ANALYZING THE USE OF INTRA- AND INTER-STRUCTURE SPACE AT AMES, A MISSISSIPPIAN TOWN IN FAYETTE COUNTY, TENNESSEE

by

Benjamin J. Cross

A Thesis

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Science

Major: Earth Sciences

The University of Memphis

May 2016

Abstract

Cross, Benjamin James. M.S. The University of Memphis. May, 2013. Analyzing the Use of Intra- and Inter-Structure Space at Ames, a Mississippian Town in Fayette County, Tennessee. Major Professor: Dr. Andrew Mickelson.

Ames (40FY7) is an Early-Middle Mississippian period town (A.D. 1050-1300) with two dozen structures, four mounds, and plazas enclosed within a palisade located in Fayette County, Tennessee. Very little research has been done on Early-Middle Mississippian settlements in West Tennessee; this has resulted in little being known about the social life history of these sites. Previous investigations at Ames have refuted that the mound site was a Vacant Ceremonial Center, and have shown a planned community layout that changed over time. This study utilizes multiple lines of evidence such as magnetometry data, surface collections, and excavation to determine the function and organization of space throughout the site. Of particular interest is the functional use of space between structures, as this helps us understand the corporate functions of the household. By understanding the household, we can understand and identify the functional necessities of the inhabitants of Ames and how they changed over time.

Acknowledgments

First, I would like to thank Dr. Andrew Mickelson for all of his advice and guidance as I navigated through this process. Without his dedication, I, like so many other students, would definitely not be in such great positions in our archaeological careers. I would also like to thank the other two members of my committee, Dr. Kathrine Mickelson and Dr. Robert Connolly. Their insight and work on this research has been invaluable. Hannah Guidry and Eric Goddard also deserve special mention, as their previous research at Ames truly made all of this possible. Finally, Scott Hadley has also been incredibly important, not only for his help in the field and classroom, but as a friend.

I'd like to thank Shelby Hobbs and Chris French for all of the help they have put in out in the field. I look forward to reading their research in the coming years. Jamie Evans has been a tremendous resource for us out at Ames, and his dedication to preserving and learning from cultural resources has made all research at Ames possible. All of my fellow graduate students that have made my time enjoyable, and the faculty of the Department of Earth Sciences for their devotion to all of us. This work would also be nonexistent without all of the hours put in by all of the undergraduates of the 2013, 2014, and 2015 field schools.

I'd like to thank my family for being so supportive of a little boy who said he wanted to dig holes and find artifacts when he grew up. I have consistently tried to do my best to make all of you proud. Finally, I would like to thank Elise Cole for her support, love, and for putting up with all of my dirt, late night writing, and for listening to my thoughts. I truly do not know where I would be without her.

Table of Contents

Chapter	Page
1. Introduction	1
Significance	1
Research Questions	2
Hypothesis	3
2. Background and Setting	6
Environmental Context	6
Cultural Background	8
Previous Research	13
3. Methods and Results	27
Previously Collected Data	32
Excavations	32
Features	41
4. Analysis	45
Artifact Densities	45
Feature Densities	49
Surface Collections	55
5. Discussion	57
Household Clustering	57
Inter-structure Activities	59
Alternative Mound Hypothesis	60
6. Conclusions and Future Research	66
References Cited	69
Appendices	75

List of Figures

Figure		Page
1.	Location of Ames within its ecological setting and in relation to other Early-Middle Mississippian sites	7
2.	Surface artifact densities in Field 1 (F1) at Ames	15
3.	Magnetometry survey results in F1 at Ames	17
4.	Plane of the building phases of structures in F1-U2	19
5.	Targeted section of second palisade (F1-U4)	20
6.	Map of excavations at Ames (2009-Present)	22
7.	Calibrated C_{14} Dates of Mounds B and D at Ames compared to Obion and Owl Creek	24
8.	Image of 4 m x 4 m excavation in progress	29
9.	Map of all excavations at Ames (2009-Present)	31
10.	Pie Chart of F1-U2 assemblage count percentages	33
11.	Pie chart of F1-U2 assemblage weight percentages	34
12.	Pie chart of F1-U19 assemblage count percentages	35
13.	Pie chart of F1-U19 assemblage weight percentages	35
14.	Pie chart of F1-U21 assemblage count percentages	36
15.	Pie chart of F1-U21 assemblage weight percentages	37
16.	Artifact count density across F1-U21	38
17.	Weight of artifacts in 1 m x 1 m screened units	39
18.	Weight of artifacts in 1 m x 1 m units after removal of large sandstone	40
19.	Assemblage weight density across F1-U21	40
20.	Image of ceramic found in feature 6 in F1-U19	42
21.	Image of feature 4 in F1-U21	44
22.	Comparison of artifact counts between U2 and U19	46
23.	Comparison of artifact weight between U2 and U19	47
24.	Comparison of artifact counts between U2 and U19 without Wall trenches	48
25.	Comparison of artifact weights between U2 and U19 without Wall trenches	48

26. Comparison of the weight of artifacts in structure features 51
27. Reclassified magnetic intensities across F1-U21 52
28. Reclassified magnetic intensities across F1-U21 with a line 53
29. Reclassified magnetic intensities and assemblage weight density Across F1-U21 54
30. Comparison of artifact weights across U2, U19, and U21 55
31. Surface Collections across Field 1 56
32. Magnetometry image of U19 60
33. Celestial alignments at Ames 64

1. Introduction

This thesis examines the function of inter-structure spaces at the Ames site (40FY7), an Early to Middle Mississippian town in Fayette County, Tennessee. Building off of previous research in developing a site settlement chronology, this study focuses on a space between structures in order to determine the cultural activities taking place. Material evidence sought to determine the use of inter-structure space include post holes and wall trenches, middens, burials, and artifacts resulting from household activities. Multiple lines of evidence such as magnetometry, surface collections, and sub-surface collections were combined to determine the function of space between previously excavated structures. By analyzing the spatial pattern of cultural remains at Ames, statements can be drawn regarding the social organization of Mississippian society, as well as the activity related to economic, ecological, and large-scale changes (Ashmore and Wilk 1988).

Significance

The purpose of my research is to determine the function of space within the site through the excavation and analysis of archaeological remains, including magnetometry data, surface artifact collections, and through the excavation of features. This research attempts to enter analysis into a subject that is very rarely done, in particular in West Tennessee. Traditionally, archaeologists have tended to focus on the large mounds at Mississippian sites, which has created "shockingly few modern excavations of entire domiciles, never mind multiple houses" (Pauketat 2008:102).

The topic of households and the functionality of inter-structure space has started to receive attention across the southeast however. For instance, Hally (2008), at the King site located in Northwestern Georgia, was able to identify household clusters represented in the archaeological record by primary domestic structures (PDS), rectangular structures, outdoor work areas, and burials. By analyzing the patterns in the household layout and associated burials, Hally (2008:314-329) was able to reconstruct the social life history of the site. This thesis uses a similar model to identify and analyze possible household clusters.

Previous investigations at Ames using geophysical prospection and excavation identified two palisades, structures with wall trench architecture, and large midden pits that conform to a planned community layout around a plaza flanked by four mounds (Goddard 2011; Guidry 2013). The residential area forms the southern and eastern edges of the plaza. Geophysical data and excavations indicate that 18-24 wall trench structures and associated middens are clustered into three to four groups representing household social organization (Goddard 2011). However, as Guidry (2013) has noted, this estimate of community size refers to only the latest stage of occupation at Ames, sometime during the late thirteenth century, and more structures from earlier occupations exist within the habitation area "exhibiting differing configurations and orientations".

Research Questions Regarding the Use of Inter-Structure Space and Community Organization

This study revolves around two interrelated questions about the cultural use of space at the Ames site. The first examines whether or not if household clustering is evident at the site. As Goddard (2011) speculated, there are approximately 18-24 structures clustered into 3 or 4 groups. By comparing subsurface data with magnetometry data and surface collections, one should be able to identify a pattern that indicates household clustering or dispersion.

The second question involves the function of the space between structures. Simply put, the goal of this research is to see what cultural activities took place around the structures. Outdoor work spaces were important aspects of prehistoric Native American life, as indicated by their existence at the King site (Hally 2008). Focusing analysis on the function of the household can be used to measure cultural change and as an indicator of social norms while allowing cross-cultural comparisons (Douglass and Gonlin 2012). By determining which activities link households together, we can place them within a wider socio-cultural context (Wilk and Netting 1984).

Hypothesis Formulation

Two separate sets of hypotheses were developed in order to test the research questions. The first set regards whether household clustering is evident or not at the site, while the second set is in regard to the use of space between buildings. These hypotheses are presented below:

1. Hypotheses Regarding Household Clustering or Dispersion. Three hypotheses were formulated regarding household clustering or dispersion. The null hypothesis (H_0) states that the data collected is insufficient in explaining the function of spaces between houses and identifying household clusters. The null hypothesis provides for the event that the data that has been collected cannot confidently determine whether the households clustered together or were dispersed throughout the site. Previously collected geophysical data indicating that households were clustered at least at one point of habitation requires the rejection of H_0.

The first hypothesis (H_1) is that there is no evidence for household clusters. This would be indicated by structures being equally spaced and failing to show any evidence of being linked together. The second hypothesis (H_2) is that there is evidence for household clusters. Evidence required to support H_2 would involve the function of space between structures to decrease, as well as evidence of shared space or activities.

2. Hypotheses Regarding the Use of Space between Buildings. Five hypotheses were formulated regarding the use of space between buildings. The null hypothesis (H_0) states that the data collected is insufficient in explaining the how the spaces around and between structures is used. This provides for the event that the data collected cannot confidently determine how interstructure space was used by the inhabitants of Ames.

The first hypothesis (H_1) is that the area between structures was a corporate space, shared and used by the residents of adjacent structures. In order to support this hypothesis, the evidence required would need to involve the orientation of structures around a shared space and/or similar cultural debris spread evenly across the inter-structure space indicating that activities were taking place evenly between the structures. The second hypothesis (H_2) is that the area around structures was used as a workspace for manufacturing by the residents of identified structures. Evidence to support H_2 would involve artifacts in surface or subsurface collections such as flakes or beads, as well as possible fire pits and storage structures.

The third hypothesis (H_3) is that the area around structures was used for dumping waste and debris of cultural activities of the residents of the structures. Middens, identified through geophysical prospection and excavation strongly support H_3. The fourth hypothesis (H_4) is that the area around and between structures was used for a variety of functions, including as a shared corporate space, an area for dumping trash, and as a workspace for manufacturing. The fifth and

final hypothesis (H_5) would be that the primary activity areas take place within the households and not in the space between them. This hypothesis would be confirmed if the cultural debris indicating activity areas were located within the structures as opposed to outside of them. In this case, it would be expected that the inter-structure space would be relatively clear of cultural material.

Thesis Outline

In order to put my research questions into context, I provide environmental and cultural backgrounds in chapter two. In Chapter three, I discuss the methods employed to collect data pertaining to my research questions and then present the results of my data recovery. Chapter four presents the analysis of my data. Finally, in Chapter five, I discuss the implications of my research.

2. Environmental and Cultural Background

Environmental Context

Ames is located in Fayette County in West Tennessee, and sits on an ecotone between the Northern Hilly Gulf Coastal Plain and the Loess Plains. Other Early Mississippian Sites within the region also fall within this ecotone as well, including Denmark (40MD85), Bolivar (40HM2), Obion (40HY14), and Owl Creek (22CS502) in Mississippi (Mickelson 2008). Ames, like the sites previously mentioned, is not located along a major waterway as Mississippian settlements usually are (Griffin 1990), but is located at the headwaters of the North Fork of the Wolf River, a third order tributary of the Mississippi River.

The Loess Plains are "gently, rolling irregular plains, 250-500 feet in elevation, with loess up to 50 feet thick" (Griffith et al 1998). Vegetation in this region tends to be oak-hickory and oak-hickory-pine, while some "less-disturbed bottomland forest and cypress-gum swamp habitats still remain" (Griffith et al 1998). Streams in the Loess Plains are "low gradient and murky with silt and sand bottoms" (Griffith et al 1998). The soil association of Ames is the Loring-Memphis-Lexington-Ruston association (United States Department of Agriculture, Soil Conservation Service [USDA, SCS] 1964). Modern crops grown in the area include primarily cotton and corn, as well as cowpeas, sorghum, and soybeans (USDA, SCS 1964). Five large river systems with wide floodplains have their headwaters in this region, and include the Obion, Forked Deer, Hatchie, Loosahatchie, and Wolf. The temperature throughout the year on average tends to be about 27° to 90° F with an average yearly precipitation of 50-52 inches.

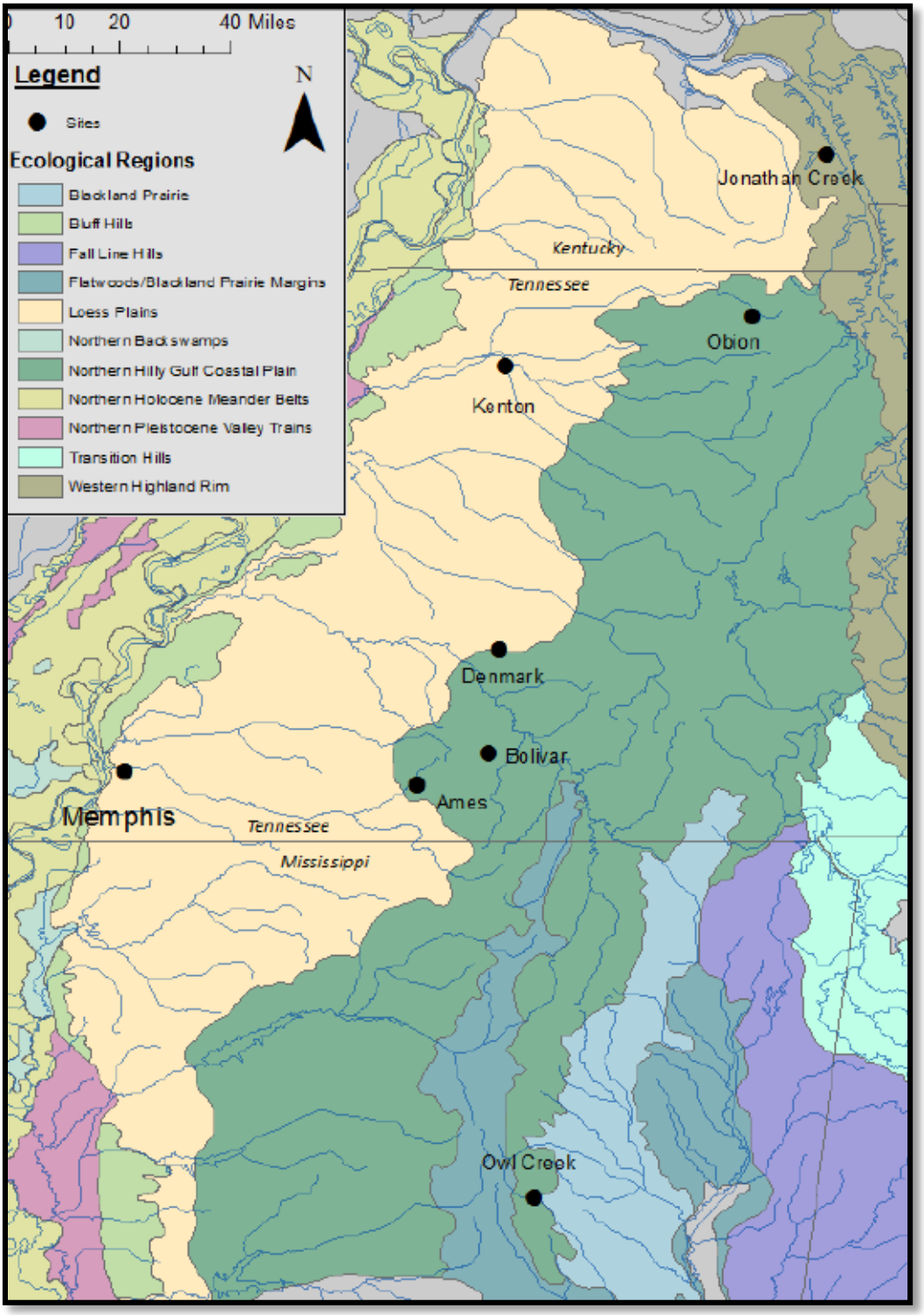


Figure 1. Location of Ames (40FY7) within its ecological setting and in relation to other Early-Middle Mississippian sites. (Guidry 2013:Figure1)

The population of Ames would have had access to varied floral and faunal resources across the region. Besides the oak-hickory and oak-hickory-pine forests with cypress-gum swamp habitats mentioned above, other important forest species would include pin oak, red oak, cottonwood, sycamore, sweet gum, and persimmon, as well as understory species such as vines, shrubs, canes, and seasonal herbs (Smith 1996). Shagbark and scalybark hickories tend to form groves in Grenada and Calloway soils on the terraces, producing nuts with a lower amount of tannic acid that would not have required special processing (Smith 1996). The primary game of the region are white-tailed deer, turkey, rabbit, black bear, opossum, and raccoon, along with fish and turtles and seasonal concentrations of migratory birds (Smith 1996). Lithic resources would have been limited due to a lack of lithic sources near Ames; however, chert and quartzite gravel were available in outcroppings below the Pleistocene loess at the base of the Mississippi river bluffs and streambeds (Smith 1996). Ferruginous sandstone and siltstone could be readily accessed in central western Tennessee and was "widely used in the region for atlatl weights, gorgets, celts, and a variety of generalized rough bifacial tools" (Smith 1996:99-100).

Cultural Background

The Mississippian culture (ca. 900-1500 AD) consisted of a set of adaptive cultural traits of the Prehistoric Native American groups living across the ancient Midwest and Southeast. Mississippian sites are geographically distributed from modern day Wisconsin to the Gulf Coast, and from Oklahoma to the Carolinas. The concept of "Mississippian" was first developed by Holmes (1886) in his description of the shell-tempered pottery commonly found across the Midwest and Southeast United States. Holmes (1886:371) writes that the pottery "is remarkably homogeneous in character, and we are warranted in assigning it to a single period of culture." Holmes (1914) later tentatively established the concept of what we see now as the Mississippian

culture while outlining prehistoric culture areas of North America. This concept of "Mississippian" primarily focused on shell tempered pottery, earthen mounds and embankments, wattle-and-daub architecture, lithic and shell art, and other artifacts (Holmes 1914: 424-428). However, definitions tend to change and evolve. By the 1960s, Griffin (1967) had established a dependency on maize agriculture as a major aspect of recognizing Mississippian culture. Griffin defined Mississippian as referring to "the wide variety of adaptations made by societies which developed a dependence upon agriculture for their basic, storable food supply (Griffin 1967: 189). Smith (1978) focused on social and political organization, creating a rather flexible definition when stating that these groups had a ranked form of social organization and adapted to specific floodplain zones. Distinctive social and religious aspects of the Mississippian cultural tradition came into focus during the 1980s, such as when Knight (1986) argued that recognizable sacred artifacts are found across the spectrum of Mississippian sites. While Mississippian sites share commonalities culturally, the broad distance covered provides several interesting regional variations.

While the definition of the term Mississippian clearly has evolved with the changing theoretical viewpoints of archaeology, this thesis defines it as a set of adaptive cultural traits of the Prehistoric Native American groups living across the ancient Midwest and Southeast. The environmental and historical differences of the Mississippian world does not allow for a precise definition, but rather a flexible and broad approach must be taken to understand commonalities. While broad generalizations are imperfect and fail to capture the specific regional variations amongst Mississippian sites, the following traits discussed below are considered to be the most common features one might expect to see of a Mississippian group. In order to provide a succinct

cultural background, I will examine the following traits: settlement systems, technology, social organization, and ideology.

Settlement Systems. Mississippian settlements are usually located in or near the floodplains of major river tributaries in order to take advantage of the fertile soils for agricultural purposes (Griffin 1967). It was the Mississippian culture that first took advantage of agriculture in the Eastern United States. The primary form of subsistence in the Mississippian diet was maize, along with squash and beans. This diet was usually complimented with fish, game, and other wild resources that varied by the region (Welch 1991).

One of the most recognizable traits of the Mississippian culture are their town/mound sites. Famous for their monumental architecture, mound sites consisted of the construction of large earthen mounds. Mounds were constructed by dumping basket loads of dirt on each other, usually in various construction episodes over time, and usually functioned in various ways. Many mounds were burial mounds and were typically ridge-topped or conical, while platform mounds were where the dwellings of the elite or religious structures were placed as evidenced by ethno historical data (Lewis, Stout, and Wesson 1998; Milner 2004). Mounds were typically constructed around an artificially created plaza, which probably served as a communal space for ceremonies and rituals (Lewis, Stout, and Wesson 1998). A residential area is also oftentimes associated with mound centers, usually constructed around the mounds and plaza.

Despite traditionally being the focus of archaeological investigations, these mound sites were more than likely not where a majority of Mississippian peoples lived. Mississippian mound sites are often associated with smaller settlements scattered around them. Small hamlets consisting of a compact clustering of houses were organized and located so as to represent "a balance among labor demands, resource distributions, and defensive needs" (Milner 2004:145).

Also common were single-family farmsteads scattered about the countryside. These connected settlement systems, or chiefdoms, were usually scattered along major stream valleys where both the floodplain and upland resources could be exploited (Milner 2004). Mississippian towns, whether they had mounds or not, would also sometimes feature defensive palisades around the site, indicating that warfare between chiefdoms was happening and is an explanation as to why areas between settlements that would have had abundant resources were sparsely occupied (Milner 2004).

Subsistence Technology. Mississippian technology is best seen in the archaeological record through their stone tools and ceramics. Lithic assemblages at Mississippian sites include both chipped stone tools and ground stone tools. Chipped stone tools include items such as projectile points, drills, and scrapers. Hoes, in particular, are a chipped stone tool that stands out within Mississippian lithic assemblages, corresponding with the shift to maize agriculture (Welch 2006). Ground stone tools include axes, grinding and nutting stones, and hammerstones. One particular form of groundstone that is distinctly found at Mississippian sites are discoidals, otherwise known as chunkey stones. These "biconcave discs" (Welch 2006:90) were a central aspect of the game "chunkey", a popular gambling sport that originated during the Woodland and was a variant of the hoop-and-pole games that were common among Native American groups across North America (DeBoer 1993).

