebraska Press, Lincoln.

Rice, Prudence M.

1987 *Pottery Analysis: A Sourcebook*. University of Chicago Press. Chicago, Illinois.

Sackett, James R.

1977 The Meaning of Style in Archaeology: A General Model. *American Antiquity* 42(3): 369-380.

1985 Style and Ethnicity in the Kalahari: A Reply to Wiessner. *American Antiquity* 50:154-159.

1986 Isochrestism and Style: a clarification. *Journal of Anthropological Archaeology* 5(3): 266-277.

1990 Style and Ethnicity in Archaeology: the case for isochrestism. In *The Uses of Style in Archaeology,* edited by M.W. Conkey. pp. 32-43.Cambridge University Press, Cambridge.

Skibo, James M. et al.

1989 Ceramic Style Analysis in Archaeology and Ethnoarchaeology: Bridging the Analytical Gap. *Journal of Anthropological Archaeology* 8. pp. 388-409.

Voss, Jerome and R. Young

1995 Style and the Self. In *Style, Society, and Person: Archaeological and Ethnographical Perspectives*, edited by Christopher Carr and Jill E. Neitzel. pp. 77-100. Plenum, New York.

Watson, Patty Jo

1997 Design Analysis of Painted Pottery. *American Antiquity*. 42(3). pp. 381-393.

Wiessner, Polly

1983 Style and Social Information in Kalahari San Projectile Points. *American Antiquity* 48(2):253-276.

1985 Style or Isochrestic Variation? A reply to Sackett. *American Antiquity* 50:160-166.

1990 Is There a Unity to Style? In *The Uses of Style in Archaeology*, edited by A.W. Conkey and C.A. Hastorf, pp. 105-112.Cambridge University Press, Cambridge.

Winters, Howard D.

1963 *An Archaeological Survey of the Wabash Valley in Illinois.* Illinois State Museum Reports of Investigations, No. 10. Springfield.

Wobst, H. Martin

1977 Stylistic Behavior and Information Exchange. In *For the Director: Research Essays in Honor of James B. Griffin*, edited by C.E. Cleland, pp. 317-342. Museum of Anthropology, University of Michigan Anthropological Papers 61. University of Michigan Museum of Anthropology, Ann Arbor.

APPENDICES

APPENDIX A – CHI SQUARE CROSSTABULATION OUTPUTS

Temper * Site Crosstabulation

			Site		
			CC	MC	Total
Temper	Grog	Count	11341	2280	13621
		Expected Count	10341.6	3279.4	13621.0
		% within Site	96.9%	61.4%	88.3%
		Residual	999.4	-999.4	
	Grog/Grit	Count	1	440	441
		Expected Count	334.8	106.2	441.0
		% within Site	0.0%	11.9%	2.9%
		Residual	-333.8	333.8	
	Grog/Limestone	Count	11	818	829
		Expected Count	629.4	199.6	829.0
		% within Site	0.1%	22.0%	5.4%
		Residual	-618.4	618.4	
	Grog/Sand	Count	344	25	369
		Expected Count	280.2	88.8	369.0
		% within Site	2.9%	0.7%	2.4%
		Residual	63.8	-63.8	
	Grit	Count	1	150	151
		Expected Count	114.6	36.4	151.0
		% within Site	0.0%	4.0%	1.0%
		Residual	-113.6	113.6	
	CC_Minor	Count	11	0	11
		Expected Count	8.4	2.6	11.0
		% within Site	0.1%	0.0%	0.1%
		Residual	2.6	-2.6	
Total		Count	11709	3713	15422
		Expected Count	11709.0	3713.0	15422.0
		% within Site	100.0%	100.0%	100.0%