Mississippian ceramics typically feature shell tempering and the use of "globular jars, shallow pans, bowls, and water bottles with a variety of incised and punctuated decorative motifs" (Smith 1996). In Western Tennessee in particular, jars are primarily low-rimmed with poorly defined necks and have loop, wide loop, or strap handles present (Smith 1996). At Shiloh,

Welch (2006) notes that the ceramic assemblage consists of neckless jars with loops, loopy straps, and narrow, parallel-sided straps.

Social Organization. Mississippian Culture is thought to have been socially and politically organized as chiefdom level societies exhibiting the characteristics of social inequality, centralization of power, and settlement hierarchies. Evidence of social inequalities include the elite portion of the population living on the mounds and thus symbolically elevated above the rest of the population, certain burials containing elaborate burial goods, and skeletal analysis that show certain members of the population had access to higher quality resources (Anderson 1994; King 2003; Welch 1991). Power in chiefdoms was often tenuous, and chiefs and elite lineages often times had to constantly prove their leadership abilities. A chief sought to keep his power through feasting, construction of monumental works, ritual, warfare, association with certain powerful ancestors, and the control of prestige goods (King 2003). As a result, warfare in chiefdom level societies, including the Mississippians, seems to be endemic.

Ideology. Evidence suggests that many Mississippian sites were connected, primarily through the trade of prestige goods and non-local resources. One fascinating example of this extensive trade network is Mound 72 at Cahokia. A burial mound, mound 72 contained one elite burial with artifacts from other areas of the Mississippian world, such as projectile points associated with regional variations from Tennessee, Wisconsin, and Oklahoma (Anderson 1994; Hall 2004). Along with this extensive trade network we see a shared ideology, which was once defined as the Southeastern Ceremonial Complex. This concept, however, is often questioned due to the regional variations of ideology and artistic expression that is not covered by a simple term. While general motifs and designs are commonly used throughout the Mississippian world on prestige goods and decorated pottery, this should not suggest that there was a unitary ideology

and artistic core that was the same across the Mississippian world. Knight (2006:2) has been one of the latest to critique the Southeastern Ceremonial Complex by arguing that "the separate domains of art style, iconographic content, ritual practice, and exchange, all have independent trajectories" and that "to embed all of this within a covering term that conveys a false sense of coherence simply begs the most important question."

Despite these critiques, the placement of these expressions of art and ideology at Mississippian sites can still inform us about these cultural adaptations. For example, a significant amount of these decorations come out of burials, suggesting that these symbols were all used for ritualistic purposes (King 2004). Also, many of these motifs were used up through European contact and ethnohistoric accounts can help explain their meaning and uses (Steponaitis and Knight 2004). Common motifs often found in Mississippian art include the open hand, winged serpents, and the falcon warrior.

Previous Research at Ames

Despite being known to archaeologists for over 50 years, substantial investigations into the cultural history of Ames were lacking until very recently. Ames was first documented by Morse, Graham, and Polhemus in 1962, who also attributed the site to the Mississippian period, despite failing to report any surface collections (Morse et al 1962). Ames was then one of six sites where subsurface testing took place during Memphis State's survey of the Wolf River Watershed in 1979 (Peterson 1979). During the subsurface testing, very few artifacts were collected, and of those, the ceramics were identified as Woodland (Peterson 1979). Mainfort and Kwas (1985) recorded a light surface density during a survey of the site, along with continued looting. Mainfort (1986) suggested that the site was Middle Woodland due to similarities with Pinson, including an interpretation of ceramics at Ames as being Woodland, as well as both

Pinson and Ames having low density scatter of off mound surface artifacts and morphologically similar platform mounds (Mainfort 1986, 1992). Mainfort (1992) later revisited four mound groups in West Tennessee, including Ames (40FY7), Bolivar (40HM2), Denmark (40MD85), and Kenton (40OB4). Mainfort (1992) concluded that all four sites were Early Mississippian instead of Woodland based off of surface collections of ceramic material and the architectural style of the mounds (Mickelson 2008). While Mainfort (1992) found that Ames was the only site lacking Mississippian shell tempered ceramics, a radiocarbon sample taken by Smith in 1969 from a looters trench on Mound B was processed and dated to Early Mississippian.

The most recent work conducted at Ames has been continued investigations by the University of Memphis from 2007 to present. Multiple investigative methods have been employed at the site in order to accurately determine the organization of Ames. Initial surface collections conducted in 2007 found very little evidence of habitation (Mickelson 2008); however, another surface collection conducted in 2009 was more successful in identifying a concentration just south of the mounds (Goddard 2011). The first magnetometry surveys were conducted during 2009 and 2010, with the results indicating multiple subsurface signatures, that when combined with surface collections, indicated a town adjacent to the mounds (Goddard 2011; Mickelson and Goddard 2011). Several magnetic signatures selected for excavation confirmed the existence of houses, non-domestic buildings, features, and palisades (Goddard 2011; Guidry 2013; Mickelson and Goddard 2011).

Surface Collections and Shovel Test Pits. Initial surface surveys in 2007 identified a low density scatter of artifacts that amounted to less than 46 per hectare, seemingly confirming the vacant ceremonial center model (Mickelson 2008). However, a second surface collection was conducted in 2009 with better surface visibility and at a greater scale. In this second surface

collection there was a surface artifact density nearly four times greater than 2007, turning up a density of nearly 146 artifacts per hectare (Mickelson and Goddard 2011). When the 2007 and 2009 surface collections were combined, nearly 67% of all artifacts found were clustered immediately south of the mounds (Goddard 2011).

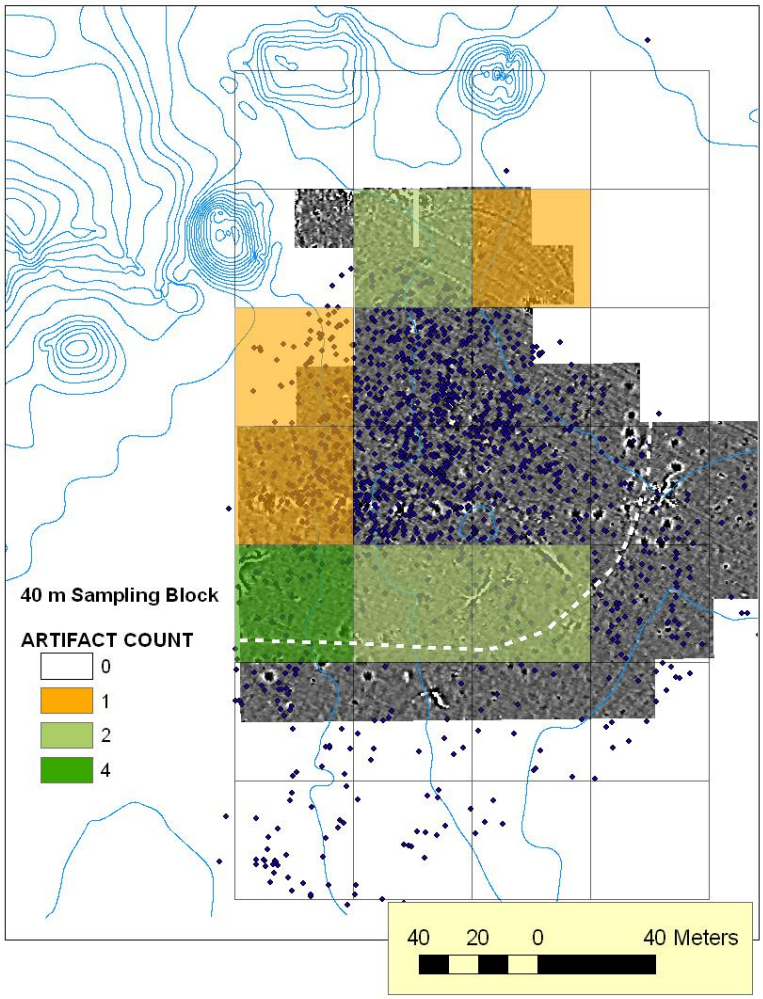


Figure 2. Surface artifact densities are heaviest within the residential area south of the mounds and inside the palisade (Goddard 2011).

Plow zone density was also tested through a systematic, random sample of shovel test pits (STP) to "determine whether or not a better measurement of the site artifact density could be ascertained through sampling the plow zone" (Mickelson and Goddard 2011:162). Extrapolation of the STP data indicated that approximately 173, 600 artifacts could exist within the plow zone of the entire 3 hectare site (Goddard 2011).

Magnetometry. Magnetrometry is a noninvasive archaeological investigative technique that measures detailed subsurface geophysical features (Lockhart and Green 2006). These surveys are time efficient compared to other traditional survey techniques, allows total coverage of an area, and preserves the site being surveyed (Johnson and Haley 2006). This geophysical prospecting technique detects changes in the magnetic signature of the soil, thus enabling the user to be able to identify contrasts between possible archaeological features and the natural, undisturbed background (Kvamme 2006).

Magnetometry surveys took place over two field seasons in 2009 and 2010 and covered approximately 3.8 ha south of the mound. The survey was completed using a Bartington 601-2 dual fluxgate gradiometer at a ".5 m transect interval with four readings per meter along each transect (Goddard 2011:29). Once the dataset was processed, recognizable features could be seen in the area south of the mound, including "a line of positive circular anomalies in a backwards 'L' shaped pattern, a positive linear anomaly enclosing the circular anomaly, and several wedge shaped anomalies located throughout the magnetometry survey" (Goddard 2011:36). Ten excavation units were then placed on select magnetic signatures to ground truth the dataset and determine whether these were cultural or geologic features.

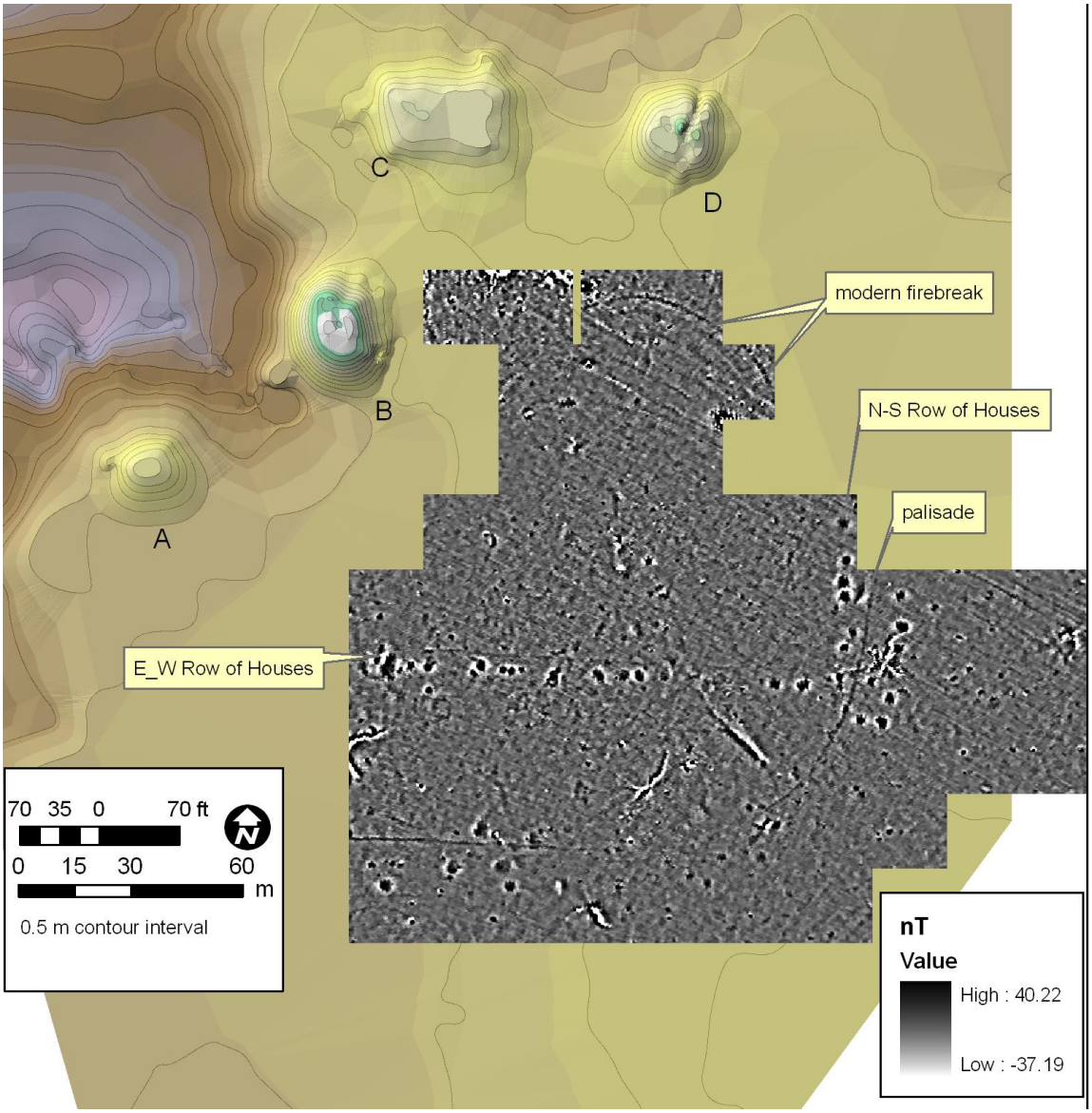


Figure 3. Magnetometry data overlaying a topographical map of Ames.

Excavations. Three types of anomalies stood out in the magnetometry data to be tested: 1) circular anomalies; (2) linear anomalies; and (3) wedge anomalies. The two excavation units placed over the wedge anomalies, F1-U5 and F1-U7, recorded no cultural features and were determined to be the result of lightning strikes. This left the two other types as a primary focus of testing.

Two excavation units, F1-U1 and F1-U2, were placed over two prominent circular magnetic signatures and revealed Mississippian structures. Structure 1 (F1-U2) was chosen for greater investigation, as it was more representative of the magnetic signature of the majority of circular anomalies in the magnetometry data (Goddard 2011; Mickelson and Goddard 2011). This unit actually revealed the existence of three overlapping structures indicating multiple construction episodes, as well as a trench indicating a palisade and a midden associated with the structures. Sigma date ranges from radiocarbon samples taken from the wall trenches in this unit show that all four construction events span at least 120 years (Guidry 2013). Using the minimum range in the radiocarbon dates and assuming a lifespan of 15 years per event, Guidry (2013) estimated that this block saw a total of 60 years of standing architecture and 60 years without standing architecture. This supports "potential temporal gaps between the reorganization of architecture in this block" (Guidry 2013:69).

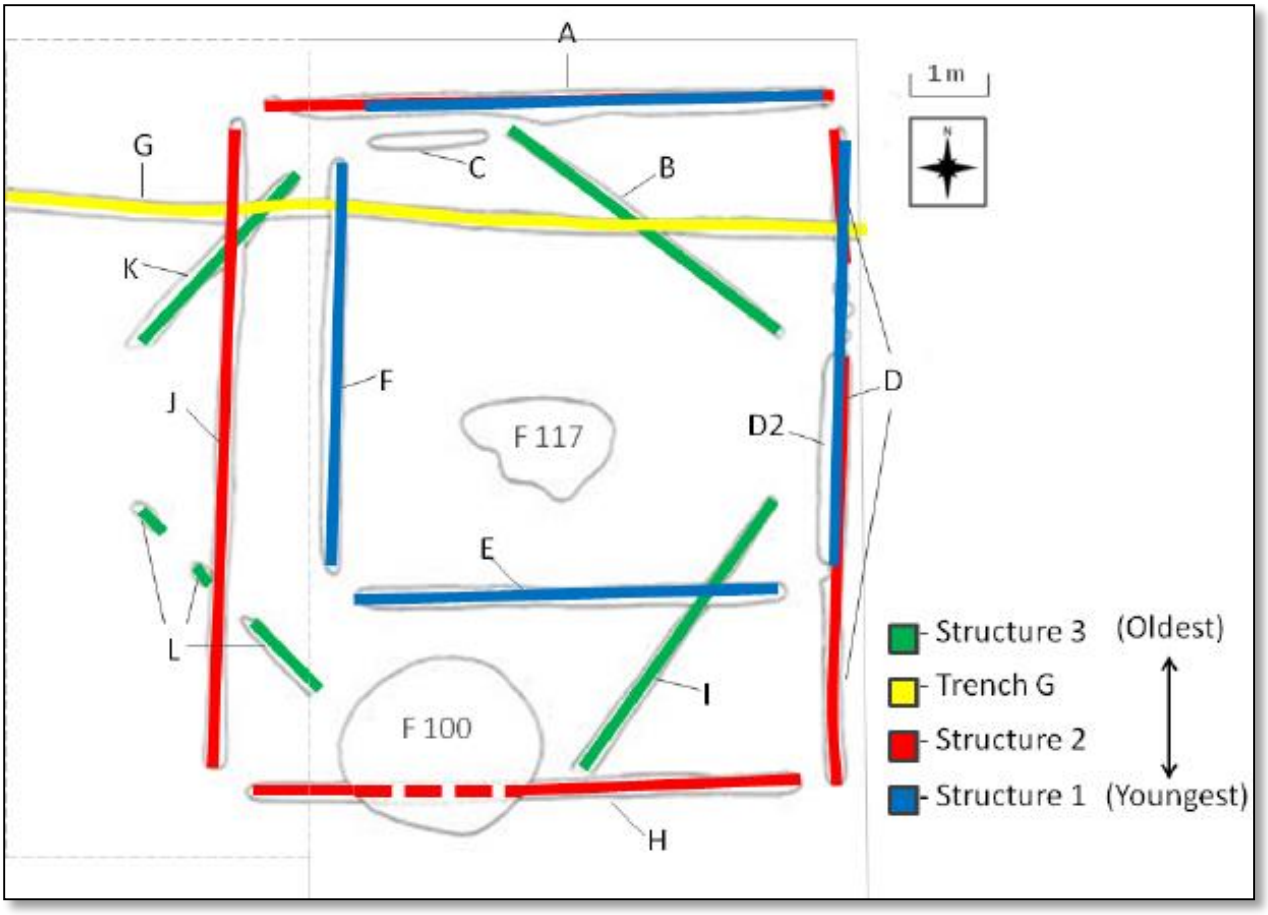


Figure 4. Plan of excavations showing the three building phases and the palisade (Trench G in yellow) at F1-U2. (Guidry 2013: Figure 8)

Several features were located on the side of the structures away from the mounds and plazas, including feature 100 located in F1-U2. Feature 100 contained "various complex zones of midden fill with distinct boundaries suggesting it was regularly used for refuse disposal" and contained charcoal and artifacts (Guidry 2013:66). A distinct line of anomalies just east of Palisade 2 similar to feature 100 in the magnetometry data was then tested in a new excavation block (F1-U14) during the 2012 field season. The initial reasoning to this excavation was to locate another structure for dating, however, no structure was not found in F1-U14. Despite the lack of a structure, the unit did uncover Feature 1, another large, deep pit feature measuring 3.5

m round and 75 cm to 95 cm deep. These two pits appear to be contemporaneous; however, if Feature 1 was actively being used while at the same time as Palisade 2, then it is most likely associated with activities taking place outside of the town and thus functionally different from Feature 100 (Guidry 2013). Pit sizes at Ames are generally similar to those at the Jonathan Creek site located near houses (Guidry 2013; Webb 1952).

Several units (F1-U3, F1-U4, F1-U6, and units F1-U8 through F1-U10) were placed to ground truth the linear signature thought to be a palisade running around the site. These excavations uncovered a deep ditch about one meter in depth with large posts placed vertically indicating a rather large palisade (Mickelson and Goddard 2011; Goddard 2011). This palisade (Palisade 2) would have been nearly 200 m of wall length around most of, if not all, of the site (Mickelson and Goddard 2011).

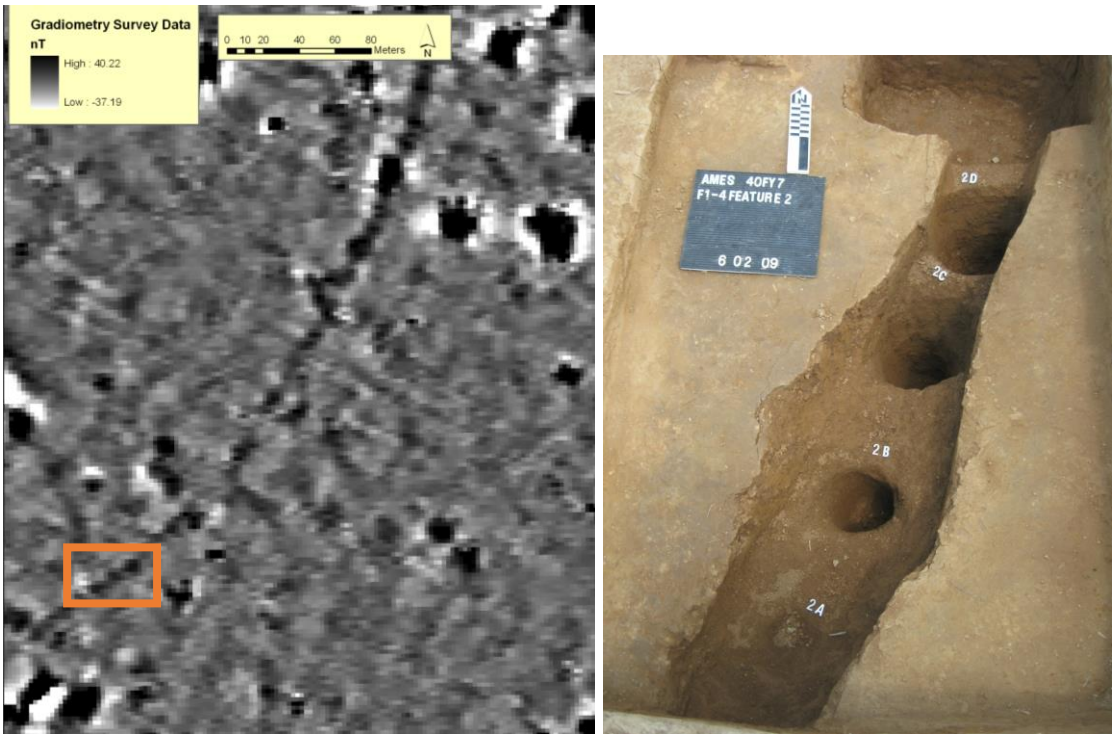
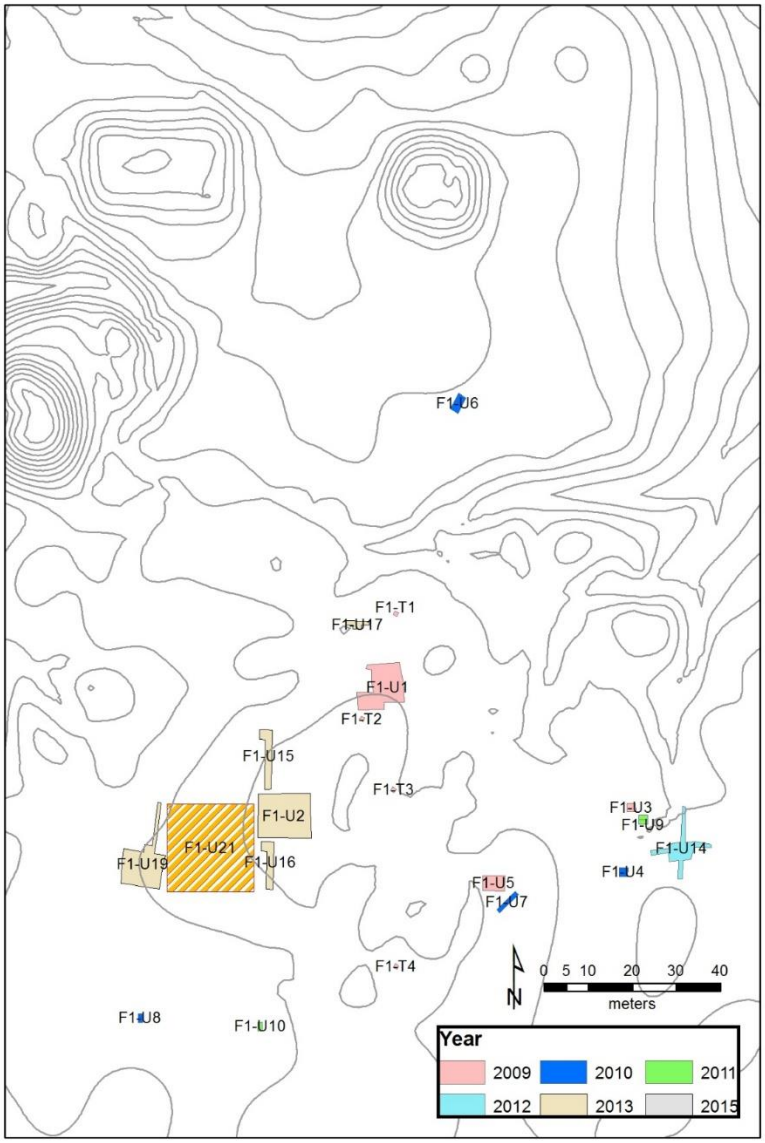


Figure 5. The targeted section of the second palisade (F1-U4) in the magnetometry and after excavation.

Further excavations in F1-U2 uncovered an earlier palisade construction, Palisade 1, in the form of Trench G. While Trench G is located within the same range as Structures 1 and 2, and appears similar to structure trench attributes, the posts tend to be slightly larger and "exhibit regularity and spacing absent in structure posts" (Guidry 2013:62). Furthermore, the post bases exhibit an ashy material that has been suggested to be due to the use of fire to cut and/or shape the posts prior to the erection of the wall (Guidry 2013; Webb 1952). Palisade 1 is both shorter, wider, and the posts set shallower than Palisade 2, as well as being the older of the two (Guidry 2013). Palisade 1 intercepts the calibration curve at approximately A.D. 1160, while Palisade 2 has an intercept of A.D. 1260 (Guidry 2013:67).



Ames (40FY7). Field 1 excavation blocks from 2009-2015.

Figure 6. All excavation units in Field 1 at Ames from 2009 to 2015.

Mound Research

There are four mounds at Ames. Mounds A, B, and D are all platform mounds, while Mound C is an oblong mound "that has an uneven surface, sloping upwards over one meter south to north, towards the bluff's edge" (Mickelson 2008:206). Mound B differs from the other two

rectangular platform mounds by being pentagonal or hexagonal in form and considerably taller at 5.5 m as opposed to 2-2.5 m tall (Mickelson 2008). Mound B also has a ditch surrounding the southern portion on both sides of the ramp. The layout of the mounds seems to have been carefully planned, with Mounds A, B, and D oriented along a 61 degree azimuth so as to correspond to the summer solstice sunrise and the winter solstice sunset (Mickelson 2008). Solstice alignments are also observed at contemporary sites such as Obion (40HY14) and Owl Creek (22CS502), as well as at the Middle Woodland Pinson Mounds Complex and the Late Mississippian West Mounds site (22TU520) (Buchner 1996; Garland 1992; McNutt 2005; Mickelson 2008; Rafferty 1995). The 2007 and 2008 field seasons focused investigations on Mounds B and D in order to establish the chronology of mound construction. These two mounds were selected for testing to take advantage of two pre-existing looters trenches, and thereby limiting negative impacts to the mounds.

A trench was placed north-south in Mound D and excavations were ended upon reaching basal deposits of a buried A horizon (Mickelson 2008). In this trench, a sample of burned thatching material associated with a wall trench structure was uncovered and dated to A.D. 1170 to 1240, with "an intercept of cal A.D. 1210" (Mickelson 2008). A 2 x 2 m excavation unit was also placed on the southern side of Mound B. Two dates were obtained from this excavation. The first was from about 2.5 m below the summit and yielded a date of cal A.D. 1020 to 1210, while the second came from about 3.75 m below the summit and yielded a date of cal A.D. 640 to 770 (Mickelson 2008). This suggests that the upper portions of Mound B are Early Mississippian construction events overlaying Late Woodland deposits (Mickelson 2008).

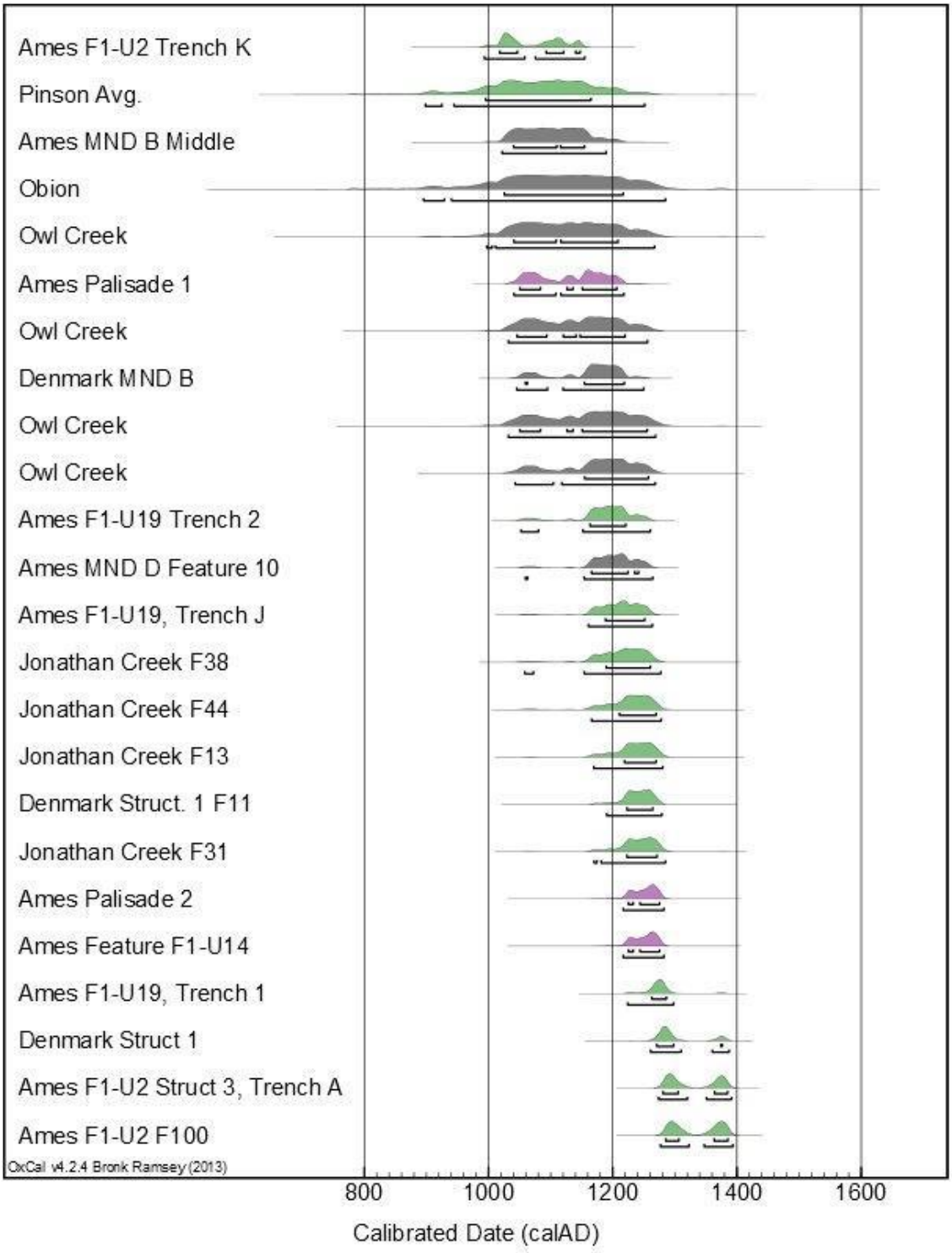


Figure 7. The calibrated dates of Mounds B and D in comparison to other sites in West Tennessee. Green is non-mound context, black is mound context, and purple is other (e.g. palisades).

Summary of Previous Research

Since its first documentation, Ames has provided several challenges and questions to researchers. The relative unobtrusiveness of surface artifact density and its location on a third order stream seemingly defied traditional methods in determining the sites usage, thus ending with it being labeled as a vacant ceremonial center. Recent research by the University of Memphis utilizing geophysical techniques and targeted excavations were able to refute the vacant ceremonial center model and confirm the existence of a fortified town. Furthermore, Guidry (2013) was able to demonstrate multiple construction episodes of a structure and possibly multiple occupations over the span of at least 120 years. During this time, there were changes in not only the community layout as evidenced by the two different palisade constructions, but also in the shift in structure orientation. Along with the possible different uses of two contemporaneous pits, Feature 1 and Feature 100, there is compelling evidence that the functional uses of space changed over time in order to match the changing social, political, and economic necessities of the population living at Ames.

This research aims to build off of previous research in understanding the lives of the inhabitants of Ames. Recent investigations have shown that not only did a town exist where many thought it had not (Goddard 2011), but also that that community changed the layout of the town over time to fit their changing needs (Guidry 2013). This research ultimately attempts to show how the households, a fundamental unit of society, functioned by analyzing the material remains that are the product of the activities of the household. As Binford (1980) stated, "We must seek a deeper understanding. We must seek to understand the relationships between the dynamics of a living system in the past and the material byproducts that contribute to the formulation of the archaeological record." By identifying patterns in the archaeological record

that show how space was used at Ames, we can further see how the functions of space changed and possibly why it changed.

3. **Methods and Results**

This research is motivated to understand the social and organizational changes of Mississippian groups living in West Tennessee, a region that has seen little research. Recent work at Ames demonstrates a town plan that changed over time to meet the needs of its population. Guidry (2013:82) concluded by stating that "improving understanding of community development at Ames during the Mississippi period has implications for other mound sites in and around western Tennessee". This thesis attempts to do that by focusing on the household, the activities of that household, and how the space between domestic structures are utilized. Two sets of research questions were formulated to determine the use of space at the site. To reiterate, the first question is in regard to whether household clustering was evident at the site. This would be tested by analyzing the function of artifacts and features in the space between structures to determine whether the space was shared and used for activities, or if houses operated as their own economic units. The second question was in regard to the function of space between structures. This would be tested by analyzing the artifacts and features within inter-structure spaces to determine the function of space.

The household, as defined by Hammel (1980), is the "smallest grouping with the maximum corporate function." The household is the most fundamental activity unit of society consisting of dwellings, activities of the members, and the members themselves and is therefore responsive to social, economic, and political changes (Douglass and Gonlin 2012). Focusing analysis on the function of the household can be used to measure cultural change and as an indicator of social norms while allowing cross-cultural comparisons (Douglass and Gonlin 2012). By determining which activities link households together, we can place them within a wider socio-cultural context (Wilk and Netting 1984).

As Rodgers (1995:83) points out, "Most would agree that changes at the domestic level reflect fundamental social organization changes… it is not clear how the changes are expressed". While archaeologists cannot excavate social units, the material culture resulting from households can be excavated to test our inferences of the households present at a Mississippian town (Wilk and Rathje 1982). Following Hammel's (1980) definition of a household stated above, then archaeologically, "this grouping is recognized by the repetitive material patterning of a variety of related activities" (Rogers 1995:82). The material evidence supporting these inferences would include post holes and wall trenches indicating primary domestic structures (PDS) or storage structures, middens, burials, and artifacts that were the result of household activities. By analyzing the spatial pattern of cultural remains at Ames, statements can be drawn regarding the social organization of Mississippian society, as well as the activity related to economic, ecological, and large-scale changes (Ashmore and Wilk 1988).

I utilized a multi-stage research design strategy combining multiple lines of evidence such as surface collections, magnetometry data, and excavation to collect data that would lend themselves to hypothesis testing. By combining several methods, I was able to see a general spatial pattern of activity between structures. To define my testable universe, a 40 m x 40 m block was established in the space between two previously excavated structures. This block was then divided up into twenty-five 4 m x 4 m units.

Excavation units were selected using a systematic sampling method. With a systematic method, the units were placed within the sample area at equal intervals. The benefits of using a systematic method is that it is quick, simple to understand, and is unlikely to coincide with the regularity of any cultural features discovered (Orton 2000). Initially, plans were to excavate every other block so as to gain a 50 percent sample size of subsurface features; however, due to a

rather wet field season that shortened the ability to produce such results, a 20 percent sample size was deemed satisfactory to answer the research questions. In order to maximize efficiency, the five units selected for excavation were placed across the 40 m x 40 m block diagonally. Furthermore, out of each 4 m x 4 m unit, a 1 m x 1 m section was screened in order to estimate the artifact density of the plow zone. Despite shortening excavations down to just five of the 40 m x 40 m blocks, all of the 13 screened 1 m x 1 m units were still completed.

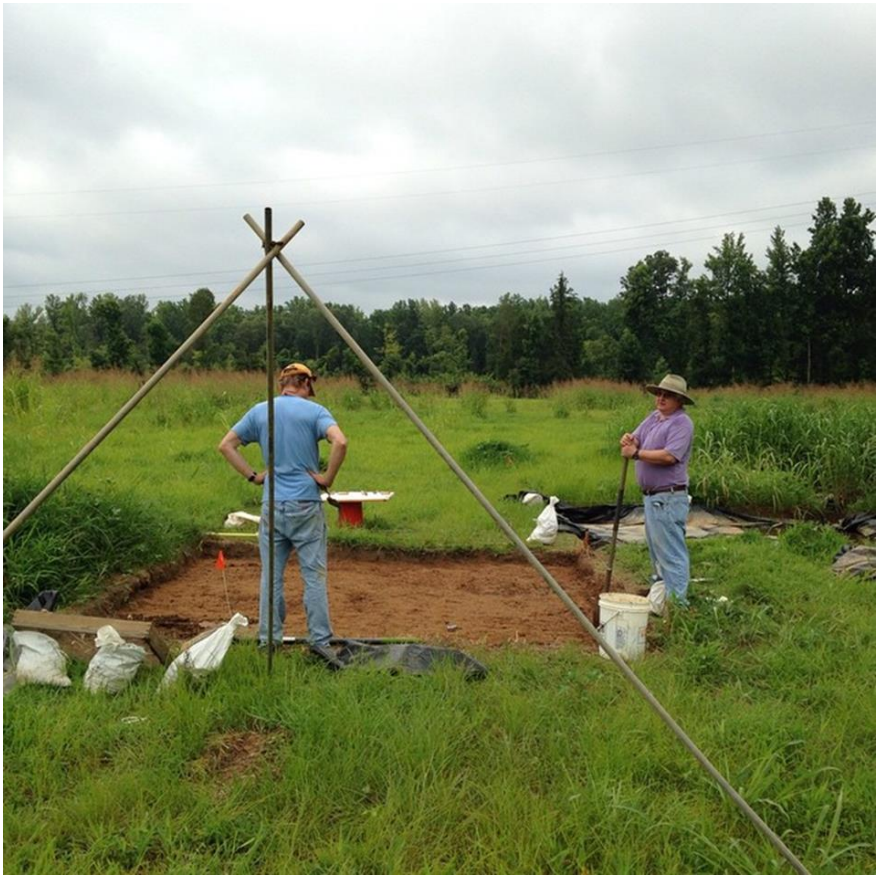
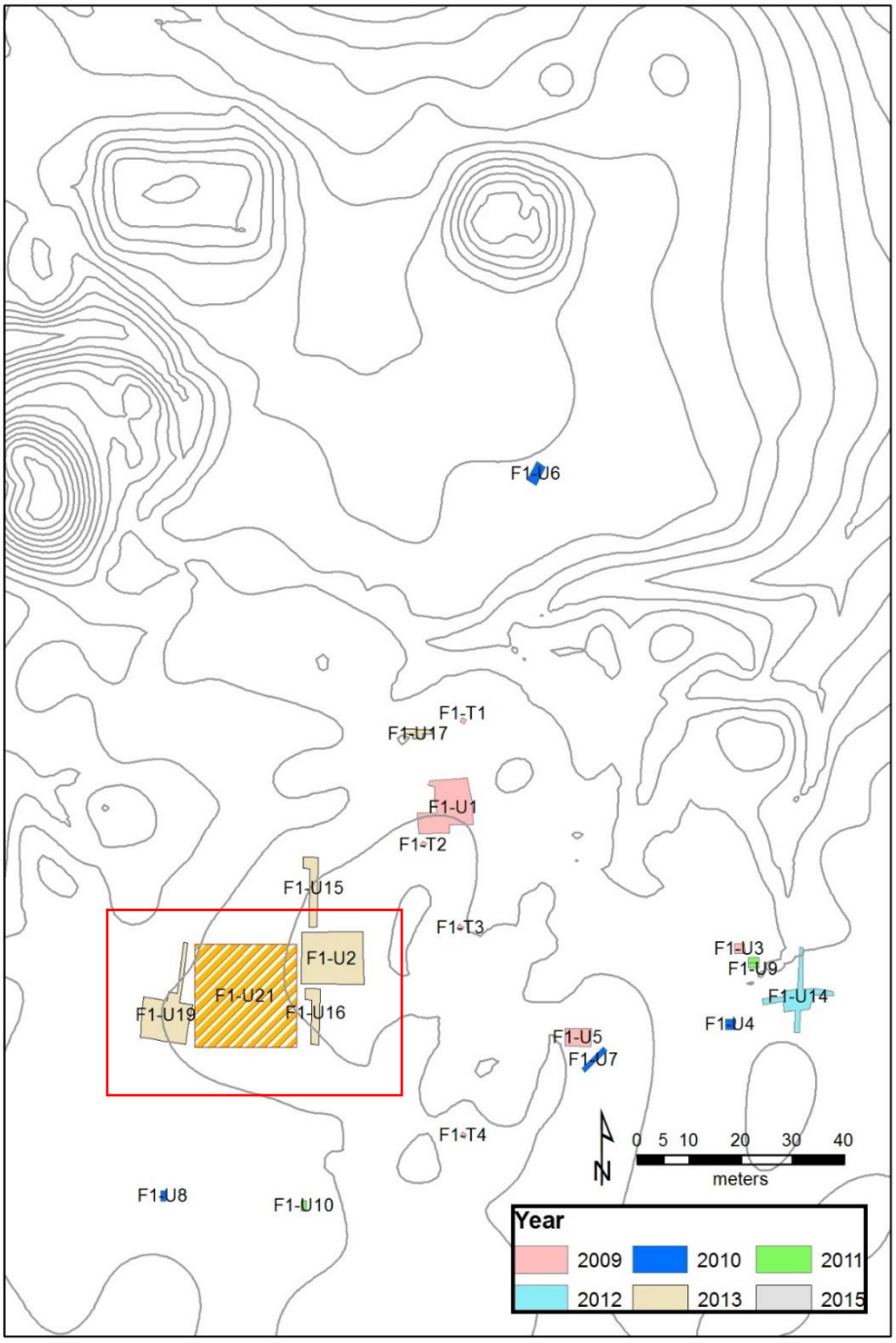


Fig.8. Dr. Andrew Mickelson (left) and Charlie Phillips (right) examine a 4 m x 4 m unit in F1-U21 as rain clouds roll in.

The reduction of sample size is possible due to the fact that this research is able to combine multiple lines of evidence from previous field seasons to increase the scope of this thesis. These lines of evidence include the magnetometry data, previous excavations, and surface collections mentioned in the previous chapter, as well as the data collected specifically for this thesis. Surface collections allow me to discern the spatial distribution and patterns of artifacts that are both independent of and complimentary to subsurface data collected during excavation (Dunnell and Dancey 1983; Ebert 1992). All of these data sets was then combined into a Geographical Information System (GIS) to determine spatial patterning. Using GIS, models were run to establish the relationships between types and locations of artifacts and features to identify possible activity areas that indicate the functionality of inter-structure space. By identifying patterns between these multiple lines of evidence in just a 40 m x 40 m space, inferences can then be drawn about how space was used across the entire site that can be tested in future research.

The rest of this chapter will be devoted to breaking down the methods and results of this research in the following order: an explanation of previously collected data utilized by this research, excavations of the two structures and the inter-structure space, feature densities, and then surface collection densities.



Ames (40FY7). Field 1 excavation blocks from 2009-2015.