Surface * Site Crosstabulation

			Site		
			CC	MC	Total
Surface	Cord marked	Count	10729	3523	14252
		Expected Count	10750.1	3501.9	14252.0
		% within Site	97.1%	97.9%	97.3%
		Residual	-21.1	21.1	
	Plain	Count	315	59	374
		Expected Count	282.1	91.9	374.0
		% within Site	2.9%	1.6%	2.6%
		Residual	32.9	-32.9	
	Check Stamped	Count	1	16	17
		Expected Count	12.8	4.2	17.0
		% within Site	0.0%	0.4%	0.1%
		Residual	-11.8	11.8	
Total		Count	11045	3598	14643
		Expected Count	11045.0	3598.0	14643.0
		% within Site	100.0%	100.0%	100.0%

CmAngle * Site Crosstabulation

			Site		
			CC	MC	Total
CmAngle	Vertical	Count	554	79	633
		Expected Count	548.0	85.0	633.0
		% within Site	68.7%	63.2%	68.0%
		Residual	6.0	-6.0	
	Horizontal	Count	12	0	12
		Expected Count	10.4	1.6	12.0
		% within Site	1.5%	0.0%	1.3%
		Residual	1.6	-1.6	
	Olbique	Count	236	46	282
		Expected Count	244.1	37.9	282.0
		% within Site	29.3%	36.8%	30.3%
		Residual	-8.1	8.1	
	Crosshatched	Count	4	0	4
		Expected Count	3.5	.5	4.0
		% within Site	0.5%	0.0%	0.4%
		Residual	.5	-.5	
Total		Count	806	125	931
		Expected Count	806.0	125.0	931.0
		% within Site	100.0%	100.0%	100.0%

Profile * Site Crosstabulation

			Site		
			CC	MC	Total
Profile	Squared	Count	139	23	162
		Expected Count	143.1	18.9	162.0
		% within Site	12.7%	15.9%	13.0%
		Residual	-4.1	4.1	
	Rounded	Count	735	103	838
		Expected Count	740.2	97.8	838.0
		% within Site	66.9%	71.0%	67.4%
		Residual	-5.2	5.2	
	Sloped to Exterior	Count	75	7	82
		Expected Count	72.4	9.6	82.0
		% within Site	6.8%	4.8%	6.6%
		Residual	2.6	-2.6	
	Extruded	Count	112	8	120
		Expected Count	106.0	14.0	120.0
		% within Site	10.2%	5.5%	9.7%
		Residual	6.0	-6.0	
	Thickened	Count	37	4	41
		Expected Count	36.2	4.8	41.0
		% within Site	3.4%	2.8%	3.3%
		Residual	.8	-.8	
Total		Count	1098	145	1243
		Expected Count	1098.0	145.0	1243.0
		% within Site	100.0%	100.0%	100.0%

Stance * Site Crosstabulation

			Site		
			CC	MC	Total
Stance	IS	Count	64	15	79
		Expected Count	67.8	11.2	79.0
		% within Site	34.0%	48.4%	36.1%
	IS/IC	Count	20	5	25
		Expected Count	21.5	3.5	25.0
		% within Site	10.6%	16.1%	11.4%
	V	Count	22	2	24
		Expected Count	20.6	3.4	24.0
		% within Site	11.7%	6.5%	11.0%
	V/IC	Count	9	3	12
		Expected Count	10.3	1.7	12.0
		% within Site	4.8%	9.7%	5.5%
	EV	Count	2	1	3
		Expected Count	2.6	.4	3.0
		% within Site	1.1%	3.2%	1.4%
	IS/OC	Count	13	1	14
		Expected Count	12.0	2.0	14.0
		% within Site	6.9%	3.2%	6.4%
	V/OC	Count	5	0	5
		Expected Count	4.3	.7	5.0
		% within Site	2.7%	0.0%	2.3%
	OC/OS	Count	53	4	57
		Expected Count	48.9	8.1	57.0
		% within Site	28.2%	12.9%	26.0%
Total		Count	188	31	219
		Expected Count	188.0	31.0	219.0
		% within Site	100.0%	100.0%	100.0%

Vessel Form * Site Crosstabulation

			Site		
			CC	MC	Total
Form	Jar	Count	105	25	130
		Expected Count	108.8	21.2	130.0
		% within Site	66.0%	80.6%	68.4%
		Residual	-3.8	3.8	
	Bowl	Count	54	6	60
		Expected Count	50.2	9.8	60.0
		% within Site	34.0%	19.4%	31.6%
		Residual	3.8	-3.8	
Total		Count	159	31	190
		Expected Count	159.0	31.0	190.0
		% within Site	100.0%	100.0%	100.0%