Figure 9. All excavations at Ames from 2009 to present. Focus is on F1-U2, U19, and U21.

Previously Collected Data

This research utilizes data collected in previous field seasons. Details of excavations, surface collections, and magnetometry surveys prior to 2014 were taken from notes, maps, and photographs from the field. The unpublished Masters Theses of Goddard (2011) and Guidry (2013) proved to be incredibly valuable as well. Surface collection, magnetometry data, and the excavation the structures in F1-U2 were all analyzed through these resources. I was able to participate and observe the majority of the excavations of F1-U19; however, this is the first time that any of the results of those excavations have been reported.

Excavations

F1-U2. Excavations at F1-U2 began in 2011 and finished in 2013. Three structures superimposed upon each other were uncovered, along with Trench G, the remains of one of the sites two palisades. The artifact assemblage collected from F1-U2 is composed of: bone (5%), ceramic (17%), charcoal (2%), daub/burned earth (16%), historic (0.1%), lithic/stone (8%), other (0.1%), and sandstone (52%). These percentages differ from that of Guidry (2013), in that some categories have been combined, such as sandstone and possible fire cracked rock or lithic and stone. This decision was made to make comparisons easier for this research. Furthermore, Guidry (2013) did not weigh the artifacts in the assemblage, something that she recognizes might have been useful, in particular for sandstone and daub/burned earth (Guidry 2013:39).

I was able to revisit and weigh the artifacts from F1-U2 in order to provide more information on the assemblage. The artifact assemblage weight of unit F1-U2 was composed of: bone (0.7%), ceramic (16%), charcoal (0.1%), daub/burned earth (19%), historic (0.1%), lithic/stone (4%), other (3%), and sandstone (59%). Later decisions were made to narrow down

these categories to match F1-U19 and F1-U21, but these will be discussed in greater detail in the next chapter.

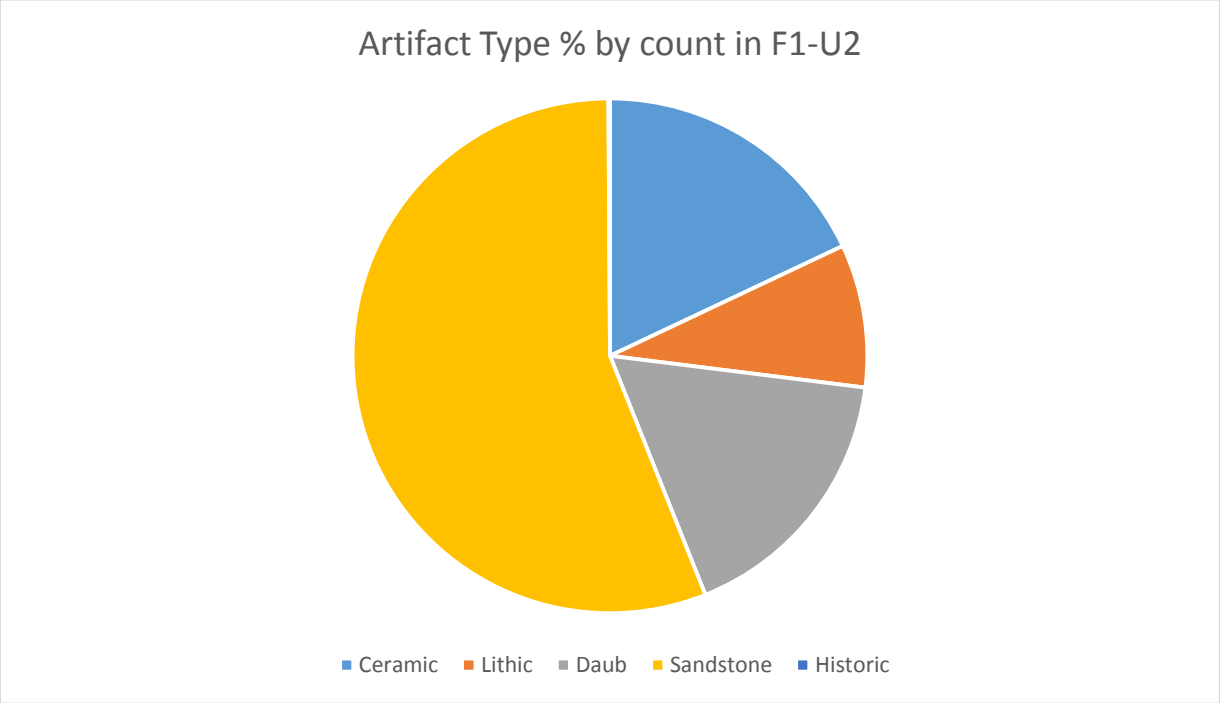


Figure 10. The percentage of each of the artifact types within the total assemblage of F1-U2.

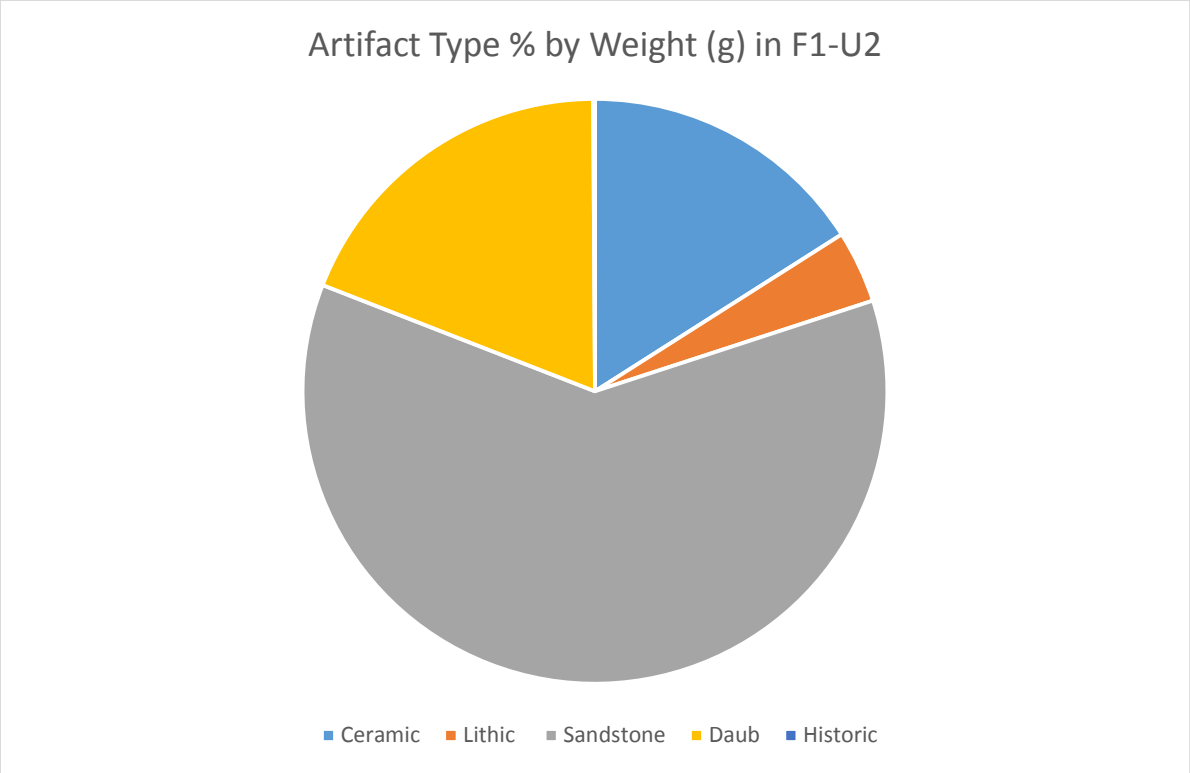


Figure 11. The percentage of the weight of artifact types in the assemblage of F1-U2.

F1-U19. Excavations at F1-U19 began at the end of the 2013 field school and have continued up to present. Located approximately 20 m East of F1-U2, F1-U19 contains what appear to be two superimposed structures. Wall trenches appear to have been a different construction method than of the structures in F1-U2, as postholes were rarely encountered. The artifacts collected from F1-U2 were separated into five categories, counted, and weighed. The assemblage count was: Ceramic (52%), daub/burned earth (19%), historic (0.3%), lithic/stone (13%), and sandstone (15%). The weighed assemblage was: Ceramic (39%), daub/burned earth (6%), historic (1%), lithic/stone (7%), and sandstone (48%).

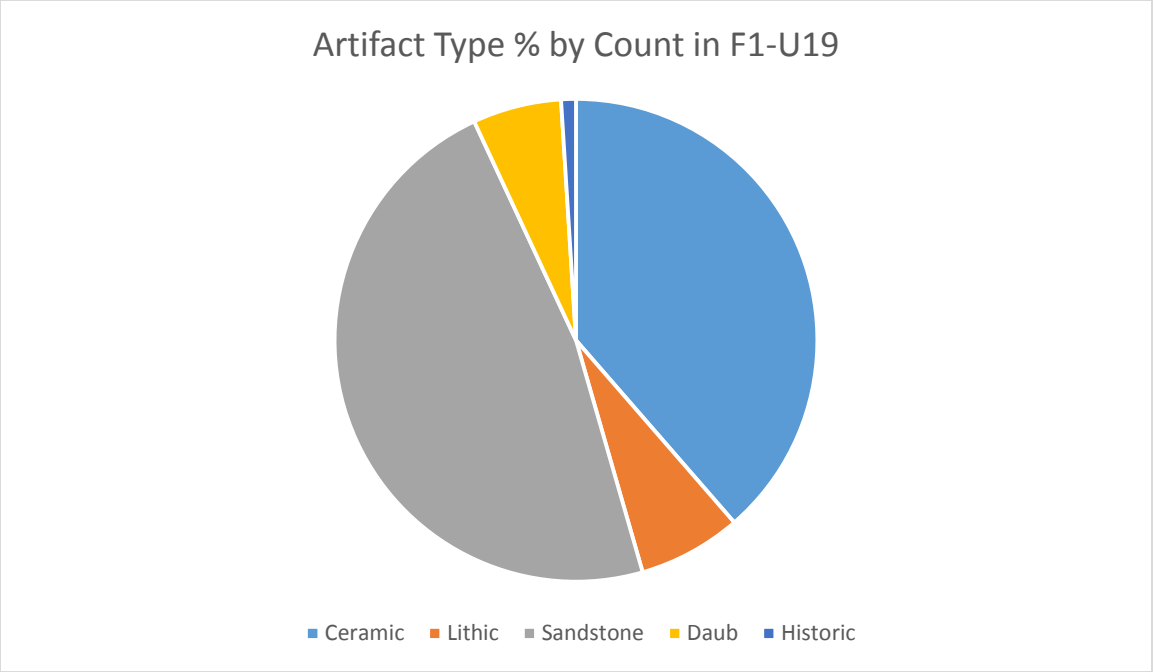


Figure 12. The percentage of artifact types in the total assemblage of F1-U19.

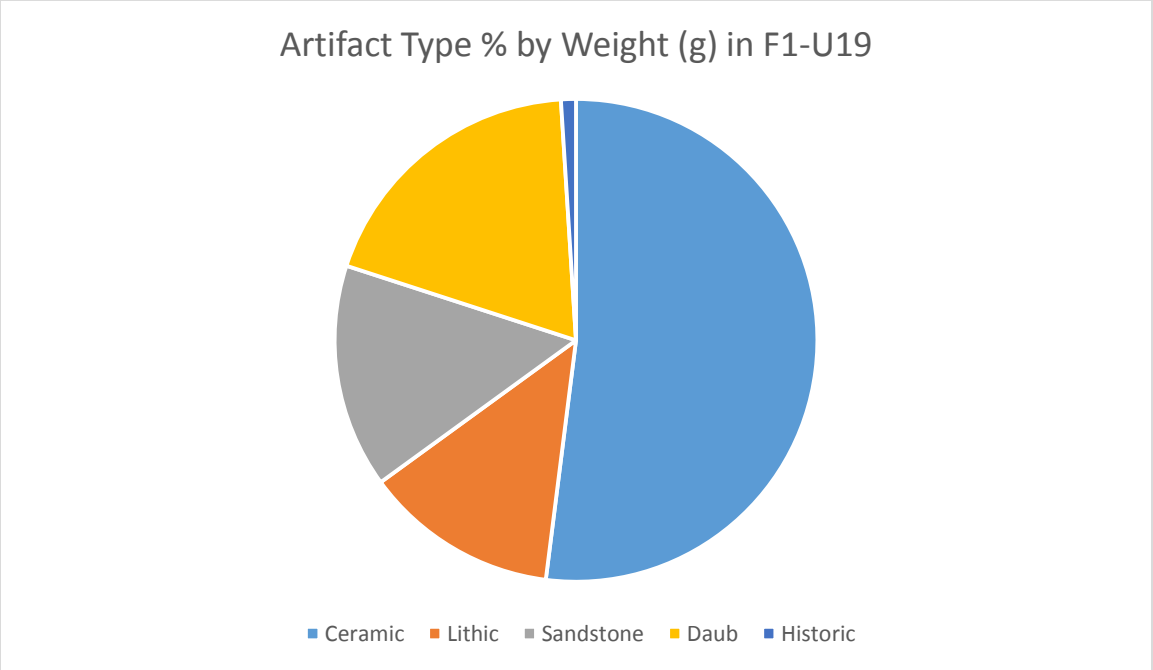


Figure 13. The percentage of artifact type weights (g) in the assemblage of F1-U19.

F1-U21. There are two aspects to excavations in F1-U21, the five 4 m x 4 m units and the thirteen 1 m x 1 m screened units. When discussing a 4 m x 4 m, it should be known that I am also including the screened 1 m x 1 m section unless stated otherwise. The two excavation unit types were meant to view two different aspects. The 4 m x 4 m units were excavated primarily to document feature density, while the 1 m x 1 m units were screened in order to document artifact density within the plow zone. All features found were excavated, however very few turned out to contain artifacts. Out of all of F1-U21, just over 1,200 artifacts were collected, yet only 30 artifacts came out of features. These artifacts, like the other two areas, were separated into the five artifact classes, counted, and weighed. The artifact assemblage count was: Ceramic (15%), Daub/burned earth (23%), historic (1%), lithic/stone (15%), and sandstone (46%). The artifact assemblage weight was: Ceramic (9%), daub/burned earth (6%), historic (0.4%), lithic/stone (12%), and sandstone (73%).

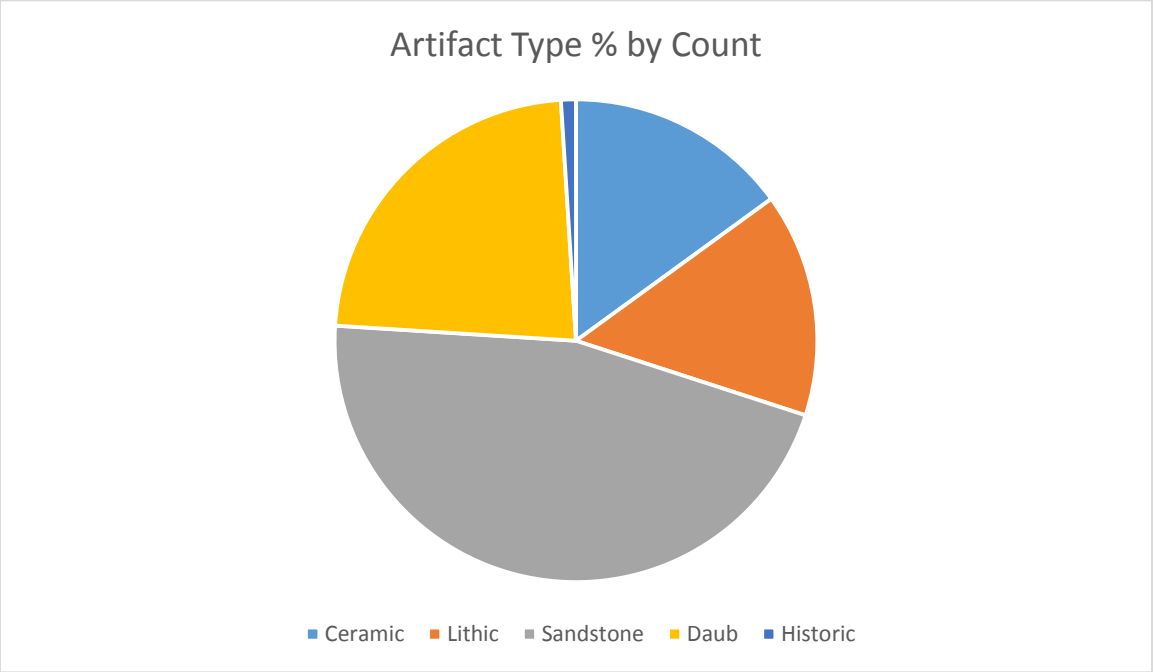


Figure 14. The percentage of artifact types in the total assemblage of F1-U21.

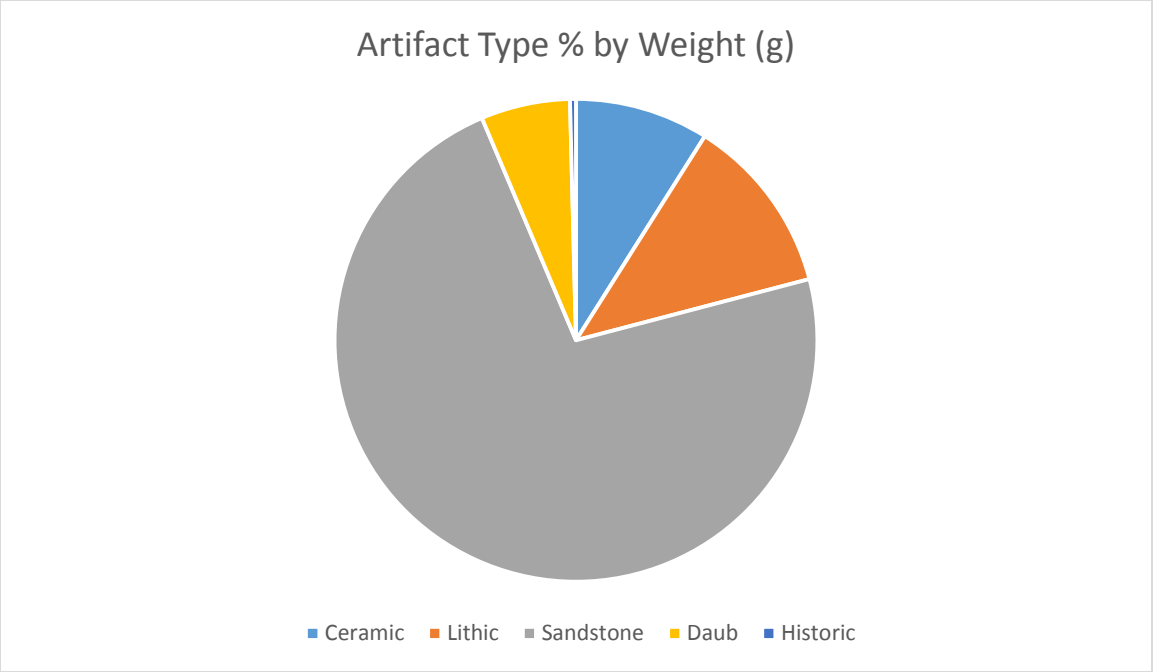


Figure 15. The percentage of artifact type weights (g) in the total assemblage of F1-U21.

Now, understanding the quantity of what was found between the structures, it is important to see how they were spread across the space. For this, I will look solely at the screened 1 m x 1 m blocks, as they are spread systematically across the space. The average 1 m x 1 m had an average of 89 artifacts and an average weight of 89.45 g. Of the twelve units screened, all but three units fell within or close to a range of 60 to 100 artifacts. Units 23 and 25 contained 182 and 218 artifacts respectively, while unit 15 contained only 22.

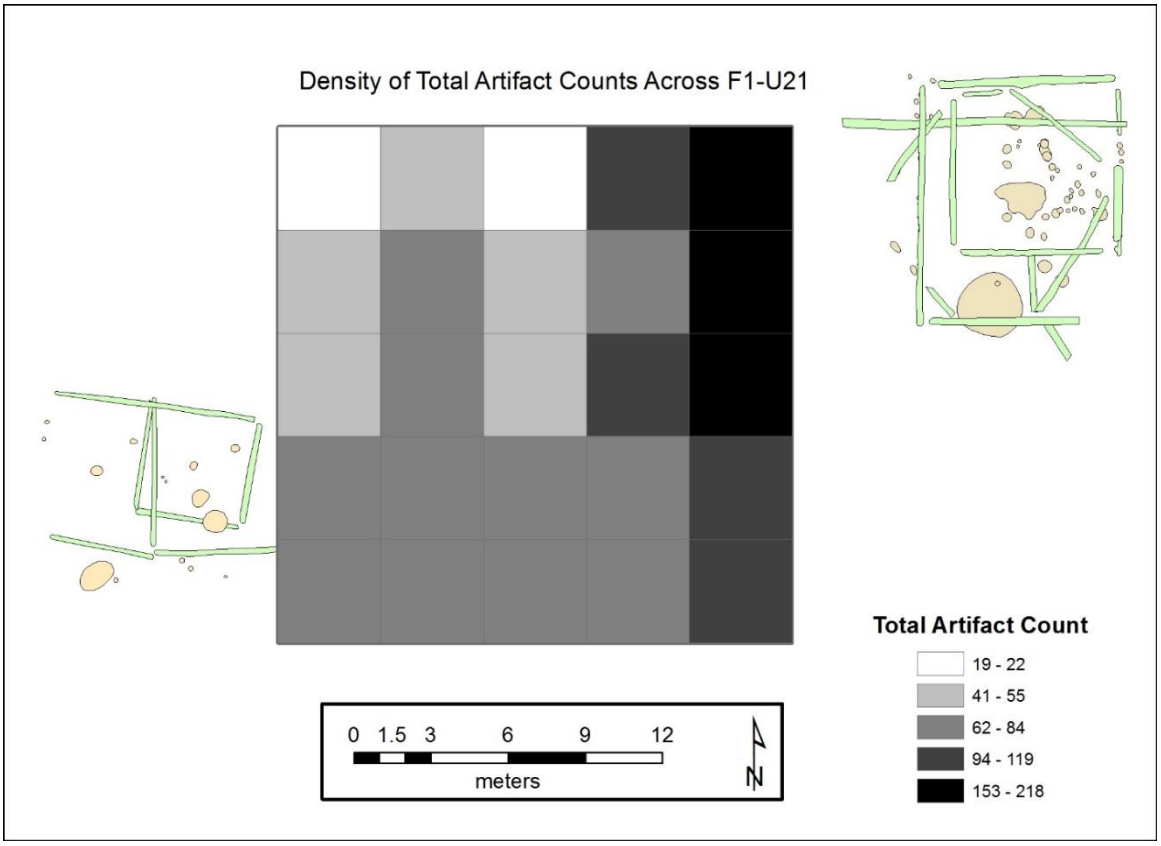


Figure 16. The density of the artifact counts across F1-U21.

The distribution of weight across the 1 m x 1 m units in U21 is much less even. While eight of the units fell within the range 30 to 70 grams, with four of those within the range of 40 to 45 grams, five of the units exceeded 100 grams quite easily. These five units were: unit 7 (144.5 g), unit 15 (219.92 g), unit 19 (185.01 g), unit 23 (146.05 g), and unit 25 (167.04 g). Examining these units, it becomes clear that a few large pieces of sandstone greatly exceed the average artifact weight (1.10 g) and the average sandstone artifact weight (1.62 g). In order to gauge the effects of these pieces, the most visibly large pieces of sandstone were removed. Overall only seven pieces of sandstone equaling 433.27 g were removed. Less than a percent of the total assemblage from the 1 m by 1 m units accounted for nearly 35% of the total weight of the assemblage of U21, and 46% of all of the sandstone in those same units. Removing those

seven pieces, the average weight of a screened 1 m x 1 m unit fell from 89.45 g to 61.65 g, the average artifact fell from 1.1 g to 0.7 g, and the average sandstone artifact fell from 1.67 g to 0.99 g. Only two units, units 23 and 25, continued to greatly exceed the average weight due to their significantly greater number of artifacts.

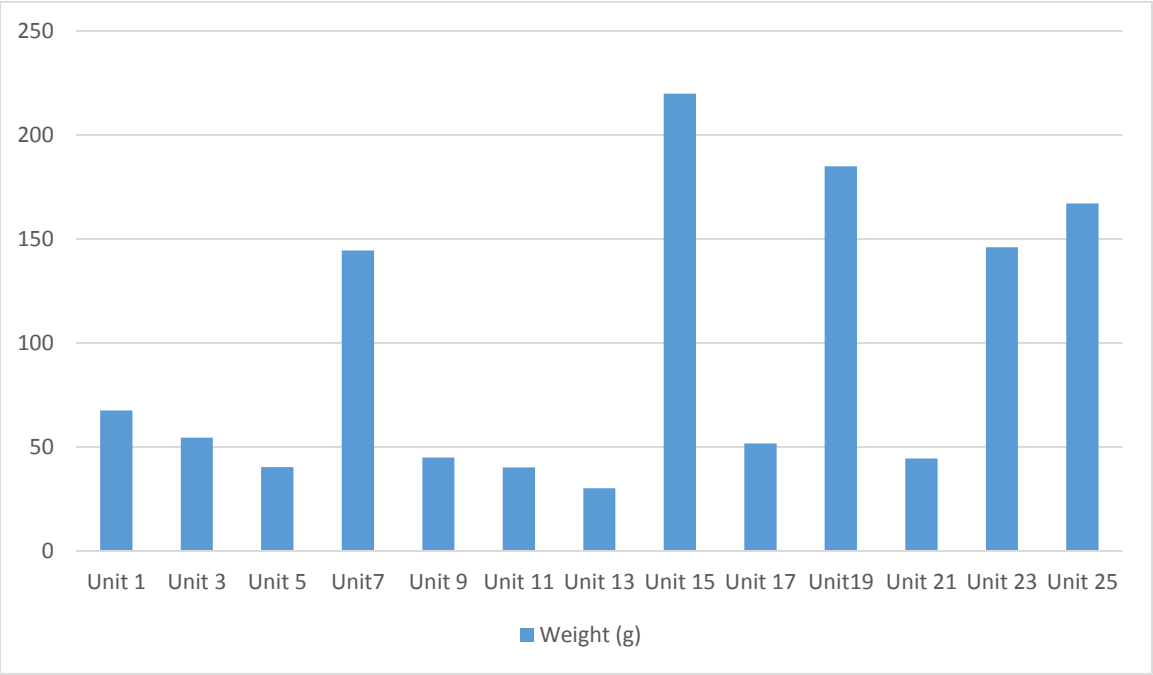


Figure 17. The weight in grams of all 1 m x 1 m units in F1-U21 prior to removal of large sandstone pieces.

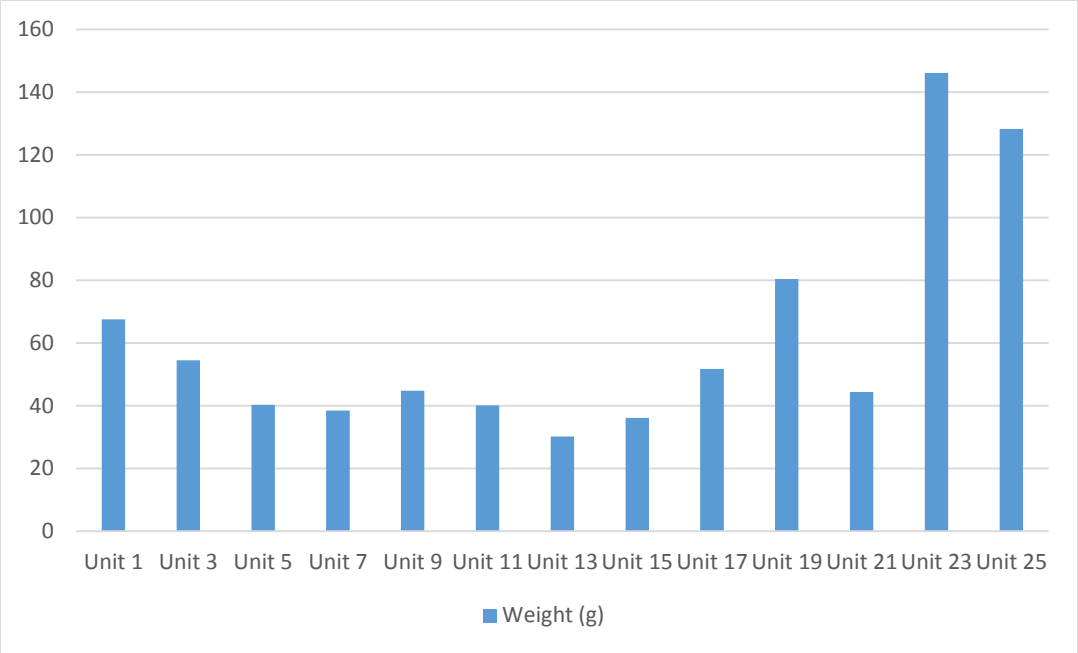


Figure 18. The weight in grams of 1 m x 1 m units in F1-U21 after removal of seven large sandstone pieces.

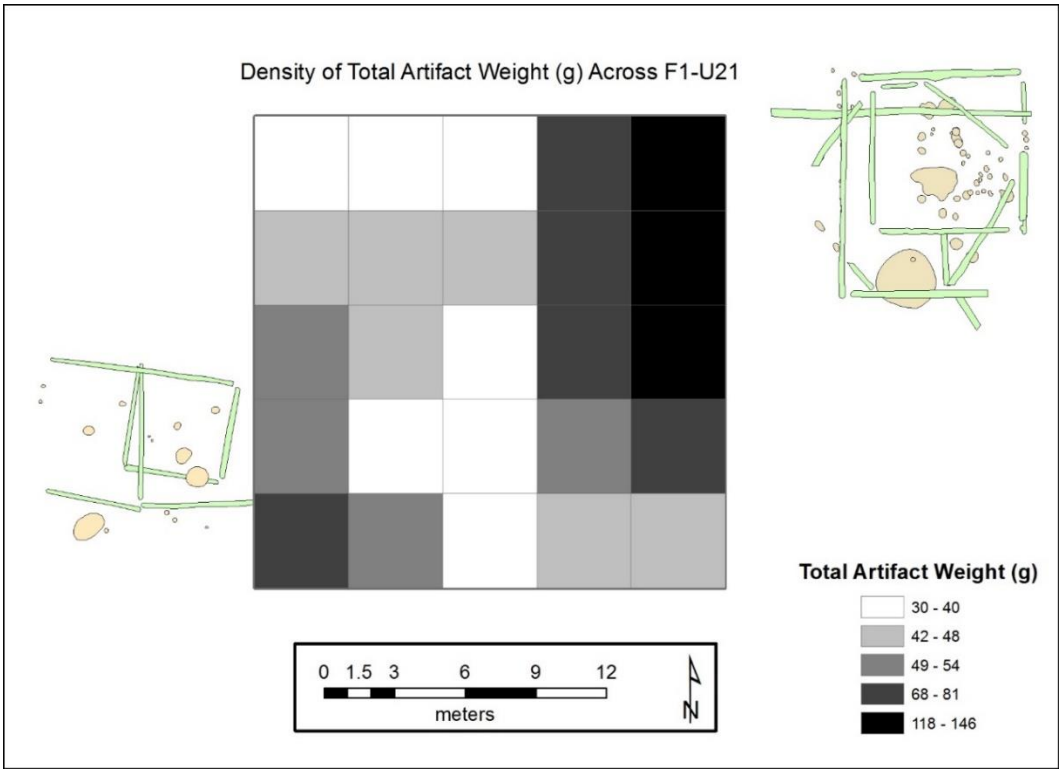


Figure 19. The density of assemblage weight across F1-U21

Features

F1-U2. Excavation block U2 contained few features on the interior of the structures, with 33 potential cultural features. Of these, only two large pit features (features 100 and 117) and the wall trenches were described in detail by Guidry (2013:58), as the other features were generally small and "no spatial patterns were recognized despite attention to this detail". Feature 117 was a relatively large and deep feature attributed to structure 2. The eastern wall of feature 117 sloped inward across 85 cm to a depth of 79 cm before dropping to a rounded base about 1.03 m deep, indicating a slide trench that was commonly used in Mississippian households for erecting and/or extracting large centrally located posts (Guidry 2013:58). Feature 100 was a large midden pit with "various complex zones of midden fill with distinct boundaries, suggesting it was regularly used for refuse disposal" (Guidry 2013:66). Of the 1,776 artifacts excavated from features in F1-U2, nearly 85% come from features 100 and 117, with 56% coming from feature 100 alone.

F1-U19. Excavation block U19 contains 15 features, half as many as that found in F1-U2 despite having only one less construction episode. Most features are small post/stake sized holes, however a few features warrant further analysis. Feature 6 is an amorphous pit feature measuring approximately 1 m east-west by 1 m north-south at the surface. The internal stratigraphy of feature 6 indicates two layers, the first sloping down to 6 cm, while the base of layer two is approximately 9 cm deep. Despite being rather shallow, feature 6 contained some of the largest pieces of ceramic found to date at Ames, including one rather whole piece of rim with a small handle.

Figure 20. Piece of rim with a loop handle found in feature 6 of F1-U19.

Feature 1, located within the structures, measures 38 cm east-west by 40 cm north-south and has two internal stratigraphic zones. Zone 1 of feature 1 is a shallow basin with an ashy fill extending to a depth of only approximately 5 cm. Zone 1 has added complexity due to a plow scar cutting directly through the feature and into zone 2. Zone 2 of feature 1 gradually steps down to a depth of about 8 cm from the north, while the southern wall is nearly vertical.

F1-U21. To analyze the distribution of features within the inter-structure space, five 4 m x 4 m units were excavated diagonally across F1-U21. The initial plans called for every other 4 m x 4 m block to be excavated, for a total of 13; however a rainy field season cut the sample size from 50% to 20%. In order to maximize the efficiency of this method, it was decided to overlay the results of these excavations over the magnetometry data collected in 2009 and 2010 in a GIS system. By utilizing what was excavated, and comparing to the magnetometry data, I recognized

the magnetic signatures that best indicated features and then identified any possible patterns of the features by their magnetic signatures. This methodology better allows the ability to identify feature patterns without having to excavate all thirteen 4 m x 4 m blocks.

Very few noteworthy features were excavated in the inter-structure space. A total of 24 features were found to be cultural in nature. Most features were relatively small in size and indicated no internal stratigraphy. These small features did not indicate any general pattern. A few features, however, warrant further description. In unit 1, an extension of trench five from a structure in F1-U19 extended almost 90 cm across the northwest corner of the unit, indicating that the structure extended further than previously thought and into a small part of F1-U21.

Two noteworthy pit features were excavated or were partially excavated in unit 25. Feature 4 stands out as a large pit feature measuring approximately 1.3 m east-west by 1.2 m north-south at the surface. Feature 4 is interesting due partly to its shape and internal stratigraphy. Excavated in quarters, four or five in strata with transitional boundaries were identified in profiles. The thickest strata extends from about 10 cm deep to 32 cm deep at the center and gently slopes upwards at the edges till it is at the surface. At the center, the pit measures about 42 cm deep. Excavations revealed that the walls gently sloped downwards until approximately 30 cm deep were the wall flattens horizontally for about 8 cm before dropping down again to the pit base, forming a small step around the base of the feature. This step was initially confusing during the excavation of the first quarter and part of it was excavated, however it was identified in the other two quarters excavated. Feature 4 also contained nearly all of the artifacts obtained from features in F1-U21, including one large piece of ceramic.

Figure 21. Feature 4 of F1-U21.

Feature 3 in unit 25 also necessitates further description. This feature is located within the southwest corner of unit 25, thus it is believed that less than a fourth has been excavated. The southern half of the feature was excavated so as to see a profile. At the surface, it is about 65 cm wide east-west and 1.4 m long north-south, and at the wall of unit 25 it measures a depth of 40 cm. Two layers of mottled fill was observed, each about 20 cm thick and not following the curves of the feature walls. Only four pieces of daub were found in feature 3, however charcoal flecks were observed on the feature surface.

4. Analysis

This chapter covers the analysis of the distribution of cultural remains of the inter-structure space at Ames. The subsequent paragraphs will contain a comparison of the artifact density, feature density and magnetometry data, and surface collections between the structures and the space between them. Comparisons and contrasts are made about the types of materials and features between the three areas indicating differential functions of space.

Artifact Densities

Structures. When discussing F1-U2 and F1-19, a few decisions were made in regard to artifacts to use in comparison. One decision was to eliminate certain artifact categories from the assemblage of F1-U2, such as bone, charcoal, and other. This is primarily due to the fact that these artifact types were not found in either of F1-U19, nor F1-U21. While the presence of these categories might tell us some more about the usage of space at F1-U2, they could not be compared to the other units and were felt to be slightly skewing the comparable data.

A further decision was made to remove the artifacts found within wall features for comparison with the inter-structure space. This data, while important, is not necessarily an indicator of activity areas of a household, but rather a part of the physical construction technique of the structures. That is not to say, however, that they can tell us nothing. For example, the artifact assemblage of the two structures wall features are radically different. In F1-U2, the count is nearly 70% smaller, sandstone pieces probably used for a chinking material to stabilize the posts in the trench. When looking at the weight of the trench assemblage, it is 85% sandstone and daub, thanks to rather large pieces of daub. When compared the trenches in F1-U19, one sees a radically different material. In count and weight, ceramic makes up 64% and 68% percent

of the assemblage respectively. Despite there being less construction episodes, and thus less wall trenches, F1-U19 still had surprisingly less artifacts in the trenches than F1-U2. For example, 786 artifacts were collected from the walls of F1-U2, but only 64 were found in F1-U19.

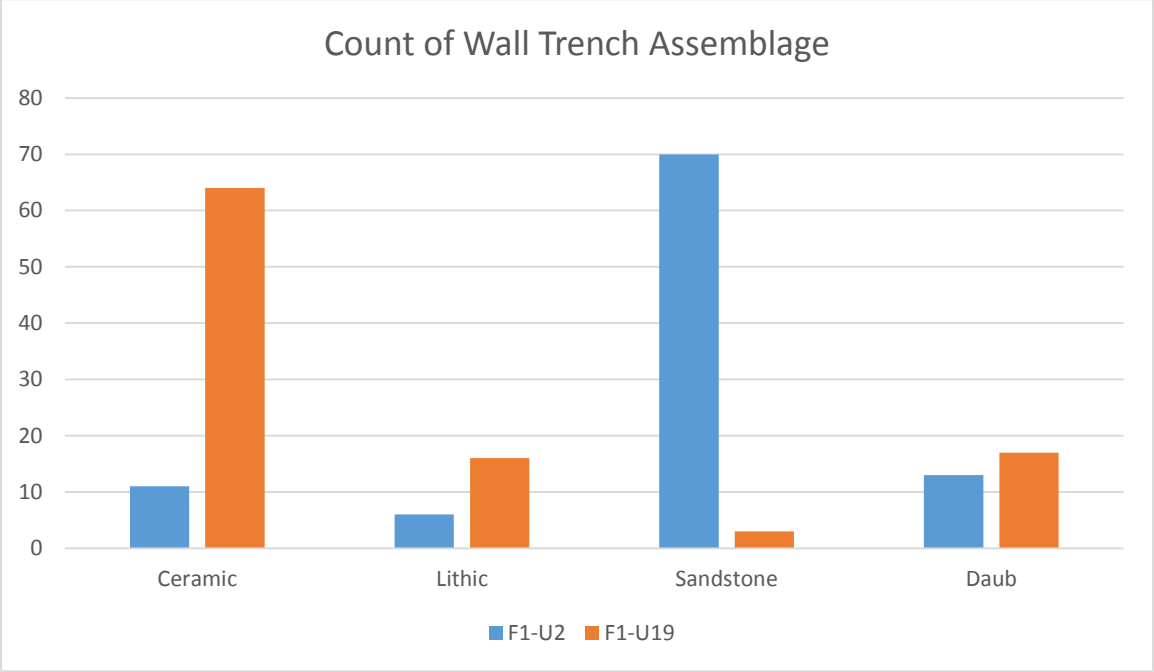


Figure 22. A comparison of the percentage of each artifact type counted in the wall trench assemblages of F1-U2 and F1-U19. Ceramic is higher in F1-U19 (64%), while sandstone is significantly higher in F1-U2 (70%).

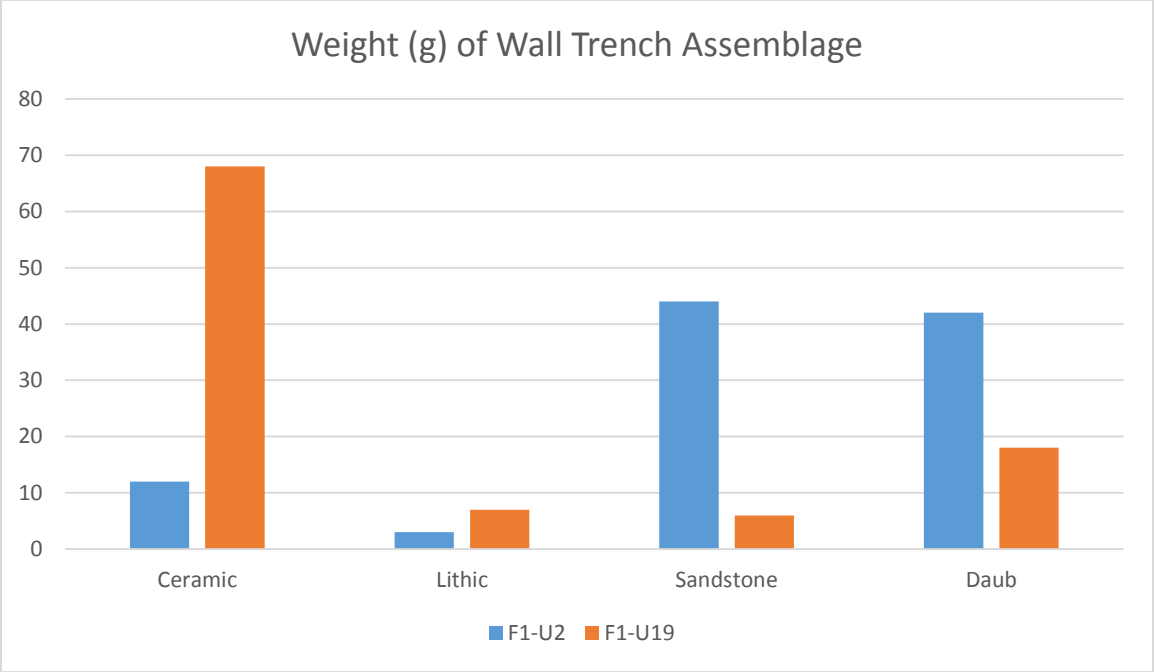


Figure 23. A comparison of the percentage of each artifact type in the weight of the assemblage of the wall trenches of F1-U2 and F1-U19. Ceramic (68%) is significantly higher in F1-U19, while sandstone is higher in F1-U2 (44%).

Having removed the trenches from consideration, the two structure block assemblages can be compared in an attempt to show similarities of the cultural debris within the structures, indicating that similar activities were taking place within both structures. If the structures are similar, then one can more easily compare both to the space between them to determine possible differences. With the trench numbers removed, the overall assemblages become bit more similar. There do continue to be two primary differences between the two structure block assemblages though. First, there are still significantly more artifacts within F1-U2 than in F1-U19. This could be of interest, as first, there continues to be more sandstone in F1-U2 and more ceramic in F1-U19. This should be of no surprise considering the differences in construction, and some feature fill that will be discussed later.