Vessel Form * Site Crosstabulation

			Site		
			CC	MC	Total
Form	Jar	Count	105	25	130
		Expected Count	113.6	16.4	130.0
		% within Site	48.8%	80.6%	52.8%
		Residual	-8.6	8.6	
	Bowl	Count	54	6	60
		Expected Count	52.4	7.6	60.0
		% within Site	25.1%	19.4%	24.4%
		Residual	1.6	-1.6	
	Pinch pot	Count	56	0	56
		Expected Count	48.9	7.1	56.0
		% within Site	26.0%	0.0%	22.8%
		Residual	7.1	-7.1	
Total		Count	215	31	246
		Expected Count	215.0	31.0	246.0
		% within Site	100.0%	100.0%	100.0%

Notch Location * Site Crosstabulation

			Site		
			CC	MC	Total
Notch	Exterior	Count	755	55	810
		Expected Count	731.9	78.1	810.0
		% within Site	83.1%	56.7%	80.5%
		Residual	23.1	-23.1	
	Interior	Count	43	10	53
		Expected Count	47.9	5.1	53.0
		% within Site	4.7%	10.3%	5.3%
		Residual	-4.9	4.9	
	Superior	Count	111	32	143
		Expected Count	129.2	13.8	143.0
		% within Site	12.2%	33.0%	14.2%
		Residual	-18.2	18.2	
Total		Count	909	97	1006
		Expected Count	909.0	97.0	1006.0
		% within Site	100.0%	100.0%	100.0%

Lip Decoration * Site Crosstabulation

			Site		
			CC	MC	Total
LipTreat	Notched	Count	798	81	879
		Expected Count	775.1	103.9	879.0
		% within Site	72.7%	55.1%	70.7%
		Residual	22.9	-22.9	
	Slashed	Count	47	5	52
		Expected Count	45.9	6.1	52.0
		% within Site	4.3%	3.4%	4.2%
		Residual	1.1	-1.1	
	Dowel Impressed	Count	51	8	59
		Expected Count	52.0	7.0	59.0
		% within Site	4.6%	5.4%	4.7%
		Residual	-1.0	1.0	
	CrodWrapped Dowel Impressed	Count	11	1	12
		Expected Count	10.6	1.4	12.0
		% within Site	1.0%	0.7%	1.0%
		Residual	.4	-.4	
	Unmodified	Count	190	52	242
		Expected Count	213.4	28.6	242.0
		% within Site	17.3%	35.4%	19.5%
		Residual	-23.4	23.4	
Total		Count	1097	147	1244
		Expected Count	1097.0	147.0	1244.0
		% within Site	100.0%	100.0%	100.0%

Line Type * Site Crosstabulation

			Site		
			CC	MC	Total
Lines	Linear	Count	1323	112	1435
		Expected Count	1297.6	137.4	1435.0
		% within Site	92.1%	73.7%	90.4%
		Residual	25.4	-25.4	
	Curvilinear	Count	57	28	85
		Expected Count	76.9	8.1	85.0
		% within Site	4.0%	18.4%	5.4%
		Residual	-19.9	19.9	
	L/C	Count	56	12	68
		Expected Count	61.5	6.5	68.0
		% within Site	3.9%	7.9%	4.3%
		Residual	-5.5	5.5	
Total		Count	1436	152	1588
		Expected Count	1436.0	152.0	1588.0
		% within Site	100.0%	100.0%	100.0%

Width * Site Crosstabulation

			Site		
			CC	MC	Total
Width	Bold	Count	1334	169	1503
		Expected Count	1324.1	178.9	1503.0
		% within Site	92.9%	87.1%	92.2%
		Residual	9.9	-9.9	
	Narrow	Count	102	25	127
		Expected Count	111.9	15.1	127.0
		% within Site	7.1%	12.9%	7.8%
		Residual	-9.9	9.9	
Total		Count	1436	194	1630
		Expected Count	1436.0	194.0	1630.0
		% within Site	100.0%	100.0%	100.0%