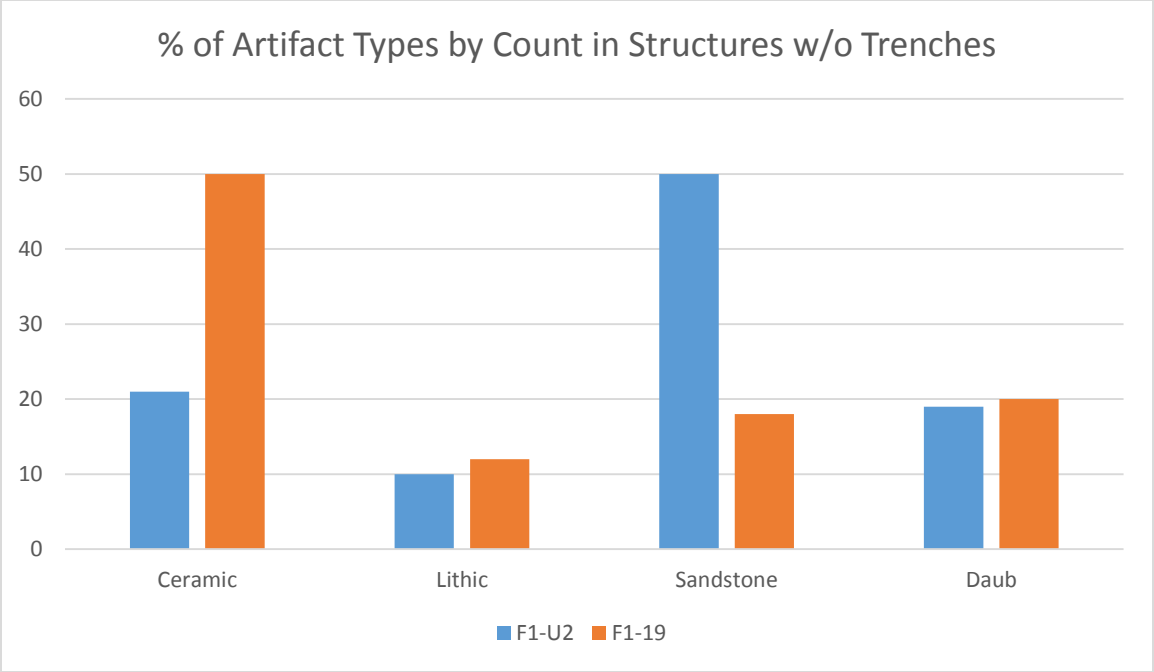


Figure 24. Comparison of the percentage of each artifact type in the assemblages of F1-U2 and F1-U19 once the wall trench artifacts were removed.

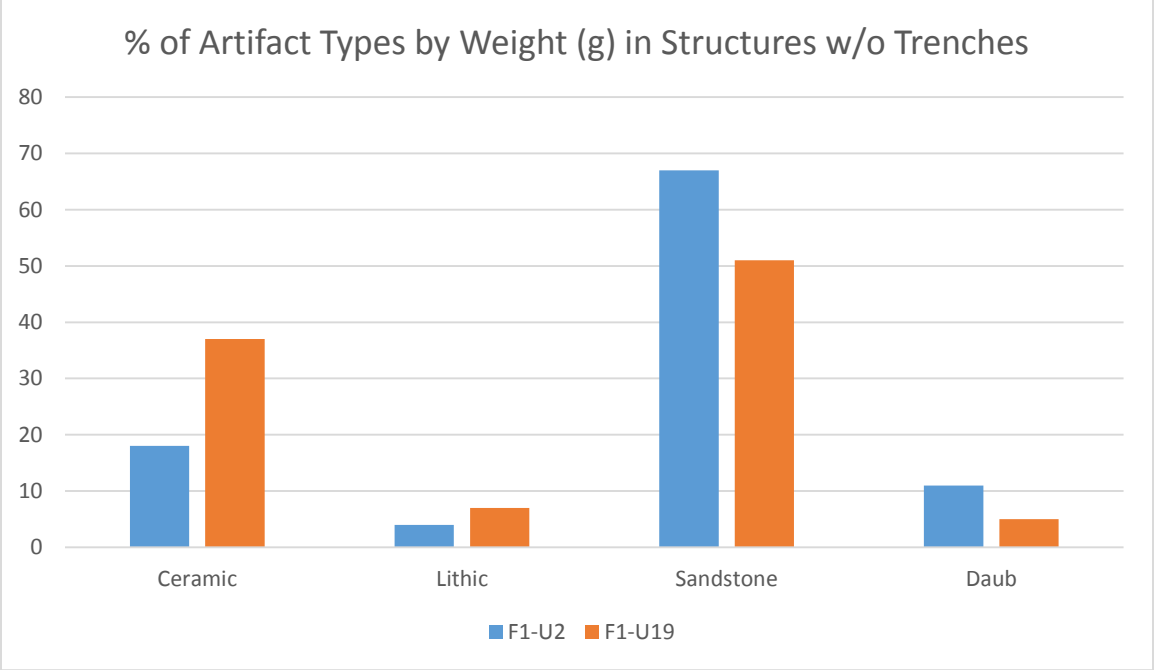


Figure 25. Comparison of the percentage of each artifact type in the assemblage weights of F1-U2 and F1-U19 once the wall trench artifacts were removed.

Features

Structures. A brief discussion of the features within the structure blocks is warranted to determine the differences between interior and exterior spaces. An analysis of the artifacts indicate some differences in the activities taking place within the two structures, as the amount is far greater in U2 than U19, and there remain to be differences between the amount of each artifact type within the assemblages, even without factoring in the wall trenches. This corresponds with the morphology of the wall trenches in each unit. The wall trenches in U2 exhibited prominent postholes, whereas the wall trenches in U19 exhibited no postholes. The presence of significant amounts of sandstone in the wall trenches for a chinking material between posts in U2 is not seen in the wall trenches of U19. Looking at the artifact densities and the morphology of the wall trenches, there is very clearly a difference in construction methods between the two structure blocks. This could indicate either that the structures served different functions or different resources were available to the builders.

Initially, it was believed that only two structure episodes were evident in F1-U19, however, an extension of trench 5 into unit 1 in U21 seems to indicate that there might be three construction episodes. Excavations are ongoing, so this cannot be confirmed at present, so two construction episodes will continue to be used for analysis for this thesis. If all of the features in the structure blocks are averaged by construction episode, there would be approximately 11 features per construction episode in U2 and approximately 7 in U19. This imperfect system seemingly indicates that there was similar feature density within each construction episode between the two structure blocks. Without radiocarbon dating for each feature, it is nearly impossible to determine at present what features went with which structure construction episode.

If there is indeed a third construction episode present in U19, then the feature densities per construction episode would indicate further differences between the two structures.

When looking at the contents of the features within the structure blocks, it is easily seen that the majority of features within the structures are small posts or stakes with no recognizable pattern. The primary difference between the structure features appear to be the amount of artifacts excavated from them. Nearly 1,800 artifacts were excavated from 16 of U2's 33 features, while only 168 artifacts were found in four of U19's 16 features. This is fairly deceiving, as only two features (100 and 117) accounted for 85% of all feature artifacts in U2, and feature 6 accounted for 93% of all feature artifacts in U19. Analyzing the types of artifacts found in the features shows that the feature fill is quite noticeably different between structure blocks. U2 features, like the trenches, were composed primarily of sandstone, with very little ceramic, lithic, or daub. The feature fill of U19 is composed almost exclusively of ceramics, with very little lithic and daub and absolutely no sandstone. It is also important to note that bone and charcoal was excavated out of features in U2, but not in U19. While excluded in comparisons, it too represents a difference between the two structure blocks.

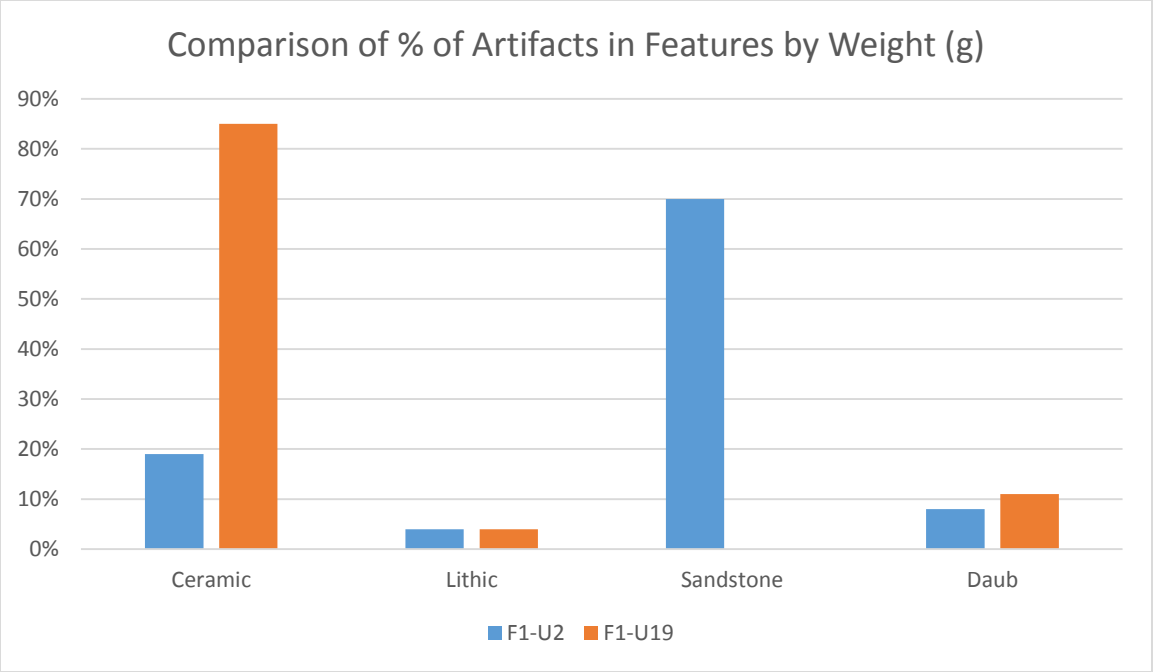


Figure 26. A comparison of the percentage of each artifact type in the two structure blocks by weight in grams. Bone, charcoal, and other were excluded from the weight of F1-U2 as they weren't found in F1-U19. Historic artifacts were found in neither as well.

Inter-structure Space. Due to rain cutting excavation short and limiting the sample size to determine feature density, it was decided to overlay the features onto the existing magnetometry data in order to determine if general patterns could be seen from the magnetic signatures. Feature locations were drawn into a GIS system from the excavation map and then overlaid onto the magnetometry data. Preliminary results showed that features 3 and 4 of F1-U21 corresponded quite strongly with the large circular magnetic signatures common across the site. This further confirms that these magnetic signatures are middens, storage pits, or both.

In order to create a cleaner image to identify patterns, it was decided to reclassify the intensity values of the magnetic signatures to remove background noise. The first step was to convert all negative values to positive by converting them to their absolute value. The next step was the actual reclassification of intensity values into five deterministic classes. Once this was

processed, a pattern was easily recognizable across F1-U21. Nearly all of the areas where magnetic intensity is strongest is located on the half of the block closest to the structures in F1-U2, including the strongest signatures indicating possible middens, as the locations of Features 3 and 4 confirm.

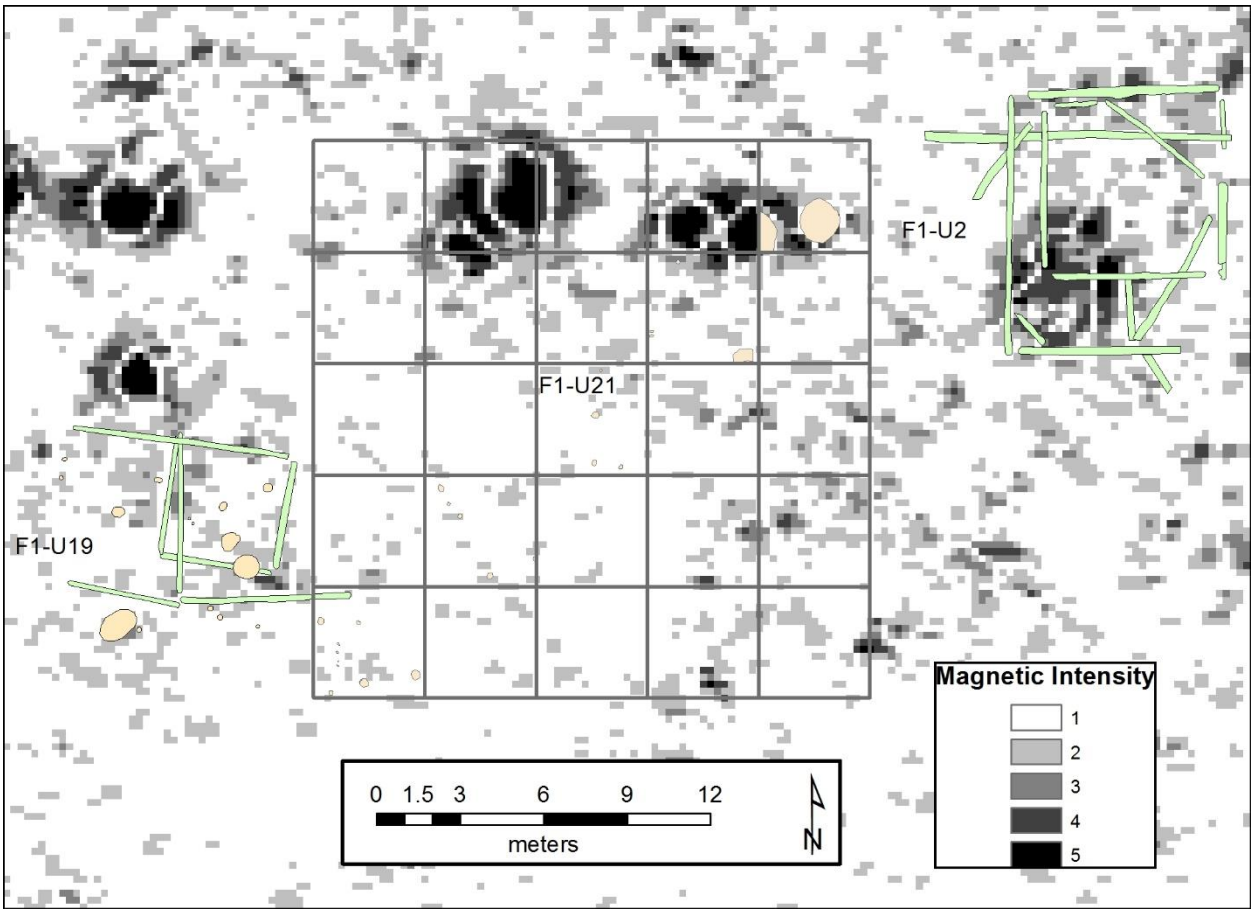


Figure 27. Reclassified magnetic intensities in the study area.

A clear line seemingly curves through the southwestern corner of the block where no or very weak magnetic intensity occurs, indicating a lack of features, in particular large features. This area actually seems to encircle the structures within U19. Combined with the artifact densities of the 1 m x 1 m units, which indicate that 5 of the 7 heaviest units were located in the areas outside of this weak magnetic zone, it appears that the space outside of U19 exhibits very

little evidence for activity areas, while the space closer to U2 indicates significant activity outside of the structures.

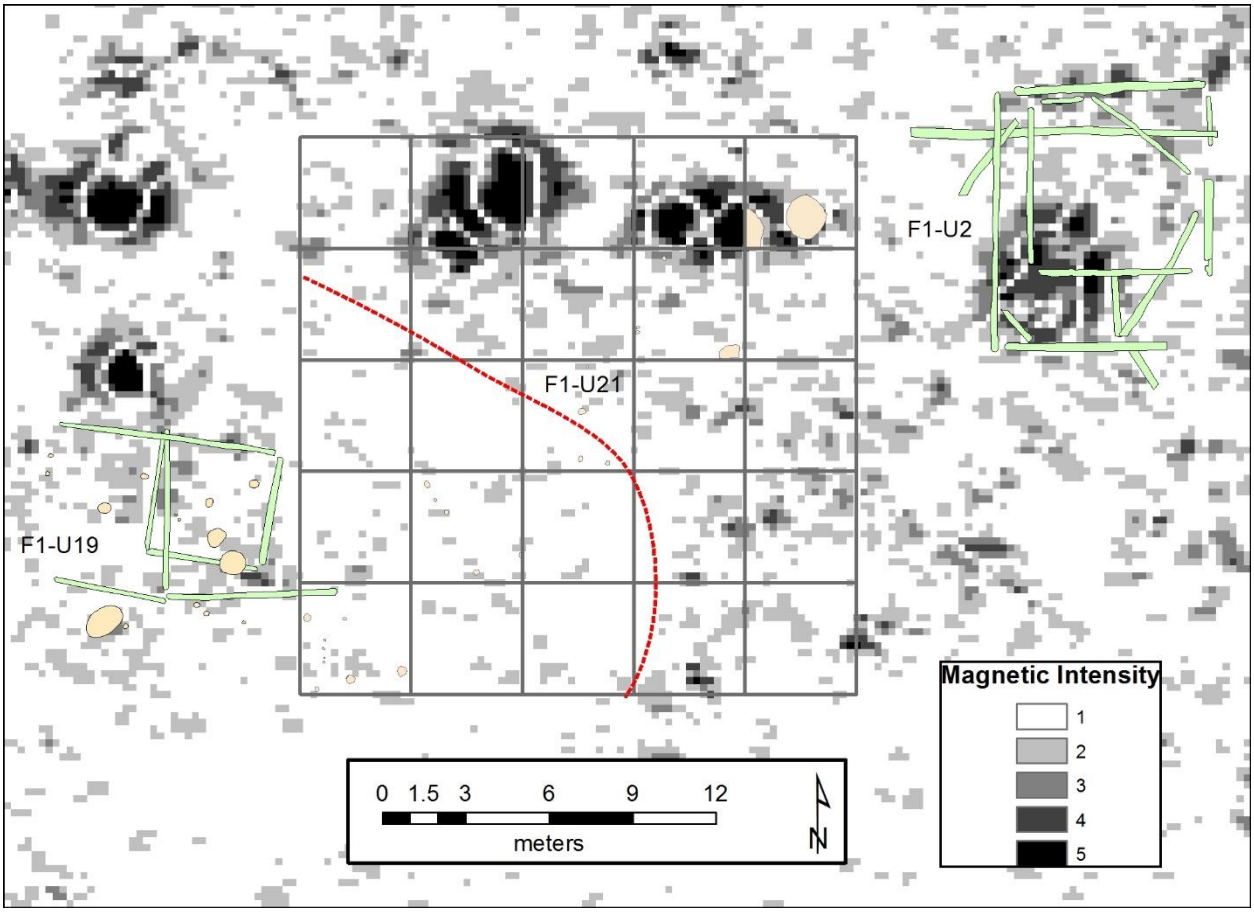


Figure 28. Reclassified magnetic intensities in the study area with line to distinguish where magnetic signatures pick up in F1-U21.

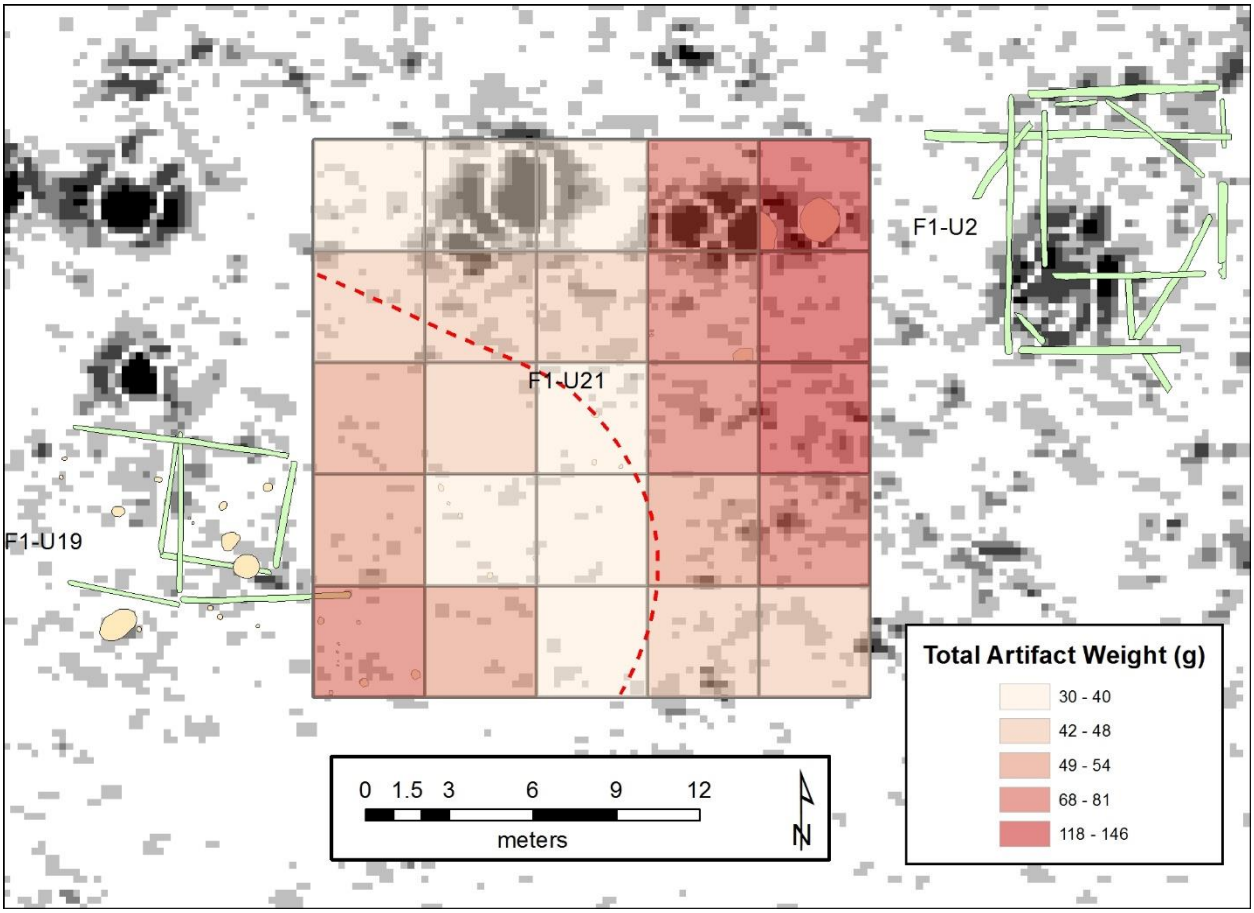


Figure 29. Density of total U21 artifact assemblage weight over the reclassified magnetic intensities. The heaviest units correspond with the area of greater magnetic signatures closer to F1-U2.