Incising Orientation * Site Crosstabulation

			Site		
			CC	MC	Total
IncDirection	Horizontal	Count	285	24	309
		Expected Count	277.6	31.4	309.0
		% within Site	78.5%	58.5%	76.5%
		Residual	7.4	-7.4	
	Oblique	Count	47	8	55
		Expected Count	49.4	5.6	55.0
		% within Site	12.9%	19.5%	13.6%
		Residual	-2.4	2.4	
	Vertical	Count	14	0	14
		Expected Count	12.6	1.4	14.0
		% within Site	3.9%	0.0%	3.5%
		Residual	1.4	-1.4	
	Curvilinear	Count	17	9	26
		Expected Count	23.4	2.6	26.0
		% within Site	4.7%	22.0%	6.4%
		Residual	-6.4	6.4	
Total		Count	363	41	404
		Expected Count	363.0	41.0	404.0
		% within Site	100.0%	100.0%	100.0%

Zoned * Site Crosstabulation

			Site		
			CC	MC	Total
Zoned	Yes	Count	293	19	312
		Expected Count	283.6	28.4	312.0
		% within Site	94.8%	61.3%	91.8%
		Residual	9.4	-9.4	
	No	Count	16	12	28
		Expected Count	25.4	2.6	28.0
		% within Site	5.2%	38.7%	8.2%
		Residual	-9.4	9.4	
Total		Count	309	31	340
		Expected Count	309.0	31.0	340.0
		% within Site	100.0%	100.0%	100.0%

APPENDIX B - PERMISSION TO PUBLISH FIGURES 3.1 AND 3.2

ILLINOIS STATE ARCHAEOLOGICAL SURVEY
COPYRIGHT USE AND PERMISSION

Permission has been granted to Wesley Jackson to reproduce two ISAS copyrighted image(s) listed here:

Figure 95 pg. 250 – "Key to Lip Types
Figure 96 pg. 252 – "Key to Rim Types and Determination of Rim Orientation"

Originally published in:
Kelly, John E., Andrew C. Fortier, Steven J. Ozuk, and Joyce A. Williams
1987 *The Range Site (11-S-47): Archaic Through Late Woodland Occupations.*
American Bottom Archaeology, FAI-270 Site Reports, Volume 16, edited by Charles J. Bareis and James W. Porter, University of Illinois Press, Urbana, IL.

This is for the purpose of a Masters thesis at the Department of Anthropology at Southern Illinois University.

The Expected date of reproduction is 2014.

- These images cannot be used for other purposes unless agreed upon in writing by ISAS.
- Use of these images does not negate ISAS copyright over them or ISAS future use of them.
- This constitutes permission for a one-time use only.
- Permission is NOT granted for use in ancillary, marketing, or advertising materials.
- There is no image use fee.
- ISAS will get one complimentary copy of the thesis after it is published.
- Please credit as follows: "Courtesy of the Illinois State Archaeological Survey, University of Illinois."

Laura Kozuch

Laura Kozuch
2014.03.07 08:13:02 -06'00'

Dr. Laura Kozuch, ISAS Curator

Date

VITA

Graduate School
Southern Illinois University

Wesley A. Jackson

jacksowe@gvsu.edu

Grand Valley State University
Bachelor of Science, Anthropology, May 2010

Thesis Paper Title:
Late Woodland Ceramic Decorative Styles in the Lewis Phase of the Lower Ohio Valley: An Investigation of Social Connectedness

Major Professor: Dr. Brian M. Butler

Publications:
Jackson, Wesley A. and Brian M. Butler
2012 Ceramic Analysis. In *Cypress Citadel (11JS76), A Lewis Phase Village Complex in the Cache River Valley of Southern Illinois*, edited by Brian M. Butler and Mark J. Wagner, pp. 131-254. Technical Report 12-1. Center for Archaeological Investigations, Southern Illinois University Carbondale.