Only 26 artifacts were excavated from two (3 and 4) of the 26 features within U21. The count percentages of the feature artifacts were: ceramic (46%), daub (23%), lithic (15%), and sandstone (15%). The weight percentages of the feature artifacts were: ceramic (46%), daub (10%), lithic (1%), and sandstone (43%). One large piece of ceramic weighing almost 61 grams and one piece of sandstone weighing almost 59 grams could possibly be skewing the weights. Comparing this to the two structure blocks, we can identify some differences. Like U2 and U19, U21 contains very little lithics or daub, but unlike the other two excavation blocks, U21 contains significant amounts of sandstone and ceramics in the feature fill instead of just one or the other.

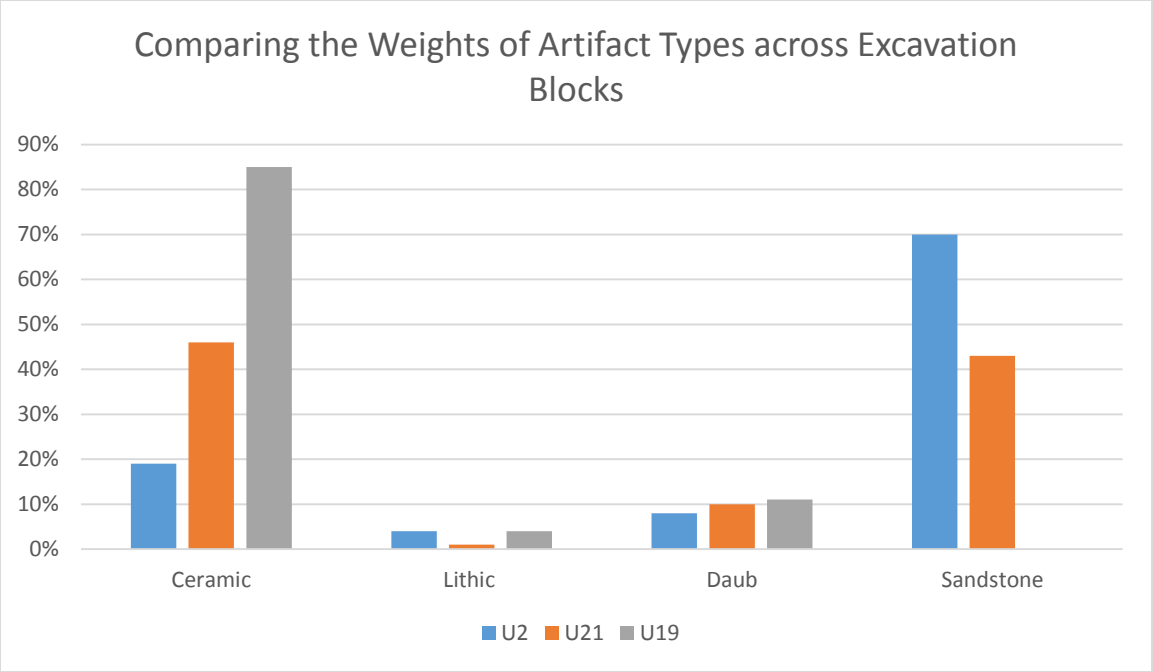


Figure 30. A comparison of the percentage of each artifact type weight across the three excavation blocks.

Surface Collections

Finally, surface collections recovered from 2007 and 2009 were analyzed to identify if any patterns could be recognized. While it initially appeared that surface artifact density followed the pattern of being heavier closer to U2, a closer look at density of the collections across the site showed that the pattern was not all that different than any other random spot. At this time, I believe that surface collections are at the wrong scale of analysis for this research.

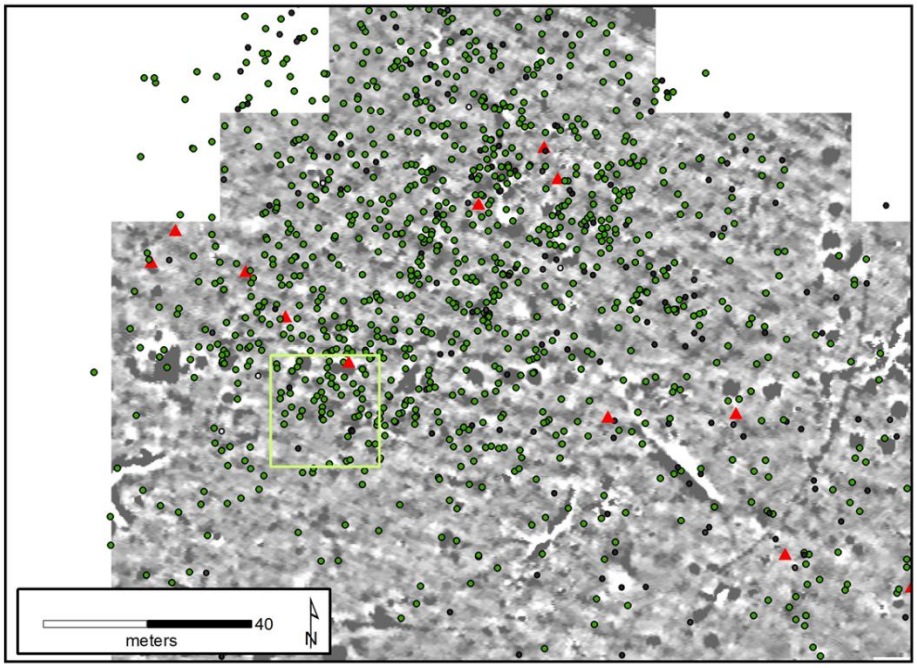


Figure 31. Spread of surface artifacts collected during surface surveys. U21 is the yellow box.

5. Discussion

Household Clustering

The layout of Ames exhibits the primary elements and patterns of spaces that "arose from the collective cultural histories and natural environment" that were "socially meaningful" during the Mississippian cultural period (Lewis et al 1998:5). These architectural elements included such features as mounds and earthworks, palisades, off mound habitation areas, and plazas. Understanding how these elements changed over time to meet the needs of the inhabitants is critical. Research at Ames has indicated a changing layout of the site, a shifting pattern of habitation over time to accommodate the changing political, economic, and natural worlds that those living at Ames were interacting within. The multiple construction episodes within F1-U2, for example, show a changing orientation and sizes of the structures, as well as one extensive palisade being eventually replaced with a stronger, more extensive wall (Guidry 2013). The two, possibly three, construction episodes within F1-U19 also show changing orientations and sizes corresponding with those in F1-U2.

In order to further understand these changes, this research decided to focus on the household and the use of space by the household, in particular outside of the structure. As Hammel (1980) defined, the household is "the smallest grouping with maximum corporate function." As the fundamental activity unit of society, the household is typically considered to be composed of the dwellings, activities of the members, and the members themselves, and are therefore responsive to social, political, and economic changes. Households are "foremost a domestic strategy designed to meet the social, material, and subsistence needs of their membership" (Nass and Yerkes 1995:69). As an archaeologist, it is impossible to excavate social

units, but it is possible to infer off of the material culture that resulted from the activities of these social groups (Wilk and Rathje 1982).

Using the patterns of material culture of the Kekchi people in Belize, Wilk (1984) was able to define two types of households: the independent household and the household cluster. Members of an independent household form a tight, cooperative unit that generally inhabits a single dwelling unit, while a household cluster usually involves the cooperation of the members of multiple dwelling units as a corporate group (Wilk 1984). This household clustering can be seen within the Mississippian settlement plan as well. At the King site in Georgia, for example, Hally (2008) was able to identify multiple household clusters forming the primary unit of social life by examining features, burials, artifacts, and the structure orientations and construction episodes. In his analysis of the signatures within the magnetometry data collected at Ames, Goddard (2011:48) identified "18 to 24 structures… in groups of three or four", thus speculating that household clustering was evident at the site. In an attempt to determine which activities linked households together, the inter-structure space was investigated between two previously excavated structures with multiple construction episodes, and similar changes in orientation and shape over time.

The data collected in this research does not confirm the household clustering hypothesis and suggests (with some caveats as discussed later) the independent household hypothesis. In order to state that household clustering was evident, features and artifact densities needed to be even across the space between the U2 and U19. Artifact densities and magnetometry data show that very little was taking place outside the structures in U2, while the material culture resulting from activities was greater around U19. This can be seen quite clearly in the magnetometry data where a line can be drawn through the inter-structure space marking where cultural material

shifts from being concentrated to a level beginning to approach zero. The artifact densities also show that the heaviest units are on one side of U21, and not spread evenly across.

Despite not being able to identify household clustering at this time, it is not impossible that two alternatives could be affecting this conclusion. The first being that these two structure blocks were not a part of the same household clusters, and thus the zone indicating little cultural activity areas could be a buffer between two domestic groups. This does not appear to be likely due to the structures similarities chronologically and in changing orientations and sizes. A second possibility is that the structures served different functions, therefore having different functions for the exterior space. This could explain the differences in artifact assemblages and the different construction methods.

Inter-structure Activities

One goal of this research was to determine what the function of inter-structure space was to define the type of activities that might be happening outside of the structures. While artifact and feature densities were low, especially for one half of the inter-structure space studied, some conclusions can be drawn. The imbalance of features and artifacts across the space indicates that the area was not a shared, corporate space connecting the households, as established above. Several large middens were almost exclusively located outside of the structures however, indicating that the dumping of waste and debris was primarily outside of the structure. The presence of worked stone and ceramic does exist within the area, yet not at a level far surpassing that within the structures. It is therefore seen that manufacturing probably did occur outside of the household as it did within, but further testing is necessary to determine whether specific activity areas special to the outside space occur.

Alternative Mound Hypothesis

One alternative scenario was seriously considered after analysis to explain the differences between the structures in U2 and U19 and their corresponding exterior spaces within U21. This scenario posits that at one point, a small mound was constructed over the structures within U19 that has since been destroyed. While doing analysis on the magnetometry data across the focus area, a grey zone containing few strong magnetic signatures was noticed circling the structures contained in U19. This zone remained in the image, even after the magnetic intensity values were reclassified (refer to figures 27 and 28). This circular zone containing very little in the way of strong magnetic features, combined with the lack of artifacts within that zone, initially indicated that an unknown, destroyed mound was at least a plausible explanation.

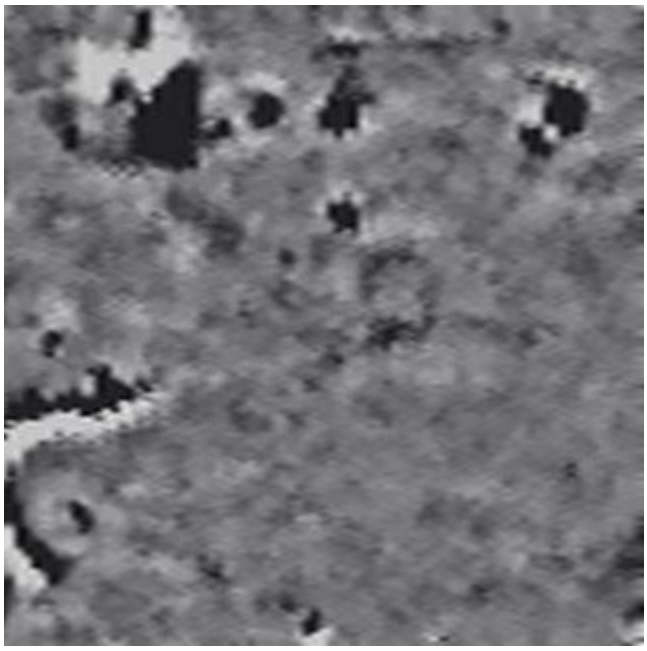


Figure 32. Magnetometry image of U19, the square shape located approximately middle of image. Grey zone appears in roughly circular appearance around U19.

Other sites in the region exhibit sub-mound structures that would be comparable to the structures in U19. At Obion, postmolds representing five structures, several hearths, burials, and a large quantity of pottery were recovered under Mound 4 (Garland 1992). While no burials were evident in U19 like those found at Obion, it is important to mention that the bones under Mound 4 at Obion were decomposed beyond saving, and even the "position and orientation of the body evidently could not be determined" (Garland 1992:19). More ceramic was also found within the structures in U19, including the large ceramic rim with a handle mentioned previously, which has been the largest and best preserved ceramic at Ames. This could be explained by better preservation and protection from agricultural practices from the possible mound. At Obion, the original Harvard researchers mention finding significant amounts of pottery, including a number of rims and handles (Garland 1992).

Jonathan Creek, a mound center in the Tennessee River drainage in western Kentucky also deserves mention. The site is famous for the multiple palisade constructions, including a rather substantial wall with defensive bastions; however it is one small mound that pertains to the research at Ames. At the southern portion of the habitation area, it was recognized that several superimposed structures were located on a low mound, something that the original excavators of the site in the 1940s did not immediately recognize (Schroeder 2006). Much like Ames, a palisade running across a portion of this low mound area contributes to initial confusion in the identification of a possible low mound. Also like Ames, the mound would have been constructed at what had previously been the margins of the town during a time of growth, as indicated by the construction of more extensive palisades expanding the habitation area within the walls (Schroeder 2006). At Ames, the construction of a low mound in an area previously on the margins of the town at the same time the second, more extensive palisade wall was going up to

expand the size of the town indicates that the site was undergoing significant cultural changes. At Jonathan Creek, Schroeder (2006:129-130) states that the small mound was a "physical manifestation of claims to authority in a new neighborhood" and was the leaders assertion of their power through the "reorganization of sacred, ritual, and secular spaces". As the town grew in size and more space was needed for an expanding plaza, the habitation zone moved slightly south and the leaders created a new space to assert their power and connection at what had previously been the edges of town (Schroeder 2006). This scenario is also plausible at Ames if it is indeed true that a low mound at one point sat at the same location as U19.

Along with Jonathan Creek and Obion, an interesting comparison can be made with Mounds 36 and 37 in Ramey Field at Cahokia. Both of these mounds, sitting just east of Monks Mound, are very low mounds that might not be immediately recognizable to the eye, in particular Mound 37. Most of the mounds in this part of the site, including Mounds 36 and 37, were plowed over during the 1900s (Iseminger 2010). For an example of how quickly a mound can be leveled, Mound 37 was documented by the Thomas Map of 1894 as about 3 meters tall, and the Peterson-McAdams Map shows a height of 1.8 meters tall (Cahokia Mounds State Historic Site 2016). Now, the mound is barely discernable and serves as an example of how quickly agricultural practices can level mounds.

Hargrave (2011) performed magnetometry surveys across Ramey Field, including Mounds 36. Looking at the magnetic data collected during his survey, "an individual unfamiliar with the site would almost certainly not recognize the presence of Mound 36" (Hargrave 2011:13). Looking at the images produced, however, Hargrave (2011:7) identified that stronger magnetic values indicating probable prehistoric materials increase in areas of domestic areas, and decrease in areas either unsuitable for occupation or were used for nondomestic purposes.

Looking at the magnetic data in U21 at Ames, it appears to echo the same findings as at Ramey Field. Magnetic signatures increase around U2, which is believed to be a domestic habitation, while the signatures are fairly absent around U19, which could be explained by the presence of a mound such as it is with the case of Mound 36.

Another indication that a small mound might have occupied the same location as U19 is that it would have fit within the layout of the town. First, Mound C is directly due celestial north from U19. Drawing a line from Feature 1 of U19, a probable hearth, to the top of mound A produces a 330 degree angle, an alignment that corresponds with the summer solstice sunset and the winter solstice sunrise. Another line drawn from mound A through mounds B and D, produces a 60 degree angle, which aligns with the summer solstice sunrise and the winter solstice sunset. Therefore, a possible mound at U19 would have fit within a town plan corresponding to celestial alignments.

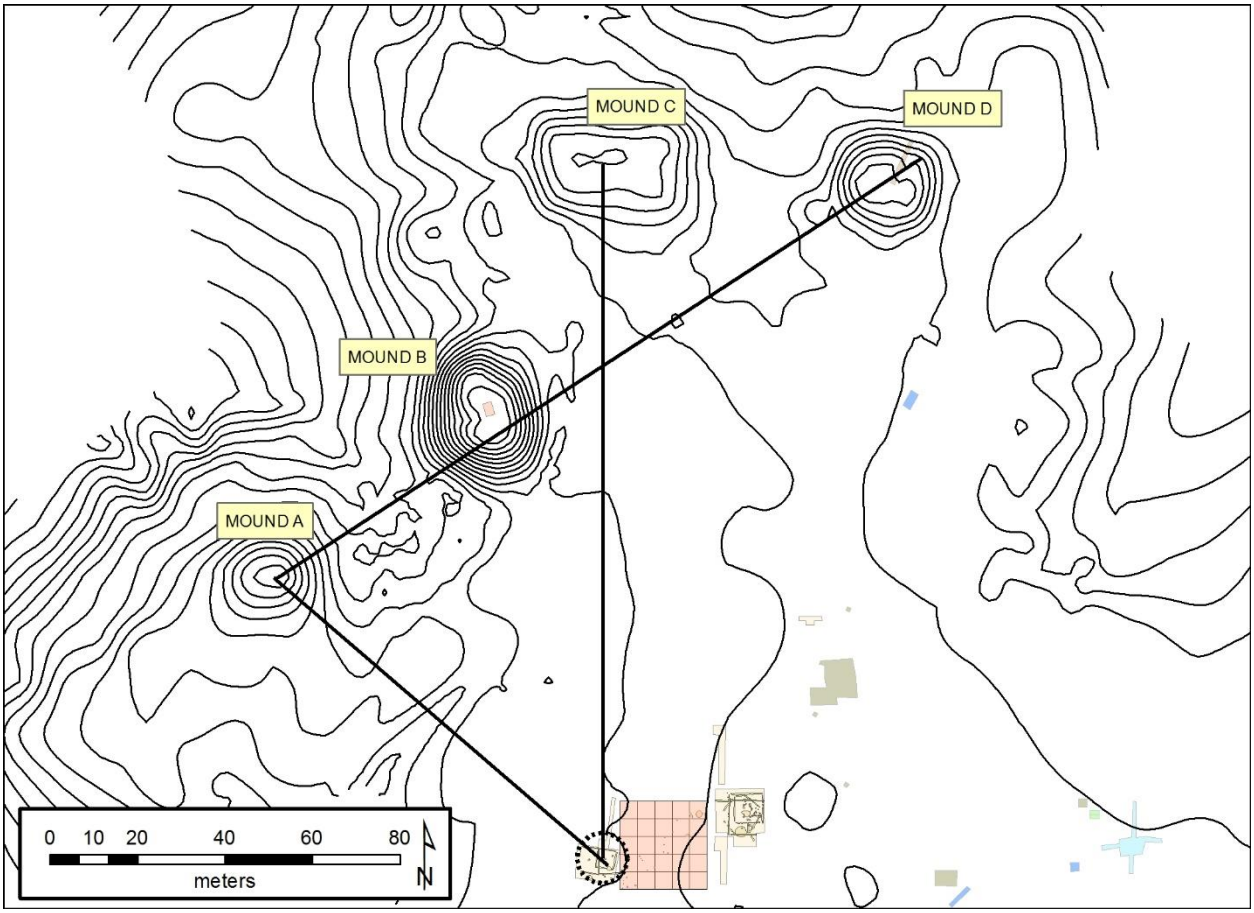


Figure 33. Celestial alignments of the mounds at Ames, including F1-U19 as a possible mound. Mound C is directly celestial north of U19. U19 to Mound A aligns with the summer solstice sunset and the winter solstice sunrise. The line from mound A to mounds B and D aligns with the summer solstice sunrise and the winter solstice sunset.

Other possibilities beyond a possible mound exist. It seems apparent, when combining the artifact density in the plow zone and feature density, that the two structures served different functions with different activities. Due to the multiple construction episodes, increased densities of artifacts and pit features, and the relatively greater evenness of artifact types found within the area within and around F1-U2, that this was primarily a domestic habitation. The same cannot be accurately stated for F1-U19 without a doubt. U19 contained less artifacts and features within and around the structure, especially if a third construction episode is found to be the case. The greater amounts of ceramic could indicate a workshop specifically for that, but that seems rather

unlikely as the amount of ceramics is not exponentially greater than what would be expected in that scenario. U19 could have also been a ceremonial structure, as possibly indicated by the greater amounts of ceramic and the lack of large middens, such as those found around U2, as an attempt to keep that space clear and clean. This could also work with the mound hypothesis, as the structures located on or under the small mounds at Obion (Garland 1992) and Jonathan Creek (Schroeder 2006) served ceremonial and funerary functions, however no exotic goods, burials, or other indications of ceremonial functions are evident within U19. One other possibility is that the structures served as habitation for winter and summer seasons and that different activities were done during the two seasons.

6. **Conclusions and Future Research**

This study continues to build off of a rapidly growing source of material and knowledge regarding Ames. Excavations, combined with magnetometry data, allowed statements to be made as to the fundamental activity units of the site, the household. Analysis of artifact and feature densities currently, in this case, confirms that household clustering is not evident at Ames, and that the independent household was the primary domestic unit. The function of the space between structures could not be conclusively shown, as two very different types of exterior activities were exhibited around the two structure blocks. It does appear, however, that the space was used primarily for the dumping of waste and cultural debris into large outdoor middens, as well as possible storage pits that could have later been turned into middens. An analysis of the artifacts in U21 show some worked stone and ceramics, indicating that there is a possibility of manufacturing similar to that seen within the structure.

Revisiting the initial hypotheses regarding household clustering or dispersion, we can safely reject the null hypothesis, as the artifact densities in the plow zone and the feature densities cluster much more strongly around and within U2. This also confirms H_1, that there is no evidence for household clusters at this time in that the U2 and U19 do not exhibit any evidence of being linked together. This confirmation of H_1 rejects H_2, that clustering is evident.

Regarding the initial hypotheses concerning the use of space between buildings, the hypotheses could not be as confidently confirmed or rejected thanks in part to the differences exhibited in U21 between the two structures. However, the null hypothesis can be rejected as the data collected can explain how space was used around structures. Hypothesis one, that the space was a corporate space shared by the inhabitants of the two structures, must be rejected as cultural debris was not spread evenly between the two structures. Hypothesis 2, that the space was used

as a workspace, can be confirmed as there are evidence of flakes, worked stone, ceramics, and possible storage pits within U21, especially in the space closer to the structures in U2. It does not appear, however, that this was a primary workspace as the cultural debris is similar to that within the structures. The existence of large pit features that appear to be middens within U21 also confirms H_3, that the space was used for dumping waste resulting from cultural activities. The confirmations of H_2 and H_3 would also confirm H_4, as the space between structures was used for a variety of activities. The final hypothesis, H_5, cannot at this time be rejected or confirmed. This hypothesis states that the primary activity areas take place within the household, and in order to confirm the activity areas would primarily be located within the structures and the inter-structure space would be relatively clear of cultural material. The data collected suggests that two very different spaces surrounded the two structure blocks. While the space around U19 was kept relatively clear of artifacts and features and thus confirming H_5, the area around U2 contained higher amounts of artifacts and features, which would reject this hypothesis.

A possible alternative scenario was proposed to explain the differences between U2 and U19 involving the possibility of a small, low mound at one point in time occupying the same space as U19. The lower densities of artifacts and features around U19, more ceramic than expected, and different construction methods of the structures in U19 could all indicate the presence of a mound over a ceremonial structure or house. Furthermore, we see similar situations taking place at the Obion and Jonathan Creek sites within the region. The possible mound would have been constructed at the same time or shortly after the expansion of the town through the construction of a second, more extensive palisade, and placing U19 no longer at the edge of the town. As Schroeder (2006) has speculated with a similar scenario at Jonathan Creek, this could be an indication of the leaders at Ames asserting their power into a new part of the town through

the physical manifestation of the mound. Other alternatives are also possible, as the possibility that U19 is a ceramic workspace or ceremonial space were mentioned, as well as the possibility that the structures were seasonal summer/winter habitations.

Whether this is true or not is difficult to ascertain, as this research was only able to analyze only a small amount of the overall site. It is possible that the conclusions arrived at by this study could be wrong due to this small frame of data. Improving the understanding of the Ames better helps establish an understanding of how communities developed during the Mississippian period in West Tennessee, and future research is necessary to accomplish a better frame of reference.

Future Work

Continued excavations are necessary within U21 in order to truly establish whether the inferences made based off of the magnetometry data are correct. Further 4 m x 4 m blocks need to be excavated. It also needs to be seen as to whether the inter-structure space in U21 might have been placed within a gap between two different household clusters, thus impacting the decision that clustering is not evident. Excavations in all directions of the structure blocks might be necessary to accomplish this. Further testing is also needed on the alternative small mound hypothesis, to establish whether that is possible, or whether the differences between the U2 and U19 structures is solely functional.

References Cited

Anderson, David G.

1994 *The Savannah River Chiefdoms: Political Change in the Late Prehistoric Southeast.* University of Alabama Press, Tuscaloosa.

Ashmore, Wendy and Richard R. Wilk

1988 Household and Community in the Mesoamerican Past. In *Household and Community in the Mesoamerican Past*, edited by Richard R. Wilk and Wendy Ashmore, pp. 1-27. University of New Mexico Press, Albuquerque.

Binford, Lewis R.

1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1):4-20.

Buchner, Andrew C.

1996 Mound A Excavations at the West Mounds Site, Tunica County, Mississippi. In *Mounds, Embankments, and Ceremonialism in the Midsouth*, edited by Robert C. Mainfort and Richard Walling, pp. 78-86. Arkansas Archaeological Survey Research Series, No. 46. Fayetteville.

Cahokia Mounds State Historic Site

2016 Mound 37. Electronic document, http://cahokiamounds.org/mound/mound-37/, accessed March 27, 2016.

DeBoer, Warren R.

1993 Like a Rolling Stone: The Chunkey Game and Political Organization in Eastern North America. *Southeastern Archaeology* 12(2):83-92.

Demel, Scott J. and Robert L. Hall

1998 The Mississippian Town Plan and Cultural Landscape of Cahokia, Illinois. In *Mississippian Towns and Sacred Spaces: Searching for an Architectural Grammar,* edited by R. Barry Lewis and Charles Stout, pp. 200-226. University of Alabama Press, Tuscaloosa.

Douglass, John G. and Nancy Gonlin

2012 The Household as Analytical Unit: Case Studies from the Americas. In *Ancient Households of the Americas: Conceptualizing What Households Do,* edited by John G. Douglass and Nancy Gonlin, pp. 1-44. University Press of Colorado, Boulder.

Dunnell, Robert C. and William S. Dancey

1983 The Siteless Survey: A Regional Scale Data Collection Strategy. In *Advances in Archaeological Method and Theory.* Academic Press, New York.

Ebert, James I.

1992 *Distributional Archaeology—Chapter 2.* University of Utah Press, Salt Lake City.

Garland, Elizabeth

1992 *The Obion Site. An Early Mississippian Center in Western Tennessee.* Cobb Institute of Archaeology. Report of Investigations 7. Mississippi State University.

Goddard, Eric

2011 *Investigating Early Mississippian Community Patterning in the Mid-South through Multiple-Method Survey of the Ames Site (40FY7) in Fayette County, Tennessee.* Unpublished Master's Thesis, Department of Earth Sciences, University of Memphis.

Griffin, James B.

1967 Eastern North American Archaeology: A Summary. *Science* 156 (3772):175-191.

1990 Comments on the Late Prehistoric Societies in the Southeast. In *Towns and Temples Along the Mississippi*, edited by David H. Dye and Cheryl Ann Cox, pp. 5- 15. The University of Alabama Press, Tuscaloosa.

Griffith, Glenn, James Omernik, and Sandra Azevedo

1998 Ecoregions of Tennessee. United States Geological Survey. Reston, Virginia. Electronic document, ftp://ftp.epa.gov/wed/ecoregions/tn/tn_front.pdf, accessed August 30, 2015.

Guidry, Hannah

2013 *Mississippian Architecture and Community Development at the Ames Site (40FY7), Fayette County, Tennessee.* Unpublished Master's Thesis, Department of Earth Sciences, University of Memphis.

Hadley, Scott P., Jr

2013 *Multi-Staged Research at the Denmark Site: A Small Early-Middle Mississippian Town.* Unpublished Master's Thesis, Department of Earth Sciences, University of Memphis.

Hall, Robert L.

2004 The Cahokia Site and its People. In *Hero, Hawk, and Open Hand: American Indian Art of the Ancient Midwest and South,* edited by Richard F. Townsend, pp. 93-103. Art Institute of Chicago, Chicago.

Hally, David J.

2008 *King: The Social Archaeology of a Late Mississippian Town in Northwestern Georgia.* University of Alabama Press. Tuscaloosa, Alabama.

Hammel, E.A.

1980 Household Structure in Fourteenth-Century Macedonia. *Journal of Family History* 5:242-273.

Hargrave, Michael L.

2011 Geophysical Survey of Complex Deposits at Ramey Field, Cahokia. *Southeastern Archaeology* 30 (1): 1-19.

Holmes, William H.

1886 Ancient Pottery of the Mississippi Valley. *Annual Report 4 Bureau of American Ethnology*, pp. 361-436. Smithsonian Institution, Washington D.C.

1914 Areas of American Culture Characterization Tentatively Outlined as an Aid in the Study of Antiquities. *American Anthropologist* 16 (3): 413-446.

Iseminger, William

2010 *Cahokia Mounds: America's First City.* The History Press, Charleston.

Johnson, Jay K. and Bryan S. Haley

2006 A Cost-Benefit Analysis of Remote Sensing Application in Cultural Resource Management Archaeology. In *Remote Sensing in Archaeology: An Explicitly North American Perspective,* edited by Jay K. Johnson, pp. 33-45. The University of Alabama Press, Tuscaloosa.

King, Adam

2003 *Etowah: The Political History of a Chiefdom Capital.* University of Alabama Press, Tuscaloosa.

2004 Power and the Sacred: Mound C and the Etowah Chiefdom. In *Hero, Hawk, and Open Hand: American Indian Art of the Ancient Midwest and South*, edited by Richard F. Townsend, pp. 151-166. Art Institute of Chicago, Chicago.

Knight, Vernon J., Jr.

2006 Farwell to the Southeastern Ceremonial Complex. *Southeastern Archaeology* 25: 1-5.

Kvamme, Kenneth L.

2006 Magnetometry: Nature's Gift to Archaeology. In *Remote Sensing in Archaeology: An Explicitly North American Perspective,* edited by Jay K. Johnson, pp. 205-234. University of Alabama Press, Tuscaloosa.

Lewis, R. Barry, Charles Stout, and Cameron B. Wesson

1998 The Design of Mississippian Towns. In *Mississippian Towns and Sacred Spaces: Searching for an Architectural Grammar,* edited by R. Barry Lewis and Charles Stout, pp. 1-22. University of Alabama Press, Tuscaloosa.

Lockhart, J.J. and Thomas J. Green

2006 The Current and Potential Role of Archaeogeophysics in Cultural Resource Management in the United States. In *Remote Sensing in Archaeology: An Explicitly North American Perspective,* edited by Jay K. Johnson, pp. 18-32. The University of Alabama Press, Tuscaloosa.

Mainfort, Robert C. and M. Kwas

1985 *Site Survey Sheet: Ames Mound Complex (40FY7).* Copy on File at the Tennessee Division of Archaeology, Nashville.

Mainfort, Robert C.

1986 *Pinson Mounds: A Middle Woodland Ceremonial Site.* Research Series No. 7, Tennessee Department of Conservation, Division of Archaeology, Nashville.

1992 The Mississippian Period in the West Tennessee Interior. In *The Obion Site. An Early Mississippian Center in Western Tennessee,* by Elizabeth Baldwin Garland, pp. 203-207. Report of Investigations 7, Cobb Institute of Archaeology, Mississippi State University, Starkville.

McNutt, Charles H.

2005 The Pinson Observatory. *Southeastern Archaeology* 24:142-164.

Mickelson, Andrew M.

2008 Recent Research at the Ames Mound Complex. An Early Mississippian site in Southwestern Tennessee. *Tennessee Archaeology* 3:201-218.

Mickelson, Andrew M. and Eric Goddard

2011 The Ames Site (40FY7): A Very Unobtrusive Mississippian Settlement Located in Southwestern Tennessee. *Tennessee Archaeology.* 5:157-172.

Milner, George R.

2004 *The Moundbuilders.* Thames and Hudson, London.

Morse, Dan F., J. Bennett Graham, and Richard R. Polhemus

1962 *Site Survey Sheet: Ames Mound Complex (40FY7).* Copy on file at the Tennessee Division of Archaeology, Nashville.

Nass, John P. and Richard Yerkes

1995 Social Differentiation in Mississippian and Fort Ancient Societies. In *Mississippian Communities and Households,* edited by J. Daniel Rogers and Bruce D. Smith, pp. 81-98. The University of Alabama Press, Tuscaloosa.

Orton, Clive

2000 *Sampling in Archaeology*. Cambridge Manuals in Archaeology. Cambridge University Press, Cambridge.

Pauketat, Timothy R.

2008 *Chiefdoms and Other Archaeological Delusions.* AltaMira Press. Lanham, MD.

Peterson, Drexel A.

1979 *An Archaeological Assessment of the Wolf River Watershed.* Report prepared for the United States Department of Agriculture, Soil Conservation Service.

Rafferty, Janet

1995 *Owl Creek Mounds: Test Excavations at a Vacant Mississippian Mound Center.* Cobb Institute of Archaeology, Report of Investigations 7, Mississippi State University.

Rogers, J. Daniel

1995 Dispersed Communities and Integrated Households: A Perspective from Spiro and the Arkansas Basin. In *Mississippian Communities and Households,* edited by J. Daniel Rogers and Bruce D. Smith, pp. 81-98. The University of Alabama Press, Tuscaloosa.

Schroeder, Sissel

2006 Walls as Symbols of Political, Economic, and Military Might. In *Leadership and Polity in Mississippian Society,* edited by Brian M. Butler and Paul D. Welch, pp. 115-141. Southern Illinois University, Carbondale.

Smith, Bruce D.

1978 *Mississippian Settlement Patterns.* Academic Press, Orlando.

Smith, Gerald P.

1996 The Mississippi River Drainage of Western Tennessee. In *Prehistory of the Central Mississippi Valley*, edited by Charles H. McNutt, pp. 97-118. The University of Alabama Press, Tuscaloosa.

Steponaitis, Vincas P. and Vernon J. Knight Jr.

2004 Moundville Art in Historical and Social Context. In *Hero, Hawk, and Open Hand: American Indian Art of the Ancient Midwest and South*, edited by Richard F. Townsend, pp. 167-181. Art Institute of Chicago, Chicago.

U.S. Department of Agriculture, Soil Conservation Service

1964 *Soil Survey: Fayette County, Tennessee.* Series 1960, No. 13. U.S. Government Printing Office, Washington, D.C.

Webb, William S.

1952 The Johnathan Creek Town. The University of Kentucky, Reports on Anthropology VIII (1). Department of Anthropology. University of Kentucky Press, Lexington.

Welch, Paul D.

1991 *Moundville's Economy.* University of Alabama Press, Tuscaloosa.

2006 *Archaeology at Shiloh Indian Mounds: 1899-1999*. University of Alabama Press, Tuscaloosa.

Wilk, Richard R. and Robert Netting

1984 Households: Changing Forms and Functions. In *Households: Comparative and Historical Studies of the Domestic Group*, edited by Robert Netting, Richard Wilk, and Eric Arnould, pp. 1-28. University of California Press, Berkeley.

Wilk, Richard R.

1984 Households in Process: Agricultural Change and Domestic Transformation among the Kekchi Maya of Belize. In *Households: Comparative and Historical Studies of the Domestic Group,* edited by Robert Netting, Richard Wilk, and Eric Arnould, pp. 217-244. University of California Press, Berkeley.

Appendix A. Artifact Assemblage Information for F1-U2

Artifact Type	*Total Count*	*Total Weight (g)*	*Average weight(g) per artifact*	*Percentage of Total Count*	*Percentage of Total Weight (g)*
Ceramic	520	713.66 g	1.37 g	*17%*	*16%*
Lithic	249	166.05 g	0.67 g	*8%*	*4%*
Sandstone	1,601	2,679.45 g	1.67 g	*52%*	*59%*
Daub	497	843.97 g	1.70 g	*16%*	*19%*
Historic	3	3.59 g	1.20 g	*0.1%*	*0.1%*
Bone	140	33.24 g	0.24 g	*5%*	*0.7%*
Charcoal	63	3.82 g	0.06 g	*2%*	*0.1%*
Other/Unknown	4	116.65 g	29.16 g	*0.1%*	*3%*
Total Overall	3,077	4,560.43 g	1.48 g		

F1-U2 Trench Assemblage	*Total Count*	*Total Weight (g)*	*Average Weight (g) per Artifact*	*Percentage of Count*	*Percentage of Weight (g)*
Ceramic	84	132.97 g	1.58 g	*11%*	*6%*
Lithic	46	34.43 g	0.75 g	*6%*	*3%*
Sandstone	552	501.94 g	0.91 g	*70%*	*44%*
Daub	104	484.46 g	4.66 g	*13%*	*42%*
Historic	1	1.40 g	1.40 g	*0.1%*	*0.1%*
Bone	27	7.26 g	0.27 g	*3%*	*0.6%*

Charcoal	31	2.22 g	0.07 g	*4%*	*0.2%*
Other	N/A	N/A	N/A	N/A	N/A
Total Overall	786	1,153.8 g	1.38 g		

F1-U2 Feature Assemblage	*Total Count*	*Total Weight (g)*	*Average Weight (g) per Artifact*	*Percentage of Count*	*Percentage of Weight (g)*
Ceramic	332	452.9 g	1.36 g	*19%*	*18%*
Lithic	141	86.47 g	0.61 g	*8%*	*3%*
Sandstone	895	1,674.24 g	1.87 g	*50%*	*66%*
Daub	282	185.37 g	0.66 g	*16%*	*7%*
Historic	N/A	N/A	N/A	N/A	N/A
Bone	97	21.62 g	0.22 g	*6%*	*0.9%*
Charcoal	26	1.12 g	0.04 g	*2%*	*0.04%*
Other/Unknown	3	114.18 g	38.06 g	*0.2%*	*5%*
Total Overall	1,776	2,535.19 g	1.43 g		

Appendix B. Artifact Assemblage Information for F1-U19

Artifact Type	*Total Count*	*Total Weight (g)*	*Average weight (g) per artifact*	*Percentage of Total Count*	*Percentage of Total Weight (g)*
Ceramic	181	422.89 g	2.34 g	*52%*	*39%*
Lithic	44	71.41 g	1.62 g	*13%*	7%
Sandstone	53	517.29 g	9.76 g	*15%*	*48%*
Daub	67	67.52 g	1.01 g	*19%*	*6%*
Historic	1	7.94 g	7.94 g	*0.3%*	*1%*
Total Overall	346	1,087.05 g	3.14 g		

F1-U19 Trench Assemblage	*Total Count*	*Total Weight (g)*	*Average weight (g) per artifact*	*Percentage of Total Count*	*Percentage of Total Weight (g)*
Ceramic	41	50.82 g	1.24 g	*64%*	*68%*
Lithic	10	5.37 g	0.54 g	*16%*	*7%*
Sandstone	2	4.59 g	2.3 g	*3%*	*48%*
Daub	11	13.59 g	1.24 g	*17%*	*6%*
Historic	N/A	N/A	N/A	N/A	N/A
Total Overall	64	74.37 g	1.16 g		

F1-19 Feature Assemblage	*Total Count*	*Total Weight (g)*	*Average Weight (g) per Artifact*	*Percentage of Count*	*Percentage of Weight (g)*
Ceramic	113	355 g	3.14 g	*67%*	*85%*
Lithic	7	15.96 g	2.28 g	*4%*	*4%*
Sandstone	N/A	N/A	N/A	N/A	N/A
Daub	48	46.83 g	0.98 g	*29%*	*11%*
Historical	N/A	N/A	N/A	N/A	N/A
Total Overall	168	417.79 g	2.49 g		

Appendix C. Artifact Assemblage Information for F1-U21

1 m x 1 m unit counts	Ceramic	Lithic	Daub	Sandstone	Historic	Total
U21_1	17	4	23	36	N/A	80
	21%	**5%**	**29%**	**45%**	**N/A**	
U21_3	5	8	4	30	3	50
	10%	**16%**	**8%**	**60%**	**6%**	
U21_5	12	6	15	22	1	56
	21%	**11%**	**27%**	**39%**	**2%**	
U21_7	10	5	2	56	N/A	73
	14%	**7%**	**3%**	**77%**	**N/A**	
U21_9	6	12	14	52	1	85
	7%	**14%**	**16%**	**61%**	**1%**	
U21_11	16	9	8	29	N/A	62
	26%	**15%**	**13%**	**47%**	**N/A**	
U21_13	9	10	N/A	30	N/A	49
	18%	**20%**	**N/A**	**61%**	**N/A**	
U21_15	4	5	1	10	N/A	20
	20%	**25%**	**5%**	**50%**	**N/A**	
U21_17	14	12	8	48	N/A	82
	17%	**15%**	**10%**	**59%**	**N/A**	
U21_19	7	15	19	19	2	62
	11%	**24%**	**31%**	**31%**	**3%**	

U21_21	15	11	12	57	1	96
	16%	**12%**	**13%**	**59%**	**1%**	
U21_23	31	22	18	109	2	182
	17%	**12%**	**10%**	**60%**	**1%**	
U21_25	17	28	148	24	N/A	217
	8%	**13%**	**68%**	**11%**	**N/A**	
All 1 m x 1 m units	163	147	272	522	10	1,114
	15%	**13%**	**24%**	**47%**	**0.9%**	

1 m x 1 m unit weights (g)	Ceramic	Lithic	Daub	Sandstone	Historic	Total
U21_1	7.44 g	7.78 g	7.43 g	44.86 g	N/A	67.51 g
	11%	**12%**	**11%**	**66%**	**N/A**	
U21_3	6.63 g	8.24 g	1.78 g	37.20 g	0.58 g	54.43 g
	12%	**15%**	**3%**	**68%**	**1%**	
U21_5	7.52 g	3.02 g	6.75 g	21.20 g	1.76 g	40.25 g
	19%	**8%**	**17%**	**53%**	**4%**	
U21_7	6.02 g	1.59 g	1.35 g	29.46 g	N/A	38.42 g
	16%	**4%**	**4%**	**77%**	**N/A**	
U21_9	3.86 g	4.65 g	10.04 g	25.74 g	0.52 g	44.81 g
	9%	**10%**	**22%**	**57%**	**1%**	
U21_11	9.27 g	4.33 g	3.03 g	23.48 g	N/A	40.11 g
	26%	**15%**	**13%**	**47%**	**N/A**	
U21_13	4.45 g	2.50 g	N/A	22.13 g	N/A	30.17 g
	15%	**8%**	**N/A**	**61%**	**N/A**	
U21_15	4.18 g	1.23 g	0.29 g	30.39 g	N/A	36.09 g
	20%	**25%**	**5%**	**50%**	**N/A**	
U21_17	9.43 g	3.75 g	7.58 g	30.94 g	N/A	51.70 g
	18%	**7%**	**15%**	**60%**	**N/A**	
U21_19	9.40 g	8.57 g	5.42 g	55.72 g	1.3 g	80.41 g
	12%	**11%**	**7%**	**69%**	**2%**	
U21_21	5.31 g	3.06 g	3.27 g	31.35 g	1.36 g	44.35 g
	12%	**7%**	**7%**	**71%**	**3%**	

U21_23	12.99 g	14.27 g	11.28 g	104.57 g	2.94 g	146.05 g
	9%	**10%**	**8%**	**72%**	**2%**	
U21_25	10.64 g	14.57 g	43.74 g	59.33 g	N/A	128.28 g
	8%	**11%**	**34%**	**46%**	**N/A**	
All 1 m x 1 m units	96.82 g	77.47 g	101.96 g	516.37 g	8.46 g	801.40 g
	12%	**10%**	**13%**	**64%**	**1%**	